APPENDIX

Water Quality Report on Impacts to Kawa Stream from Proposed Expansion of Hawaiian Memorial Park – July 2018

Prepared by: Element Environmental LLC

Kawa Stream Watershed Impact Analysis Report

Water Quality Report on Impacts to Kawa Stream from Proposed Expansion of Hawaiian Memorial Park Kaneohe, Oahu, Hawaii

Prepared for:

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July 2018

Executive Summary

This report evaluates the impacts to water quality in Kawa Stream resulting from the proposed expansion of the Hawaiian Memorial Park (HMP) into 53.45-acres of currently undeveloped forest land located adjacent to the existing cemetery. The flow and water quality of perched groundwater input and storm runoff to Kawa Stream and its tributaries was monitored over a 71-day period between December 11, 2017 and February 20, 2018. A cutthroat flume was installed just above the end of Lipalu Street to monitor the volume of ephemeral storm water runoff that flows in the drainageway within the undeveloped, forested watershed into which the proposed cemetery expansion will occur. Rating curves were also developed for the United States Geological Survey (USGS) gaging station located on the lower reaches of Kawa Stream. The mean concentration levels of nutrients (total phosphorous, total nitrogen and nitrates) and total suspended solids (TSS) at various monitoring locations within the Kawa stream watershed were determined by combining the analytical results obtained on samples collected during this and previous studies. In addition, a total of 42 samples of perched groundwater and stream water collected under groundwater and rainfall runoff dominant flow conditions were analyzed for pesticide content during this study.

Groundwater input was found to be the primary source of nitrate to Kawa stream. The total phosphorous, total nitrogen and pesticide (i.e. glyphosate) loads in the stream were determined to be related to particulate loading to the stream during rainfall runoff events. The vast majority of nutrients, TSS and pesticides leave the watershed during large, intense rainfall events. The storm event during the afternoon of 2/18/2018 contributed the majority of nutrient and sediment load to Kaneohe Bay during the 71-day monitoring period of this study. The maximum rainfall intensity measured at a tipping-rain gauge on the hillside above the cemetery during this storm event was 2.51 inches per hour (by comparison the 10 year-1 hour rainfall intensity for the Kaneohe area is 2.96 inches).

The water quality of runoff measured at the Lipalu flume during this study indicates that the runoff from the existing forested watershed is characterized by highly elevated levels of TSS, total nitrogen and total phosphorous compared to storm water generated elsewhere in the watershed that enters Kawa Stream. The draft preliminary engineering report for the proposed cemetery development calls for installation of retention basins with 12,500 cubic feet (93,500 gallons) of storage in the lower portion of the development that will improve the water quality of the storm water runoff currently exiting the property (Sam O. Hirota, 2018). These retention basins will lower the TSS, and to a lesser degree total nitrogen and total phosphorous loads, entering Kawa stream by retaining and treating (by settling) the first flush of runoff generated during the infrequent high-intensity rainfall events that initiate surface water runoff from the portion of the currently forested watershed that will be converted to cemetery use.

Introduction

There are plans to expand the size of the existing 80-acre HMP cemetery into an adjacent, makai 53.45-acre plot of undeveloped land to accommodate future burial sites as the existing cemetery is reaching capacity. Previous land uses on this undeveloped property included grazing and possibly agriculture (pineapple cultivation) use. Only 28.2 of the 53.45-acre expansion area would be used for cemetery use. The remaining 25.25 acres would consist of internal roadways (3-acres), open space (7.75-acres), and land for the establishment of a cultural preserve (14.5-acres). Small private structures will be placed throughout the cemetery grounds with special features, garden walls, walkways, and monuments similar to that present within other areas of the existing HMP. After grading of the undeveloped lot to establish appropriate slopes, the majority of the land would be landscaped with turf and would match the general appearance of the existing cemetery.

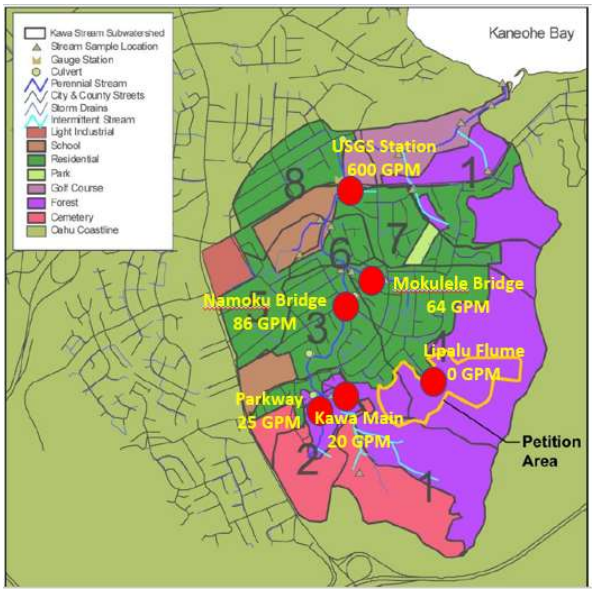
The watershed in which the cemetery expansion will occur does not have any perennial streams but does contain two drainageways that convey storm water runoff originating from the watershed during periods of heavy rainfall. Runoff within the watershed generally follows the existing topography and flows in an overall northwest direction toward the Pikoiloa Tract subdivision. The Pikoiloa subdivision does have a drainage system that collects storm water runoff from residences and roadways and channels this runoff into Kawa Stream and ultimately into Kaneohe Bay. The majority of runoff that will be generated from the proposed development currently flows into a large drainage culvert constructed just mauka of the end of Lipalu Street. The western end of the proposed development drains to a smaller drainage culvert located on Ohaha Place. This culvert receives runoff from the forested hillslope

located above Ohaha Place as well as from seepage from the area around a Plantation era well located within this watershed.

Project Site Description

Kawa Stream is a perennial stream composed of approximately 2.8 miles of main and tributary stream courses located within a 1.13 square mile (723.2 acre) watershed in Kaneohe, Hawaii. The contributory watershed has a maximum elevation of 938 feet (286 meters). On maps, the main course of Kawa Stream is depicted as originating within the Hawaii State Veteran's Cemetery. The stream has an average gradient of 11% before discharging into the southern portion of Kaneohe Bay. During dry periods of the year, the uppermost groundwater baseflow actually enters Kawa stream from the basin located below the HMP. The stream receives perched groundwater input and storm runoff that originates from both forested and urbanized areas that include two cemeteries (HMP and the adjacent Hawaii State Veteran's Cemetery), residential and commercial developments, schools and parks, a golf course, and a municipal sewer pumping station. The eastern edge of this watershed is delineated by the ridge of hills that separate Kaneohe from Kailua, and the shoreline runs from Kokokahi and BayView GolfPark on the east to Waikalua (an early Hawaiian fishpond) on the west .

Kawa Stream is a Class 2 inland water body. The objective of Class 2 waters is to protect their use for recreational purposes, the support and propagation of aquatic life, agricultural and industrial water supplies, shipping, and navigation. (Hawaii Administrative Rules §11-54-03). A Stream Bioassessment report prepared for Kawa Stream found that the stream does not in general provide good habitat for native aquatic organisms and does not support any substantial populations of native fish and crustaceans (Burr, 2001).



Kawa stream is perennial due to baseflow that originates from springs located throughout the watershed which are fed by shallow, likely discontinuous perched groundwater bodies. The watershed contains both upland forestland and comparatively impervious residential areas which (along with roadways) are estimated to cover approximately 40% of the total watershed (Oceanit 2002). The average volume of groundwater input to Kawa Stream above the USGS monitoring station site during the monitoring period evaluated during this study (December 2017 to February 2018) is estimated to be around 600 gallons per minute (GPM). The adjacent figure shows the flow rates measured in various portions of Kawa Stream and its tributaries on February 12, 2018 after five days of dry conditions. The stream flow measured at the Parkway site reflects the approximate volume of baseflow that originates from the basin located below the current HMP. A seepage run conducted on January 25, 2018 in the basin below the existing cemetery measured spring flow of 5 gpm in the slope below the cemetery's maintenance facility, 2 gpm from the nearby buried culvert that drains the cemetery and receives perched groundwater input and around 8 gpm of perched groundwater inflow across the course of the small stream as it flows from the spring and culvert to behind the recreational center at Parkway. Water samples collected during this and previous studies from various monitoring locations throughout the watershed after several days of no rain reflect the water quality of the perched groundwater rather than the water quality of rainfall runoff.

Kawa Stream TMDL

The Clean Water Act required the State of Hawaii to initiate a pollutant-specific water quality planning process that would identify impaired waters within the state. More than 30 streams on Oahu were initially identified by the State as water-quality impaired, primarily for exceeding standards for nutrients and suspended sediment (Henderson and Harrigan, 2002). The State contracted Oceanit Laboratories, Inc., and AECOS, Inc. to conduct a technical study of water pollution in Kawa Stream and to determine relationships between measured pollutant loads and State water

quality standards (Oceanit 2002). Based on the findings from this study, Kawa stream was included in the list of impaired streams for nutrients (total nitrogen and phosphorous), turbidity and suspended solids prepared by the Hawaii Department of Health in 2004 to comply with Sections (§) 303(d) and 305(b) of the Clean Water Act (HDOH 2004). The State of Hawaii continues to coordinate with stakeholders and government agencies to reduce nonpoint-source pollution under the United States Environmental Protection Agency's Total Maximum Daily Load (TMDL) program of the Clean Water Act.

The Oceanit study established TMDLs, which reflect the maximum rate at which Kawa Stream can receive certain pollutants (in this case, nutrients and sediments) without exceeding the State's water quality standards. This TMDL report concluded that excess nitrogen is the most common pollutant problem in the watershed. Excessive phosphorous and sediment loading within the stream occurred only during storm events. The study estimated that the largest source areas for the measured nitrogen and sediment loads was residential areas and cemetery lands (combined, about 68% and 65% of total loads, respectively), whereas the largest source areas for phosphorous loads were from forest land and residential areas (combined, about 67% of the total loads). One concern is that these pollutants could enhance unwanted algae growth within the Kawa stream and impact coral reef resources in the receiving waters of Kaneohe Bay. Kaneohe Bay is also listed on the 2004 303 (d) list for nutrients, nitrates/nitrites, NH_4 (ammonia), turbidity, *chlorophyll a* and enterococci. Kaneohe Bay provides important habitat for freshwater and marine species of importance to subsistence, commercial and cultural uses.

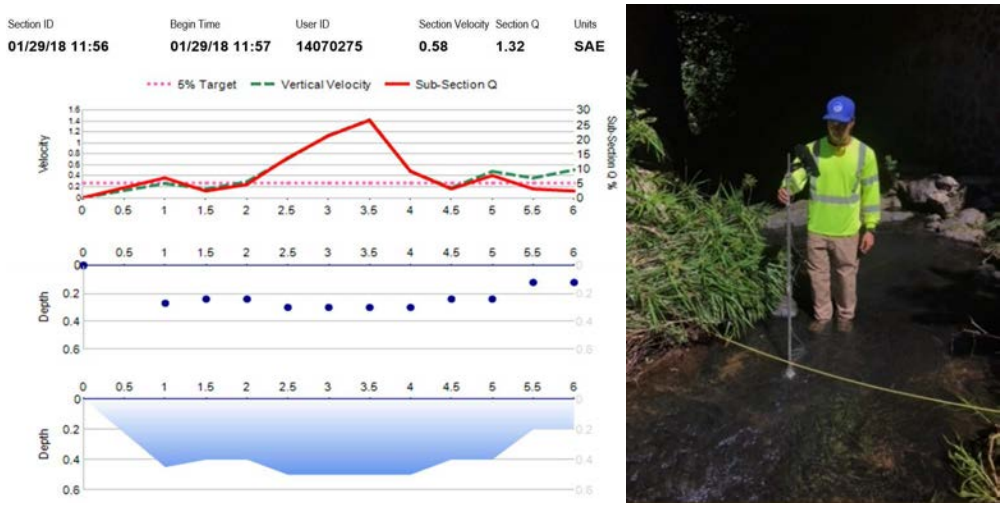
Monitoring Equipment Installation

A 108-inch long, 48-inch wide cutthroat flume was installed in early December 2017 in the main drainageway exiting the undeveloped watershed into which the proposed cemetery expansion will occur. This drainageway receives storm water runoff from upland areas during periods of high-intensity rainfall. The flume is located approximately 200 feet mauka of the large cement drainage culvert constructed at the end of Lipalu Street. A pressure transducer was installed in the stilling well of the flume on December 11 to allow continuous monitoring of ephemeral stream flow within this drainageway. A manual rain gauge was installed on the ridgeline between the existing Hawaiian Memorial Cemetery and the adjacent watershed into which the cemetery expansion will occur on December 11, 2017. A tipping rain gauge was installed at the same location on December 18, 2017. Th tipping rain gauge recorded every one hundredth of an inch of rainfall that fell along the ridgeline at the project site which allowed determination of rainfall totals and intensities associated with individual storm events during the 71 days of monitoring.

Wooden 108-inch length, 48-inch wide cutthroat flume and rain gauges installed within watershed

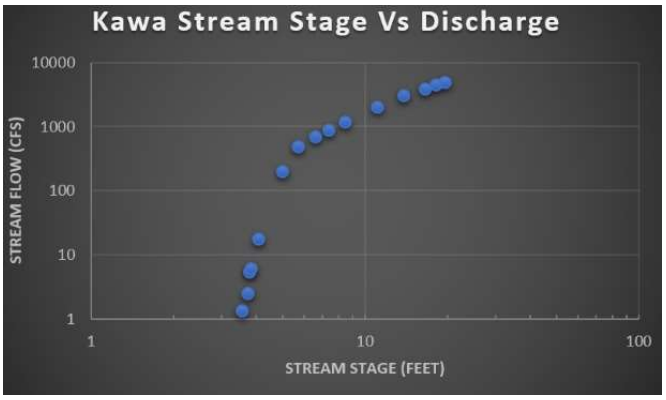
Flow Monitoring and Rating Curve Development

The United States Geological Survey (USGS) began real-time stream flow monitoring at a gaging station located just mauka of Kaneohe Bay Drive in October 2016. The USGS currently provides real-time stage (height of stream flow) data rather than flow volume estimates on their hydrologic website because a rating curve has not yet been developed for this monitoring station. During this study, we developed two rating curves for this gaging station by making a series of flow measurements of stream flow at different stream stages (stream height) and combining this information with other point measurements of stream flow made by the USGS at this station since 2012. The flow within the stream was measured using a Pygmy meter which measures stream flow velocity and stream depth at six-inch intervals along a selected cross-section of the stream located in the vicinity of the USGS gaging station.



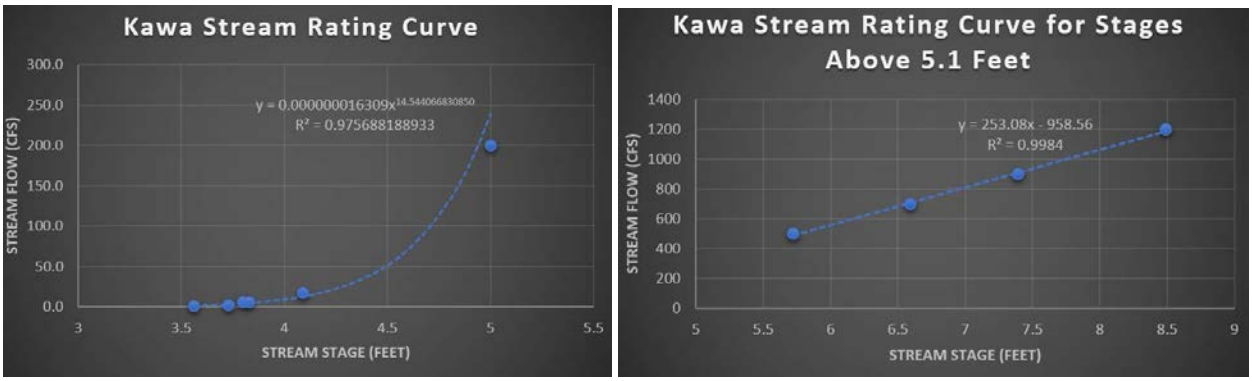
Measuring Stream Flow within Kawa Stream Using Pygmy Meter and Resultant Output from Measurements

The table and figure below contain and depict the existing data available for establishing a rating curve for the USGS monitoring station.



Flow (GPM)	Stage (Feet)	Flow (cfs)	Measurement	Date
Flow Measurements Made During Current Study				
593	3.56	1.3	Pygmy	1/29/2018
1110	3.73	2.5	Visual	2/15/2018
2455	3.8	5.5	Pygmy	2/15/2018
2715	3.83	6.1	Pygmy	2/15/2018
8000	4.09	17.8	Visual	2/14/2018
90000	5	200.5	Visual	2/14/2018
Prior USGS Flow Measurements at Current Monitoring Site				
224400	5.72	500	Visual?	3/12/2012
314160	6.59	700	Visual?	3/12/2012
403920	7.39	900	Visual?	3/12/2012
538560	8.49	1200	Visual?	3/12/2012
897600	11.07	2000	Visual?	3/12/2012
1346400	13.85	3000	Visual?	3/12/2012
1795200	16.63	4000	Visual?	3/12/2012
2019600	18.15	4500	Visual?	3/12/2012
2244000	19.59	5000	Visual?	3/12/2012

A break in slope is observed in the stream stage versus stream flow graph around a stage height of 5.1 feet. This stage height corresponds to a rise in stream level to a height where the stream expands to its maximum width between the hardened rock walls present along both sides of the stream at the USGS gaging station location. Because of this observed break in slope, two separate rating curves were developed to convert the stage readings measured at the USGS gaging station into stream flow values. For stage heights between 3.5 to 5.1 feet, a power equation relationship was developed for converting measured stage height into stream flow values. For stage heights above 5.1 feet, a linear equation relationship was developed to convert measured stage height values into stream flow values (see graphs below). The two photographs show the change in stream width that occurs in the vicinity of the USGS gaging station during low, baseflow conditions and at higher stage levels during storm events.



Rating Curve Equations Developed for Kawa Stream Gaging Station for Stage Heights Above and Below 5.1 Feet

Change in Kawa Stream Width Under Low Flow Conditions and Storm Flow Conditions at USGS Gaging Station

Spring, Perched Groundwater and Stream Sampling

Stream samples were collected for nutrient and total suspended solid (TSS) analysis from two primary locations during this study; the main stream course at the new USGS gaging station located just mauka of Kaneohe Bay Drive

and from the small groundwater fed tributary that enters the main course of Kawa Stream behind the Parkview recreation center. The USGS monitoring site receives groundwater input and stormwater runoff from the entire watershed located mauka of Kaneohe Bay Drive while the Parkview monitoring site receives groundwater input and stormwater runoff from the existing Hawaiian Memorial Cemetery and the adjacent residential community (Leleua Place and Lelelua Loop).

Perched groundwater was collected for nutrient and formaldehyde analysis from two locations during this study: a small spring (Cascade Spring) located in the hillslope below the maintenance yard at HMP and from an old cement collection structure (Plantation Well) located below the new most recent expansion of HMP. The cement collection structure is a twelve-foot deep vault that was likely constructed to capture shallow perched groundwater while the area was formerly used for cattle grazing or pineapple cultivation. Additional stream and perched groundwater samples were collected from these primary monitoring locations and additional sites located throughout the watershed during this study for pesticide analysis.

Perched Groundwater Sampling Sites: Plantation Well and Cascade Spring

USGS Kawa Stream Gauge Sampling Site and Maintenance Culvert Sampling Sites

Spring, Perched Groundwater and Stream Sampling Results

The mean concentration of nutrients and TSS measured during this study, ongoing USGS measurements, and previous Oceanit, and Hawaii Department of Health water quality studies (Oceanit 2002) at monitoring sites within the Kawa Stream watershed are summarized in the table below. In addition, four perched groundwater samples collected from the Cascade Spring and Plantation Well were also analyzed for formaldehyde. Formaldehyde was not detected in any of these samples at an analytical detection limit of 5 parts per billion.

Location	Flow Regime	Total Phosphorous	Total Nitrogen	Nitrate plus Nitrite	Total Suspended Solids	Sample Count
		mg/L	mg/L	mg/L	mg/L	
Perched Groundwater	Groundwater Dominant	0.11	1.7	1.29	12.1	5
Bayview Golf Course	Groundwater Dominant[1]	0.04	1.45	1.09	2.6	24
Bayview Golf Course	Runoff Dominant[2]	0.11	0.73	0.40	262.0	1
Kawa Stream-USGS	Groundwater Dominant	0.07	0.95	0.70	7.6	2
Kawa Stream-USGS	Runoff Dominant	0.90	2.10	0.25	189.2	22
Parkway	Groundwater Dominant	0.04	1.07	0.79	4.9	26
Parkway	Runoff Dominant	0.37	1.04	0.38	96.5	7
Lipalu Flume	Runoff Dominant	1.04	10.8	0.25	3,470	2

[1]Groundwater Dominant if Conductance >200 µS/cm or TSS < 20 mg/L

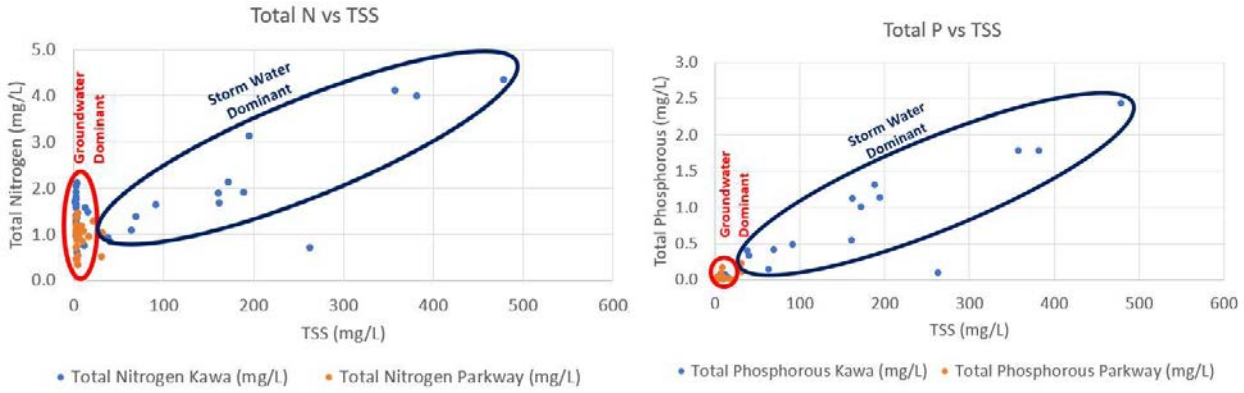
[2]Runoff Dominant if Conductance < 200 µS/cm or TSS > 20 mg/L

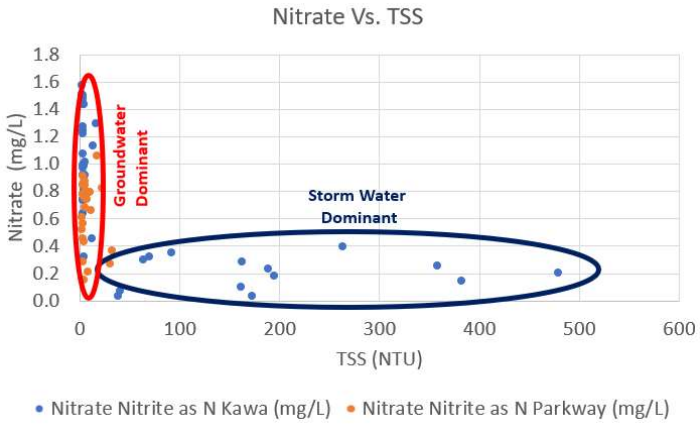
The perched groundwater samples include data collected from the Plantation Well, the Cascade Spring and the Maintenance Culvert during this study. The stream data from Bayview Golf Course was collected by the Hawaii Department of Health over a year of monthly stream monitoring conducted between September 1999 to September 2000 (Oceanit 2002). These samples were collected from a small bridge within Bayview Golf Course located about 1,000 feet north and downstream of the USGS monitoring station. The nutrient data for the Kawa Stream location was obtained from samples conducted by E2 during this study, from water quality sampling conducted at this location by the USGS since early 2017, and from data obtained during the Oceanit TMDL study (Oceanit, 2002). The nutrient data for the Parkway site was collected during this study, the Oceanit TMDL study and the yearlong HDOH monitoring conducted between 1999 and 2000. The nutrient data for the Lipalu Flume was collected during this study.

The nutrient data collected from the Bayview, USGS Gauge and Parkway sites was broken into two sets based upon the flow conditions present at the time the samples were collected. If the turbidity measured in the sample was less than 20 NTU and the electrical conductance above 200 μS/cm, then the sample was considered to be predominately composed of water that originated from groundwater input to the stream. If the turbidity of the sample was above 20 NTU and the electrical conductance below 200 μS/cm, then the sample was considered to be predominately composed of storm water runoff. The data in this table clearly shows that groundwater dominant baseflow within Kawa stream is characterized by relatively low concentrations of total phosphorous (0.04-0.11 mg/l) and total suspended solids (4.9-12 mg/l), intermediate concentrations of total nitrogen (0.95-1.7 mg/l) and somewhat elevated concentration levels of Nitrate plus Nitrite (0.70-1.29 mg/l). Runoff dominated stream samples tend to have somewhat elevated concentrations of total phosphorous (0.11-1.04 mg/l), elevated concentration levels of total suspended solids (96.5-3,470 mg/l), elevated concentrations of total nitrogen (1.45-10.8 mg/l) and comparatively low concentration levels of Nitrate plus Nitrite (0.25-0.40 mg/l). The photo below visually depicts the range in turbidity of the stream and tributary samples collected from throughout the watershed during the storm event on 2/7/2018 that lasted from 12:30 to 19:15.

2/7/18 Storm Samples (L to R): Kawa@12:53; Kawa@13:35; Mokulele Bridge@13:40; Parkway Bridge@13:46; Parkway@13:52; Lipalu Flume@14:00; Kawa@14:10

The following graphs depict the relationship between nutrients (Total Nitrogen, Nitrate and Total Phosphorous) and total suspended solids measured at the USGS Kawa Stream gaging site and behind the Parkway Recreational Center. The data plotted on the left side of these variation diagrams (TSS from 0 ~ 25 mg/l) represent stream samples that predominately originated from perched groundwater input (which are characterized by generally low TSS concentrations, see previous table of mean TSS values measured in the watershed under groundwater and runoff dominant conditions) while the higher TSS concentration data represent samples composed predominately of storm water runoff.





The nitrate versus TSS graph clearly indicates that groundwater is the primary source of nitrates to Kawa Stream. The strong correlation observed between total phosphorous concentrations and total suspended sediment indicates that the increasing concentrations of phosphorous are likely related to particulate loading to the stream during rainfall runoff events. The increasing total Nitrogen concentrations and low nitrate concentrations measured in samples containing high concentrations of TSS suggest that increasing concentrations of inorganic nitrogen are also related to particulate loading to the stream during rainfall runoff events. The fact that the samples collected from the Parkway site plot along the same variation trends as the Kawa Stream data suggest that the nutrient and TSS contribution to Kawa Stream from the existing cemetery are not elevated compared to the contributions of these constituents received from the urban portion of the watershed.

The total phosphorous, total nitrogen and total suspended solids concentrations present in the runoff measured at the Lipalu Flume from the undeveloped watershed are elevated in comparison to the concentrations of these constituents measured elsewhere throughout the watershed. The total suspended solid concentrations present in the runoff from this undeveloped forestland is particularly elevated compared to concentrations measured elsewhere, including the Parkway monitoring site which receives runoff from the existing cemetery. The elevated concentrations may reflect the higher amounts of rainfall and rainfall intensity required to initiate flow within this

forested watershed. The photographs below show the turbid, chocolate-brown runoff that passed through the Lipalu flume during the storm event on 2/5/2018.

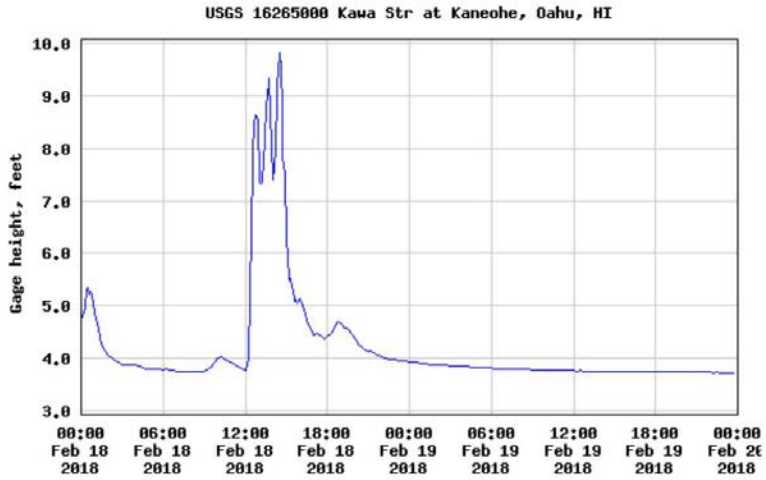
Turbid Runoff at Lipalu Flume on 2/5/2018 around 15:30

Kawa Stream and Lipalu Flume Flow Analysis

The volume of stream and runoff flow at the Lipalu Flume and USGS gaging station were continuously monitored from December 11, 2017 to February 18, 2018 and February 20, 2018, respectively. The volume of stream flow at the USGS station was determined by downloading the 15-minute stage values for this station for this period from the USGS website and converting the recorded stage values into flow volumes using the two rating curves developed during this study. The volume of storm water runoff at the Lipalu Flume during this period was determined by downloading the pressure transducer data collected from the stilling well in the flume. The transducer was programmed to measure water levels in the stilling well at one-minute intervals. The water level heights measured in the flume were then converted to water flow rates using the rating curves developed for the 108-inch long by 48-inch wide flume that was installed in this drainageway. The monitoring period at the Lipalu Flume was terminated at noon of February 18, 2018 for this analysis since the large storm event that began shortly after noon on February 18 partially destroyed the Lipalu Flume just over two hours later. The pressure transducer at the flume recorded a water level of over 4.55-foot height shortly before the stilling well was uplifted and displaced and the side walls at the back end of the flume collapsed around 14:20. At the time of its collapse, the water level at the flume was over 1.5 feet higher than the sidewalls of the flume. A three-foot high level in the flume is associated with a flow rate of 80.4 cfs, or over 36,000 gallons per minute. It is likely that the peak flow volume during this intense storm was on the order of 200 cfs. The flow measured at the USGS gaging station rose from 10 cfs at 12:15 to 1,000 cfs at 12:30 during the initial intense period of rainfall associated with this storm.

Kawa stream is a perennial stream and is fed by perched groundwater input during dry periods of the year. The drainageway monitored by the Lipalu Flume only flow during large or high-intensity rainfall events. During the 71-

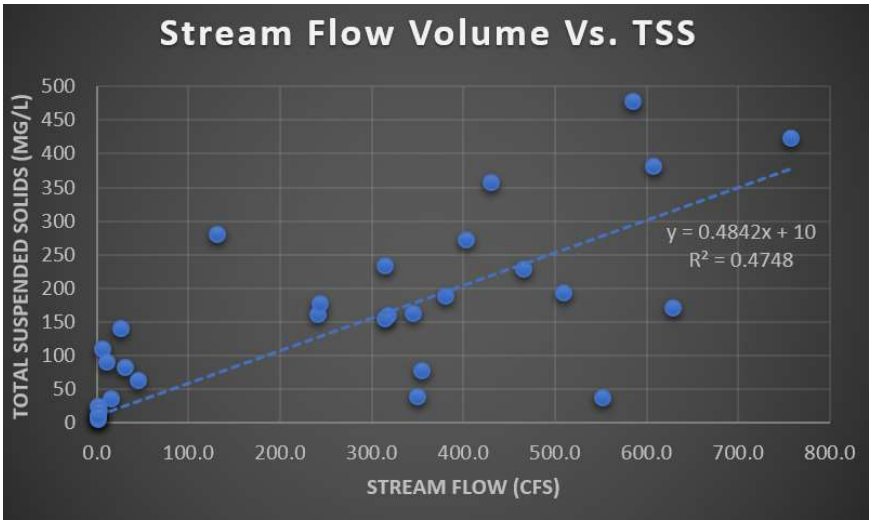
day monitoring period, runoff was measured at the Lipalu Flume on the following nine days: 12/26/17, 1/27/18, 2/4/18, 2/5/18, 2/7/18, 2/14/18, 2/15/18, 2/17/18 and 2/18/18. From December 11, 2017 to the morning of February 20, 2018, a total of 304 million gallons of water passed the USGS gaging station. A total of 203 million gallons of water passed the USGS gaging station between December 11, 2017 and noon February 18, 2018, just prior to the large storm event that destroyed the LIpalu Flume.

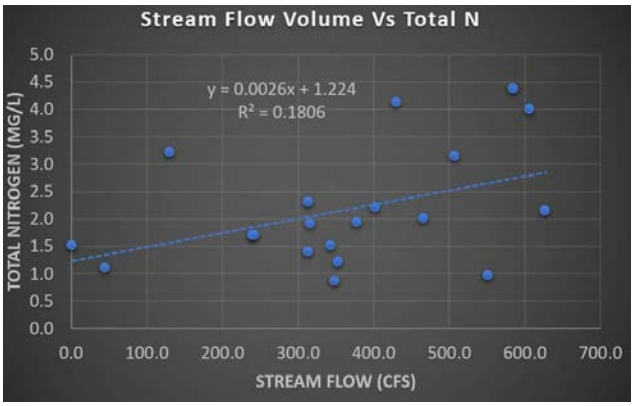


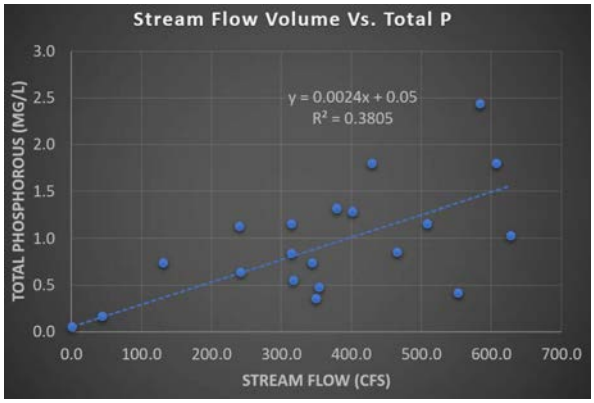
2/18/18 Storm Hydrograph and Resultant Damage to Lipalu Flume Where the Depth of Water Exceeded 4.5 Feet

Nutrient and Total Suspended Solids Runoff Analysis

The nutrient and total suspended loads that left the watershed was calculated using the flow and water quality data collected at the USGS monitoring station. Regressions were run between the total nitrogen, total phosphorous and total suspended solid concentrations measured in stream water at this monitoring site as a function of the stream flow (based on the stage level measured at the gaging station). The resulting variation diagrams are depicted below along with the linear regression equations and associated coefficient of determination, or r-squared values. The r-squared value is a statistical measure of how close the data fit the regression line.







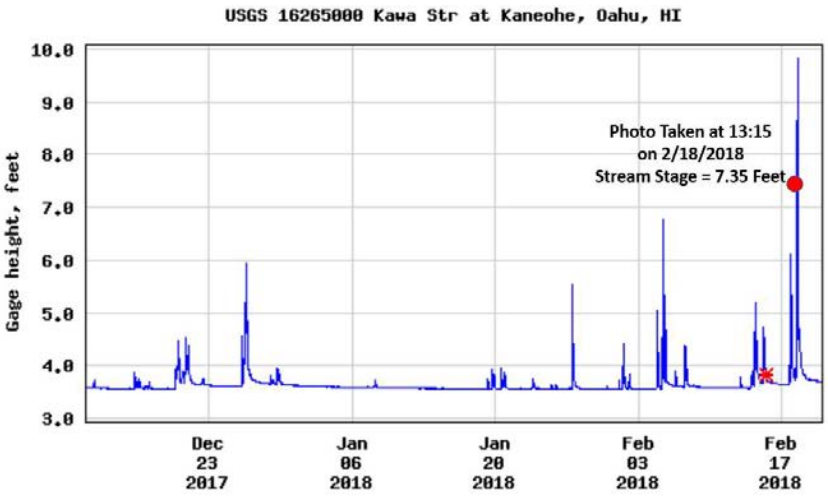
Relationship Between Stream Flow and Nutrient and TSS Concentrations at Kawa Stream Gaging Station

These regression equations were used to estimate the mass of total Nitrogen, total Phosphorous and TSS that passed by the USGS gaging station during the 71-day monitoring period between December 11, 2017 and the morning of February 20, 2018. A total of 304 million gallons of water flowed past the USGS gauge during the monitoring period. Using the regression equations developed in the variation diagrams above, it is estimated that 232,966 kilograms (256.8 tons) of suspended solids, 2,599 kilograms of total nitrogen (2.9 tons) and 1,155 kilograms of total phosphorous (1.3 tons) were entrained in this water passing the gauging station during the monitoring period. The vast majority of the sediment and nutrient loads were carried in Kawa Stream during nine storm events that occurred during the monitoring period. The table below summarizes streamflow and the estimated mass of TSS and total Nitrogen and Phosphorous associated with each storm event.

Storm Date/Time Start	Storm Date/Time End	Time Interval Streamflow (gal)	Mass of TSS (kg)	Mass of Total N (kg)	Mass of Total P (kg)
12/19/17: 17:00	12/21/18: 5:00	8,387,379	624	41	3
12/26/17: 10:30	12/27/17: 0:00	39,200,912	20,998	286	104
1/27/18: 13:00	1/27/18: 18:30	7,876,324	3,906	56	19
2/4/18: 20:30	2/5/18: 0:00	2,466,395	634	14	3
2/5/18: 6:30	2/5/18: 19:00	17,629,921	12,247	144	61
2/7/18: 12:30	2/7/18: 19:15	1,664,682	111	8	1
2/14/18: 7:00	2/14/18: 20:00	10,110,376	2,416	58	12
2/17/18 21:00	2/18/18 5:00	26,728,954	15,565	202	77
2/18/18 12:00	2/19/18 1:00	96,911,874	172,127	1,354	853
Total Storm Flow and Mass		210,976,816	228,628	2,162	1,134
Total Flow and Mass of Constituents in Kawa Stream from 12/11/17 to 2/20/18		304,270,034	232,966	2,599	1,155
Percentage of Flow and Constituent Mass During Nine Rainfall Events		69.3%	98.1%	83.2%	99.2%
Percentage of Flow and Constituent Mass During Rainfall Event that Started Around Noon 2/18/18		31.9%	73.9%	52.1%	73.9%

While 69.3 percent of the stream flow occurred during these nine storm events, 98.1 percent of the suspended sediment, 99.2% of the total phosphorous load and 83.2 percent of the total nitrogen load occurred during these nine discrete rainfall-runoff events. The USGS has observed that single storm events may deliver the equivalent of years, even decades, of the pollutant loads received by coastal waters over time under less extreme weather conditions. During a three-year sediment yield study of the Waikele watershed between 2007 and 2010, a single

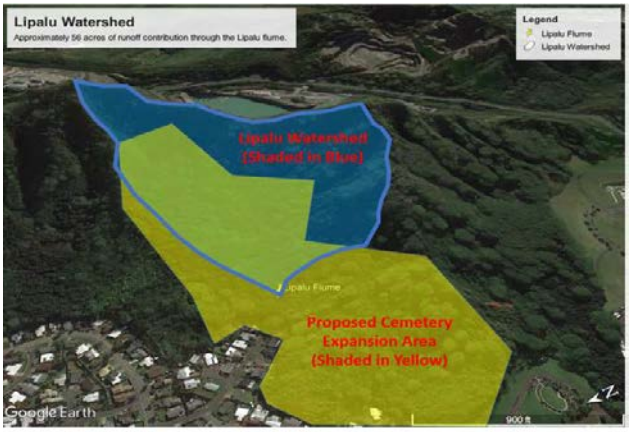
storm event on December 11, 2008 accounted for more than 90 percent of the three-year suspended-sediment yield from the watershed (Izuka, 2012). The same phenomenon is observed in the Kawa watershed. The intense rainfall event that began around noon on 2/18/2018 accounted for roughly 74 percent of the total suspended sediment yield and total phosphorous load and 52 percent of the total nitrogen load measured over the entire 71-day monitoring period. As previously mentioned, the stream flow at the USGS gaging station rose 100-fold (from 10 to 1,000 cfs) in a fifteen-minute period of time during this storm. The resultant raging stream flow undoubtedly scoured the un-hardened portions of Kawa Stream leading to changes in the size, shape and composition of the channel. As a result, these large episodic storm events produce the vast majority of sediment and nutrient loads that enter Kaneohe Bay from Kawa Stream.



Kawa Stream Hydrograph During 71-Day Monitoring Period / Photo Taken at 13:15 During 2/18/18 Storm Event

Impact to TMDL from Proposed Cemetery Expansion

The storm water runoff data collected from the Lipalu Flume can be used to evaluate the future impact to suspended sediment and nutrient loads that exit the watershed as a result of the proposed cemetery expansion. The cemetery expansion is being designed with retention/detention basins that will capture and treat the runoff generated from the developed cemetery lands (Sam O. Hirota, 2018). The proposed expansion involves converting a 53.45-acre area from undeveloped forested land use to cemetery use. The watershed that contributes flow to the Lipalu flume is estimated to be approximately 56-acres in size, approximately half of which will be covered by the proposed cemetery expansion. The one-hour, 100-year design storm event for the Kaneohe area is around 4.5 inches/hour (City and County of Honolulu, 2000). The largest storm during the study monitoring period was the 2/18/18 event that started just after noon. The highest one-hour rainfall total associated with this runoff event was 2.51 inches which fell between 12:05 and 13:05 on 2/18/18. The highest ten-minute rainfall intensity measured during this storm was 0.57 inches which fell at the beginning of this storm event between 12:05 and 12:15. This pulse of rain led to the measured streamflow in Kawa stream to increase from 10 to 1,000 cfs in fifteen minutes at the USGS gaging station (largely due to runoff from the impervious surfaces (roofs and roadways) within the lower portions of the watershed). The current engineering design for the cemetery expansion calls for installation of 12,700 cubic feet



Portion of Contributory 56-Acre Watershed to Lipalu Flume Covered by Proposed Cemetery Expansion

(~95,000 gallons) of permanent retention/detention structures that will be used to temporarily store and infiltrate surface water runoff. The engineering analysis estimates that the detention/retention basins that will be constructed will reduce the volume of discharge associated with the design 10 year -1hr and the 100 year -1hr storm event by around 5.5% from the areas within the watershed that will be developed into a cemetery (Sam O. Hirota, 2018).

The table below summarizes the storm runoff volumes measured at the Lipalu Flume during the monitoring period. The large storm on 2/18/2018 led to the partial collapse of the flume around 14:20 as the water level in the drainage way reached about 4.5 feet height (1.5 feet above the top of the flume). Thus, the flow data and mass estimates of nutrient and suspended sediments for this storm event are not accurate but are provided to show that the volume of runoff from this single storm dwarfed the volume of runoff generated during the previous eight runoff events. Based upon the hydrograph measured at the USGS gaging station on Kawa Stream and the rainfall recorded during this storm event, it is likely that storm runoff continued to flow through the damaged flume for another four to six hours during this storm event and that the actual volume of storm runoff related to this storm was likely on the order of five to eight million gallons (or 3 to 6 times the total flow of all the previous runoff events during the monitoring period combined).

Flow Date / Time Start	Flow Date / Time End	Event Rainfall (inches)	Time Interval Streamflow (gal)	Mass of TSS (kg)	Mass of Total N (kg)	Mass of Total P (kg)	Notes
12/26/2017 11:15	12/26/2017 20:01	3.72	206,339	2,710	8.4	0.8	Less than 0.1" within 72hrs
1/27/2018 13:56	1/27/2018 14:36	1.03	17,126	225	0.7	0.1	Less than 0.1" within 72hrs
2/4/2018 21:24	2/4/2018 21:43	0.36	7,874	103	0.3	0.0	Less than 0.1" within 48hrs
2/5/2018 6:32	2/5/2018 16:49	1.24	202,757	2,663	8.3	0.8	
2/7/2018 13:23	2/7/2018 17:24	0.6	41,912	551	1.7	0.2	
2/14/2018 7:24	2/14/2018 17:19	1.6	208,783	2,742	8.5	0.8	Less than 0.1" within 48hrs
2/15/2018 4:33	2/15/2018 13:01	0.89	219,222	2,880	9.0	0.9	
2/17/2018 20:10	2/18/2018 7:24	2.26	542,017	7,120	22.2	2.1	
Total Measured Flow			1,446,030	18,994	59.1	5.7	
2/18/2018 12:24	2/18/2018 14:20	6.95	2,563,491	33,672	104.8	10.1	***Flow Exceeded Flume Boundaries, Data Is Not Accurate***

The contribution of streamflow, total suspended solids and nutrients generated from the watershed in which the cemetery expansion will occur for the monitoring period between 12/11/2017 and noon on 2/18/2018 (before the large storm that destroyed the flume hit) is calculated in the table above. The measured volume of runoff generated by this watershed (1,446,030 gallons) represent approximately 0.71% of the total water flow measured at the USGS gaging station on Kawa stream during the same abbreviated monitoring period (202,958,400 gallons between 12/11/2017 and noon 2/18/2018). The TSS, total nitrogen and total phosphorous loads measured in Kawa stream between 12/11/2017 and noon 2/18/2018 were 60,643, 1,225 and 301 kilograms, respectively. Thus, the total suspended solid load leaving the watershed monitored by the Lipalu flume represents about 31.3% (18,994 kg/60,643 kg) of the TSS load measured at the USGS gaging station during the abbreviated monitoring period up to noon of 2/18/2018. By comparison, this watershed contributed 4.8% (59.1 kg/1,225 kg) and 1.9% (5.7 kg/301 kg) respectively of the total nitrogen and total phosphorus mass measured at the USGS gaging station during this same abbreviated monitoring period.

The proposed 53.45-acre cemetery expansion load will reduce the sediment and nutrient loads leaving the portion of the existing forested watershed that is converted to cemetery use by treating the first flush of runoff generated

during high-intensity rainfall events in retention/detention basins designed with 12,500 cubic feet (93,500 gallons) of storage capacity. The exact amount of sediment and nutrient reduction that will occur on an annual basis will depend on the timing, size (rainfall amount) and intensity of the specific rainfall events that occur during any given year as well as the infiltration capacity of the detention/retention basins ultimately installed.

Pesticide Analysis

A stream water sample was collected from Kawa Stream by the United States Geological Survey (USGS) on February 11, 2017 as part of the 2016 Interagency Pesticide Monitoring Initiative established between the State of Hawaii Department of Agriculture and the USGS. This sample was collected during the beginning of a moderately heavy rainfall event where the USGS gauge had reached a stage of 5.29 feet associated with 380 cfs of stream flow. The table below shows the pesticide concentrations detected in the filtered sample collected from Kawa Stream on 2/11/17.

Pesticide	Detected Concentration	Detection Limit	Pesticide Usage
	ng/liter	ng/liter	
2,4-D	**208**	**62**	2,4-D is one of the oldest and most widely available herbicides in the world, having been commercially available since 1945. It can be found in numerous commercial lawn herbicide mixtures, and is widely used as a weedkiller on cereal crops, pastures, and orchards. Over 1,500 herbicide products contain 2,4-D as an active ingredient.
Imazaquin	**165**	**18**	Imazaquin is primarily used as a herbicide to control weed growth on lawns and turf fields.
Diuron	**87.5**	**5**	Diuron is an herbicide that is used as a spray for selective control of weeds in certain crops and for nonselective weed control on non-cropland areas. Diuron may be applied to soil prior to emergence of weeds to control susceptible weed seedlings for an extended period of time.
Fipronil	**55.1**	**4**	Fipronil is a broad-spectrum insecticide that belongs to the phenylpyrazole chemical family. Because of its effectiveness on a large number of pests, fipronil is used as the active ingredient in flea control products for pets and home roach traps as well as field pest control for corn, golf courses, and commercial turf.
Carbaryl	**6.7**	**5.6**	Carbaryl (1-naphthyl methylcarbamate) is a chemical in the carbamate family used chiefly as an insecticide.

E2 had originally proposed analyzing stream and groundwater samples collected during this project for the herbicide Glyphosate using an enzyme-linked immunosorbent assay (ELISA) method. Glyphosate (Roundup) was selected for analysis since it is the world's most widely used broad-spectrum herbicide, accounting for about 25% of the global herbicide market. Due to its high usage, glyphosate tends to be ubiquitous in the environment and our food supply. Since the detected pesticides 2,4-D and Diuron can also be analyzed using ELISA, it was decided to expand the pesticide analyses to add these two pesticides that were detected in the USGS sample collected from Kawa Stream.

The USGS previously tested surface waters for pesticides between 1999 to 2001 in three streams (Waikele, Manoa and Waihee) on the island of Oahu (Anthony et al., 2004). Stream samples were collected during dry periods (base flow conditions) and during wet periods with storm runoff. Diuron and 2,4-D were detected in stream samples collected from both Waikele and Manoa streams during this study. These pesticides were not detected in Waihee Stream.

The State of Hawaii Department of Health collected surface water samples from 24 sites statewide for pesticide analysis between December 2013 and January 2014 (HDOH 2014). Diuron was detected in Waikele and Manoa Streams while 2,4-D was detected in Waikele Stream during this study. Glyphosate was detected in water samples collected from three of the seven sampling sites: Manoa stream on Oahu, a taro patch in Hanalei, Kauai and in an agricultural ditch located in the Mana Plain on Kauai. Co-located sediment samples were collected from the seven stream sampling sites during this study. Glyphosate was detected at concentrations ranging from 6.8 to 1,100 µg/kg in all seven stream bed sediment samples collected.

The Surfrider Foundation conducted repetitive sampling at a number of streams located on the islands of Kauai and Oahu in 2016 and 2017. All the stream samples collected were analyzed for atrazine and glyphosate concentrations

using an ELISA method that allows these pesticides to be detected at part per trillion concentration levels. Glyphosate was detected in 60 percent of the stream samples collected at concentrations ranging from 70 to greater than 4,000 ng/L (parts per trillion). Sediment samples were also collected from a subset of these sites. Glyphosate was detected in 74% of the sediment samples collected at concentrations ranging from 33 to 5,500 µg/kg (parts per billion). The table below shows the concentration of these three pesticides (diuron, 2,4-D, and glyphosate) that have been detected in Hawaiian streams during previous studies along with the concentration of diuron and 2,4-D measured in Kawa Stream by the USGS. It should be noted that these pesticides are not always detected (see detection frequency values in table) and that the detected values are present at trace levels, typically in the low to mid-part per trillion concentration levels. In order to put the detected pesticide concentrations in perspective, the table includes concentration levels of glyphosate that have been measured in common beers and wines sold in Germany and the United States (Munich Environmental Institute, 2016; Glaze et al., 2017). The concentration levels of glyphosate in beers and wines are typically a couple of orders of magnitude higher (part per billion levels) than the levels commonly detected in Hawaiian streams. However, the German Federal Institute for Risk Assessment (*Bundesinstitut für Risikobewertung*, BfR) concluded that the highest glyphosate concentration detected in German beer (30 parts per billion) does not constitute a risk to human health and that an adult would need to drink 1,000 liters of beer in a single day for these levels of glyphosate to pose a health risk.

Pesticide	Detected Concentration Range (ng/L)	Detection Frequency	Detection Limit (ng/L)	Number of Samples	Locations Where Pesticide Was Detected	Source
Diuron	10 – 180	23%	10	30	Waikele and Manoa Streams	Anthony et al., 2004
Diuron	20(E) - 70	13%	40	24	Waikele and Manoa Streams	HDOH, 2014
Diuron	88	100%	5	1	Kawa Stream	USGS, 2017
2,4-D	90 – 100	10%	80	30	Waikele and Manoa Streams	Anthony et al., 2004
2,4-D	80 - 90	4%	60	24	Waikele Stream	HDOH, 2014
2,4-D	208	100%	62	1	Kawa Stream	USGS, 2017
Glyphosate	30 – 110	43%	20	7	Oahu: Manoa Stream; Kauai: Hanalei Taro Field, Mana Plain Agricultural Ditch	HDOH, 2014
Glyphosate	70 - > 4,000	60%	75	55	Oahu: Manoa, Honoululi, Kaupuni and Waialae Streams; Kauai: Hanamaulu, Hanapepe, Mahaulepu, Mana Plain Agricultural Ditch	Gray and Heskett, 2018
Comparison of Glyphosate Concentrations Measured in Streams to Concentrations Measured in Domestic and Foreign Beers and Wines						
Glyphosate	460 – 29,700	100%	200	14	14 Most Popular Beers Sold in Germany	Munich Environmental Institute, 2016
Glyphosate	380 – 196,000	95%	380	112	Domestic and imported Beers purchased in Philadelphia, Pennsylvania	Glaze et al., 2017
Glyphosate	2,600 – 29,000	100%	380	30	Red (cabernet, merlot) and white (chardonnay, pinot grigio) wine purchased in Philadelphia, Pennsylvania	Glaze et al., 2017

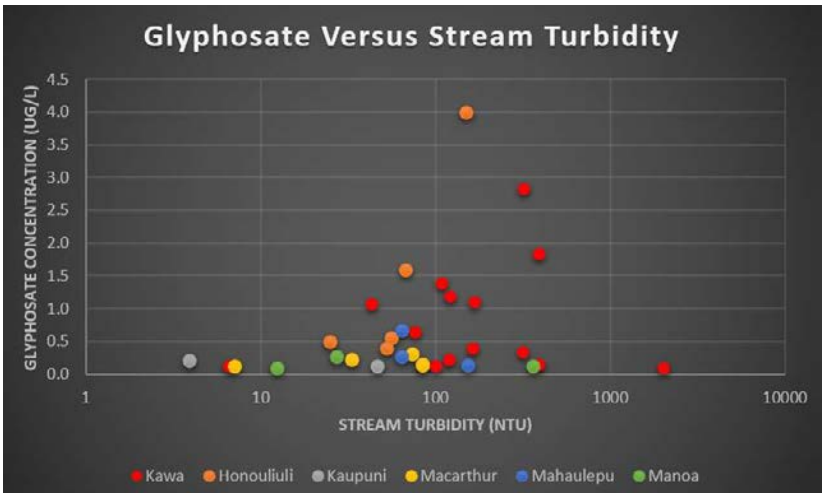
A total of 42 primary stream and groundwater samples collected during this study were analyzed for Glyphosate, Diuron and 2,4-D using ELISA. The water quality parameters associated with these samples are compiled in the appendix to this report. The table on the following page summarizes the concentration levels of pesticides detected in these 42 samples along with their frequency of detection. Glyphosate was the most commonly detected pesticide (15 detections out of 42 primary samples). Diuron was detected in 7 of the 42 primary samples analyzed while 2,4-D was only detected in a single primary sample analyzed. The pesticides were most commonly detected in stream samples collected under rainfall runoff conditions when the total suspended solid concentrations tended to be elevated. This suggests that the source of the detected pesticides is from pesticide contaminated sediments that either get transported into Kawa Stream during rainfall events or are already present in the alluvial deposits located adjacent to the stream that get resuspended into the stream by scouring of these deposits during periods of high

stream flow. The detected concentration levels of glyphosate are similar at the Parkway monitoring site which receives runoff from the existing cemetery, as were measured at the Kawa Stream monitoring site, that receives runoff from the entire watershed. This suggests that the input of glyphosate into the stream from the cemetery is broadly similar to the input of glyphosate from the residential communities that provide runoff to Kawa Stream. The generally trace concentrations of Diuron detected may reflect residual pesticide input to the stream from prior agricultural usage of the area, based upon the detection of this pesticide in runoff from the currently undeveloped watershed at the Lipalu Flume.

Location	Flow Regime	Glyphosate		Diuron		2,4-D		Sample Count
		Detect Range (ng/L)	Detect Frequency	Detect Range (ng/L)	Detect Frequency	Detect Range (ng/L)	Detect Frequency	
Perched Groundwater[1]	Groundwater Dominant	121 – 1,072	25%	1 J	13%	< 1,000	0%	8
Kawa Stream	Groundwater Dominant[2]	772	10%	< 1	0%	< 1,000	0%	10
Kawa Stream	Runoff Dominant[3]	90 – 1,836	89%	4 - 6 J	22%	3,050	11%	9
Parkway	Groundwater Dominant	< 1	0%	< 1	0%	< 1,000	0%	4
Parkway	Runoff Dominant	343 - 2,831	43%	1-1,293	29%	< 1,000	0%	7
Lipalu Flume	Runoff Dominant	< 1	0%	14 - 21 J	50%	< 1,000	0%	4
J: Estimated value								
[1]Perched groundwater includes samples collected from Cascade Spring, Maintenance Culvert and Plantation Well								
[2]Groundwater if Conductance >200 µS/cm or TSS < 20 mg/L								
[3]Runoff impacted if Conductance < 200 µS/cm or TSS > 20 mg/L								

Glyphosate was detected in all four stream samples collected from Kawa Stream at the USGS gaging station between 6:40 and 16:05 on 2/5/2018 at concentrations ranging from 120 to 1,098 ng/L. Extrapolating the glyphosate data measured in these four samples over the entire duration of this storm event allows an estimate of the total mass/volume of glyphosate that travelled past the USGS gaging station. The total mass of glyphosate in the roughly 17.6 million gallons of runoff that occurred during this storm event is estimated to be 12.9 grams, or 7.6 milliliters (a little less than a tablespoon), of glyphosate. In comparison, the total mass of TSS, total nitrogen and total phosphorous associated with this runoff event was 12,247, 144 and 61 kilograms, respectively.

The figure below plots the glyphosate data measured during this study along with glyphosate concentrations measured in various streams on the islands of Oahu and Kauai during the Surfrider study as a function of the turbidity of the sample (Gray and Heskett, 2018). This graph shows that there is a lot of scatter in the existing data but that samples that contain greater than 0.5 part per billion glyphosate tend to be moderately to highly turbid samples (> 50 NTU). This finding is consistent with the common detection of glyphosate in stream bed sediments (100% of sediment samples in HDOH study and 74% of sediment samples in the Surfrider study) which supports the hypothesis that the source of the glyphosate is resuspension of sediments contaminated with glyphosate during storm runoff events.



Relationship Between Measured Glyphosate Concentration and Stream Turbidity

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Appendix A

Water Quality Data Obtained During Study

Pesticide Samples in 4oz Boston Round Ambers			Formaldehyde (mg/L)	Glyphosate (µg/L)	Diuron (µg/L)	2,4-D (µg/L)	Total Nitrogen (mg/L)	Nitrate Nitrite as N (mg/L)	Total Kjeldahl Nitrogen (mg/L)	Total Phosphorous (mg/L)	Total Suspended Solids (mg/L)	Visual Flow Rate Estimate (GPM)	USGS Stage Height (Feet)	Temperature (°C)	Specific Conductance (mS/cm)	Salinity	pH	Turbidity (NTU)	Dissolved Oxygen (mg/L)
Sample Site	Date	Time																	
Maintenance Culvert	12/18/2017	16:05		< 0.001	< 0.001	< 1.0					13								
Cascade Spring	12/18/2017	15:45	< 0.005				3.4	3.4	< 0.10	0.088		NA		23.9	0.249		6.71	0	5.55
Plantation Well	12/18/2017	16:40	< 0.005	< 0.001	< 0.001	< 1.0	0.4	0.4	< 0.10	0.096		NA		24.2	0.208		7.02	0	3.51
Parkway	12/18/2017	17:05		< 0.001	< 0.001	< 1.0						50 gpm							
Kawa Stream	12/18/2017	18:20		< 0.001	< 0.001	< 1.0	1.5	1.3	0.2	0.040		765 gpm	3.55	23.98	0.272		6.76	0	4.38
Parkway	12/26/2017	11:40		< 0.001	1.293	< 1.0	1.3	0.31	1.0	0.640	150	100 gpm		23.52	0.105	0.05	6.65	492	6.05
Kawa Stream	12/26/2017	12:00		0.646	0.004 J	< 1.0	1.1	0.31	0.75	0.160	63	28,590 gpm	4.46	23.85	0.112	0.06	7.35	76.3	5.86
Lipalu Flume	12/26/2017	13:50		< 0.001	0.014 J	< 1.0	16.0	0.044	16.0	0.970	4000	100 gpm		21.45	0.073	0.04	6.66	> 6000	6.09
Parkway	12/26/2017	14:05		< 0.001	< 0.001	< 1.0	1.9	0.09	1.8	0.850	340	300 gpm		22	0.054	0.03	6.95	520	5.41
Kawa Stream	12/26/2017	14:15		< 0.001	< 0.001	< 1.0	1.9	0.11	1.8	0.550	160	142,270 gpm	5.1	22.63	0.054	0.03	7.58	19	5.36
Maintenance Culvert	1/25/2018	-	-		-		-	-	-	-	-	2 gpm		-	-	-	-	-	-
Cascade Spring	1/25/2018	-	-		-		-	-	-	-	-	4-6 gpm		-	-	-	-	-	-
Parkway	1/25/2018	-	-		-		-	-	-	-	-	15 gpm		-	-	-	-	-	-
Kawa Stream	1/25/2018	-	-	0.772	< 0.001	< 1.0	-	-	-	-	-	180-220 gpm	3.54	-	-	-	-	-	-
Kawa Stream	1/27/2018	14:40		1.836	< 0.001	< 1.0	3.2	0.38	2.8	0.73	280	4500 gpm	4.75	23.65	0.056	0.03	7.7	389	5.15
Parkway	1/27/2018	14:50		2.831	0.001 J	< 1.0	1.3	0.59	0.67	0.5	110	150 gpm		23.14	0.107	0.05	7.07	320	4.48
Maintenance Culvert	1/27/2018	15:05					1.6	1.2	0.42	0.18	18	15-20 gpm		23.9	0.149	0.07	7.13	82.5	4.77
Plantation Well	1/29/2018	11:00	< 0.005				0.36	0.38	< 0.10	0.11	7.2	-		23.89	0.229		6.5	3.2	4.71
Cascade Spring	1/29/2018	13:06	< 0.005	< 0.001	< 0.001	< 1.0	2.8	1.1	1.7	0.095	11	30 gpm		21.22	0.279		7.85	24.6	4.74
Parkway	1/29/2018	13:15										50 gpm		-	-	-	-	-	-
Kawa Stream	1/29/2018	12:43		< 0.001	< 0.001	< 1.0						593 gpm (pygmy)	3.53	-	-	-	-	-	-
Maintenance Culvert	1/31/2018	14:25		1.072	< 0.001	< 1.0						5 gpm		23.71	0.424		7.12	42.8	5.23
Cascade Spring	1/31/2018	14:34		0.121	0.001 J	< 1.0						15 gpm		23.32	0.281		7.48	6.6	5.61
Parkway	1/31/2018	14:49		< 0.001	< 0.001	< 1.0						20 gpm		23.28	0.25		7.6	15.7	5.77
Downstream of Cascade	1/31/2018	14:49		< 0.001	< 0.001	< 1.0						20 gpm		23.54	0.231		7.62	15.7	5.13
Kawa Stream	1/31/2018	13:50		< 0.001	< 0.001	< 1.0						100 gpm	3.53	23.73	0.279		7.85	24.6	4.74
Kawa Stream	2/4/2018	14:00		< 0.001	< 0.001	< 1.0					6	375 gpm	3.53	24.31	0.275	0.13	6.55	2.5	5.91
Parkway	2/4/2018	14:30		< 0.001	< 0.001	< 1.0					5.7	36 gpm		24.02	0.197	0.09	6.96	1.1	6.26
Kawa Stream	2/5/2018	6:40		0.120	< 0.001	< 1.0					35.3	9,155 gpm	4.15	22.11	0.171	0.08	6.54	100	5.09
Kawa Stream	2/5/2018	6:50		0.219	< 0.001	< 1.0					83	19,300 gpm	4.35	21.79	0.102	0.05	6.62	120	6.5
Parkway	2/5/2018	7:25		1.098	< 0.001	< 1.0					91	300 gpm		21.27	0.079	0.04	6.85	167	5.66
Kawa Stream	2/5/2018	9:10		0.156	< 0.001	< 1.0					424	341,000 gpm	6.78	21.54	0.049	0.03	7.47	388	5.92
Lipalu Flume	2/5/2018	9:30		< 0.001	< 0.001	< 1.0	2.4	0.89	1.5	0.4	380	10 gpm		21.9	0.104	0.05	6.7	1115	6.06
Lipalu Flume	2/5/2018	15:30		< 0.001	< 0.001	< 1.0	5.5	0.46	5	1.1	2940	550 gpm		20.92	0.057	0.03	7.9	>6000	6.45
Parkway	2/5/2018	15:45		0.343	< 0.001	< 1.0					116	~350 gpm		21.74	0.087	0.05	6.27	314	6.29
Bridge Crossing	2/5/2018	15:55		< 0.001	< 0.001	< 1.0					3060	~3000 gpm		21.95	0.055	0.03	6.55	>6000	6.67
Kawa Stream	2/5/2018	16:05		0.090	< 0.001	< 1.0					860	32,942 gpm	4.5	22.09	0.054	0.03	6.54	2000	6.78
Kawa Stream	2/6/2018	9:50		< 0.001	< 0.001	< 1.0					25	1,032 gpm	3.61	22.57	0.285	0.14	6.52	68.5	6.24
Kawa Stream	2/7/2018	12:53		< 0.001	< 0.001	< 1.0					18	1,212 gpm	3.65	23.76	0.275	0.13	6.57	18	6.6
Kawa Stream	2/7/2018	13:35		< 0.001	< 0.001	< 1.0					109	3,187 gpm	3.88	23.81	0.241	0.12	6.48	160	6.43
Main Road Bridge	2/7/2018	13:40		1.398	< 0.001	< 1.0					29	~900 gpm		23.85	0.069	0.04	6.66	108	6.57
Parkway Bridge	2/7/2018	13:46		< 0.001	< 0.001	< 1.0					96	~1200 gpm		23.27	0.207	0.1	6.55	161	6.43
Parkway	2/7/2018	13:52		< 0.001	< 0.001	< 1.0					86	~300 gpm		23.19	0.233	0.11	6.49	178	6.45
Lipalu Flume	2/7/2018	14:00		< 0.001	0.021 J	< 1.0					1310	15 gpm		22.52	0.092	0.05	6.76	2000	6.5
Kawa Stream	2/7/2018	14:10		0.403	0.006 J	< 1.0					90	6,014 gpm	4.04	22.83	0.154	0.08	6.58	163	6.29
Kawa Stream	2/9/2018	8:50		< 0.001	< 0.001	< 1.0					7.8	898 gpm	3.58	21.1	0.319	0.15	7.07	20.8	6.45
Parkway	2/9/2018	9:10		< 0.001	< 0.001	< 1.0					5.4	120 gpm		20.81	0.245	0.12	7.22	5	6.34

Pesticide Samples in 4oz Boston Round Ambers			Formaldehyde (mg/L)	Glyphosate (µg/L)	Diuron (µg/L)	2,4-D (µg/L)	Total Nitrogen (mg/L)	Nitrate Nitrite as N (mg/L)	Total Kjeldahl Nitrogen (mg/L)	Total Phosphorous (mg/L)	Total Suspended Solids (mg/L)	Visual Flow Rate Estimate (GPM)	USGS Stage Height (Feet)	Temperature (^{o} C)	Specific Conductance (mS/cm)	Salinity	pH	Turbidity (NTU)	Dissolved Oxygen (mg/L)
Sample Site	Date	Time																	
Maintenance Culvert	2/9/2018	15:00		< 0.001	< 0.001	< 1.0					3.6	15 gpm		22.52	0.421	0.2	6.96	9.6	5.84
Cascade Spring	2/9/2018	14:52		< 0.001	< 0.001	< 1.0					1.4	30 gpm		22.31	0.305	0.15	7.62	22.3	6.77
Downstream of Cascade	2/9/2018	14:45										37.5 gpm		NM	NM	NM	NM	NM	NM
Plantation Well	2/9/2018	15:30		< 0.001	< 0.001	< 1.0					1.8	-		23.79	0.224	0.11	6.72	3.1	3.18
Mokuelele Bridge	2/12/2018	14:02		< 0.001	< 0.001	< 1.0					3.6	64 gpm		26.41	0.298	0.14	6.76	1.1	6.48
Parkway	2/12/2018	14:20		< 0.001	< 0.001	< 1.0					4.2	25 gpm		23.18	0.244	0.12	7.18	2	6.35
Main Kawa at Parkway	2/12/2018	14:25		< 0.001	< 0.001	< 1.0					3.2	20 gpm		23.15	0.249	0.12	7.13	0.2	6.49
Namoku Bridge	2/12/2018	14:55		< 0.001	< 0.001	< 1.0					4.2	86 gpm		23.93	0.255	0.12	6.9	0.9	6.72
Kawa Stream	2/12/2018	15:55		< 0.001	< 0.001	< 1.0					9.6	808 gpm	3.56	24.21	0.277	0.13	7.06	6.5	6.25
Kawa Stream	2/14/2018	8:00		1.195	< 0.001	3.051					141	16,070 gpm	4.3	22.62	0.13	0.07	6.41	121	6.33

Appendix B

Laboratory Reports

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Irvine
17461 Derian Ave
Suite 100
Irvine, CA 92614-5817
Tel: (949)261-1022

TestAmerica Job ID: 440-198845-1
Client Project/Site: Hawaiian Memorial Cemetery

For:
Element Environmental, LLC
98-030 Hekaha Street, Unit 9
Aiea, Hawaii 96701

Attn: James Tsubone

Authorized for release by:
1/3/2018 10:07:17 AM

David Alltucker, Project Manager I
(916)374-4383
david.alltucker@testamericainc.com

Table of Contents

Sample Summary

Client: Element Environmental, LLC
Project/Site: Hawaiian Memorial Cemetery

TestAmerica Job ID: 440-198845-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
440-198845-1	Cascade Spring	Water	12/18/17 15:45	12/20/17 10:50
440-198845-2	Maintenance Culver	Water	12/18/17 16:05	12/20/17 10:50
440-198845-3	Kawa Stream Xng	Water	12/18/17 18:20	12/20/17 10:50
440-198845-4	Plantation Well	Water	12/18/17 16:40	12/20/17 10:50

Job ID: 440-198845-1

Laboratory: TestAmerica Irvine

Narrative

Job Narrative
440-198845-1

Receipt
The samples were received on 12/20/2017 10:50 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 0.9º C.

HPLC/IC
Method(s) 8315A: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 440-447739 and analytical batch 440-447867.The associated laboratory control sample/laboratory control sample duplicate (LCS/LCSD) met acceptance criteria.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

General Chemistry
Method(s) SM 2540D: The sample duplicate (DUP) precision for analytical batch 320-201148 was outside control limits. Sample non-homogeneity is suspected. Samples are not being re-extracted and reanalyzed because the relative percent difference (RPD) does not apply to samples are less than 5x the reporting limit (RL). Data is being reported.

Method(s) 353.2: The following samples were diluted to bring the concentration of target analytes within the calibration range: Cascade Spring (440-198845-1), Kawa Stream Xng (440-198845-3), (440-198845-B-3 MS) and (440-198845-B-3 MSD) in analytical batch 320-201658. Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Organic Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Client Sample ID: Cascade Spring

Lab Sample ID: 440-198845-1
Date Collected: 12/18/17 15:45
Matrix: Water
Date Received: 12/20/17 10:50

Method: 8315A - Carbonyl Compounds (HPLC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Formaldehyde	ND		0.010	0.0050	mg/L		12/20/17 16:55	12/21/17 10:32	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Kjeldahl Nitrogen	ND		0.20	0.10	mg/L		12/28/17 11:22	12/29/17 15:42	1
Nitrate Nitrite as N	**3.4**		0.10	0.0062	mg/L			12/28/17 10:29	2
Phosphorus, Total	**0.088**		0.050	0.025	mg/L		12/27/17 10:03	12/27/17 15:05	1
Nitrogen, Total	**3.4**		0.11	0.11	mg/L			12/30/17 10:40	1

Client Sample ID: Maintenance Culver

Lab Sample ID: 440-198845-2
Date Collected: 12/18/17 16:05
Matrix: Water
Date Received: 12/20/17 10:50

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	**13**		5.0	5.0	mg/L			12/22/17 14:05	1

Client Sample ID: Kawa Stream Xng

Lab Sample ID: 440-198845-3
Date Collected: 12/18/17 18:20
Matrix: Water
Date Received: 12/20/17 10:50

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Kjeldahl Nitrogen	**0.20**		0.20	0.10	mg/L		12/28/17 11:22	12/29/17 15:42	1
Nitrate Nitrite as N	**1.3**		0.10	0.0062	mg/L			12/28/17 11:03	2
Phosphorus, Total	**0.040**	**J**	0.050	0.025	mg/L		12/27/17 10:03	12/27/17 15:05	1
Nitrogen, Total	**1.5**		0.11	0.11	mg/L			12/30/17 10:40	1

Client Sample ID: Plantation Well

Lab Sample ID: 440-198845-4
Date Collected: 12/18/17 16:40
Matrix: Water
Date Received: 12/20/17 10:50

Method: 8315A - Carbonyl Compounds (HPLC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Formaldehyde	ND		0.010	0.0050	mg/L		12/20/17 16:55	12/21/17 10:51	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Kjeldahl Nitrogen	ND		0.20	0.10	mg/L		12/28/17 11:22	12/29/17 15:42	1
Nitrate Nitrite as N	**0.37**		0.050	0.0031	mg/L			12/28/17 10:37	1
Phosphorus, Total	**0.096**		0.050	0.025	mg/L		12/27/17 10:03	12/27/17 15:05	1
Nitrogen, Total	**0.37**		0.11	0.11	mg/L			12/30/17 10:40	1

Method Summary

Client: Element Environmental, LLC
Project/Site: Hawaiian Memorial Cemetery

TestAmerica Job ID: 440-198845-1

Method	Method Description	Protocol	Laboratory
8315A	Carbonyl Compounds (HPLC)	SW846	TAL IRV
351.2	Nitrogen, Total Kjeldahl	MCAWW	TAL IRV
353.2	Nitrogen, Nitrate-Nitrite	MCAWW	TAL SAC
365.3	Phosphorus, Total	EPA	TAL IRV
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL SAC
Total Nitrogen	Nitrogen, Total	EPA	TAL IRV

Protocol References:

EPA = US Environmental Protection Agency
MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.
SM = "Standard Methods For The Examination Of Water And Wastewater",
SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL IRV = TestAmerica Irvine, 17461 Derian Ave, Suite 100, Irvine, CA 92614-5817, TEL (949)261-1022
TAL SAC = TestAmerica Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Lab Chronicle

Client: Element Environmental, LLC
Project/Site: Hawaiian Memorial Cemetery

TestAmerica Job ID: 440-198845-1

Client Sample ID: Cascade Spring
Date Collected: 12/18/17 15:45
Date Received: 12/20/17 10:50

Lab Sample ID: 440-198845-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	8315_W_Prep			100 mL	1 mL	447739	12/20/17 16:55	FTD	TAL IRV
Total/NA	Analysis	8315A		1			448022	12/21/17 10:32	IVA	TAL IRV
Total/NA	Prep	351.2			25 mL	25 mL	449033	12/28/17 11:22	AN	TAL IRV
Total/NA	Analysis	351.2		1			449382	12/29/17 15:42	AN	TAL IRV
Total/NA	Analysis	353.2		2			201658	12/28/17 10:29	TCS	TAL SAC
Total/NA	Prep	365.2/365.3/365			50 mL	50 mL	448756	12/27/17 10:03	MMP	TAL IRV
Total/NA	Analysis	365.3		1			448836	12/27/17 15:05	MMP	TAL IRV
Total/NA	Analysis	Total Nitrogen		1			449484	12/30/17 10:40	TLN	TAL IRV

Client Sample ID: Maintenance Culver
Date Collected: 12/18/17 16:05
Date Received: 12/20/17 10:50

Lab Sample ID: 440-198845-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	SM 2540D		1	100 mL	100 mL	201148	12/22/17 14:05	JMD	TAL SAC

Client Sample ID: Kawa Stream Xng
Date Collected: 12/18/17 18:20
Date Received: 12/20/17 10:50

Lab Sample ID: 440-198845-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	351.2			25 mL	25 mL	449033	12/28/17 11:22	AN	TAL IRV
Total/NA	Analysis	351.2		1			449382	12/29/17 15:42	AN	TAL IRV
Total/NA	Analysis	353.2		2			201658	12/28/17 11:03	TCS	TAL SAC
Total/NA	Prep	365.2/365.3/365			50 mL	50 mL	448756	12/27/17 10:03	MMP	TAL IRV
Total/NA	Analysis	365.3		1			448836	12/27/17 15:05	MMP	TAL IRV
Total/NA	Analysis	Total Nitrogen		1			449484	12/30/17 10:40	TLN	TAL IRV

Client Sample ID: Plantation Well
Date Collected: 12/18/17 16:40
Date Received: 12/20/17 10:50

Lab Sample ID: 440-198845-4
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	8315_W_Prep			100 mL	1 mL	447739	12/20/17 16:55	FTD	TAL IRV
Total/NA	Analysis	8315A		1			448022	12/21/17 10:51	IVA	TAL IRV
Total/NA	Prep	351.2			25 mL	25 mL	449033	12/28/17 11:22	AN	TAL IRV
Total/NA	Analysis	351.2		1			449382	12/29/17 15:42	AN	TAL IRV
Total/NA	Analysis	353.2		1			201658	12/28/17 10:37	TCS	TAL SAC
Total/NA	Prep	365.2/365.3/365			50 mL	50 mL	448756	12/27/17 10:03	MMP	TAL IRV
Total/NA	Analysis	365.3		1			448836	12/27/17 15:05	MMP	TAL IRV
Total/NA	Analysis	Total Nitrogen		1			449484	12/30/17 10:40	TLN	TAL IRV

Lab Chronicle

Client: Element Environmental, LLC
Project/Site: Hawaiian Memorial Cemetery

TestAmerica Job ID: 440-198845-1

Laboratory References:

TAL IRV = TestAmerica Irvine, 17461 Derian Ave, Suite 100, Irvine, CA 92614-5817, TEL (949)261-1022

TAL SAC = TestAmerica Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Method: 8315A - Carbonyl Compounds (HPLC)

Lab Sample ID: MB 440-447739/1-A
Matrix: Water
Analysis Batch: 447867

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 447739

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Formaldehyde	ND		0.010	0.0050	mg/L		12/20/17 06:07	12/20/17 16:27	1

Lab Sample ID: LCS 440-447739/2-A
Matrix: Water
Analysis Batch: 447867

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 447739

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Formaldehyde	0.0500	0.0407		mg/L		81	70 - 129

Lab Sample ID: LCSD 440-447739/3-A
Matrix: Water
Analysis Batch: 447867

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 447739

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Formaldehyde	0.0500	0.0428		mg/L		86	70 - 129	5	20

Method: 353.2 - Nitrogen, Nitrate-Nitrite

Lab Sample ID: MB 320-201658/15
Matrix: Water
Analysis Batch: 201658

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate Nitrite as N	ND		0.050	0.0031	mg/L			12/28/17 10:25	1

Lab Sample ID: LCS 320-201658/16
Matrix: Water
Analysis Batch: 201658

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate Nitrite as N	1.00	0.990		mg/L		99	90 - 110

Lab Sample ID: 440-198845-3 MS
Matrix: Water
Analysis Batch: 201658

Client Sample ID: Kawa Stream Xng
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate Nitrite as N	1.3		2.00	3.16		mg/L		95	90 - 110

Lab Sample ID: 440-198845-3 MSD
Matrix: Water
Analysis Batch: 201658

Client Sample ID: Kawa Stream Xng
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Nitrate Nitrite as N	1.3		2.00	3.22		mg/L		98	90 - 110	2	20

Method: 365.3 - Phosphorus, Total

Lab Sample ID: MB 440-448756/1-A
Matrix: Water
Analysis Batch: 448836

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 448756

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phosphorus, Total	ND		0.050	0.025	mg/L		12/27/17 10:03	12/27/17 15:04	1

Lab Sample ID: LCS 440-448756/2-A
Matrix: Water
Analysis Batch: 448836

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 448756

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Phosphorus, Total			0.501	0.486		mg/L		97	80 - 120		

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 320-201148/1
Matrix: Water
Analysis Batch: 201148

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		5.0	5.0	mg/L			12/22/17 14:05	1

Lab Sample ID: LCS 320-201148/2
Matrix: Water
Analysis Batch: 201148

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Total Suspended Solids			1000	968		mg/L		97	85 - 115		

Lab Sample ID: 440-198845-2 DU
Matrix: Water
Analysis Batch: 201148

Client Sample ID: Maintenance Culver
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Total Suspended Solids	13			9.00	F5	mg/L				36	20

HPLC/IC

Prep Batch: 447739

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-198845-1	Cascade Spring	Total/NA	Water	8315_W_Prep	
440-198845-4	Plantation Well	Total/NA	Water	8315_W_Prep	
MB 440-447739/1-A	Method Blank	Total/NA	Water	8315_W_Prep	
LCS 440-447739/2-A	Lab Control Sample	Total/NA	Water	8315_W_Prep	
LCSD 440-447739/3-A	Lab Control Sample Dup	Total/NA	Water	8315_W_Prep	

Analysis Batch: 447867

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 440-447739/1-A	Method Blank	Total/NA	Water	8315A	447739
LCS 440-447739/2-A	Lab Control Sample	Total/NA	Water	8315A	447739
LCSD 440-447739/3-A	Lab Control Sample Dup	Total/NA	Water	8315A	447739

Analysis Batch: 448022

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-198845-1	Cascade Spring	Total/NA	Water	8315A	447739
440-198845-4	Plantation Well	Total/NA	Water	8315A	447739

General Chemistry

Analysis Batch: 201148

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-198845-2	Maintenance Culver	Total/NA	Water	SM 2540D	
MB 320-201148/1	Method Blank	Total/NA	Water	SM 2540D	
LCS 320-201148/2	Lab Control Sample	Total/NA	Water	SM 2540D	
440-198845-2 DU	Maintenance Culver	Total/NA	Water	SM 2540D	

Analysis Batch: 201658

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-198845-1	Cascade Spring	Total/NA	Water	353.2	
440-198845-3	Kawa Stream Xng	Total/NA	Water	353.2	
440-198845-4	Plantation Well	Total/NA	Water	353.2	
MB 320-201658/15	Method Blank	Total/NA	Water	353.2	
LCS 320-201658/16	Lab Control Sample	Total/NA	Water	353.2	
440-198845-3 MS	Kawa Stream Xng	Total/NA	Water	353.2	
440-198845-3 MSD	Kawa Stream Xng	Total/NA	Water	353.2	

Prep Batch: 448756

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-198845-1	Cascade Spring	Total/NA	Water	365.2/365.3/365	
440-198845-3	Kawa Stream Xng	Total/NA	Water	365.2/365.3/365	
440-198845-4	Plantation Well	Total/NA	Water	365.2/365.3/365	
MB 440-448756/1-A	Method Blank	Total/NA	Water	365.2/365.3/365	
LCS 440-448756/2-A	Lab Control Sample	Total/NA	Water	365.2/365.3/365	

Analysis Batch: 448836

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-198845-1	Cascade Spring	Total/NA	Water	365.3	448756
440-198845-3	Kawa Stream Xng	Total/NA	Water	365.3	448756
440-198845-4	Plantation Well	Total/NA	Water	365.3	448756
MB 440-448756/1-A	Method Blank	Total/NA	Water	365.3	448756

General Chemistry (Continued)

Analysis Batch: 448836 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 440-448756/2-A	Lab Control Sample	Total/NA	Water	365.3	448756

Prep Batch: 449033

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-198845-1	Cascade Spring	Total/NA	Water	351.2	
440-198845-3	Kawa Stream Xng	Total/NA	Water	351.2	
440-198845-4	Plantation Well	Total/NA	Water	351.2	

Analysis Batch: 449382

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-198845-1	Cascade Spring	Total/NA	Water	351.2	449033
440-198845-3	Kawa Stream Xng	Total/NA	Water	351.2	449033
440-198845-4	Plantation Well	Total/NA	Water	351.2	449033

Analysis Batch: 449484

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-198845-1	Cascade Spring	Total/NA	Water	Total Nitrogen	
440-198845-3	Kawa Stream Xng	Total/NA	Water	Total Nitrogen	
440-198845-4	Plantation Well	Total/NA	Water	Total Nitrogen	

Definitions/Glossary

Client: Element Environmental, LLC
Project/Site: Hawaiian Memorial Cemetery

TestAmerica Job ID: 440-198845-1

Qualifiers

General Chemistry

Qualifier	Qualifier Description
F5	Duplicate RPD exceeds limit, and one or both sample results are less than 5 times RL. The data are considered valid because the absolute difference is less than the RL.
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)

Accreditation/Certification Summary

Client: Element Environmental, LLC
Project/Site: Hawaiian Memorial Cemetery

TestAmerica Job ID: 440-198845-1

Laboratory: TestAmerica Irvine

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	State Program	10	CA01531	06-30-18
Arizona	State Program	9	AZ0671	10-14-18
California	LA Cty Sanitation Districts	9	10256	06-30-18
California	State Program	9	CA ELAP 2706	06-30-18
Guam	State Program	9	Cert. No. 17-003R	01-23-18 *
Hawaii	State Program	9	N/A	01-29-18 *
Kansas	NELAP	7	E-10420	07-31-18
Nevada	State Program	9	CA015312018-1	07-31-18
New Mexico	State Program	6	N/A	01-29-18 *
Northern Mariana Islands	State Program	9	MP0002	01-29-17 *
Oregon	NELAP	10	4028	01-29-18 *
USDA	Federal		P330-15-00184	07-08-18
Washington	State Program	10	C900	09-03-18

Laboratory: TestAmerica Sacramento

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-055	01-31-18
Arizona	State Program	9	AZ0708	08-11-18
Arkansas DEQ	State Program	6	88-0691	06-17-18
California	State Program	9	2897	01-31-18
Colorado	State Program	8	CA00044	08-31-18
Connecticut	State Program	1	PH-0691	06-30-19
Florida	NELAP	4	E87570	06-30-18
Georgia	State Program	4	N/A	01-28-19
Hawaii	State Program	9	N/A	01-29-18
Illinois	NELAP	5	200060	03-17-18
Kansas	NELAP	7	E-10375	12-31-17 *
L-A-B	DoD ELAP		L2468	01-20-18
Louisiana	NELAP	6	30612	06-30-18
Maine	State Program	1	CA0004	04-18-18
Michigan	State Program	5	9947	01-31-18
Nevada	State Program	9	CA00044	07-31-18
New Hampshire	NELAP	1	2997	04-18-18
New Jersey	NELAP	2	CA005	06-30-18
New York	NELAP	2	11666	04-01-18
Oregon	NELAP	10	4040	01-28-18
Pennsylvania	NELAP	3	68-01272	03-31-18
Texas	NELAP	6	T104704399	05-31-18
US Fish & Wildlife	Federal		LE148388-0	07-31-18
USDA	Federal		P330-11-00436	12-30-17 *
USEPA UCMR	Federal	1	CA00044	11-06-18
Utah	NELAP	8	CA00044	02-28-18
Virginia	NELAP	3	460278	03-14-18
Washington	State Program	10	C581	05-05-18
West Virginia (DW)	State Program	3	9930C	12-31-17
Wyoming	State Program	8	8TMS-L	01-28-19

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

TestAmerica Sacramento
880 Riverside Parkway

West Sacramento, CA 95605-1500
phone 916.373.5600 fax 303.467.7248

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Regulatory Program: ☐DW ☐NPDES ☐RCRA ☑Other:

TestAmerica Laboratories, Inc.

Client Contact	Project Manager: Steve Spengler	Site Contact:	12/19/2017	COC No:
Element Environmental, LLC	Tel/Fax: 808-864-3953	Lab Contact:	Carrier:	____ of ____ COCs
98-030 Hekaha St. Unit 9	Analysis Turnaround Time			Sampler:
Aiea/ HI/ 96701	☐ CALENDAR DAYS ☐ WORKING DAYS			For Lab Use Only:
(808) 488-1200 Phone	TAT if different from Below ____			Walk-in Client:
(808) 488-1300 FAX	☐ 2 weeks			Lab Sampling:
Project Name: Hawaii Memorial Cemetery	☐ 1 week			
Site:	☐ 2 days			Job / SDG No.:
P O #	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y / N)	Perform MS / MSD (Y / N)	Total Nitrogen	Total Phosphorous	TSS	Formaldehyde	Sample Specific Notes:
Cascade Spring	12/18/17	15:45	G	W	2	N		X	X		X	
Maintenance Culvert	12/18/17	16:05	G	W	1	N				X		
Kawa Stream Xng	12/18/17	18:20	G	W	1	N		X	X			
Plantation Well	12/18/17	16:40	G	W	2	N		X	X		X	

440-198845 Chain of Custody

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other ____

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

☐ Return to Client ☐ Disposal by Lab ☐ Archive for ____ Months

Special Instructions/QC Requirements & Comments:
Received on Blue Ice 6.1°C/6.2°C IR-81 0.3 0.9 ik WC

Custody Seals Intact: ☐ Yes ☐ No	Custody Seal No.:		Cooler Temp. (°C): Obs'd: ____ Corr'd: ____		Therm ID No.: ____
Relinquished by: James Tarbone	Company: Element Environmental	Date/Time: 12/19/17 1515	Received by: Eric Yates	Company: TA	Date/Time: 12/19/17 1315
Relinquished by: Eric Yates	Company: TA	Date/Time: 12/19/17 1518	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company: TA	Date/Time: 12/20/17 1050

Fedex. 7710 4575 8123

Form No. CA-C-WI-002, Rev. 4.15, dated 9/27/2017

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1/3/2018

TestAmerica Irvine
17461 Derian Ave Suite 100
Irvine, CA 92614-5817
Phone (949) 261-1022 Fax (949) 260-3297

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Alltucker, David R	Carrier Tracking No(s):	COC No: 440-117550.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: david.alltucker@testamericainc.com	State of Origin: Hawaii	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note):		Job #: 440-198845-1
Address: 880 Riverside Parkway, ,	Due Date Requested: 1/3/2018			
City: West Sacramento	TAT Requested (days):			
State, Zip: CA, 95605				
Phone: 916-373-5600(Tel) 916-372-1059(Fax)	PO #:			
Email:	WO #:			
Project Name: Hawaiian Memorial Cemetery	Project #: 32010538			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	353.2/ Nitrate Nitrite Only	2540D/ Total Suspended Solids	Total Number of containers	Special Instructions/Note:
			Preservation Code:							
Cascade Spring (440-198845-1)	12/18/17	15:45 Hawaiian		Water			X		1	
Maintenance Culver (440-198845-2)	12/18/17	16:05 Hawaiian		Water				X	1	
Kawa Stream Xng (440-198845-3)	12/18/17	18:20 Hawaiian		Water			X		1	
Plantation Well (440-198845-4)	12/18/17	16:40 Hawaiian		Water			X		1	

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc.

Possible Hazard Identification	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Unconfirmed	☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
	12/21/17 0700	TA		12/22/17	TA-Sac
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Ver: 09/20/2016

Login Sample Receipt Checklist

Client: Element Environmental, LLC

Job Number: 440-198845-1

Login Number: 198845
List Number: 1
Creator: Escalante, Maria I

List Source: TestAmerica Irvine

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.	N/A	Not Present
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").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Element Environmental, LLC

Job Number: 440-198845-1

Login Number: 198845
List Number: 2
Creator: Nelson, Kym D

List Source: TestAmerica Sacramento
List Creation: 12/22/17 12:18 PM

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.	N/A	
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?	False	Received project as a subcontract.
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").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Samp

440-198845 Field Sheet

Job:_____

Tracking # 4176 2737 0872

Use this form to record Sample Custody Seal, Cooler Custody Seal, Temperature & corrected Temperature & other observations. File in the job folder with the COC.

Notes:_____

Therm. ID: **AK-2** / **AK-3** / **HACCP** /Other_____

Ice X Wet X Dry_____ Other_____

Cooler Custody Seal: -

Sample Custody Seal: -

Cooler ID: -

Temp: Observed 3.3

Corrected: -

From: Temp Blank ☐ Sample ☒

NCM Filed: Yes ☐ No ☐

	Yes	No	NA
Perchlorate has headspace?	☐	☐	☒
CoC is complete w/o discrepancies?	☒	☐	☐
Samples received within holding time?	☒	☐	☐
Sample preservatives verified?	☐	☐	☒
Cooler compromised/tampered with?	☐	☒	☐
Samples compromised/tampered with?	☐	☒	☐
COC and Samples w/o discrepancies?	☒	☐	☐
Sample containers have legible labels?	☒	☐	☐
Containers are not broken or leaking?	☒	☐	☐
Sample date/times are provided.	☒	☐	☐
Appropriate containers are used?	☒	☐	☐
Sample bottles are completely filled?	☒	☐	☐
Zero headspace?*	☐	☐	☒
Multiphasic samples are not present?	☒	☐	☐

Initials: DH Date: 12/22/17

*Containers requiring zero headspace have no headspace, or bubble < 6 mm (1/4")

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Irvine
17461 Derian Ave
Suite 100
Irvine, CA 92614-5817
Tel: (949)261-1022

TestAmerica Job ID: 440-199358-1
Client Project/Site: Hawaiian Memorial Cemetery

For:
Element Environmental, LLC
98-030 Hekaha Street, Unit 9
Aiea, Hawaii 96701

Attn: James Tsubone

Authorized for release by:
1/15/2018 3:56:48 PM

David Alltucker, Project Manager I
(916)374-4383
david.alltucker@testamericainc.com

Table of Contents

Sample Summary

Client: Element Environmental, LLC
Project/Site: Hawaiian Memorial Cemetery

TestAmerica Job ID: 440-199358-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
440-199358-1	KAWA STREAM-12:00-1226	Water	12/26/17 12:00	12/29/17 09:30
440-199358-2	KAWA STREAM-14:15-1226	Water	12/26/17 14:15	12/29/17 09:30
440-199358-3	PARKWAY-11:40-1226	Water	12/26/17 11:40	12/29/17 09:30
440-199358-4	PARKWAY-1405-1226	Water	12/26/17 14:05	12/29/17 09:30
440-199358-5	LIPALU-1350-1226	Water	12/26/17 13:50	12/29/17 09:30

Job ID: 440-199358-1

Laboratory: TestAmerica Irvine

Narrative

Job Narrative
440-199358-1

Receipt
The samples were received on 12/29/2017 9:30 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 3.4º C.

General Chemistry
Method(s) SM 2540D: The following samples were diluted due to the nature of the sample matrix: PARKWAY-1405-1226 (440-199358-4) and LIPALU-1350-1226 (440-199358-5) in 320-202107. Elevated reporting limits (RLs) are provided.

Method(s) SM 2540D: The following sample had limited sample volume and observable sediment. Analyst ran at a dilution in order to have volume in case a re-analysis was needed. PARKWAY-1405-1226 (440-199358-4)

Method(s) SM 2540D: There was heavy sediment observed in the following sample. Sample needs to be re-analyzed. LIPALU-1350-1226 (440-199358-5)

Method(s) SM 2540D: The following samples LIPALU-1350-1226 (440-199358-5) and (440-199358-B-5 DU) were initially analyzed in analytical batch 202107 using 50mL of sample volume due to visibly high particulates present in the sample. During the filtration process in the initial analysis, the filtration time exceeded 15 minutes. Analyst suspects that the amount of total suspended solids could not be accurately measured in initial analysis due to a long filtration time. The sample and a duplicate were reanalyzed, outside of holding time, using 5mL of sample volume. Sample results from both analysis were not comparable, as suspected; however, the relative percent difference (RPD) in the second analysis, between the parent sample and it's duplicate, met acceptable limits. Data is being reported with this narration.

Method(s) 353.2: The following samples were diluted due to the nature of the sample matrix: KAWA STREAM-12:00-1226 (440-199358-1) and PARKWAY-11:40-1226 (440-199358-3) in 320-202586. Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Client Sample ID: KAWA STREAM-12:00-1226

Lab Sample ID: 440-199358-1
Date Collected: 12/26/17 12:00
Matrix: Water
Date Received: 12/29/17 09:30

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Kjeldahl Nitrogen	0.75		0.20	0.10	mg/L		01/02/18 11:14	01/02/18 16:01	1
Nitrate Nitrite as N	0.31		0.10	0.0062	mg/L			01/04/18 14:39	2
Phosphorus, Total	0.16		0.050	0.025	mg/L		01/10/18 18:00	01/11/18 12:02	1
Total Suspended Solids	63		5.0	5.0	mg/L			01/02/18 10:14	1
Nitrogen, Total	1.1		0.11	0.11	mg/L			01/11/18 10:32	1

Client Sample ID: KAWA STREAM-14:15-1226

Lab Sample ID: 440-199358-2
Date Collected: 12/26/17 14:15
Matrix: Water
Date Received: 12/29/17 09:30

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Kjeldahl Nitrogen	1.8		0.20	0.10	mg/L		01/02/18 11:14	01/02/18 16:01	1
Nitrate Nitrite as N	0.11		0.050	0.0031	mg/L			01/04/18 14:37	1
Phosphorus, Total	0.55		0.25	0.13	mg/L		01/10/18 18:00	01/11/18 12:02	1
Total Suspended Solids	160		5.0	5.0	mg/L			01/02/18 10:14	1
Nitrogen, Total	1.9		0.11	0.11	mg/L			01/11/18 10:32	1

Client Sample ID: PARKWAY-11:40-1226

Lab Sample ID: 440-199358-3
Date Collected: 12/26/17 11:40
Matrix: Water
Date Received: 12/29/17 09:30

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Kjeldahl Nitrogen	1.0		0.20	0.10	mg/L		01/02/18 11:14	01/02/18 16:01	1
Nitrate Nitrite as N	0.31		0.10	0.0062	mg/L			01/04/18 14:49	2
Phosphorus, Total	0.64		0.050	0.025	mg/L		01/10/18 18:00	01/11/18 12:02	1
Total Suspended Solids	150		5.0	5.0	mg/L			01/02/18 10:14	1
Nitrogen, Total	1.3		0.11	0.11	mg/L			01/11/18 10:32	1

Client Sample ID: PARKWAY-1405-1226

Lab Sample ID: 440-199358-4
Date Collected: 12/26/17 14:05
Matrix: Water
Date Received: 12/29/17 09:30

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Kjeldahl Nitrogen	1.8		0.20	0.10	mg/L		01/02/18 11:14	01/02/18 16:01	1
Nitrate Nitrite as N	0.090		0.050	0.0031	mg/L			01/04/18 14:47	1
Phosphorus, Total	0.85		0.25	0.13	mg/L		01/10/18 18:00	01/11/18 12:03	1
Total Suspended Solids	340		10	10	mg/L			01/02/18 10:14	1
Nitrogen, Total	1.9		0.11	0.11	mg/L			01/11/18 10:32	1

Client Sample ID: LIPALU-1350-1226

Lab Sample ID: 440-199358-5
Date Collected: 12/26/17 13:50
Matrix: Water
Date Received: 12/29/17 09:30

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Kjeldahl Nitrogen	16		0.40	0.20	mg/L		01/02/18 11:14	01/02/18 17:54	2
Nitrate Nitrite as N	0.044	J	0.050	0.0031	mg/L			01/04/18 15:05	1

Client: Element Environmental, LLC
Project/Site: Hawaiian Memorial Cemetery

TestAmerica Job ID: 440-199358-1

Client Sample ID: LIPALU-1350-1226
Date Collected: 12/26/17 13:50
Date Received: 12/29/17 09:30

Lab Sample ID: 440-199358-5
Matrix: Water

General Chemistry (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phosphorus, Total	0.97		0.25	0.13	mg/L		01/10/18 18:00	01/11/18 12:03	1
Total Suspended Solids	4000	H	100	100	mg/L			01/05/18 10:28	1
Nitrogen, Total	16		0.11	0.11	mg/L			01/11/18 10:32	1

Method Summary

Client: Element Environmental, LLC
Project/Site: Hawaiian Memorial Cemetery

TestAmerica Job ID: 440-199358-1

Method	Method Description	Protocol	Laboratory
351.2	Nitrogen, Total Kjeldahl	MCAWW	TAL IRV
353.2	Nitrogen, Nitrate-Nitrite	MCAWW	TAL SAC
365.3	Phosphorus, Total	EPA	TAL IRV
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL SAC
Total Nitrogen	Nitrogen, Total	EPA	TAL IRV

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater",

Laboratory References:

TAL IRV = TestAmerica Irvine, 17461 Derian Ave, Suite 100, Irvine, CA 92614-5817, TEL (949)261-1022

TAL SAC = TestAmerica Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Lab Chronicle

Client: Element Environmental, LLC
Project/Site: Hawaiian Memorial Cemetery

TestAmerica Job ID: 440-199358-1

Client Sample ID: KAWA STREAM-12:00-1226

Lab Sample ID: 440-199358-1

Date Collected: 12/26/17 12:00

Matrix: Water

Date Received: 12/29/17 09:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	351.2			25 mL	25 mL	449628	01/02/18 11:14	AN	TAL IRV
Total/NA	Analysis	351.2		1			449697	01/02/18 16:01	AN	TAL IRV
Total/NA	Analysis	353.2		2			202586	01/04/18 14:39	TCS	TAL SAC
Total/NA	Prep	365.2/365.3/365			50 mL	50 mL	451008	01/10/18 18:00	MMP	TAL IRV
Total/NA	Analysis	365.3		1			451155	01/11/18 12:02	MMP	TAL IRV
Total/NA	Analysis	SM 2540D		1	100 mL	100 mL	202107	01/02/18 10:14	TCS	TAL SAC
Total/NA	Analysis	Total Nitrogen		1			451126	01/11/18 10:32	TLN	TAL IRV

Client Sample ID: KAWA STREAM-14:15-1226

Lab Sample ID: 440-199358-2

Date Collected: 12/26/17 14:15

Matrix: Water

Date Received: 12/29/17 09:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	351.2			25 mL	25 mL	449628	01/02/18 11:14	AN	TAL IRV
Total/NA	Analysis	351.2		1			449697	01/02/18 16:01	AN	TAL IRV
Total/NA	Analysis	353.2		1			202586	01/04/18 14:37	TCS	TAL SAC
Total/NA	Prep	365.2/365.3/365			10 mL	50 mL	451008	01/10/18 18:00	MMP	TAL IRV
Total/NA	Analysis	365.3		1			451155	01/11/18 12:02	MMP	TAL IRV
Total/NA	Analysis	SM 2540D		1	100 mL	100 mL	202107	01/02/18 10:14	TCS	TAL SAC
Total/NA	Analysis	Total Nitrogen		1			451126	01/11/18 10:32	TLN	TAL IRV

Client Sample ID: PARKWAY-11:40-1226

Lab Sample ID: 440-199358-3

Date Collected: 12/26/17 11:40

Matrix: Water

Date Received: 12/29/17 09:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	351.2			25 mL	25 mL	449628	01/02/18 11:14	AN	TAL IRV
Total/NA	Analysis	351.2		1			449697	01/02/18 16:01	AN	TAL IRV
Total/NA	Analysis	353.2		2			202586	01/04/18 14:49	TCS	TAL SAC
Total/NA	Prep	365.2/365.3/365			50 mL	50 mL	451008	01/10/18 18:00	MMP	TAL IRV
Total/NA	Analysis	365.3		1			451155	01/11/18 12:02	MMP	TAL IRV
Total/NA	Analysis	SM 2540D		1	100 mL	100 mL	202107	01/02/18 10:14	TCS	TAL SAC
Total/NA	Analysis	Total Nitrogen		1			451126	01/11/18 10:32	TLN	TAL IRV

Client Sample ID: PARKWAY-1405-1226

Lab Sample ID: 440-199358-4

Date Collected: 12/26/17 14:05

Matrix: Water

Date Received: 12/29/17 09:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	351.2			25 mL	25 mL	449628	01/02/18 11:14	AN	TAL IRV
Total/NA	Analysis	351.2		1			449697	01/02/18 16:01	AN	TAL IRV
Total/NA	Analysis	353.2		1			202586	01/04/18 14:47	TCS	TAL SAC

Lab Chronicle

Client: Element Environmental, LLC
Project/Site: Hawaiian Memorial Cemetery

TestAmerica Job ID: 440-199358-1

Client Sample ID: PARKWAY-1405-1226

Date Collected: 12/26/17 14:05
Date Received: 12/29/17 09:30

Lab Sample ID: 440-199358-4

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	365.2/365.3/365			10 mL	50 mL	451008	01/10/18 18:00	MMP	TAL IRV
Total/NA	Analysis	365.3		1			451155	01/11/18 12:03	MMP	TAL IRV
Total/NA	Analysis	SM 2540D		1	50 mL	100 mL	202107	01/02/18 10:14	TCS	TAL SAC
Total/NA	Analysis	Total Nitrogen		1			451126	01/11/18 10:32	TLN	TAL IRV

Client Sample ID: LIPALU-1350-1226

Date Collected: 12/26/17 13:50
Date Received: 12/29/17 09:30

Lab Sample ID: 440-199358-5

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	351.2			25 mL	25 mL	449628	01/02/18 11:14	AN	TAL IRV
Total/NA	Analysis	351.2		2			449697	01/02/18 17:54	AN	TAL IRV
Total/NA	Analysis	353.2		1			202586	01/04/18 15:05	TCS	TAL SAC
Total/NA	Prep	365.2/365.3/365			10 mL	50 mL	451008	01/10/18 18:00	MMP	TAL IRV
Total/NA	Analysis	365.3		1			451155	01/11/18 12:03	MMP	TAL IRV
Total/NA	Analysis	SM 2540D		1	5 mL	100 mL	202702	01/05/18 10:28	JMD	TAL SAC
Total/NA	Analysis	Total Nitrogen		1			451126	01/11/18 10:32	TLN	TAL IRV

Laboratory References:

TAL IRV = TestAmerica Irvine, 17461 Derian Ave, Suite 100, Irvine, CA 92614-5817, TEL (949)261-1022

TAL SAC = TestAmerica Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Method: 351.2 - Nitrogen, Total Kjeldahl

Lab Sample ID: MB 440-449628/3-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 449697 — **Prep Batch: 449628**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Kjeldahl Nitrogen	ND		0.20	0.10	mg/L		01/02/18 11:14	01/02/18 16:01	1

Lab Sample ID: LCS 440-449628/4-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 449697 — **Prep Batch: 449628**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Kjeldahl Nitrogen	5.00	4.91		mg/L		98	90 - 110

Lab Sample ID: LCSD 440-449628/5-A — **Client Sample ID: Lab Control Sample Dup**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 449697 — **Prep Batch: 449628**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Kjeldahl Nitrogen	5.00	5.05		mg/L		101	90 - 110	3	20

Method: 353.2 - Nitrogen, Nitrate-Nitrite

Lab Sample ID: MB 320-202586/15 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 202586

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate Nitrite as N	ND		0.050	0.0031	mg/L			01/04/18 14:23	1

Lab Sample ID: LCS 320-202586/16 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 202586

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate Nitrite as N	1.00	1.05		mg/L		105	90 - 110

Method: 365.3 - Phosphorus, Total

Lab Sample ID: MB 440-451008/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 451155 — **Prep Batch: 451008**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phosphorus, Total	ND		0.050	0.025	mg/L		01/10/18 18:00	01/11/18 12:01	1

Lab Sample ID: LCS 440-451008/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 451155 — **Prep Batch: 451008**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Phosphorus, Total	0.501	0.507		mg/L		101	80 - 120

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 320-202107/1
Matrix: Water
Analysis Batch: 202107

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		5.0	5.0	mg/L			01/02/18 10:14	1

Lab Sample ID: LCS 320-202107/2
Matrix: Water
Analysis Batch: 202107

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	1000	1000		mg/L		100	85 - 115

Lab Sample ID: MB 320-202702/1
Matrix: Water
Analysis Batch: 202702

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		5.0	5.0	mg/L			01/05/18 10:28	1

Lab Sample ID: LCS 320-202702/2
Matrix: Water
Analysis Batch: 202702

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	1000	965		mg/L		96	85 - 115

Lab Sample ID: 440-199358-5 DU
Matrix: Water
Analysis Batch: 202702

Client Sample ID: LIPALU-1350-1226
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Suspended Solids	4000	H	4240		mg/L		6	20

General Chemistry

Analysis Batch: 202107

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-199358-1	KAWA STREAM-12:00-1226	Total/NA	Water	SM 2540D	
440-199358-2	KAWA STREAM-14:15-1226	Total/NA	Water	SM 2540D	
440-199358-3	PARKWAY-11:40-1226	Total/NA	Water	SM 2540D	
440-199358-4	PARKWAY-1405-1226	Total/NA	Water	SM 2540D	
MB 320-202107/1	Method Blank	Total/NA	Water	SM 2540D	
LCS 320-202107/2	Lab Control Sample	Total/NA	Water	SM 2540D	

Analysis Batch: 202586

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-199358-1	KAWA STREAM-12:00-1226	Total/NA	Water	353.2	
440-199358-2	KAWA STREAM-14:15-1226	Total/NA	Water	353.2	
440-199358-3	PARKWAY-11:40-1226	Total/NA	Water	353.2	
440-199358-4	PARKWAY-1405-1226	Total/NA	Water	353.2	
440-199358-5	LIPALU-1350-1226	Total/NA	Water	353.2	
MB 320-202586/15	Method Blank	Total/NA	Water	353.2	
LCS 320-202586/16	Lab Control Sample	Total/NA	Water	353.2	

Analysis Batch: 202702

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-199358-5	LIPALU-1350-1226	Total/NA	Water	SM 2540D	
MB 320-202702/1	Method Blank	Total/NA	Water	SM 2540D	
LCS 320-202702/2	Lab Control Sample	Total/NA	Water	SM 2540D	
440-199358-5 DU	LIPALU-1350-1226	Total/NA	Water	SM 2540D	

Prep Batch: 449628

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-199358-1	KAWA STREAM-12:00-1226	Total/NA	Water	351.2	
440-199358-2	KAWA STREAM-14:15-1226	Total/NA	Water	351.2	
440-199358-3	PARKWAY-11:40-1226	Total/NA	Water	351.2	
440-199358-4	PARKWAY-1405-1226	Total/NA	Water	351.2	
440-199358-5	LIPALU-1350-1226	Total/NA	Water	351.2	
MB 440-449628/3-A	Method Blank	Total/NA	Water	351.2	
LCS 440-449628/4-A	Lab Control Sample	Total/NA	Water	351.2	
LCSD 440-449628/5-A	Lab Control Sample Dup	Total/NA	Water	351.2	

Analysis Batch: 449697

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-199358-1	KAWA STREAM-12:00-1226	Total/NA	Water	351.2	449628
440-199358-2	KAWA STREAM-14:15-1226	Total/NA	Water	351.2	449628
440-199358-3	PARKWAY-11:40-1226	Total/NA	Water	351.2	449628
440-199358-4	PARKWAY-1405-1226	Total/NA	Water	351.2	449628
440-199358-5	LIPALU-1350-1226	Total/NA	Water	351.2	449628
MB 440-449628/3-A	Method Blank	Total/NA	Water	351.2	449628
LCS 440-449628/4-A	Lab Control Sample	Total/NA	Water	351.2	449628
LCSD 440-449628/5-A	Lab Control Sample Dup	Total/NA	Water	351.2	449628

Prep Batch: 451008

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-199358-1	KAWA STREAM-12:00-1226	Total/NA	Water	365.2/365.3/365	
440-199358-2	KAWA STREAM-14:15-1226	Total/NA	Water	365.2/365.3/365	
440-199358-3	PARKWAY-11:40-1226	Total/NA	Water	365.2/365.3/365	

General Chemistry (Continued)

Prep Batch: 451008 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-199358-4	PARKWAY-1405-1226	Total/NA	Water	365.2/365.3/365	
440-199358-5	LIPALU-1350-1226	Total/NA	Water	365.2/365.3/365	
MB 440-451008/1-A	Method Blank	Total/NA	Water	365.2/365.3/365	
LCS 440-451008/2-A	Lab Control Sample	Total/NA	Water	365.2/365.3/365	

Analysis Batch: 451126

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-199358-1	KAWA STREAM-12:00-1226	Total/NA	Water	Total Nitrogen	
440-199358-2	KAWA STREAM-14:15-1226	Total/NA	Water	Total Nitrogen	
440-199358-3	PARKWAY-11:40-1226	Total/NA	Water	Total Nitrogen	
440-199358-4	PARKWAY-1405-1226	Total/NA	Water	Total Nitrogen	
440-199358-5	LIPALU-1350-1226	Total/NA	Water	Total Nitrogen	

Analysis Batch: 451155

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-199358-1	KAWA STREAM-12:00-1226	Total/NA	Water	365.3	451008
440-199358-2	KAWA STREAM-14:15-1226	Total/NA	Water	365.3	451008
440-199358-3	PARKWAY-11:40-1226	Total/NA	Water	365.3	451008
440-199358-4	PARKWAY-1405-1226	Total/NA	Water	365.3	451008
440-199358-5	LIPALU-1350-1226	Total/NA	Water	365.3	451008
MB 440-451008/1-A	Method Blank	Total/NA	Water	365.3	451008
LCS 440-451008/2-A	Lab Control Sample	Total/NA	Water	365.3	451008

Qualifiers

General Chemistry

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.
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)

Accreditation/Certification Summary

Client: Element Environmental, LLC
Project/Site: Hawaiian Memorial Cemetery

TestAmerica Job ID: 440-199358-1

Laboratory: TestAmerica Irvine

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	State Program	10	CA01531	06-30-18
Arizona	State Program	9	AZ0671	10-14-18
California	LA Cty Sanitation Districts	9	10256	06-30-18
California	State Program	9	CA ELAP 2706	06-30-18
Guam	State Program	9	Cert. No. 17-003R	01-23-18 *
Hawaii	State Program	9	N/A	01-29-18 *
Kansas	NELAP	7	E-10420	07-31-18
Nevada	State Program	9	CA015312018-1	07-31-18
New Mexico	State Program	6	N/A	01-29-18 *
Northern Mariana Islands	State Program	9	MP0002	01-29-17 *
Oregon	NELAP	10	4028	01-29-18 *
USDA	Federal		P330-15-00184	07-08-18
Washington	State Program	10	C900	09-03-18

Laboratory: TestAmerica Sacramento

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-055	01-31-18
Arizona	State Program	9	AZ0708	08-11-18
Arkansas DEQ	State Program	6	88-0691	06-17-18
California	State Program	9	2897	01-31-18
Colorado	State Program	8	CA00044	08-31-18
Connecticut	State Program	1	PH-0691	06-30-19
Florida	NELAP	4	E87570	06-30-18
Georgia	State Program	4	N/A	01-28-19
Hawaii	State Program	9	N/A	01-29-18
Illinois	NELAP	5	200060	03-17-18
Kansas	NELAP	7	E-10375	12-31-17 *
L-A-B	DoD ELAP		L2468	01-20-18
Louisiana	NELAP	6	30612	06-30-18
Maine	State Program	1	CA0004	04-18-18
Michigan	State Program	5	9947	01-31-18
Nevada	State Program	9	CA00044	07-31-18
New Hampshire	NELAP	1	2997	04-18-18
New Jersey	NELAP	2	CA005	06-30-18
New York	NELAP	2	11666	04-01-18
Oregon	NELAP	10	4040	01-29-20
Pennsylvania	NELAP	3	68-01272	03-31-18
Texas	NELAP	6	T104704399	05-31-18
US Fish & Wildlife	Federal		LE148388-0	07-31-18
USDA	Federal		P330-11-00436	12-30-17 *
USEPA UCMR	Federal	1	CA00044	11-06-18
Utah	NELAP	8	CA00044	02-28-18
Virginia	NELAP	3	460278	03-14-18
Washington	State Program	10	C581	05-05-18
Wyoming	State Program	8	8TMS-L	01-28-19

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

TestAmerica Sacramento
880 Riverside Parkway
West Sacramento, CA 95605-1500
phone 916.373.5600 fax 303.467.7248

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Regulatory Program: ☐DW ☐NPDES ☐RCRA ☑Other:

TestAmerica Laboratories, Inc.

Client Contact	Project Manager: Spencer	Site Contact:	Date:	COC No:
Element Environmental, LLC	Tel/Fax: 808 964-3953	Lab Contact:	Carrier:	____ of ____ COCs
98-030 Hekaha St. Unit 9	Analysis Turnaround Time			Sampler:
Aiea/ HI/ 96701	☐ CALENDAR DAYS ☐ WORKING DAYS			For Lab Use Only:
(808) 488-1200 Phone	TAT if different from Below ____			Walk-in Client:
(808) 488-1300 FAX	☐ 2 weeks			Lab Sampling:
Project Name: HALAU Cemetery	☐ 1 week			
Site:	☐ 2 days			Job / SDG No.:
P O #	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS / MSD (Y/N)	Total Nitrogen	Total Phosphorus	Total Suspended Solids	Sample Specific Notes:
KALA STREAM - 12:00-1226	12/26	12:00	G	W	2	N		X	X	X	
KALA STREAM - 14:15-1226	12/26	14:15	G	W	2	N		X	X	X	
PARKWAY - 11:40-1226	12/26	11:40	G	W	2	N		X	X	X	
PARKWAY - 1405-1226	12/26	1405	G	W	2	N		X	X	X	
LIPALU - 1350 - 1226	12/26	1350	G	W	2	N		X	X	X	

440-199358 Chain of Custody

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other ____

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return to Client ☐ Disposal by Lab ☐ Archive for ____ Months

Special Instructions/QC Requirements & Comments: Received on ice 8.8°c/8.9°c IR-81

Custody Seals Intact: ☐ Yes ☐ No	Custody Seal No.:		Cooler Temp. (°C): Obs'd: ____ Corr'd: ____		Therm ID No.: ____
Relinquished by:	Company: Element Env	Date/Time: 12/27/17 1355	Received by: Eric Yates	Company: TA-HON	Date/Time: 12/27/17 1355
Relinquished by:	Company:	Date/Time:	Received by:	Company: TA-IRV	Date/Time: 12/29/17 930
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:

Form No. CA-C-WI-002, Rev. 4.15, dated 9/27/2017

2.8/3.4 IR-66

TS 12/29/17

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1/15/2018

TestAmerica Irvine
17461 Derian Ave Suite 100
Irvine, CA 92614-5817
Phone (949) 261-1022 Fax (949) 260-3297

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Alltucker, David R	Carrier Tracking No(s):	COC No: 440-117721.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: david.alltucker@testamericainc.com	State of Origin: Hawaii	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note):		Job #: 440-199358-1
Address: 880 Riverside Parkway,	Due Date Requested: 1/11/2018			
City: West Sacramento	TAT Requested (days):			
State, Zip: CA, 95605				
Phone: 916-373-5600(Tel) 916-372-1059(Fax)	PO #:			
Email:	WO #:			
Project Name: Hawaiian Memorial Cemetery	Project #: 32010538			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	353.2/ Nitrate Nitrite Only	2540D/ Total Suspended Solids	Total Number of containers	Special Instructions/Note:
			Preservation Code:							
KAWA STREAM-12:00-1226 (440-199358-1)	12/26/17	12:00 Hawaiian		Water			X	X	2	
KAWA STREAM-14:15-1226 (440-199358-2)	12/26/17	14:15 Hawaiian		Water			X	X	2	
PARKWAY-11:40-1226 (440-199358-3)	12/26/17	11:40 Hawaiian		Water			X	X	2	
PARKWAY-1405-1226 (440-199358-4)	12/26/17	14:05 Hawaiian		Water			X	X	2	
LIPALU-1350-1226 (440-199358-5)	12/26/17	13:50 Hawaiian		Water			X	X	2	

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc.

Possible Hazard Identification	*Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*
Unconfirmed	☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
	12/27/17 0700	HA HV		12/30/17 910	TAIrv
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 1.6

Ver: 09/20/2016

1/15/2018

Login Sample Receipt Checklist

Client: Element Environmental, LLC

Job Number: 440-199358-1

Login Number: 199358
List Number: 1
Creator: Soderblom, Tim

List Source: TestAmerica Irvine

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	Not Present
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?	False	The Field Sampler was not listed on the Chain of Custody.
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.	False	Limited volume received.
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").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	False	Sample splitting required for subcontract purposes.
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Element Environmental, LLC

Job Number: 440-199358-1

Login Number: 199358
List Number: 2
Creator: Her, David A

List Source: TestAmerica Sacramento
List Creation: 12/30/17 11:10 AM

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.	N/A	
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	1.1 C
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?	False	Received project as a subcontract.
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").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Sampl

440-199358 Field Sheet

Job:__

Tracking # 4176 2737 2686

Use this form to record Sample Custody Seal, Cooler Custody Seal, Temperature & corrected Temperature & other observations. File in the job folder with the COC.

Notes:

Therm. ID: (AK-2) / AK-3 / HACCP /Other

Ice X Wet X Dry Other

Cooler Custody Seal: Seal

Sample Custody Seal: —

Cooler ID: —

Temp: Observed 1.6

Corrected: —

From: Temp Blank ☐ Sample ☒

NCM Filed: Yes ☐ No ☐

	Yes	No	NA
Perchlorate has headspace?	☐	☐	☒
CoC is complete w/o discrepancies?	☒	☐	☐
Samples received within holding time?	☒	☐	☐
Sample preservatives verified?	☐	☐	☒
Cooler compromised/tampered with?	☐	☒	☐
Samples compromised/tampered with?	☐	☒	☐
COC and Samples w/o discrepancies?	☒	☐	☐
Sample containers have legible labels?	☒	☐	☐
Containers are not broken or leaking?	☒	☐	☐
Sample date/times are provided.	☒	☐	☐
Appropriate containers are used?	☒	☐	☐
Sample bottles are completely filled?	☒	☐	☐
Zero headspace?*	☐	☐	☒
Multiphasic samples are not present?	☒	☐	☐

Initials: DH Date: 12/30/17

*Containers requiring zero headspace have no headspace, or bubble < 6 mm (1/4")

WBC

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Sacramento
880 Riverside Parkway
West Sacramento, CA 95605
Tel: (916)373-5600

TestAmerica Job ID: 320-35552-1
Client Project/Site: Hawaiian Memorial Cemetery

For:
Element Environmental, LLC
98-030 Hekaha Street, Unit 9
Aiea, Hawaii 96701

Attn: James Tsubone

Authorized for release by:
2/14/2018 3:28:10 PM

David Alltucker, Project Manager I
(916)374-4383
david.alltucker@testamericainc.com

Table of Contents

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)

Job ID: 320-35552-1

Laboratory: TestAmerica Sacramento

Narrative

Job Narrative
320-35552-1

Receipt
The samples were received on 1/31/2018 9:30 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.4º C.

HPLC/IC
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.

Organic Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Detection Summary

Client: Element Environmental, LLC
Project/Site: Hawaiian Memorial Cemetery

TestAmerica Job ID: 320-35552-1

Client Sample ID: KAWA Stream-1-27 — Lab Sample ID: 320-35552-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Total Kjeldahl Nitrogen	2.8		0.20	0.10	mg/L	1		351.2	Total/NA
Nitrate Nitrite as N	0.38		0.050	0.0031	mg/L	1		353.2	Total/NA
Phosphorus, Total	0.73		0.25	0.13	mg/L	1		365.3	Total/NA
Total Suspended Solids	280		20	10	mg/L	1		SM 2540D	Total/NA
Nitrogen, Total	3.2		0.11	0.11	mg/L	1		Total Nitrogen	Total/NA

Client Sample ID: Maintenance Culvert-1-27 — Lab Sample ID: 320-35552-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Total Kjeldahl Nitrogen	0.42		0.20	0.10	mg/L	1		351.2	Total/NA
Nitrate Nitrite as N	1.2		0.050	0.0031	mg/L	1		353.2	Total/NA
Phosphorus, Total	0.18		0.050	0.025	mg/L	1		365.3	Total/NA
Total Suspended Solids	18		2.5	1.3	mg/L	1		SM 2540D	Total/NA
Nitrogen, Total	1.6		0.11	0.11	mg/L	1		Total Nitrogen	Total/NA

Client Sample ID: Park View-1-27 — Lab Sample ID: 320-35552-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Total Kjeldahl Nitrogen	0.67		0.20	0.10	mg/L	1		351.2	Total/NA
Nitrate Nitrite as N	0.59		0.050	0.0031	mg/L	1		353.2	Total/NA
Phosphorus, Total	0.50		0.25	0.13	mg/L	1		365.3	Total/NA
Total Suspended Solids	110		6.7	3.3	mg/L	1		SM 2540D	Total/NA
Nitrogen, Total	1.3		0.11	0.11	mg/L	1		Total Nitrogen	Total/NA

Client Sample ID: Plantation Spring-1-29 — Lab Sample ID: 320-35552-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Nitrate Nitrite as N	0.36		0.050	0.0031	mg/L	1		353.2	Total/NA
Phosphorus, Total	0.11		0.050	0.025	mg/L	1		365.3	Total/NA
Total Suspended Solids	7.2		1.1	0.57	mg/L	1		SM 2540D	Total/NA
Nitrogen, Total	0.36		0.11	0.11	mg/L	1		Total Nitrogen	Total/NA

Client Sample ID: Cascade Spring-1-29 — Lab Sample ID: 320-35552-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Total Kjeldahl Nitrogen	1.7		0.20	0.10	mg/L	1		351.2	Total/NA
Nitrate Nitrite as N	1.1		0.050	0.0031	mg/L	1		353.2	Total/NA
Phosphorus, Total	0.095		0.050	0.025	mg/L	1		365.3	Total/NA
Total Suspended Solids	11		3.3	1.7	mg/L	1		SM 2540D	Total/NA
Nitrogen, Total	2.8		0.11	0.11	mg/L	1		Total Nitrogen	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: KAWA Stream-1-27

Lab Sample ID: 320-35552-1
Date Collected: 01/27/18 14:40
Matrix: Water
Date Received: 01/31/18 09:30

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Kjeldahl Nitrogen	2.8		0.20	0.10	mg/L		02/09/18 11:00	02/09/18 17:53	1
Nitrate Nitrite as N	0.38		0.050	0.0031	mg/L			02/02/18 10:22	1
Phosphorus, Total	0.73		0.25	0.13	mg/L		02/13/18 15:55	02/13/18 17:33	1
Total Suspended Solids	280		20	10	mg/L			02/02/18 17:09	1
Nitrogen, Total	3.2		0.11	0.11	mg/L			02/14/18 15:03	1

Client Sample ID: Maintenance Culvert-1-27

Lab Sample ID: 320-35552-2
Date Collected: 01/27/18 15:05
Matrix: Water
Date Received: 01/31/18 09:30

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Kjeldahl Nitrogen	0.42		0.20	0.10	mg/L		02/09/18 11:00	02/09/18 17:53	1
Nitrate Nitrite as N	1.2		0.050	0.0031	mg/L			02/02/18 10:24	1
Phosphorus, Total	0.18		0.050	0.025	mg/L		02/12/18 12:40	02/12/18 14:43	1
Total Suspended Solids	18		2.5	1.3	mg/L			02/02/18 17:09	1
Nitrogen, Total	1.6		0.11	0.11	mg/L			02/14/18 15:03	1

Client Sample ID: Park View-1-27

Lab Sample ID: 320-35552-3
Date Collected: 01/27/18 14:50
Matrix: Water
Date Received: 01/31/18 09:30

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Kjeldahl Nitrogen	0.67		0.20	0.10	mg/L		02/09/18 11:00	02/09/18 17:53	1
Nitrate Nitrite as N	0.59		0.050	0.0031	mg/L			02/02/18 10:32	1
Phosphorus, Total	0.50		0.25	0.13	mg/L		02/12/18 12:40	02/12/18 14:44	1
Total Suspended Solids	110		6.7	3.3	mg/L			02/02/18 17:09	1
Nitrogen, Total	1.3		0.11	0.11	mg/L			02/14/18 15:03	1

Client Sample ID: Plantation Spring-1-29

Lab Sample ID: 320-35552-4
Date Collected: 01/29/18 11:00
Matrix: Water
Date Received: 01/31/18 09:30

Method: 8315A - Carbonyl Compounds (HPLC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Formaldehyde	ND		0.010	0.0050	mg/L		02/01/18 05:53	02/01/18 16:00	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Kjeldahl Nitrogen	ND		0.20	0.10	mg/L		02/09/18 11:00	02/09/18 17:53	1
Nitrate Nitrite as N	0.36		0.050	0.0031	mg/L			02/02/18 10:34	1
Phosphorus, Total	0.11		0.050	0.025	mg/L		02/12/18 12:40	02/12/18 14:44	1
Total Suspended Solids	7.2		1.1	0.57	mg/L			02/02/18 17:09	1
Nitrogen, Total	0.36		0.11	0.11	mg/L			02/14/18 15:03	1

Client: Element Environmental, LLC
Project/Site: Hawaiian Memorial Cemetery

TestAmerica Job ID: 320-35552-1

Client Sample ID: Cascade Spring-1-29
Date Collected: 01/29/18 13:06
Date Received: 01/31/18 09:30

Lab Sample ID: 320-35552-5
Matrix: Water

Method: 8315A - Carbonyl Compounds (HPLC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Formaldehyde	ND		0.010	0.0050	mg/L		02/01/18 05:53	02/01/18 16:19	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Kjeldahl Nitrogen	1.7		0.20	0.10	mg/L		02/09/18 11:00	02/09/18 17:53	1
Nitrate Nitrite as N	1.1		0.050	0.0031	mg/L			02/02/18 10:36	1
Phosphorus, Total	0.095		0.050	0.025	mg/L		02/12/18 12:40	02/12/18 14:44	1
Total Suspended Solids	11		3.3	1.7	mg/L			02/02/18 17:09	1
Nitrogen, Total	2.8		0.11	0.11	mg/L			02/14/18 15:03	1

Method: 8315A - Carbonyl Compounds (HPLC)

Lab Sample ID: MB 440-455001/1-A
Matrix: Water
Analysis Batch: 455103

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 455001

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Formaldehyde	ND		0.010	0.0050	mg/L		02/01/18 05:53	02/01/18 14:08	1

Lab Sample ID: LCS 440-455001/2-A
Matrix: Water
Analysis Batch: 455103

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 455001

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Formaldehyde	0.0500	0.0424		mg/L		85	70 - 129

Method: 351.2 - Nitrogen, Total Kjeldahl

Lab Sample ID: MB 440-456621/3-A
Matrix: Water
Analysis Batch: 456705

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 456621

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Kjeldahl Nitrogen	ND		0.20	0.10	mg/L		02/09/18 11:00	02/09/18 17:48	1

Lab Sample ID: LCS 440-456621/4-A
Matrix: Water
Analysis Batch: 456705

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 456621

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Kjeldahl Nitrogen	5.00	4.78		mg/L		96	90 - 110

Lab Sample ID: LCSD 440-456621/5-A
Matrix: Water
Analysis Batch: 456705

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 456621

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Kjeldahl Nitrogen	5.00	4.77		mg/L		95	90 - 110	0	20

Method: 353.2 - Nitrogen, Nitrate-Nitrite

Lab Sample ID: MB 320-206693/15
Matrix: Water
Analysis Batch: 206693

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate Nitrite as N	ND		0.050	0.0031	mg/L			02/02/18 10:06	1

Lab Sample ID: LCS 320-206693/16
Matrix: Water
Analysis Batch: 206693

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate Nitrite as N	1.00	0.985		mg/L		99	90 - 110

Method: 365.3 - Phosphorus, Total

Lab Sample ID: MB 440-456933/1-A
Matrix: Water
Analysis Batch: 456971

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 456933

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phosphorus, Total	ND		0.050	0.025	mg/L		02/12/18 12:40	02/12/18 14:42	1

Lab Sample ID: LCS 440-456933/2-A
Matrix: Water
Analysis Batch: 456971

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 456933

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Phosphorus, Total	0.501	0.500		mg/L		100	80 - 120

Lab Sample ID: MB 440-457244/1-A
Matrix: Water
Analysis Batch: 457288

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 457244

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phosphorus, Total	ND		0.050	0.025	mg/L		02/13/18 15:55	02/13/18 17:32	1

Lab Sample ID: LCS 440-457244/2-A
Matrix: Water
Analysis Batch: 457288

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 457244

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Phosphorus, Total	0.501	0.508		mg/L		102	80 - 120

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 440-455361/1
Matrix: Water
Analysis Batch: 455361

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		1.0	0.50	mg/L			02/02/18 17:09	1

Lab Sample ID: LCS 440-455361/2
Matrix: Water
Analysis Batch: 455361

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	1000	1010		mg/L		101	85 - 115

Lab Sample ID: 320-35552-1 DU
Matrix: Water
Analysis Batch: 455361

Client Sample ID: KAWA Stream-1-27
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Suspended Solids	280		286		mg/L		1	10

HPLC/IC

Prep Batch: 455001

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-35552-4	Plantation Spring-1-29	Total/NA	Water	8315_W_Prep	
320-35552-5	Cascade Spring-1-29	Total/NA	Water	8315_W_Prep	
MB 440-455001/1-A	Method Blank	Total/NA	Water	8315_W_Prep	
LCS 440-455001/2-A	Lab Control Sample	Total/NA	Water	8315_W_Prep	

Analysis Batch: 455103

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-35552-4	Plantation Spring-1-29	Total/NA	Water	8315A	455001
320-35552-5	Cascade Spring-1-29	Total/NA	Water	8315A	455001
MB 440-455001/1-A	Method Blank	Total/NA	Water	8315A	455001
LCS 440-455001/2-A	Lab Control Sample	Total/NA	Water	8315A	455001

General Chemistry

Analysis Batch: 206693

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-35552-1	KAWA Stream-1-27	Total/NA	Water	353.2	
320-35552-2	Maintenance Culvert-1-27	Total/NA	Water	353.2	
320-35552-3	Park View-1-27	Total/NA	Water	353.2	
320-35552-4	Plantation Spring-1-29	Total/NA	Water	353.2	
320-35552-5	Cascade Spring-1-29	Total/NA	Water	353.2	
MB 320-206693/15	Method Blank	Total/NA	Water	353.2	
LCS 320-206693/16	Lab Control Sample	Total/NA	Water	353.2	

Analysis Batch: 455361

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-35552-1	KAWA Stream-1-27	Total/NA	Water	SM 2540D	
320-35552-2	Maintenance Culvert-1-27	Total/NA	Water	SM 2540D	
320-35552-3	Park View-1-27	Total/NA	Water	SM 2540D	
320-35552-4	Plantation Spring-1-29	Total/NA	Water	SM 2540D	
320-35552-5	Cascade Spring-1-29	Total/NA	Water	SM 2540D	
MB 440-455361/1	Method Blank	Total/NA	Water	SM 2540D	
LCS 440-455361/2	Lab Control Sample	Total/NA	Water	SM 2540D	
320-35552-1 DU	KAWA Stream-1-27	Total/NA	Water	SM 2540D	

Prep Batch: 456621

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-35552-1	KAWA Stream-1-27	Total/NA	Water	351.2	
320-35552-2	Maintenance Culvert-1-27	Total/NA	Water	351.2	
320-35552-3	Park View-1-27	Total/NA	Water	351.2	
320-35552-4	Plantation Spring-1-29	Total/NA	Water	351.2	
320-35552-5	Cascade Spring-1-29	Total/NA	Water	351.2	
MB 440-456621/3-A	Method Blank	Total/NA	Water	351.2	
LCS 440-456621/4-A	Lab Control Sample	Total/NA	Water	351.2	
LCSD 440-456621/5-A	Lab Control Sample Dup	Total/NA	Water	351.2	

Analysis Batch: 456705

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-35552-1	KAWA Stream-1-27	Total/NA	Water	351.2	456621
320-35552-2	Maintenance Culvert-1-27	Total/NA	Water	351.2	456621

General Chemistry (Continued)

Analysis Batch: 456705 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-35552-3	Park View-1-27	Total/NA	Water	351.2	456621
320-35552-4	Plantation Spring-1-29	Total/NA	Water	351.2	456621
320-35552-5	Cascade Spring-1-29	Total/NA	Water	351.2	456621
MB 440-456621/3-A	Method Blank	Total/NA	Water	351.2	456621
LCS 440-456621/4-A	Lab Control Sample	Total/NA	Water	351.2	456621
LCSD 440-456621/5-A	Lab Control Sample Dup	Total/NA	Water	351.2	456621

Prep Batch: 456933

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-35552-2	Maintenance Culvert-1-27	Total/NA	Water	365.2/365.3/365	
320-35552-3	Park View-1-27	Total/NA	Water	365.2/365.3/365	
320-35552-4	Plantation Spring-1-29	Total/NA	Water	365.2/365.3/365	
320-35552-5	Cascade Spring-1-29	Total/NA	Water	365.2/365.3/365	
MB 440-456933/1-A	Method Blank	Total/NA	Water	365.2/365.3/365	
LCS 440-456933/2-A	Lab Control Sample	Total/NA	Water	365.2/365.3/365	

Analysis Batch: 456971

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-35552-2	Maintenance Culvert-1-27	Total/NA	Water	365.3	456933
320-35552-3	Park View-1-27	Total/NA	Water	365.3	456933
320-35552-4	Plantation Spring-1-29	Total/NA	Water	365.3	456933
320-35552-5	Cascade Spring-1-29	Total/NA	Water	365.3	456933
MB 440-456933/1-A	Method Blank	Total/NA	Water	365.3	456933
LCS 440-456933/2-A	Lab Control Sample	Total/NA	Water	365.3	456933

Prep Batch: 457244

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-35552-1	KAWA Stream-1-27	Total/NA	Water	365.2/365.3/365	
MB 440-457244/1-A	Method Blank	Total/NA	Water	365.2/365.3/365	
LCS 440-457244/2-A	Lab Control Sample	Total/NA	Water	365.2/365.3/365	

Analysis Batch: 457288

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-35552-1	KAWA Stream-1-27	Total/NA	Water	365.3	457244
MB 440-457244/1-A	Method Blank	Total/NA	Water	365.3	457244
LCS 440-457244/2-A	Lab Control Sample	Total/NA	Water	365.3	457244

Analysis Batch: 457519

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-35552-1	KAWA Stream-1-27	Total/NA	Water	Total Nitrogen	
320-35552-2	Maintenance Culvert-1-27	Total/NA	Water	Total Nitrogen	
320-35552-3	Park View-1-27	Total/NA	Water	Total Nitrogen	
320-35552-4	Plantation Spring-1-29	Total/NA	Water	Total Nitrogen	
320-35552-5	Cascade Spring-1-29	Total/NA	Water	Total Nitrogen	

Lab Chronicle

Client: Element Environmental, LLC
Project/Site: Hawaiian Memorial Cemetery

TestAmerica Job ID: 320-35552-1

Client Sample ID: KAWA Stream-1-27

Lab Sample ID: 320-35552-1
Matrix: Water
Date Collected: 01/27/18 14:40
Date Received: 01/31/18 09:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	351.2			25 mL	25 mL	456621	02/09/18 11:00	AN	TAL IRV
Total/NA	Analysis	351.2		1			456705	02/09/18 17:53	AN	TAL IRV
Total/NA	Analysis	353.2		1			206693	02/02/18 10:22	TCS	TAL SAC
Total/NA	Prep	365.2/365.3/365			10 mL	50 mL	457244	02/13/18 15:55	MMP	TAL IRV
Total/NA	Analysis	365.3		1			457288	02/13/18 17:33	MMP	TAL IRV
Total/NA	Analysis	SM 2540D		1	50 mL	1000 mL	455361	02/02/18 17:09	HTL	TAL IRV
Total/NA	Analysis	Total Nitrogen		1			457519	02/14/18 15:03	TLN	TAL IRV

Client Sample ID: Maintenance Culvert-1-27

Lab Sample ID: 320-35552-2
Matrix: Water
Date Collected: 01/27/18 15:05
Date Received: 01/31/18 09:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	351.2			25 mL	25 mL	456621	02/09/18 11:00	AN	TAL IRV
Total/NA	Analysis	351.2		1			456705	02/09/18 17:53	AN	TAL IRV
Total/NA	Analysis	353.2		1			206693	02/02/18 10:24	TCS	TAL SAC
Total/NA	Prep	365.2/365.3/365			50 mL	50 mL	456933	02/12/18 12:40	MMP	TAL IRV
Total/NA	Analysis	365.3		1			456971	02/12/18 14:43	MMP	TAL IRV
Total/NA	Analysis	SM 2540D		1	400 mL	1000 mL	455361	02/02/18 17:09	HTL	TAL IRV
Total/NA	Analysis	Total Nitrogen		1			457519	02/14/18 15:03	TLN	TAL IRV

Client Sample ID: Park View-1-27

Lab Sample ID: 320-35552-3
Matrix: Water
Date Collected: 01/27/18 14:50
Date Received: 01/31/18 09:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	351.2			25 mL	25 mL	456621	02/09/18 11:00	AN	TAL IRV
Total/NA	Analysis	351.2		1			456705	02/09/18 17:53	AN	TAL IRV
Total/NA	Analysis	353.2		1			206693	02/02/18 10:32	TCS	TAL SAC
Total/NA	Prep	365.2/365.3/365			10 mL	50 mL	456933	02/12/18 12:40	MMP	TAL IRV
Total/NA	Analysis	365.3		1			456971	02/12/18 14:44	MMP	TAL IRV
Total/NA	Analysis	SM 2540D		1	150 mL	1000 mL	455361	02/02/18 17:09	HTL	TAL IRV
Total/NA	Analysis	Total Nitrogen		1			457519	02/14/18 15:03	TLN	TAL IRV

Client Sample ID: Plantation Spring-1-29

Lab Sample ID: 320-35552-4
Matrix: Water
Date Collected: 01/29/18 11:00
Date Received: 01/31/18 09:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	8315_W_Prep			100 mL	1 mL	455001	02/01/18 05:53	FTD	TAL IRV
Total/NA	Analysis	8315A		1			455103	02/01/18 16:00	D1D	TAL IRV
Total/NA	Prep	351.2			25 mL	25 mL	456621	02/09/18 11:00	AN	TAL IRV

Lab Chronicle

Client: Element Environmental, LLC
Project/Site: Hawaiian Memorial Cemetery

TestAmerica Job ID: 320-35552-1

Client Sample ID: Plantation Spring-1-29

Date Collected: 01/29/18 11:00
Date Received: 01/31/18 09:30

Lab Sample ID: 320-35552-4
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	351.2		1			456705	02/09/18 17:53	AN	TAL IRV
Total/NA	Analysis	353.2		1			206693	02/02/18 10:34	TCS	TAL SAC
Total/NA	Prep	365.2/365.3/365			50 mL	50 mL	456933	02/12/18 12:40	MMP	TAL IRV
Total/NA	Analysis	365.3		1			456971	02/12/18 14:44	MMP	TAL IRV
Total/NA	Analysis	SM 2540D		1	880 mL	1000 mL	455361	02/02/18 17:09	HTL	TAL IRV
Total/NA	Analysis	Total Nitrogen		1			457519	02/14/18 15:03	TLN	TAL IRV

Client Sample ID: Cascade Spring-1-29

Date Collected: 01/29/18 13:06
Date Received: 01/31/18 09:30

Lab Sample ID: 320-35552-5
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	8315_W_Prep			100 mL	1 mL	455001	02/01/18 05:53	FTD	TAL IRV
Total/NA	Analysis	8315A		1			455103	02/01/18 16:19	D1D	TAL IRV
Total/NA	Prep	351.2			25 mL	25 mL	456621	02/09/18 11:00	AN	TAL IRV
Total/NA	Analysis	351.2		1			456705	02/09/18 17:53	AN	TAL IRV
Total/NA	Analysis	353.2		1			206693	02/02/18 10:36	TCS	TAL SAC
Total/NA	Prep	365.2/365.3/365			50 mL	50 mL	456933	02/12/18 12:40	MMP	TAL IRV
Total/NA	Analysis	365.3		1			456971	02/12/18 14:44	MMP	TAL IRV
Total/NA	Analysis	SM 2540D		1	300 mL	1000 mL	455361	02/02/18 17:09	HTL	TAL IRV
Total/NA	Analysis	Total Nitrogen		1			457519	02/14/18 15:03	TLN	TAL IRV

Laboratory References:

TAL IRV = TestAmerica Irvine, 17461 Derian Ave, Suite 100, Irvine, CA 92614-5817, TEL (949)261-1022

TAL SAC = TestAmerica Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Accreditation/Certification Summary

Client: Element Environmental, LLC
Project/Site: Hawaiian Memorial Cemetery

TestAmerica Job ID: 320-35552-1

Laboratory: TestAmerica Sacramento

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	17-020	01-20-21
Arizona	State Program	9	AZ0708	08-11-18
Arkansas DEQ	State Program	6	88-0691	06-17-18
California	State Program	9	2897	01-31-19
Colorado	State Program	8	CA00044	08-31-18
Connecticut	State Program	1	PH-0691	06-30-19
Florida	NELAP	4	E87570	06-30-18
Georgia	State Program	4	N/A	01-28-19
Hawaii	State Program	9	N/A	01-29-19
Illinois	NELAP	5	200060	03-17-18
Kansas	NELAP	7	E-10375	10-31-18
L-A-B	DoD ELAP		L2468	01-20-21
Louisiana	NELAP	6	30612	06-30-18
Maine	State Program	1	CA0004	04-14-18
Michigan	State Program	5	9947	01-31-18 *
Nevada	State Program	9	CA00044	07-31-18
New Hampshire	NELAP	1	2997	04-18-18
New Jersey	NELAP	2	CA005	06-30-18
New York	NELAP	2	11666	04-01-18
Oregon	NELAP	10	4040	01-29-19
Pennsylvania	NELAP	3	68-01272	03-31-18
Texas	NELAP	6	T104704399	05-31-18
US Fish & Wildlife	Federal		LE148388-0	07-31-18
USDA	Federal		P330-11-00436	01-17-21
USEPA UCMR	Federal	1	CA00044	11-06-18
Utah	NELAP	8	CA00044	02-28-18
Virginia	NELAP	3	460278	03-14-18
Washington	State Program	10	C581	05-05-18
West Virginia (DW)	State Program	3	9930C	12-31-18
Wyoming	State Program	8	8TMS-L	01-28-19

Laboratory: TestAmerica Irvine

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	State Program	10	CA01531	06-30-18
Arizona	State Program	9	AZ0671	10-14-18
California	LA Cty Sanitation Districts	9	10256	06-30-18
California	State Program	9	CA ELAP 2706	06-30-18
Guam	State Program	9	Cert. No. 17-003R	01-23-18 *
Hawaii	State Program	9	N/A	01-29-19
Kansas	NELAP	7	E-10420	07-31-18
Nevada	State Program	9	CA015312018-1	07-31-18
New Mexico	State Program	6	N/A	01-29-19
Northern Mariana Islands	State Program	9	MP0002	01-29-17 *
Oregon	NELAP	10	4028	01-29-19
USDA	Federal		P330-15-00184	07-08-18
Washington	State Program	10	C900	09-03-18

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Method Summary

Client: Element Environmental, LLC
Project/Site: Hawaiian Memorial Cemetery

TestAmerica Job ID: 320-35552-1

Method	Method Description	Protocol	Laboratory
8315A	Carbonyl Compounds (HPLC)	SW846	TAL IRV
351.2	Nitrogen, Total Kjeldahl	MCAWW	TAL IRV
353.2	Nitrogen, Nitrate-Nitrite	MCAWW	TAL SAC
365.3	Phosphorus, Total	EPA	TAL IRV
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL IRV
Total Nitrogen	Nitrogen, Total	EPA	TAL IRV

Protocol References:

EPA = US Environmental Protection Agency
MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.
SM = "Standard Methods For The Examination Of Water And Wastewater",
SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL IRV = TestAmerica Irvine, 17461 Derian Ave, Suite 100, Irvine, CA 92614-5817, TEL (949)261-1022
TAL SAC = TestAmerica Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Sample Summary

Client: Element Environmental, LLC
Project/Site: Hawaiian Memorial Cemetery

TestAmerica Job ID: 320-35552-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-35552-1	KAWA Stream-1-27	Water	01/27/18 14:40	01/31/18 09:30
320-35552-2	Maintenance Culvert-1-27	Water	01/27/18 15:05	01/31/18 09:30
320-35552-3	Park View-1-27	Water	01/27/18 14:50	01/31/18 09:30
320-35552-4	Plantation Spring-1-29	Water	01/29/18 11:00	01/31/18 09:30
320-35552-5	Cascade Spring-1-29	Water	01/29/18 13:06	01/31/18 09:30

TestAmerica Sacramento
880 Riverside Parkway
West Sacramento, CA 95605
Phone: 916.373.5600 Fax:

Chain of Custody Record 242127

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
TestAmerica Laboratories, Inc.
TAL-8210 (0713)

Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other:

Client Contact	Project Manager: Steve Spangler	Site Contact:	Date: 1/29/18	COC No:
Company Name: Element Environmental LLC	Tel/Fax: 808 864 3953	Lab Contact:	Carrier:	1 of 1 COCs
Address: 98-030 Hekaha St, Unit 9	Analysis Turnaround Time			Sampler:
City/State/Zip: Aiea, HI 96701	☐ CALENDAR DAYS ☐ WORKING DAYS			For Lab Use Only:
Phone: 808 488 1200	TAT if different from Below			Walk-in Client:
Fax: 808 488 1300	☐ 2 weeks			Lab Sampling:
Project Name: Hawaii Memorial Cemetery	☐ 1 week			
Site:	☐ 2 days			Job / SDG No.:
PO# 170057	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS / MSD (Y/N)	TN, TKN, TP, Nitrate-Nitrite	TSS	Formaldehyde	Sample Specific Notes:
Kawa Stream - 1-27	1/27/18	1440	G	Water	3			X	X		
Maintenance Culvert - 1-27	"	1505	"	"	3			X	X		
Park View - 1-27	"	1450	"	"	3			X	X		
Plantation Spring - 1-29	1/29/18	1100	"	"	4			X	X	X	
Cascade Spring - 1-29	"	1306	"	"	4			X	X	X	

320-35552 Chain of Custody

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return to Client ☐ Disposal by Lab ☐ Archive for _____ Months

Special Instructions/QC Requirements & Comments: Received on ice 7.6°C / 7.6°C IR-67 IR-3

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.: | Cooler Temp. (°C): Obs'd: 1.4 Corr'd: _____ | Therm ID No.:

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	Element Env	1/29/18 1657	Eric Yates [signature]	TA-HON	1/29/18 1657
Relinquished by: Eric Yates [signature]	Company: TA-HON	Date/Time: 1/30/18 1037	Received by: [signature]	Company: TA-Sac	Date/Time: 1-31-18 930
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:

TestAmerica Sacramento
880 Riverside Parkway
West Sacramento, CA 95605
Phone (916) 373-5600 Fax (916) 372-1059

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)	Sampler	Lab PM: Alltucker, David R	Carrier Tracking No(s)	COC No: 320-110921 1
Client Contact: Shipping/Receiving	Phone	E-Mail: david.alltucker@testamericainc.com	State of Origin: Hawaii	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc		Accreditations Required (See note)		Job #: 320-35552-1
Address: 17461 Derian Ave, Suite 100.	Due Date Requested: 2/12/2018			Preservation Codes:
City: Irvine	TAT Requested (days):			A - HCL; B - NaOH; C - Zn Acetate; D - Nitric Acid; E - NaHSO4; F - MeOH; G - Amchlor; H - Ascorbic Acid; I - Ice; J - DI Water; K - EDTA; L - EDA; M - Hexane; N - None; O - AsNaO2; P - Na2O4S; Q - Na2SO3; R - Na2S2O3; S - H2SO4; T - TSP Dodecahydrate; U - Acetone; V - MCAA; W - pH 4-5; Z - other (specify)
State, Zip: CA, 92614-5817	PO #			
Phone: 949-261-1022(Tel) 949-260-3297(Fax)	WO #			
Email	Project #: 32010538			Other:
Project Name: Hawaiian Memorial Cemetery	SSOW#			
Site				

Analysis Requested

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	351.2/351.2_Prep	Nitrogen,Total	365.3/365_Prep	2540D	8315/8316_W_LLE_Prep (MOD) Local Method	Total Number of containers	Special Instructions/Note:
			Preservation Code:										
KAWA Stream-1-27 (320-35552-1)	1/27/18	14:40 Hawaiian		Water			X	X	X	X		2	
Maintenance Culvert-1-27 (320-35552-2)	1/27/18	15:05 Hawaiian		Water			X	X	X	X		2	
Park View-1-27 (320-35552-3)	1/27/18	14:50 Hawaiian		Water			X	X	X	X		2	
Plantation Spring-1-29 (320-35552-4)	1/29/18	11:00 Hawaiian		Water			X	X	X	X	X	3	
Cascade Spring-1-29 (320-35552-5)	1/29/18	13:06 Hawaiian		Water			X	X	X	X	X	3	

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to TestAmerica Laboratories, Inc.

Possible Hazard Identification	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Unconfirmed	☐ Return To Client ☐ Disposal By Lab ☐ Archive For ____ Months
Deliverable Requested: I, II, III, IV, Other (specify) — Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment

Relinquished by	Date/Time	Company	Received by	Date/Time	Company
[signature]	1/31/18 1600	TAESAC			
Relinquished by	Date/Time	Company	Received by	Date/Time	Company
			[signature]		
Relinquished by	Date/Time	Company	Received by	Date/Time	Company
			[signature]	2/1/18 0945	TAEIRV

Custody Seals Intact: ☒ Yes ☐ No	Custody Seal No.: fedex: 4895 5408 4653	Cooler Temperature(s) °C and Other Remarks: 1.1 @ 1.2 @ 1.9

Ver: 09/20/2016

Login Sample Receipt Checklist

Client: Element Environmental, LLC

Job Number: 320-35552-1

Login Number: 35552
List Number: 1
Creator: Nelson, Kym D

List Source: TestAmerica Sacramento

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.	N/A	
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?	False	
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").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Element Environmental, LLC

Job Number: 320-35552-1

Login Number: 35552
List Number: 2
Creator: Perez, Angel

List Source: TestAmerica Irvine
List Creation: 02/01/18 10:10 AM

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.	N/A	
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?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	N/A	
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	

Login Sample Receipt Checklist

Client: Element Environmental, LLC

Job Number: 320-35552-1

Login Number: 35552
List Number: 3
Creator: Ornelas, Olga

List Source: TestAmerica Irvine
List Creation: 02/01/18 12:40 PM

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.	N/A	Not Present
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?	N/A	Received project as a subcontract.
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").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Sacramento
880 Riverside Parkway
West Sacramento, CA 95605
Tel: (916)373-5600

TestAmerica Job ID: 320-35837-1
Client Project/Site: Hawaiian Memorial Cemetery

For:
Element Environmental, LLC
98-030 Hekaha Street, Unit 9
Aiea, Hawaii 96701

Attn: James Tsubone

Authorized for release by:
2/22/2018 11:46:48 AM

David Alltucker, Project Manager I
(916)374-4383
david.alltucker@testamericainc.com

Table of Contents

Qualifiers

General Chemistry

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
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)

Job ID: 320-35837-1

Laboratory: TestAmerica Sacramento

Narrative

Job Narrative
320-35837-1

Receipt
The samples were received on 2/8/2018 8:55 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 3.2º C.

General Chemistry
Method(s) 353.2: For the following samples in batch: 320-208659 , a matrix spike/matrix spike duplicate was analyzed on non-client samples but not reported with this sample set. The MS/MSD pair were in control. Lepolu25-15:30 (320-35837-1) and Lepolu2518-9:30 (320-35837-2)

Method(s) 365.3: The matrix spike / matrix spike duplicate (MS/MSD) recoveries and precision for preparation batch 440-458960 and analytical batch 440-459023 were outside control limits. Sample matrix interference is suspected.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Detection Summary

Client: Element Environmental, LLC
Project/Site: Hawaiian Memorial Cemetery

TestAmerica Job ID: 320-35837-1

Client Sample ID: Lepolu25-15:30 — Lab Sample ID: 320-35837-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Total Kjeldahl Nitrogen	5.0		0.20	0.10	mg/L	1		351.2	Total/NA
Nitrate Nitrite as N	0.46	B	0.050	0.0031	mg/L	1		353.2	Total/NA
Phosphorus, Total	1.1		0.10	0.050	mg/L	1		365.3	Total/NA
Nitrogen, Total	5.5		0.11	0.11	mg/L	1		Total Nitrogen	Total/NA

Client Sample ID: Lepolu2518-9:30 — Lab Sample ID: 320-35837-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Total Kjeldahl Nitrogen	1.5		0.20	0.10	mg/L	1		351.2	Total/NA
Nitrate Nitrite as N	0.89	B	0.050	0.0031	mg/L	1		353.2	Total/NA
Phosphorus, Total	0.40		0.050	0.025	mg/L	1		365.3	Total/NA
Nitrogen, Total	2.4		0.11	0.11	mg/L	1		Total Nitrogen	Total/NA

This Detection Summary does not include radiochemical test results.

Client: Element Environmental, LLC
Project/Site: Hawaiian Memorial Cemetery

TestAmerica Job ID: 320-35837-1

Client Sample ID: Lepolu25-15:30

Lab Sample ID: 320-35837-1

Date Collected: 02/05/18 15:30

Matrix: Water

Date Received: 02/07/18 16:14

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Kjeldahl Nitrogen	5.0		0.20	0.10	mg/L		02/21/18 16:24	02/21/18 18:45	1
Nitrate Nitrite as N	0.46	B	0.050	0.0031	mg/L			02/15/18 14:41	1
Phosphorus, Total	1.1		0.10	0.050	mg/L		02/21/18 12:03	02/21/18 15:02	1
Nitrogen, Total	5.5		0.11	0.11	mg/L			02/22/18 11:35	1

Client Sample ID: Lepolu2518-9:30

Lab Sample ID: 320-35837-2

Date Collected: 02/05/18 09:30

Matrix: Water

Date Received: 02/07/18 16:14

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Kjeldahl Nitrogen	1.5		0.20	0.10	mg/L		02/21/18 16:24	02/21/18 18:45	1
Nitrate Nitrite as N	0.89	B	0.050	0.0031	mg/L			02/15/18 14:43	1
Phosphorus, Total	0.40		0.050	0.025	mg/L		02/21/18 12:03	02/21/18 15:02	1
Nitrogen, Total	2.4		0.11	0.11	mg/L			02/22/18 11:35	1

Method: 351.2 - Nitrogen, Total Kjeldahl

Lab Sample ID: MB 440-459047/3-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 459087 — **Prep Batch: 459047**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Kjeldahl Nitrogen	ND		0.20	0.10	mg/L		02/21/18 16:24	02/21/18 18:45	1

Lab Sample ID: LCS 440-459047/4-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 459087 — **Prep Batch: 459047**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Kjeldahl Nitrogen	5.00	4.85		mg/L		97	90 - 110

Lab Sample ID: LCSD 440-459047/5-A — **Client Sample ID: Lab Control Sample Dup**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 459087 — **Prep Batch: 459047**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Kjeldahl Nitrogen	5.00	4.89		mg/L		98	90 - 110	1	20

Method: 353.2 - Nitrogen, Nitrate-Nitrite

Lab Sample ID: MB 320-208659/15 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 208659

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate Nitrite as N	0.00400	J	0.050	0.0031	mg/L			02/15/18 14:29	1

Lab Sample ID: LCS 320-208659/16 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 208659

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate Nitrite as N	1.00	0.966		mg/L		97	90 - 110

Method: 365.3 - Phosphorus, Total

Lab Sample ID: MB 440-458960/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 459023 — **Prep Batch: 458960**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phosphorus, Total	ND		0.050	0.025	mg/L		02/21/18 12:03	02/21/18 15:00	1

Lab Sample ID: LCS 440-458960/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 459023 — **Prep Batch: 458960**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Phosphorus, Total	0.501	0.497		mg/L		99	80 - 120

General Chemistry

Analysis Batch: 208659

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-35837-1	Lepolu25-15:30	Total/NA	Water	353.2	
320-35837-2	Lepolu2518-9:30	Total/NA	Water	353.2	
MB 320-208659/15	Method Blank	Total/NA	Water	353.2	
LCS 320-208659/16	Lab Control Sample	Total/NA	Water	353.2	

Prep Batch: 458960

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-35837-1	Lepolu25-15:30	Total/NA	Water	365.2/365.3/365	
320-35837-2	Lepolu2518-9:30	Total/NA	Water	365.2/365.3/365	
MB 440-458960/1-A	Method Blank	Total/NA	Water	365.2/365.3/365	
LCS 440-458960/2-A	Lab Control Sample	Total/NA	Water	365.2/365.3/365	

Analysis Batch: 459023

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-35837-1	Lepolu25-15:30	Total/NA	Water	365.3	458960
320-35837-2	Lepolu2518-9:30	Total/NA	Water	365.3	458960
MB 440-458960/1-A	Method Blank	Total/NA	Water	365.3	458960
LCS 440-458960/2-A	Lab Control Sample	Total/NA	Water	365.3	458960

Prep Batch: 459047

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-35837-1	Lepolu25-15:30	Total/NA	Water	351.2	
320-35837-2	Lepolu2518-9:30	Total/NA	Water	351.2	
MB 440-459047/3-A	Method Blank	Total/NA	Water	351.2	
LCS 440-459047/4-A	Lab Control Sample	Total/NA	Water	351.2	
LCSD 440-459047/5-A	Lab Control Sample Dup	Total/NA	Water	351.2	

Analysis Batch: 459087

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-35837-1	Lepolu25-15:30	Total/NA	Water	351.2	459047
320-35837-2	Lepolu2518-9:30	Total/NA	Water	351.2	459047
MB 440-459047/3-A	Method Blank	Total/NA	Water	351.2	459047
LCS 440-459047/4-A	Lab Control Sample	Total/NA	Water	351.2	459047
LCSD 440-459047/5-A	Lab Control Sample Dup	Total/NA	Water	351.2	459047

Analysis Batch: 459218

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-35837-1	Lepolu25-15:30	Total/NA	Water	Total Nitrogen	
320-35837-2	Lepolu2518-9:30	Total/NA	Water	Total Nitrogen	

Lab Chronicle

Client: Element Environmental, LLC
Project/Site: Hawaiian Memorial Cemetery

TestAmerica Job ID: 320-35837-1

Client Sample ID: Lepolu25-15:30

Lab Sample ID: 320-35837-1

Date Collected: 02/05/18 15:30

Matrix: Water

Date Received: 02/07/18 16:14

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	351.2			25 mL	25 mL	459047	02/21/18 16:24	AN	TAL IRV
Total/NA	Analysis	351.2		1			459087	02/21/18 18:45	AN	TAL IRV
Total/NA	Analysis	353.2		1			208659	02/15/18 14:41	TCS	TAL SAC
Total/NA	Prep	365.2/365.3/365			25 mL	50 mL	458960	02/21/18 12:03	MMP	TAL IRV
Total/NA	Analysis	365.3		1			459023	02/21/18 15:02	MMP	TAL IRV
Total/NA	Analysis	Total Nitrogen		1			459218	02/22/18 11:35	TLN	TAL IRV

Client Sample ID: Lepolu2518-9:30

Lab Sample ID: 320-35837-2

Date Collected: 02/05/18 09:30

Matrix: Water

Date Received: 02/07/18 16:14

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	351.2			25 mL	25 mL	459047	02/21/18 16:24	AN	TAL IRV
Total/NA	Analysis	351.2		1			459087	02/21/18 18:45	AN	TAL IRV
Total/NA	Analysis	353.2		1			208659	02/15/18 14:43	TCS	TAL SAC
Total/NA	Prep	365.2/365.3/365			50 mL	50 mL	458960	02/21/18 12:03	MMP	TAL IRV
Total/NA	Analysis	365.3		1			459023	02/21/18 15:02	MMP	TAL IRV
Total/NA	Analysis	Total Nitrogen		1			459218	02/22/18 11:35	TLN	TAL IRV

Laboratory References:

TAL IRV = TestAmerica Irvine, 17461 Derian Ave, Suite 100, Irvine, CA 92614-5817, TEL (949)261-1022

TAL SAC = TestAmerica Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Accreditation/Certification Summary

Client: Element Environmental, LLC
Project/Site: Hawaiian Memorial Cemetery

TestAmerica Job ID: 320-35837-1

Laboratory: TestAmerica Sacramento

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	17-020	01-20-21
Arizona	State Program	9	AZ0708	08-11-18
Arkansas DEQ	State Program	6	88-0691	06-17-18
California	State Program	9	2897	01-31-19
Colorado	State Program	8	CA00044	08-31-18
Connecticut	State Program	1	PH-0691	06-30-19
Florida	NELAP	4	E87570	06-30-18
Georgia	State Program	4	N/A	01-28-19
Hawaii	State Program	9	N/A	01-29-19
Illinois	NELAP	5	200060	03-17-18
Kansas	NELAP	7	E-10375	10-31-18
L-A-B	DoD ELAP		L2468	01-20-21
Louisiana	NELAP	6	30612	06-30-18
Maine	State Program	1	CA0004	04-14-18
Michigan	State Program	5	9947	01-31-18 *
Nevada	State Program	9	CA00044	07-31-18
New Hampshire	NELAP	1	2997	04-18-18
New Jersey	NELAP	2	CA005	06-30-18
New York	NELAP	2	11666	04-01-18
Oregon	NELAP	10	4040	01-29-19
Pennsylvania	NELAP	3	68-01272	03-31-18
Texas	NELAP	6	T104704399	05-31-18
US Fish & Wildlife	Federal		LE148388-0	07-31-18
USDA	Federal		P330-11-00436	01-17-21
USEPA UCMR	Federal	1	CA00044	11-06-18
Utah	NELAP	8	CA00044	02-28-18 *
Virginia	NELAP	3	460278	03-14-18
Washington	State Program	10	C581	05-05-18
West Virginia (DW)	State Program	3	9930C	12-31-18
Wyoming	State Program	8	8TMS-L	01-28-19

Laboratory: TestAmerica Irvine

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	State Program	10	CA01531	06-30-18
Arizona	State Program	9	AZ0671	10-14-18
California	LA Cty Sanitation Districts	9	10256	06-30-18
California	State Program	9	CA ELAP 2706	06-30-18
Guam	State Program	9	Cert. No. 17-003R	01-23-18 *
Hawaii	State Program	9	N/A	01-29-19
Kansas	NELAP	7	E-10420	07-31-18
Nevada	State Program	9	CA015312018-1	07-31-18
New Mexico	State Program	6	N/A	01-29-19
Northern Mariana Islands	State Program	9	MP0002	01-29-17 *
Oregon	NELAP	10	4028	01-29-19
USDA	Federal		P330-15-00184	07-08-18
Washington	State Program	10	C900	09-03-18

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Method Summary

Client: Element Environmental, LLC
Project/Site: Hawaiian Memorial Cemetery

TestAmerica Job ID: 320-35837-1

Method	Method Description	Protocol	Laboratory
351.2	Nitrogen, Total Kjeldahl	MCAWW	TAL IRV
353.2	Nitrogen, Nitrate-Nitrite	MCAWW	TAL SAC
365.3	Phosphorus, Total	EPA	TAL IRV
Total Nitrogen	Nitrogen, Total	EPA	TAL IRV

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

Laboratory References:

TAL IRV = TestAmerica Irvine, 17461 Derian Ave, Suite 100, Irvine, CA 92614-5817, TEL (949)261-1022

TAL SAC = TestAmerica Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Sample Summary

Client: Element Environmental, LLC
Project/Site: Hawaiian Memorial Cemetery

TestAmerica Job ID: 320-35837-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-35837-1	Lepolu25-15:30	Water	02/05/18 15:30	02/07/18 16:14
320-35837-2	Lepolu2518-9:30	Water	02/05/18 09:30	02/07/18 16:14

TestAmerica Sacramento
880 Riverside Parkway

West Sacramento, CA 95605-1500
phone 916.373.5600 fax 303.467.7248

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

Regulatory Program: ☐DW ☐NPDES ☐RCRA ☑Other:

Client Contact	Project Manager: Steve Spengler	Site Contact:	Date: 2/6/18	COC No:
Element Environmental, LLC	Tel/Fax: (808) 864-3953	Lab Contact:	Carrier:	____ of ____ COCs
98-030 Hekaha St. Unit 9	Analysis Turnaround Time			Sampler:
Aiea/ HI/ 96701	☐ CALENDAR DAYS ☐ WORKING DAYS			For Lab Use Only:
(808) 488-1200 Phone	TAT if different from Below ____			Walk-in Client:
(808) 488-1300 FAX	☑ 2 weeks			Lab Sampling:
Project Name: Hawaiian Cemetery Project	☐ 1 week			
Site:	☐ 2 days			Job / SDG No.:
P O #	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS / MSD (Y/N)	Total Nitrogen	Total Phosphorous	Total Kjeldahl Nitrogen	Nitrate Nitrite as N	Sample Specific Notes:
Lepolu25-15:30	2/5/2018	15:30	G	W	2			x	x	x	x	
Lepolu2518-9:30	2/5/18	9:30	G	W	2			x	x	x	x	

320-35837 Chain of Custody

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other ____

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

☐ Return to Client ☐ Disposal by Lab ☐ Archive for ____ Months

Special Instructions/QC Requirements & Comments:
Received on Blue Ice 8.3°C/83°C IR-67 3.2 IR-4

Custody Seals Intact: ☐ Yes ☐ No	Custody Seal No.:		Cooler Temp. (°C): Obs'd:	Corr'd:	Therm ID No.:
Relinquished by: James Tsubore	Company: Element Environmental	Date/Time: 2/6/18 1130	Received by: Eric Yates	Company: TA HON	Date/Time: 2/6/18 1130
Relinquished by: Eric Yates	Company: TA HON	Date/Time: 2/7/18 1100	Received by:	Company:	Date/Time: 2/8/18 855
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:

Form No. CA-C-WI-002, Rev. 4.15, dated 9/27/2017

TestAmerica Sacramento
880 Riverside Parkway
West Sacramento, CA 95605
Phone (916) 373-5600 Fax (916) 372-1059

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)	Sampler	Lab PM: Alltucker, David R	Carrier Tracking No(s)	COC No: 320-111410.1
Client Contact: Shipping/Receiving	Phone	E-Mail: david.alltucker@testamericainc.com	State of Origin: Hawaii	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc		Accreditations Required (See note)		Job #: 320-35837-1
Address: 17461 Derian Ave, Suite 100,	Due Date Requested: 2/20/2018			
City: Irvine	TAT Requested (days):			
State, Zip: CA, 92614-5817				
Phone: 949-261-1022(Tel) 949-260-3297(Fax)	PO #			
Email	WO #			
Project Name: Hawaiian Memorial Cemetery	Project #: 32010538			
Site	SSOW#			

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (Water, Solid, Oil/Waste, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	351.2/351.2_Prep	Nitrogen, Total	365.3/365_Prep	Total Number of containers	Special Instructions/Note:
			Preservation Code:								
Lepolu25-15.30 (320-35837-1)	2/5/18	15:30 Hawaiian		Water			X	X	X	1	
Lepolu2518-9:30 (320-35837-2)	2/5/18	09:30 Hawaiian		Water			X	X	X	1	

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to TestAmerica Laboratories, Inc.

Possible Hazard Identification *Unconfirmed*	***Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*** ☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment

	Date/Time	Company	Received by	Date/Time	Company
Relinquished by	2-8-18 1630	TAISAC			
Relinquished by	Date/Time	Company	Received by	Date/Time	Company
Relinquished by	Date/Time	Company	Received by: Fedex Ctrl	Date/Time: 9:40 2/09/18	Company: TA IRV

Custody Seals Intact: ☐ Yes ☐ No	Custody Seal No.:
Cooler Temperature(s) °C and Other Remarks: -0.4/0.1 IR66 4895 5408 5156 C/S	

Ver: 09/20/2016

Login Sample Receipt Checklist

Client: Element Environmental, LLC

Job Number: 320-35837-1

Login Number: 35837
List Number: 1
Creator: Nelson, Kym D

List Source: TestAmerica Sacramento

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.	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?	False	
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").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Element Environmental, LLC

Job Number: 320-35837-1

Login Number: 35837
List Number: 2
Creator: Ornelas, Olga

List Source: TestAmerica Irvine
List Creation: 02/09/18 01:46 PM

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.	N/A	Not Present
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?	N/A	Received project as a subcontract.
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").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

AECOS, Inc.

45-939 Kamehameha Hwy., Room 104 · Kaneohe, HI 96744
Telephone: (808) 234-7770 · Fax: (808) 234-7775

CLIENT: Element Environmental LLC
98-030 Hekaha Street, #9
Aiea HI 96701
ATTENTION: Steve Spengler 808-864-3953
SSpengler@e2hi.com

FILE No.:	2018-MI
REPORT DATE:	02/13/18
PAGE:	1 of 1

AECOS REPORT OF ANALYTICAL RESULTS

SAMPLE TYPE: Stormwater
DATE SAMPLED: 02/04/18, 02/05/18
AECOS LOG No.: 35688
DATE RECEIVED: 02/06/18

ANALYTE (UNITS)	Total Suspended Solids (mg/L)			
Analysis Date/ ID ⇨	02/08/18 ml			
Method / Reporting Limit⇨	SM2540D / 0.1			
SAMPLE ID ⇩				
Kawa 24-1400	6.0			
Parkway 24-1430	5.7			
Kawa 25-640	35.3			
Kawa 25-650	83.0			
Kawa 2318-910	424			
Parkway 2518-923	91			
Lepolu 2518-930	380			
Lepolu 25-1530	2940			
Parkway 25-1545	116			
Bridge 25-1545	3060			
Kawa 25-1605	860			
Kawa 2618-950	25			

J. Mello, Laboratory Director

AECOS, Inc.

45-939 Kamehameha Highway Suite 104
Kaneohe, Oahu, HI 96744
Tel: (808) 234-7770 Fax: 234-7775

CHAIN OF CUSTODY FORM

PROJECT FILE No.:

LOG NUMBER [035688]

CLIENT: Element Environmental
ADDRESS:

CONTACT: Steve Spengler
PHONE No.: ☎ 808 864-3953
Purchase Order No.:

☐ RUSH
☐ SEE REVERSE
SPECIAL INSTRUCTIONS

	☑	SAMPLE ID	SAMPLED DATE	TIME	SAMPLE TYPE	CONTAINER(S)		REQUESTED ANALYSES	PRESERVATION
1	X	KAWA24-1400 *	2/4	14:00	Stormwater	1	1L poly	TSS	
2	✓	PARKWAY24-1430*	2/4	14:30	"	1		"	
3	✓	KAWA25-640 *	2/5	6:40	"	1		"	
4	✓	KAWA25-650 *	2/5	6:50	"	1		"	
5	✓	KALA 2518-910	2/5	9:10	"	1		"	
6	✓	PARKWAY 2518-925	2/5	9:25	"	1		"	
7	✓	Lepolo 2518-930	2/5	9:30	"	1		"	
8	✓	Lepolo 25-1530	2/5	15:30	"	1		"	
9	✓	Parkway 25-1545	2/5	15:45	"	1		"	
10	✓	Bridge 25-1545	2/5	15:45	"	1		"	

CLIENTS PROVIDING SAMPLES TO THE LABORATORY SHOULD COMPLETE AS MUCH OF THE ABOVE FORM AS POSSIBLE. NOTE: NAME AND DATED SIGNATURE OF PERSON COLLECTING THE SAMPLE MUST BE ENTERED BELOW ↓ INFORMATION REQUESTED IN SHADED BOXES ABOVE TO BE FILLED IN BY THE LABORATORY.

SAMPLED BY: DATE 2/5 20 18
PRINT NAME STEVE SPENGLER
RELINQUISHED: DATE 2/6 20 18
SIGNATURE TIME 9:20

RECEIVED BY: DATE 20___
SIGNATURE TIME
RELINQUISHED: DATE 20___
SIGNATURE OR INITIALS TIME

RECEIVED FOR LABORATORY: DATE 2/6 20 18
SIGNATURE TIME 1402
RELINQUISHED: DATE 20___
SIGNATURE OR INITIALS TIME

COMMENTS: T=9.0°C

PRECAUTIONS:

DISPOSAL:

USE (BLACK) INK

* partial fill

RETURN SAMPLE TO CLIENT ☐

AECOS, Inc.

45-939 Kamehameha Highway Suite 104
Kaneohe, Oahu, HI 96744
Tel: (808) 234-7770 Fax: 234-7775

CHAIN OF CUSTODY FORM

PROJECT FILE No.:

LOG NUMBER: [35688]

CLIENT: Element Environmental
ADDRESS:

CONTACT: Steve Spangler
PHONE No.: ☎ 808 964-3953
Purchase Order No.:

☐ RUSH
☐ SEE REVERSE
SPECIAL INSTRUCTIONS

	☑	SAMPLE ID	SAMPLED DATE	TIME	SAMPLE TYPE	CONTAINER(S)		REQUESTED ANALYSES	PRESERVATION
1	✓	KAWA-25-1605	2/5	16:05	Stream water	1	1L poly	TSS	
2	✓	KAWA-2618-950	2/6	9:50	"	1	↓	TSS	
3									
4									
5									
6									
7									
8									
9									
10									

CLIENTS PROVIDING SAMPLES TO THE LABORATORY SHOULD COMPLETE AS MUCH OF THE ABOVE FORM AS POSSIBLE. NOTE: NAME AND DATED SIGNATURE OF PERSON COLLECTING THE SAMPLE MUST BE ENTERED BELOW ↓. INFORMATION REQUESTED IN SHADED BOXES ABOVE TO BE FILLED IN BY THE LABORATORY.

SAMPLED BY: DATE 2/5 20 18
PRINT NAME Steve Spangler
RELINQUISHED: DATE 2/6 20 18
SIGNATURE TIME 14:0

COMMENTS: T=9.0

RECEIVED BY: DATE 20___
SIGNATURE TIME
RELINQUISHED: DATE 20___
SIGNATURE OR INITIALS TIME

PRECAUTIONS:

RECEIVED FOR LABORATORY: DATE 2/6 20 18
SIGNATURE TIME 1402
RELINQUISHED: DATE 20___
SIGNATURE OR INITIALS TIME

DISPOSAL:

USE (BLACK) INK

RETURN SAMPLE TO CLIENT ☐

AECOS, Inc.

45-939 Kamehameha Hwy., Room 104 · Kaneohe, HI 96744
Telephone: (808) 234-7770 · Fax: (808) 234-7775

CLIENT: Element Environmental LLC
98-030 Hekaha Street, #9
Aiea HI 96701
ATTENTION: Steve Spengler 808-864-3953
SSpengler@e2hi.com

FILE No.:	2018-MI
REPORT DATE:	02/13/18
PAGE:	1 of 1

AECOS REPORT OF ANALYTICAL RESULTS

SAMPLE TYPE: Streamwater
DATE SAMPLED: 02/07/18

AECOS LOG No.: 35703
DATE RECEIVED: 02/08/18

ANALYTE (UNITS)	Total Suspended Solids (mg/L)			
Analysis Date/ ID ⇨	02/09/18 ml			
Method / Reporting Limit⇨	SM2540D / 0.1			
SAMPLE ID ⇩				
Kawa 2718:1410	90			
Parkway 2718-1352	86			
Kawa 2718-1253	18			
Lipalu 2718-1400	1310			
Kawa 2718-1335	109			
Parkway 2718-1346	96			
Mokulele Bridge 2718-1340	29			

J. Mello, Laboratory Director

AECOS, Inc.

45-939 Kamehameha Highway Suite 104
Kaneohe, Oahu, HI 96744
Tel: (808) 234-7770 Fax: 234-7775

CHAIN OF CUSTODY FORM

PROJECT
FILE No.
LOG NUMBER [035703]

CLIENT: Element Environmental
ADDRESS:

CONTACT: Steve Spengler
PHONE No.: ☎ 808 864-3953
Purchase Order No.:

☐ RUSH
☐ SEE REVERSE
SPECIAL INSTRUCTIONS

	☑	SAMPLE ID	SAMPLED DATE	SAMPLED TIME	SAMPLE TYPE	CONTAINER(S)		REQUESTED ANALYSES	PRESERVATION
1		KAWA-2718:14:10	2/7	14:10	Stream	1	1L Poly	TSS	
2		PARKWAY-2718-1352	2/7	13:52		1		TSS	
3		KAWA-2718-1253	2/7	12:53		1		TSS	
4		LIPALU-2718-1400	2/7	14:00		1		TSS	
5		KAWA-2713-1335	2/7	13:35		1		TSS	
6		PARKWAY BRIDGE 2718-1346	2/7	13:46		1		TSS	
7		MOKULELE BRIDGE-2718-1340	2/7	13:40		1		TSS	
8									
9									
10									

CLIENTS PROVIDING SAMPLES TO THE LABORATORY SHOULD COMPLETE AS MUCH OF THE ABOVE FORM AS POSSIBLE. NOTE: NAME AND DATED SIGNATURE OF PERSON COLLECTING THE SAMPLE MUST BE ENTERED BELOW ↓. INFORMATION REQUESTED IN SHADED BOXES ABOVE TO BE FILLED IN BY THE LABORATORY.

SAMPLED BY: DATE 2/7 20 13
PRINT NAME Steve Spengler
RELINQUISHED: DATE 2/9 20 13
SIGNATURE TIME 15:40

RECEIVED BY: DATE 20
SIGNATURE TIME
RELINQUISHED: DATE 20
SIGNATURE OR INITIALS TIME

RECEIVED FOR LABORATORY: DATE 2-8 20 13
SIGNATURE TIME 1500
RELINQUISHED: DATE 20
SIGNATURE OR INITIALS TIME

COMMENTS:

PRECAUTIONS:

DISPOSAL:

USE (BLACK) INK

T=12.8°C

RETURN SAMPLE TO CLIENT ☐

AECOS, Inc.

45-939 Kamehameha Hwy., Room 104 · Kaneohe, HI 96744
Telephone: (808) 234-7770 · Fax: (808) 234-7775

CLIENT: Element Environmental LLC
98-030 Hekaha Street, #9
Aiea HI 96701

ATTENTION: Steve Spengler 808-864-3953
SSpengler@e2hi.com

FILE No.:	2018-MI
REPORT DATE:	02/19/18
PAGE:	1 of 1

AECOS REPORT OF ANALYTICAL RESULTS

SAMPLE TYPE: Streamwater
DATE SAMPLED: 02/09/18, 02/12/18

***AECOS* LOG No.:** 35715
DATE RECEIVED: 02/13/18

ANALYTE (UNITS)	Total Suspended Solids (mg/L)			
Analysis Date/ ID ⇨	02/14/18 ml			
Method / Reporting Limit⇨	SM2540D / 0.1			
SAMPLE ID ⇩				
Kawa 2918-8:50	7.8			
Parkway 2918-9:10	5.4			
Cascade 2918-1452	1.4			
Plantation Spring-2918	1.8			
Maintenance Culvert – 2918	3.6			
Mokuelele – 21218 14:02	3.6			
Parkway-21218 14:20	4.2			
Main Kawa – 21218 14:25	3.2			
Namoku – 21218 14:55	4.2			
Kawa – 21218 15:55	9.6			

J. Mello

J. Mello, Laboratory Director

AECOS, Inc.

45-939 Kamehameha Highway Suite 104
Kaneohe, Oahu, HI 96744
Tel: (808) 234-7770 Fax: 234-7775

Send to

CHAIN OF CUSTODY FORM

PROJECT
FILE No.
LOG NUMBER [03575]

CLIENT: Element Environmental CONTACT: Steve Spengler
ADDRESS: Steve.spengler@gmail.com PHONE No.: ☎ 864-3953
Purchase Order No.:

☐ RUSH
☐ SEE REVERSE
SPECIAL INSTRUCTIONS

	SAMPLED ☑	SAMPLE ID	DATE	TIME	SAMPLE TYPE	CONTAINER(S)		REQUESTED ANALYSES	PRESERVATION
1		KAWA2918-3:50	2/9/18	8:50	WATER	1		TSS	
2		PARKWAY2918-9:10	2/9/18	9:10	"	1		"	
3		CASCADE 2918-1452	2/9/18	14:52	"	1		"	
4		MAINSTREAM CULVERT-2918	2/9/18	15:00	"	1		"	
5		Plantation Spring-2918	2/9/18	15:30	"	1		"	
6		MOKUELELE-21218:1402	2/12/18	14:02	"	1		"	
7		PARKWAY-21218:14:20	2/12/18	14:20	"	1		"	
8		MAINKAWA-21218:14:25	2/12/18	14:25	"	1		"	
9		NAMOKU-21218:14:55	2/12/18	14:55	"	1		"	
10		KAWA-21218:15:55	2/12/18	15:55	"	1		"	

CLIENTS PROVIDING SAMPLES TO THE LABORATORY SHOULD COMPLETE AS MUCH OF THE ABOVE FORM AS POSSIBLE. NOTE: NAME AND DATED SIGNATURE OF PERSON COLLECTING THE SAMPLE MUST BE ENTERED BELOW ↓. INFORMATION REQUESTED IN SHADED BOXES ABOVE TO BE FILLED IN BY THE LABORATORY.

SAMPLED BY: DATE
PRINT NAME STEVE SPENGLER 2/13/18 20 14:00
RELINQUISHED: DATE
SIGNATURE 20___
TIME

RECEIVED BY: DATE
SIGNATURE 20___
TIME
RELINQUISHED: DATE
SIGNATURE OR INITIALS 20___
TIME

RECEIVED FOR LABORATORY: DATE 2/13
SIGNATURE 20 18
TIME 1401
RELINQUISHED: DATE
SIGNATURE OR INITIALS 20___
TIME

COMMENTS: T=2.8°C

PRECAUTIONS:

DISPOSAL:

USE (BLACK) INK

RETURN SAMPLE TO CLIENT ☐

AECOS, Inc.

45-939 Kamehameha Hwy., Room 104 · Kaneohe, HI 96744
Telephone: (808) 234-7770 · Fax: (808) 234-7775

CLIENT: Element Environmental LLC
98-030 Hekaha Street, #9
Aiea HI 96701

ATTENTION: Steve Spengler 808-864-3953
Steve.Spengler@gmail.com

FILE No.:	2018-MI
REPORT DATE:	02/20/18
PAGE:	1 of 1

AECOS REPORT OF ANALYTICAL RESULTS

SAMPLE TYPE: Streamwater
DATE SAMPLED: 02/14/18

***AECOS* LOG No.:** 35723
DATE RECEIVED: 02/14/18

ANALYTE (UNITS)	Total Suspended Solids (mg/L)			
Analysis Date/ ID ⇨	02/15/18 ml			
Method / Reporting Limit⇨	SM2540D / 0.1			
SAMPLE ID ⇩				
Kawa 214 8:00	141			

J. Mello, Laboratory Director

AECOS, Inc.

45-939 Kamehameha Highway Suite 104
Kaneohe, Oahu, HI 96744
Tel: (808) 234-7770 Fax: 234-7775

CHAIN OF CUSTODY FORM

PROJECT
FILE No.
LOG NUMBER [035723]

Email Result

CLIENT: Element Environmental EZ
ADDRESS:
CONTACT: Steve Spengler
PHONE No.: ☎ 808 864-3953
Purchase Order No.:
Steve.Spengler@gmail.com

☐ RUSH
☐ SEE REVERSE
SPECIAL INSTRUCTIONS

	☑ SAMPLED	SAMPLE ID	DATE	TIME	SAMPLE TYPE	CONTAINER(S)		REQUESTED ANALYSES	PRESERVATION
1		KAWA 2/14 9:00	2/14/18	9:00	GRAB	1	1L poly	TSS	
2									
3									
4									
5									
6									
7									
8									
9									
10									

CLIENTS PROVIDING SAMPLES TO THE LABORATORY SHOULD COMPLETE AS MUCH OF THE ABOVE FORM AS POSSIBLE. NOTE: NAME AND DATED SIGNATURE OF PERSON COLLECTING THE SAMPLE MUST BE ENTERED BELOW ↓. INFORMATION REQUESTED IN SHADED BOXES ABOVE TO BE FILLED IN BY THE LABORATORY.

SAMPLED BY: DATE 2/14 20 18
PRINT NAME Steve Spengler
RELINQUISHED: DATE 2/14 20 18
SIGNATURE TIME 1015

RECEIVED BY: DATE 20___
SIGNATURE TIME
RELINQUISHED: DATE 20___
SIGNATURE OR INITIALS TIME

RECEIVED FOR LABORATORY: DATE 2/14 20 18
SIGNATURE TIME 1015
RELINQUISHED: DATE 20___
SIGNATURE OR INITIALS TIME

COMMENTS: T= 24.4°C

PRECAUTIONS:

DISPOSAL:

USE (BLACK) INK

RETURN SAMPLE TO CLIENT ☐

AWARENESS TECHNOLOGY INC

Test Report (by Request)

Test Information

Request: 2/20/2018 1:40:17 PM
Date: 2/20/2018

Name/ID	Assay	Absorbance	Concentration	Interpretation	Reference
Std1	Glyphosate	1.296 Abs	< 0.000 ng/mL		0.000
Std1	Glyphosate	1.273 Abs	0.000 ng/mL		0.000
Std2	Glyphosate	1.031 Abs	0.087 ng/mL		0.075
Std2	Glyphosate	1.076 Abs	0.064 ng/mL		0.075
Std3	Glyphosate	0.847 Abs	0.228 ng/mL		0.200
Std3	Glyphosate	0.879 Abs	0.197 ng/mL		0.200
Std4	Glyphosate	0.644 Abs	0.521 ng/mL		0.500
Std4	Glyphosate	0.728 Abs	0.375 ng/mL		0.500
Std5	Glyphosate	0.525 Abs	0.824 ng/mL		1.000
Std5	Glyphosate	0.379 Abs	1.483 ng/mL		1.000
Std6	Glyphosate	0.185 Abs	3.832 ng/mL		4.000
Std6	Glyphosate	0.178 Abs	3.996 ng/mL		4.000
control negative	Glyphosate	0.501 Abs	0.905 ng/mL		
control negative	Glyphosate	0.607 Abs	0.601 ng/mL		
control positive	Glyphosate	1.322 Abs	< 0.000 ng/mL	Out(LR)	
control positive	Glyphosate	1.263 Abs	0.000 ng/mL		
R-1	Glyphosate	1.472 Abs	< 0.000 ng/mL	Out(LR)	0.075 - 4.000
R-2	Glyphosate	1.308 Abs	< 0.000 ng/mL	Out(LR)	0.075 - 4.000
R-3	Glyphosate	1.253 Abs	0.000 ng/mL	Low	0.075 - 4.000
R-4	Glyphosate	1.436 Abs	< 0.000 ng/mL	Out(LR)	0.075 - 4.000
R-5	Glyphosate	1.806 Abs	< 0.000 ng/mL	Out(LR)	0.075 - 4.000
R-6	Glyphosate	0.588 Abs	0.646 ng/mL		0.075 - 4.000
R-7	Glyphosate	1.314 Abs	< 0.000 ng/mL	Out(LR)	0.075 - 4.000
R-8	Glyphosate	1.153 Abs	0.000 ng/mL	Low	0.075 - 4.000
R-9	Glyphosate	1.176 Abs	0.000 ng/mL	Low	0.075 - 4.000
R-10	Glyphosate	0.542 Abs	0.772 ng/mL		0.075 - 4.000
R-11	Glyphosate	0.330 Abs	1.836 ng/mL		0.075 - 4.000
R-12	Glyphosate	0.240 Abs	2.831 ng/mL		0.075 - 4.000
R-13	Glyphosate	1.223 Abs	0.000 ng/mL	Low	0.075 - 4.000
R-14	Glyphosate	1.160 Abs	0.000 ng/mL	Low	0.075 - 4.000
R-15	Glyphosate	0.458 Abs	1.072 ng/mL		0.075 - 4.000
R-16	Glyphosate	0.976 Abs	0.121 ng/mL		0.075 - 4.000
R-17	Glyphosate	1.278 Abs	0.000 ng/mL	Low	0.075 - 4.000
R-18	Glyphosate	1.244 Abs	0.000 ng/mL	Low	0.075 - 4.000
R-19	Glyphosate	1.174 Abs	0.000 ng/mL	Low	0.075 - 4.000
R-20	Glyphosate	1.294 Abs	< 0.000 ng/mL	Out(LR)	0.075 - 4.000
R-21	Glyphosate	1.207 Abs	0.000 ng/mL	Low	0.075 - 4.000
R-22	Glyphosate	0.977 Abs	0.120 ng/mL		0.075 - 4.000
R-23	Glyphosate	0.856 Abs	0.219 ng/mL		0.075 - 4.000
R-24	Glyphosate	0.452 Abs	1.098 ng/mL		0.075 - 4.000
R-25	Glyphosate	0.928 Abs	0.156 ng/mL		0.075 - 4.000
R-26	Glyphosate	1.300 Abs	< 0.000 ng/mL	Out(LR)	0.075 - 4.000
R-27	Glyphosate	1.360 Abs	< 0.000 ng/mL	Out(LR)	0.075 - 4.000
R-28	Glyphosate	0.750 Abs	0.343 ng/mL		0.075 - 4.000
R-29	Glyphosate	1.301 Abs	< 0.000 ng/mL	Out(LR)	0.075 - 4.000
R-30	Glyphosate	1.025 Abs	0.090 ng/mL		0.075 - 4.000
R-31	Glyphosate	1.191 Abs	0.000 ng/mL	Low	0.075 - 4.000
R-32	Glyphosate	1.222 Abs	0.000 ng/mL	Low	0.075 - 4.000
R-33	Glyphosate	1.322 Abs	< 0.000 ng/mL	Out(LR)	0.075 - 4.000
R-34	Glyphosate	0.393 Abs	1.398 ng/mL		0.075 - 4.000

* LR - Linear Range; [. .] - Mean result of duplicate tests
* Generated by Plate Reader version (6.3.1.220/02582/AE:20 /) 2/20/2018 1:44:38 PM

AWARENESS TECHNOLOGY INC

Test Report (by Request)

Name/ID	Assay	Absorbance	Concentration	Interpretation	Reference
R-35	Glyphosate	1.208 Abs	0.000 ng/mL	Low	0.075 - 4.000
R-36	Glyphosate	1.237 Abs	0.000 ng/mL	Low	0.075 - 4.000
R-37	Glyphosate	1.240 Abs	0.000 ng/mL	Low	0.075 - 4.000
R-38	Glyphosate	0.710 Abs	0.403 ng/mL		0.075 - 4.000
R-39	Glyphosate	1.329 Abs	< 0.000 ng/mL	Out(LR)	0.075 - 4.000
R-40	Glyphosate	1.390 Abs	< 0.000 ng/mL	Out(LR)	0.075 - 4.000
R-41	Glyphosate	1.646 Abs	< 0.000 ng/mL	Out(LR)	0.075 - 4.000
R-42	Glyphosate	1.521 Abs	< 0.000 ng/mL	Out(LR)	0.075 - 4.000
R-43	Glyphosate	1.432 Abs	< 0.000 ng/mL	Out(LR)	0.075 - 4.000
R-44	Glyphosate	1.525 Abs	< 0.000 ng/mL	Out(LR)	0.075 - 4.000
R-45	Glyphosate	1.299 Abs	< 0.000 ng/mL	Out(LR)	0.075 - 4.000
R-46	Glyphosate	1.312 Abs	< 0.000 ng/mL	Out(LR)	0.075 - 4.000
R-47	Glyphosate	1.418 Abs	< 0.000 ng/mL	Out(LR)	0.075 - 4.000
R-48	Glyphosate	1.189 Abs	0.000 ng/mL	Low	0.075 - 4.000
R-49	Glyphosate	0.431 Abs	1.195 ng/mL		0.075 - 4.000
R-50	Glyphosate	1.413 Abs	< 0.000 ng/mL	Out(LR)	0.075 - 4.000
R-51	Glyphosate	1.234 Abs	0.000 ng/mL	Low	0.075 - 4.000
R-52	Glyphosate	1.359 Abs	< 0.000 ng/mL	Out(LR)	0.075 - 4.000
R-53	Glyphosate	0.927 Abs	0.156 ng/mL		0.075 - 4.000
R-54	Glyphosate	1.436 Abs	< 0.000 ng/mL	Out(LR)	0.075 - 4.000
R-55	Glyphosate	1.351 Abs	< 0.000 ng/mL	Out(LR)	0.075 - 4.000
R-56	Glyphosate	0.634 Abs	0.542 ng/mL		0.075 - 4.000
R-57	Glyphosate	0.363 Abs	1.588 ng/mL		0.075 - 4.000
R-58	Glyphosate	1.581 Abs	< 0.000 ng/mL	Out(LR)	0.075 - 4.000
R-59	Glyphosate	0.943 Abs	0.144 ng/mL		0.075 - 4.000
R-60	Glyphosate	1.084 Abs	0.060 ng/mL	Low	0.075 - 4.000
R-61	Glyphosate	1.122 Abs	0.043 ng/mL	Low	0.075 - 4.000
R-62	Glyphosate	0.334 Abs	1.804 ng/mL		0.075 - 4.000

* LR - Linear Range; [...] - Mean result of duplicate tests

* Generated by Plate Reader version (6.3.1.220/02582/AE;20 /) 2/20/2018 1:44:38 PM

AWARENESS TECHNOLOGY INC

Glyphosate - Assay Calibration Report

Assay Information

Assay Name: Glyphosate
Normal: 0.075 - 4.000
# of decimals: 3
Assay Substances: Controls:
control negative
control positive
Standards:
Std1, Concentration = 0.000, Minimum number to use: 2
Std2, Concentration = 0.075, Minimum number to use: 2
Std3, Concentration = 0.200, Minimum number to use: 2
Std4, Concentration = 0.500, Minimum number to use: 2
Std5, Concentration = 1.000, Minimum number to use: 2
Std6, Concentration = 4.000, Minimum number to use: 2
Curve valid interval: 7 days 0 hours
Axis Mode: Y = Abs, X = Log(Conc)

Assay Mode: 4-Parameter Logistic
Units: ng/mL
Assay Description:

Assay Calibration

Current Calibration Status: " "

Name	Absorbance	Concentration	Interpretation	Position
2/20/2018 1:40:17 PM				
Std1	1.296 Abs	< 0.000 ng/mL		A01
Std1	1.273 Abs	0.000 ng/mL		B01
Std2	1.031 Abs	0.087 ng/mL		C01
Std2	1.076 Abs	0.064 ng/mL		D01
Std3	0.847 Abs	0.228 ng/mL		E01
Std3	0.879 Abs	0.197 ng/mL		F01
Std4	0.644 Abs	0.521 ng/mL		G01
Std4	0.728 Abs	0.375 ng/mL		H01
Std5	0.525 Abs	0.824 ng/mL		A02
Std5	0.379 Abs	1.483 ng/mL		B02
Std6	0.185 Abs	3.832 ng/mL		C02
Std6	0.178 Abs	3.996 ng/mL		D02
2/20/2018 1:40:17 PM				
control negative	0.501 Abs	0.905 ng/mL		E02
control positive	1.263 Abs	0.000 ng/mL		H02
control positive	1.322 Abs	< 0.000 ng/mL	Out(LR)	G02
Statistic				
Std1 [MEAN]	1.285			
Std1 [SD]	0.016			
Std1 [%CV]	1.27			
Std2 [MEAN]	1.053	0.075		
Std2 [SD]	0.032	0.016		
Std2 [%CV]	3.02	21.54		
Std2 [%DIFF]		-0.00		
Std3 [MEAN]	0.863	0.213		
Std3 [SD]	0.023	0.022		
Std3 [%CV]	2.62	10.32		
Std3 [%DIFF]		6.50		
Std4 [MEAN]	0.686	0.448		
Std4 [SD]	0.059	0.103		
Std4 [%CV]	8.66	23.04		
Std4 [%DIFF]		-10.40		
Std5 [MEAN]	0.452	1.154		
Std5 [SD]	0.103	0.466		
Std5 [%CV]	22.84	40.40		

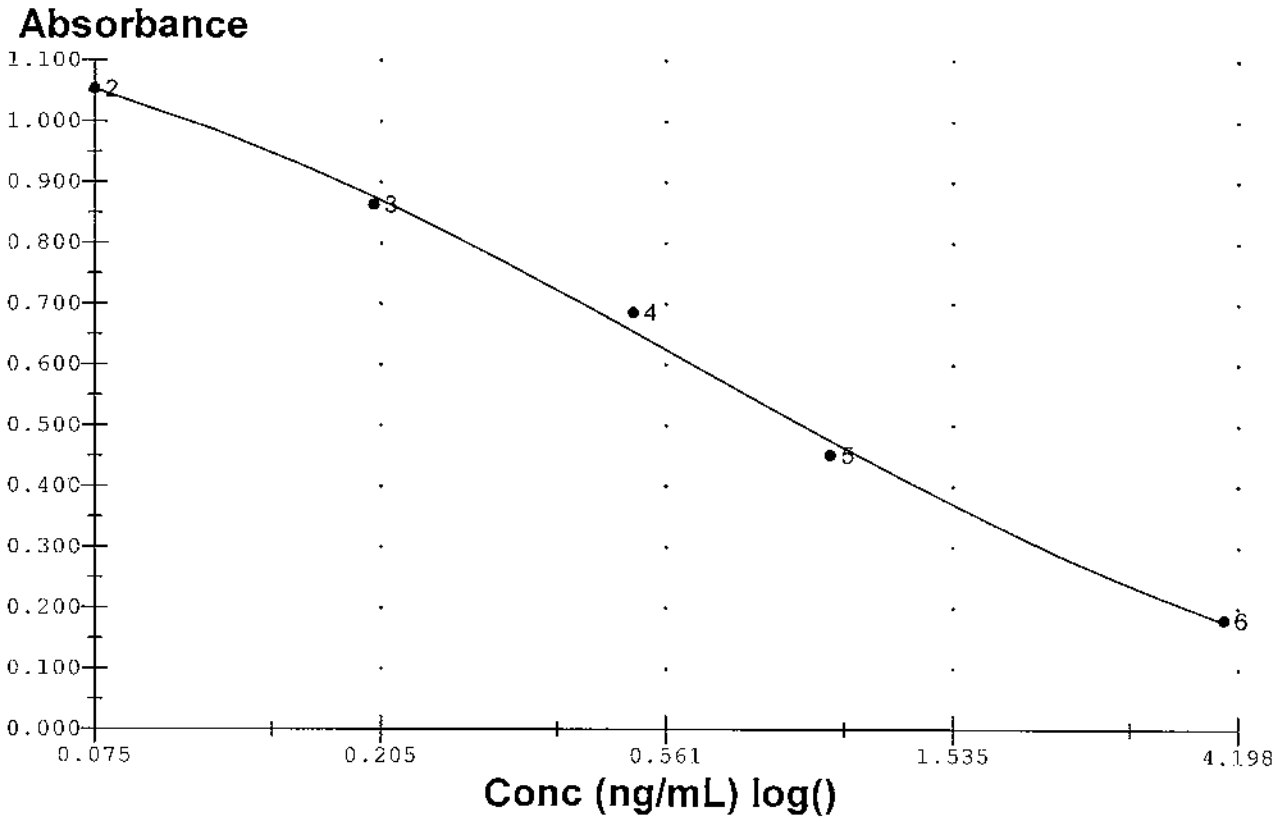
AWARENESS TECHNOLOGY INC

Glyphosate - Assay Calibration Report

Name	Absorbance	Concentration	Interpretation	Position
Std5 [%DIFF]		15.40		
Std6 [MEAN]	0.182	3.914		
Std6 [SD]	0.005	0.116		
Std6 [%CV]	2.73	2.96		
Std6 [%DIFF]		-2.15		
control negative [MEAN]	0.501	0.905		
control positive [MEAN]	1.293			
control positive [SD]	0.042			
control positive [%CV]	3.23			

Assay Curve

y = (A-D)/(1+(x/C)^B) + D
A = -0.098355
B = -0.75372
C = 0.63481
D = 1.2837
R2 coef = 0.99787



AWARENESS TECHNOLOGY INC

Test Report (by Request)

Test Information

Request: 2/19/2018 4:09:40 PM
Date: 2/19/2018

Name/ID	Assay	Absorbance	Concentration	Interpretation	Reference
Std1	2,4-D	0.736 Abs	< 0.000 ng/mL		0.000
Std1	2,4-D	0.704 Abs	0.106 ng/mL		0.000
Std2	2,4-D	0.429 Abs	2.323 ng/mL		2.000
Std2	2,4-D	0.448 Abs	2.099 ng/mL		2.000
Std3	2,4-D	0.351 Abs	3.499 ng/mL		5.000
Std3	2,4-D	0.330 Abs	3.915 ng/mL		5.000
Std4	2,4-D	0.137 Abs	16.800 ng/mL		10.000
Std4	2,4-D	0.127 Abs	19.360 ng/mL		10.000
Std5	2,4-D	0.122 Abs	20.960 ng/mL		40.000
Std5	2,4-D	0.099 Abs	33.680 ng/mL		40.000
Std6	2,4-D	0.082 Abs	62.400 ng/mL		80.000
Std6	2,4-D	0.072 Abs	> 80.000 ng/mL		80.000
control positive	2,4-D	0.640 Abs	0.514 ng/mL		
control negative	2,4-D	0.061 Abs	> 80.000 ng/mL	Out(LR)	
R-1	2,4-D	0.647 Abs	0.469 ng/mL	Low	2.000 - 80.000
R-2	2,4-D	0.532 Abs	1.290 ng/mL	Low	2.000 - 80.000
R-3	2,4-D	0.742 Abs	< 0.000 ng/mL	Out(LR)	2.000 - 80.000
R-4	2,4-D	0.662 Abs	0.374 ng/mL	Low	2.000 - 80.000
R-5	2,4-D	0.545 Abs	1.185 ng/mL	Low	2.000 - 80.000
R-6	2,4-D	0.551 Abs	1.137 ng/mL	Low	2.000 - 80.000
R-7	2,4-D	0.546 Abs	1.177 ng/mL	Low	2.000 - 80.000
R-8	2,4-D	0.513 Abs	1.452 ng/mL	Low	2.000 - 80.000
R-9	2,4-D	0.593 Abs	0.827 ng/mL	Low	2.000 - 80.000
R-10	2,4-D	0.513 Abs	1.452 ng/mL	Low	2.000 - 80.000
R-11	2,4-D	0.699 Abs	0.139 ng/mL	Low	2.000 - 80.000
R-12	2,4-D	0.589 Abs	0.856 ng/mL	Low	2.000 - 80.000
R-13	2,4-D	0.583 Abs	0.898 ng/mL	Low	2.000 - 80.000
R-14	2,4-D	0.513 Abs	1.452 ng/mL	Low	2.000 - 80.000
R-15	2,4-D	0.523 Abs	1.366 ng/mL	Low	2.000 - 80.000
R-16	2,4-D	0.514 Abs	1.443 ng/mL	Low	2.000 - 80.000
R-17	2,4-D	0.520 Abs	1.392 ng/mL	Low	2.000 - 80.000
R-18	2,4-D	0.558 Abs	1.083 ng/mL	Low	2.000 - 80.000
R-19	2,4-D	0.757 Abs	< 0.000 ng/mL	Out(LR)	2.000 - 80.000
R-20	2,4-D	0.631 Abs	0.571 ng/mL	Low	2.000 - 80.000
R-21	2,4-D	0.556 Abs	1.098 ng/mL	Low	2.000 - 80.000
R-22	2,4-D	0.654 Abs	0.425 ng/mL	Low	2.000 - 80.000
R-23	2,4-D	0.651 Abs	0.443 ng/mL	Low	2.000 - 80.000
R-24	2,4-D	0.533 Abs	1.282 ng/mL	Low	2.000 - 80.000
R-25	2,4-D	0.624 Abs	0.618 ng/mL	Low	2.000 - 80.000
R-26	2,4-D	0.584 Abs	0.890 ng/mL	Low	2.000 - 80.000
R-27	2,4-D	0.384 Abs	2.944 ng/mL		2.000 - 80.000
R-28	2,4-D	0.380 Abs	3.004 ng/mL		2.000 - 80.000
R-29	2,4-D	0.243 Abs	6.536 ng/mL		2.000 - 80.000
R-30	2,4-D	0.251 Abs	6.208 ng/mL		2.000 - 80.000
R-31	2,4-D	0.286 Abs	5.009 ng/mL		2.000 - 80.000
R-32	2,4-D	0.351 Abs	3.499 ng/mL		2.000 - 80.000
R-33	2,4-D	0.278 Abs	5.256 ng/mL		2.000 - 80.000
R-34	2,4-D	0.246 Abs	6.408 ng/mL		2.000 - 80.000
R-35	2,4-D	0.632 Abs	0.565 ng/mL	Low	2.000 - 80.000
R-36	2,4-D	0.659 Abs	0.393 ng/mL	Low	2.000 - 80.000

* LR - Linear Range; [...] - Mean result of duplicate tests
* Generated by Plate Reader version (6.3.1.220/02582/AE:20 /) 2/19/2018 4:31:10 PM

AWARENESS TECHNOLOGY INC

Test Report (by Request)

Name/ID	Assay	Absorbance	Concentration	Interpretation	Reference
R-37	2,4-D	0.497 Abs	1.597 ng/mL	Low	2.000 - 80.000
R-38	2,4-D	0.624 Abs	0.618 ng/mL	Low	2.000 - 80.000
R-39	2,4-D	0.640 Abs	0.514 ng/mL	Low	2.000 - 80.000
R-40	2,4-D	0.574 Abs	0.963 ng/mL	Low	2.000 - 80.000
R-41	2,4-D	0.620 Abs	0.644 ng/mL	Low	2.000 - 80.000
R-42	2,4-D	0.579 Abs	0.926 ng/mL	Low	2.000 - 80.000
R-43	2,4-D	0.613 Abs	0.690 ng/mL	Low	2.000 - 80.000
R-44	2,4-D	0.602 Abs	0.765 ng/mL	Low	2.000 - 80.000
R-45	2,4-D	0.700 Abs	0.133 ng/mL	Low	2.000 - 80.000
R-46	2,4-D	0.710 Abs	0.064 ng/mL	Low	2.000 - 80.000
R-47	2,4-D	0.636 Abs	0.539 ng/mL	Low	2.000 - 80.000
R-48	2,4-D	0.536 Abs	1.257 ng/mL	Low	2.000 - 80.000
R-49	2,4-D	0.377 Abs	3.051 ng/mL		2.000 - 80.000
R-50	2,4-D	0.497 Abs	1.597 ng/mL	Low	2.000 - 80.000
R-51	2,4-D	0.066 Abs	> 80.000 ng/mL	Out(LR)	2.000 - 80.000
R-52	2,4-D	0.689 Abs	0.204 ng/mL	Low	2.000 - 80.000
R-53	2,4-D	0.555 Abs	1.106 ng/mL	Low	2.000 - 80.000
R-54	2,4-D	0.715 Abs	0.024 ng/mL	Low	2.000 - 80.000
R-55	2,4-D	0.788 Abs	< 0.000 ng/mL	Out(LR)	2.000 - 80.000
R-56	2,4-D	0.498 Abs	1.588 ng/mL	Low	2.000 - 80.000
R-57	2,4-D	0.528 Abs	1.323 ng/mL	Low	2.000 - 80.000
R-58	2,4-D	0.648 Abs	0.462 ng/mL	Low	2.000 - 80.000
R-59	2,4-D	0.735 Abs	< 0.000 ng/mL	Out(LR)	2.000 - 80.000
R-60	2,4-D	0.743 Abs	< 0.000 ng/mL	Out(LR)	2.000 - 80.000
R-61	2,4-D	0.583 Abs	0.898 ng/mL	Low	2.000 - 80.000
R-62	2,4-D	0.676 Abs	0.286 ng/mL	Low	2.000 - 80.000

* LR - Linear Range; [...] - Mean result of duplicate tests
* Generated by Plate Reader version (6.3.1.220/02582/AE:20 /) 2/19/2018 4:31:10 PM

AWARENESS TECHNOLOGY INC

2,4-D - Assay Calibration Report

Assay Information

Assay Name: 2,4-D
Normal: 2.000 - 80.000
# of decimals: 3
Assay Substances: Controls:
control positive
control negative
Standards:
Std1, Concentration = 0.000, Minimum number to use: 1
Std2, Concentration = 2.000, Minimum number to use: 1
Std3, Concentration = 5.000, Minimum number to use: 1
Std4, Concentration = 10.000, Minimum number to use: 1
Std5, Concentration = 40.000, Minimum number to use: 1
Std6, Concentration = 80.000, Minimum number to use: 1
Curve valid interval: 7 days 0 hours
Axis Mode: Y = Abs, X = Log(Conc)

Assay Mode: 4-Parameter Logistic
Units: ng/mL
Assay Description: ELISA

Assay Calibration

Current Calibration Status: "

"

Name	Absorbance	Concentration	Interpretation	Position
2/19/2018 4:09:40 PM				
Std1	0.736 Abs	< 0.000 ng/mL		A01
Std1	0.704 Abs	0.106 ng/mL		B01
Std2	0.429 Abs	2.323 ng/mL		C01
Std2	0.448 Abs	2.099 ng/mL		D01
Std3	0.351 Abs	3.499 ng/mL		E01
Std3	0.330 Abs	3.915 ng/mL		F01
Std4	0.137 Abs	16.800 ng/mL		G01
Std4	0.127 Abs	19.360 ng/mL		H01
Std5	0.122 Abs	20.960 ng/mL		A02
Std5	0.099 Abs	33.680 ng/mL		B02
Std6	0.082 Abs	62.400 ng/mL		C02
Std6	0.072 Abs	> 80.000 ng/mL		D02
2/19/2018 4:09:40 PM				
control positive	0.640 Abs	0.514 ng/mL		E02
control negative	0.061 Abs	> 80.000 ng/mL	Out(LR)	F02
Statistic				
Std1 [MEAN]	0.720			
Std1 [SD]	0.023			
Std1 [%CV]	3.14			
Std2 [MEAN]	0.438	2.211		
Std2 [SD]	0.013	0.158		
Std2 [%CV]	3.06	7.16		
Std2 [%DIFF]		10.55		
Std3 [MEAN]	0.340	3.707		
Std3 [SD]	0.015	0.294		
Std3 [%CV]	4.36	7.94		
Std3 [%DIFF]		-25.86		
Std4 [MEAN]	0.132	18.080		
Std4 [SD]	0.007	1.810		
Std4 [%CV]	5.36	10.01		
Std4 [%DIFF]		80.80		
Std5 [MEAN]	0.111	27.320		
Std5 [SD]	0.016	8.994		
Std5 [%CV]	14.72	32.92		
Std5 [%DIFF]		-31.70		

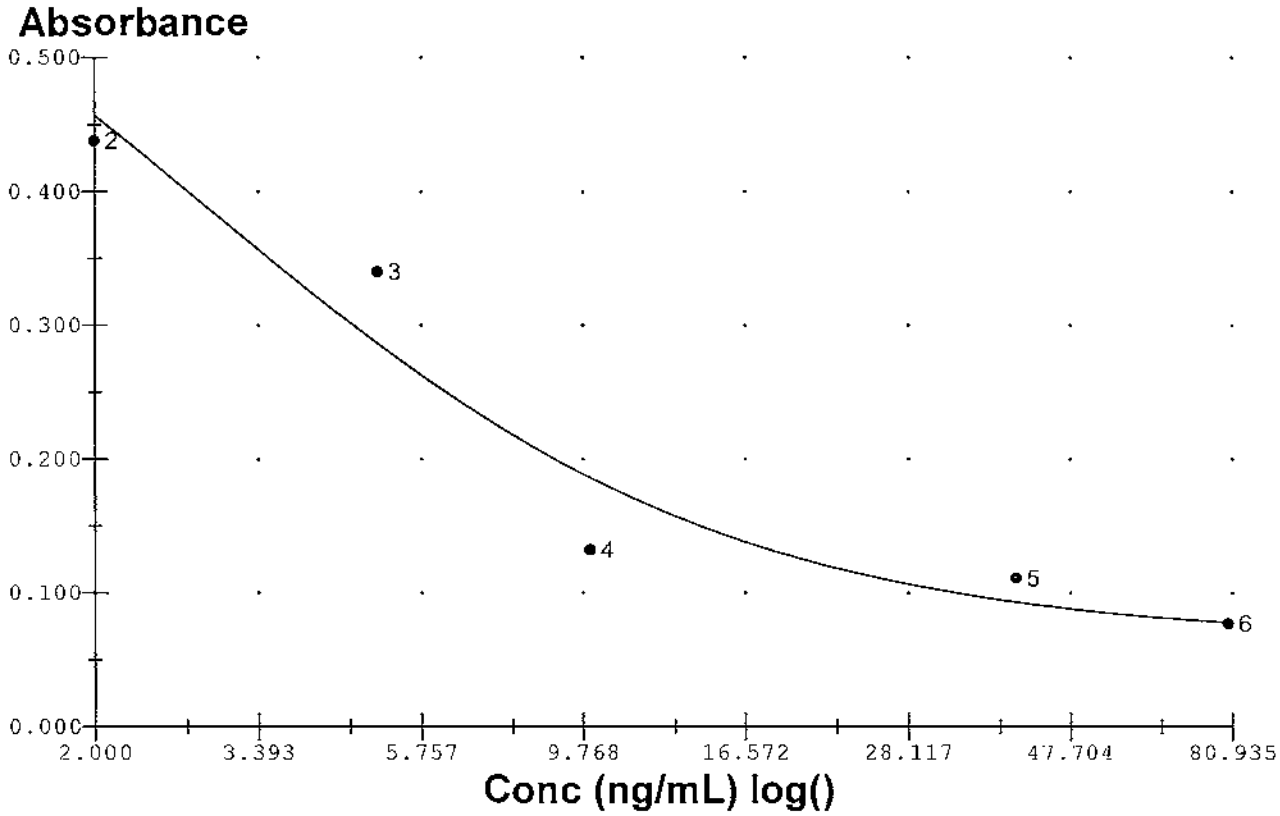
AWARENESS TECHNOLOGY INC

2,4-D - Assay Calibration Report

Name	Absorbance	Concentration	Interpretation	Position
Std6 [MEAN]	0.077			
Std6 [SD]	0.007			
Std6 [%CV]	9.18			
Std6 [%DIFF]		-100.00		
control positive [MEAN]	0.640	0.514		
control negative [MEAN]	0.061			

Assay Curve

y = (A-D)/(1+(x/C)^B) + D
A = 0.065242
B = -1.1740
C = 2.8320
D = 0.71747
R2 coef = 0.97912



AWARENESS TECHNOLOGY INC

Test Report (by Request)

Test Information

Request: 2/16/2018 3:01:09 PM
Date: 2/16/2018

Name/ID	Assay	Absorbance	Concentration	Interpretation	Reference
Std1	Diuron	1.022 Abs	0.000 ng/mL		0.000
Std1	Diuron	1.026 Abs	< 0.000 ng/mL		0.000
Std2	Diuron	0.566 Abs	0.019 ng/mL		0.030
Std2	Diuron	0.473 Abs	0.057 ng/mL		0.030
Std3	Diuron	0.366 Abs	0.185 ng/mL		0.100
Std3	Diuron	0.516 Abs	0.035 ng/mL		0.100
Std4	Diuron	0.302 Abs	0.366 ng/mL		0.300
Std4	Diuron	0.333 Abs	0.263 ng/mL		0.300
Std5	Diuron	0.187 Abs	1.251 ng/mL		1.000
Std5	Diuron	0.207 Abs	1.008 ng/mL		1.000
Std6	Diuron	0.115 Abs	2.778 ng/mL		3.000
Std6	Diuron	0.113 Abs	2.841 ng/mL		3.000
control positive	Diuron	0.271 Abs	0.509 ng/mL		
control positive	Diuron	0.352 Abs	0.215 ng/mL		
control negative	Diuron	1.015 Abs	0.000 ng/mL		
control negative	Diuron	0.880 Abs	0.000 ng/mL		
R-1	Diuron	1.062 Abs	< 0.000 ng/mL	Out(LR)	0.030 - 3.000
R-2	Diuron	1.253 Abs	< 0.000 ng/mL	Out(LR)	0.030 - 3.000
R-3	Diuron	1.266 Abs	< 0.000 ng/mL	Out(LR)	0.030 - 3.000
R-4	Diuron	1.095 Abs	< 0.000 ng/mL	Out(LR)	0.030 - 3.000
R-5	Diuron	0.184 Abs	1.293 ng/mL		0.030 - 3.000
R-6	Diuron	0.676 Abs	0.004 ng/mL	Low	0.030 - 3.000
R-7	Diuron	0.592 Abs	0.014 ng/mL	Low	0.030 - 3.000
R-8	Diuron	0.938 Abs	0.000 ng/mL	Low	0.030 - 3.000
R-9	Diuron	0.923 Abs	0.000 ng/mL	Low	0.030 - 3.000
R-10	Diuron	0.955 Abs	0.000 ng/mL	Low	0.030 - 3.000
R-11	Diuron	0.814 Abs	0.000 ng/mL	Low	0.030 - 3.000
R-12	Diuron	0.767 Abs	0.001 ng/mL	Low	0.030 - 3.000
R-13	Diuron	1.017 Abs	0.000 ng/mL	Low	0.030 - 3.000
R-14	Diuron	0.960 Abs	0.000 ng/mL	Low	0.030 - 3.000
R-15	Diuron	0.869 Abs	0.000 ng/mL	Low	0.030 - 3.000
R-16	Diuron	0.754 Abs	0.001 ng/mL	Low	0.030 - 3.000
R-17	Diuron	1.149 Abs	< 0.000 ng/mL	Out(LR)	0.030 - 3.000
R-18	Diuron	1.137 Abs	< 0.000 ng/mL	Out(LR)	0.030 - 3.000
R-19	Diuron	1.217 Abs	< 0.000 ng/mL	Out(LR)	0.030 - 3.000
R-20	Diuron	1.141 Abs	< 0.000 ng/mL	Out(LR)	0.030 - 3.000
R-21	Diuron	1.268 Abs	< 0.000 ng/mL	Out(LR)	0.030 - 3.000
R-22	Diuron	1.091 Abs	< 0.000 ng/mL	Out(LR)	0.030 - 3.000
R-23	Diuron	1.042 Abs	< 0.000 ng/mL	Out(LR)	0.030 - 3.000
R-24	Diuron	0.919 Abs	0.000 ng/mL	Low	0.030 - 3.000
R-25	Diuron	1.139 Abs	< 0.000 ng/mL	Out(LR)	0.030 - 3.000
R-26	Diuron	1.232 Abs	< 0.000 ng/mL	Out(LR)	0.030 - 3.000
R-27	Diuron	1.035 Abs	< 0.000 ng/mL	Out(LR)	0.030 - 3.000
R-28	Diuron	1.082 Abs	< 0.000 ng/mL	Out(LR)	0.030 - 3.000
R-29	Diuron	1.148 Abs	< 0.000 ng/mL	Out(LR)	0.030 - 3.000
R-30	Diuron	1.015 Abs	0.000 ng/mL	Low	0.030 - 3.000
R-31	Diuron	1.075 Abs	< 0.000 ng/mL	Out(LR)	0.030 - 3.000
R-32	Diuron	1.159 Abs	< 0.000 ng/mL	Out(LR)	0.030 - 3.000
R-33	Diuron	1.059 Abs	< 0.000 ng/mL	Out(LR)	0.030 - 3.000
R-34	Diuron	0.918 Abs	0.000 ng/mL	Low	0.030 - 3.000

* LR - Linear Range; [...] - Mean result of duplicate tests
* Generated by Plate Reader version (6.3.1.220///) 2/16/2018 3:04:21 PM

AWARENESS TECHNOLOGY INC

Test Report (by Request)

Name/ID	Assay	Absorbance	Concentration	Interpretation	Reference
R-35	Diuron	0.915 Abs	0.000 ng/mL	Low	0.030 - 3.000
R-36	Diuron	0.962 Abs	0.000 ng/mL	Low	0.030 - 3.000
R-37	Diuron	0.561 Abs	0.021 ng/mL	Low	0.030 - 3.000
R-38	Diuron	0.657 Abs	0.006 ng/mL	Low	0.030 - 3.000
R-39	Diuron	0.806 Abs	0.000 ng/mL	Low	0.030 - 3.000
R-40	Diuron	1.147 Abs	< 0.000 ng/mL	Out(LR)	0.030 - 3.000
R-41	Diuron	1.217 Abs	< 0.000 ng/mL	Out(LR)	0.030 - 3.000
R-42	Diuron	0.994 Abs	0.000 ng/mL	Low	0.030 - 3.000
R-43	Diuron	1.144 Abs	< 0.000 ng/mL	Out(LR)	0.030 - 3.000
R-44	Diuron	1.216 Abs	< 0.000 ng/mL	Out(LR)	0.030 - 3.000
R-45	Diuron	1.120 Abs	< 0.000 ng/mL	Out(LR)	0.030 - 3.000
R-46	Diuron	1.300 Abs	< 0.000 ng/mL	Out(LR)	0.030 - 3.000
R-47	Diuron	1.105 Abs	< 0.000 ng/mL	Out(LR)	0.030 - 3.000
R-48	Diuron	0.983 Abs	0.000 ng/mL	Low	0.030 - 3.000
R-49	Diuron	0.977 Abs	0.000 ng/mL	Low	0.030 - 3.000
R-50	Diuron	1.167 Abs	< 0.000 ng/mL	Out(LR)	0.030 - 3.000
R-51	Diuron	1.200 Abs	< 0.000 ng/mL	Out(LR)	0.030 - 3.000
R-52	Diuron	1.068 Abs	< 0.000 ng/mL	Out(LR)	0.030 - 3.000
R-53	Diuron	0.952 Abs	0.000 ng/mL	Low	0.030 - 3.000
R-54	Diuron	1.134 Abs	< 0.000 ng/mL	Out(LR)	0.030 - 3.000
R-55	Diuron	1.079 Abs	< 0.000 ng/mL	Out(LR)	0.030 - 3.000
R-56	Diuron	0.817 Abs	0.000 ng/mL	Low	0.030 - 3.000
R-57	Diuron	0.884 Abs	0.000 ng/mL	Low	0.030 - 3.000
R-58	Diuron	1.214 Abs	< 0.000 ng/mL	Out(LR)	0.030 - 3.000
R-59	Diuron	0.968 Abs	0.000 ng/mL	Low	0.030 - 3.000
R-60	Diuron	1.117 Abs	< 0.000 ng/mL	Out(LR)	0.030 - 3.000
R-61	Diuron	1.179 Abs	< 0.000 ng/mL	Out(LR)	0.030 - 3.000
R-62	Diuron	0.878 Abs	0.000 ng/mL	Low	0.030 - 3.000

* LR - Linear Range; (...) - Mean result of duplicate tests

* Generated by Plate Reader version (6.3.1.220///) 2/16/2018 3:04:21 PM

AWARENESS TECHNOLOGY INC

Diuron - Assay Calibration Report

Assay Information

Assay Name: Diuron
Normal: 0.030 - 3.000
# of decimals: 3
Assay Substances: Controls:
control positive
control negative
Standards:
Std1, Concentration = 0.000, Minimum number to use: 1
Std2, Concentration = 0.030, Minimum number to use: 1
Std3, Concentration = 0.100, Minimum number to use: 1
Std4, Concentration = 0.300, Minimum number to use: 1
Std5, Concentration = 1.000, Minimum number to use: 1
Std6, Concentration = 3.000, Minimum number to use: 1
Curve valid interval: 7 days 0 hours
Axis Mode: Y = Abs, X = Conc

Assay Mode: 4-Parameter Logistic
Units: ng/mL
Assay Description: ELISA

Assay Calibration

Current Calibration Status: "

"

Name	Absorbance	Concentration	Interpretation	Position
2/16/2018 3:01:09 PM				
Std1	1.022 Abs	0.000 ng/mL		A01
Std1	1.026 Abs	< 0.000 ng/mL		B01
Std2	0.566 Abs	0.019 ng/mL		C01
Std2	0.473 Abs	0.057 ng/mL		D01
Std3	0.366 Abs	0.185 ng/mL		E01
Std3	0.516 Abs	0.035 ng/mL		F01
Std4	0.302 Abs	0.366 ng/mL		G01
Std4	0.333 Abs	0.263 ng/mL		H01
Std5	0.187 Abs	1.251 ng/mL		A02
Std5	0.207 Abs	1.008 ng/mL		B02
Std6	0.115 Abs	2.778 ng/mL		C02
Std6	0.113 Abs	2.841 ng/mL		D02
2/16/2018 3:01:09 PM				
control positive	0.352 Abs	0.215 ng/mL		F02
control positive	0.271 Abs	0.509 ng/mL		E02
control negative	0.880 Abs	0.000 ng/mL		H02
control negative	1.015 Abs	0.000 ng/mL		G02
Statistic				
Std1 [MEAN]	1.024			
Std1 [SD]	0.003			
Std1 [%CV]	0.28			
Std2 [MEAN]	0.520	0.038		
Std2 [SD]	0.066	0.027		
Std2 [%CV]	12.66	70.71		
Std2 [%DIFF]		26.67		
Std3 [MEAN]	0.441	0.110		
Std3 [SD]	0.106	0.106		
Std3 [%CV]	24.05	96.42		
Std3 [%DIFF]		10.00		
Std4 [MEAN]	0.317	0.315		
Std4 [SD]	0.022	0.073		
Std4 [%CV]	6.90	23.16		
Std4 [%DIFF]		5.00		
Std5 [MEAN]	0.197	1.130		
Std5 [SD]	0.014	0.172		

AWARENESS TECHNOLOGY INC

Diuron - Assay Calibration Report

Name	Absorbance	Concentration	Interpretation	Position
Std5 [%CV]	7.18	15.21		
Std5 [%DIFF]		13.00		
Std6 [MEAN]	0.114	2.810		
Std6 [SD]	0.001	0.045		
Std6 [%CV]	1.24	1.59		
Std6 [%DIFF]		-6.33		
control positive [MEAN]	0.312	0.362		
control positive [SD]	0.057	0.208		
control positive [%CV]	18.39	57.43		
control negative [MEAN]	0.947	0.000		
control negative [SD]	0.095	0.000		
control negative [%CV]	10.07	0.00		

Assay Curve

y = (A-D)/(1+(x/C)^B) + D
A = -0.42745
B = -0.25979
C = 0.38120
D = 1.0238
R2 coef = 0.99891