

Massachusetts Department of Environmental Protection

Supplemental Transmittal Form

(to accompany supplemental material or payment to previously submitted DEP permit applications)

1. Transmittal Number	Obtain from the upper right hand corner of the original application's Transmittal Form:
	X023110

2. Facility Information	(a) Facility Name:	(b) Facility Address:
	Concord Avenue Landfill	Concord Avenue
	(c) Facility Town/City	(d) Telephone Number:
	Belmont, MA	N/A

3. Permit Information	(a) Permit Name:	(b) Permit Code: (from original application)
	Solid Waste Landfill - Comprehensive Site Assessment	BWP SW 23

4. Reason For Supplemental Submission	☐	(a) Response to Request for Additional information	☐	(b) Response to Statement of Deficiency
	☐	(c) Supplemental Fee Payment	☐	(d) Withdrawal of Application
	☒	(e) Other (please specify below):		
		Ecological Risk Assessment - Supplement to CSA Permit Application		

5. Form Prepared by	(a) Name of individual or firm preparing this submission:	(b) Affiliation with application, i.e. applicant, consultant to applicant:
	Langdon Environmental LLC	Consultant
	(c) Contact Name:	(d) Contact Telephone #:
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October 7, 2022

Mr. Mark Fairbrother
Section Chief - Solid Waste
Massachusetts Department of Environmental Protection
Northeast Regional Office
205B Lowell Street
Wilmington, Massachusetts 01887

Subject: Stage I/II MCP Environmental Risk Characterization
Concord Avenue Landfill, Belmont, Massachusetts

Dear Mr. Fairbrother:

On behalf of the Town of Belmont, Massachusetts, Langdon Environmental LLC (Langdon) subcontracted with the Woods Hole Group (WHG) to complete the attached Stage I/II MCP Environmental Risk Characterization Report for the Concord Avenue Landfill in Belmont. The attached report incorporates the recommendations made in our letter to your office dated January 25, 2019 and is a supplement to the previously submitted Comprehensive Site Assessment (CSA) permit application for the Landfill. The attached field work and assessment was conducted in accordance with the Massachusetts Contingency Plan (MCP, 310 CMR 40.0000) and the Solid Waste Management Regulations (310 CMR 19.000, the Solid Waste Regulations), both promulgated by the Massachusetts Department of Environmental Protection (MassDEP).

The presumptive corrective action remedy for the Landfill is to construct a final cap meeting the current requirements of the Solid Waste Regulations or augment the existing clay soil cap. Both alternatives will significantly decrease the continued release of contaminants from the Landfill into the surrounding wetland resource areas both by minimizing direct contact of rainwater with landfilled waste that can migrate contaminants into groundwater that eventually discharges into the wetland resource areas. The final cap will also eliminate the continued erosion of landfilled materials into the wetlands. Alternative approaches for the final cap, and any other corrective actions required based on the results of the CSA, will be evaluated as part of the Corrective Actions Alternative Analysis (CAAA) Permit Application. The scope of work for the CAAA has been previously submitted and approved by MassDEP.

As detailed in the attached report, WHG was not able to reach a conclusion of no significant risk to wildlife contacting the wetland sediments, wetland soils or surface water around the Landfill. When considering the next steps of assessing corrective actions, impacts to a sensitive wetland environment from remedial activities need to be balanced with the potential harm to wildlife from exposures to Site COCs. The removal of potentially active transport pathways from the Landfill to the surrounding wetland habitats will reduce exposures. Particularly helpful will be removal of any remaining groundwater pathways as these may influence sediment toxicity and surface water screening value

exceedances. Additionally, there is value in considering if the wildlife activity is as expected in a wetland that is not impacted by the Landfill.

The risk to wildlife (in this case songbirds) estimated by WHG is driven by exposure to contaminants in earthworm tissue, although earthworms were not easily located for chemical analysis. Other invertebrate food sources were also not located for chemical assessment. While the food chain models provide analysis of potential exposure pathways, there is value in considering if the wildlife activity around the Landfill, especially songbird activity, is as expected in a wetland that is not impacted by the Landfill. Although a wildlife/vegetation survey has not been completed, during collection of Site media, field technicians did not observe obvious evidence of stressed biota and noted evidence of biological activity, including frogs, songbirds, and insects around the wetland areas.

The CAAA will evaluate corrective action alternatives to remediate wetland sediments and wetland soils to approximate limits based on the sampling conducted as part of the attached Report. This assessment will use the standard criteria outlined in the Landfill Technical Guidance Manual (LTGM, MassDEP, 1997) to qualitatively assess if sediment removal or further actions are required. If further remedial actions are recommended, preliminary remediation goals (PRGs) can be developed and applied for limited removals.

The attached Report also includes an assessment of the wetland areas around the Landfill where iron floc exists as has been previously reported. Based on observations and estimates made by WHG during their site visits, the persistent area of iron floc is less than 1,000 ft², which is the threshold area to be considered Readily Apparent Harm as defined in the MCP. WHG also concluded that it was unlikely that the aquatic community in the iron floc areas differs from that in the areas where there is no floc. Because the condition of Readily Apparent Harm does not exist related to iron floc, there will be no assessment of alternatives to address iron floc in the wetland resource areas in the CAAA Permit Application.

Please do not hesitate to contact me at (617) 875-3693 if you have any questions or require anything further.

Sincerely yours

Bruce W. Haskell

Bruce W. Haskell, P.E.
Langdon Environmental LLC



cc: Patrice Garvin, Belmont
Glenn Clancy, Belmont
Jerry Cura, WHG
Ted Wickwire, WHG



STAGE I/II MCP ENVIRONMENTAL RISK CHARACTERIZATION

Concord Avenue Landfill

Belmont, Massachusetts

9/26/2022

Prepared for:

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ACRONYMS

BAF	Bioaccumulation Factor
BSAF	Biota to Sediment Accumulation Factors
CBR	Critical Body Residue
COC	Contaminant of Concern
CSA	Comprehensive Site Assessment
EH	Estimated Habitat
EPA	United States Environmental Protection Agency
EPC	Exposure Point Concentration
ERC	Environmental Risk Characterization
ES	Environmental Screening
HQ	Hazard Quotient
LOAEL	Lowest Observed Adverse Effect Level
LSP	Licensed Site Professional
MassDEP	Massachusetts Department of Environmental Protection
MCP	Massachusetts Contingency Plan
NHESP	Natural Heritage and Endangered Species Program
NOAA	United States National Oceanic and Atmospheric Administration
NOAEL	No Observed Adverse Effect Level
NRWQC	National Recommended Water Quality Criteria
OHM	Oil and Hazardous Material
PAH	Polynuclear Aromatic Hydrocarbons
PCB	Polychlorinated Biphenyls
PEC	Possible Effect Concentrations
PH	Priority Habitat
RAH	Readily Apparent Harm
SITE	Concord Avenue Landfill, Belmont, MA
TEC	Threshold Effect Concentration
TRV	Toxicity Reference Value
TTF	Trophic Transfer Factors



1.0 EXECUTIVE SUMMARY

1.1 Introduction

This Stage I Environmental Screening (ES) and Stage II Environmental Risk Characterization (ERC) examine potential ecological risks associated with chemicals detected in wetland sediments, wetland soils, and surface water in specific areas potentially affected by the Concord Avenue Landfill (the 'Site'). The ES and ERC were prepared in support of the Concord Avenue Landfill Comprehensive Site Assessment (CSA) activities led by Langdon Environmental LLC (Langdon). The CSA is a required phase of the MassDEP's Landfill Assessment and Closure process and must be performed when a landfill ceases operation and prepares for final closure.

The risk assessments follow ecological risk assessment guidance developed by the Massachusetts Department of Environmental Protection (MassDEP, 1996) and subsequent updates to that guidance.

1.2 Stage I ES

Woods Hole Group, Inc. (WHG) prepared the Stage I ES in support of the Concord Avenue Landfill Comprehensive Site Assessment (CSA) activities led by Langdon Environmental LLC (Langdon).

The Stage I ES addresses the forested wetlands, Beaver Brook, ponded areas, and phragmites patches surrounding the landfill. These environments include areas of sediment, surface water, and wetland soil. The Site is near but does not include Threatened or Endangered Species Priority or Estimated Habitat. The Stage I ES includes the selection of Contaminants of Concern (COCs) based on an analysis of detection frequency in site media (sediment, soil, surface water); an analysis of readily apparent harm using MassDEP criteria; an analysis of potentially significant exposures based on Site ecological conditions and, for sediment and surface water, a comparison to MassDEP screening criteria (MassDEP, 1996).

The criteria for Readily Apparent Harm (RAH) were reviewed. Regarding the evaluation of the RAH criterion '*Visible presence of oil, tar or other non-aqueous phase hazardous material...*', multiple observations including photos and areal estimates of distribution were made particularly in the areas with iron floc. The location of the floc, total coverage area, and whether the floc is floating or deposited on sediment surface varies with each visit. Based on observations and area estimates made during Site visits, the persistent area of floc is <1,000 square feet. Following communication from MADEP (October 2017) that floc presents readily apparent harm when a distinct and persistent layer of floc material is present, we do not conclude that a condition of RAH is present due to visible presence of iron floc. However, because there are surface water concentrations that exceed National Recommended Water Quality Criteria (NRWQC), the Site conditions result in Readily Apparent Harm to aquatic receptors from direct exposure to surface water



This Stage I ES could not come to a conclusion of no significant risk. For wetland sediments, potentially significant exposure pathways are present. For wetland soils, potentially significant exposure pathways are present and cannot be directly evaluated using Stage I Screening Criteria (no criteria available for soil). Therefore, further analysis is required in a Stage II ERC for exposure pathways in wetland sediment and wetland soil.

1.3 Stage II ERC

Because potentially significant exposure pathways are present (sediment and surface water) or uncertain (wetland soil), WHG proceeded with the Stage II ERC, which follows ecological risk assessment guidance developed by the Massachusetts Department of Environmental Protection (MassDEP, 1996).

This Stage II Ecological Risk Assessment (ERC) estimates the potential for significant risk of harm to environmental receptors using Site habitats. These habitats include forested wetlands, Beaver Brook, ponded areas and phragmites wetlands.

The exposure assessment recognizes three Site-wide exposure media including: wetland sediment in the ponded areas and Beaver Brook, wetland soil in the floodplain surrounding Beaver Brook, and surface water in the ponded areas and Beaver Brook.

The Stage II assessed exposure to Site related Contaminants of Concern (COCs) in:

- Invertebrate organisms through direct contact with sediments;
- Herbivorous wildlife selected as representative receptors (muskrat, robin, Canada goose) that may ingest soil, sediment, surface water, and plant material growing in the open marsh sediment and the forested wetland soil;
- Carnivorous species selected as representative receptors (robin, raccoon, shrew) that may ingest soil, sediment, surface water and invertebrates (freshwater bivalves or earthworms; and,
- Amphibians potentially exposed to Site surface water.

The analysis of these exposures indicated that:

Direct Contact Pathway in Wetland and Brook Sediment

The results of the screening models and the toxicity testing using wetland sediment demonstrate that we cannot reach a conclusion of no significant risk of harm to invertebrates from exposures to wetland and Beaver Brook sediments.

Dietary Exposures in wetland and Beaver Brook Sediment

There is no significant risk of harm to receptors from exposure to COCs in the wetland and Beaver Brook sediment.



Dietary Exposures to Wetland Soil

We cannot conclude a condition of no significant risk to songbirds consuming plants in wetland soil due to ingestion of lead and zinc in plant tissue.

We cannot conclude a condition of no significant risk to songbirds consuming earthworms; there is evidence of potential harm due to lead in the measured earthworm tissue.

There is no significant risk to small mammals from exposure to COCs through ingestion of earthworms in wetland soils.

Amphibian Exposures

We cannot come to a conclusion of no significant risk to amphibians due to exposure to iron in surface waters.

In addition, there is readily apparent harm to amphibians from exposure to surface water due to NRWQC exceedances for lead and iron in surface water.



2.0 STAGE I ENVIRONMENTAL SCREENING

WHG prepared this Stage I Environmental Screening (ES) to evaluate environmental conditions at the Concord Avenue Landfill (the 'Site') in Belmont, Massachusetts (Figure 2-1). The purpose of this ES is to provide an opinion as to whether there is significant risk of harm to biota or habitats from exposure to chemicals in wetland sediments, wetland soils, and surface water in streams running through the wetlands near the landfill.

This characterization generally follows the characterization of the risk of harm to the environment described in 310 CMR 40.0995 (Method 3 Environmental Risk Characterization) and the *Guidance for Environmental Risk Characterization* (MassDEP, 1996).

Under these regulations, there is a two-stage process. Stage I is a screening level assessment. A more advanced assessment, Stage II, occurs if certain conditions apply. Stage I is used to eliminate from further evaluation those situations in which either: 1) the exposures are clearly unlikely to result in environmental harm; or 2) harm is readily apparent. Exposure pathways that are not eliminated in Stage I are carried into a Stage II ERC to determine whether we can come to a conclusion of no significant risk to representative receptors.

A Stage I Environmental Screening can result in one of three conclusions:

- Conclusion 1 - a Stage II ERC is not required because there are no complete exposure pathways that could result in potentially significant exposures, and a condition of no significant risk of harm to site biota and habitats clearly exists;
- Conclusion 2 - a Stage II ERC is not required because, for one or more specific media, harm is readily apparent; therefore, a condition of no significant risk of harm to site biota and habitats *does not exist* and a Stage II ERC would be redundant for that medium; or
- Conclusion 3 - a Stage II ERC is required because, for one or more contaminated media, there is not enough information to determine whether a condition of no significant risk of harm exists, and therefore those media are considered to present "potentially significant exposures."

This characterization uses three information sources:

1. Site visits and field sample collection conducted by WHG (2021) including an initial site visit, and a field sampling effort to evaluate wetland soil, sediment, and surface water chemistry as well as observation of iron floc conditions in Beaver Brook and the ponded areas¹.

¹ NOTE: additional field work was completed to support the Stage 2 ERC and was guided by the work completed in the Stage I including: collection of sediment for toxicity testing and bioaccumulation testing and collection of earthworms. Each visit included an observation of floc conditions.



2. CDM November 2017 Sediment and Surface Water Sampling Program Data (as received from Langdon). Background data included in this data set were not used in this assessment because of potential issues with data quality;
3. Scientific literature on ecological effects; and,
4. Proposed Corrective Actions Alternative Analysis (CAAA) Supplemental Scope of Work and Approach for Closure of Concord Avenue Landfill, Belmont BWP SW-45 Any Facility – Alternate Review FMF # 39069, Transmittal Number X252973 (CDM Smith, September 2012).

The steps in a Stage I Environmental Screening are:

1. Describe the site;
2. Describe the nature and extent of site contamination;
3. Select Contaminants of Concern;
4. Identify complete exposure pathways;
5. Estimate whether risk of harm to the environment is readily apparent for each complete exposure pathway; and,
6. For sediment and surface water, conduct an effects-based screening step to assess whether complete pathways do not pose a significant environmental risk.

2.1 Site Description

The Site is the Concord Avenue Landfill in Belmont, Massachusetts. The property is 25.5 acres, 14 of which are historically landfill; presently with a mix of forested upland, with gravel access roads and scattered open vegetated areas. The remaining 8.5 acres are freshwater wetlands bordering Beaver Brook and an approximately 3-acre upland area that was not historically part of the Landfill. The Site previously housed an incinerator and transfer station building which have since been demolished. Municipal composting and materials storage are still active on the Site. The Site is adjacent (upgradient) to Beaver Brook Reservation (Figure 2-1).

2.1.1 Initial Site Visit

On June 30, 2021, the WHG Team conducted a site visit to observe site conditions and plan for a field sampling program to characterize conditions in the wetland and forested habitat areas. They noted water levels and access points. They also noted orange-brown staining and possible iron floc in ponded areas west of Beaver Brook (Figure 2-2, Figure 2-3). The floc observations were continued through every subsequent Site visit and Figure 2-2 provides the time series of approximate areal coverage. The field team noted evidence of biological activity including frogs, songbirds, and insects around the Site.



2.1.2 July 2021 Field Program

The Field Team returned to collect environmental samples on July 27, 2021. They collected surface sediment, wetland soils, and surface water samples from the study area, as well as from upgradient locations (Figure 2-4). They also noted and measured the floc distribution (Figure 2-2; Figure 2-3).

2.2 Distribution of Contaminants in Environmental Media

The Stage I ES uses sediment and soil data collected by CDM (2017) and sediment, soil and surface water data collected by WHG (2021). The surface water data from 2017 were not included as the 2021 are most representative of current surface water conditions. The 2017 CDM sediment, soil, and surface water data have been submitted separately to MassDEP as a supplement to the CSA.

This section summarizes the type, concentrations, and media of occurrence for contaminants detected in samples collected from the wetland areas.

For purposes of selecting COCs, WHG recognized two habitats: wetland/stream sediments and forested wetland soils (as defined in 310 CMR 40.0006 and MassDEP, 1996 p. 9-92). We sampled these media in the top six inches, the depth of most probable biological exposure.

Data used in this ES include sediment, surface water and wetland soil chemistry. The 2017 data were received from Langdon in Excel tables while the 2021 data were received electronically from Alpha Analytical in laboratory data reports and Excel spreadsheets.

The laboratory data showed many instances in which a chemical was not detected. For the purposes of calculating summary statistics, if a chemical was not detected in a sample, the chemical is assumed to be present at ½ the laboratory reporting limit.

The data used for the Stage I ES are summarized in Tables 2-1, 2-2 and 2-3 and the sample locations are provided in Figure 2-4. Although a formal background assessment was not planned or completed, the Stations that are upgradient (north) of the landfill proper are considered outside the influence of the landfill and are therefore considered representative of background conditions. The background stations from the 2017 data set are not considered of sufficient quality for inclusion in the background data set and have not been included. The screening focuses on the Site data. A formal background comparison is not included, but these values are considered in the uncertainty sections.

2.3 Selection of Contaminants of Concern

2.3.1 Analytical Parameters

The analytical parameters for each medium assessed are based on the *Proposed Corrective Actions Alternative Analysis (CAAA), Supplemental Scope of Work and Approach for Closure of*



Concord Avenue Landfill (CDM, 2012). For the wetland sediment and wetland soil samples, the analytes include:

- PAHs;
- 2,3,7,8-TCDD (Dioxin)
- Inorganic chemicals (metals): Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Copper, Lead, Mercury, Nickel, Selenium, Silver, Zinc;
- Percent Solids;
- Total Organic Carbon; and
- Grain Size.

The surface water analytes included (based on the analytes identified in CDM (2012), Page 3-7):

- Total and Dissolved Metals: Barium, Iron, Lead, Manganese, Zinc; and
- Free cyanide.

2.3.2 Selection of COCs in Wetland Sediment and Wetland Soil

The selection of Contaminants of Concern (COCs) is based on the detection frequency evaluated separately for wetland soil and wetland sediment data to provide a final list of sediment-specific and soil-specific COCs (Tables 2-4a and 2-4b). These steps included:

- Eliminating a contaminant as a COC if it was not detected in any of the site samples; if an analyte was not detected in any station, but the detection limit was elevated², it is carried forward for further assessment. In this analysis, Selenium is carried into the Stage I ES despite not being detected because of elevated detection limits;
- Because historic studies did not formally identify background stations, we do not include the standard background comparison for sorting the final COC list. Data from the upgradient stations as well as MADEP Soil Background are used in the Stage II ERC to add context to the risk findings.

The final COC list for wetland sediment and soil is provided in Table 2-4a and 2-4b.

2.3.3 Selection of COCs in Surface Water

The surface water analytical list was based on previous work at the Site (CDM, 2012). Further analysis to determine surface water COCs for ecological receptors included:

- Retaining any chemical that has a National Recommended Water Quality Criterion;

² Elevated in comparison to available information such as MCP background, screening values, USGS background (<https://pubs.usgs.gov/ds/801/pdf/ds801.pdf>)



- Eliminating chemicals that are common salts or nutrients in surface water or have low biological activity; and,
- Eliminating chemicals that were not detected in surface water or have low detection limits and low frequency of detection.

The final COC list for surface water is provided in Table 2-4c.

2.4 Identification of Complete Exposure Pathways

Exposure Pathways from Sediment and Surface Water: The selection of COCs indicates that the aquatic environments (brook surface water, stream sediment, and wetland/marsh sediment) pose complete exposure pathways of potential concern from landfill sources of COCs to receptors in these environments. MassDEP guidance (MassDEP, 1996) indicates that the mere presence of contaminants is generally sufficient to demonstrate the presence of a complete exposure pathway for aquatic organisms (surface water and benthic) that are or would be present in the absence of site related COCs. Thus, (following MassDEP guidance Section 9.6.3) the detection of elevated levels of contamination in sediment or surface water, or the potential for elevated levels to occur in the future, constitutes identification of a complete exposure pathway.

Exposure Pathways from Forested Wetland Soil: MassDEP guidance indicates that exposures to contaminated wetland soil should be evaluated as in a manner similar to that for terrestrial habitats and organisms with the exception that wetland soil habitats cannot be evaluated for habitat quality as is allowed for purely terrestrial habitat (MassDEP, 1996 Section 9.6.3.2 p 9-94). The selection of COCs and detected site related chemicals and their comparison of wetland soil data to MassDEP background concentrations and upgradient soil concentrations indicates that the forested wetland environments (wetland soil) pose complete exposure pathways from landfill sources of COCs to receptors in these environments.

Note that those receptors foraging in the forested wetland areas may also be exposed through ingestion of Site surface water.

The application of the guidance in the identification of complete exposure pathways indicates that:

- There are complete exposure pathways for the exposure of receptors foraging in areas of wetland sediment to Site-related COCs through stream sediment, open marsh sediment, and surface water; and,
- There are complete exposure pathways for the exposure of terrestrial organisms using the forested wetland through exposure to wetland soils. In addition, as required by guidance, there may also be complete exposure pathways to terrestrial organisms that nest, forage, or use nearby wetland surface waters through ingestion of surface water.



2.5 Selecting Representative Receptors

In order to have a complete exposure pathway, there must be ecological receptors. We summarize the receptors briefly below.

2.5.1 Vegetation and Invertebrates

The wetland areas are generally heavily vegetated. The open marsh wetlands are heavily vegetated with reeds (*Phragmites* and/or cattails). Wetland streams support aquatic vegetation and streambanks are vegetated with ferns, grasses, shrubs, and trees.

The Site wetlands support benthic invertebrates including insect larvae and oligochaetes (aquatic worms) as well as various beetles and insects.

2.5.2 Fish

No fish were observed during site visits. A comprehensive fish survey was not conducted. However, it is unlikely that the wetlands or brook support large fish communities because the brook and ponded areas are shallow and may be intermittent in some areas during summer months.

2.5.3 Wildlife

WHG personnel observed songbirds and heard and observed frogs and tadpoles during the Site visits. They also saw a mallard duck at the Site. Other foraging animals such as the racoon, field mice, voles, and shrews may forage in the wetlands.

2.5.4 Threatened, Endangered, and Species of Special Concern

Based on data received from the Natural Heritage and Endangered Species Program (NHESP) of the MA Division of Fisheries & Wildlife (NHESP, 2020) (Appendix A):

*This project site, or a portion thereof, is located **near but not within** Priority Habitat 1420 (PH 1420) and Estimated Habitat 1028 (EH 1028) as indicated in the Massachusetts Natural Heritage Atlas (14th Edition). Our database indicates that the following state-listed rare species have been found in the vicinity of the site:*

Scientific name	Common Name	Taxonomic Group	State Status
<i>Ambystoma laterale</i> pop. 1	Blue-spotted Salamander	Amphibian	Special Concern

The species listed above is protected under the Massachusetts Endangered Species Act (MESA) (M.G.L. c. 131A) and its implementing regulations (321 CMR 10.00). State-listed wildlife are also protected under the state's Wetlands Protection Act (WPA) (M.G.L. c. 131, s. 40) and its implementing regulations (310 CMR 10.00).



Using the current version of the MassMapper NHESP maps (Figures 2-5a, 2-5b, 2-5c), PH1380 NHESP Priority Habitat for rare species and estimated habitats for rare wildlife is adjacent to the Site. NHESP noted that although identifying number has changed, the PH is the same as that noted in the NHESP letter noted above. The habitat is mapped for the blue-spotted salamander. Amphibian exposures are most direct through water contact, therefore comparison to water-based ecotoxicological effects data and NRWQC provide some insight into potential risks. Table A-1 provides a comparison to screening values. Iron concentrations exceed both the NRWQC and selected ECOTOX values, while the lead concentration exceeds the NRWQC acute value. In addition to Priority and Estimated habitat analyses, there are no certified vernal pools mapped on the Site.

2.6 Exposure Analysis

The Stage I ES includes an exposure analysis to evaluate whether there is current or potential future exposure of environmental receptors (plants, animals, or habitats) to site-related contaminants based on lines of evidence such as historic records, site data, field observations, site history, or other information sources. There are two possible outcomes of the exposure analysis:

1. If the evaluation does not indicate a current or potential future exposure pathway, then a condition of "no significant risk of harm" to biota or habitats exists or has been achieved and a Stage II ERC is not required;
2. If the evaluation indicates a current or potential future exposure, based on the above lines of evidence, then the risk assessor must evaluate environmental conditions to determine whether significant environmental harm is "readily apparent".



Comparison of Site Conditions to MCP Stage I Environmental Characterization Screening Criteria to Identify Current or Future Exposure Pathways		
MCP criteria [310 CMR 40.0995(3)(a)]	Conditions At Site	Condition Met for Site?
1. Current or past visible physical evidence that oil and/or hazardous material at or from the disposal site have come to be located in surface soil, surface water, sediment, or wetlands.	There is evidence of iron floc that may be related to the Site. It is not persistent in all areas. While there is orange stained sediment throughout the floodplain including upgradient, only the non-aqueous iron floc was observed downgradient of the landfill.	Yes
2. Records or other evidence of current or past impacts of oil and/or hazardous material from the disposal site on wildlife, fish, shellfish, or other aquatic biota. Examples include, fish kills and abiotic conditions.	There are no currently visible impacts of contamination at the Site such as dead or stressed vegetation, dead animals, etc.	No
3. Analytical data indicating the presence of oil and/or hazardous material attributable to the site in surface water or sediment (including wetlands).	The review of recent chemical analyses indicate that metals and PAHs are present in the wetland sediment and wetland soil at the Site.	Yes
4. The potential for the transport of oil and/or hazardous material in the groundwater or surface runoff to receptors such as surface water or sediments identified as Environmental Receptors.	In terms of this study site there is the potential for surface runoff to wetland sediment and surface water.	Yes
5. The presence of oil and/or hazardous material at the disposal site within two feet of the ground surface and the potential for such contamination to result in exposure to wildlife.	The Site COCs in soils and sediments are in habitat areas and present potential wildlife exposures. This includes avian and mammalian species exposed through direct contact with wetland sediment, soil and surface water, incidental ingestion of those media and food chain exposures through ingestion of prey that were exposed to those media and COCs.	Yes

The exposure evaluation indicates the potential for current and future exposure of ecological receptors in the wetland sediment, stream sediment, surface water, and forested wetland soil.



2.7 Evaluation of Readily Apparent Harm

The MCP states that if there is sufficient evidence to conclude readily apparent harm, then one cannot meet the requirements for No Significant Risk, and Stage II Environmental Risk Characterization for the subject media cannot overcome this conclusion.

The application of MCP criteria [310 CMR 40.0995(3)(b)1] that define readily apparent harm indicates that the Site does exhibit readily apparent harm. Specifically:

Stage I Environmental Screening for Readily Apparent Harm		
MCP criteria [310 CMR 40.0995(3)(b)1]	Conditions At Site	Condition Met?
Visual evidence of stressed biota attributable to the release at the disposal site, including, without limitation, fish kills or abiotic conditions.	There is no visual evidence of stressed biota attributable to the release at the disposal site.	No
The existence of oil and/or hazardous material attributable to the disposal site in concentrations which exceed Massachusetts Surface Water Quality Standards promulgated in 314 CMR 4.00, which include USEPA National Recommended Water Quality Criteria (NRWQC).	Iron and Lead exceed NRWQC.	Yes
Visible presence of oil, tar, or other non-aqueous phase hazardous material in soil over an area equal to or greater than two acres, or over an area equal to or greater than 1,000 square feet in sediment.	Maximum area of floc >1000 sq feet, but the observed floc is not all persistent. It is highly variable in terms of thickness, presence and whether it is on the sediment surface or floating (dependent on water conditions). The area of 'persistent' floc is less than 1000 sq ft. To date we have not assessed redox potential, though it is unlikely that aquatic community differs from that in wetland organic sediments without floc. There is one area with more persistent floc near a stormwater pipe along the stream. However, it is less than 500 sq ft. Also, floc has been noted in upgradient areas.	No

NOTE: The comparison to cyanide uses Sitewide maximum physiologically available cyanide (assumed to be a conservative analogue of free cyanide).

Regarding the evaluation of the RAH criterion '*Visible presence of oil, tar or other non-aqueous phase hazardous material...*' floc observations were made multiple times including photos and



areal estimates. The location of the floc, total coverage area and whether the floc is floating or deposited on sediment surface varies with each visit.

In communication with MassDEP Office of Research and Standards (ORS) (October 2017), WHG received a clarification on the MassDEP position regarding iron floc and readily apparent harm. We received the following response from MassDEP regarding iron floc in sediments:

“While we do not have a formal floc policy, we are generally calling floc readily apparent harm only when a distinct and persistent layer of floc material is present. Iron staining of vegetation which might happen naturally in the environment for a variety of reasons is not a condition we are calling readily apparent harm. The basis of this distinction is the fact that a persistent floc layer has the potential to create distinct anoxic zones under the flocculent material, which poses clear risks to many aquatic organisms.”

Therefore, WHG considers that floc over sediment constitute readily apparent harm if the floc layer across the site:

Is greater than 1,000 square feet;

Is persistent; and,

Is sufficient to inhibit the dispersion of oxygen across the floc layer to the sediments.

Readily apparent harm occurs if all three conditions are met.

Based on observations and area estimates made during Site visits, the persistent area of floc is <1000 square feet. There are larger ephemeral areas, and at discrete visits there were times that the total floc area was > 1000 square ft, but the area of persistent floc, observed at one location two times or more is less than 1000 square ft. Floc observations have been made multiple times over the course of 11 months and the results are presented in a map series of observations in Figures 2-2 and 2-3.

Based on the NRWQC exceedances, but not the presence of floc, a condition of Readily Apparent Harm is present at the Site.

2.8 Evaluation of Potentially Significant Exposure

The MCP states that each current or potential future complete exposure pathway identified in 40.0995(3)(a) must be evaluated using available information to assess whether it could result in a "potentially significant exposure". The MCP proposes an effects-based screening approach to rule out a source of potentially significant exposures. The Stage I effects-based screening should be consistent with scientifically acceptable risk characterization practices and take into



consideration guidance and screening criteria published by MassDEP, including but not limited to:

1. Concentrations reported in the scientific literature to be associated, or potentially associated, with toxic effects; and,
2. Site size and location criteria, which may be identified by MassDEP.

The MCP requires a Stage II ERC for any current or potential future exposures to any media which remain as "potentially significant exposures" in the Stage I Screening.

This analysis compares sediment concentrations from the Beaver Brook and the wetlands to the current MassDEP sediment screening criteria to screen for potentially significant exposure through the sediment pathway (Table 2-1). Surface water concentrations are also compared to the NRWQC (Table 2-3).

There are no Stage I screening criteria for wetland soils. The analysis does not use any site size or location criteria to screen for habitat quality because the soils on Site are wetland soils and thus not subject to such habitat quality evaluations. Therefore, a Stage II ERC is required for forested wetland soils, using the COCs not eliminated based on detection frequency or comparison to Site-specific upgradient samples.

2.8.1 Comparison of Sediment and Surface Water Concentrations to Screening Criteria

Under the MCP, sediment and surface water COCs are compared to screening level concentrations to assess whether there is a need for a Stage II assessment. The MCP requires that a Stage II risk assessment be performed for the sediment pathway for *all* COCs not previously eliminated, if *any* COC occurs in concentrations above its Stage I screening criteria in sediment (MassDEP, 2006). This step does not allow for the elimination of individual COCs.

Table 2-1 shows the concentrations of each sediment COC and, if available, the respective MassDEP freshwater sediment screening guidance provided in Tables 1-3, MassDEP, 2006. Exceedances are highlighted

Table 2-2 shows the concentrations of COCs in soil. There are no screening criteria for soils. The MassDEP Soil Background values are shown for context.

Table 2-3 show the concentrations of surface water COCs compared to NRWQC and exceedances are highlighted.

There is potentially significant exposure to wetland sediments and surface water because there are exceedances of screening criteria, and the Stage I ES cannot come to a conclusion of no significant risk from exposure to wetland sediment or surface water. According to the MCP, as long as there is at least one instance where a COC is found at a concentration above the sediment screening criteria and NRWQCs, all sediment and surface water COCs must be brought forward into the Stage II Environmental Risk Characterization.



There is an assumed significant exposure to wetland soil and soil COCs are brought forward to a Stage II because there are no soil screening criteria.

2.9 Stage I ES Conclusion

This Stage I ES could not come to a conclusion of no significant risk under MassDEP guidance and therefore recommends a Stage II ERC be performed. For wetland sediments potentially significant exposure pathways are present. For wetland soils potentially significant exposure pathways are present, but cannot be directly evaluated using Stage I Screening Criteria because MassDEP has not provided these values. Therefore, further analysis is required in a Stage II Environmental Risk Characterization.

There is Readily Apparent Harm at the Site because wetland surface water concentrations exceeds NRWQC. This means that a Stage II Environmental Risk Characterization to assess risks to the aquatic community from exposure to site surface water is not required because a condition of readily apparent harm cannot be overcome by a Stage II Environmental Risk Characterization.

2.10 Recommendations

2.10.1 Wetland Sediment

There are potentially significant exposure pathways from wetland sediment to ecological receptors because the concentrations of several COCs in sediment exceeded their respective MassDEP Stage I freshwater sediment screening criteria. Therefore, we recommend a Stage II ERC addressing exposure to sediment COCs through the food chain and from direct ingestion of sediment and surface water.

2.10.2 Wetland Soil

There are potentially significant exposure pathways from wetland soil to ecological receptors based on the presence of COCs in wetland soil and the presence of ecological receptors in contact with that soil. Therefore, we recommend a Stage II ERC addressing exposure to soil COCs through the food chain and from direct ingestion of sediment and surface water.

2.10.3 Wetland Surface Water

There is readily apparent harm to the aquatic community from exposure to Site surface water. Therefore, a Stage II ERC is not required to evaluate risk to aquatic receptors. Such risk is assumed due to readily apparent harm.

We recommend that the surface water concentrations of soil and sediment COCs be incorporated into the exposure analysis of receptors exposed to surface water COCs so that the estimated dose in the calculations include all media.

2.10.4 Stage II Specific Recommendations for Exposure and Toxicity Assessment

The specific recommendations for the Stage II ERC include:



- Food chain modeling using sediment, soil, and surface water data to evaluate potential risk to receptors from exposure to Site media and through the food chain;
- Toxicity assessment using PEC quotient models, the sum PAH model and Narcosis models in wetland sediment and toxicity testing if models indicate potential toxicity;
- Bioaccumulation modeling using Biota to Sediment Accumulation Factors (BSAF) for organic chemicals in wetland sediment, trophic transfer factors where appropriate for individual metals in wetland sediment, bioaccumulation factors for organic chemicals and individual metals in wetland soils; and plant uptake factors for chemicals in wetland sediments and wetland soils; and
- Incorporating these results into a Stage II ERC report.



3.0 STAGE II ENVIRONMENTAL RISK CHARACTERIZATION

3.1 Ecological Conceptual Site Model

This section provides an ecological conceptual exposure model to guide the Stage II ERC under current conditions. The ecological conceptual exposure site model follows the general guidance for such models (MassDEP, 1996; EPA, 1998) provided under the Massachusetts Contingency Plan (MCP) and United States Environmental Protection Agency (USEPA). The purpose of the ecological conceptual site model is to address three questions:

- 1) What organisms might be exposed to contaminants associated with releases of contaminants at the Site?
- 2) What are the Site-specific contaminants?
- 3) What are the physical or biological processes which might link the Site-specific contaminants with organisms?

There are generally seven steps in the development of the ecological conceptual site model:

- 1) Describe the Site history.
- 2) Identify the kinds and spatial extent of habitats that are present in the vicinity of the Site.
- 3) Identify the species that may use these habitats and that may be potential receptors.
- 4) Specify the contaminants of concern.
- 5) Describe mechanisms which may bring a contaminant into contact with an organism.
- 6) Describe the potential routes of contact between the contaminant and the receptor.
- 7) Describe the complete exposure pathway.

Note that the ecological conceptual site model does not provide an estimate of risk, nor does it provide any quantitative estimate of exposure or the fate and transport of contaminants. Rather, the working product of the ecological conceptual site model is a description of the probable complete exposure pathways. A complete exposure pathway is a physical, chemical, or biological mechanism or some combination of these which may transport a contaminant from a source, such as sediment, to a specified organism such as wetland or upland animal or plant. A complete exposure pathway does not necessarily translate to risk. The ecological conceptual site model attempts only to describe the potential for exposure to contaminants based on the site-specific physical conditions, chemistry, and geology. The ecological conceptual site model (CSM) is presented in Figure 3-1.

3.1.1 Describe the Site History

The Stage I ES and CSA Report provide the Site description and a description of historical activities at the landfill.



3.1.2 Identify the Kinds and Spatial Extent of Habitats in the Resources Study Area

As described in the Stage I ES, the habitats within the Site include: wetlands with open water areas in addition to dense phragmites stands, Beaver Brook (a small shallow stream), and forested wetlands/uplands. Within these habitats the media of concern include wetland sediments in the open water and phragmites wetlands, Beaver Brook sediment, soil in the forested wetland and upland areas, and surface water in the wetlands and brook. The different areas are illustrated in Figure 2-4 by the sample type.

The exposure assessment evaluates two habitat types – wetland/brook (sediment and surface water) and forested wetland/upland (soil). Note that wetland and upland soil are evaluated together because: (1) there is no clearly defined boundary between wetland soil (defined in guidance as above the bank and without persistent standing water that would support aquatic biota), and upland soil at this Site; and (2) both habitats are expected to support similar wildlife.

The Stage 1 ES also provides a natural heritage evaluation (see Section 2.5.4).

3.1.3 Identify the Species That May Use These Habitats

As indicated in the Stage 1 ES, the species that may use these habitats are typical New England wetland species. The wetland areas are generally heavily vegetated. The open marsh wetlands are vegetated with reeds (largely *Phragmites*) along with understory ferns, mosses, and worts. Beaver Brook has some aquatic vegetation and streambanks are vegetated with ferns, grasses, mosses, shrubs, and trees.

Invertebrate species that may use these habitats include: (1) benthic invertebrates in wetland sediments including insect larvae and oligochaetes (aquatic worms) as well as various beetles and insects; and (2) earthworms or other soil inhabiting invertebrates in forested wetland soil.

Fish were not observed and the shallow, seasonally intermittent Brook is unlikely to support a notable fish population.

WHG personnel observed songbirds, amphibians, and ducks during site visits. Though they did not observe mammals directly, foraging animals such as the deer, fox, raccoon, field mouse, vole and shrew may forage in the wetlands.

3.1.4 Specify the Contaminants of Concern

Table 2-4a,b,c provides a summary of the COCs which include PAHs, Dioxin and metals.

3.1.5 Mechanisms Which May Bring a Contaminant into Contact with an Organism

The Brook includes slow moving surface water that flows through the forested wetlands and open marsh areas dominated by *Phragmites*. These habitats are low energy and generally depositional. These sediment and surface waters contain various COCs. These also are habitat for benthic invertebrates and foraging areas for higher trophic level organisms. Therefore, the most likely mechanisms by which organisms may contact these sediments is through direct



contact with sediment and surface water, ingestion of rooted plants (largely *Phragmites* and *Typha*) or fruits and seeds and ingestion of benthic invertebrates.

The forested wetlands include wetland soils which contain COCs and support forest plants and soil invertebrates. The mechanisms for contact with these COCs are through direct contact of invertebrates and plants with soils and biological uptake through the food chain.

There is also the potential for higher order organisms to drink from the site surface waters.

3.1.6 Potential Routes of Contact between the Contaminant and the Receptor.

Ecological exposure routes in the wetland sediments and forested wetland soil areas include COC uptake from:

- Sediment into plants with subsequent ingestion by marsh herbivores;
- Surface waters in open marsh to marsh herbivores;
- Sediment into invertebrates and subsequent ingestion by wetland predators;
- Incidental ingestion of sediment where appropriate;
- Incidental ingestion of surface water by higher order organisms;
- Soil into invertebrates and plants in the forested wetland habitats and subsequent ingestion by wetland herbivores and predators respectively; and,
- Incidental ingestion of soil.

This analysis assumes equilibrium among prey items, sediment, and surface water for each COC so that the estimates of body burdens from sediment adequately encompass the contribution from water at equilibrium. Therefore, the Stage II ERC did not estimate separate body burdens of food in prey through uptake from surface water.

3.1.7 Complete Exposure Pathways

Figure 3-1 shows the proposed exposure pathways subject to evaluation in the assessment of ecological risks.

3.2 Assessment Endpoints and Ecological Exposure Assessment

3.2.1 Development of Assessment and Measurement Endpoints

The development of assessment and measurement endpoints relies on the descriptions of the food chain and transport pathways described in the ecological exposure pathway site model.

The ecological risk assessment uses assessment and measurement endpoints to develop risk estimates (MassDEP, 1997). The *assessment endpoint* is an explicit expression of the actual environmental value to be protected from exposure to Site surface waters, wetland sediment, and wetland soil. These environmental values commonly refer to ecological resources that:



- 1) are critical to the normal functioning of an ecosystem;
- 2) provide critical resources (e.g., fishery); or
- 3) are perceived by stakeholders as valuable (e.g., endangered species).

Often, the assessment endpoint cannot be directly measured (e.g., health of a benthic community). In such cases, the risk assessment uses measurement endpoints to make inferences about the assessment endpoint. In the case of risk from chemical exposures, the measurement endpoint is some measurable concentration (in biota, environmental media, food) or some dose of the contaminant that can be related to an analogous concentration or dose that elicits a toxic effect. Risk is then assessed by a comparison of the measured parameter to its toxic concentration or dose.

These endpoints are derived from the ecological conceptual site model which represents the ecological conditions at the site. The ecological conceptual site model reveals that the site habitat includes several biological communities that are critical to the functioning of the ecosystem.

The proposed assessment endpoints and their associated measurement endpoints include:

Assessment Endpoint 1: The health of the invertebrate community in wetland sediments. This assessment endpoint meets the criteria for selecting assessment endpoints in that they are: (1) clearly defined as abundant or important species in the ecological conceptual site model; (2) known to be susceptible to chemical exposures; and (3) ecologically relevant in that they are a food source for higher order predators.

The associated measurement endpoints include:

- a. Application of the sum PAH model to assess potential risk from PAH concentrations;
- b. Application of the PEC Quotient toxicity model to assess the probability of toxicity from exposure to Site related COCs.
- c. Application of the Narcosis Model to evaluate whether nonpolar narcotic COCs present an acute lethal risk to aquatic invertebrates.
- d. Direct measurement of sediment toxicity using a 42-day *Hyalella azteca* test in any wetland sediment habitat predicted to be toxic using measurement endpoints 1a and 1b.

Assessment Endpoint 2: The health of wildlife populations feeding on plants (largely phragmites) in Beaver Brook and wetland sediments.

The associated measurement endpoints include:



- a. Doses of COCs to muskrats feeding on plants and ingesting sediment, and surface water in the *Phragmites* and *Typha* stands; and
- b. Doses of COCs to Canada geese feeding on plants and ingesting sediment and surface water in the *Phragmites* and *Typha* stands.

Assessment Endpoint 3: The health of wildlife populations feeding on invertebrates in Beaver Brook and wetland sediments.

The associated measurement endpoint includes:

- a. Doses of COCs to raccoons feeding on invertebrates (freshwater bivalves), and ingesting sediment and surface water in areas of wetland sediments.

Assessment Endpoint 4: The health of wildlife populations feeding in the forested wetland areas.

The associated measurement endpoints include:

- a. Doses of COCs to robins feeding on plants (seeds and fruiting bodies), ingesting soil and surface water in the forested wetland;
- b(1). Doses of COCs to robins feeding on soil invertebrates (based on estimated earthworm concentrations), and ingesting soil in the forested wetlands and surface water site surface water bodies;
- b(2). Doses of COCs to robins feeding on soil invertebrates (based on measured earthworm concentrations), and ingesting soil in the forested wetlands and surface water site surface water bodies;
- c(1). Doses of COCs to shrews feeding on soil invertebrates (based on estimated earthworm concentrations), and ingesting soil, from the forested wetlands and surface water from site surface water bodies;
- c(2). Doses of COCs to shrews feeding on soil invertebrates (based on measured earthworm concentrations), and ingesting soil, from the forested wetlands and surface water from site surface water bodies.

Assessment Endpoint 5: Health of Amphibians exposed to Site Surface Water

The associated measurement endpoints include:

- a. Comparison of Site surface water concentrations to effects values from the literature.



3.2.2 Ecological Exposure Assessment

The ecological exposure assessment uses the ecological pathways described in the Conceptual Exposure Pathway Model (Figure 3-1) to calculate a quantitative estimate of the exposure of selected receptors to the contaminants of concern (COCs). The conceptual model indicates that the exposures to the selected ecological receptors are either through direct contact with site media or ingestion of prey in contact with these media as described above in the selection of measurement endpoints. As explained in the Stage I ES, this assessment recognized two habitats: wetland sediments and forested wetland soils (as defined in 310 CMR 40.0006 and associated guidance).

This ecological exposure has three general steps:

- 1) Estimate the concentration of the COCs in Site media (sediment, soil, surface water) that selected receptors may contact;
- 2) Estimate the concentrations in prey that are in direct contact with these media;
- 3) Estimate the dose to predators from ingestion of prey, soil or sediment, and surface water as appropriate.

Estimate the concentration of the COCs in sediment, soil, and surface water that selected receptors may contact

The exposure assessment estimated the concentration of COCs in various Site media including:

- 1) sediment in sitewide wetland sediments (open marsh and Brook sediment combined in that these all support invertebrates);
- 2) wetland soils across the site; and
- 3) surface water in all site surface water bodies combined.

The exposure zone for the receptors in direct contract with soil or sediment was assumed to be in the surface layer of these media (zero to one foot deep). MassDEP (1996) states that *“The average soil concentration in the exposure area may be used as an estimate of the average exposure concentration over time, assuming that (1) the data from the exposure area represent a random or systematically collected sample and (2) at any one time, an organism of concern is equally likely to contact soil at all locations in the exposure area”*. Because sampling plans were designed to capture exposures in all Site habitat areas and exposure is equally likely in all Site areas, the exposure point concentrations (EPCs) of COCs are the average concentrations in sediment (Table 3-1a) and wetland soil (Table 3-1b).

As discussed in Section 2, selenium is carried through as a COC despite not being detected because the detection limits are elevated (compared to soil screening values). Because it is not detected, ½ the detection limit is used in the EPC averaging process.

The EPCs of COCs for surface water (Table 3-1c) were estimated as the mean concentration of the COCs on the assumption that foraging receptors may drink from any available surface water



in the site study area. Note that these are total, not dissolved, concentrations because the animals will get a surface water dose from ingestion of total COC in surface water.

The exposure point concentrations in soils and sediment were used to estimate the concentrations of COCs in vegetative plants, seeds and fruits, forage fish, sediment invertebrates, and earthworms for use in the wildlife food chain models.

Concentrations of Sediment COCs used in the Sediment Toxicity Models

Table 3-1a provides the exposure point concentrations for sediment COCs for use in the sediment toxicity models. As a conservative (ecologically protective) exposure, the maximum concentrations are used as the exposure point concentrations for the first pass of the sediment toxicity models.

If the model indicated the potential risk of harm based on the probability of sediment toxicity in sitewide maximum or average, that model was re-rerun on a station-by-station basis using the station-specific concentrations of each COC.

Estimate the body burden (bivalves, earthworms) of hydrophobic organic compounds

The exposure assessment estimated the concentrations hydrophobic organic compounds in:

- 1) Wetland sediment invertebrates (freshwater bivalves) based on site wetland sediment concentrations; and
- 2) Earthworms in site soils.

Estimation of Hydrophobic Organics in Benthic Invertebrates

The assessment estimated lipid normalized tissue concentrations of hydrophobic organic compounds (Cb) based on biota to sediment accumulation factors (note that there are no BSAFs for metals) (Table B-1a) as:

$$C_b = BSAF * C_e$$

Where:

Cb = lipid normalized tissue concentration;

Ce = Total organic carbon normalized sediment concentration; and

BSAF = Biota to Sediment Accumulation Factors

= species or taxon specific value (Kg sediment organic carbon/Kg Biota lipid).

Lipid Content

For freshwater shellfish, the assumed lipid content was 10.5% (Gray and Kreeger, 2013).



Sediment Total Organic Content

The total organic content of the sediments was estimated as the average TOC measured in Site wetland sediments.

BSAF Selection: Hydrophobic Organics

BSAFs for freshwater bivalves (representing benthic invertebrate prey for foraging mammals in wetland sediments) were derived primarily from the United States Army Corps of Engineers (USACE) data base (<https://bsaf.el.erdc.dren.mil/>). The general protocol was to derive the BSAF as the average value for the species reported in the USACE data base. If there were no species-specific values, the BSAF for closely related species from the USACE data base was used in the calculations.

Estimation of Hydrophobic Organics in Earthworms

The estimates of hydrophobic organic compounds in earthworm tissue was estimated as (Table B-2):

$C(B) = C(s) * FL / 0.66(foc)$ following Menzie et al., 1992 for pesticides and PCBs; and as:

$C(B) = 0.23 * C(s) * (FL/foc)$ following Jager, 2002 for PAHs;

Where:

$C(B)$ = concentration in tissue;

$C(s)$ = average soil concentration;

FL = fraction lipid (0.088, based on average of several species from Stafford and Tacon, 1988); and

Foc = Average organic fraction in sitewide soils = 10.82% (average of all wetland soil samples).

The analyses assume 80% water in earthworms.

Table B-2 provides the BSAFs, exposure concentrations, and estimated tissue concentrations (dry and wet weight) of hydrophobic organic compounds in invertebrates (bivalve) exposed to site wide sediments, and earthworms exposed to site wide wetland soil.

Estimation of Metal Body Burdens in Soil and Sediment Invertebrates

Metal concentrations in invertebrate tissue were estimated from the sediment and soil exposure concentrations. These estimates rely on regressions developed in United States Department of Energy (USDOE) for soil to earthworms (USDOE, 1998) and sediment to benthic invertebrates (USDOE, 1998a) (Table B-3). The estimations assume 80% water in invertebrate tissue.

This estimate for metal tissue in earthworms from **soil** uptake takes the form:

$\ln(y) = B_0 + B_1 \ln(x)$; where:

y = chemical concentration in organism;



x = chemical concentration in sediment;
Bo = ln transformed y intercept (empirically derived in USDOE, 1998); and
B1 = slope (empirically derived in USDOE, 1998).

This estimate for metal tissue in benthic invertebrates from **sediment** uptake takes the form:

$\log(y) = Bo + B1 \log(x)$; where:

y = chemical concentration in organism;
x = chemical concentration in sediment;
Bo = ln transformed y intercept (empirically derived in USDOE, 1998a); and
B1 = slope (empirically derived in USDOE, 1998a).

If a regression was unavailable for a metal, published uptake factors from a USDOE Savannah River study (USDOE, 1999) was used in the calculations. Table B-3 provides the regression coefficients, exposure concentrations, and the results of the estimates of metal concentrations in earthworms and bivalves.

For mercury, an assumed exposure to methyl mercury soils was used to estimate risk levels. The exposures to mercury were calculated from an assumed fraction of methylated mercury in worm tissue. The toxic form of mercury is methyl mercury in the diet of organisms, and the EPA (EPA, 1997) recommends assessing risk to mercury exposure based on the exposure to methyl mercury. Therefore, this assessment used the toxicity factors for methyl mercury as recommended (EPA, 1997). Accordingly, the exposure dose of mercury was adjusted to account for the fraction that is methyl mercury in earthworm tissue based on measurements of the fraction methyl mercury in earthworm and invertebrate tissue offered in the literature. Specifically, Zhang et al. (2009) measured methyl and total mercury in tissue of three earthworm species and found that methyl mercury ranged from 3% to 12% of total mercury depending on species. This observation is consistent with the more general observation that the proportion of methyl mercury in macroinvertebrate tissue is about 26% (Beckvar et al., 1996). Therefore, we made the conservative (i.e., ecologically protective) assumption that the fraction of methyl mercury in earthworm tissue is approximately 20% of the measured total mercury (higher than the observed maxima of 12% for earthworms, and well within the range observed for invertebrates in general).

Estimation of COCs in Plants from Sediment or Soil

Sediment to Plant Pathway

The concentrations of COCs in plant tissue were estimated based on: (1) USDOE (1998c) regressions for the estimate of metal uptake in plants; and (2) Travis and Arms (1988) regressions using octanol water partitioning coefficients for organic compounds.

Estimates of Metal Concentrations in Plants

This estimate for metal tissue in plants from soil uptake takes the form (Table B-4):



$\ln(y) = B_0 + B_1 \ln(x)$; where:

y = chemical concentration in plant;

x = chemical concentration in sediment;

B₀ = ln transformed y intercept (empirically derived in USDOE, 1998c); and

B₁ = slope (empirically derived in USDOE, 1998c).

Regressions were not available for barium, beryllium, chromium, cyanide, manganese, and silver. For these metals, plant tissue concentrations were based on Soil-to-Plant uptake values for vegetative or reproductive tissue as appropriate (USDOE, 1999, Biouptake Factors in Savannah report Protocol. Bioaccumulation and Bioconcentration Screening. Environmental Restoration Division. Manual ERD-AG-003. P. 7.4 04/06/1999).

Estimates of Organic Compound Uptake into Plant Material from Soil or Sediment

The bioconcentration factors (BCF) for organic compounds from soil or sediment to plant material were estimated using published regression models (Travis and Arms, 1988) (Table B-4). The recommended equation is:

$\log BCF = 1.588 - 0.578 \log Kow$ where:

BCF = bioconcentration factor of (mg COC/kg dry tissue) / (mg COC/kg dry soil or sediment); and

Kow = octanol water partitioning coefficient.

The Kow values were obtained from the superfund chemical data matrix maintained by EPA (<https://www.epa.gov/superfund/superfund-chemical-data-matrix-scdm>).

Note that Qiuhua et al., 2020 show that the above ground portions of herbaceous plants have an average methyl mercury fraction of 0.008. Therefore, the assessment adjusted the estimated mercury concentration in plants to account for this fraction methyl mercury.

Measured COCs in earthworms from Wetland Soil

Table B-5 provides the measured concentrations of COCs in earthworms for application to assessment endpoints 4b(2) and 4c(2). Figure 3-2 provides the worm composite sampling locations. The table shows the earthworm chemical concentrations by wetland and as an average exposure concentration. Non-detected chemicals were assumed to be one-half the detection limit.

Doses to Higher Order Predators

A Food Chain Model (FCM) was used to estimate an exposure dose for each chemical. The equation used is:



$$\text{ExposureDose(oral)} = \frac{[(\text{Conc food} * \text{IR food}) + (\text{conc sw} * \text{IRsw}) + (\text{RAF} * \text{Concsoil} / \text{sediment} * \text{IRsoil} / \text{sediment})] * a}{fa}$$

Where:

Exposure Dose(oral) = receptor's daily dose of a COC (mg/kg-day);

Conc food = Exposure point concentration of the COC (mg/kg wet) in the food (estimated);

IR food = Daily food ingestion rate normalized to body weight (kg/kg-day) expressed in terms of wet weight/wet weight;

Concsw = Exposure point concentration of the COC in surface water (mg/L) in the relevant exposure zone;

IRsw = Daily incidental ingestion rate of surface water normalized to body weight (kg/kg/day);

RAF = Relative availability factor for COPECs in soil/sediment via incidental ingestion of wetland soil; in this case 100% availability of COCs in soil is assumed (RAF = 1). Note that the assumption of 100% availability maximizes the absorbed dose and thus is conservative (protective of the environment) because this assumption contributes to the likelihood that the assessment will overestimate rather than underestimate risk;

Concsoil/sediment = Exposure point concentration of the COC (mg/kg dry weight) in the relevant exposure zone;

IRsoil/sediment = Daily incidental ingestion rate of soil/sediment normalized to body weight (kg/kg/day) expressed in terms of dry weight/dry weight; and

a/fa = Area of the Site (or region of interest within the Site)/total foraging area of the receptor. Where this ratio is greater than 1, it defaults to 1.

Table C-1 provides the food chain exposure factors by species.

Tables C2-C9 provide the estimated doses for each selected receptor as a total dose and as the fraction contribution to the dose from food, soil/sediment incidental ingestion, and surface water ingestion.



3.3 Toxicity Assessment

This section describes the approach for assessing toxicity to selected receptors from exposure to site related COCs at the concentrations estimated in the ecological exposure assessment. The approach used:

- The sum PAH model to assess the probability of toxicity to sediment dwelling organisms from exposure to site related PAH compounds;
- The PEC Quotient model to assess the probability of toxicity to sediment dwelling organisms from exposure to metals, total PAHs, and DDE;
- The Narcosis Model to evaluate whether nonpolar narcotic COCs present a lethal risk to aquatic invertebrates;
- Direct measurement of sediment toxicity using 42-day *Hyalella azteca* in any wetland sediment habitat predicted to be toxic using measurement endpoints 1a and 1b.
- No Observed Adverse Effect Level (NOAEL) and Lowest Observed Adverse Effect Level (LOAEL) doses of Site related COCs to selected wildlife species ingesting prey, sediment or soil, and surface water in areas of Site wetland sediments and Site forested wetland soils.

The MassDEP guidance specifies that the toxicity factors must: (1) relate to the selected assessment endpoint for the site; and (2) be specific to the receptor species identified during development of the conceptual model. The toxicity factors selected for this assessment are toxic units derived for the sum PAH model, the mean of probable effect concentrations used in the PEC quotient model; or doses (expressed as mass of contaminant per mass body weight per day) of a contaminant associated with an effect on reproduction or growth (or failing those, survival) of the receptor species specified in the conceptual model.

3.3.1 Sum PAH Model

Benthic organisms can biotransform PAHs to metabolites that exert toxic effects. Swartz et al. (1995) developed a concentration-response model that predicts the probability of acute toxicity from additive exposures to thirteen PAHs. The PAHs included in the model are acenaphthene, acenaphthylene, anthracene, fluorene, naphthalene, phenanthrene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, fluoranthene, and pyrene. The model uses a simple, linear regression, based on the relationship between concentrations of PAHs in interstitial water and toxicity to estuarine amphipods in spiked sediment bioassays, to estimate toxic-units of PAHs. Toxic-units, which are equal to the concentration of the PAH in the interstitial water of the sediment divided by the interstitial water 10-day LC50 (LC50_{iw}), are calculated for each PAH. The sum of the toxic units predicts the probability of significant acute toxicity to marine and estuarine amphipods. Significant mortality is defined as 24% greater mean mortality in field collected sediments, as compared to reference sediments. Model verification was a comparison of model predictions to mortality observed in sediment toxicity tests in field-collected samples from thirteen investigations.

The toxicity endpoints are:



The Σ PAH Threshold of Acute Toxicity (Sum of Toxic Units = 0.186, p of >24% mortality = 0.05) is the toxic-unit value below which mixtures of PAHs are unlikely to contribute to sediment toxicity above background;

The Σ PAH 25% Probability of Acute Toxicity (Sum of Toxic Units = 0.34, p of >24% mortality = 0.25) is the toxic-unit value expected to cause acute toxicity in 25% of the cases;

The Σ PAH 50% Probability of Acute Toxicity (Sum of Toxic Units = 0.725, p of >24% mortality = 0.5) is the toxic-unit value expected to cause acute toxicity in 50% of the cases; and

The Σ PAH Level of Acute Toxicity (Sum of Toxic Units = 3.291, p of >24% mortality = 1.0) is the toxic-unit value above which acute toxicity is always expected to occur.

3.3.2 PEC Quotient Model

Ingersoll et al. (2000) discusses the ability of consensus-based freshwater sediment quality guidelines to predict sediment toxicity (primarily survival and growth). The consensus-based probable effects concentrations (PECs) are concentrations of individual chemicals above which adverse effects are expected to occur frequently. The investigation (Ingersoll et al., 2000) demonstrated the usefulness of PEC quotients for predicting toxicity, and specifically the utility of mean PEC quotients for major classes of compounds (e.g., metals). The major classes of compounds addressed in the model are metals, total PAHs, and Total PCBs or sum of DDE. The application of this model used Site COCs for sediment (metals, total PAHs as the sum of site related PAH compounds, and DDE) as measured in the Site wetland sediments. Table 3-2 shows the probabilities of sediment toxicity associated with a range of PEC Quotients (0.1 to >5) in the Ingersoll model.

Table 3-2. The incidence of sediment toxicity associated with various ranges of PEC Quotients (0.1 to >5) in the Ingersoll model based on three types of toxicity tests.

Incidence of toxicity based on mean metals, total PAH, and DDE PEC quotients						
Test	<0.1	0.1 - <0.5	0.5 - <1.0	1.0 - <5.0	>1.0	>5.0
<i>H. azteca</i> 10- to 14-d	20%	16%	36%	52%	57%	67%
<i>H. azteca</i> 28- to 42-d	8%	11%	57%	-	91%	-
<i>Chironomus</i> 10- to 14d	20%	19%	33%	44%	51%	64%

MassDEP recommends the chronic sediment toxicity test for *Hyalella* (28-to-42-day test). Therefore, this assessment used the *H. azteca* 28-to-42-day probabilities for mean PEC quotients based on COC metals, COC total PAHs, and COC DDE.

We estimated the incidence of toxicity in sediment by:



- Calculating the PEC Quotients based on the maximum concentrations of COCs measured in each wetland;
- Assuming that the probability of toxicity was unlikely at less than or equal to 11% incidence; and
- Re-calculated the mean PECs on a station-by-station basis if the maximum PEC quotient yielded a probability of greater than 11%.

3.3.3 Application of the Narcosis Model

The definition of narcosis due to organic contaminants in aquatic organisms is a nonspecific reversible disturbance in the function of the cell membrane caused by the accumulation of contaminants in the hydrophobic phases of the organism (Van Wezel and Opperhuizen, 1995). Experimental work demonstrated that the Critical Body Residue for the acute lethal effect of nonpolar narcotic chemicals is fairly constant at 2 to 8 mmol chemical/kg wet weight tissue (McCarty and MacKay, 1993). In addition, we assumed that a concentration of 0.2 to 0.8 mmol chemical/kg wet weight is protective of chronic effects. We did not apply the model to individual benthic invertebrate, but rather to the maximally exposed benthic invertebrate using the molar concentrations from the maximum benthic invertebrate concentrations.

3.3.4 Sediment Toxicity Testing

The PEC Quotient model (see Section 3.4.1) predicted potential sediment toxicity. Therefore, WHG collected sediment samples for toxicity testing (Figure 3-2).

Using a combination of trowels and Ekman grab, the toxicity test sampling proceeded by:

- Sampling approximately 5 liters of sediment from the top six inches at each station;
- Compositing and thoroughly mixing the sediment samples in the field;
- Holding all samples on ice for transport to the laboratories.

Aquatec Biological Sciences (Aquatec) conducted standard 42-day *Hyalella azteca* chronic sediment toxicity tests (EPA/600/R-99/064). Appendix D provides the toxicity test methods and results.

3.3.5 Food Chain Models

The daily exposure dose calculated in the previous section is evaluated by comparison to a toxicity reference value, in this case a reference dietary dose. The comparison is the ratio of the dose to the analogous toxicity factor expressed as:

HQ=Dietary Dose/TRV where:

HQ = hazard quotient;

Dietary Dose = the calculated dietary dose from the FCM; and

Toxicity Reference Value = the selected TRV appropriate for the chemical and receptor.



TRVs for Dietary Doses to Birds and Mammals: We selected TRVs as No Observed Adverse Effect Levels (NOAEL) and Lowest Observed Adverse Effect Levels (LOAEL) from the scientific literature to evaluate the doses obtained from food chain models.

The TRVs include chronic NOAELs and LOAELs for the avian and mammalian species derived from laboratory studies and reported in the literature. The NOAEL is the highest dose of a particular chemical at which no adverse effects are observed in the test species. The LOAEL is the lowest dose of a particular chemical at which adverse effects are observed in the test species. The NOAELs and LOAELs are daily doses of chemicals expressed in mg/kg/d.

Data Sources: The preferred source for TRVs for birds and mammals in this assessment was Sample et al. (1996).

We obtained TRVs from studies that met the following criteria:

- Close taxonomic relationship between the test species and the receptor species;
- Ecologically relevant endpoints – Endpoints, such as reproduction, development, growth, and mortality, were chosen because they can lead to population-level effects;
- Appropriate exposure duration – chronic studies longer than 70 days for birds and 1 year for mammals or for shorter periods during critical life stages; and
- Appropriate exposure route – Studies in which the test species received the chemical dose by diet were preferred to those in which the test species received an oral capsule or by gavage.

If only subchronic studies were available for selecting chronic TRVs, an Acute to Chronic Ratio of 10 (Sample et al., 1996) was applied. If the authors of a selected study provided only a LOAEL, then the LOAEL was divided by a factor of 10 to estimate a NOAEL.

USEPA no longer recommends allometric scaling of the TRVs, based on the work of Allard et al. (2010). Therefore, we compare all calculated wildlife doses directly to the selected TRV without interspecies body weight adjustments.

For the FCM measurement endpoints, we assume the following conclusions, based on MCP Guidance (MassDEP, 1996 Section 9.5 9):

HQ $\geq$ 1 for LOAEL-Based TRV indicates evidence of harm.

HQ < 1 for LOAEL-Based TRV and HQ > 1 for the NOAEL-Based TRV indicates that no conclusion may be reached on this method alone and that additional efforts are necessary to determine if there is harm to the environment.

HQ < 1 for LOAEL-Based TRV and NOAEL-Based TRV indicates no evidence of harm.



Tables C-10 (avian) and C-11 (mammalian) provide the NOAELs and LOAELs dietary doses for each COC for which there is sufficient data to estimate these endpoints.

3.3.6 ECOTOX Screening Values for Amphibians

EPA provides ECOTOX which is a comprehensive database of chemical toxicity data for terrestrial and aquatic species³. The following search criteria were used to identify screen values by which to evaluate whether there may be the potential for harm from amphibian exposures to COCs in surface waters:

Measured test concentrations selected over unmeasured;

Preferred test endpoints: mortality or reproduction (few repro studies);

Species: Amphibian (generally - not region or species specific because minimal data);

Prefer NOEL and LOEL but if neither available then select LC50;

Any formulation available (so little data); and,

Used Average Concentration and Average of those for the screening value).

3.4 Risk Characterization

3.4.1 Risks to Sediment Invertebrates through Direct Contact with Sediments

Assessment Endpoint 1: The health of the invertebrate community in Beaver Brook and wetland sediments.

Measurement Endpoint 1a: Application of the sum PAH model to assess potential risk from PAH concentrations.

The sum PAH model (Table 3-3) was run on a sitewide basis using the maximum and mean concentrations of PAH compounds, as well as on a station-by-station basis for wetland sediment. The results of the sum PAH model for estimating the probability of toxicity from PAH exposure indicates that there is low likelihood of acute toxicity from exposure to PAH compounds in Site sediments.

These results indicate that there is no significant risk of harm to sediment invertebrates from exposure to PAH compounds based on the model's cutoff that defines potential toxicity.

Measurement Endpoint 1b: Application of the PEC Quotient toxicity model to assess the probability of toxicity from exposure to Site related COCs.

The PEC Quotient model (Table 3-4) was initially run on a sitewide basis using the maximum concentrations of COCs. This indicated a high potential incidence of sediment toxicity, so the PEC

³ <https://cfpub.epa.gov/ecotox/>



Quotient was calculated on a station-by-station basis. Our analysis focused on the toxicity values for the *Hyalella Azteca* 28–42-day test because chronic tests are generally preferred by MassDEP. The results of the PEC Quotient model for estimating the probability of toxicity from COC exposure predicts a potential high incidence of toxicity for a number of sediment stations, while the incidence of toxicity is predicted to be lower at other stations.

91% Incidence of Sediment Toxicity	SED-1, SED-2, SED-3, SED-6, SED-8, SED-11, SED-12, SED-PHI-2, TOX-1, TOX-2
57% Incidence of Sediment Toxicity	SED-4, SED-5, SED-7, SED-10, SED-PHI-3, SED-PHI-4, SED-PHI-6, SED-PHI-7, TOX-4,
11% Incidence of Sediment Toxicity	SED-9, SED-PHI-1, SED-PHI-5, DUP-1, SED-PHI-8, SED-PHI-9, SED-PHI-10, TOX-3, TOX-3DUP, TOX-5, TOX-6

Because the PEC Model indicated potential risk to invertebrates in sediment, an additional study was completed to provide more data to consider risk to invertebrates. To evaluate the potential toxicity more directly, chronic toxicity tests (*H. Azteca* 42-Day – Survival, Growth and Reproduction Tests) were completed on Site sediments.

Measurement Endpoint 1c: Application of the Narcosis Model to evaluate whether nonpolar narcotic COCs present an acute lethal risk to aquatic invertebrates.

The Narcosis Model evaluated whether there is evidence of harm to bivalves based on comparison of modeled mussel tissue concentrations compared to the narcosis toxicity values for PAHs and dioxins. There is no evidence of harm for this exposure route for dioxin and PAHs (Table 3-5).

*Measurement Endpoint 1d: Direct measurement of sediment toxicity using a 42-day *Hyalella azteca* test in any wetland sediment habitat predicted to be toxic using measurement endpoints 1a and 1b.*

A review of the toxicity test results indicates that there is potential sediment toxicity at the Site (Table 3-6) (Figure 3-2). One station (TOX-1) had significantly reduced survival compared to the laboratory control sample as well as the upgradient station, TOX-6⁴. Although the toxicity tests do not reveal the risk driver directly, this sample had elevated PAH concentrations compared to the other test stations. Additionally, TOX-4 had percent survival that was significantly less than the survival in the upgradient sample (TOX-6). This sample also showed reduced growth, biomass and reproduction compared to the laboratory control and TOX-6. Compared to the other testing stations, the metal concentrations were elevated. Also of note, at the conclusion of the test, CTRL, TOX-1, TOX-2, TOX-3 showed significantly lower growth and reproduction compared to TOX-6.

⁴ Located upstream of the landfill and considered to be outside of the influence of the landfill



The chronic toxicity tests provide evidence that sediments are potentially toxic to invertebrate species at two locations (Figure 3-2).

Assessment Endpoint 1 Summary

The results of the screening models and the toxicity testing using wetland sediment demonstrate that we cannot reach a conclusion of no significant risk of harm to invertebrate from exposures to wetland and Brook sediments.

3.4.2 Risks to Wildlife

Risks to wildlife were estimated based on a comparison of calculated doses to No Observed and Lowest Observed Adverse Effect Levels (NOAEL and LOAEL). MassDEP guidance indicates that: if the exposure dose is equal to or greater than the LOAEL, there is a significant risk of harm; if the exposure dose is equal to or less than the NOAEL, there is no significant risk of harm; and, if the exposure dose falls between the NOAEL and the LOAEL one cannot come to a conclusion of no significant risk and that more information is needed to reach that conclusion.

The doses were estimated as the mean of sediment or soil concentrations (and resulting tissue concentrations from the prey item bioaccumulation modeling) Appendix C provides the results of the Wildlife Exposure and Risk Models. It shows the NOAEL and LOAEL Hazard Quotient (HQ) where the HQ is equal to the estimated dose to wildlife divided by the effect level (NOAEL or LOAEL) and the effect doses (NOAEL and LOAEL).

Assessment Endpoint 2: The health of wildlife populations feeding on plants (largely phragmites) in Beaver Brook and wetland sediments.

Measurement Endpoint 2a: Doses of COCs to muskrats feeding on plants, ingesting sediment, and ingesting surface water in the Phragmites and Typha stands;

Table C-2 and the summary below show that there is no significant risk of harm to muskrats exposed to COCs in wetland sediments.

Muskrat				
CTE		COCs	Risk Conclusion	Confidence
NOAEL	LOAEL			
HQ ≤1	HQ <1	All COCs	No evidence of harm	High
HQ >1	HQ <1	None	Potential harm	Low
HQ > 1	HQ ≥1	None	Evidence of potential harm	Moderate

Measurement Endpoint 2b: Doses of COCs to Canada geese feeding on plants, ingesting sediment, and ingesting surface water in the Phragmites and Typha stands;



Table C-3 and the summary below show that there is no significant risk of harm to Canada geese exposed to COCs in wetland sediments.

Canada Goose				
CTE		COCs	Risk Conclusion	Confidence
NOAEL	LOAEL			
HQ $\leq$ 1	HQ < 1	All COCs	No evidence of harm	High
HQ > 1	HQ < 1	None	Potential harm	Low
HQ > 1	HQ $\geq$ 1	None	Evidence of potential harm	Moderate

Assessment Endpoint 3: The health of wildlife populations feeding in Beaver Brook and wetland sediments.

The associated measurement endpoints include:

Measurement Endpoint 3: Doses of COCs to raccoons feeding on invertebrates (freshwater bivalves), ingesting sediment, and ingesting surface water in areas of wetland sediments;

Table C-4 shows that there is no significant risk of harm to raccoons exposed to COCs in wetland sediments.

Raccoon				
CTE		COCs	Risk Conclusion	Confidence
NOAEL	LOAEL			
HQ $\leq$ 1	HQ < 1	All COCs	No evidence of harm	High
HQ > 1	HQ < 1	None	Potential harm	Low
HQ > 1	HQ $\geq$ 1	None	Evidence of potential harm	Moderate

Assessment Endpoint 4: The health of wildlife populations feeding in the forested wetland areas.

Measurement Endpoint 4a: Doses of COCs to robins feeding on plants (seeds and fruiting bodies), soil, and surface water in the forested wetland;

Table C-5 shows that there is the potential for harm to the robin consuming plants in wetland soils from lead and zinc. While MassDEP indicates that when an exposure dose exceeds the NOAEL but not the LOAEL, there is insufficient information to reach a conclusion of no significant risk. In this case, earthworms are considered the more predominant diet item for



robins. Therefore, the additional information collected includes earthworm tissue sampled from the Site.

Robin-Plant				
CTE		COCs	Risk Conclusion	Confidence
NOAEL	LOAEL			
HQ $\leq$ 1	HQ < 1	All Remaining COCs	No evidence of harm	High
HQ > 1	HQ < 1	Lead, Zinc	Potential harm	Low
HQ > 1	HQ $\geq$ 1	None	Evidence of potential harm	Moderate

Measurement Endpoint 4b(1): Doses of COCs to robins feeding on soil invertebrates (based on estimated earthworm concentrations), soil, and surface water in the forested wetlands;

Table C-6 shows that one cannot conclude no significant risk of harm to songbirds from exposure to COCs due to exposure to soils and earthworms (modeled tissue concentrations). Cadmium, chromium, mercury, and zinc exposures in earthworms exceed NOAEL, but not LOAEL reference doses, while the lead exposure dose exceeds the LOAEL reference dose as well.

The MassDEP guidance explicitly states that when the Hazard Quotient exceeds one for the NOAEL but is less than one for the LOAEL, there is insufficient information to reach a conclusion of no significant risk and additional site-specific information is required. Measurement endpoint 4b(2) provides that additional information.

Robin – Modeled Worm				
CTE		COCs	Risk Conclusion	Confidence
NOAEL	LOAEL			
HQ $\leq$ 1	HQ < 1	All Remaining COCs	No evidence of harm	High
HQ > 1	HQ < 1	Cadmium, Chromium (total), Mercury, Zinc	Potential harm	Low
HQ > 1	HQ $\geq$ 1	Lead	Evidence of potential harm	Moderate

Measurement Endpoint 4b(2): Doses of COCs to robins feeding on soil invertebrates (based on measured earthworm concentrations), and ingesting soil in the forested wetlands and surface water site surface water bodies.

This measurement endpoint provides additional site-specific information (measured earthworm concentrations) for refining the estimates of dose and risk of harm to songbirds



feeding on soil invertebrates. As indicated by Measurement Endpoint 4b(1), exposures in Wetland Soils present uncertain risks to songbirds because the estimated dose is between the NOAEL dose and the LOAEL dose for a subset of COCs; though there is evidence of potential harm due to lead exposures exceeding both the NOAEL and LOAEL. In both cases, direct measurement of earthworm tissue concentrations will provide a more direct assessment of site-specific exposures.

In such cases, MassDEP (MassDEP, 1997) notes that:

“It is likely that there is no risk of harm” but MassDEP guidance explicitly states that “The level of uncertainty...depends in part upon whether exposures were measured directly or estimated from environmental concentrations.”

The specific performance standard stated by MassDEP is “When the site dose exceeds the LOAEL and the LOAEL-based hazard quotient is greater than one, it is reasonable to conclude that the quotient evaluation method provides evidence of harm.”

Assessment Endpoint 4b(2) addresses the question,

How certain are we that the songbird exposures result in LOAEL hazard quotients that do not exceed 1 and so meet the MassDEP guidance for a condition of no significant risk?

We addressed this uncertainty by:

- Following MassDEP recommendations to use measured exposures, in this case measured concentrations of site related contaminants in earthworm.
- Obtaining composited earthworm samples from three locations (we looked for earthworms in 6 locations, but only found sufficient tissue mass in three locations. These locations are distributed around the entire site however (Figure 3-2)
- Re-running the songbird food chain models substituting the average of the three measured concentrations of each site related contaminant in earthworm tissue.
- Calculating the LOAEL hazard quotients using the doses from the food chain model.

Table C-7 shows the results of these calculation. The results show that chromium, mercury and zinc do not exceed the LOAEL dose (and the measured dose of cadmium no longer exceeds the NOAEL). Therefore, based on this additional information, there is no significant risk of harm to songbirds exposed to site these COCs in wetland soils. However, we cannot conclude that a condition of no significant risk for the robin exposed to lead in earthworms; there is evidence of potential harm due to lead in the robin diet.



Robin – Measured Worm				
CTE		COCs	Risk Conclusion	Confidence
NOAEL	LOAEL			
HQ ≤1	HQ <1	All Remaining COCs	No evidence of harm	High
HQ >1	HQ <1	Chromium (total), Mercury, Zinc	Potential harm	Low
HQ > 1	HQ ≥1	Lead	Evidence of potential harm	Moderate

Measurement Endpoint 4c(1): Doses of COCs to shrews feeding on soil invertebrates (based on estimated earthworm concentrations), soil, and surface water in the forested wetlands;

Table C-8 shows that one cannot conclude no significant risk of harm to the shrew from exposure to COCs due to exposure to soils and earthworms (modeled tissue concentrations). Cadmium and lead exposures in earthworms exceed NOAELs, but not LOAELs based reference doses.

The MassDEP guidance explicitly states that when the Hazard Quotient exceeds one for the NOAEL but is less than one for the LOAEL, there is insufficient information to reach a conclusion of no significant risk and additional site-specific information is required. Measurement endpoint 4c(2) provides that additional information.

Shrew – Modeled Worm				
CTE		COCs	Risk Conclusion	Confidence
NOAEL	LOAEL			
HQ ≤1	HQ <1	All Remaining COCs	No evidence of harm	High
HQ >1	HQ <1	Cadmium, Lead	Potential harm	Low
HQ > 1	HQ ≥1	None	Evidence of potential harm	Moderate

The dose of selenium also exceeds the NOAEL reference dose. However, due a review of toxicological literature, it is clear that selenium does not present a risk of harm to mammals. This is discussed in detail in the next Section.

Measurement Endpoint 4c(2): Doses of COCs to shrews feeding on soil invertebrates (based on measured earthworm concentrations), soil, and surface water in the forested wetlands;

This measurement endpoint provides additional site-specific information (measured earthworm concentrations) for refining the estimates of dose and risk of harm to shrews feeding on soil invertebrates. As indicated by Measurement Endpoint 4c(1), exposures in Wetland Soils present uncertain risks to shrews because the estimated dose is between the



NOAEL dose and the LOAEL dose for a subset of COCs. Direct measurement of earthworm tissue concentrations will provide a more direct assessment of site-specific exposures.

In such cases, MassDEP (MassDEP, 1997) notes that:

“It is likely that there is no risk of harm” but DEP guidance explicitly states that “The level of uncertainty...depends in part upon whether exposures were measured directly or estimated from environmental concentrations.”

The specific performance standard stated by MassDEP is “When the site dose exceeds the LOAEL and the LOAEL-based hazard quotient is greater than one, it is reasonable to conclude that the quotient evaluation method provides evidence of harm.”

Assessment Endpoint 4c(2) addresses the question,

How certain are we that the songbird exposures result in LOAEL hazard quotients that do not exceed 1 and so meet the MassDEP guidance for a condition of no significant risk?

We addressed this uncertainty by:

- Following MassDEP recommendations to use measured exposures, in this case measured concentrations of site related contaminants in earthworm.
- Obtaining composited earthworm samples from three locations (we looked for earthworms in 6 locations, but only found sufficient tissue mass in three locations. These locations are distributed around the entire site however (Figure 3-2)
- Re-running the shrew food chain models substituting the average of the three measured concentrations of each site related contaminant in earthworm tissue.
- Calculating the LOAEL hazard quotients using the doses from the food chain model.

Table C-9 shows the results of these calculation. The results show that lead does not exceed the LOAEL dose (and the measured dose of cadmium no longer exceeds the NOAEL). Also of note, the exposure dose of antimony in measured earthworm tissue exceeds the NOAEL, but not the LOAEL. In contrast the modeled dose of antimony did not the NOAEL or the LOAEL. In this case, the dose based on the measured concentration provides higher confidence the dose does not exceed the LOAEL reference dose. Therefore, based on this additional information, there is no significant risk of harm to shrew exposed to Site COCs in wetland soils.

Shrew – Measured Worm				
CTE		COCs	Risk Conclusion	Confidence
NOAEL	LOAEL			
HQ ≤1	HQ <1	All Remaining COCs	No evidence of harm	High
HQ >1	HQ <1	Antimony, Lead	Potential harm	Low
HQ > 1	HQ ≥1	None	Evidence of potential harm	Moderate



Tables C-8 and C-9 shows that there is potential harm (modeled earthworm tissue) or evidence of potential harm (measured earthworm tissue) to shrews from exposure to selenium through ingestion. However, the evidence of harm to small mammals from selenium exposure based on the results of the food chain model is unlikely to rise to a potential ecological risk because various field studies indicate that measured selenium exposures do not result in adverse effects to mammal populations. A SETAC (Society of Environmental Toxicology and Chemistry) review of selenium exposure (based on elevated tissue concentrations in mammals) noted that “Regarding sensitivity of mammals, none of the documented incidences of elevated Se concentrations in tissues indicated any negative impacts on the organisms (Janz et al., 2010).

Several small mammal studies conducted at the selenium contaminated site, Kesterson Reservoir, support this conclusion. No Se-associated effects have been observed in small mammals monitored at Kesterson (e.g. CH2M HILL 2000; Clark 1987; Clark et al. 1989), where small mammals are exposed to dietary Se ranging from 0.10 to 90 ug/g. Specifically:

Clark (1987) conducted a comparative field study between populations of the California Vole at a reference area and the Kesterson Reservoir, a selenium contaminated habitat. The study included observation of population parameters (Sex ratios, condition, organ weights, and reproductive status) and body burdens of selenium. Despite higher body burdens of selenium in Kesterton Reservoir voles, the author concludes that no adverse impacts of selenium on wild mammals was demonstrated.

In a raccoon study (Clark et al. 1989), body condition, blood parameters, histopathology and evidence of pregnancy were investigated in the animals. No effects were noted and one pregnant female from Kesterson was trapped.

Ohlendorf et al. (1989 as cited in Beaty and Russo, 2014) found that of the wildlife species evaluated at Kesterson Reservoir, 195 aquatic birds had the most frequent and extreme signs of Se toxicity, while small mammals showed almost none.

Subsequent field studies on small mammals in this selenium contaminated area suggest high reproductive rates among small mammals exposed to selenium, and that “there is no evidence to indicate that small mammal populations (particularly shrews and voles) are adversely affected by selenium...” (CH2M HILL, 2000).

Santolo (2009) was unable to demonstrate specific effects on small mammals exposed to selenium at Kesterton Reservoir. He noted that a condition index (defined as ratio of body weight to body length) was lower for several species of small mammals at Kesterton Reservoir and the percentage of animals in reproductive condition was lower (for some species of small mammals but not all) relative to a non-contaminated reference area. However, the author recognizes that the observations are subtle and may be due to environmental effects.

In Canada, the Elk Valley Selenium Task force (which is studying the effects of selenium releases in the valley due to coal mining) has found no effects on large mammal



populations (ungulates) and note that the Kesterson Reservoir studies conclude that “... it is highly unlikely that mammals are presently at risk from selenium poisoning” (Elk Valley Selenium Task Force, 2005).

It is our opinion that there is no ecological risk to small mammal populations from selenium exposures at the Site based on the literature review of field exposures.

Assessment Endpoint 5: Health of Amphibians exposed to Site Surface Water

5a. Comparison of Site surface water concentrations to effects values from the literature.

Although it is unclear from the maps whether the State NHESP mapping of PH overlaps with the Site, amphibians are potentially exposed to Site COCs through their skin in surface water. Table A-1 indicates that iron concentrations exceed the selected ECOTOX screening values indicating the potential for effects.

3.4.3 Risk Summary

The analysis of these exposures indicated that:

Direct Contact Pathway

The results of the screening models and the toxicity testing using wetland sediment demonstrate that we cannot reach a conclusion of no significant risk of harm to invertebrate from exposures to wetland and Brook sediments.

Dietary Exposures in wetland and Brook Sediment

There is no significant risk of harm to receptors from exposure to COCs in the wetland and Brook sediment.

Dietary Exposures to Wetland Soil

There is potential harm to songbirds consuming plants in wetland soil due to lead and zinc.

We cannot conclude a condition of no significant risk to songbirds consuming earthworms; there is evidence of potential harm due to lead in the measured earthworm tissue.

There is no significant risk to small mammals from exposure to COCs through ingestion of earthworms in wetland soils.

Amphibian Exposures

We cannot conclude that there is no risk to amphibians due to exposure to iron in surface waters. In addition, there is readily apparent harm due NRWQC exceedances for lead and iron in surface water.



3.5 Uncertainties

This section provides a brief summary of potential sources of uncertainty in the Stage II ERC.

The uncertainties in this Stage II ERC are largely in the estimation of COCs in tissue, but uncertainties also exist in the food chain models and effects assessment.

Uncertainty in Wetland Soil, Sediment and Surface Water Data

As with any large Site with a history of landfill activities, there is uncertainty about the characterization of Site media. The collection of these current data was informed by a knowledge of site history assuring that data gaps were minimized. Applying multiple lines of evidence also increase confidence in the final risk estimates.

Uncertainty in Sum-PAH and PEC Quotient Models

The sum PAH model, PEC Quotient model and Narcosis Model are reasonably conservative models and have been subject to peer-reviewed, published approaches. The assessment used maximum exposure concentrations in the model to assure that model predictions are likely to be conservative. When toxicity was predicted by the models, chronic toxicity tests were added and provided a directly measured line of evidence to evaluate this exposure.

Uncertainty in Modeling of Tissue

There is inherent uncertainty in the estimation of COC body burdens of prey items (plants, fish, and invertebrates) since these biological media were not collected at the Site. No one literature source provides a comprehensive set of equations for estimating tissue concentrations from sediment concentrations. Therefore, we used multiple studies and reliable/proven compilations/databases to model tissue for all the COCs.

There is additional uncertainty in the estimation of invertebrate tissue body burdens from sediment concentrations. We relied on literature and databases that follow clear and defensible quality control procedures. The literature does not provide a direct model for the estimation of metals in invertebrate tissue, therefore we modeled COCs in invertebrate tissue (sediment to invertebrate).

When the models predicted potential risk for some COCs, direct measures of earthworm tissue concentrations were used to reduce the uncertainty. Laboratory bioaccumulation tests were selected because there is more control over the process and the field teams were already in the field collecting samples for toxicity testing. However, the samples exceeded the ideal moisture content for the bioaccumulation tests and, as a result, the tests were stopped and abandoned. Because of the challenge of working at the boundary between sediment and soil in wetlands and variability in moisture levels spatially and temporally, the Team decided to search directly for earthworms. While earthworms represent a category of prey item – the soil invertebrate, it is possible that they would not be found in Site wetland soils due to water content. The Team visited six stations (aligned with previous wetland soil collections) and found sufficient worm tissue at three of those stations. These stations were sufficiently distributed around the Site to provide data



for the food chain models. It should be noted that we did not find earthworms at all locations likely due in part to the moisture content. The measured data were used to update the food chain models for the respective COCs.

Uncertainty in Food Chain Models

There are inherent uncertainties in the use of the food chain model because the model incorporates simplifying assumptions to represent a complex ecological system. For example, food chain models assume that chemicals in food and incidentally ingested sediment are completely available to the receptor. This may overestimate risk depending on the fraction of the ingested dose that is available.

The actual diets of the species examined in the food chain models include a larger diversity of food types than are represented by this risk characterization data. This assessment assumes that exposure from consumption of particular prey types can be estimated on the basis of concentrations in particular food items that are representative of the prey type. In this assessment, we assumed a 100% invertebrate or plant diet depending on the receptor.

There is also uncertainty in the ingestion rates of wildlife. However, studies were used that present conservative estimates of quantity of food and sediment in each species diet (EPA, 1993) to reduce the likelihood of underestimating risk. In this assessment, there is further uncertainty about the proportion of soil in diets, as well as the proportion of sediment and soil in the diets of other receptors. The lack of Toxicity Reference Values (TRV) for many individual COCs does not allow an estimate of potential adverse exposure for all COCs. This may result in an underestimation of risk.



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FIGURES

Figure 2-1. Site Map
Concord Avenue Landfill
Belmont, MA

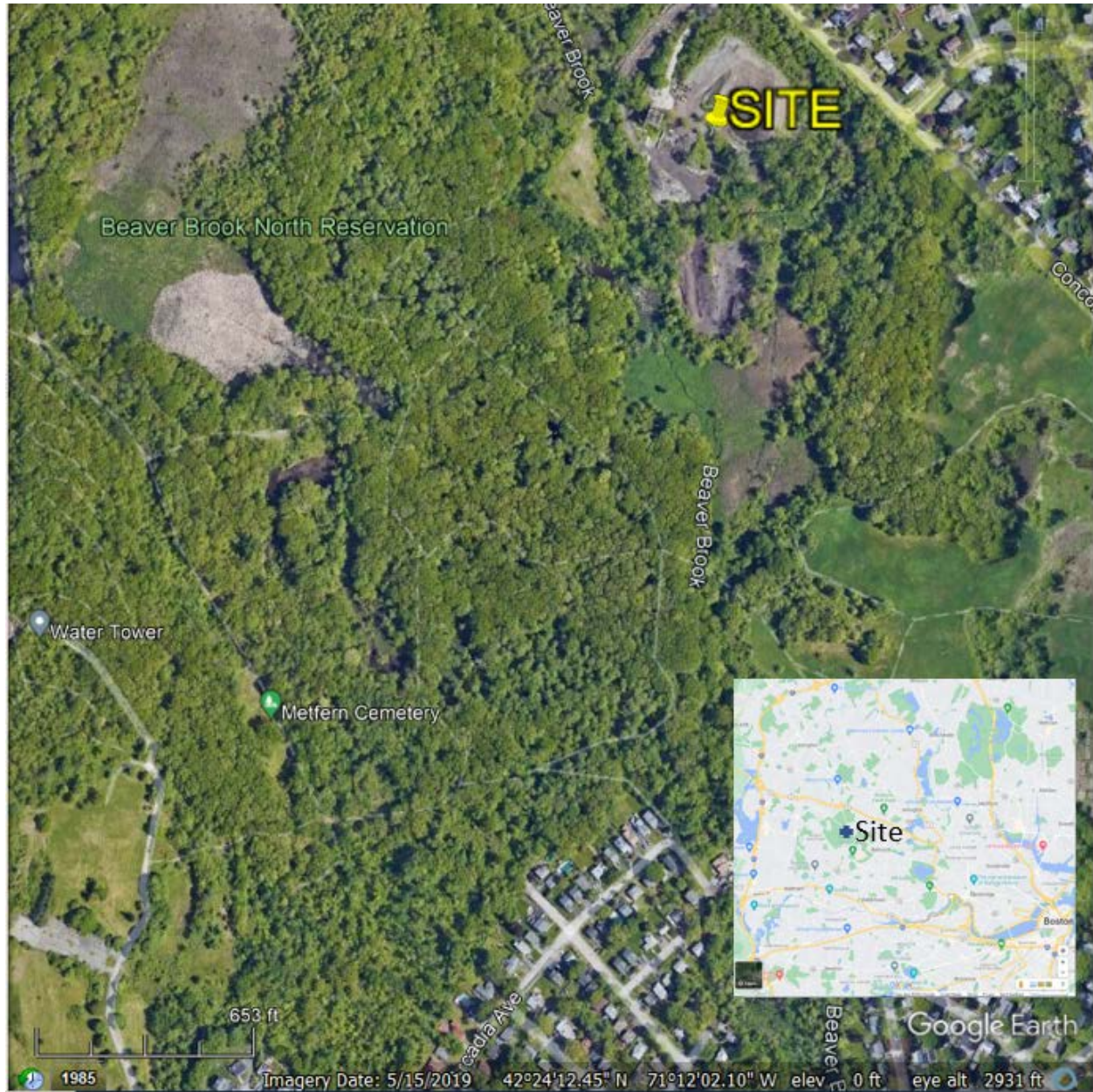


Figure 2-2. Floc Observations – Time Series
Concord Avenue Landfill
Belmont, MA

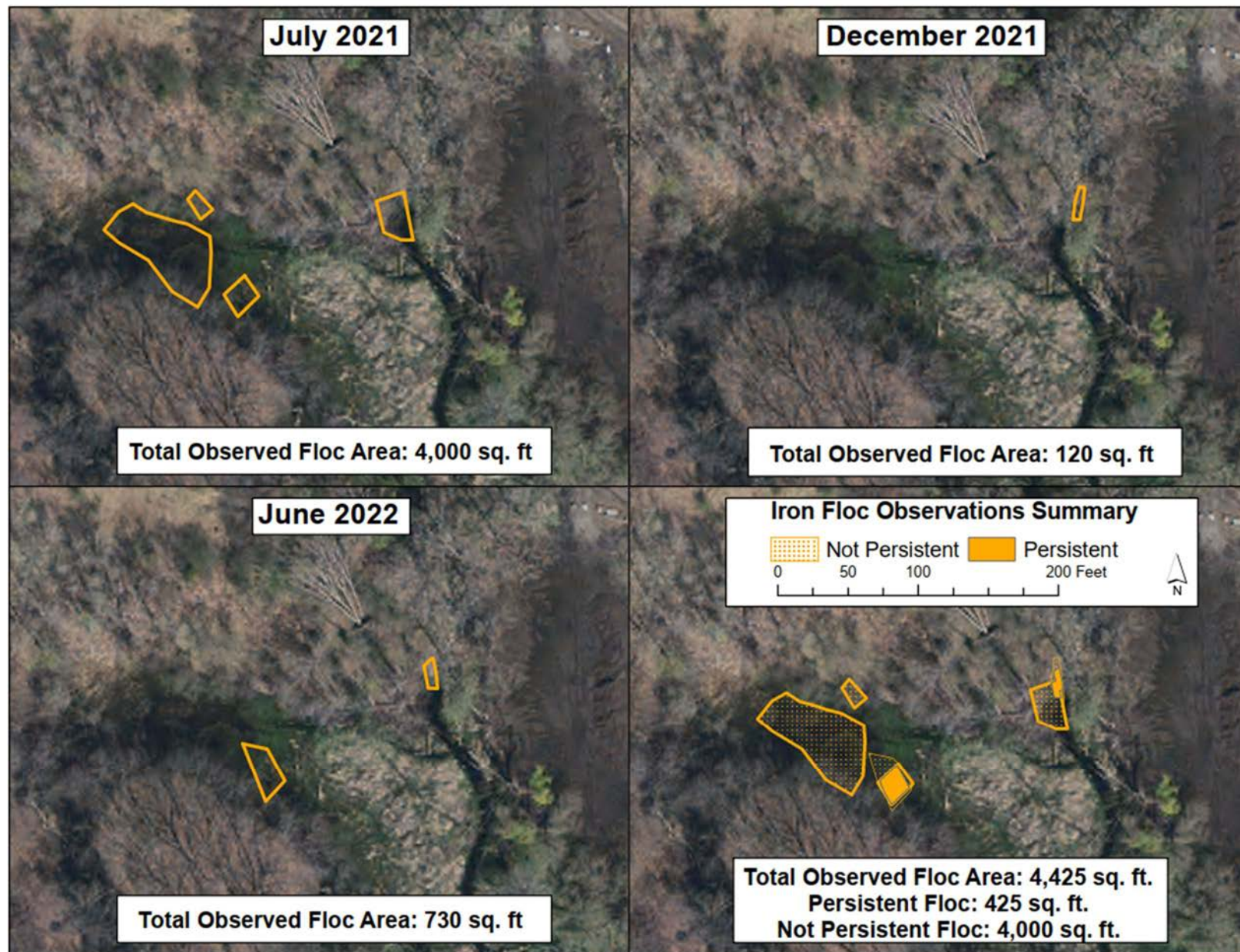


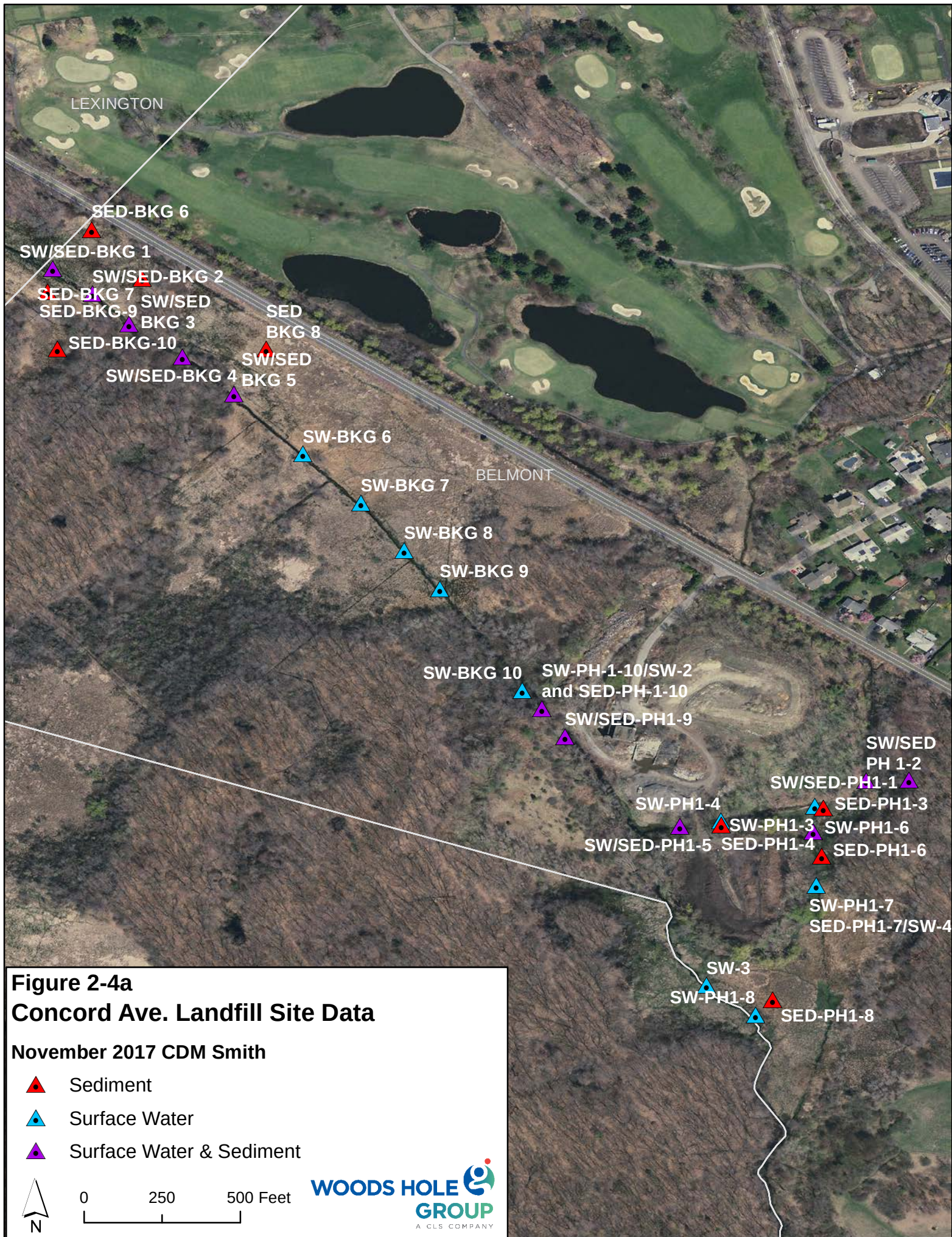
Figure 2-3. Floc Photographs
Concord Avenue
LandfillBelmont, MA

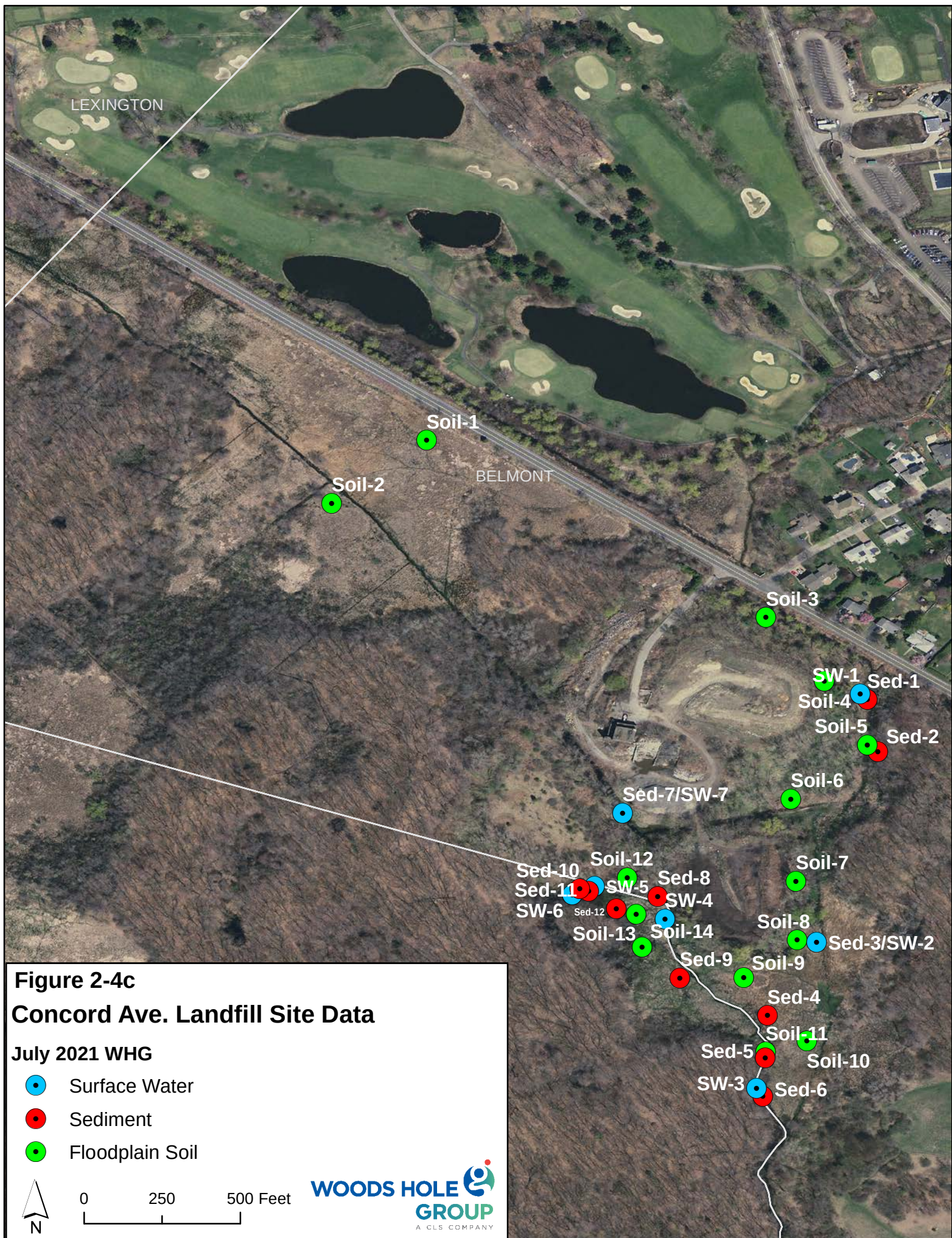
July 2021



June 2022







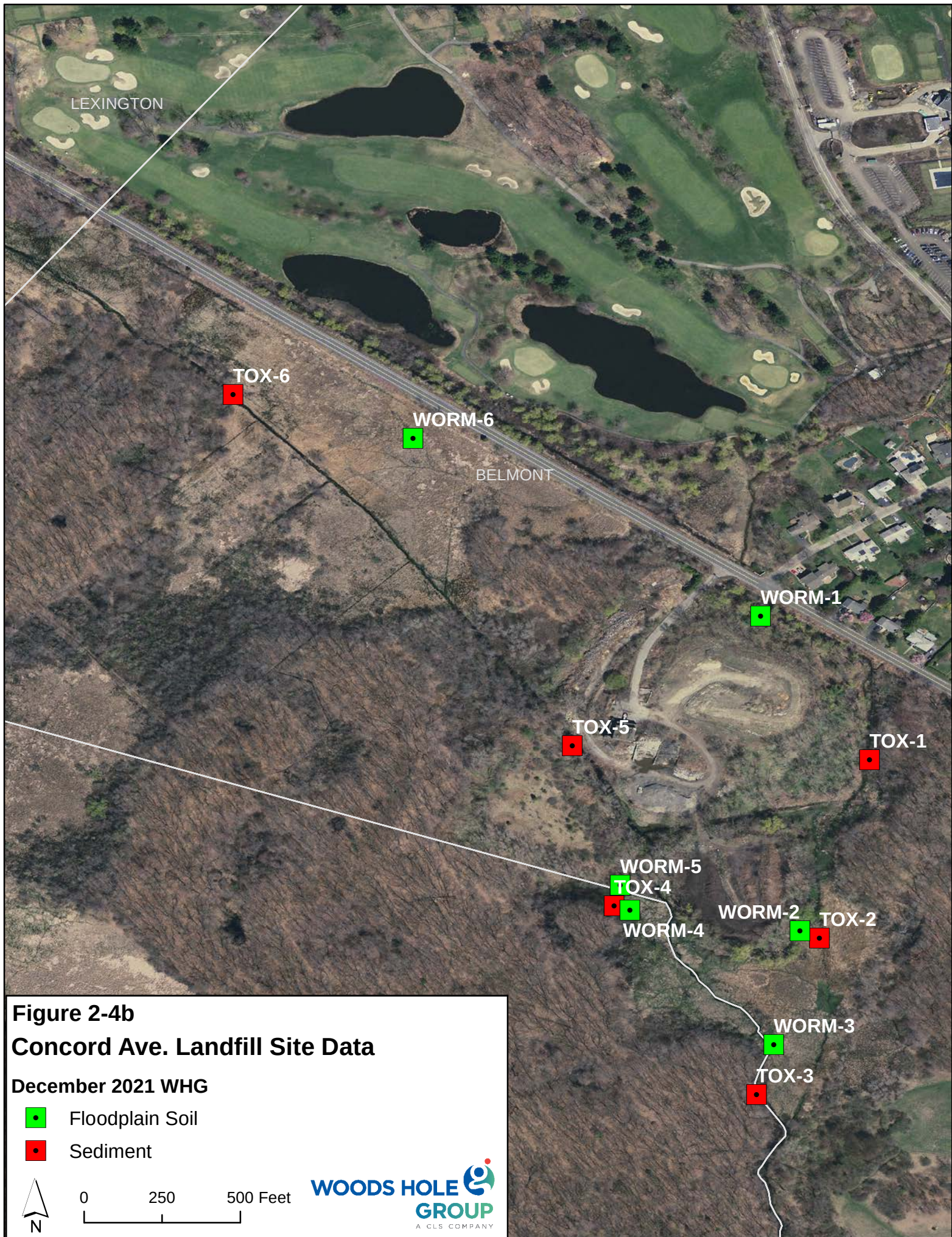




Figure 2-4d

Concord Ave. Landfill Site Data

December 2021 WHG

- Floodplain Soil
- Sediment

July 2021 WHG

- Surface Water
- Sediment

November 2017 CDM Smith

- ▲ Sediment
- ▲ Surface Water
- ▲ Surface Water & Sediment

Legend

- Floodplain Soil

0

250

500 Feet



Figure 2-5a. Map of NHESP Priority Habitat for Rare Species near Site. (SOURCE: NHESP MassMapper, Accessed 7/28/2022)

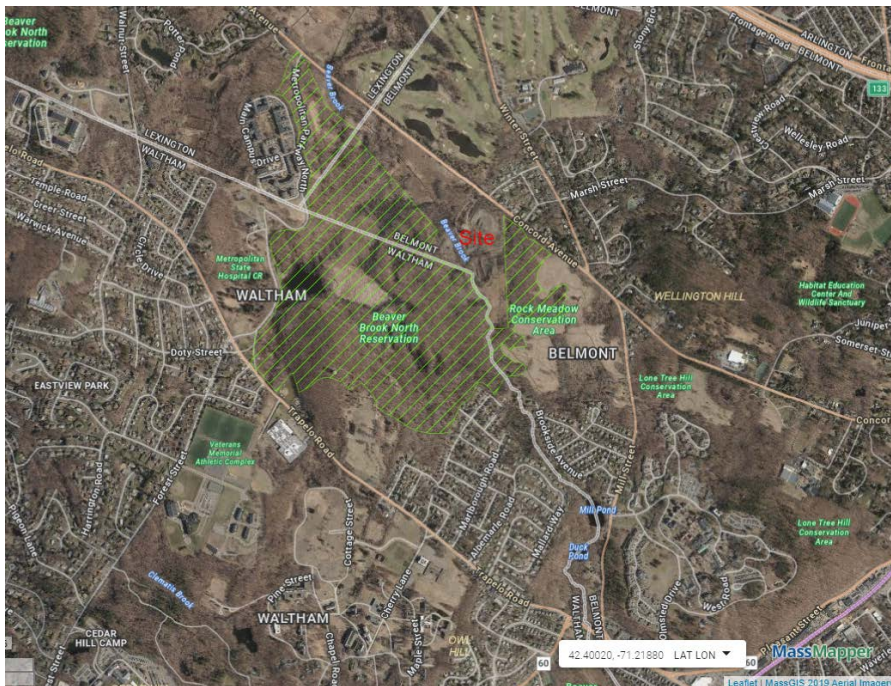


Figure 2-5b. Map of NHESP Estimated Habitats of Rare Wildlife near Site. (SOURCE: NHESP MassMapper, Accessed 7/28/2022)



Figure 2-5c. Map of Certified Vernal Pools near Site. (SOURCE: NHESP MassMapper, Accessed 7/28/2022)

Figure 3-1. Ecological Site Conceptual Model

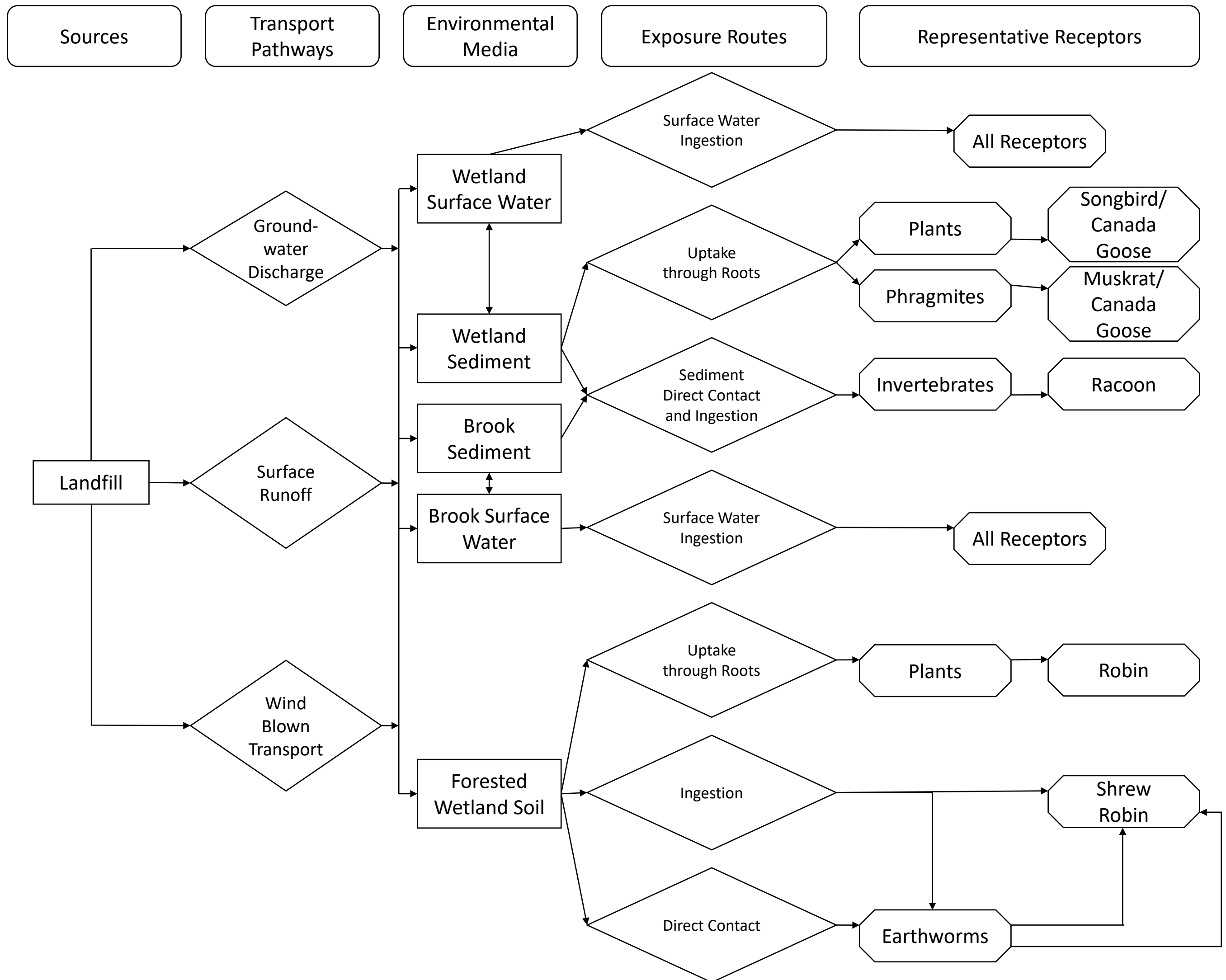


Figure 3-2 Concord Ave. Landfill Stage II Data

-  Sediment Toxicity
-  Worm Tissue Analysis



0 250 500 Feet





TABLES

TABLE 2-1
Summary of Laboratory Analytical Results - Sediment
Concord Avenue Landfill Site
Belmont, Massachusetts

Parameter		Sediment Criteria	Concentrations in mg/kg, unless otherwise noted												Concentrations in mg/kg, unless otherwise noted												Concentrations in mg/kg, unless otherwise noted												Concentrations in mg/kg, unless otherwise noted											
			SED-1	SED-2	SED-3	SED-4	SED-5	SED-6	SED-7	SED-8	SED-9	SED-10	SED-11	SED-12	SED-PHI-1	SED-PHI-2	SED-PHI-3	SED-PHI-4	SED-PHI-5	SED-PHI-6	SED-PHI-7	DUP-1	SED-PHI-8	SED-PHI-9	SED-PHI-10	Tox-1	Tox-2	Tox-3	Tox-3-Dup	Tox-4	Tox-5	Tox-6	SED-BKG-1	SED-BKG-2	SED-BKG-3	SED-BKG-4	SED-BKG-5	SED-BKG-6	SED-BKG-7	SED-BKG-8	SED-BKG-9	SED-BKG-10								
			MA DEP Stage I Freshwater Sediment (mg/kg)	SED-1	SED-2	SED-3	SED-4	SED-5	SED-6	SED-7	SED-8	SED-9	SED-10	SED-11	SED-12	SED-PHI-1	SED-PHI-2	SED-PHI-3	SED-PHI-4	SED-PHI-5	SED-PHI-6	SED-PHI-7	DUP-1	SED-PHI-8	SED-PHI-9	SED-PHI-10	Tox-1	Tox-2	Tox-3	Tox-3-Dup	Tox-4	Tox-5	Tox-6	SED-BKG-1	SED-BKG-2	SED-BKG-3	SED-BKG-4	SED-BKG-5	SED-BKG-6	SED-BKG-7	SED-BKG-8	SED-BKG-9	SED-BKG-10							
			SED-1	SED-2	SED-3	SED-4	SED-5	SED-6	SED-7	SED-8	SED-9	SED-10	SED-11	SED-12	SED-PHI-1	SED-PHI-2	SED-PHI-3	SED-PHI-4	SED-PHI-5	SED-PHI-6	SED-PHI-7	DUP-1	SED-PHI-8	SED-PHI-9	SED-PHI-10	Tox-1	Tox-2	Tox-3	Tox-3-Dup	Tox-4	Tox-5	Tox-6	SED-BKG-1	SED-BKG-2	SED-BKG-3	SED-BKG-4	SED-BKG-5	SED-BKG-6	SED-BKG-7	SED-BKG-8	SED-BKG-9	SED-BKG-10								
Sediment Criteria			SED-1	SED-2	SED-3	SED-4	SED-5	SED-6	SED-7	SED-8	SED-9	SED-10	SED-11	SED-12	SED-PHI-1	SED-PHI-2	SED-PHI-3	SED-PHI-4	SED-PHI-5	SED-PHI-6	SED-PHI-7	DUP-1	SED-PHI-8	SED-PHI-9	SED-PHI-10	Tox-1	Tox-2	Tox-3	Tox-3-Dup	Tox-4	Tox-5	Tox-6	SED-BKG-1	SED-BKG-2	SED-BKG-3	SED-BKG-4	SED-BKG-5	SED-BKG-6	SED-BKG-7	SED-BKG-8	SED-BKG-9	SED-BKG-10								
Sediment Criteria			SED-1	SED-2	SED-3	SED-4	SED-5	SED-6	SED-7	SED-8	SED-9	SED-10	SED-11	SED-12	SED-PHI-1	SED-PHI-2	SED-PHI-3	SED-PHI-4	SED-PHI-5	SED-PHI-6	SED-PHI-7	DUP-1	SED-PHI-8	SED-PHI-9	SED-PHI-10	Tox-1	Tox-2	Tox-3	Tox-3-Dup	Tox-4	Tox-5	Tox-6	SED-BKG-1	SED-BKG-2	SED-BKG-3	SED-BKG-4	SED-BKG-5	SED-BKG-6	SED-BKG-7	SED-BKG-8	SED-BKG-9	SED-BKG-10								
Sediment Criteria			SED-1	SED-2	SED-3	SED-4	SED-5	SED-6	SED-7	SED-8	SED-9	SED-10	SED-11	SED-12	SED-PHI-1	SED-PHI-2	SED-PHI-3	SED-PHI-4	SED-PHI-5	SED-PHI-6	SED-PHI-7	DUP-1	SED-PHI-8	SED-PHI-9	SED-PHI-10	Tox-1	Tox-2	Tox-3	Tox-3-Dup	Tox-4	Tox-5	Tox-6	SED-BKG-1	SED-BKG-2	SED-BKG-3	SED-BKG-4	SED-BKG-5	SED-BKG-6	SED-BKG-7	SED-BKG-8	SED-BKG-9	SED-BKG-10								
Sediment Criteria			SED-1	SED-2	SED-3	SED-4	SED-5	SED-6	SED-7	SED-8	SED-9	SED-10	SED-11	SED-12	SED-PHI-1	SED-PHI-2	SED-PHI-3	SED-PHI-4	SED-PHI-5	SED-PHI-6	SED-PHI-7	DUP-1	SED-PHI-8	SED-PHI-9	SED-PHI-10	Tox-1	Tox-2	Tox-3	Tox-3-Dup	Tox-4	Tox-5	Tox-6	SED-BKG-1	SED-BKG-2	SED-BKG-3	SED-BKG-4	SED-BKG-5	SED-BKG-6	SED-BKG-7	SED-BKG-8	SED-BKG-9	SED-BKG-10								
Sediment Criteria			SED-1	SED-2	SED-3	SED-4	SED-5	SED-6	SED-7	SED-8	SED-9	SED-10	SED-11	SED-12	SED-PHI-1	SED-PHI-2	SED-PHI-3	SED-PHI-4	SED-PHI-5	SED-PHI-6	SED-PHI-7	DUP-1	SED-PHI-8	SED-PHI-9	SED-PHI-10	Tox-1	Tox-2	Tox-3	Tox-3-Dup	Tox-4	Tox-5	Tox-6	SED-BKG-1	SED-BKG-2	SED-BKG-3	SED-BKG-4	SED-BKG-5	SED-BKG-6	SED-BKG-7	SED-BKG-8	SED-BKG-9	SED-BKG-10								
Sediment Criteria			SED-1	SED-2	SED-3	SED-4	SED-5	SED-6	SED-7	SED-8	SED-9	SED-10	SED-11	SED-12	SED-PHI-1	SED-PHI-2	SED-PHI-3	SED-PHI-4	SED-PHI-5	SED-PHI-6	SED-PHI-7	DUP-1	SED-PHI-8	SED-PHI-9	SED-PHI-10	Tox-1	Tox-2	Tox-3	Tox-3-Dup	Tox-4	Tox-5	Tox-6	SED-BKG-1	SED-BKG-2	SED-BKG-3	SED-BKG-4	SED-BKG-5	SED-BKG-6	SED-BKG-7	SED-BKG-8	SED-BKG-9	SED-BKG-10								
Sediment Criteria			SED-1	SED-2	SED-3	SED-4	SED-5	SED-6	SED-7	SED-8	SED-9	SED-10	SED-11	SED-12	SED-PHI-1	SED-PHI-2	SED-PHI-3	SED-PHI-4	SED-PHI-5	SED-PHI-6	SED-PHI-7	DUP-1	SED-PHI-8	SED-PHI-9	SED-PHI-10	Tox-1	Tox-2	Tox-3	Tox-3-Dup	Tox-4	Tox-5	Tox-6	SED-BKG-1	SED-BKG-2	SED-BKG-3	SED-BKG-4	SED-BKG-5	SED-BKG-6	SED-BKG-7	SED-BKG-8	SED-BKG-9	SED-BKG-10								
Sediment Criteria			SED-1	SED-2	SED-3	SED-4	SED-5	SED-6	SED-7	SED-8	SED-9	SED-10	SED-11	SED-12	SED-PHI-1	SED-PHI-2	SED-PHI-3	SED-PHI-4	SED-PHI-5	SED-PHI-6	SED-PHI-7	DUP-1	SED-PHI-8	SED-PHI-9	SED-PHI-10	Tox-1	Tox-2	Tox-3	Tox-3-Dup	Tox-4	Tox-5	Tox-6	SED-BKG-1	SED-BKG-2	SED-BKG-3	SED-BKG-4	SED-BKG-5	SED-BKG-6	SED-BKG-7	SED-BKG-8	SED-BKG-9	SED-BKG-10								
Sediment Criteria			SED-1	SED-2	SED-3	SED-4	SED-5	SED-6	SED-7	SED-8	SED-9	SED-10	SED-11	SED-12	SED-PHI-1	SED-PHI-2	SED-PHI-3	SED-PHI-4	SED-PHI-5	SED-PHI-6	SED-PHI-7	DUP-1	SED-PHI-8	SED-PHI-9	SED-PHI-10	Tox-1	Tox-2	Tox-3	Tox-3-Dup	Tox-4	Tox-5	Tox-6	SED-BKG-1	SED-BKG-2	SED-BKG-3	SED-BKG-4	SED-BKG-5	SED-BKG-6	SED-BKG-7	SED-BKG-8	SED-BKG-9	SED-BKG-10								
Sediment Criteria			SED-1	SED-2	SED-3	SED-4	SED-5	SED-6	SED-7	SED-8	SED-9	SED-10	SED-11	SED-12	SED-PHI-1	SED-PHI-2	SED-PHI-3	SED-PHI-4	SED-PHI-5	SED-PHI-6	SED-PHI-7	DUP-1	SED-PHI-8	SED-PHI-9	SED-PHI-10	Tox-1	Tox-2	Tox-3	Tox-3-Dup	Tox-4	Tox-5	Tox-6	SED-BKG-1	SED-BKG-2	SED-BKG-3	SED-BKG-4	SED-BKG-5	SED-BKG-6	SED-BKG-7	SED-BKG-8	SED-BKG-9	SED-BKG-10								
Sediment Criteria			SED-1	SED-2	SED-3	SED-4	SED-5	SED-6	SED-7	SED-8	SED-9	SED-10	SED-11	SED-12	SED-PHI-1	SED-PHI-2	SED-PHI-3	SED-PHI-4	SED-PHI-5	SED-PHI-6	SED-PHI-7	DUP-1	SED-PHI-8	SED-PHI-9	SED-PHI-10	Tox-1	Tox-2	Tox-3	Tox-3-Dup	Tox-4	Tox-5	Tox-6	SED-BKG-1	SED-BKG-2	SED-BKG-3	SED-BKG-4	SED-BKG-5	SED-BKG-6	SED-BKG-7	SED-BKG-8	SED-BKG-9	SED-BKG-10								
Sediment Criteria			SED-1	SED-2	SED-3	SED-4	SED-5	SED-6	SED-7	SED-8	SED-9	SED-10	SED-11	SED-12	SED-PHI-1	SED-PHI-2	SED-PHI-3	SED-PHI-4	SED-PHI-5	SED-PHI-6	SED-PHI-7	DUP-1	SED-PHI-8	SED-PHI-9	SED-PHI-10	Tox-1	Tox-2	Tox-3	Tox-3-Dup	Tox-4	Tox-5	Tox-6	SED-BKG-1	SED-BKG-2	SED-BKG-3	SED-BKG-4	SED-BKG-5	SED-BKG-6	SED-BKG-7	SED-BKG-8	SED-BKG-9	SED-BKG-10								
Sediment Criteria			SED-1	SED-2	SED-3	SED-4	SED-5	SED-6	SED-7	SED-8	SED-9	SED-10	SED-11	SED-12	SED-PHI-1	SED-PHI-2	SED-PHI-3	SED-PHI-4	SED-PHI-5	SED-PHI-6	SED-PHI-7	DUP-1	SED-PHI-8	SED-PHI-9	SED-PHI-10	Tox-1	Tox-2	Tox-3	Tox-3-Dup	Tox-4	Tox-5	Tox-6	SED-BKG-1	SED-BKG-2	SED-BKG-3	SED-BKG-4	SED-BKG-5	SED-BKG-6	SED-BKG-7	SED-BKG-8	SED-BKG-9	SED-BKG-10								
Sediment Criteria			SED-1	SED-2	SED-3	SED-4	SED-5	SED-6	SED-7	SED-8	SED-9	SED-10	SED-11	SED-12	SED-PHI-1	SED-PHI-2	SED-PHI-3	SED-PHI-4	SED-PHI-5	SED-PHI-6	SED-PHI-7	DUP-1	SED-PHI-8	SED-PHI-9	SED-PHI-10	Tox-1	Tox-2	Tox-3	Tox-3-Dup	Tox-4	Tox-5	Tox-6	SED-BKG-1	SED-BKG-2	SED-BKG-3	SED-BKG-4	SED-BKG-5	SED-BKG-6	SED-BKG-7	SED-BKG-8	SED-BKG-9	SED-BKG-10								
Sediment Criteria			SED-1	SED-2	SED-3	SED-4	SED-5	SED-6	SED-7	SED-8	SED-9	SED-10	SED-11	SED-12	SED-PHI-1	SED-PHI-2	SED-PHI-3	SED-PHI-4	SED-PHI-5	SED-PHI-6	SED-PHI-7	DUP-1	SED-PHI-8	SED-PHI-9	SED-PHI-10	Tox-1	Tox-2	Tox-3	Tox-3-Dup	Tox-4	Tox-5	Tox-6	SED-BKG-1	SED-BKG-2	SED-BKG-3	SED-BKG-4	SED-BKG-5	SED-BKG-6	SED-BKG-7	SED-BKG-8	SED-BKG-9	SED-BKG-10								
Sediment Criteria			SED-1	SED-2	SED-3	SED-4	SED-5	SED-6	SED-7	SED-8	SED-9	SED-10	SED-11	SED-12	SED-PHI-1	SED-PHI-2	SED-PHI-3	SED-PHI-4	SED-PHI-5	SED-PHI-6	SED-PHI-7	DUP-1	SED-PHI-8	SED-PHI-9	SED-PHI-10	Tox-1	Tox-2	Tox-3	Tox-3-Dup	Tox-4	Tox-5	Tox-6	SED-BKG-1	SED-BKG-2	SED-BKG-3	SED-BKG-4	SED-BKG-5	SED-BKG-6	SED-BKG-7	SED-BKG-8	SED-BKG-9	SED-BKG-10								
Sediment Criteria			SED-1	SED-2	SED-3	SED-4	SED-5	SED-6	SED-7	SED-8	SED-9	SED-10	SED-11	SED-12	SED-PHI-1	SED-PHI-2	SED-PHI-3	SED-PHI-4	SED-PHI-5	SED-PHI-6	SED-PHI-7	DUP-1	SED-PHI-8	SED-PHI-9	SED-PHI-10	Tox-1	Tox-2	Tox-3	Tox-3-Dup	Tox-4	Tox-5	Tox-6	SED-BKG-1	SED-BKG-2	SED-BKG-3	SED-BKG-4	SED-BKG-5	SED-BKG-6	SED-BKG-7	SED-BKG-8	SED-BKG-9	SED-BKG-10								
Sediment Criteria			SED-1	SED-2	SED-3	SED-4	SED-5	SED-6	SED-7	SED-8	SED-9	SED-10	SED-11	SED-12	SED-PHI-1	SED-PHI-2	SED-PHI-3	SED-PHI-4	SED-PHI-5	SED-PHI-6	SED-PHI-7	DUP-1	SED-PHI-8	SED-PHI-9	SED-PHI-10	Tox-1	Tox-2	Tox-3	Tox-3-Dup	Tox-4	Tox-5	Tox-6	SED-BKG-1	SED-BKG-2	SED-BKG-3	SED-BKG-4	SED-BKG-5	SED-BKG-6	SED-BKG-7	SED-BKG-8	SED-BKG-9	SED-BKG-10								
Sediment Criteria			SED-1	SED-2	SED-3	SED-4	SED-5	SED-6	SED-7	SED-8	SED-9	SED-10	SED-11	SED-12	SED-PHI-1	SED-PHI-2	SED-PHI-3	SED-PHI-4	SED-PHI-5	SED-PHI-6	SED-PHI-7	DUP-1	SED-PHI-8	SED-PHI-9	SED-PHI-10	Tox-1	Tox-2	Tox-3	Tox-3-Dup	Tox-4	Tox-5	Tox-6	SED-BKG-1	SED-BKG-2	SED-BKG-3	SED-BKG-4	SED-BKG-5	SED-BKG-6	SED-BKG-7	SED-BKG-8	SED-BKG-9	SED-BKG-10								
Sediment Criteria			SED-1	SED-2	SED-3	SED-4	SED-5	SED-6	SED-7	SED-8	SED-9	SED-10	SED-11	SED-12	SED-PHI-1	SED-PHI-2	SED-PHI-3	SED-PHI-4	SED-PHI-5	SED-PHI-6	SED-PHI-7	DUP-1	SED-PHI-8	SED-PHI-9	SED-PHI-10	Tox-1	Tox-2	Tox-3	Tox-3-Dup	Tox-4	Tox-5	Tox-6	SED-BKG-1	SED-BKG-2	SED-BKG-3	SED-BKG-4	SED-BKG-5	SED-BKG-6	SED-BKG-7	SED-BKG-8	SED-BKG-9	SED-BKG-10								
Sediment Criteria			SED-1	SED-2	SED-3	SED-4	SED-5	SED-6	SED-7	SED-8	SED-9	SED-10	SED-11	SED-12	SED-PHI-1	SED-PHI-2	SED-PHI-3	SED-PHI-4	SED-PHI-5	SED-PHI-6	SED-PHI-7	DUP-1	SED-PHI-8	SED-PHI-9	SED-PHI-10	Tox-1	Tox-2	Tox-3	Tox-3-Dup	Tox-4	Tox-5	Tox-6	SED-BKG-1	SED-BKG-2	SED-BKG-3	SED-BKG-4	SED-BKG-5	SED-BKG-6	SED-BKG-7	SED-BKG-8	SED-BKG-9	SED-BKG-10								
Sediment Criteria			SED-1	SED-2	SED-3	SED-4	SED-5	SED-6	SED-7	SED-8	SED-9	SED-10	SED-11	SED-12	SED-PHI-1	SED-PHI-2	SED-PHI-3	SED-PHI-4	SED-PHI-5	SED-PHI-6	SED-PHI-7	DUP-1	SED-PHI-8	SED-PHI-9	SED-PHI-10	Tox-1	Tox-2	Tox-3	Tox-3-Dup	Tox-4	Tox-5	Tox-6	SED-BKG-1	SED-BKG-2	SED-BKG-3	SED-BKG-4	SED-BKG-5	SED-BKG-6	SED-BKG-7	SED-BKG-8	SED-BKG-9	SED-BKG-10								
Sediment Criteria			SED-1	SED-2	SED-3	SED-4	SED-5	SED-6	SED-7	SED-8	SED-9	SED-10	SED-11	SED-12	SED-PHI-1	SED-PHI-2	SED-PHI-3	SED-PHI-4	SED-PHI-5	SED-PHI-6	SED-PHI-7	DUP-1	SED-PHI-8	SED-PHI-9	SED-PHI-10	Tox-1	Tox-2	Tox-3	Tox-3-Dup	Tox-4	Tox-5	Tox-6	SED-BKG-1	SED-BKG-2	SED-BKG-3	SED-BKG-4	SED-BKG-5	SED-BKG-6	SED-BKG-7	SED-BKG-8	SED-BKG-9	SED-BKG-10								
Sediment Criteria			SED-1	SED-2	SED-3	SED-4	SED-5	SED-6	SED-7	SED-8	SED-9	SED-10	SED-11	SED-12	SED-PHI-1	SED-PHI-2	SED-PHI-3	SED-PHI-4	SED-PHI-5	SED-PHI-6	SED-PHI-7	DUP-1	SED-PHI-8	SED-PHI-9	SED-PHI-10	Tox-1	Tox-2	Tox-3	Tox-3-Dup	Tox-4	Tox-5	Tox-6	SED-BKG-1	SED-BKG-2	SED-BKG-3	SED-BKG-4	SED-BKG-5	SED-BKG-6	SED-BKG-7	SED-BKG-8	SED-BKG-9	SED-BKG-10								
Sediment Criteria			SED-1	SED-2	SED-3	SED-4	SED-5	SED-6	SED-7	SED-8	SED-9	SED-10	SED-11	SED-12	SED-PHI-1	SED-PHI-2	SED-PHI-3	SED-PHI-4	SED-PHI-5	SED-PHI-6	SED-PHI-7	DUP-1	SED-PHI-8	SED-PHI-9	SED-PHI-10	Tox-1	Tox-2	Tox-3	Tox-3-Dup	Tox-4	Tox-5	Tox-6	SED-BKG-1	SED-BKG-2	SED-BKG-3	SED-BKG-4	SED-BKG-5	SED-BKG-6	SED-BKG-7	SED-BKG-8	SED-BKG-9	SED-BKG-10								
Sediment Criteria			SED-1	SED-2	SED-3	SED-4	SED-5	SED-6	SED-7	SED-8	SED-9	SED-10	SED-11	SED-12	SED-PHI-1	SED-PHI-2	SED-PHI-3	SED-PHI-4	SED-PHI-5	SED-PHI-6	SED-PHI-7	DUP-1	SED-PHI-8	SED-PHI-9	SED-PHI-10	Tox-1	Tox-2	Tox-3	Tox-3-Dup	Tox-4	Tox-5	Tox-6	SED-BKG-1	SED-BKG-2	SED-BKG-3	SED-BKG-4	SED-BKG-5	SED-BKG-6	SED-BKG-7	SED-BKG-8	SED-BKG-9	SED-BKG-10								
Sediment Criteria			SED-1	SED-2	SED-3	SED-4	SED-5	SED-6	SED-7	SED-8	SED-9	SED-10	SED-11	SED-12	SED-PHI-1	SED-PHI-2	SED-PHI-3	SED-PHI-4	SED-PHI-5	SED-PHI-6	SED-PHI-7	DUP-1	SED-PHI-8	SED-PHI-9	SED-PHI-10	Tox-1	Tox-2	Tox-3	Tox-3-Dup	Tox-4	Tox-5	Tox-6	SED-BKG-1	SED-BKG-2	SED-BKG-3	SED-BKG-4	SED-BKG-5	SED-BKG-6	SED-BKG-7	SED-BKG-8	SED-BKG-9	SED-BKG-10								
Sediment Criteria			SED-1	SED-2	SED-3	SED-4	SED-5	SED-6	SED-7	SED-8	SED-9	SED-10	SED-11	SED-12	SED-PHI-1	SED-PHI-2	SED-PHI-3	SED-PHI-4	SED-PHI-5	SED-PHI-6	SED-PHI-7	DUP-1	SED-PHI-8	SED-PHI-9	SED-PHI-10	Tox-1	Tox-2	Tox-3	Tox-3-Dup	Tox-4	Tox-5	Tox-6	SED-BKG-1	SED-BKG-2	SED-BKG-3	SED-BKG-4	SED-BKG-5	SED-BKG-6	SED-BKG-7	SED-BKG-8	SED-BKG-9	SED-BKG-10								
Sediment Criteria			SED-1	SED-2	SED-3	SED-4	SED-5	SED-6	SED-7	SED-8	SED-9	SED-10	SED-11	SED-12	SED-PHI-1	SED-PHI-2	SED-PHI-3	SED-PHI-4	SED-PHI-5	SED-PHI-6	SED-PHI-7	DUP-1	SED-PHI-8	SED-PHI-9	SED-PHI-10	Tox-1	Tox-2	Tox-3	Tox-3-Dup	Tox-4	Tox-5	Tox-6	SED-BKG-1	SED-BKG-2	SED-BKG-3	SED-BKG-4	SED-BKG-5	SED-BKG-6	SED-BKG-7	SED-BKG-8	SED-BKG-9	SED-BKG-10								
Sediment Criteria			SED-1	SED-2																																														

TABLE 2-2
Summary of Laboratory Analytical Results - Soil
Concord Avenue Landfill Site
Belmont, Massachusetts

Parameter	Soil Criteria				Concentrations in mg/kg, unless otherwise noted																Concentrations in mg/kg, unless otherwise noted									
	USEPA EcoSSLs				SOIL-1	SOIL-2	SOIL-3	SOIL-4	SOIL-5	SOIL-6	SOIL-7	SOIL-7-DUP	SOIL-8	SOIL-9	SOIL-10	SOIL-11	SOIL-12	SOIL-13	SOIL-14	WORM-1	WORM-2	WORM-3	WORM-3-DUP	WORM-4	WORM-5	WORM-6				
	Plants	Soil Invertebrates	Avian	Mammalian	7/29/2021	7/29/2021	7/27/2021	7/27/2021	7/27/2021	7/27/2021	7/27/2021	7/27/2021	7/27/2021	7/27/2021	7/29/2021	7/29/2021	7/28/2021	7/28/2021	7/28/2021	7/28/2021	12/21/2022	12/21/2022	12/21/2022	12/21/2022	12/21/2022	12/21/2022	12/21/2022			
					2018-10 OB Drilling	2018-10 OB Drilling	2019-04 Test Pits	2019-04 Test Pits	2019-04 Test Pits	2019-04 Test Pits	2019-04 Test Pits	2019-04 Test Pits	2018-10 OB Drilling	2018-10 OB Drilling	2019-04 Test Pits	2019-04 Test Pits	2019-04 Test Pits	2019-04 Test Pits	2019-04 Test Pits	2019-04 Test Pits	2019-04 Test Pits									
Semivolatile Organic Compounds (SVOCs)																														
PAHs																														
Acenaphthene	NS	NS	NS	NS	0.03 U	0.01 J	0.02 J	0.04	0.04	0.18	0.03 U	0.01 J	0.04 J	0.03 J	0.02 J	0.06	0.00 J	0.08	0.04	0.01	0.03 J	0.03 J	0.04	0.04	0.01	0.02 U				
Acenaphthylene	NS	NS	NS	NS	0.03	0.02	0.14	0.11	0.08	2.61	0.11	0.11	0.33	0.22	0.14	0.43	0.04	0.85	0.28	0.09	0.15	0.10	0.15	0.36	0.03	0.02				
Anthracene	NS	NS	NS	NS	0.03	0.04	0.13	0.16	0.14	1.35	0.07	0.11	0.30	0.17	0.12	0.31	0.04	0.56	0.19	0.06	0.15	0.11	0.15	0.28	0.06	0.02 J				
Benzo(a)anthracene	NS	NS	NS	NS	0.13	0.13	0.70	0.54	0.53	5.10	0.32	0.60	1.80	0.83	0.65	1.65	0.18	2.50	1.10	0.27	1.11	0.53	0.77	1.56	0.31	0.08				
Benzo(a)pyrene	NS	NS	NS	NS	0.17	0.14	1.00	0.59	0.60	4.77	0.43	0.68	3.14	1.27	1.15	1.85	0.20	3.12	1.34	0.35	1.96	0.73	1.08	1.98	0.32	0.11				
Benzo(b)fluoranthene	NS	NS	NS	NS	0.23	0.19	1.20	0.68	0.67	4.05	0.51	0.70	4.93	1.85	1.87	2.47	0.22	4.21	1.89	0.33	2.38	0.77	1.10	2.03	0.29	0.11				
Benzo(g,h,i)perylene	NS	NS	NS	NS	0.17	0.14	0.94	0.47	0.46	3.72	0.37	0.55	3.62	1.28	1.42	1.79	0.15	2.82	1.29	0.28	2.26	0.69	1.03	1.90	0.22	0.14				
Benzo(k)fluoranthene	NS	NS	NS	NS	0.13	0.12	0.91	0.46	0.42	2.56	0.28	0.54	2.67	0.93	1.21	1.42	0.18	2.11	1.10	0.26	2.02	0.61	0.96	1.64	0.26	0.09				
Chloronaphthalene (2-)	NS	NS	NS	NS	0.03 U	0.02 U	0.03 U	0.03 U	0.03 U	0.13 U	0.03 U	0.03 U	0.10 U	0.05 U	0.03 U	0.02 U	0.00 J	0.04 U	0.03 U	0.01 U	0.03 U	0.03 U	0.03 U	0.04 U	0.01 U	0.02 U				
Chrysene	NS	NS	NS	NS	0.21	0.20	1.04	0.61	0.58	4.70	0.38	0.61	3.32	1.31	1.30	1.71	0.20	2.91	1.30	0.33	2.03	0.73	0.99	1.95	0.30	0.14				
Dibenzo(a,h)anthracene	NS	NS	NS	NS	0.05	0.04	0.27	0.16	0.15	1.00	0.11	0.17	0.96	0.37	0.37	0.51	0.06	0.87	0.37	0.06	0.43	0.14	0.20	0.38	0.05	0.02 J				
Fluoranthene	NS	NS	NS	NS	0.37	0.27	1.62	0.98	0.99	5.84	0.50	0.96	4.95	1.92	1.73	3.09	0.33	4.68	2.05	0.54	3.27	1.26	1.81	2.43	0.59	0.25				
Fluorene	NS	NS	NS	NS	0.03 U	0.02	0.03	0.05	0.05	0.54	0.02 J	0.02 J	0.10	0.04 J	0.02 J	0.05	0.01	0.09	0.04	0.01	0.03 J	0.03	0.04	0.05	0.01	0.02 U				
Indeno(1,2,3-cd)pyrene	NS	NS	NS	NS	0.15	0.12	0.98	0.46	0.46	3.22	0.35	0.56	3.43	1.25	1.41	1.72	0.16	2.80	1.28	0.29	2.20	0.70	1.01	1.85	0.23	0.08				
Methylnaphthalene (1-)	NS	NS	NS	NS	0.01 J	0.07	0.02 J	0.03 J	0.05	0.43	0.02 J	0.02 J	0.10 U	0.03 J	0.02 J	0.05	0.02	0.06	0.04	0.01	0.03 U	0.03 J	0.04	0.04	0.02	0.01 J				
Methylnaphthalene (2-)	NS	NS	NS	NS	0.01 J	0.09	0.02 J	0.03	0.05	0.37	0.02 J	0.02 J	0.10 U	0.04 J	0.02 J	0.08	0.02	0.09	0.07	0.01	0.02 J	0.04	0.05	0.06	0.03	0.01 J				
Naphthalene	NS	NS	NS	NS	0.02 J	0.05	0.03 J	0.05	0.05	0.32	0.03 J	0.03 J	0.07 J	0.06	0.05	0.09	0.02	0.13	0.08	0.03	0.06	0.08	0.08	0.11	0.04	0.03				
Phenanthrene	NS	NS	NS	NS	0.18	0.20	0.45	0.49	0.48	4.69	0.16	0.24	1.25	0.55	0.42	0.97	0.13	1.40	0.66	0.22	0.79	0.44	0.60	0.70	0.25	0.12				
Pyrene	NS	NS	NS	NS	0.34	0.24	1.42	0.93	0.88	8.70	0.49	0.92	4.15	1.71	1.48	2.67	0.31	3.93	1.85	0.45	2.30	0.97	1.29	2.43	0.47	0.26				
Low Molecular Weight PAHs	NA	29	NA	100	0.35	0.51	0.84	0.95	0.93	10.49	0.47	0.56	2.31	1.12	0.81	2.03	0.27	3.25	1.39	0.44	1.26	0.86	1.13	1.65	0.45	0.26				
High Molecular Weight PAHs	NA	18	NA	1.1	1.95	1.57	10.08	5.89	5.74	43.66	3.75	6.29	32.97	12.72	12.59	18.88	2.00	29.95	13.57	3.15	19.96	7.12	10.25	18.15	3.04	1.28				
Total PAHs	NS	NS	NS	NS	2.33	2.10	10.96	6.87	6.70	54.27	4.24	6.88	35.39	13.89	13.43	20.92	2.28	33.24	14.99	3.60	21.25	8.01	11.41	19.84	3.49	1.56				
Dioxans-Furans																														
Dioxin (2,3,7,8-TCDD)	NS	NS	NS	NS	3.53E-06 U	2.24E-06 U	8.32E-07 U	7.30E-07 U	9.67E-07	8.54E-07	7.11E-07 U	6.75E-07 U	2.58E-06 U	5.96E-06 U	3.29E-06 U	2.39E-06 U	4.20E-07 J	4.92E-06 U	3.66E-06 U	6.84E-07 U	2.00E-06 U	3.51E-06 U	4.01E-06 U	4.77E-06 U	7.19E-07 U	2.78E-09 U				
Metals																														
Antimony	NA	78	NA	0.27	11.00 U	6.98 U	4.38	2.33 U	2.47	2.49 U	2.32 U	2.42	8.28 U	18.60 U	10.50 U	7.46 U	2.04 U	15.90 U	11.70 U	2.19 U	6.28 U	11.00 U	12.60 U	15.00 U	2.22 U	8.93 U				
Arsenic	18	NA	43	46	4.84	9.30	14.00	5.09	8.29	5.26	7.32	6.49	32.20	22.60	14.90	25.1	5.62	35.8	22.3	7.00	29.30	18.7	35.3	19.3	9.46	12.2				
Barium	NA	330	NA	2,000	109.00	95.60	349.00	89.90	128.00	94.80	92.60	79.10	234.00	137.00	119.00	207	66.7	344	247	66.60	236.00	99.4	239	344	87.2	302				
Beryllium	NA	40	NA	21	2.07 U	1.31 U	0.49 U	0.44 U	0.39 U	0.47 U	0.43 U	0.40 U	1.55 U	3.49 U	1.97 U	1.40 U	0.56	2.98 U	2.70	0.46	1.18 U	2.06 U	2.36 U	2.82 U	0.48	1.68 U				
Cadmium	32	140	0.77	0.36	1.56	0.93	5.26	1.22	0.99	0.85	1.13	1.18	2.18	2.33 U	1.31 U	2.67	0.50	2.41	3.54	0.62	2.13	2.21	3.83	2.79	0.64	2.41				
Chromium (total)	NA	NA	26 ^F	34 ^F	13.80 U	13.90	33.10	17.50	25.80	16.70	19.20	16.30	62.40	23.20 U	28.80	32.6	18.8	36.9	30.3	17.30	67.90	15.3	42.2	45.5	22.7	14.7				
Copper	70	80	28	49	46.60	41.30	186.00	46.80	58.80	44.00	80.00	77.30	107.00	59.10	68.00	75	29.5	86.4	113	25.70	116.00	46	111	103	28.9	77.7				
Lead	120	1,700	11	56	73.80	108.00	1,030.00	284.00	290.00	223.00	544.00	523.00	273.00	310.00	158.00	366.0	85.0	191.0	237.0	199.00	245.00	253.0	657.0	282.0	143.0	111.0				
Mercury	NS	NS	NS	NS	0.52 U	0.31 U	0.41	0.26	0.32	0.22	0.24	0.21	0.38 U	0.92 U	0.46 U	0.39	0.24	0.70 U	0.52 U	0.43	0.27	0.46 U	0.53 U	0.68	0.16	0.42 U				
Nickel	38	280	210	130	9.82	11.80	29.00	12.50	17.30	16.00	18.90	22.70	33.40	16.50	19.30	26.1	13	24.2	65.4	12.20	35.10	20.6	44.6	32	17.1	24.4				
Selenium	0.52	4.1	1.2	0.63	13.80 U	8.73 U	3.30	2.90 U	2.62 U	3.11 U	2.90 U	2.66 U	10.40 U	23.20 U	13.10 U	9.3 U	2.6 U	19.8 U	14.6 U	2.74 U	7.85 U	13.7 U	15.7 U	18.8 U	2.8 U	11.2 U				
Silver	560	NA	4.2	14	3.45 U	2.18 U	2.11	0.73 U	0.72	0.78 U	0.72 U	0.66 U	2.59 U	5.81 U	3.28 U	2.33 U	0.64 U	4.96 U	3.66 U	0.68 U	1.96 U	3.43 U	3.92 U	4.70 U	0.69 U	2.79 U				
Zinc	160	120	46	79	101.00	96.70	833.00	216.00	251.00	184																				

TABLE 2-3
Summary of Laboratory Analytical Results - Surface Water
Concord Avenue Landfill Site
Belmont, Massachusetts

Parameter	Surface Water Quality Criteria		Concentrations in mg/l, unless otherwise noted						
	USEPA NRWQC		SW-1	SW-2	SW-3	SW-4	SW-5	SW-6	SW-7
	CMC (Acute)	CCC (Chronic)	7/27/2021	7/28/2021	7/28/2021	7/28/2021	7/28/2021	7/28/2021	7/27/2021
Metals									
MCP Total Metals									
Barium, Total	NS	NS	0.061	0.0472	0.0354	0.0343	0.0475	0.0495	0.063
Iron, Total	NS	1	1.020	6.59	4.04	4.3	4.9	4.25	10.600
Lead, Total	0.05	0.0019	0.001 U	0.009	0.001	0.002	0.003	0.005	0.001
Manganese, Total	NS	NS	0.077	0.233	0.1645	0.251	0.2429	0.3276	1.144
Zinc, Total	0.086	0.086	0.010 U	0.031	0.01 U	0.01 U	0.015	0.012	0.010 U
MCP Dissolved Metals									
Barium, Dissolved	NS	NS	0.056	0.0349	0.0292	0.0275	0.0372	0.0393	0.042
Iron, Dissolved	NS	1	0.464	0.896	1.75	1.46	1.7	1.72	3.830
Lead, Dissolved	0.042	0.0016	0.001 U	0.001 U	0.001 U	0.009	0.001 U	0.001 U	0.001 U
Manganese, Dissolved	NS	NS	0.001 U	0.0012	0.0093	0.0121	0.0018	0.0053	0.277
Zinc, Dissolved	0.084	0.085	0.010 U	0.0 U	0.01 U	0.01 U	0.01 U	0.01 U	0.010 U
MCP General Chemistry									
Cyanide, Free	0.022	0.0052	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Total Hardness	NS	NS	103	70.8	51.1	52.2	49.3	54.8	94.5

Table 2-4a COC Selection Analysis - Sediment

Concord Avenue Landfill

Belmont, MA

Ecological Screening for Chemicals in Sediment (Concentrations in mg/kg unless otherwise noted)						
CHEMICAL	Freq. of Detection	Range of Detection Limits	Range of Detected Conc.	Location of Maximum Detected Conc.	Sitewide Maximum Conc. (mg/kg)	Background Average Conc. (mg/kg)
Semivolatile Organic Compounds (SVOCs)						
PAHs						
Acenaphthene	22/29	0.0104 - 0.101	0.0208 - 0.163	SED-6	0.16	0.01
Acenaphthylene	27/29	0.0104 - 0.254	0.036 - 0.659	SED-12	0.66	0.01
Anthracene	28/29	0.0104 - 0.367	0.022 - 0.639	SED-1	0.64	0.01
Benzo(a)anthracene	29/29	0.0104 - 2.35	0.031 - 3.38	SED-1	3.38	0.06
Benzo(a)pyrene	29/29	0.0104 - 2.84	0.033 - 4	SED-3	4.00	0.08
Benzo(b)fluoranthene	29/29	0.0104 - 3.38	0.043 - 6.48	SED-3	6.48	0.11
Benzo(g,h,i)perylene	29/29	0.0104 - 2.54	0.024 - 3.9	SED-3	3.90	0.08
Benzo(k)fluoranthene	29/29	0.0104 - 2.25	0.016 - 4.39	SED-3	4.39	0.06
Chloronaphthalene (2-)	1/29	0.00632 - 0.101	0.0165	SED-8	0.02	0.01
Chrysene	29/29	0.0104 - 3.24	0.032 - 4.7	SED-1	4.70	0.10
Dibenzo(a,h)anthracene	28/29	0.0104 - 0.488	0.014 - 1.19	SED-3	1.19	0.02
Fluoranthene	29/29	0.0104 - 6.57	0.063 - 9.31	SED-1	9.31	0.15
Fluorene	28/29	0.0104 - 0.133	0.014 - 0.343	SED-1	0.34	0.02
Indeno(1,2,3-cd)pyrene	29/29	0.0104 - 2.48	0.027 - 4.17	SED-3	4.17	0.07
Methylnaphthalene (1-)	17/29	0.0104 - 0.101	0.015 - 0.131	SED-6	0.13	0.02
Methylnaphthalene (2-)	12/29	0.0104 - 0.123	0.0156 - 0.123	TOX-3	0.12	0.04
Naphthalene	26/29	0.0104 - 0.104	0.027 - 0.181	SED-6	0.18	0.04
Phenanthrene	29/29	0.0104 - 2.07	0.035 - 2.74	SED-1	2.74	0.07
Pyrene	29/29	0.0104 - 4.4	0.053 - 7.3	SED-1	7.30	0.11
Low Molecular Weight PAHs	29/29	0.7622 - 2.9449	0.049 - 4.3807	SED-1	4.38	0.21
High Molecular Weight PAHs	29/29	3.4933 - 30.538	0.336 - 44.59	SED-1	44.59	0.83
Total PAHs	29/29	4.3817 - 33.5055	0.385 - 48.9707	SED-1	48.97	1.04
Dioxans-Furans						
Dioxin (2,3,7,8-TCDD)	5/29	0.000000764 - 0.00000905	0.0000012 - 0.0000024	SED-PHI-4	2.40E-06	5.00E-07
Metals						
Antimony	1/29	2.43 - 28.2	5.58	SED-7	5.58	3.74
Arsenic	29/29	1 - 26.8	3.33 - 41.8	SED-3	41.80	9.68
Barium	29/29	6.2 - 285	35 - 1320	SED-11	1320.00	193.00
Beryllium	2/29	0.4553 - 5.296	1.1 - 1.696	TOX-4	1.70	0.70
Cadmium	27/29	0.41 - 3.531	0.4514 - 7.772	SED-7	7.77	1.86
Chromium (total)	29/29	4.1 - 57.5	6.7 - 82.9	SED-3	82.90	15.80
Copper	29/29	4.1 - 162	22 - 243	SED-11	243.00	58.30
Lead	29/29	1.2 - 487	36 - 540	SED-11	540.00	89.30
Mercury	12/29	0.112 - 1.24	0.134 - 0.86	SED-PHI-3	0.86	0.16
Nickel	29/29	2 - 48.7	7.9 - 65.5	SED-11	65.50	18.50
Selenium	0/29	3.04 - 35.3	ND	NA	17.65	4.67
Silver	0/29	0.759 - 8.83	ND	NA	4.42	1.17
Zinc	29/29	20 - 468	50 - 2260	SED-11	2260.00	219.00
Other Parameters						
Cyanide (Total)	4/29	2.1 - 6.8	4.2 - 12	SED-PHI-6		0.24

Summary of Laboratory Analytical Results - Sediment (less than or equal to 1 ft depth; Habitat Areas)
Concord Avenue Landfill Site
Belmont, Massachusetts

Notes:

1. In 2021, samples were collected by Woods Hole Group, Inc. on the dates indicated. Samples collected in 2017 were collected by CDM Smith.

Semivolatile organic compounds (SVOCs) were analyzed by Alpha Analytical, Inc. of Westborough and Mansfield, Massachusetts, by PAH GC/MS-SIM/8270D-SIM. Dioxins & Furancs by ID HRMS/1613B.

Metals were analyzed by Alpha Analytical, Inc. of Westborough and Mansfield, Massachusetts by EIASOP-INGOPTIMAS0 \$METMS_PE and EIASOP-INGNIPPONHG1 MERCS.

Total cyanide was analyzed by Alpha Analytical by USEPA Method 9010C/9012B.

In 2017, Dioxin was analyzed by Pace Analytical by Method 8290.

2. All concentrations are presented in milligrams per kilogram (mg/kg) which are equivalent to parts per million (ppm), unless otherwise noted.

3. Totals concentrations (e.g. Total PAHs) are the sum of the detected concentrations of the relevant analytes.

4. "U" indicates the analyte was not detected above the listed laboratory reporting limit.

"J" indicates an estimated value.

"JI" indicates an estimated value with indeterminate bias.

"J+" and "JH" indicate an estimated value with high bias.

"J-" and "JL" indicate an estimated value with low bias.

"B" indicates a qualified value due to blank contamination.

"D" indicates a concentration from a diluted analysis.

"E" indicates an esitmated value that exceeds the calibration range.

"R" indicates data (non-detects) rejected during validation.

"Dup." indicates the sample is a field duplicate.

A blank cell indicates the parameter was not measured.

5. MA DEP Stage I Freshwater Sediment are used as the screening values (<https://www.mass.gov/doc/revised-sediment-screening-values/download>).

6. "PAHs" are polycyclic aromatic hydrocarbons.

"NS" indicates no value is listed in the source document for this analyte.

"NA" indicates the source document lists as not applicable.

7. **Bold** values exceed the Sediment Criteria.

Table 2-4b COC Selection Analysis - Soil
Concord Avenue Landfill
Belmont, MA

Ecological Screening for Chemicals in Soils (Concentrations in mg/kg unless otherwise noted)							
CHEMICAL	Freq. of Detection	Range of Detection Limits (mg/kg)	Range of Detected Conc.	Location of Maximum Detected Conc.	Sitewide Maximum Conc. (mg/kg)	Background Average Conc. (mg/kg)	MADEP Soil Background (mg/kg)
Semivolatile Organic Compounds (SVOCs)							
PAHs							
Acenaphthene	18/19	0.00222 - 0.127	0.00487 - 0.184	SOIL-6	0.18	0.01	0.50
Acenaphthylene	19/19	0.00224 - 0.127	0.0333 - 2.61	SOIL-6	2.61	0.03	0.50
Anthracene	19/19	0.0039 - 0.127	0.0355 - 1.35	SOIL-6	1.35	0.03	1.00
Benzo(a)anthracene	19/19	0.00281 - 0.127	0.184 - 5.1	SOIL-6	5.10	0.11	2.00
Benzo(a)pyrene	19/19	0.00165 - 0.127	0.203 - 4.77	SOIL-6	4.77	0.14	2.00
Benzo(b)fluoranthene	19/19	0.00273 - 0.127	0.223 - 4.93	SOIL-8	4.93	0.18	2.00
Benzo(g,h,i)perylene	19/19	0.00367 - 0.127	0.15 - 3.72	SOIL-6	3.72	0.15	1.00
Benzo(k)fluoranthene	19/19	0.00164 - 0.127	0.178 - 2.67	SOIL-8	2.67	0.11	1.00
Chloronaphthalene (2-)	0/19	0.00208 - 0.127	ND	ND	0.06	0.01	NA
Chrysene	18/19	0.00207 - 0.127	0.204 - 4.7	SOIL-6	4.70	0.19	2.00
Dibenzo(a,h)anthracene	19/19	0.00338 - 0.127	0.0539 - 0.995	SOIL-6	1.00	0.04	0.50
Fluoranthene	19/19	0.00263 - 0.127	0.334 - 5.84	SOIL-6	5.84	0.30	4.00
Fluorene	19/19	0.00337 - 0.127	0.00542 - 0.535	SOIL-6	0.54	0.02	1.00
Indeno(1,2,3-cd)pyrene	19/19	0.00162 - 0.127	0.161 - 3.43	SOIL-8	3.43	0.12	1.00
Methylnaphthalene (1-)	18/19	0.00258 - 0.127	0.0112 - 0.432	SOIL-6	0.43	0.03	NA
Methylnaphthalene (2-)	19/19	0.00248 - 0.127	0.013 - 0.367	SOIL-6	0.37	0.04	0.50
Naphthalene	19/19	0.00224 - 0.127	0.0191 - 0.32	SOIL-6	0.32	0.04	0.50
Phenanthrene	19/19	0.00367 - 0.127	0.129 - 4.69	SOIL-6	4.69	0.17	3.00
Pyrene	19/19	0.00315 - 0.127	0.305 - 8.7	SOIL-6	8.70	0.28	4.00
Low Molecular Weight PAHs	19/19	0.00222 - 0.127	0.27333 - 10.499	SOIL-6	10.49	0.36	NA
High Molecular Weight PAHs	19/19	0.00162 - 0.127	1.9978 - 43.655	SOIL-6	43.66	1.60	NA
Total PAHs		0.00162 - 0.127	2.01002 - 44.999	SOIL-6	44.90	1.84	NA
Dioxans-Furans							
Dioxin (2,3,7,8-TCDD)	9/19	0.000000636 - 0.0000147	0.00000042 - 0.00000477	WORM-4	4.77E-06	9.63E-07	NA
Metals							
Antimony	3/19	2.04 - 18.6	2.42 - 4.38	SOIL-3	4.38	4.49	1.00
Arsenic	19/19	0.638 - 5.81	5.09 - 35.8	SOIL-13	35.80	8.78	20.00
Barium	19/19	3.83 - 34.9	66.6 - 349	SOIL-3	349.00	168.87	50.00
Beryllium	4/19	0.3828 - 3.487	0.4641 - 2.704	SOIL-14	2.70	0.84	0.40
Cadmium	17/19	0.2552 - 2.325	0.4966 - 5.261	SOIL-3	5.26	1.63	2.00
Chromium (total)	18/19	2.55 - 23.2	15.3 - 67.9	WORM-2	67.90	11.83	30.00
Copper	19/19	2.55 - 23.2	25.7 - 186	SOIL-3	186.00	55.20	40.00
Lead	19/19	0.766 - 6.97	85 - 1030	SOIL-3	1030.00	97.60	100.00
Mercury	12/19	0.088 - 0.922	0.158 - 0.683	WORM-4	0.68	0.21	0.30
Nickel	19/19	1.28 - 11.6	12.2 - 65.4	SOIL-14	65.40	15.34	20.00
Selenium	0/19	2.55 - 23.2	ND	ND	11.60	5.62	0.50
Silver	2/19	0.638 - 5.81	0.716 - 2.11	SOIL-3	2.11	1.40	0.60
Zinc	19/19	12.8 - 116	124 - 833	SOIL-3	833.00	140.23	100.00
Other Parameters							
Cyanide (Total)	0/19	1.3 - 12	ND	ND	6.00	2.93	NA

Summary of Laboratory Analytical Results - Soil (less than or equal to 1 ft depth; Habitat Areas)
Concord Avenue Landfill Site
Belmont, Massachusetts

Notes:

1. Samples were collected by Woods Hole Group, Inc. on the dates indicated.

Semivolatile organic compounds (SVOCs) were analyzed by Alpha Analytical, Inc. of Westborough and Mansfield, Massachusetts, by PAH GC/MS-SIM/8270D-SIM. Dioxins & Furancs by ID HRMS/1613B.

Metals were analyzed by Alpha Analytical, Inc. of Westborough and Mansfield, Massachusetts by EIASOP-INGOPTIMAS0 \$METMS_PE and EIASOP-INGNIPPONHG1 MERCS.

Total cyanide was analyzed by Alpha Analytical by USEPA Method 9010C/9012B.

2. All concentrations are presented in milligrams per kilogram (mg/kg) which are equivalent to parts per million (ppm), unless otherwise noted.

3. Totals concentrations (e.g. Total PAHs) are the sum of the detected concentrations of the relevant analytes.

4. "U" indicates the analyte was not detected above the listed laboratory reporting limit.

"J" indicates an estimated value.

"JI" indicates an estimated value with indeterminate bias.

"J+" and "JH" indicate an estimated value with high bias.

"J-" and "JL" indicate an estimated value with low bias.

"B" indicates a qualified value due to blank contamination.

"D" indicates a concentration from a diluted analysis.

"E" indicates an esitimated value that exceeds the calibration range.

"R" indicates data (non-detects) rejected during validation.

"Dup." indicates the sample is a field duplicate.

A blank cell indicates the parameter was not measured.

5. "USEPA EcoSSLs" are Ecological Soil Screening Levels (<https://www.epa.gov/chemical-research/interim-ecological-soil-screening-level-documents>; downloaded 9/23/2019).

6. "PAHs" are polycyclic aromatic hydrocarbons.

"NS" indicates no value is listed in the source document for this analyte.

"NA" indicates the source document lists as not applicable.

7. Blue shading indicates the lowest value of the USEPA EcoSSLs.

Bold values exceed one or more Soil Criteria.

Table 2-4c COC Selection Analysis - Surface Water

Concord Avenue Landfill

Belmont, MA

Ecological Screening for Chemicals in Surface Water (Concentrations in mg/L unless otherwise noted)						
CHEMICAL	Freq. of Detection	Range of Detection Limits	Range of Detected Conc.	Location of Maximum Detected Conc.	Minimum Screening Value	Freq. Exceeding ESV
MCP Total Metals						
Barium, Total	7/7	0.0005	0.0343 - 0.0627	SW-7	NS	NA
Iron, Total	7/7	0.05	1.02 - 10.6	SW-7	1	7
Lead, Total	6/7	0.001	0.001 - 0.009	SW-2	NS	3
Manganese, Total	7/7	0.001	0.0769 - 1.144	SW-7	NS	NA
Zinc, Total	3/7	0.01	0.012 - 0.031	SW-2	NS	NA
MCP Dissolved Metals						
Barium, Dissolved	7/7	0.0005	0.0275 - 0.0555	SW-1	NS	NA
Iron, Dissolved	7/7	0.05	0.464 - 3.83	SW-7	NS	5
Lead, Dissolved	2/7	0.001	0.001 - 0.009	SW-4	0.0032	1
Manganese, Dissolved	6/7	0.001	0.0012 - 0.2774	SW-7	NS	NA
Zinc, Dissolved	0/7	0.01	ND	NA	0.143	0
MCP General Chemistry						
Cyanide, Free	1/7	0.002	0.002	SW-4	0.0052	NA
Total Hardness	7/7	0.46	49.3 - 103	SW-1		NA

Average Hardness = 126 mg/L

**Summary of Laboratory Analytical Results - Surface Water
Concord Avenue Landfill Site
Belmont, Massachusetts**

Notes:

1. In 2021, samples were collected by Woods Hole Group, Inc. on the dates indicated. Samples collected in 2017 were collected by CDM Smith.
2. All concentrations are presented in micrograms per liter (mg/L) which are equivalent to parts per million (ppm).
3. Total concentrations (e.g., Total Xylenes) are the sum of the detected concentrations of the relevant analytes.
4. "ND" and "U" indicates not detected.
"J" indicates an estimated value.
"Dup." indicates the sample is a field duplicate.
"NS" indicates the parameter was not measured.
5. "USEPA NRWQC" are the US Environmental Protection Agency's National Recommended Water Quality Criteria. Freshwater surface water screening values are used.
6. **Bold** values exceed Surface Water Quality Criteria.

TABLE 3-1a
Exposure Point Concentrations - Sediment
Concord Avenue Landfill Site
Belmont, Massachusetts

CHEMICAL (mg/kg)	Site Sediment	
	Mean	Max
Semivolatile Organic Compounds (SVOCs)		
PAHs		
Acenaphthene	0.05	0.16
Acenaphthylene	0.20	0.66
Anthracene	0.23	0.64
Benzo(a)anthracene	1.13	3.38
Benzo(a)pyrene	1.38	4.00
Benzo(b)fluoranthene	2.00	6.48
Benzo(g,h,i)perylene	1.16	3.90
Benzo(k)fluoranthene	1.07	4.39
Chloronaphthalene (2-)	0.02	0.02
Chrysene	1.53	4.70
Dibenzo(a,h)anthracene	0.33	1.19
Fluoranthene	2.64	9.31
Fluorene	0.09	0.34
Indeno(1,2,3-cd)pyrene	1.20	4.17
Methylnaphthalene (1-)	0.03	0.13
Methylnaphthalene (2-)	0.03	0.12
Naphthalene	0.07	0.18
Phenanthrene	0.96	2.74
Pyrene	2.09	7.30
Low Molecular Weight PAHs	1.64	4.38
High Molecular Weight PAHs	14.54	44.59
Total PAHs	16.18	48.97
Dioxans-Furans		
Dioxin (2,3,7,8-TCDD)	1.50E-06	2.40E-06
Metals		
Antimony	4.16	5.58
Arsenic	17.04	41.80
Barium	201.99	1320.00
Beryllium	0.82	1.70
Cadmium	2.62	7.77
Chromium (total)	32.10	82.90
Copper	90.63	243.00
Lead	245.73	540.00
Mercury	0.28	0.86
Nickel	24.46	65.50
Selenium	5.06	17.65
Silver	1.27	4.42
Zinc	432.31	2260.00
Other Parameters		
Cyanide (Total)	3.49	12.00
Cyanide (Free)	2.69	9.00

TABLE 3-1b
Exposure Point Concentrations - Soil
Concord Avenue Landfill Site
Belmont, Massachusetts

CHEMICAL (mg/kg)	Site Soil	
	Mean	Max
Semivolatile Organic Compounds (SVOCs)		
PAHs		
Acenaphthene	0.04	0.18
Acenaphthylene	0.33	2.61
Anthracene	0.23	1.35
Benzo(a)anthracene	1.11	5.10
Benzo(a)pyrene	1.40	4.77
Benzo(b)fluoranthene	1.69	4.93
Benzo(g,h,i)perylene	1.33	3.72
Benzo(k)fluoranthene	1.08	2.67
Chloronaphthalene (2-)	0.02	0.00
Chrysene	1.33	4.70
Dibenzo(a,h)anthracene	0.35	1.00
Fluoranthene	2.08	5.84
Fluorene	0.06	0.54
Indeno(1,2,3-cd)pyrene	1.28	3.43
Methylnaphthalene (1-)	0.05	0.43
Methylnaphthalene (2-)	0.06	0.37
Naphthalene	0.07	0.32
Phenanthrene	0.78	4.69
Pyrene	1.97	8.70
Low Molecular Weight PAHs	1.64	10.49
High Molecular Weight PAHs	13.62	43.66
Total PAHs	13.89	44.90
Dioxans-Furans		
Dioxin (2,3,7,8-TCDD)	1.62E-06	4.77E-06
Metals		
Antimony	3.93	4.38
Arsenic	17.05	35.80
Barium	171.59	349.00
Beryllium	0.81	2.70
Cadmium	1.89	5.26
Chromium (total)	29.52	67.90
Copper	76.92	186.00
Lead	331.21	1030.00
Mercury	0.31	0.68
Nickel	25.05	65.40
Selenium	4.53	11.60
Silver	1.24	2.11
Zinc	331.26	833.00
Other Parameters		
Cyanide (Free)	2.20	6.00
Cyanide (Total)	2.72	4.90

Bold exceeds MADEP Soil Background

TABLE 3-1c
Exposure Point Concentrations - Surface Water
 Concord Avenue Landfill Site
 Belmont, Massachusetts

CHEMICAL (mg/L)	Updated Surface Water - Site Only	
	Mean	Max.
MCP Total Metals		
Barium, Total	0.05	0.06
Iron, Total	5.10	10.60
Lead, Total	0.003	0.009
Manganese, Total	0.35	1.14
Zinc, Total	0.01	0.03
MCP Dissolved Metals		
Barium, Dissolved	0.04	0.06
Iron, Dissolved	1.69	3.83
Lead, Dissolved	0.002	0.009
Manganese, Dissolved	0.04	0.28
Zinc, Dissolved	<i>0.01</i>	<i>0.01</i>
MCP General Chemistry		
Cyanide, Free	<i>0.001</i>	<i>0.002</i>

Italicised Values are Reporting Limits; Analyte Not Detected

Table 3-2. The incidence of sediment toxicity associated with various ranges of PEC Quotients (0.1 to >5) in the Ingersoll model based on three types of toxicity tests.

Incidence of toxicity based on mean metals, total PAH, and DDE PEC quotients						
Test	<0.1	0.1 - <0.5	0.5 - <1.0	1.0 - <5.0	>1.0	>5.0
<i>H. azteca</i> 10- to 14-d	20%	16%	36%	52%	57%	67%
<i>H. azteca</i> 28- to 42-d	8%	11%	57%	-	91%	-
<i>Chironomus</i> 10- to 14d	20%	19%	33%	44%	51%	64%

Table 3-3
ΣPAH Model for Predicting Sediment Toxicity (Using Mean and Max)
Concord Avenue Landfill
Belmont, MA

All Sediment - Maximum	Sediment Sample Concentration ¹ (ug/kg-oc)	MW (ug/umol)	log K _{ow}	log K _{oc} ²	PAH _{iw} ³ (ug/L)	10-d LC50 _{iw} ² (ug/L)	Toxic Units ⁴
PAHs							
Acenaphthene	1.04E+03	154	4	3.78	1.73E-01	9.70E+02	1.79E-04
Acenaphthylene	4.22E+03	152	3.22	4.00	4.22E-01	4.90E+02	8.62E-04
Anthracene	4.10E+03	178	4.54	4.37	1.75E-01	1.80E+02	9.71E-04
Fluorene	2.20E+03	166	4.21	4.11	1.71E-01	2.70E+02	6.32E-04
Naphthalene	1.16E+03	128	3.36	3.31	5.68E-01	3.50E+03	1.62E-04
Phenanthrene	1.76E+04	178	4.57	4.29	9.01E-01	2.40E+02	3.75E-03
Benzo(a)anthracene	2.17E+04	228	5.67	5.51	6.70E-02	6.60E+00	1.01E-02
Benzo(a)pyrene	2.56E+04	252	6.11	5.94	2.94E-02	1.90E+00	1.55E-02
Benzo(b)fluoranthene	4.15E+04	216	6.27	6.46	1.44E-02	3.80E-01	3.79E-02
Benzo(k)fluoranthene	2.81E+04	252	6.29	6.72	5.36E-03	1.70E-01	3.15E-02
Chrysene	3.01E+04	228	5.71	5.51	9.31E-02	6.60E+00	1.41E-02
Fluoranthene	5.97E+04	202	5.08	5.00	5.97E-01	2.90E+01	2.06E-02
Pyrene	4.68E+04	202	4.92	5.23	2.76E-01	1.40E+01	1.97E-02
Sum of Toxic Units							1.56E-01

Table 3-3
ΣPAH Model for Predicting Sediment Toxicity (Using Mean and Max)
Concord Avenue Landfill
Belmont, MA

All Sediment - <u>Mean</u>	Sediment Sample Concentration ¹ (ug/kg-oc)	MW (ug/umol)	log K _{ow}	log K _{oc} ²	PAH _{iw} ³ (ug/L)	10-d LC50 _{iw} ² (ug/L)	Toxic Units ⁴
PAHs							
Acenaphthene	3.36E+02	154	4	3.78	5.58E-02	9.70E+02	5.75E-05
Acenaphthylene	1.26E+03	152	3.22	4.00	1.26E-01	4.90E+02	2.58E-04
Anthracene	1.49E+03	178	4.54	4.37	6.35E-02	1.80E+02	3.53E-04
Fluorene	5.74E+02	166	4.21	4.11	4.46E-02	2.70E+02	1.65E-04
Naphthalene	4.46E+02	128	3.36	3.31	2.18E-01	3.50E+03	6.23E-05
Phenanthrene	6.15E+03	178	4.57	4.29	3.15E-01	2.40E+02	1.31E-03
Benzo(a)anthracene	7.26E+03	228	5.67	5.51	2.24E-02	6.60E+00	3.40E-03
Benzo(a)pyrene	8.85E+03	252	6.11	5.94	1.02E-02	1.90E+00	5.35E-03
Benzo(b)fluoranthene	1.28E+04	216	6.27	6.46	4.45E-03	3.80E-01	1.17E-02
Benzo(k)fluoranthene	6.88E+03	252	6.29	6.72	1.31E-03	1.70E-01	7.71E-03
Chrysene	9.80E+03	228	5.71	5.51	3.03E-02	6.60E+00	4.59E-03
Fluoranthene	1.69E+04	202	5.08	5.00	1.69E-01	2.90E+01	5.83E-03
Pyrene	1.34E+04	202	4.92	5.23	7.90E-02	1.40E+01	5.65E-03
Sum of Toxic Units							4.64E-02

Notes:

¹Sediment Concentration (mg/kg-oc) = (mg-chemical/kg dry wt sed)/(kg-organic carbon/kg dry wt sediment).

²Values for log K_{oc} and 10-d LC50_{iw} are from Swartz et al. (1995)

³PAH_{iw} = Sediment Concentration (mg/kg-oc) / K_{oc}

⁴Toxic Unit = PAH_{iw} / 10-d LC50_{iw}

Reference: Swartz et al., 1995.

Table 3-4
PEC Quotient Model
Concord Avenue Landfill
Belmont, MA

All Site Sediment Data (2017 & 2021)

			Maximum PEC		Mean PEC		SED-1 PEC		SED-2 PEC		SED-3 PEC		SED-4 PEC		SED-5 PEC		SED-6 PEC	
			Result	Quotient	Result	Quotient	Result	Quotient	Result	Quotient	Result	Quotient	Result	Quotient	Result	Quotient	Result	Quotient
Analyte	PEC	Units																
Acenaphthene	NA		163		51.0		145		90		57.5		34.2		44		163	
Acenaphthylene	NA	ug/kg	659		190.8		351		279		488		242		160		366	
Anthracene	845	ug/kg	639	7.56E-01	224.8	2.66E-01	639	7.56E-01	469	5.55E-01	627	7.42E-01	189	2.24E-01	278	3.29E-01	491	5.81E-01
Benzo(a)anthracene	1050	ug/kg	3380	3.22E+00	1096.3	1.04E+00	3380	3.22E+00	2770	2.64E+00	2500	2.38E+00	1040	9.90E-01	1560	1.49E+00	2090	1.99E+00
Benzo(a)pyrene	1450	ug/kg	4000	2.76E+00	1337.4	9.22E-01	3970	2.74E+00	3570	2.46E+00	4000	2.76E+00	1590	1.10E+00	1470	1.01E+00	1850	1.28E+00
Benzo(b)fluoranthene	NA	ug/kg	6480		1939.4		5420		5100		6480		2500		1720		2410	
Benzo(g,h,i)perylene	NA	ug/kg	3900		1126.9		3180		3300		3900		1830		1040		1720	
Benzo(k)fluoranthene	NA	ug/kg	4390		1039.5		2880		2850		4390		1370		1200		1610	
Chrysene	1290	ug/kg	4700	3.64E+00	1481.1	1.15E+00	4700	3.64E+00	4260	3.30E+00	4560	3.53E+00	1710	1.33E+00	1510	1.17E+00	1940	1.50E+00
Dibenzo(a,h)anthracene	NA	ug/kg	1190		319.7		1020		990		1190		496		370		512	
Fluoranthene	2230	ug/kg	9310	4.17E+00	2556.2	1.15E+00	9310	4.17E+00	7820	3.51E+00	6130	2.75E+00	2530	1.13E+00	2860	1.28E+00	4330	1.94E+00
Fluorene	536	ug/kg	343	6.40E-01	87.2	1.63E-01	343	6.40E-01	189	3.53E-01	94.9	1.77E-01	43.7	8.15E-02	80.6	1.50E-01	273	5.09E-01
Indeno(1,2,3-cd)pyrene	NA	ug/kg	4170		1162.9		3430		3170		4170		1800		1040		1560	
Methylnaphthalene (1-)	NA	ug/kg	131		32.7		43.6		0		31.2		31.1		61.6		131	
Methylnaphthalene (2-)	NA	ug/kg	123		31.8		43.6		ND		ND				ND		ND	
Naphthalene	561	ug/kg	181	3.23E-01	68.7	1.22E-01	75.5	1.35E-01	55.2	9.84E-02	76.2	1.36E-01	67.4	1.20E-01	106	1.89E-01	181	3.23E-01
Phenanthrene	1170	ug/kg	2740	2.34E+00	929.4	7.94E-01	2740	2.34E+00	2540	2.17E+00	1580	1.35E+00	691	5.91E-01	916	7.83E-01	2060	1.76E+00
Pyrene	1520	ug/kg	7300	4.80E+00	2027.8	1.33E+00	7300	4.80E+00	5920	3.89E+00	4570	3.01E+00	2190	1.44E+00	2320	1.53E+00	3640	2.39E+00
2,3,7,8-TCDD (Dioxin)	NA	ug/kg	0.0015		0.0		ND		ND		ND				ND		ND	
Antimony	NA	mg/kg	14.1		4.1		ND		ND		ND		ND		ND		ND	
Arsenic	33	mg/kg	41.8	1.27E+00	16.8	5.09E-01	11.2	3.39E-01	13.5	4.09E-01	41.8	1.27E+00	29.8	9.03E-01	17.8	5.39E-01	21.4	6.48E-01
Barium	NA	mg/kg	1320		201.7		70.7		86.6		312		232		153		207	
Beryllium	NA	mg/kg	2.648		0.8		ND		ND		ND		ND		ND		ND	
Cadmium	4.98	mg/kg	7.772	1.56E+00	2.6	5.22E-01	1.66	3.33E-01	1.548	3.11E-01	5.064	1.02E+00	ND		3.057	6.14E-01	4.217	8.47E-01
Chromium (total)	111	mg/kg	82.9	7.47E-01	31.6	2.84E-01	27.7	2.50E-01	34.9	3.14E-01	82.9	7.47E-01	38.8	3.50E-01	15.1	1.36E-01	20.5	1.85E-01
Copper	149	mg/kg	243	1.63E+00	89.6	6.01E-01	61.9	4.15E-01	57.4	3.85E-01	198	1.33E+00	101	6.78E-01	49.7	3.34E-01	62.4	4.19E-01
Lead	128	mg/kg	540	4.22E+00	240.5	1.88E+00	130	1.02E+00	82	6.41E-01	451	3.52E+00	321	2.51E+00	186	1.45E+00	335	2.62E+00
Mercury	1.06	mg/kg	0.86	8.11E-01	0.3	2.56E-01	ND		ND		ND		ND		ND		ND	
Nickel	48.6	mg/kg	65.5	1.35E+00	24.3	4.99E-01	15.3	3.15E-01	15.3	3.15E-01	41.3	8.50E-01	26.2	5.39E-01	15.6	3.21E-01	19.7	4.05E-01
Selenium	NA	mg/kg	17.65		5.1		ND		ND		ND		ND		ND		ND	
Silver	NA	mg/kg	4.415		1.3		ND		ND		ND		ND		ND		ND	
Zinc	459	mg/kg	2260	4.92E+00	425.2	9.26E-01	257	5.60E-01	257	5.60E-01	587	1.28E+00	381	8.30E-01	287	6.25E-01	399	8.69E-01
Cyanide (total)	NA	mg/kg	12		6.7		NA		NA		NA		NA		NA		NA	
Cyanide (free)	NA	mg/kg	0		0.0		ND		ND		ND		ND		ND		ND	
Mean PEC Quotient ²			2.30		0.73		1.60		1.37		1.68		0.85		0.75		1.14	
Probability of toxicity																		
<i>H. azteca</i> 10- to 14-day tests			57%		36%		57%		57%		57%		36%		36%		57%	
<i>H. azteca</i> 28- to 42-day tests			91%		57%		91%		91%		91%		57%		57%		91%	
<i>Chironomous</i> spp. 10- to 14-day tests			51%		33%		51%		51%		51%		33%		33%		51%	

Notes:
1. PEC not available for indeno(1,2,3-cd)Pyrene, Dibenzo(a,h)anthracene, Benzo(g,h,i)perylene, barium, iron, manganese, selenium, or sodium.
2. Mean PEC Quotient utilizes only reliable PECs (>20 samples and >75% correct calculation as toxic). Mercury is not a reliable PEC. All COCs here have reliable PECs
Source:
Ingersol, C.G., D.D. MacDonald, N. Wang, J.L. Crane, L.J. Field, P.S. Haverland, N.E. Kemble, R.A. Lindscoog, C. Severn and D.E. Smorong. 2000.

Table 3-4
PEC Quotient Model
Concord Avenue Landfill
Belmont, MA

All Site Sediment Data (2017 & 2021)

			Maximum PEC		Mean PEC		SED-7 PEC		SED-8 PEC		SED-9 PEC		SED-10 PEC		SED-11 PEC		SED-12 PEC		SED-PHI-1 PEC		SED-PHI-2 PEC	
			Result	Quotient	Result	Quotient	Result	Quotient	Result	Quotient	Result	Quotient	Result	Quotient	Result	Quotient	Result	Quotient	Result	Quotient	Result	Quotient
Analyte	PEC	Units																				
Acenaphthene	NA		163		51.0		59.4		143		48.3		28.5		43.3		47.2		ND		130	
Acenaphthylene	NA	ug/kg	659		190.8		62.3		395		116		256		332		659		36		300	
Anthracene	845	ug/kg	639	7.56E-01	224.8	2.66E-01	104	1.23E-01	412	4.88E-01	197	2.33E-01	164	1.94E-01	229	2.71E-01	361	4.27E-01	30	3.55E-02	480	5.68E-01
Benzo(a)anthracene	1050	ug/kg	3380	3.22E+00	1096.3	1.04E+00	412	3.92E-01	2650	2.52E+00	636	6.06E-01	880	8.38E-01	1090	1.04E+00	1940	1.85E+00	74	7.05E-02	2400	2.29E+00
Benzo(a)pyrene	1450	ug/kg	4000	2.76E+00	1337.4	9.22E-01	406	2.80E-01	2620	1.81E+00	705	4.86E-01	1100	7.59E-01	1500	1.03E+00	2440	1.68E+00	95	6.55E-02	3000	2.07E+00
Benzo(b)fluoranthene	NA	ug/kg	6480		1939.4		441		4340		829		1360		1910		3580		180		5200	
Benzo(g,h,i)perylene	NA	ug/kg	3900		1126.9		336		2620		603		1040		1380		2330		48		1400	
Benzo(k)fluoranthene	NA	ug/kg	4390		1039.5		348		1720		564		928		1190		1990		55		1700	
Chrysene	1290	ug/kg	4700	3.64E+00	1481.1	1.15E+00	446	3.46E-01	2680	2.08E+00	791	6.13E-01	1030	7.98E-01	1300	1.01E+00	2300	1.78E+00	150	1.16E-01	3600	2.79E+00
Dibenzo(a,h)anthracene	NA	ug/kg	1190		319.7		120		776		167		309		419		692		ND		440	
Fluoranthene	2230	ug/kg	9310	4.17E+00	2556.2	1.15E+00	756	3.39E-01	5030	2.26E+00	1470	6.59E-01	1670	7.49E-01	2120	9.51E-01	3370	1.51E+00	240	1.08E-01	5100	2.29E+00
Fluorene	536	ug/kg	343	6.40E-01	87.2	1.63E-01	42.3	7.89E-02	141	2.63E-01	113	2.11E-01	47.3	8.82E-02	56.2	1.05E-01	56.9	1.06E-01	ND		300	5.60E-01
Indeno(1,2,3-cd)pyrene	NA	ug/kg	4170		1162.9		334		2780		593		1040		1410		2450		60		1700	
Methylnaphthalene (1-)	NA	ug/kg	131		32.7		28.4		70.5		39.6		33.8		37.3		45.3		ND		ND	
Methylnaphthalene (2-)	NA	ug/kg	123		31.8		49.2		16.5		62.1		ND		ND		ND		ND		ND	
Naphthalene	561	ug/kg	181	3.23E-01	68.7	1.22E-01	39.2	6.99E-02	134	2.39E-01	82.3	1.47E-01	80.4	1.43E-01	92.5	1.65E-01	110	1.96E-01	67	1.19E-01	66	1.18E-01
Phenanthrene	1170	ug/kg	2740	2.34E+00	929.4	7.94E-01	367	3.14E-01	2000	1.71E+00	822	7.03E-01	528	4.51E-01	677	5.79E-01	899	7.68E-01	140	1.20E-01	2500	2.14E+00
Pyrene	1520	ug/kg	7300	4.80E+00	2027.8	1.33E+00	621	4.09E-01	4140	2.72E+00	1300	8.55E-01	1540	1.01E+00	1760	1.16E+00	2870	1.89E+00	200	1.32E-01	4400	2.89E+00
2,3,7,8-TCDD (Dioxin)	NA	ug/kg	0.0015		0.0		ND		ND		ND		ND		ND		ND		ND		1.3000	
Antimony	NA	mg/kg	14.1		4.1		5.58		ND		ND		ND		ND		ND		ND		ND	
Arsenic	33	mg/kg	41.8	1.27E+00	16.8	5.09E-01	7.73	2.34E-01	19.9	6.03E-01	10.7	3.24E-01	13.2	4.00E-01	18.9	5.73E-01	29.3	8.88E-01	26	7.88E-01	9.4	2.85E-01
Barium	NA	mg/kg	1320		201.7		191		226		116		559		1320		387		35		77	
Beryllium	NA	mg/kg	2.648		0.8		ND		ND		ND		ND		ND		ND		ND		ND	
Cadmium	4.98	mg/kg	7.772	1.56E+00	2.6	5.22E-01	7.772	1.56E+00	3.028	6.08E-01	0.896	1.80E-01	3.044	6.11E-01	5.756	1.16E+00	6.85	1.38E+00	ND		1.6	3.21E-01
Chromium (total)	111	mg/kg	82.9	7.47E-01	31.6	2.84E-01	14.6	1.32E-01	47.7	4.30E-01	9.89	8.91E-02	33.5	3.02E-01	34.1	3.07E-01	39.8	3.59E-01	20	1.80E-01	35	3.15E-01
Copper	149	mg/kg	243	1.63E+00	89.6	6.01E-01	57.6	3.87E-01	111	7.45E-01	26	1.74E-01	184	1.23E+00	243	1.63E+00	156	1.05E+00	52	3.49E-01	62	4.16E-01
Lead	128	mg/kg	540	4.22E+00	240.5	1.88E+00	447	3.49E+00	246	1.92E+00	112	8.75E-01	375	2.93E+00	540	4.22E+00	248	1.94E+00	110	8.59E-01	100	7.81E-01
Mercury	1.06	mg/kg	0.86	8.11E-01	0.3	2.56E-01	0.217	2.05E-01	ND		ND		ND		ND		ND		ND		0.213	2.01E-01
Nickel	48.6	mg/kg	65.5	1.35E+00	24.3	4.99E-01	17.6	3.62E-01	27.4	5.64E-01	8.02	1.65E-01	43	8.85E-01	65.5	1.35E+00	44.4	9.14E-01	15	3.09E-01	18	3.70E-01
Selenium	NA	mg/kg	17.65		5.1		ND		ND		ND		ND		ND		ND		ND		ND	
Silver	NA	mg/kg	4.415		1.3		ND		ND		ND		ND		ND		ND		ND		ND	
Zinc	459	mg/kg	2260	4.92E+00	425.2	9.26E-01	586	1.28E+00	549	1.20E+00	132	2.88E-01	830	1.81E+00	2260	4.92E+00	1060	2.31E+00	50	1.09E-01	300	6.54E-01
Cyanide (total)	NA	mg/kg	12		6.7		NA		NA		NA		NA		NA		NA		ND		ND	
Cyanide (free)	NA	mg/kg	0		0.0		ND		ND		ND		ND		ND		ND		NA		NA	
Mean PEC Quotient ²			2.30		0.73		0.59		1.26		0.41		0.83		1.28		1.19		0.24		1.12	
Probability of toxicity																						
<i>H. azteca</i> 10- to 14-day tests			57%		36%		36%		57%		16%		36%		57%		57%		16%		57%	
<i>H. azteca</i> 28- to 42-day tests			91%		57%		57%		91%		11%		57%		91%		91%		11%		91%	
<i>Chironomous</i> spp. 10- to 14-day tests			51%		33%		33%		51%		19%		33%		51%		51%		19%		51%	

Notes:

1. PEC not available for indeno(1,2,3-cd)Pyrene, Dibenzo(a,h)anthracene, Benzo(g,h,i)perylene, barium, iron, manganese, selenium, or sodium.
2. Mean PEC Quotient utilizes only reliable PECs (>20 samples and >75% correct calculation as toxic). Mercury is not a reliable PEC. All COCs here have reliable PECs

Source:

Ingersol, C.G., D.D. MacDonald, N. Wang, J.L. Crane, L.J. Field, P.S. Haverland, N.E. Kemble, R.A. Lindskoog, C. Severn and D.E. Smorong. 2000.

Table 3-4
PEC Quotient Model
Concord Avenue Landfill
Belmont, MA

All Site Sediment Data (2017 & 2021)

			Maximum PEC		Mean PEC		SED-PHI-3 PEC		SED-PHI-4 PEC		SED-PHI-5 PEC		SED-PHI-6 PEC		SED-PHI-7 PEC		DUP-1 PEC		SED-PHI-8 PEC		SED-PHI-9 PEC	
			Result	Quotient	Result	Quotient	Result	Quotient	Result	Quotient	Result	Quotient	Result	Quotient	Result	Quotient	Result	Quotient	Result	Quotient	Result	Quotient
Analyte	PEC	Units																				
Acenaphthene	NA		163		51.0		ND		ND		ND		ND		58		44		44		ND	
Acenaphthylene	NA	ug/kg	659		190.8		82		72		82		130		190		150		68		ND	
Anthracene	845	ug/kg	639	7.56E-01	224.8	2.66E-01	91	1.08E-01	82	9.70E-02	73	8.64E-02	110	1.30E-01	220	2.60E-01	180	2.13E-01	66	7.81E-02	ND	
Benzo(a)anthracene	1050	ug/kg	3380	3.22E+00	1096.3	1.04E+00	320	3.05E-01	270	2.57E-01	240	2.29E-01	670	6.38E-01	880	8.38E-01	580	5.52E-01	220	2.10E-01	31	2.95E-02
Benzo(a)pyrene	1450	ug/kg	4000	2.76E+00	1337.4	9.22E-01	430	2.97E-01	330	2.28E-01	280	1.93E-01	1000	6.90E-01	1300	8.97E-01	740	5.10E-01	350	2.41E-01	33	2.28E-02
Benzo(b)fluoranthene	NA	ug/kg	6480		1939.4		740		560		420		1900		2500		1300		660		43	
Benzo(g,h,i)perylene	NA	ug/kg	3900		1126.9		280		230		210		520		580		430		200		24	
Benzo(k)fluoranthene	NA	ug/kg	4390		1039.5		250		190		150		650		830		440		210		16	
Chrysene	1290	ug/kg	4700	3.64E+00	1481.1	1.15E+00	520	4.03E-01	410	3.18E-01	340	2.64E-01	1100	8.53E-01	1600	1.24E+00	1000	7.75E-01	440	3.41E-01	32	2.48E-02
Dibenzo(a,h)anthracene	NA	ug/kg	1190		319.7		74		61		53		160		170		120		57		14	
Fluoranthene	2230	ug/kg	9310	4.17E+00	2556.2	1.15E+00	860	3.86E-01	620	2.78E-01	510	2.29E-01	1600	7.17E-01	2600	1.17E+00	1600	7.17E-01	750	3.36E-01	63	2.83E-02
Fluorene	536	ug/kg	343	6.40E-01	87.2	1.63E-01	31	5.78E-02	24	4.48E-02	31	5.78E-02	72	1.34E-01	77	1.44E-01	75	1.40E-01	44	8.21E-02	14	2.61E-02
Indeno(1,2,3-cd)pyrene	NA	ug/kg	4170		1162.9		320		250		220		660		720		490		240		27	
Methylnaphthalene (1-)	NA	ug/kg	131		32.7		ND		ND		ND		ND		ND		ND		ND		ND	
Methylnaphthalene (2-)	NA	ug/kg	123		31.8		ND		ND		ND		ND		43		31		ND		ND	
Naphthalene	561	ug/kg	181	3.23E-01	68.7	1.22E-01	48	8.56E-02	36	6.42E-02	27	4.81E-02	ND		99	1.76E-01	67	1.19E-01	64	1.14E-01	ND	
Phenanthrene	1170	ug/kg	2740	2.34E+00	929.4	7.94E-01	410	3.50E-01	290	2.48E-01	270	2.31E-01	640	5.47E-01	1200	1.03E+00	770	6.58E-01	300	2.56E-01	35	2.99E-02
Pyrene	1520	ug/kg	7300	4.80E+00	2027.8	1.33E+00	720	4.74E-01	530	3.49E-01	470	3.09E-01	1300	8.55E-01	2200	1.45E+00	1300	8.55E-01	630	4.14E-01	53	3.49E-02
2,3,7,8-TCDD (Dioxin)	NA	ug/kg	0.0015		0.0		ND		2.4000		ND		ND		1.3000		1.2000		1.3000		ND	
Antimony	NA	mg/kg	14.1		4.1		ND		ND		ND		ND		ND		ND		ND		ND	
Arsenic	33	mg/kg	41.8	1.27E+00	16.8	5.09E-01	26	7.88E-01	29	8.79E-01	15	4.55E-01	26	7.88E-01	17	5.15E-01	9.8	2.97E-01	15	4.55E-01	5.4	1.64E-01
Barium	NA	mg/kg	1320		201.7		160		180		100		110		150		79		130		54	
Beryllium	NA	mg/kg	2.648		0.8		1.1		ND		ND		ND		ND		ND		ND		ND	
Cadmium	4.98	mg/kg	7.772	1.56E+00	2.6	5.22E-01	3.3	6.63E-01	4.9	9.84E-01	2.3	4.62E-01	1.8	3.61E-01	2	4.02E-01	1.1	2.21E-01	2.4	4.82E-01	0.46	9.24E-02
Chromium (total)	111	mg/kg	82.9	7.47E-01	31.6	2.84E-01	72	6.49E-01	44	3.96E-01	30	2.70E-01	58	5.23E-01	44	3.96E-01	24	2.16E-01	22	1.98E-01	11	9.91E-02
Copper	149	mg/kg	243	1.63E+00	89.6	6.01E-01	140	9.40E-01	120	8.05E-01	82	5.50E-01	110	7.38E-01	92	6.17E-01	47	3.15E-01	63	4.23E-01	22	1.48E-01
Lead	128	mg/kg	540	4.22E+00	240.5	1.88E+00	360	2.81E+00	400	3.13E+00	360	2.81E+00	290	2.27E+00	200	1.56E+00	120	9.38E-01	230	1.80E+00	37	2.89E-01
Mercury	1.06	mg/kg	0.86	8.11E-01	0.3	2.56E-01	0.86	8.11E-01	0.454	4.28E-01	0.351	3.31E-01	0.463	4.37E-01	0.272	2.57E-01	0.134	1.26E-01	ND		ND	
Nickel	48.6	mg/kg	65.5	1.35E+00	24.3	4.99E-01	40	8.23E-01	27	5.56E-01	22	4.53E-01	28	5.76E-01	27	5.56E-01	14	2.88E-01	18	3.70E-01	11	2.26E-01
Selenium	NA	mg/kg	17.65		5.1		ND		ND		ND		ND		ND		ND		ND		ND	
Silver	NA	mg/kg	4.415		1.3		ND		ND		ND		ND		ND		ND		ND		ND	
Zinc	459	mg/kg	2260	4.92E+00	425.2	9.26E-01	650	1.42E+00	610	1.33E+00	330	7.19E-01	320	6.97E-01	360	7.84E-01	190	4.14E-01	260	5.66E-01	93	2.03E-01
Cyanide (total)	NA	mg/kg	12		6.7		5.2		ND		ND		12		5.3		4.2		ND		ND	
Cyanide (free)	NA	mg/kg	0		0.0		NA		NA		NA		NA		NA		NA		NA		NA	
Mean PEC Quotient ²			2.30		0.73		0.67		0.61		0.45		0.68		0.72		0.43		0.40		0.10	
Probability of toxicity																						
<i>H. azteca</i> 10- to 14-day tests			57%		36%		36%		36%		16%		36%		36%		16%		16%		16%	
<i>H. azteca</i> 28- to 42-day tests			91%		57%		57%		57%		11%		57%		57%		11%		11%		11%	
<i>Chironomous</i> spp. 10- to 14-day tests			51%		33%		33%		33%		19%		33%		33%		19%		19%		19%	

Notes:

1. PEC not available for indeno(1,2,3-cd)Pyrene, Dibenz(a,h)anthracene, Benzo(g,h,i)perylene, barium, iron, manganese, selenium, or sodium.
2. Mean PEC Quotient utilizes only reliable PECs (>20 samples and >75% correct calculation as toxic). Mercury is not a reliable PEC. All COCs here have reliable PECs

Source:

Ingersol, C.G., D.D. MacDonald, N. Wang, J.L. Crane, L.J. Field, P.S. Haverland, N.E. Kemble, R.A. Lindskoog, C. Severn and D.E. Smorong. 2000.

Table 3-4
PEC Quotient Model
Concord Avenue Landfill
Belmont, MA

All Site Sediment Data (2017 & 2021)

			Maximum PEC		Mean PEC		SED-PHI-10 PEC		Tox-1 PEC		Tox-2 PEC		Tox-3 PEC		Tox-3-Dup PEC		Tox-4 PEC		Tox-5 PEC		Tox-6 PEC	
			Result	Quotient	Result	Quotient	Result	Quotient	Result	Quotient	Result	Quotient	Result	Quotient	Result	Quotient	Result	Quotient	Result	Quotient	Result	Quotient
Analyte	PEC	Units																				
Acenaphthene	NA		163		51.0		ND		74.4		39.7		34.6		20.8		26.5		50.8		ND	
Acenaphthylene	NA	ug/kg	659		190.8		ND		208		254		115		94.3		131		81.3		ND	
Anthracene	845	ug/kg	639	7.56E-01	224.8	2.66E-01	22	2.60E-02	367	4.34E-01	244	2.89E-01	118	1.40E-01	91.6	1.08E-01	116	1.37E-01	273	3.23E-01	13	1.54E-02
Benzo(a)anthracene	1050	ug/kg	3380	3.22E+00	1096.3	1.04E+00	53	5.05E-02	2350	2.24E+00	1510	1.44E+00	456	4.34E-01	329	3.13E-01	645	6.14E-01	850	8.10E-01	62.8	5.98E-02
Benzo(a)pyrene	1450	ug/kg	4000	2.76E+00	1337.4	9.22E-01	54	3.72E-02	2840	1.96E+00	2070	1.43E+00	498	3.43E-01	354	2.44E-01	710	4.90E-01	741	5.11E-01	76.1	5.25E-02
Benzo(b)fluoranthene	NA	ug/kg	6480		1939.4		74		3380		2830		468		310		807		613		108	
Benzo(g,h,i)perylene	NA	ug/kg	3900		1126.9		40		2540		2060		394		274		713		507		78.3	
Benzo(k)fluoranthene	NA	ug/kg	4390		1039.5		29		2250		1570		385		289		552		518		62.3	
Chrysene	1290	ug/kg	4700	3.64E+00	1481.1	1.15E+00	58	4.50E-02	3240	2.51E+00	2200	1.71E+00	570	4.42E-01	404	3.13E-01	743	5.76E-01	699	5.42E-01	100	7.75E-02
Dibenzo(a,h)anthracene	NA	ug/kg	1190		319.7		18		488		429		97.3		68.3		146		107		16.5	
Fluoranthene	2230	ug/kg	9310	4.17E+00	2556.2	1.15E+00	130	5.83E-02	6570	2.95E+00	4260	1.91E+00	991	4.44E-01	641	2.87E-01	849	3.81E-01	1760	7.89E-01	147	6.59E-02
Fluorene	536	ug/kg	343	6.40E-01	87.2	1.63E-01	18	3.36E-02	133	2.48E-01	75.6	1.41E-01	68.1	1.27E-01	47.3	8.82E-02	31	5.78E-02	63.6	1.19E-01	18.9	3.53E-02
Indeno(1,2,3-cd)pyrene	NA	ug/kg	4170		1162.9		46		2480		2010		387		267		663		500		71	
Methylnaphthalene (1-)	NA	ug/kg	131		32.7		ND		21.1		23.1		78		59		24.8		15		24.3	
Methylnaphthalene (2-)	NA	ug/kg	123		31.8		ND		22.1		31		123		95.1		44.8		15.6		35.5	
Naphthalene	561	ug/kg	181	3.23E-01	68.7	1.22E-01	ND		49.3	8.79E-02	62.4	1.11E-01	104	1.85E-01	75.7	1.35E-01	66.1	1.18E-01	32.4	5.78E-02	44	7.84E-02
Phenanthrene	1170	ug/kg	2740	2.34E+00	929.4	7.94E-01	93	7.95E-02	2070	1.77E+00	1100	9.40E-01	569	4.86E-01	394	3.37E-01	322	2.75E-01	884	7.56E-01	74.1	6.33E-02
Pyrene	1520	ug/kg	7300	4.80E+00	2027.8	1.33E+00	100	6.58E-02	4400	2.89E+00	2690	1.77E+00	795	5.23E-01	557	3.66E-01	825	5.43E-01	1380	9.08E-01	112	7.37E-02
2,3,7,8-TCDD (Dioxin)	NA	ug/kg	0.0015		0.0		ND		ND		ND		ND		ND		ND		ND		ND	
Antimony	NA	mg/kg	14.1		4.1		ND		ND		ND		ND		ND		ND		ND		ND	
Arsenic	33	mg/kg	41.8	1.27E+00	16.8	5.09E-01	5.2	1.58E-01	11.8	3.58E-01	26.8	8.12E-01	9.9	3.00E-01	12.3	3.73E-01	11.1	3.36E-01	3.33	1.01E-01	9.68	2.93E-01
Barium	NA	mg/kg	1320		201.7		81		98.8		185		98.6		126		285		47.9		193	
Beryllium	NA	mg/kg	2.648		0.8		ND		ND		ND		ND		ND		1.696		ND		ND	
Cadmium	4.98	mg/kg	7.772	1.56E+00	2.6	5.22E-01	0.85	1.71E-01	1.787	3.59E-01	3.202	6.43E-01	1.196	2.40E-01	1.302	2.61E-01	2.586	5.19E-01	0.4514	9.06E-02	1.861	3.74E-01
Chromium (total)	111	mg/kg	82.9	7.47E-01	31.6	2.84E-01	6.7	6.04E-02	36.2	3.26E-01	57.5	5.18E-01	12.2	1.10E-01	14.9	1.34E-01	35.4	3.19E-01	8.47	7.63E-02	15.8	1.42E-01
Copper	149	mg/kg	243	1.63E+00	89.6	6.01E-01	25	1.68E-01	63.4	4.26E-01	123	8.26E-01	41.4	2.78E-01	49.9	3.35E-01	162	1.09E+00	65.7	4.41E-01	58.3	3.91E-01
Lead	128	mg/kg	540	4.22E+00	240.5	1.88E+00	36	2.81E-01	95.2	7.44E-01	397	3.10E+00	124	9.69E-01	167	1.30E+00	487	3.80E+00	140	1.09E+00	89.3	6.98E-01
Mercury	1.06	mg/kg	0.86	8.11E-01	0.3	2.56E-01	ND		ND		0.371	3.50E-01	0.265	2.50E-01	0.249	2.35E-01	0.398	3.75E-01	ND		ND	
Nickel	48.6	mg/kg	65.5	1.35E+00	24.3	4.99E-01	7.9	1.63E-01	18.8	3.87E-01	34	7.00E-01	13.5	2.78E-01	16.4	3.37E-01	48.7	1.00E+00	10.6	2.18E-01	18.5	3.81E-01
Selenium	NA	mg/kg	17.65		5.1		ND		ND		ND		ND		ND		ND		ND		ND	
Silver	NA	mg/kg	4.415		1.3		ND		ND		ND		ND		ND		ND		ND		ND	
Zinc	459	mg/kg	2260	4.92E+00	425.2	9.26E-01	130	2.83E-01	325	7.08E-01	468	1.02E+00	139	3.03E-01	172	3.75E-01	426	9.28E-01	129	2.81E-01	219	4.77E-01
Cyanide (total)	NA	mg/kg	12		6.7		ND		NA		NA		NA		NA		NA		NA		NA	
Cyanide (free)	NA	mg/kg	0		0.0		NA		ND		ND		ND		ND		ND		ND		ND	
Mean PEC Quotient ²			2.30		0.73		0.11		1.15		1.04		0.34		0.33		0.68		0.44		0.20	
Probability of toxicity																						
<i>H. azteca</i> 10- to 14-day tests			57%		36%		16%		57%		57%		16%		16%		36%		16%		16%	
<i>H. azteca</i> 28- to 42-day tests			91%		57%		11%		91%		91%		11%		11%		57%		11%		11%	
<i>Chironomous</i> spp. 10- to 14-day tests			51%		33%		19%		51%		51%		19%		19%		33%		19%		19%	

Notes:

1. PEC not available for indeno(1,2,3-cd)Pyrene, Dibenzo(a,h)anthracene, Benzo(g,h,i)perylene, barium, iron, manganese, selenium, or sodium.
2. Mean PEC Quotient utilizes only reliable PECs (>20 samples and >75% correct calculation as toxic). Mercury is not a reliable PEC. All COCs here have reliable PECs

Source:

Ingersol, C.G., D.D. MacDonald, N. Wang, J.L. Crane, L.J. Field, P.S. Haverland, N.E. Kemble, R.A. Lindskoog, C. Severn and D.E. Smorong. 2000.

Table 3-5
Narcosis Model Results
Molar Concentrations of Organic Chemicals
in mM/Kg Invertebrate
Concord Avenue Landfill
Belmont, MA

Molecular Weight (mg/mM)	Chemicals (mg/kg, wet weight)	Average Benthic Invertebrate Concentration	Average Molar Concentration (mM/kg)	Maximum Benthic Invertebrate Concentration	Maximum Molar Concentration (mM/kg)
142.2	1-Methylnaphthalene	ND	ND	ND	ND
162.6	2-Chloronaphthalene	ND	ND	ND	ND
142.2	2-Methylnaphthalene	ND	ND	ND	ND
152.2	Acenaphthylene	1.59E-03	1.04E-05	5.30E-03	3.48E-05
154.21	Acenaphthene	1.65E-02	1.07E-04	5.14E-02	3.33E-04
178.2	Anthracene	2.80E-02	1.57E-04	7.71E-02	4.33E-04
252.32	Benzo(e)pyrene	ND	ND	ND	ND
228.29	Benzo(a)anthracene	4.92E-02	2.15E-04	1.47E-01	6.43E-04
252.31	Benzo(a)pyrene	4.00E-02	1.59E-04	1.16E-01	4.59E-04
252.32	Benzo(b)fluoranthene	1.13E-01	4.47E-04	3.65E-01	1.45E-03
276.34	Benzo(g,h,i)perylene	5.43E-02	1.96E-04	1.82E-01	6.59E-04
252.32	Benzo(k)fluoranthene	5.18E-02	2.05E-04	2.12E-01	8.40E-04
228.29	Chrysene	1.23E-01	5.39E-04	3.78E-01	1.66E-03
278.35	Dibenzo(a,h)anthracene	2.18E-02	7.83E-05	7.85E-02	2.82E-04
202.26	Fluoranthene	2.00E-01	9.87E-04	7.04E-01	3.48E-03
166.2	Fluorene	3.16E-02	1.90E-04	1.21E-01	7.27E-04
276.23	Indeno(1,2,3-cd)pyrene	5.22E-02	1.89E-04	1.81E-01	6.56E-04
128.19	Naphthalene	2.36E-02	1.84E-04	6.15E-02	4.79E-04
178.2	Phenanthrene	2.73E-01	1.53E-03	7.80E-01	4.38E-03
202.26	Pyrene	2.56E-01	1.27E-03	8.93E-01	4.41E-03
321.97	Dioxin (2,3,7,8-TCDD)	3.69E-05	1.15E-07	5.79E-05	1.80E-07
	Total Molar Concentration:		6.46E-03		2.09E-02
	Narcosis TRV:	0.2 to 0.8 mM/kg wet weight			
	Hazard Quotients:	0.0081 to 0.0323		0.0262 to 0.1046	

Notes:

ND = Not Detected

Molar Concentration = Invertebrate Concentration / Molecular Weight

Table 3-6. H. Azteca 42-day Sediment Toxicity Test Results

Concord Avenue Landfill

Belmont, MA

TOXICITY SUMMARY REPORT:

100.4 Amphipod, H. azteca, 42-D Survival, Growth, and Reproduction Test									
Species: <i>Hyalella azteca</i>			Reference: EPA/600/R-99/064			SOP: SED-A-003			
Test Start:			1/6/2022 3:25:00 PM			Test End: 2/17/2022 12:00:00 PM			
Sample Identification		Percent Survival (%)			Growth (mg)		Biomass (mg)		Repro. (#/F)
		DAY 28	DAY 35	DAY 42	DAY 28	DAY 42	DAY 28	DAY 42	DAY 42
53040	CTRL (Natural Sediment)	83.3	76.3	73.8	0.347 ^c	0.536 ^c	0.292 ^c	0.387 ^c	4.32 ^c
53041	TOX - 4	93.3	88.8	70.0 ^c	0.327 ^c	0.426 ^{abc}	0.302 ^c	0.309 ^{bc}	1.92 ^{abc}
53042	TOX - 1	83.3 ^c	73.8 ^{bc}	61.3 ^{bc}	0.284 ^{abc}	0.545 ^c	0.263 ^c	0.332 ^c	2.45 ^c
53043	TOX - 2	95.8	90.0	88.8	0.341 ^c	0.583 ^c	0.341 ^c	0.515	3.80 ^c
53044	TOX - 3	94.2	90.0	85.0	0.313 ^c	0.506 ^c	0.280 ^c	0.426 ^c	4.69 ^c
53045	TOX - 5	94.2	87.5	82.5	0.495	0.585	0.457 ^c	0.493	6.52
53046	TOX - 6 (Reference Sediment)	96.7	93.8	86.3	0.537	0.662	0.537	0.569	8.08

a) Indicates a statistically significant reduction ($P < 0.05$) in the response relative to the corresponding response in the laboratory control sample (CTRL; 53040).

b) Indicates a statistically significant reduction ($P < 0.05$) in the response relative to the corresponding response in the laboratory control sample with outlier removed (53040 w/o replicate D). Exclusion of Replicate D brings survival rates to 90.9% (Day 28), 87.1% (Day 35), and 84.3% (Day 42).

c) Indicates a statistically significant reduction ($P < 0.05$) in the response relative to the corresponding response in the reference sample (TOX-6; 53046).



APPENDICES



Appendix A



MASSWILDLIFE

DIVISION OF FISHERIES & WILDLIFE

1 Rabbit Hill Road, Westborough, MA 01581

p: (508) 389-6300 | f: (508) 389-7890

MASS.GOV/MASSWILDLIFE

September 14, 2020

Bruce Haskell
Langdon Environmental
PO Box 511
Portsmouth NH 03802

RE: Project Location: 1084 Concord Ave
Town: BELMONT
NHESP Tracking No.: 20-39567

To Whom It May Concern:

Thank you for contacting the Natural Heritage and Endangered Species Program of the MA Division of Fisheries & Wildlife (the "Division") for information regarding state-listed rare species in the vicinity of the above referenced site. Based on the information provided, this project site, or a portion thereof, is located **near but not within** *Priority Habitat 1420* (PH 1420) and *Estimated Habitat 1028* (EH 1028) as indicated in the *Massachusetts Natural Heritage Atlas* (14th Edition). Our database indicates that the following state-listed rare species have been found in the vicinity of the site:

<u>Scientific name</u>	<u>Common Name</u>	<u>Taxonomic Group</u>	<u>State Status</u>
<i>Ambystoma laterale</i> pop. 1	Blue-spotted Salamander	Amphibian	Special Concern

The species listed above is protected under the Massachusetts Endangered Species Act (MESA) (M.G.L. c. 131A) and its implementing regulations (321 CMR 10.00). State-listed wildlife are also protected under the state's Wetlands Protection Act (WPA) (M.G.L. c. 131, s. 40) and its implementing regulations (310 CMR 10.00). Fact sheets for most state-listed rare species can be found on our website (www.mass.gov/nhesp).

This evaluation is based on the most recent information available in the Natural Heritage database, which is constantly being expanded and updated through ongoing research and inventory. If the purpose of your inquiry is to generate a species list to fulfill the federal Endangered Species Act (16 U.S.C. 1531 et seq.) information requirements for a permit, proposal, or authorization of any kind from a federal agency, we recommend that you contact the National Marine Fisheries Service at (978)281-9328 and use the U.S. Fish and Wildlife Service's Information for Planning and Conservation website (<https://ecos.fws.gov/ipac>). If you have any questions regarding this letter please contact Melany Cheeseman, Endangered Species Review Assistant, at (508) 389-6357.

Sincerely,

A handwritten signature in black ink that reads "Everose Schlüter".

Everose Schlüter, Ph.D.
Assistant Director

MASSWILDLIFE

Table A-1. Amphibian Screening Analysis

Concord Avenue Landfill

Belmont, MA

Chemical	ECOTOX			CMC (Acute)	CCC (Chronic)	CMC (Acute)	CCC (Chronic)	SITE SW - Dissolved		SITE SW - Total	
	NOEL (mg/L)	LOEL (mg/L)	LC50 (mg/L)	NRWQC - DISSOLVED	NRWQC - DISSOLVED	NRWQC - TOTAL	NRWQC - TOTAL	MEAN	MAX	MEAN	MAX
Barium	NA	NA	NA	NS	NS	NS	NS	0.04	0.06	0.05	0.06
Iron	NA	NA	0.335	NA	1	NA	1	1.69	3.83	5.1	10.6
Lead	NA	NA	2.82	0.042	0.0016	0.05	0.0019	0.002	0.009	0.003	0.009
Manganese	0.524	2.5	1.42	NS	NS	NS	NS	0.04	0.28	0.35	1.144
Zinc	1.4	11	1.20	0.084	0.085	0.086	0.086	0.01	0.01	0.01	0.03
Cyanide	NA	NA	NA	0.022	0.0052			0.001	0.002	NA	NA

RED = Exceed ECOTOX Screening Value

ECOTOX Selection Criteria:

Measured over unmeasured

Mortality or Reproduction (few repro studies)

Amphibian (generally - not region specific because minimal data)

NOEL, LOEL or if neither LC50

Any formulation available (so little data)

Used Average Concentration and Average of those for the screening value)



Appendix B

Table B-1a
Organics Uptake from Wetland Sediment to Freshwater Invertebrate and Estimated Body Burden
Concord Avenue Landfill
Belmont, MA

Contaminant	Mean Sediment Conc (mg/Kg dry)	Fraction TOC (dry)	BSAF (Freshwater Invertebrate / Sediment)	Fraction Lipid FW Invertebrate (dry)	Tissue Conc (mg/Kg dry)	Assumed Fraction Dry Weight	Mean Tissue Concentration (mg/Kg wet wt)
Acenaphthene	5.24E-02	0.131	1.96	0.105	8.27E-02	0.2	1.65E-02
Acenaphthylene	1.97E-01	0.131	0.05	0.105	7.93E-03	0.2	1.59E-03
Anthracene	2.32E-01	0.131	0.75	0.105	1.40E-01	0.2	2.80E-02
Benzo(a)anthracene	1.13E+00	0.131	0.27	0.105	2.46E-01	0.2	4.92E-02
Benzo(a)pyrene	1.38E+00	0.131	0.18	0.105	2.00E-01	0.2	4.00E-02
Benzo(b)fluoranthene	2.00E+00	0.131	0.35	0.105	5.64E-01	0.2	1.13E-01
Benzo(g,h,i)perylene	1.16E+00	0.131	0.29	0.105	2.71E-01	0.2	5.43E-02
Benzo(k)fluoranthene	1.07E+00	0.131	0.300	0.105	2.59E-01	0.2	5.18E-02
Chloronaphthalene (2-)	1.71E-02	0.131	NA	0.105	NA	0.2	NA
Chrysene	1.53E+00	0.131	0.5	0.105	6.15E-01	0.2	1.23E-01
Dibenzo(a,h)anthracene	3.30E-01	0.131	0.41	0.105	1.09E-01	0.2	2.18E-02
Fluoranthene	2.64E+00	0.131	0.47	0.105	9.98E-01	0.2	2.00E-01
Fluorene	8.96E-02	0.131	2.19	0.105	1.58E-01	0.2	3.16E-02
Indeno(1,2,3-cd)pyrene	1.20E+00	0.131	0.27	0.105	2.61E-01	0.2	5.22E-02
Methylnaphthalene (1-)	3.30E-02	0.131	0.60	0.105	1.59E-02	0.2	3.19E-03
Methylnaphthalene (2-)	3.17E-02	0.131	0.87	0.105	2.22E-02	0.2	4.43E-03
Naphthalene	6.95E-02	0.131	2.11	0.105	1.18E-01	0.2	2.36E-02
Phenanthrene	9.59E-01	0.131	1.77	0.105	1.37E+00	0.2	2.73E-01
Pyrene	2.09E+00	0.131	0.76	0.105	1.28E+00	0.2	2.56E-01
Dioxin (2,3,7,8-TCDD)	1.50E-06	0.131	0.15	0.105	1.81E-07	0.2	3.61E-08

Fraction Lipid is the average of 2 reported values in Gray, MW and D Kreeger. 2013.

BSAFs for Freshwater Invertebrates from USACE Online source (<https://bsaf.el.erdc.dren.mil/index.cfm>)

Fraction TOC is the Average TOC Measured in all Site Sediment Samples = 13.05%

Used invertebrate uptake factor (BAFinv) from Savannah River Site, US Department of Energy, Environmental Restoration Division Manual: ERD-AG-003 Bioaccumulation and Bioconcentration Screening P.7.4 Revision: 0 Date: 04/06/99 where C (B) = BAFinv * C(s)

Table B-1b
Inorganics Uptake from Wetland Sediment to Freshwater Invertebrate and Estimated Body Burden
Concord Avenue Landfill
Belmont, MA

Model Equation: $\ln(y) = B_0 + B_1 \ln(x)$ From USDOE, 1998

y = chemical concentration in organism
x = chemical concentration in soil
a = ln transformed y intercept (empirically derived)
b = slope (empirically derived)

Chemical (mg/Kg)	Mean Sediment Concentration (mg/Kg dw)	B ₀	B ₁	Invertebrate Uptake Factor	Log Organism Concentration	Organism Dry Weight Concentration (mg/Kg)	Organism Wet Weight Concentration (mg/Kg (1))
Antimony	4.16			0.05		2.08E-01	4.16E-02
Arsenic	17.04	0.566	0.289		1.39	4.00E+00	7.99E-01
Barium	201.99	(2)		0.0075		1.51E+00	3.03E-01
Beryllium	0.82	(2)		0.05		4.09E-02	8.19E-03
Cadmium	2.62	-0.314	0.513		0.18	1.20E+00	2.40E-01
Chromium (total)	32.10	0.0445	0.448		1.60	4.94E+00	9.89E-01
Copper	90.63	1.23	0.079		1.59	4.88E+00	9.77E-01
Lead	245.73	-0.515	0.653		3.08	2.17E+01	4.35E+00
Mercury	0.28	-0.67	0.327		-1.09	3.36E-01	1.34E-02
Nickel	24.46	-0.44	0.695		1.78	5.94E+00	1.19E+00
Selenium	5.06	(2)		7.60E-01		3.85E+00	7.70E-01
Silver	1.27	(2)		1.50E-01		1.90E-01	3.80E-02
Zinc	432.31	1.89	0.126		2.65	1.42E+01	2.84E+00
Cyanide (Total)	3.49	(2)		0		0.00E+00	0.00E+00

(1) assume 80% water in earthworm

(2) no regression available. Used invertebrate uptake factor (BAF_{inv}) from Savannah River Site, US Department of Energy, Environmental Restoration Division Manual: ERD-AG-003 Bioaccumulation and Bioconcentration Screening P.7.4 Revision: 0 Date: 04/06/99 where $C(B) = BAF_{inv} * C(s)$

Table B-2
Food Chain Model For Chronic Exposures
Organic Uptake (Modeled) by Earthworms
Concord Avenue Landfill
Belmont, MA

Compounds	Mean Soil Concentration (mg/Kg dw (1))	Average TOC in Wetland Soils	Earthworm Dry Weight Estimate (mg/Kg)	Notes	Earthworm Wet Weight Estimate (mg/Kg (2))
Acenaphthene	0.038	0.166	0.005	(4)	9.35E-04
Acenaphthylene	0.333	0.166	0.041	(4)	8.13E-03
Anthracene	0.234	0.166	0.029	(4)	5.70E-03
Benzo(a)anthracene	1.108	0.166	0.135	(4)	2.70E-02
Benzo(a)pyrene	1.398	0.166	0.171	(4)	3.41E-02
Benzo(b)fluoranthene	1.693	0.166	0.206	(4)	4.13E-02
Benzo(g,h,i)perylene	1.328	0.166	0.162	(4)	3.24E-02
Benzo(k)fluoranthene	1.081	0.166	0.132	(4)	2.64E-02
Chloronaphthalene (2-)	0.015	0.166	0.002	(4)	3.78E-04
Chrysene	1.331	0.166	0.162	(4)	3.25E-02
Dibenzo(a,h)anthracene	0.349	0.166	0.042	(4)	8.50E-03
Fluoranthene	2.081	0.166	0.254	(4)	5.07E-02
Fluorene	0.065	0.166	0.008	(4)	1.58E-03
Indeno(1,2,3-cd)pyrene	1.282	0.166	0.156	(4)	3.13E-02
Methylnaphthalene (1-)	0.055	0.166	0.007	(4)	1.33E-03
Methylnaphthalene (2-)	0.060	0.166	0.007	(4)	1.47E-03
Naphthalene	0.073	0.166	0.009	(4)	1.77E-03
Phenanthrene	0.783	0.166	0.095	(4)	1.91E-02
Pyrene	1.966	0.166	0.240	(4)	4.79E-02
Dioxin (2,3,7,8-TCDD)	0.000	0.166	0.000	(4)	3.95E-08
Total PAHs	13.889	0.166	1.693	(4)	3.39E-01

(1) C(s) = Average Wetland Sediment Concentration

(2) Assume 80% water in earthworms

(3) C(B) = C(s) * FL/0.66(foc) following Menzie et al., 1992 for pesticides and pcbs

(4) C(B) = 0.23 * C(s) * (FL/foc) following Jager, 2002

(5) Used invertebrate uptake factor (BAF_{inv}) from:

Savannah River Site, US Department of Energy, Environmental Restoration Division, Bioaccumulation and Bioconcentration Screening , Manual: ERD-AG-003. P.7.4 Revision: 0 Date: 04/06/99.
Where, C (B) = BAF_{inv} * C(s)

Assumptions:

FL = 0.088, based on average of several species from Stafford & Tacon, 1988

TOC = average TOC of Site Soil Samples = 16.6%

Table B-3
Food Chain Model For Chronic Exposures
Inorganic Uptake (Modeled) by Earthworms
Concord Avenue Landfill
Belmont, MA

Model Equation: $\ln(y) = B_0 + B_1 \ln(x)$ From USDOE, 1998

y = chemical concentration in organism
x = chemical concentration in soil
a= ln transformed y intercept (empirically derived)
b = slope (empirically derived)

Chemical (mg/Kg)	Mean Soil Concentration (mg/Kg dw)	B ₀	B ₁	Invertebrate Uptake Factor	Ln Organism Concentration	Organism Dry Weight Concentration (mg/Kg)	Organism Wet Weight Concentration (mg/Kg (1))
Antimony	3.93			0.05		1.97E-01	3.93E-02
Arsenic	17.05	-1.421	0.706		0.58	1.79E+00	3.58E-01
Barium	171.59	(3)		0.0075		1.29E+00	2.57E-01
Beryllium	0.81			0.05		4.06E-02	8.11E-03
Cadmium	1.89	2.11	0.795		2.62	1.38E+01	2.75E+00
Chromium (total)	29.52	2.481	-0.067		2.25	9.53E+00	1.91E+00
Copper	76.92	1.675	0.264		2.82	1.68E+01	3.36E+00
Lead	331.21	-0.218	0.807		4.46	8.69E+01	1.74E+01
Mercury	0.31	-0.684	0.118		-0.82	4.39E-01	1.75E-02
Nickel	25.05	3.677	-0.26		2.84	1.71E+01	3.42E+00
Selenium	4.53	-0.075	0.733		1.03	2.81E+00	5.61E-01
Silver	1.24			0.15		1.86E-01	3.73E-02
Zinc	331.26	4.449	0.328		6.35	5.73E+02	1.15E+02
Cyanide (Total)	2.72			0.00		0.00E+00	0.00E+00
Dioxin (2,3,7,8-TCDD)	0.00	3.533	1.182		-12.23	4.91E-06	9.82E-07

(1) assume 80% water in earthworm

(2) exposure concentration less than soil screening levels for mammals and birds

(3) no regression available. Used invertebrate uptake factor (BAF_{inv}) from Savannah River Site, US Department of Energy, Environmental Restoration Division Manual: ERD-AG-003 Bioaccumulation and Bioconcentration Screening P.7.4 Revision: 0 Date: 04/06/99 where C (B) = BAF_{inv} * C(s)

Mercury TRV is for methyl mercury. Organism wet weight mercury concentration adjusted to 20% methylmercury per J Cura memo and references therein.

Table B-4
Food Chain Model For Chronic Exposures
Inorganic and Organic Uptake by Aquatic Vegetation

Concord Avenue Landfill
Belmont, MA

Contaminant	Average Sediment Concentration (mg/kg) (dry)	log Kow	Source of Kow	Plant Uptake Factor (organism/sediment)	Plant Concentration (dry) mg/Kg	Assumed Fraction Dry Weight	Plant Concentration (mg/kg wet weight)
Acenaphthene	5.24E-02	3.92	EPA, 2020	2.10E-01	1.10E-02	0.2	2.20E-03
Acenaphthylene	1.97E-01	3.93	PubChem, 2021	2.07E-01	4.08E-02	0.2	8.17E-03
Anthracene	2.32E-01	4.45	EPA, 2020	1.04E-01	2.41E-02	0.2	4.81E-03
Benzo(a)anthracene	1.13E+00	5.76	PubChem, 2020	1.81E-02	2.05E-02	0.2	4.11E-03
Benzo(a)pyrene	1.38E+00	6.13	EPA, 2020	1.11E-02	1.53E-02	0.2	3.06E-03
Benzo(b)fluoranthene	2.00E+00	6.6	PubChem, 2020	5.93E-03	1.19E-02	0.2	2.38E-03
Benzo(g,h,i)perylene	1.16E+00	6.63	EPA, 2020	5.70E-03	6.63E-03	0.2	1.33E-03
Benzo(k)fluoranthene	1.07E+00	6.11	EPA, 2020	1.14E-02	1.22E-02	0.2	2.44E-03
Chloronaphthalene (2-)	1.71E-02	3.9	PubChem, 2020	2.16E-01	3.69E-03	0.2	7.37E-04
Chrysene	1.53E+00	5.81	EPA, 2020	1.70E-02	2.60E-02	0.2	5.19E-03
Dibenzo(a,h)anthracene	3.30E-01	6.54	EPA, 2020	6.43E-03	2.12E-03	0.2	4.24E-04
Fluoranthene	2.64E+00	5.16	PubChem, 2020	4.03E-02	1.06E-01	0.2	2.13E-02
Fluorene	8.96E-02	4.18	EPA, 2020	1.49E-01	1.33E-02	0.2	2.66E-03
Indeno(1,2,3-cd)pyrene	1.20E+00	6.7	EPA, 2020	5.19E-03	6.23E-03	0.2	1.25E-03
Methylnaphthalene (1-)	3.30E-02	3.87	PubChem, 2020	2.24E-01	7.41E-03	0.2	1.48E-03
Methylnaphthalene (2-)	3.17E-02	3.86	EPA, 2020	2.27E-01	7.20E-03	0.2	1.44E-03
Naphthalene	6.95E-02	3.3	EPA, 2020	4.79E-01	3.33E-02	0.2	6.66E-03
Phenanthrene	9.59E-01	4.46	EPA, 2020	1.02E-01	9.81E-02	0.2	1.96E-02
Pyrene	2.09E+00	4.88	EPA, 2020	5.85E-02	1.23E-01	0.2	2.45E-02
Dioxin (2,3,7,8-TCDD)	1.50E-06	6.8	PubChem, 2020	4.55E-03	6.80E-09	0.2	1.36E-09
Antimony	4.16E+00			6.00E-03	2.50E-02	0.2	4.99E-03
Arsenic	1.70E+01				6.75E-01	0.2	1.35E-01
Barium	2.02E+02			3.00E-02	6.06E+00	0.2	1.21E+00
Beryllium	8.19E-01			2.00E-03	1.64E-03	0.2	3.27E-04
Cadmium	2.62E+00				1.05E+00	0.2	2.10E-01
Chromium (total)	3.21E+01			9.00E-04	2.89E-02	0.2	5.78E-03
Copper	9.06E+01				1.15E+01	0.2	2.31E+00
Lead	2.46E+02				5.81E+00	0.2	1.16E+00
Mercury	2.75E-01				1.83E-01	0.2	2.93E-04
Nickel	2.45E+01				1.18E+00	0.2	2.36E-01
Selenium	5.06E+00				3.04E+00	0.2	6.09E-01
Silver	1.27E+00			2.00E-02	2.54E-02	0.2	5.07E-03
Zinc	4.32E+02				1.40E+02	0.2	2.80E+01
Cyanide (Total)	3.49E+00			1.00E+00	3.49E+00	0.2	6.98E-01

Arsenic, cadmium, copper, lead, mercury, nickel, selenium and zinc estimates for B0 and B1 are from Table 7 (page 22) in USDOE, 1998 *Empirical Models for the Uptake of Inorganic Chemicals from Soil by Plants*. United States Department of Energy, Office of Environmental Management. BJC/OR-133. **Model is $\ln(\text{conc in plant}) = B0+B1(\ln[\text{conc in soil}])$** , where concentrations are mg/Kg dry weight.

Antimony, Barium, Beryllium, Chromium, Silver, and Cyanide uptake is from Soil-to-Plant (Vegetative tissue) value in Table 1. Biouptake Factors in Savannah report Protocol. *Bioaccumulation and Bioconcentration Screening. Environmental Restoration Division. Manual ERD-AG-003. P. 7.4 04/06/1999* Uptake factor is for soils to vegetative tissue in plants)

EPA, 2018 Superfund Chemical Data Matrix <https://www.epa.gov/superfund/superfund-chemical-data-matrix-scdm>

Organic compound uptake factors estiamted based on Travis, C.C. and A.D. Arms. 1988. "Bioconcentration of Organics in Beef, Milk, and Vegetation." Environmental Science and Technology. 22:271-274.

PubChem 2020. National Institutes of Health National Library of Medicine. Online at <https://pubchem.ncbi.nlm.nih.gov/compound/>

Table B-5
Food Chain Model For Chronic Exposures
Robin Model
Inorganic and Organic Uptake by Vegetation

Concord Avenue Landfill
Belmont, MA

Contaminant	Mean Soil Concentration (mg/Kg)	log Kow	Source of Kow	Plant Uptake Factor (organism/sediment)	Plant Concentration (mg/Kg dry)	Assumed Fraction Dry Weight	Plant Concentration (mg/Kg wet)
Acenaphthene	3.83E-02	3.92	EPA, 2018	2.10E-01	8.05E-03	0.2	1.61E-03
Acenaphthylene	3.33E-01	3.93	PubChem, 2021	2.07E-01	6.91E-02	0.2	1.38E-02
Anthracene	2.34E-01	4.45	EPA, 2018	1.04E-01	2.42E-02	0.2	4.85E-03
Benzo(a)anthracene	1.11E+00	5.76	PubChem, 2020	1.81E-02	2.01E-02	0.2	4.02E-03
Benzo(a)pyrene	1.40E+00	6.13	EPA, 2018	1.11E-02	1.55E-02	0.2	3.10E-03
Benzo(b)fluoranthene	1.69E+00	6.6	PubChem, 2020	5.93E-03	1.00E-02	0.2	2.01E-03
Benzo(g,h,i)perylene	1.33E+00	6.63	EPA, 2018	5.70E-03	7.57E-03	0.2	1.51E-03
Benzo(k)fluoranthene	1.08E+00	6.11	EPA, 2018	1.14E-02	1.23E-02	0.2	2.46E-03
Chloronaphthalene (2-)	1.55E-02	3.9	PubChem, 2020	2.16E-01	3.34E-03	0.2	6.68E-04
Chrysene	1.33E+00	5.81	EPA, 2018	1.70E-02	2.26E-02	0.2	4.52E-03
Dibenzo(a,h)anthracene	3.49E-01	6.54	EPA, 2018	6.43E-03	2.24E-03	0.2	4.48E-04
Fluoranthene	2.08E+00	5.16	PubChem, 2020	4.03E-02	8.39E-02	0.2	1.68E-02
Fluorene	6.50E-02	4.18	EPA, 2018	1.49E-01	9.65E-03	0.2	1.93E-03
Indeno(1,2,3-cd)pyrene	1.28E+00	6.7	EPA, 2018	5.19E-03	6.66E-03	0.2	1.33E-03
Methylnaphthalene (1-)	5.45E-02	3.87	PubChem, 2020	2.24E-01	1.22E-02	0.2	2.45E-03
Methylnaphthalene (2-)	6.03E-02	3.86	EPA, 2018	2.27E-01	1.37E-02	0.2	2.74E-03
Naphthalene	7.25E-02	3.3	EPA, 2018	4.79E-01	3.48E-02	0.2	6.95E-03
Phenanthrene	7.83E-01	4.46	EPA, 2018	1.02E-01	8.02E-02	0.2	1.60E-02
Pyrene	1.97E+00	4.88	EPA, 2018	5.85E-02	1.15E-01	0.2	2.30E-02
Dioxin (2,3,7,8-TCDD)	1.62E-06	6.8	PubChem, 2020	4.55E-03	7.37E-09	0.2	1.47E-09
Antimony	3.93E+00			6.00E-03	2.36E-02	0.2	4.72E-03
Arsenic	1.71E+01				6.76E-01	0.2	1.35E-01
Barium	1.72E+02			3.00E-02	5.15E+00	0.2	1.03E+00
Beryllium	8.11E-01			2.00E-03	1.62E-03	0.2	3.25E-04
Cadmium	1.89E+00				8.80E-01	0.2	1.76E-01
Chromium (total)	2.95E+01			9.00E-04	2.66E-02	0.2	5.31E-03
Copper	7.69E+01				1.08E+01	0.2	2.16E+00
Lead	3.31E+02				6.87E+00	0.2	1.37E+00
Mercury	3.05E-01				1.94E-01	0.2	3.10E-04
Nickel	2.50E+01				1.20E+00	0.2	2.41E-01
Selenium	4.53E+00				2.69E+00	0.2	5.38E-01
Silver	1.24E+00			2.00E-02	2.48E-02	0.2	4.97E-03
Zinc	3.31E+02				1.21E+02	0.2	2.42E+01
Cyanide (Total)	2.72E+00			1.00E+00	2.72E+00	0.2	5.44E-01
Total PAHs	1.39E+01			4.79E-01	6.66E+00	0.2	1.33E+00

Arsenic, cadmium, mercury, nickel, copper, lead, mercury, nickel, selenium and zinc estimates for B0 and B1 are from Table 7 (page 22) in USDOE, 1998 *Empirical Models for the Uptake of Inorganic Chemicals from Soil by Plants*. United States Department of Energy, Office of Environmental Management. BJC/OR-133. **Model is $\ln(\text{conc in plant}) = B0 + B1(\ln[\text{conc in soil}])$** , where concentrations are mg/Kg dry weight.

Antimony, Barium, Beryllium, Chromium, Silver and Cyanide uptake is from Soil-to-Plant (Vegetative tissue) value in Table 1. Biouptake Factors in Savannah report Protocol. *Bioaccumulation and Bioconcentration Screening. Environmental Restoration Division. Manual ERD-AG-003. P. 7.4 04/06/1999* Uptake factor is for soils to vegetative tissue in plants)

EPA, 2018 Superfund Chemical Data Matrix <https://www.epa.gov/superfund/superfund-chemical-data-matrix-scdm>

Organic compound uptake factors estiamted based on Travis, C.C. and A.D. Arms. 1988. "Bioconcentration of Organics in Beef, Milk, and Vegetation." Environmental Science and Technology. 22:271-274.

PubChem 2020. National Institutes of Health National Library of Medicine. Online at <https://pubchem.ncbi.nlm.nih.gov/compound/>



Appendix C

Table C-1. Food Chain Model Exposure Factors by Representative Species

Species	Raccoon	Muskrat	Canada Goose	Robin	Robin	Shrew
Food Conc	Estimated shellfish body burdens	Estimated Plant Tissue Conc.	Estimated Plant Tissue Conc.	Estimated Plant Tissue Conc.	Estimated Earthworm Conc.	Estimated Earthworm Conc.
Ingestion Rate Food (kg/kg/d)	0.3 kg wet food/kg body weight /day as estimated from metabolic rate in EPA Exposure Factors Handbook	0.34	0.033 kg/kg/day	0.9	0.9	0.55
Relative Availability	100%	100%	100%	100%	100%	100%
Exposure Media	Beaver Brook and Wetland Sediments Site Wide Surface Water	Beaver Brook and Wetland Sediments Site Wide Surface Water	Beaver Brook and Wetland Sediments Site Wide Surface Water	Site Wide Soil Site Wide Surface Water	Site Wide Soil Site Wide Surface Water	Site Wide Soil Site Wide Surface Water
Ingestion Rate Sediment/ Soil (kg/kg/d)	.0068	0.0014	0.0008	0.0047	0.0047	0.0156
Ingestion Rate Water (L/kg/day)		0.0973	0.037	0.14	0.14	0.233

(Factors from EPA Wildlife Exposure Factors Handbook unless otherwise noted)

Table C-2
Food Chain Model For Chronic Exposures
Muskrat Model
Ingestion of Aquatic Vegetation

Concord Avenue Landfill
Belmont, MA

			NOAEL	LOAEL	Forage Area			Food					Sediment				Water		
	NOAEL	LOAEL	Benchmark	Benchmark	Normalized	Site Area to	Exposure	Total Conc.	Plant	Proportion	Ingestion	Proportion		Conc.	Dry Sediment	Proportion	Conc.	Ingestion	Proportion
	Hazard	Hazard	Dose	Dose	Exposure Dose	Forage Area	Dose	in Food	Concentration	Plant	Rate	of		in Sediment	Ing. Rate	of	in Water	Rate	of
Contaminant	Index	Index	mg/kg/d	mg/kg/d	mg/kg/day	Ratio	mg/kg/day	mg/kg wet	mg/kg wet	In Diet	kg/kg/day	Dose	RAF	mg/kg dry	kg/kg/day	Dose	mg/l	l/kg/day	Dose
Acenaphthene	2.00E-06	1.00E-06	350	700	8.22E-04	1	8.22E-04	2.20E-03	2.20E-03	1	0.34	0.91	1	5.24E-02	0.0014	0.09	0.00E+00	0.0973	0.00
Acenaphthylene	Bench NA	Bench NA	NA	NA	3.05E-03	1	3.05E-03	8.17E-03	8.17E-03	1	0.34	0.91	1	1.97E-01	0.0014	0.09	0.00E+00	0.0973	0.00
Anthracene	2.00E-05	Bench NA	100	NA	1.96E-03	1	1.96E-03	4.81E-03	4.81E-03	1	0.34	0.83	1	2.32E-01	0.0014	0.17	0.00E+00	0.0973	0.00
Benzo(a)anthracene	Bench NA	Bench NA	NA	NA	2.98E-03	1	2.98E-03	4.11E-03	4.11E-03	1	0.34	0.47	1	1.13E+00	0.0014	0.53	0.00E+00	0.0973	0.00
Benzo(a)pyrene	3.00E-03	3.00E-04	1	10	2.97E-03	1	2.97E-03	3.06E-03	3.06E-03	1	0.34	0.35	1	1.38E+00	0.0014	0.65	0.00E+00	0.0973	0.00
Benzo(b)fluoranthene	Bench NA	Bench NA	NA	NA	3.61E-03	1	3.61E-03	2.38E-03	2.38E-03	1	0.34	0.22	1	2.00E+00	0.0014	0.78	0.00E+00	0.0973	0.00
Benzo(g,h,i)perylene	Bench NA	Bench NA	NA	NA	2.08E-03	1	2.08E-03	1.33E-03	1.33E-03	1	0.34	0.22	1	1.16E+00	0.0014	0.78	0.00E+00	0.0973	0.00
Benzo(k)fluoranthene	Bench NA	Bench NA	NA	NA	2.33E-03	1	2.33E-03	2.44E-03	2.44E-03	1	0.34	0.36	1	1.07E+00	0.0014	0.64	0.00E+00	0.0973	0.00
Chloronaphthalene (2-)	Bench NA	Bench NA	NA	NA	2.75E-04	1	2.75E-04	7.37E-04	7.37E-04	1	0.34	0.91	1	1.71E-02	0.0014	0.09	0.00E+00	0.0973	0.00
Chrysene	Bench NA	Bench NA	NA	NA	3.90E-03	1	3.90E-03	5.19E-03	5.19E-03	1	0.34	0.45	1	1.53E+00	0.0014	0.55	0.00E+00	0.0973	0.00
Dibenzo(a,h)anthracene	Bench NA	Bench NA	NA	NA	6.07E-04	1	6.07E-04	4.24E-04	4.24E-04	1	0.34	0.24	1	3.30E-01	0.0014	0.76	0.00E+00	0.0973	0.00
Fluoranthene	2.00E-05	Bench NA	500	NA	1.09E-02	1	1.09E-02	2.13E-02	2.13E-02	1	0.34	0.66	1	2.64E+00	0.0014	0.34	0.00E+00	0.0973	0.00
Fluorene	2.00E-06	Bench NA	500	NA	1.03E-03	1	1.03E-03	2.66E-03	2.66E-03	1	0.34	0.88	1	8.96E-02	0.0014	0.12	0.00E+00	0.0973	0.00
Indeno(1,2,3-cd)pyrene	Bench NA	Bench NA	NA	NA	2.10E-03	1	2.10E-03	1.25E-03	1.25E-03	1	0.34	0.20	1	1.20E+00	0.0014	0.80	0.00E+00	0.0973	0.00
Methylnaphthalene (1-)	Bench NA	Bench NA	NA	NA	5.50E-04	1	5.50E-04	1.48E-03	1.48E-03	1	0.34	0.92	1	3.30E-02	0.0014	0.08	0.00E+00	0.0973	0.00
Methylnaphthalene (2-)	Bench NA	Bench NA	NA	NA	5.34E-04	1	5.34E-04	1.44E-03	1.44E-03	1	0.34	0.92	1	3.17E-02	0.0014	0.08	0.00E+00	0.0973	0.00
Naphthalene	3.00E-04	2.00E-04	7.1	14	2.36E-03	1	2.36E-03	6.66E-03	6.66E-03	1	0.34	0.96	1	6.95E-02	0.0014	0.04	0.00E+00	0.0973	0.00
Phenanthrene	Bench NA	Bench NA	NA	NA	8.02E-03	1	8.02E-03	1.96E-02	1.96E-02	1	0.34	0.83	1	9.59E-01	0.0014	0.17	0.00E+00	0.0973	0.00
Pyrene	2.00E-03	9.00E-04	7.5	13	1.13E-02	1	1.13E-02	2.45E-02	2.45E-02	1	0.34	0.74	1	2.09E+00	0.0014	0.26	0.00E+00	0.0973	0.00
Dioxin (2,3,7,8-TCDD)	3.00E-06	3.00E-07	0.001	0.01	2.56E-09	1	2.56E-09	1.36E-09	1.36E-09	1	0.34	0.18	1	1.50E-06	0.0014	0.82	0.00E+00	0.0973	0.00
Antimony	6.00E-02	6.00E-03	0.125	1.25	7.53E-03	1	7.53E-03	4.99E-03	4.99E-03	1	0.34	0.23	1	4.16E+00	0.0014	0.77	0.00E+00	0.0973	0.00
Arsenic	3.00E-02	Bench NA	2.5	NA	6.98E-02	1	6.98E-02	1.35E-01	1.35E-01	1	0.34	0.66	1	1.70E+01	0.0014	0.34	0.00E+00	0.0973	0.00
Barium	5.00E-02	4.00E-02	13.8	19.8	7.00E-01	1	7.00E-01	1.21E+00	1.21E+00	1	0.34	0.59	1	2.02E+02	0.0014	0.40	4.82E-02	0.0973	0.01
Beryllium	2.00E-03	Bench NA	0.66	NA	1.26E-03	1	1.26E-03	3.27E-04	3.27E-04	1	0.34	0.09	1	8.19E-01	0.0014	0.91	0.00E+00	0.0973	0.00
Cadmium	8.00E-02	8.00E-03	1	10	7.52E-02	1	7.52E-02	2.10E-01	2.10E-01	1	0.34	0.95	1	2.62E+00	0.0014	0.05	0.00E+00	0.0973	0.00
Chromium (total)	2.00E-05	Bench NA	2737	NA	4.69E-02	1	4.69E-02	5.78E-03	5.78E-03	1	0.34	0.04	1	3.21E+01	0.0014	0.96	0.00E+00	0.0973	0.00
Copper	8.00E-02	6.00E-02	11.7	15.4	9.11E-01	1	9.11E-01	2.31E+00	2.31E+00	1	0.34	0.86	1	9.06E+01	0.0014	0.14	0.00E+00	0.0973	0.00
Lead	9.00E-02	9.00E-03	8	80	7.40E-01	1	7.40E-01	1.16E+00	1.16E+00	1	0.34	0.53	1	2.46E+02	0.0014	0.47	3.07E-03	0.0973	0.00
Mercury	2.00E-02	3.00E-03	0.032	0.16	4.85E-04	1	4.85E-04	2.93E-04	2.93E-04	1	0.34	0.21	1	2.75E-01	0.0014	0.79	0.00E+00	0.0973	0.00
Nickel	3.00E-03	1.00E-03	40	80	1.15E-01	1	1.15E-01	2.36E-01	2.36E-01	1	0.34	0.70	1	2.45E+01	0.0014	0.30	0.00E+00	0.0973	0.00
Selenium	1.00E+00	6.00E-01	0.2	0.33	2.14E-01	1	2.14E-01	6.09E-01	6.09E-01	1	0.34	0.97	1	5.06E+00	0.0014	0.03	0.00E+00	0.0973	0.00
Silver	2.00E-04	2.00E-05	22	222.2	3.50E-03	1	3.50E-03	5.07E-03	5.07E-03	1	0.34	0.49	1	1.27E+00	0.0014	0.51	0.00E+00	0.0973	0.00
Zinc	6.00E-02	3.00E-02	160	320	1.01E+01	1	1.01E+01	2.80E+01	2.80E+01	1	0.34	0.94	1	4.32E+02	0.0014	0.06	1.11E-02	0.0973	0.00
Cyanide (Total)	4.00E-03	Bench NA	68.7	NA	2.42E-01	1	2.42E-01	6.98E-01	6.98E-01	1	0.34	0.98	1	3.49E+00	0.0014	0.02	1.14E-03	0.0973	0.00

Notes:
NA=Not available/applicable
Bench NA = Benchmark not available
Bolded values indicate a Hazard Index greater than 1

Table C-3
Food Chain Model For Chronic Exposures
Canada Goose Model
Ingestion of Marsh Vegetation
Concord Avenue Landfill
Belmont, MA

Contaminant	NOAEL Hazard Index	LOAEL Hazard Index	NOAEL Benchmark Dose mg/kg/d	LOAEL Benchmark Dose mg/kg/d	Forage Area Normalized Exposure Dose mg/kg/day	Site Area to Forage Area Ratio	Foraging Area acres	Site Area acres	Exposure Dose mg/kg/day	Food					Sediment				Water		
										Total Conc. in Food mg/kg wet	Plant Concentration mg/kg wet	Proportion Plant In Diet	Ingestion Rate kg/kg/day	Proportion of Dose	RAF	Conc. in Sediment mg/kg dry	Dry Sediment Ing. Rate mg/kg/day	Proportion of Dose	Conc. in Water mg/l	Ingestion Rate l/kg/day	Proportion of Dose
Acenaphthene	Bench NA	Bench NA	NA	NA	1.15E-04	1	2429.00	51	1.15E-04	2.20E-03	2.20E-03	1	0.033	0.63	1	5.24E-02	0.0008	0.37	0.000	0.037	0.00
Acenaphthylene	Bench NA	Bench NA	NA	NA	4.27E-04	1	2429.00	51	4.27E-04	8.17E-03	8.17E-03	1	0.033	0.63	1	1.97E-01	0.0008	0.37	0.000	0.037	0.00
Anthracene	Bench NA	Bench NA	NA	NA	3.45E-04	1	2429.00	51	3.45E-04	4.81E-03	4.81E-03	1	0.033	0.46	1	2.32E-01	0.0008	0.54	0.000	0.037	0.00
Benzo(a)anthracene	Bench NA	Bench NA	NA	NA	1.04E-03	1	2429.00	51	1.04E-03	4.11E-03	4.11E-03	1	0.033	0.13	1	1.13E+00	0.0008	0.87	0.000	0.037	0.00
Benzo(a)pyrene	Bench NA	Bench NA	NA	NA	1.21E-03	1	2429.00	51	1.21E-03	3.06E-03	3.06E-03	1	0.033	0.08	1	1.38E+00	0.0008	0.92	0.000	0.037	0.00
Benzo(b)fluoranthene	Bench NA	Bench NA	NA	NA	1.68E-03	1	2429.00	51	1.68E-03	2.38E-03	2.38E-03	1	0.033	0.05	1	2.00E+00	0.0008	0.95	0.000	0.037	0.00
Benzo(g,h,i)perylene	Bench NA	Bench NA	NA	NA	9.74E-04	1	2429.00	51	9.74E-04	1.33E-03	1.33E-03	1	0.033	0.04	1	1.16E+00	0.0008	0.96	0.000	0.037	0.00
Benzo(k)fluoranthene	Bench NA	Bench NA	NA	NA	9.39E-04	1	2429.00	51	9.39E-04	2.44E-03	2.44E-03	1	0.033	0.09	1	1.07E+00	0.0008	0.91	0.000	0.037	0.00
Chloronaphthalene (2-)	Bench NA	Bench NA	NA	NA	3.80E-05	1	2429.00	51	3.80E-05	7.37E-04	7.37E-04	1	0.033	0.64	1	1.71E-02	0.0008	0.36	0.000	0.037	0.00
Chrysene	Bench NA	Bench NA	NA	NA	1.39E-03	1	2429.00	51	1.39E-03	5.19E-03	5.19E-03	1	0.033	0.12	1	1.53E+00	0.0008	0.88	0.000	0.037	0.00
Dibenzo(a,h)anthracene	Bench NA	Bench NA	NA	NA	2.78E-04	1	2429.00	51	2.78E-04	4.24E-04	4.24E-04	1	0.033	0.05	1	3.30E-01	0.0008	0.95	0.000	0.037	0.00
Fluoranthene	Bench NA	Bench NA	NA	NA	2.81E-03	1	2429.00	51	2.81E-03	2.13E-02	2.13E-02	1	0.033	0.25	1	2.64E+00	0.0008	0.75	0.000	0.037	0.00
Fluorene	Bench NA	Bench NA	NA	NA	1.59E-04	1	2429.00	51	1.59E-04	2.66E-03	2.66E-03	1	0.033	0.55	1	8.96E-02	0.0008	0.45	0.000	0.037	0.00
Indeno(1,2,3-cd)pyrene	Bench NA	Bench NA	NA	NA	1.00E-03	1	2429.00	51	1.00E-03	1.25E-03	1.25E-03	1	0.033	0.04	1	1.20E+00	0.0008	0.96	0.000	0.037	0.00
Methylnaphthalene (1-)	Bench NA	Bench NA	NA	NA	7.53E-05	1	2429.00	51	7.53E-05	1.48E-03	1.48E-03	1	0.033	0.65	1	3.30E-02	0.0008	0.35	0.000	0.037	0.00
Methylnaphthalene (2-)	Bench NA	Bench NA	NA	NA	7.29E-05	1	2429.00	51	7.29E-05	1.44E-03	1.44E-03	1	0.033	0.65	1	3.17E-02	0.0008	0.35	0.000	0.037	0.00
Naphthalene	Bench NA	Bench NA	NA	NA	2.75E-04	1	2429.00	51	2.75E-04	6.66E-03	6.66E-03	1	0.033	0.80	1	6.95E-02	0.0008	0.20	0.000	0.037	0.00
Phenanthrene	Bench NA	Bench NA	NA	NA	1.41E-03	1	2429.00	51	1.41E-03	1.96E-02	1.96E-02	1	0.033	0.46	1	9.59E-01	0.0008	0.54	0.000	0.037	0.00
Pyrene	Bench NA	Bench NA	NA	NA	2.48E-03	1	2429.00	51	2.48E-03	2.45E-02	2.45E-02	1	0.033	0.33	1	2.09E+00	0.0008	0.67	0.000	0.037	0.00
Total PAHs	2.00E-03	2.00E-04	40	400	6.41E-02	1	2429.00	51	6.41E-02	1.55E+00	1.55E+00	1	0.033	0.80	1	1.62E+01	0.0008	0.20	0.000	0.037	0.00
Dioxin (2,3,7,8-TCDD)	9.00E-05	9.00E-06	0.000014	0.00014	1.24E-09	1	2429.00	51	1.24E-09	1.36E-09	1.36E-09	1	0.033	0.04	1	1.50E-06	0.0008	0.96	0.000	0.037	0.00
Antimony	Bench NA	Bench NA	NA	NA	3.49E-03	1	2429.00	51	3.49E-03	4.99E-03	4.99E-03	1	0.033	0.05	1	4.16E+00	0.0008	0.95	0.000	0.037	0.00
Arsenic	4.00E-03	1.00E-03	5.14	12.84	1.81E-02	1	2429.00	51	1.81E-02	1.35E-01	1.35E-01	1	0.033	0.25	1	1.70E+01	0.0008	0.75	0.000	0.037	0.00
Barium	1.00E-02	5.00E-03	20.8	41.7	2.02E-01	1	2429.00	51	2.02E-01	1.21E+00	1.21E+00	1	0.033	0.20	1	2.02E+02	0.0008	0.80	0.000	0.037	0.00
Beryllium	Bench NA	Bench NA	NA	NA	6.66E-04	1	2429.00	51	6.66E-04	3.27E-04	3.27E-04	1	0.033	0.02	1	8.19E-01	0.0008	0.98	0.000	0.037	0.00
Cadmium	6.00E-03	5.00E-04	1.45	20.03	9.04E-03	1	2429.00	51	9.04E-03	2.10E-01	2.10E-01	1	0.033	0.77	1	2.62E+00	0.0008	0.23	0.000	0.037	0.00
Chromium (total)	3.00E-02	5.00E-03	1	5.00	2.59E-02	1	2429.00	51	2.59E-02	5.78E-03	5.78E-03	1	0.033	0.01	1	3.21E+01	0.0008	0.99	0.000	0.037	0.00
Copper	3.00E-03	2.00E-03	47	61.7	1.49E-01	1	2429.00	51	1.49E-01	2.31E+00	2.31E+00	1	0.033	0.51	1	9.06E+01	0.0008	0.49	0.000	0.037	0.00
Lead	2.00E-01	2.00E-02	1.13	11.3	2.35E-01	1	2429.00	51	2.35E-01	1.16E+00	1.16E+00	1	0.033	0.16	1	2.46E+02	0.0008	0.84	0.003	0.037	0.00
Mercury	4.00E-02	4.00E-03	0.0064	0.064	2.30E-04	1	2429.00	51	2.30E-04	2.93E-04	2.93E-04	1	0.033	0.04	1	2.75E-01	0.0008	0.96	0.000	0.037	0.00
Nickel	4.00E-04	3.00E-04	77.4	107	2.74E-02	1	2429.00	51	2.74E-02	2.36E-01	2.36E-01	1	0.033	0.29	1	2.45E+01	0.0008	0.71	0.000	0.037	0.00
Selenium	6.00E-02	3.00E-02	0.4	0.8	2.41E-02	1	2429.00	51	2.41E-02	6.09E-01	6.09E-01	1	0.033	0.83	1	5.06E+00	0.0008	0.17	0.000	0.037	0.00
Silver	Bench NA	Bench NA	NA	NA	1.18E-03	1	2429.00	51	1.18E-03	5.07E-03	5.07E-03	1	0.033	0.14	1	1.27E+00	0.0008	0.86	0.000	0.037	0.00
Zinc	9.00E-02	1.00E-02	14.5	131	1.27E+00	1	2429.00	51	1.27E+00	2.80E+01	2.80E+01	1	0.033	0.73	1	4.32E+02	0.0008	0.27	0.011	0.037	0.00
Cyanide (Total)	Bench NA	Bench NA	NA	NA	2.59E-02	1	2429.00	51	2.59E-02	6.98E-01	6.98E-01	1	0.033	0.89	1	3.49E+00	0.0008	0.11	0.001	0.037	0.00

Notes:
NA=Not available/applicable
Bench NA = Benchmark not available
Bolded values indicate a Hazard Index greater than 1
Site area is larger than foraging area therefore a site area to forage area ratio of 1 is applied to the exposure dose
LOAEL and LOAEL Benchmmarks based on Sample et al 1996, scaled to muskrat body weight of 1.35 kg.

Table C-4
Food Chain Model For Chronic Exposures
Raccoon Model
Ingestion of Invertebrates in Sediment
Concord Avenue Landfill
Belmont, MA

Contaminant	NOAEL Hazard Index	LOAEL Hazard Index	NOAEL Benchmark Dose mg/kg/day	LOAEL Benchmark Dose mg/kg/day	Forage Area Normalized Exposure Dose mg/kg/day	Site Area to Forage Area Ratio	Foraging Area acres	Site Area acres	Exposure Dose mg/kg/day	Food					Sitewide Sediment						Water		
										Total Conc. in Food mg/kg wet	FW Invert Tissue mg/kg wet	Proportion FW Invert In Diet	Ingestion Rate kg/kg/day	Proportion of Dose	RAF	Conc. in Sediment mg/kg dry	Ave. Percent Solids in Sediment	Percentage Soil in Diet	Ingestion Rate kg/kg/day	Proportion of Dose	Conc. in Water mg/l	Ingestion Rate l/kg/day	Proportion of Dose
Acenaphthene	2.00E-05	8.00E-06	350	700	5.32E-03	1	267	51	5.32E-03	1.65E-02	1.65E-02	1	0.3	0.93	1	5.24E-02	1	1	0.0068	0.07	0.00000	0.083	0.00
Acenaphthylene	Bench NA	Bench NA	NA	NA	1.82E-03	1	267	51	1.82E-03	1.59E-03	1.59E-03	1	0.3	0.26	1	1.97E-01	1	1	0.0068	0.74	0.00000	0.083	0.00
Anthracene	1.00E-04	Bench NA	100	NA	9.98E-03	1	267	51	9.98E-03	2.80E-02	2.80E-02	1	0.3	0.84	1	2.32E-01	1	1	0.0068	0.16	0.00000	0.083	0.00
Benzo(a)anthracene	Bench NA	Bench NA	NA	NA	2.25E-02	1	267	51	2.25E-02	4.92E-02	4.92E-02	1	0.3	0.66	1	1.13E+00	1	1	0.0068	0.34	0.00000	0.083	0.00
Benzo(a)pyrene	2.00E-02	2.00E-03	1	10	2.14E-02	1	267	51	2.14E-02	4.00E-02	4.00E-02	1	0.3	0.56	1	1.38E+00	1	1	0.0068	0.44	0.00000	0.083	0.00
Benzo(b)fluoranthene	Bench NA	Bench NA	NA	NA	4.75E-02	1	267	51	4.75E-02	1.13E-01	1.13E-01	1	0.3	0.71	1	2.00E+00	1	1	0.0068	0.29	0.00000	0.083	0.00
Benzo(g,h,i)perylene	Bench NA	Bench NA	NA	NA	2.42E-02	1	267	51	2.42E-02	5.43E-02	5.43E-02	1	0.3	0.67	1	1.16E+00	1	1	0.0068	0.33	0.00E+00	0.083	0.00
Benzo(k)fluoranthene	Bench NA	Bench NA	NA	NA	2.28E-02	1	267	51	2.28E-02	5.18E-02	5.18E-02	1	0.3	0.68	1	1.07E+00	1	1	0.0068	0.32	0.00E+00	0.083	0.00
Chloronaphthalene (2-)	Bench NA	Bench NA	NA	NA	1.16E-04	1	267	51	1.16E-04	0.00E+00	0.00E+00	1	0.3	0.00	1	1.71E-02	1	1	0.0068	1.00	0.00E+00	0.083	0.00
Chrysene	Bench NA	Bench NA	NA	NA	4.73E-02	1	267	51	4.73E-02	1.23E-01	1.23E-01	1	0.3	0.78	1	1.53E+00	1	1	0.0068	0.22	0.00E+00	0.083	0.00
Dibenzo(a,h)anthracene	Bench NA	Bench NA	NA	NA	8.78E-03	1	267	51	8.78E-03	2.18E-02	2.18E-02	1	0.3	0.74	1	3.30E-01	1	1	0.0068	0.26	0.00E+00	0.083	0.00
Fluoranthene	2.00E-04	Bench NA	500	NA	7.78E-02	1	267	51	7.78E-02	2.00E-01	2.00E-01	1	0.3	0.77	1	2.64E+00	1	1	0.0068	0.23	0.00E+00	0.083	0.00
Fluorene	2.00E-05	Bench NA	500	NA	1.01E-02	1	267	51	1.01E-02	3.16E-02	3.16E-02	1	0.3	0.94	1	8.96E-02	1	1	0.0068	0.06	0.00E+00	0.083	0.00
Indeno(1,2,3-cd)pyrene	Bench NA	Bench NA	NA	NA	2.38E-02	1	267	51	2.38E-02	5.22E-02	5.22E-02	1	0.3	0.66	1	1.20E+00	1	1	0.0068	0.34	0.00E+00	0.083	0.00
Methylnaphthalene (1-)	Bench NA	Bench NA	NA	NA	1.18E-03	1	267	51	1.18E-03	3.19E-03	3.19E-03	1	0.3	0.81	1	3.30E-02	1	1	0.0068	0.19	0.00E+00	0.083	0.00
Methylnaphthalene (2-)	Bench NA	Bench NA	NA	NA	1.55E-03	1	267	51	1.55E-03	4.43E-03	4.43E-03	1	0.3	0.86	1	3.17E-02	1	1	0.0068	0.14	0.00E+00	0.083	0.00
Naphthalene	1.00E-03	5.00E-04	7.1	14	7.55E-03	1	267	51	7.55E-03	2.36E-02	2.36E-02	1	0.3	0.94	1	6.95E-02	1	1	0.0068	0.06	0.00E+00	0.083	0.00
Phenanthrene	Bench NA	Bench NA	NA	NA	8.85E-02	1	267	51	8.85E-02	2.73E-01	2.73E-01	1	0.3	0.93	1	9.59E-01	1	1	0.0068	0.07	0.00E+00	0.083	0.00
Pyrene	1.00E-02	7.00E-03	7.5	13	9.11E-02	1	267	51	9.11E-02	2.56E-01	2.56E-01	1	0.3	0.84	1	2.09E+00	1	1	0.0068	0.16	0.00E+00	0.083	0.00
Dioxin (2,3,7,8-TCDD)	2.00E-05	2.00E-06	0.001	0.01	2.10E-08	1	267	51	2.10E-08	3.61E-08	3.61E-08	1	0.3	0.52	1	1.50E-06	1	1	0.0068	0.48	0.00E+00	0.083	0.00
Antimony	3.00E-01	3.00E-02	0.125	1.25	4.08E-02	1	267	51	4.08E-02	4.16E-02	4.16E-02	1	0.3	0.31	1	4.16E+00	1	1	0.0068	0.69	0.00E+00	0.083	0.00
Arsenic	1.00E-01	Bench NA	2.5	NA	3.56E-01	1	267	51	3.56E-01	7.99E-01	7.99E-01	1	0.3	0.67	1	1.70E+01	1	1	0.0068	0.33	0.00E+00	0.083	0.00
Barium	1.00E-01	7.00E-02	13.8	19.8	1.47E+00	1	267	51	1.47E+00	3.03E-01	3.03E-01	1	0.3	0.06	1	2.02E+02	1	1	0.0068	0.94	4.82E-02	0.083	0.00
Beryllium	1.00E-02	Bench NA	0.66	NA	8.02E-03	1	267	51	8.02E-03	8.19E-03	8.19E-03	1	0.3	0.31	1	8.19E-01	1	1	0.0068	0.69	0.00E+00	0.083	0.00
Cadmium	9.00E-02	9.00E-03	1	10	8.97E-02	1	267	51	8.97E-02	2.40E-01	2.40E-01	1	0.3	0.80	1	2.62E+00	1	1	0.0068	0.20	0.00E+00	0.083	0.00
Chromium (total)	2.00E-04	Bench NA	2737	NA	5.15E-01	1	267	51	5.15E-01	9.89E-01	9.89E-01	1	0.3	0.58	1	3.21E+01	1	1	0.0068	0.42	0.00E+00	0.083	0.00
Copper	8.00E-02	6.00E-02	11.7	15.4	9.09E-01	1	267	51	9.09E-01	9.77E-01	9.77E-01	1	0.3	0.32	1	9.06E+01	1	1	0.0068	0.68	0.00E+00	0.083	0.00
Lead	4.00E-01	4.00E-02	8	80	2.98E+00	1	267	51	2.98E+00	4.35E+00	4.35E+00	1	0.3	0.44	1	2.46E+02	1	1	0.0068	0.56	3.07E-03	0.083	0.00
Mercury	2.00E-01	4.00E-02	0.032	0.16	5.90E-03	1	267	51	5.90E-03	1.34E-02	1.34E-02	1	0.3	0.68	1	2.75E-01	1	1	0.0068	0.32	0.00E+00	0.083	0.00
Nickel	1.00E-02	7.00E-03	40	80	5.23E-01	1	267	51	5.23E-01	1.19E+00	1.19E+00	1	0.3	0.68	1	2.45E+01	1	1	0.0068	0.32	0.00E+00	0.083	0.00
Selenium	1.00E+00	8.00E-01	0.2	0.33	2.65E-01	1	267	51	2.65E-01	7.70E-01	7.70E-01	1	0.3	0.87	1	5.06E+00	1	1	0.0068	0.13	0.00E+00	0.083	0.00
Silver	9.00E-04	9.00E-05	22	222.2	2.00E-02	1	267	51	2.00E-02	3.80E-02	3.80E-02	1	0.3	0.57	1	1.27E+00	1	1	0.0068	0.43	0.00E+00	0.083	0.00
Zinc	2.00E-02	1.00E-02	160	320	3.79E+00	1	267	51	3.79E+00	2.84E+00	2.84E+00	1	0.3	0.22	1	4.32E+02	1	1	0.0068	0.77	1.11E-02	0.083	0.00
Cyanide (Total)	3.00E-04	Bench NA	68.7	NA	2.38E-02	1	267	51	2.38E-02	0.00E+00	0.00E+00	1	0.3	0.00	1	3.49E+00	1	1	0.0068	1.00	1.14E-03	0.083	0.00

Notes:
NA=Not available/applicable
Bench NA = Benchmark not available
Bolded values indicate a Hazard Index greater than 1

Food Ingestion Rate calculated from the metabolic rate in EPA, 1993

Water Ingestion Rate (EPA, 1993).

**For the soil component, we convert the food ingestion rate from wet weight to dry weight (invertebrate moisture=80%; plant moisture=70%) and then calculate a soil ingestion rate from the soil proportion in the diet (dry weight) estimated in Beyer et al. (1994).

Table C-5
Food Chain Model For Chronic Exposures
Robin Model
Ingestion of Plants
Concord Avenue Landfill
Belmont, MA

	NOAEL	LOAEL	NOAEL	LOAEL	Forage Area	Site Area to	Foraging	Site	Exposure	Food					Soil					Water			
	Hazard Index	Hazard Index	Benchmark Dose mg/kg/day	Benchmark Dose mg/kg/day	Normalized Exposure Dose mg/kg/day	Forage Area Ratio	Area acres	Area acres	Dose mg/kg/day	Total Conc. in Food mg/kg wet	Plant Concentration mg/kg wet	Proportion Plant In Diet	Ingestion Rate kg/kg/day	Proportion of Dose		Conc. in Soil mg/kg dry	Ave. Percent Solids in Soil	Percentage Soil in Diet	Ingestion Rate kg/kg/day	Proportion of Dose	Conc. in Water mg/l	Ingestion Rate l/kg/day	Proportion of Dose
Contaminant															RAF								
Acenaphthene	Bench NA	Bench NA	NA	NA	1.63E-03	1	0.96	51	1.63E-03	0.002	1.61E-03	1	0.9	0.89	1	3.83E-02	1	1	0.0047	0.11	0	0.14	0.00
Acenaphthylene	Bench NA	Bench NA	NA	NA	1.40E-02	1	0.96	51	1.40E-02	0.014	1.38E-02	1	0.9	0.89	1	3.33E-01	1	1	0.0047	0.11	0	0.14	0.00
Anthracene	Bench NA	Bench NA	NA	NA	5.46E-03	1	0.96	51	5.46E-03	0.005	4.85E-03	1	0.9	0.80	1	2.34E-01	1	1	0.0047	0.20	0	0.14	0.00
Benzo(a)anthracene	Bench NA	Bench NA	NA	NA	8.83E-03	1	0.96	51	8.83E-03	0.004	4.02E-03	1	0.9	0.41	1	1.11E+00	1	1	0.0047	0.59	0	0.14	0.00
Benzo(a)pyrene	Bench NA	Bench NA	NA	NA	9.36E-03	1	0.96	51	9.36E-03	0.003	3.10E-03	1	0.9	0.30	1	1.40E+00	1	1	0.0047	0.70	0	0.14	0.00
Benzo(b)fluoranthene	Bench NA	Bench NA	NA	NA	9.76E-03	1	0.96	51	9.76E-03	0.002	2.01E-03	1	0.9	0.19	1	1.69E+00	1	1	0.0047	0.81	0	0.14	0.00
Benzo(g,h,i)perylene	Bench NA	Bench NA	NA	NA	7.61E-03	1	0.96	51	7.61E-03	0.002	1.51E-03	1	0.9	0.18	1	1.33E+00	1	1	0.0047	0.82	0	0.14	0.00
Benzo(k)fluoranthene	Bench NA	Bench NA	NA	NA	7.30E-03	1	0.96	51	7.30E-03	0.002	2.46E-03	1	0.9	0.30	1	1.08E+00	1	1	0.0047	0.70	0	0.14	0.00
Chloronaphthalene (2-)	Bench NA	Bench NA	NA	NA	6.74E-04	1	0.96	51	6.74E-04	0.001	6.68E-04	1	0.9	0.89	1	1.55E-02	1	1	0.0047	0.11	0	0.14	0.00
Chrysene	Bench NA	Bench NA	NA	NA	1.03E-02	1	0.96	51	1.03E-02	0.005	4.52E-03	1	0.9	0.39	1	1.33E+00	1	1	0.0047	0.61	0	0.14	0.00
Dibenzo(a,h)anthracene	Bench NA	Bench NA	NA	NA	2.04E-03	1	0.96	51	2.04E-03	0.000	4.48E-04	1	0.9	0.20	1	3.49E-01	1	1	0.0047	0.80	0	0.14	0.00
Fluoranthene	Bench NA	Bench NA	NA	NA	2.49E-02	1	0.96	51	2.49E-02	0.017	1.68E-02	1	0.9	0.61	1	2.08E+00	1	1	0.0047	0.39	0	0.14	0.00
Fluorene	Bench NA	Bench NA	NA	NA	2.04E-03	1	0.96	51	2.04E-03	0.002	1.93E-03	1	0.9	0.85	1	6.50E-02	1	1	0.0047	0.15	0	0.14	0.00
Indeno(1,2,3-cd)pyrene	Bench NA	Bench NA	NA	NA	7.22E-03	1	0.96	51	7.22E-03	0.001	1.33E-03	1	0.9	0.17	1	1.28E+00	1	1	0.0047	0.83	0	0.14	0.00
Methylnaphthalene (1-)	Bench NA	Bench NA	NA	NA	2.46E-03	1	0.96	51	2.46E-03	0.002	2.45E-03	1	0.9	0.90	1	5.45E-02	1	1	0.0047	0.10	0	0.14	0.00
Methylnaphthalene (2-)	Bench NA	Bench NA	NA	NA	2.75E-03	1	0.96	51	2.75E-03	0.003	2.74E-03	1	0.9	0.90	1	6.03E-02	1	1	0.0047	0.10	0	0.14	0.00
Naphthalene	Bench NA	Bench NA	NA	NA	6.60E-03	1	0.96	51	6.60E-03	0.007	6.95E-03	1	0.9	0.95	1	7.25E-02	1	1	0.0047	0.05	0	0.14	0.00
Phenanthrene	Bench NA	Bench NA	NA	NA	1.81E-02	1	0.96	51	1.81E-02	0.016	1.60E-02	1	0.9	0.80	1	7.83E-01	1	1	0.0047	0.20	0	0.14	0.00
Pyrene	Bench NA	Bench NA	NA	NA	2.99E-02	1	0.96	51	2.99E-02	0.023	2.30E-02	1	0.9	0.69	1	1.97E+00	1	1	0.0047	0.31	0	0.14	0.00
Total PAHs	3.00E-02	3.00E-03	40	400	1.26E+00	1	0.96	51	1.26E+00	1.331	1.33E+00	1	0.9	0.95	1	1.39E+01	1	1	0.0047	0.05	0	0.14	0.00
Dioxin (2,3,7,8-TCDD)	6.00E-04	6.00E-05	0.000014	0.00014	8.95E-09	1	0.96	51	8.95E-09	0.000	1.47E-09	1	0.9	0.15	1	1.62E-06	1	1	0.0047	0.85	0	0.14	0.00
Antimony	Bench NA	Bench NA	NA	NA	2.27E-02	1	0.96	51	2.27E-02	0.005	4.72E-03	1	0.9	0.19	1	3.93E+00	1	1	0.0047	0.81	0	0.14	0.00
Arsenic	4.00E-02	2.00E-02	5.14	12.84	2.02E-01	1	0.96	51	2.02E-01	0.135	1.35E-01	1	0.9	0.60	1	1.71E+01	1	1	0.0047	0.40	0	0.14	0.00
Barium	8.00E-02	4.00E-02	20.8	41.7	1.74E+00	1	0.96	51	1.74E+00	1.030	1.03E+00	1	0.9	0.53	1	1.72E+02	1	1	0.0047	0.46	0.05	0.14	0.00
Beryllium	Bench NA	Bench NA	NA	NA	4.11E-03	1	0.96	51	4.11E-03	0.000	3.25E-04	1	0.9	0.07	1	8.11E-01	1	1	0.0047	0.93	0	0.14	0.00
Cadmium	1.00E-01	8.00E-03	1.45	20.03	1.67E-01	1	0.96	51	1.67E-01	0.176	1.76E-01	1	0.9	0.95	1	1.89E+00	1	1	0.0047	0.05	0	0.14	0.00
Chromium (total)	1.00E-01	3.00E-02	1	5	1.44E-01	1	0.96	51	1.44E-01	0.005	5.31E-03	1	0.9	0.03	1	2.95E+01	1	1	0.0047	0.97	0	0.14	0.00
Copper	5.00E-02	4.00E-02	47	61.7	2.31E+00	1	0.96	51	2.31E+00	2.161	2.16E+00	1	0.9	0.84	1	7.69E+01	1	1	0.0047	0.16	0	0.14	0.00
Lead	2.00E+00	2.00E-01	1.13	11.3	2.79E+00	1	0.96	51	2.79E+00	1.374	1.37E+00	1	0.9	0.44	1	3.31E+02	1	1	0.0047	0.56	0.003	0.14	0.00
Mercury	3.00E-01	3.00E-02	0.0064	0.064	1.71E-03	1	0.96	51	1.71E-03	0.000	3.10E-04	1	0.9	0.16	1	3.05E-01	1	1	0.0047	0.84	0	0.14	0.00
Nickel	4.00E-03	3.00E-03	77.4	107	3.34E-01	1	0.96	51	3.34E-01	0.241	2.41E-01	1	0.9	0.65	1	2.50E+01	1	1	0.0047	0.35	0	0.14	0.00
Selenium	1.00E+00	6.00E-01	0.4	0.8	5.05E-01	1	0.96	51	5.05E-01	0.538	5.38E-01	1	0.9	0.96	1	4.53E+00	1	1	0.0047	0.04	0	0.14	0.00
Silver	Bench NA	Bench NA	NA	NA	1.03E-02	1	0.96	51	1.03E-02	0.005	4.97E-03	1	0.9	0.43	1	1.24E+00	1	1	0.0047	0.57	0	0.14	0.00
Zinc	2.00E+00	2.00E-01	14.5	131	2.33E+01	1	0.96	51	2.33E+01	24.196	2.42E+01	1	0.9	0.93	1	3.31E+02	1	1	0.0047	0.07	0.01	0.14	0.00
Cyanide (Total)	Bench NA	Bench NA	NA	NA	5.03E-01	1	0.96	51	5.03E-01	0.544	5.44E-01	1	0.9	0.97	1	2.72E+00	1	1	0.0047	0.03	0.001	0.14	0.00

Notes:
NA=Not available/applicable
Bench NA = Benchmark not available
Bolded values indicate a Hazard Index greater than 1

Table C-6
Food Chain Model For Chronic Exposures
Robin-Invertebrates Model
Ingestion of Earthworms (Modeled)
Concord Avenue Landfill
Belmont, MA

	NOAEL	LOAEL	NOAEL	LOAEL	Forage Area	Site Area to	Foraging	Site	Exposure	Food					Soil					Water			
	NOAEL Hazard Index	LOAEL Hazard Index	Benchmark Dose mg/kg/day	Benchmark Dose mg/kg/day	Normalized Exposure Dose mg/kg/day	Site Area to Forage Area Ratio	Area acres	Area acres	Dose mg/kg/day	Total Conc. in Food mg/kg wet	Earthworm Tissue mg/kg wet	Proportion Worm In Diet	Ingestion Rate kg/kg/day	Proportion of Dose		Conc. in Soil mg/kg dry	Ave. Percent Solids in Soil	Percentage Soil in Diet	Ingestion Rate kg/kg/day	Proportion of Dose	Conc. in Water mg/l	Ingestion Rate l/kg/day	Proportion of Dose
Contaminant	Index	Index	mg/kg/day	mg/kg/day	mg/kg/day	Ratio			mg/kg/day	mg/kg wet	mg/kg wet	In Diet	kg/kg/day	Dose	RAF	mg/kg dry	Soil	Diet	kg/kg/day	Dose	mg/l	l/kg/day	Dose
Acenaphthene	Bench NA	Bench NA	NA	NA	1.02E-03	1	0.96	51	1.02E-03	0.001	9.35E-04	1	0.9	0.82	1	3.83E-02	1	1	0.0047	0.18	0.00E+00	0.14	0.00
Acenaphthylene	Bench NA	Bench NA	NA	NA	8.89E-03	1	0.96	51	8.89E-03	0.008	8.13E-03	1	0.9	0.82	1	3.33E-01	1	1	0.0047	0.18	0.00E+00	0.14	0.00
Anthracene	Bench NA	Bench NA	NA	NA	6.23E-03	1	0.96	51	6.23E-03	0.006	5.70E-03	1	0.9	0.82	1	2.34E-01	1	1	0.0047	0.18	0.00E+00	0.14	0.00
Benzo(a)anthracene	Bench NA	Bench NA	NA	NA	2.95E-02	1	0.96	51	2.95E-02	0.027	2.70E-02	1	0.9	0.82	1	1.11E+00	1	1	0.0047	0.18	0.00E+00	0.14	0.00
Benzo(a)pyrene	Bench NA	Bench NA	NA	NA	3.73E-02	1	0.96	51	3.73E-02	0.034	3.41E-02	1	0.9	0.82	1	1.40E+00	1	1	0.0047	0.18	0.00E+00	0.14	0.00
Benzo(b)fluoranthene	Bench NA	Bench NA	NA	NA	4.51E-02	1	0.96	51	4.51E-02	0.041	4.13E-02	1	0.9	0.82	1	1.69E+00	1	1	0.0047	0.18	0.00E+00	0.14	0.00
Benzo(g,h,i)perylene	Bench NA	Bench NA	NA	NA	3.54E-02	1	0.96	51	3.54E-02	0.032	3.24E-02	1	0.9	0.82	1	1.33E+00	1	1	0.0047	0.18	0.00E+00	0.14	0.00
Benzo(k)fluoranthene	Bench NA	Bench NA	NA	NA	2.88E-02	1	0.96	51	2.88E-02	0.026	2.64E-02	1	0.9	0.82	1	1.08E+00	1	1	0.0047	0.18	0.00E+00	0.14	0.00
Chloronaphthalene (2-)	Bench NA	Bench NA	NA	NA	4.13E-04	1	0.96	51	4.13E-04	0.000	3.78E-04	1	0.9	0.82	1	1.55E-02	1	1	0.0047	0.18	0.00E+00	0.14	0.00
Chrysene	Bench NA	Bench NA	NA	NA	3.55E-02	1	0.96	51	3.55E-02	0.032	3.25E-02	1	0.9	0.82	1	1.33E+00	1	1	0.0047	0.18	0.00E+00	0.14	0.00
Dibenzo(a,h)anthracene	Bench NA	Bench NA	NA	NA	9.29E-03	1	0.96	51	9.29E-03	0.008	8.50E-03	1	0.9	0.82	1	3.49E-01	1	1	0.0047	0.18	0.00E+00	0.14	0.00
Fluoranthene	Bench NA	Bench NA	NA	NA	5.54E-02	1	0.96	51	5.54E-02	0.051	5.07E-02	1	0.9	0.82	1	2.08E+00	1	1	0.0047	0.18	0.00E+00	0.14	0.00
Fluorene	Bench NA	Bench NA	NA	NA	1.73E-03	1	0.96	51	1.73E-03	0.002	1.58E-03	1	0.9	0.82	1	6.50E-02	1	1	0.0047	0.18	0.00E+00	0.14	0.00
Indeno(1,2,3-cd)pyrene	Bench NA	Bench NA	NA	NA	3.42E-02	1	0.96	51	3.42E-02	0.031	3.13E-02	1	0.9	0.82	1	1.28E+00	1	1	0.0047	0.18	0.00E+00	0.14	0.00
Methylnaphthalene (1-)	Bench NA	Bench NA	NA	NA	1.45E-03	1	0.96	51	1.45E-03	0.001	1.33E-03	1	0.9	0.82	1	5.45E-02	1	1	0.0047	0.18	0.00E+00	0.14	0.00
Methylnaphthalene (2-)	Bench NA	Bench NA	NA	NA	1.61E-03	1	0.96	51	1.61E-03	0.001	1.47E-03	1	0.9	0.82	1	6.03E-02	1	1	0.0047	0.18	0.00E+00	0.14	0.00
Naphthalene	Bench NA	Bench NA	NA	NA	1.93E-03	1	0.96	51	1.93E-03	0.002	1.77E-03	1	0.9	0.82	1	7.25E-02	1	1	0.0047	0.18	0.00E+00	0.14	0.00
Phenanthrene	Bench NA	Bench NA	NA	NA	2.09E-02	1	0.96	51	2.09E-02	0.019	1.91E-02	1	0.9	0.82	1	7.83E-01	1	1	0.0047	0.18	0.00E+00	0.14	0.00
Pyrene	Bench NA	Bench NA	NA	NA	5.24E-02	1	0.96	51	5.24E-02	0.048	4.79E-02	1	0.9	0.82	1	1.97E+00	1	1	0.0047	0.18	0.00E+00	0.14	0.00
Total PAHs	9.00E-03	9.00E-04	40	400	3.70E-01	1	0.96	51	3.70E-01	0.339	3.39E-01	1	0.9	0.82	1	1.39E+01	1	1	0.0047	0.18	0.00E+00	0.14	0.00
Dioxin (2,3,7,8-TCDD)	6.00E-02	6.00E-03	0.000014	0.00014	8.91E-07	1	0.96	51	8.91E-07	0.000	9.82E-07	1	0.9	0.99	1	1.62E-06	1	1	0.0047	0.01	0.00E+00	0.14	0.00
Antimony	Bench NA	Bench NA	NA	NA	5.39E-02	1	0.96	51	5.39E-02	0.039	3.93E-02	1	0.9	0.66	1	3.93E+00	1	1	0.0047	0.34	0.00E+00	0.14	0.00
Arsenic	8.00E-02	3.00E-02	5.14	12.84	4.02E-01	1	0.96	51	4.02E-01	0.358	3.58E-01	1	0.9	0.80	1	1.71E+01	1	1	0.0047	0.20	0.00E+00	0.14	0.00
Barium	5.00E-02	3.00E-02	20.8	41.7	1.04E+00	1	0.96	51	1.04E+00	0.257	2.57E-01	1	0.9	0.22	1	1.72E+02	1	1	0.0047	0.77	4.82E-02	0.14	0.01
Beryllium	Bench NA	Bench NA	NA	NA	1.11E-02	1	0.96	51	1.11E-02	0.008	8.11E-03	1	0.9	0.66	1	8.11E-01	1	1	0.0047	0.34	0.00E+00	0.14	0.00
Cadmium	2.00E+00	1.00E-01	1.45	20.03	2.48E+00	1	0.96	51	2.48E+00	2.750	2.75E+00	1	0.9	1.00	1	1.89E+00	1	1	0.0047	0.00	0.00E+00	0.14	0.00
Chromium (total)	2.00E+00	4.00E-01	1	5	1.85E+00	1	0.96	51	1.85E+00	1.905	1.91E+00	1	0.9	0.93	1	2.95E+01	1	1	0.0047	0.07	0.00E+00	0.14	0.00
Copper	7.00E-02	5.00E-02	47	61.7	3.38E+00	1	0.96	51	3.38E+00	3.359	3.36E+00	1	0.9	0.89	1	7.69E+01	1	1	0.0047	0.11	0.00E+00	0.14	0.00
Lead	2.00E+01	2.00E+00	1.13	11.3	1.72E+01	1	0.96	51	1.72E+01	17.373	1.74E+01	1	0.9	0.91	1	3.31E+02	1	1	0.0047	0.09	3.07E-03	0.14	0.00
Mercury	3.00E+00	3.00E-01	0.0064	0.064	1.72E-02	1	0.96	51	1.72E-02	0.018	1.75E-02	1	0.9	0.92	1	3.05E-01	1	1	0.0047	0.08	0.00E+00	0.14	0.00
Nickel	4.00E-02	3.00E-02	77.4	107	3.20E+00	1	0.96	51	3.20E+00	3.421	3.42E+00	1	0.9	0.96	1	2.50E+01	1	1	0.0047	0.04	0.00E+00	0.14	0.00
Selenium	1.00E+00	7.00E-01	0.4	0.8	5.26E-01	1	0.96	51	5.26E-01	0.561	5.61E-01	1	0.9	0.96	1	4.53E+00	1	1	0.0047	0.04	0.00E+00	0.14	0.00
Silver	Bench NA	Bench NA	NA	NA	3.94E-02	1	0.96	51	3.94E-02	0.037	3.73E-02	1	0.9	0.85	1	1.24E+00	1	1	0.0047	0.15	0.00E+00	0.14	0.00
Zinc	7.00E+00	8.00E-01	14.5	131	1.05E+02	1	0.96	51	1.05E+02	114.693	1.15E+02	1	0.9	0.99	1	3.31E+02	1	1	0.0047	0.01	1.11E-02	0.14	0.00
Cyanide (Total)	Bench NA	Bench NA	NA	NA	1.28E-02	1	0.96	51	1.28E-02	0.000	0.00E+00	1	0.9	0.00	1	2.72E+00	1	1	0.0047	1.00	0.00E+00	0.14	0.00

Notes:
NA=Not available/applicable
Bench NA = Benchmark not available
Bolded values indicate a Hazard Index greater than 1

Table C-7
Food Chain Model For Chronic Exposures
Robin-Invertebrates Model
Ingestion of Earthworms (measured)
Concord Avenue Landfill
Belmont, MA

	NOAEL	LOAEL	NOAEL	LOAEL	Forage Area	Site Area to	Foraging	Site	Exposure	Food					Soil					Water			
	Hazard Index	Hazard Index	Benchmark Dose mg/kg/day	Benchmark Dose mg/kg/day	Normalized Exposure Dose mg/kg/day	Forage Area Ratio	Area acres	Area acres	Dose mg/kg/day	Total Conc. in Food mg/kg wet	Earthworm Tissue mg/kg wet	Proportion Worm In Diet	Ingestion Rate kg/kg/day	Proportion of Dose	RAF	Conc. in Soil mg/kg dry	Ave. Percent Solids in Soil	Percentage Soil in Diet	Ingestion Rate kg/kg/day	Proportion of Dose	Conc. in Water mg/l	Ingestion Rate l/kg/day	Proportion of Dose
Contaminant																							
Acenaphthene	Bench NA	Bench NA	NA	NA	1.02E-03	1	0.96	51	1.02E-03	0.001	9.35E-04	1	0.9	0.82	1	3.83E-02	1	1	0.0047	0.18	0.00E+00	0.14	0.00
Acenaphthylene	Bench NA	Bench NA	NA	NA	8.89E-03	1	0.96	51	8.89E-03	0.008	8.13E-03	1	0.9	0.82	1	3.33E-01	1	1	0.0047	0.18	0.00E+00	0.14	0.00
Anthracene	Bench NA	Bench NA	NA	NA	6.23E-03	1	0.96	51	6.23E-03	0.006	5.70E-03	1	0.9	0.82	1	2.34E-01	1	1	0.0047	0.18	0.00E+00	0.14	0.00
Benzo(a)anthracene	Bench NA	Bench NA	NA	NA	2.95E-02	1	0.96	51	2.95E-02	0.027	2.70E-02	1	0.9	0.82	1	1.11E+00	1	1	0.0047	0.18	0.00E+00	0.14	0.00
Benzo(a)pyrene	Bench NA	Bench NA	NA	NA	3.73E-02	1	0.96	51	3.73E-02	0.034	3.41E-02	1	0.9	0.82	1	1.40E+00	1	1	0.0047	0.18	0.00E+00	0.14	0.00
Benzo(b)fluoranthene	Bench NA	Bench NA	NA	NA	4.51E-02	1	0.96	51	4.51E-02	0.041	4.13E-02	1	0.9	0.82	1	1.69E+00	1	1	0.0047	0.18	0.00E+00	0.14	0.00
Benzo(g,h,i)perylene	Bench NA	Bench NA	NA	NA	3.54E-02	1	0.96	51	3.54E-02	0.032	3.24E-02	1	0.9	0.82	1	1.33E+00	1	1	0.0047	0.18	0.00E+00	0.14	0.00
Benzo(k)fluoranthene	Bench NA	Bench NA	NA	NA	2.88E-02	1	0.96	51	2.88E-02	0.026	2.64E-02	1	0.9	0.82	1	1.08E+00	1	1	0.0047	0.18	0.00E+00	0.14	0.00
Chloronaphthalene (2-)	Bench NA	Bench NA	NA	NA	4.13E-04	1	0.96	51	4.13E-04	0.000	3.78E-04	1	0.9	0.82	1	1.55E-02	1	1	0.0047	0.18	0.00E+00	0.14	0.00
Chrysene	Bench NA	Bench NA	NA	NA	3.55E-02	1	0.96	51	3.55E-02	0.032	3.25E-02	1	0.9	0.82	1	1.33E+00	1	1	0.0047	0.18	0.00E+00	0.14	0.00
Dibenzo(a,h)anthracene	Bench NA	Bench NA	NA	NA	9.29E-03	1	0.96	51	9.29E-03	0.008	8.50E-03	1	0.9	0.82	1	3.49E-01	1	1	0.0047	0.18	0.00E+00	0.14	0.00
Fluoranthene	Bench NA	Bench NA	NA	NA	5.54E-02	1	0.96	51	5.54E-02	0.051	5.07E-02	1	0.9	0.82	1	2.08E+00	1	1	0.0047	0.18	0.00E+00	0.14	0.00
Fluorene	Bench NA	Bench NA	NA	NA	1.73E-03	1	0.96	51	1.73E-03	0.002	1.58E-03	1	0.9	0.82	1	6.50E-02	1	1	0.0047	0.18	0.00E+00	0.14	0.00
Indeno(1,2,3-cd)pyrene	Bench NA	Bench NA	NA	NA	3.42E-02	1	0.96	51	3.42E-02	0.031	3.13E-02	1	0.9	0.82	1	1.28E+00	1	1	0.0047	0.18	0.00E+00	0.14	0.00
Methylnaphthalene (1-)	Bench NA	Bench NA	NA	NA	1.45E-03	1	0.96	51	1.45E-03	0.001	1.33E-03	1	0.9	0.82	1	5.45E-02	1	1	0.0047	0.18	0.00E+00	0.14	0.00
Methylnaphthalene (2-)	Bench NA	Bench NA	NA	NA	1.61E-03	1	0.96	51	1.61E-03	0.001	1.47E-03	1	0.9	0.82	1	6.03E-02	1	1	0.0047	0.18	0.00E+00	0.14	0.00
Naphthalene	Bench NA	Bench NA	NA	NA	1.93E-03	1	0.96	51	1.93E-03	0.002	1.77E-03	1	0.9	0.82	1	7.25E-02	1	1	0.0047	0.18	0.00E+00	0.14	0.00
Phenanthrene	Bench NA	Bench NA	NA	NA	2.09E-02	1	0.96	51	2.09E-02	0.019	1.91E-02	1	0.9	0.82	1	7.83E-01	1	1	0.0047	0.18	0.00E+00	0.14	0.00
Pyrene	Bench NA	Bench NA	NA	NA	5.24E-02	1	0.96	51	5.24E-02	0.048	4.79E-02	1	0.9	0.82	1	1.97E+00	1	1	0.0047	0.18	0.00E+00	0.14	0.00
Total PAHs	9.00E-03	9.00E-04	40	400	3.70E-01	1	0.96	51	3.70E-01	0.339	3.39E-01	1	0.9	0.82	1	1.39E+01	1	1	0.0047	0.18	0.00E+00	0.14	0.00
Dioxin (2,3,7,8-TCDD)	6.00E-02	6.00E-03	0.000014	0.00014	8.91E-07	1	0.96	51	8.91E-07	0.000	9.82E-07	1	0.9	0.99	1	1.62E-06	1	1	0.0047	0.01	0.00E+00	0.14	0.00
Antimony	Bench NA	Bench NA	NA	NA	4.47E-01	1	0.96	51	4.47E-01	0.476	4.76E-01	1	0.9	0.96	1	3.93E+00	1	1	0.0047	0.04	0.00E+00	0.14	0.00
Arsenic	2.00E-01	6.00E-02	5.14	12.84	7.87E-01	1	0.96	51	7.87E-01	0.785	7.85E-01	1	0.9	0.90	1	1.71E+01	1	1	0.0047	0.10	0.00E+00	0.14	0.00
Barium	9.00E-01	4.00E-01	20.8	41.7	1.80E+01	1	0.96	51	1.80E+01	19.093	1.91E+01	1	0.9	0.95	1	1.72E+02	1	1	0.0047	0.04	4.82E-02	0.14	0.00
Beryllium	Bench NA	Bench NA	NA	NA	5.42E-02	1	0.96	51	5.42E-02	0.056	5.60E-02	1	0.9	0.93	1	8.11E-01	1	1	0.0047	0.07	0.00E+00	0.14	0.00
Cadmium	1.00E+00	8.00E-02	1.45	20.03	1.69E+00	1	0.96	51	1.69E+00	1.869	1.87E+00	1	0.9	0.99	1	1.89E+00	1	1	0.0047	0.01	0.00E+00	0.14	0.00
Chromium (total)	2.00E+00	3.00E-01	1	5	1.57E+00	1	0.96	51	1.57E+00	1.594	1.59E+00	1	0.9	0.91	1	2.95E+01	1	1	0.0047	0.09	0.00E+00	0.14	0.00
Copper	1.00E-01	9.00E-02	47	61.7	5.77E+00	1	0.96	51	5.77E+00	6.007	6.01E+00	1	0.9	0.94	1	7.69E+01	1	1	0.0047	0.06	0.00E+00	0.14	0.00
Lead	2.00E+01	2.00E+00	1.13	11.3	2.02E+01	1	0.96	51	2.02E+01	20.767	2.08E+01	1	0.9	0.92	1	3.31E+02	1	1	0.0047	0.08	3.07E-03	0.14	0.00
Mercury	2.00E+00	2.00E-01	0.0064	0.064	1.22E-02	1	0.96	51	1.22E-02	0.012	1.20E-02	1	0.9	0.88	1	3.05E-01	1	1	0.0047	0.12	0.00E+00	0.14	0.00
Nickel	1.00E-02	9.00E-03	77.4	107	9.66E-01	1	0.96	51	9.66E-01	0.943	9.43E-01	1	0.9	0.88	1	2.50E+01	1	1	0.0047	0.12	0.00E+00	0.14	0.00
Selenium	2.00E+00	9.00E-01	0.4	0.8	7.21E-01	1	0.96	51	7.21E-01	0.778	7.78E-01	1	0.9	0.97	1	4.53E+00	1	1	0.0047	0.03	0.00E+00	0.14	0.00
Silver	Bench NA	Bench NA	NA	NA	6.40E-02	1	0.96	51	6.40E-02	0.065	6.47E-02	1	0.9	0.91	1	1.24E+00	1	1	0.0047	0.09	0.00E+00	0.14	0.00
Zinc	7.00E+00	8.00E-01	14.5	131	1.08E+02	1	0.96	51	1.08E+02	117.967	1.18E+02	1	0.9	0.99	1	3.31E+02	1	1	0.0047	0.01	1.11E-02	0.14	0.00
Cyanide (Total)	Bench NA	Bench NA	NA	NA	1.28E-02	1	0.96	51	1.28E-02	0.000	0.00E+00	1	0.9	0.00	1	2.72E+00	1	1	0.0047	1.00	0.00E+00	0.14	0.00

Notes:
NA=Not available/applicable
Bench NA = Benchmark not available
Bolded values indicate a Hazard Index greater than 1

Table C-8
Food Chain Model For Chronic Exposures
Short-Tailed Shrew-Invertebrate Model
Ingestion of Earthworms (Modeled)
Concord Avenue Landfill
Belmont, MA

			NOAEL	LOAEL	Forage Area					Food					Soil					Water			
	NOAEL	LOAEL	Benchmark	Benchmark	Normalized	Site Area to	Foraging	Site	Exposure	Total Conc.	Earthworm	Proportion	Ingestion	Proportion		Conc.	Ave. Percent	Percentage	Ingestion	Proportion	Conc.	Ingestion	Proportion
	Hazard	Hazard	Dose	Dose	Exposure Dose	Forage Area	Area	Area	Dose	in Food	Tissue	Worm	Rate	of	RAF	in Soil	Solids in	Soil in	Rate	of	in Water	Rate	of
Contaminant	Index	Index	mg/kg/day	mg/kg/day	mg/kg/day	Ratio	acres	acres	mg/kg/day	mg/kg wet	mg/kg wet	In Diet	kg/kg/day	Dose		mg/kg dry	Soils in	Diet	kg/kg/day	Dose	mg/l	l/kg/day	Dose
Acenaphthene	3.00E-06	2.00E-06	350	700	1.11E-03	1	0.96	51	1.11E-03	9.35E-04	9.35E-04	1	0.55	0.46	1	3.83E-02	1	1	0.0156	0.54	0.00E+00	0.233	0.00
Acenaphthylene	Bench NA	Bench NA	NA	NA	9.67E-03	1	0.96	51	9.67E-03	8.13E-03	8.13E-03	1	0.55	0.46	1	3.33E-01	1	1	0.0156	0.54	0.00E+00	0.233	0.00
Anthracene	7.00E-05	Bench NA	100	NA	6.78E-03	1	0.96	51	6.78E-03	5.70E-03	5.70E-03	1	0.55	0.46	1	2.34E-01	1	1	0.0156	0.54	0.00E+00	0.233	0.00
Benzo(a)anthracene	Bench NA	Bench NA	NA	NA	3.22E-02	1	0.96	51	3.22E-02	2.70E-02	2.70E-02	1	0.55	0.46	1	1.11E+00	1	1	0.0156	0.54	0.00E+00	0.233	0.00
Benzo(a)pyrene	4.00E-02	4.00E-03	1	10	4.06E-02	1	0.96	51	4.06E-02	3.41E-02	3.41E-02	1	0.55	0.46	1	1.40E+00	1	1	0.0156	0.54	0.00E+00	0.233	0.00
Benzo(b)fluoranthene	Bench NA	Bench NA	NA	NA	4.91E-02	1	0.96	51	4.91E-02	4.13E-02	4.13E-02	1	0.55	0.46	1	1.69E+00	1	1	0.0156	0.54	0.00E+00	0.233	0.00
Benzo(g,h,i)perylene	Bench NA	Bench NA	NA	NA	3.85E-02	1	0.96	51	3.85E-02	3.24E-02	3.24E-02	1	0.55	0.46	1	1.33E+00	1	1	0.0156	0.54	0.00E+00	0.233	0.00
Benzo(k)fluoranthene	Bench NA	Bench NA	NA	NA	3.14E-02	1	0.96	51	3.14E-02	2.64E-02	2.64E-02	1	0.55	0.46	1	1.08E+00	1	1	0.0156	0.54	0.00E+00	0.233	0.00
Chloronaphthalene (2-)	Bench NA	Bench NA	NA	NA	4.49E-04	1	0.96	51	4.49E-04	3.78E-04	3.78E-04	1	0.55	0.46	1	1.55E-02	1	1	0.0156	0.54	0.00E+00	0.233	0.00
Chrysene	Bench NA	Bench NA	NA	NA	3.86E-02	1	0.96	51	3.86E-02	3.25E-02	3.25E-02	1	0.55	0.46	1	1.33E+00	1	1	0.0156	0.54	0.00E+00	0.233	0.00
Dibenzo(a,h)anthracene	Bench NA	Bench NA	NA	NA	1.01E-02	1	0.96	51	1.01E-02	8.50E-03	8.50E-03	1	0.55	0.46	1	3.49E-01	1	1	0.0156	0.54	0.00E+00	0.233	0.00
Fluoranthene	1.00E-04	Bench NA	500	NA	6.04E-02	1	0.96	51	6.04E-02	5.07E-02	5.07E-02	1	0.55	0.46	1	2.08E+00	1	1	0.0156	0.54	0.00E+00	0.233	0.00
Fluorene	4.00E-06	Bench NA	500	NA	1.89E-03	1	0.96	51	1.89E-03	1.58E-03	1.58E-03	1	0.55	0.46	1	6.50E-02	1	1	0.0156	0.54	0.00E+00	0.233	0.00
Indeno(1,2,3-cd)pyrene	Bench NA	Bench NA	NA	NA	3.72E-02	1	0.96	51	3.72E-02	3.13E-02	3.13E-02	1	0.55	0.46	1	1.28E+00	1	1	0.0156	0.54	0.00E+00	0.233	0.00
Methylnaphthalene (1-)	Bench NA	Bench NA	NA	NA	1.58E-03	1	0.96	51	1.58E-03	1.33E-03	1.33E-03	1	0.55	0.46	1	5.45E-02	1	1	0.0156	0.54	0.00E+00	0.233	0.00
Methylnaphthalene (2-)	Bench NA	Bench NA	NA	NA	1.75E-03	1	0.96	51	1.75E-03	1.47E-03	1.47E-03	1	0.55	0.46	1	6.03E-02	1	1	0.0156	0.54	0.00E+00	0.233	0.00
Naphthalene	3.00E-04	2.00E-04	7.1	14	2.10E-03	1	0.96	51	2.10E-03	1.77E-03	1.77E-03	1	0.55	0.46	1	7.25E-02	1	1	0.0156	0.54	0.00E+00	0.233	0.00
Phenanthrene	Bench NA	Bench NA	NA	NA	2.27E-02	1	0.96	51	2.27E-02	1.91E-02	1.91E-02	1	0.55	0.46	1	7.83E-01	1	1	0.0156	0.54	0.00E+00	0.233	0.00
Pyrene	8.00E-03	4.00E-03	7.5	13	5.70E-02	1	0.96	51	5.70E-02	4.79E-02	4.79E-02	1	0.55	0.46	1	1.97E+00	1	1	0.0156	0.54	0.00E+00	0.233	0.00
Dioxin (2,3,7,8-TCDD)	6.00E-04	6.00E-05	0.001	0.01	5.65E-07	1	0.96	51	5.65E-07	9.82E-07	9.82E-07	1	0.55	0.96	1	1.62E-06	1	1	0.0156	0.04	0.00E+00	0.233	0.00
Antimony	7.00E-01	7.00E-02	0.125	1.25	8.30E-02	1	0.96	51	8.30E-02	3.93E-02	3.93E-02	1	0.55	0.26	1	3.93E+00	1	1	0.0156	0.74	0.00E+00	0.233	0.00
Arsenic	2.00E-01	Bench NA	2.5	NA	4.63E-01	1	0.96	51	4.63E-01	3.58E-01	3.58E-01	1	0.55	0.43	1	1.71E+01	1	1	0.0156	0.57	0.00E+00	0.233	0.00
Barium	2.00E-01	1.00E-01	13.8	19.8	2.83E+00	1	0.96	51	2.83E+00	2.57E-01	2.57E-01	1	0.55	0.05	1	1.72E+02	1	1	0.0156	0.95	4.82E-02	0.233	0.00
Beryllium	3.00E-02	Bench NA	0.66	NA	1.71E-02	1	0.96	51	1.71E-02	8.11E-03	8.11E-03	1	0.55	0.26	1	8.11E-01	1	1	0.0156	0.74	0.00E+00	0.233	0.00
Cadmium	2.00E+00	2.00E-01	1	10	1.54E+00	1	0.96	51	1.54E+00	2.75E+00	2.75E+00	1	0.55	0.98	1	1.89E+00	1	1	0.0156	0.02	0.00E+00	0.233	0.00
Chromium (total)	6.00E-04	Bench NA	2737	NA	1.51E+00	1	0.96	51	1.51E+00	1.91E+00	1.91E+00	1	0.55	0.69	1	2.95E+01	1	1	0.0156	0.31	0.00E+00	0.233	0.00
Copper	3.00E-01	2.00E-01	11.7	15.14	3.05E+00	1	0.96	51	3.05E+00	3.36E+00	3.36E+00	1	0.55	0.61	1	7.69E+01	1	1	0.0156	0.39	0.00E+00	0.233	0.00
Lead	2.00E+00	2.00E-01	8	80	1.47E+01	1	0.96	51	1.47E+01	1.74E+01	1.74E+01	1	0.55	0.65	1	3.31E+02	1	1	0.0156	0.35	3.07E-03	0.233	0.00
Mercury	5.00E-01	9.00E-02	0.032	0.16	1.44E-02	1	0.96	51	1.44E-02	1.75E-02	1.75E-02	1	0.55	0.67	1	3.05E-01	1	1	0.0156	0.33	0.00E+00	0.233	0.00
Nickel	6.00E-02	3.00E-02	40	80	2.27E+00	1	0.96	51	2.27E+00	3.42E+00	3.42E+00	1	0.55	0.83	1	2.50E+01	1	1	0.0156	0.17	0.00E+00	0.233	0.00
Selenium	2.00E+00	1.00E+00	0.2	0.33	3.79E-01	1	0.96	51	3.79E-01	5.61E-01	5.61E-01	1	0.55	0.81	1	4.53E+00	1	1	0.0156	0.19	0.00E+00	0.233	0.00
Silver	2.00E-03	2.00E-04	22	222.2	3.99E-02	1	0.96	51	3.99E-02	3.73E-02	3.73E-02	1	0.55	0.51	1	1.24E+00	1	1	0.0156	0.49	0.00E+00	0.233	0.00
Zinc	4.00E-01	2.00E-01	160	320	6.83E+01	1	0.96	51	6.83E+01	1.15E+02	1.15E+02	1	0.55	0.92	1	3.31E+02	1	1	0.0156	0.08	1.11E-02	0.233	0.00
Cyanide (Total)	6.00E-04	Bench NA	68.7	NA	4.27E-02	1	0.96	51	4.27E-02	0.00E+00	0.00E+00	1	0.55	0.00	1	2.72E+00	1	1	0.0156	0.99	1.14E-03	0.233	0.01

Notes:
NA=Not available/applicable
Bench NA = Benchmark not available
Bolded values indicate a Hazard Index greater than 1

Table C-9
Food Chain Model For Chronic Exposures
Short-Tailed Shrew-Invertebrate Model
Ingestion of Earthworms (Measured)
Concord Avenue Landfill
Belmont, MA

			NOAEL	LOAEL	Forage Area					Food					Soil					Water			
	NOAEL	LOAEL	Benchmark	Benchmark	Normalized	Site Area to	Foraging	Site	Exposure	Total Conc.	Earthworm	Proportion	Ingestion	Proportion		Conc.	Ave. Percent	Percentage	Ingestion	Proportion	Conc.	Ingestion	Proportion
	Hazard	Hazard	Dose	Dose	Exposure Dose	Forage Area	Area	Area	Dose	in Food	Tissue	Worm	Rate	of		in Soil	Solids in	Soil in	Rate	of	in Water	Rate	of
Contaminant	Index	Index	mg/kg/day	mg/kg/day	mg/kg/day	Ratio	acres	acres	mg/kg/day	mg/kg wet	mg/kg wet	In Diet	kg/kg/day	Dose	RAF	mg/kg dry	Soils in	Soil in Diet	kg/kg/day	of Dose	mg/l	l/kg/day	Dose
Acenaphthene	3.00E-06	2.00E-06	350	700	1.11E-03	1	0.96	51	1.11E-03	9.35E-04	9.35E-04	1	0.55	0.46	1	3.83E-02	1	1	0.0156	0.54	0.00E+00	0.233	0.00
Acenaphthylene	Bench NA	Bench NA	NA	NA	9.67E-03	1	0.96	51	9.67E-03	8.13E-03	8.13E-03	1	0.55	0.46	1	3.33E-01	1	1	0.0156	0.54	0.00E+00	0.233	0.00
Anthracene	7.00E-05	Bench NA	100	NA	6.78E-03	1	0.96	51	6.78E-03	5.70E-03	5.70E-03	1	0.55	0.46	1	2.34E-01	1	1	0.0156	0.54	0.00E+00	0.233	0.00
Benzo(a)anthracene	Bench NA	Bench NA	NA	NA	3.22E-02	1	0.96	51	3.22E-02	2.70E-02	2.70E-02	1	0.55	0.46	1	1.11E+00	1	1	0.0156	0.54	0.00E+00	0.233	0.00
Benzo(a)pyrene	4.00E-02	4.00E-03	1	10	4.06E-02	1	0.96	51	4.06E-02	3.41E-02	3.41E-02	1	0.55	0.46	1	1.40E+00	1	1	0.0156	0.54	0.00E+00	0.233	0.00
Benzo(b)fluoranthene	Bench NA	Bench NA	NA	NA	4.91E-02	1	0.96	51	4.91E-02	4.13E-02	4.13E-02	1	0.55	0.46	1	1.69E+00	1	1	0.0156	0.54	0.00E+00	0.233	0.00
Benzo(g,h,i)perylene	Bench NA	Bench NA	NA	NA	3.85E-02	1	0.96	51	3.85E-02	3.24E-02	3.24E-02	1	0.55	0.46	1	1.33E+00	1	1	0.0156	0.54	0.00E+00	0.233	0.00
Benzo(k)fluoranthene	Bench NA	Bench NA	NA	NA	3.14E-02	1	0.96	51	3.14E-02	2.64E-02	2.64E-02	1	0.55	0.46	1	1.08E+00	1	1	0.0156	0.54	0.00E+00	0.233	0.00
Chloronaphthalene (2-)	Bench NA	Bench NA	NA	NA	4.49E-04	1	0.96	51	4.49E-04	3.78E-04	3.78E-04	1	0.55	0.46	1	1.55E-02	1	1	0.0156	0.54	0.00E+00	0.233	0.00
Chrysene	Bench NA	Bench NA	NA	NA	3.86E-02	1	0.96	51	3.86E-02	3.25E-02	3.25E-02	1	0.55	0.46	1	1.33E+00	1	1	0.0156	0.54	0.00E+00	0.233	0.00
Dibenzo(a,h)anthracene	Bench NA	Bench NA	NA	NA	1.01E-02	1	0.96	51	1.01E-02	8.50E-03	8.50E-03	1	0.55	0.46	1	3.49E-01	1	1	0.0156	0.54	0.00E+00	0.233	0.00
Fluoranthene	1.00E-04	Bench NA	500	NA	6.04E-02	1	0.96	51	6.04E-02	5.07E-02	5.07E-02	1	0.55	0.46	1	2.08E+00	1	1	0.0156	0.54	0.00E+00	0.233	0.00
Fluorene	4.00E-06	Bench NA	500	NA	1.89E-03	1	0.96	51	1.89E-03	1.58E-03	1.58E-03	1	0.55	0.46	1	6.50E-02	1	1	0.0156	0.54	0.00E+00	0.233	0.00
Indeno(1,2,3-cd)pyrene	Bench NA	Bench NA	NA	NA	3.72E-02	1	0.96	51	3.72E-02	3.13E-02	3.13E-02	1	0.55	0.46	1	1.28E+00	1	1	0.0156	0.54	0.00E+00	0.233	0.00
Methylnaphthalene (1-)	Bench NA	Bench NA	NA	NA	1.58E-03	1	0.96	51	1.58E-03	1.33E-03	1.33E-03	1	0.55	0.46	1	5.45E-02	1	1	0.0156	0.54	0.00E+00	0.233	0.00
Methylnaphthalene (2-)	Bench NA	Bench NA	NA	NA	1.75E-03	1	0.96	51	1.75E-03	1.47E-03	1.47E-03	1	0.55	0.46	1	6.03E-02	1	1	0.0156	0.54	0.00E+00	0.233	0.00
Naphthalene	3.00E-04	2.00E-04	7.1	14	2.10E-03	1	0.96	51	2.10E-03	1.77E-03	1.77E-03	1	0.55	0.46	1	7.25E-02	1	1	0.0156	0.54	0.00E+00	0.233	0.00
Phenanthrene	Bench NA	Bench NA	NA	NA	2.27E-02	1	0.96	51	2.27E-02	1.91E-02	1.91E-02	1	0.55	0.46	1	7.83E-01	1	1	0.0156	0.54	0.00E+00	0.233	0.00
Pyrene	8.00E-03	4.00E-03	7.5	13	5.70E-02	1	0.96	51	5.70E-02	4.79E-02	4.79E-02	1	0.55	0.46	1	1.97E+00	1	1	0.0156	0.54	0.00E+00	0.233	0.00
Dioxin (2,3,7,8-TCDD)	6.00E-04	6.00E-05	0.001	0.01	5.65E-07	1	0.96	51	5.65E-07	9.82E-07	9.82E-07	1	0.55	0.96	1	1.62E-06	1	1	0.0156	0.04	0.00E+00	0.233	0.00
Antimony	3.00E+00	3.00E-01	0.125	1.25	3.23E-01	1	0.96	51	3.23E-01	4.76E-01	4.76E-01	1	0.55	0.81	1	3.93E+00	1	1	0.0156	0.19	0.00E+00	0.233	0.00
Arsenic	3.00E-01	Bench NA	2.5	NA	6.98E-01	1	0.96	51	6.98E-01	7.85E-01	7.85E-01	1	0.55	0.62	1	1.71E+01	1	1	0.0156	0.38	0.00E+00	0.233	0.00
Barium	1.00E+00	7.00E-01	13.8	19.8	1.32E+01	1	0.96	51	1.32E+01	1.91E+01	1.91E+01	1	0.55	0.80	1	1.72E+02	1	1	0.0156	0.20	4.82E-02	0.233	0.00
Beryllium	7.00E-02	Bench NA	0.66	NA	4.35E-02	1	0.96	51	4.35E-02	5.60E-02	5.60E-02	1	0.55	0.71	1	8.11E-01	1	1	0.0156	0.29	0.00E+00	0.233	0.00
Cadmium	1.00E+00	1.00E-01	1	10	1.06E+00	1	0.96	51	1.06E+00	1.87E+00	1.87E+00	1	0.55	0.97	1	1.89E+00	1	1	0.0156	0.03	0.00E+00	0.233	0.00
Chromium (total)	5.00E-04	Bench NA	2737	NA	1.34E+00	1	0.96	51	1.34E+00	1.59E+00	1.59E+00	1	0.55	0.66	1	2.95E+01	1	1	0.0156	0.34	0.00E+00	0.233	0.00
Copper	4.00E-01	3.00E-01	11.7	15.14	4.50E+00	1	0.96	51	4.50E+00	6.01E+00	6.01E+00	1	0.55	0.73	1	7.69E+01	1	1	0.0156	0.27	0.00E+00	0.233	0.00
Lead	2.00E+00	2.00E-01	8	80	1.66E+01	1	0.96	51	1.66E+01	2.08E+01	2.08E+01	1	0.55	0.69	1	3.31E+02	1	1	0.0156	0.31	3.07E-03	0.233	0.00
Mercury	4.00E-01	7.00E-02	0.032	0.16	1.14E-02	1	0.96	51	1.14E-02	1.20E-02	1.20E-02	1	0.55	0.58	1	3.05E-01	1	1	0.0156	0.42	0.00E+00	0.233	0.00
Nickel	2.00E-02	1.00E-02	40	80	9.09E-01	1	0.96	51	9.09E-01	9.43E-01	9.43E-01	1	0.55	0.57	1	2.50E+01	1	1	0.0156	0.43	0.00E+00	0.233	0.00
Selenium	2.00E+00	2.00E+00	0.2	0.33	4.98E-01	1	0.96	51	4.98E-01	7.78E-01	7.78E-01	1	0.55	0.86	1	4.53E+00	1	1	0.0156	0.14	0.00E+00	0.233	0.00
Silver	2.00E-03	2.00E-04	22	222.2	5.49E-02	1	0.96	51	5.49E-02	6.47E-02	6.47E-02	1	0.55	0.65	1	1.24E+00	1	1	0.0156	0.35	0.00E+00	0.233	0.00
Zinc	4.00E-01	2.00E-01	160	320	7.01E+01	1	0.96	51	7.01E+01	1.18E+02	1.18E+02	1	0.55	0.93	1	3.31E+02	1	1	0.0156	0.07	1.11E-02	0.233	0.00
Cyanide (Total)	6.00E-04	Bench NA	68.7	NA	4.27E-02	1	0.96	51	4.27E-02	0.00E+00	0.00E+00	1	0.55	0.00	1	2.72E+00	1	1	0.0156	0.99	1.14E-03	0.233	0.01

Notes:
NA=Not available/applicable
Bench NA = Benchmark not available
Bolded values indicate a Hazard Index greater than 1

Table C-10
Toxicological Endpoints for Birds
Concord Avenue Landfill
Belmont, MA

Compound	CHRONIC							
	Chemical Form	Test Species	Exposure Route	Exposure Duration (Days)	Effect	NOAEL (mg/kg/d)	LOAEL (mg/kg/d)	Source
Metals								
Aluminum, Total	Al ₂ (SO ₄) ₃	Ringed Dove	Incorporation into Food	116	Reproduction	109.7	NA	Sample et al., 1996
Antimony, Total						NA	NA	
Arsenic, Total	Sodium Arsenite	Mallard Duck	Incorporation into Food	128	Mortality	5.14	12.84	Sample et al., 1996
Barium, Total	Barium Hydroxide	1 day old Chick	Incorporation into Food	4 weeks; subchronic to chronic factor of 0.1 applied to data by authors	Mortality	20.8	41.7	Sample et al., 1996
Beryllium, Total						NA	NA	Sample et al., 1997
Cadmium, Total	Cadmium Chloride	Mallard Duck	Incorporation into Food	90	Reproduction	1.45	20.03	Sample et al., 1996
Chromium, Total	Trivalent	Black Duck	Incorporation into Food	290	Reproduction	1	5	Sample et al., 1996
Cobalt, Total					Growth	7.61	NA	USEPA, 2005; EcoSSL
Copper, Total	Copper Oxide	1 day old Chick	Incorporation into Food	70	Growth, Mortality	47.0	61.7	Sample et al., 1996
Cyanide, Total						NA	NA	
Iron, Total						NA	NA	
Lead, Total	Acetate	Japanese Quail	Incorporation into Food	84	Reproduction	1.13	11.3	Sample et al., 1996
Manganese	Mn ₃ O ₄	Japanese Quail	Incorporation into Food	75	Growth, Behavior	977	NA	Sample et al., 1996
Mercury, Total	Mercuric Chloride	Japanese Quail	Incorporation into Food	365	Reproduction	0.45	0.9	Sample et al., 1996
Methyl mercury	Methyl Mercury Dicyandiamide	Mallard Duck	Incorporation into Food	3 generations 21 days through reproduction	Reproduction	0.0064 ^a	0.064	Sample et al., 1996
Molybdenum	Sodium Molybdate	Chicken	Incorporation into Food		Reproduction	3.5 ^a	35.3	Sample et al., 1996
Nickel, Total	Nickel Sulfate	Mallard Duckling	Incorporation into Food	90	Mortality, Growth, Behavior	77.4	107	Sample et al., 1996
Selenium, Total	Selenomethionine	Mallard Duck	Incorporation into Food	78	Reproduction	0.4	0.8	Sample et al., 1996
Silver, Total						NA	NA	
Thallium, Total						NA	NA	
Vanadium, Total	Vanadyl Sulfate	Mallard Duck	Incorporation into Food	84	Longevity, Mortality	11.4	NA	Sample et al., 1996
Zinc, Total	Zinc Sulfate	White Leghorn Hen	Incorporation into Food	308	Reproduction	14.5	131	Sample et al., 1996
Semivolatiles								
Naphthalene						NA	NA	
Acenaphthylene						NA	NA	
Acenaphthene						NA	NA	
Fluorene						NA	NA	
Phenanthrene						NA	NA	
Anthracene						NA	NA	
Fluoranthene						NA	NA	
Pyrene						NA	NA	
Benzo[a]anthracene						NA	NA	
Chrysene						NA	NA	
Benzo[b]fluoranthene						NA	NA	
Benzo[k]fluoranthene						NA	NA	
Benzo[a]pyrene						NA	NA	
Indeno[1,2,3-cd]pyrene						NA	NA	
Dibenz[a,h]anthracene						NA	NA	
Benzo[g,h,i]perylene						NA	NA	
2-Methylnaphthalene						NA	NA	
Total PAHs	Mix of PAHs	Mallard Duck	Oral	203	Increased Liver Weight	40 ^a	400	Eisler, 1987
2,3,7,8-tetrachlorodibenzodioxin (TCDD)	NA	Ring-necked Pheasant	Weekly intraperitoneal injection	70	Reproduction	1.4E-05	0.00014	Sample et al., 1996
TEQ	2,3,7,8-TCDD	Ring-necked Pheasant	Intraperitoneal	70	Fertility, Embryo Mortality	0.014 ^a	0.14	Nosek et al., 1992

NA = Not Available
TEF = Toxicity equivalency factor
~ NOAEL value was derived by applying an Acute to Chronic Ratio of 10 to the LOAEL value.

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TABLE C-11
Toxicological Endpoints for Mammals
Concord Avenue Landfill
Belmont, MA

Compound	CHRONIC												Raccoon			Otter			Meadow Vole			Red Fox			Shrew			White-footed mouse			
	Test Species									Muskrat																					
	Exposure Route	Effect Endpoint	Exposure Duration	Chemical Form	Test Species	Body Weight ^a (kg)	NOAEL (mg/kg/d)	LOAEL (mg/kg/d)	Reference	Body Weight (kg)	Final NOAEL (mg/kg/d)	Final LOAEL (mg/kg/d)	Body Weight (kg)	Final NOAEL (mg/kg/d)	Final LOAEL (mg/kg/d)	Body Weight (kg)	Final NOAEL (mg/kg/d)	Final LOAEL (mg/kg/d)	Body Weight (kg)	Final NOAEL (mg/kg/d)	Final LOAEL (mg/kg/d)	Body Weight (kg)	Final NOAEL (mg/kg/d)	Final LOAEL (mg/kg/d)	Body Weight (kg)	Final NOAEL (mg/kg/d)	Final LOAEL (mg/kg/d)	Body Weight (kg)	Final NOAEL (mg/kg/d)	Final LOAEL (mg/kg/d)	
Metals																															
Antimony, Total	Oral-water	Longevity	lifetime (>1yr) 3 generations	Antimony Potassium Tartrate	Mouse	0.03	0.125	1.25	Sample et al., 1996	1.35	0.048	0.48	5.74	0.034	0.34	8	0.031	0.31	0.044	0.114	1.14	4.5	0.036	0.36	0.015	0.149	1.49	0.022	0.135	1.35	
Arsenic, Total	Oral-gavage	Reproduction	>1 yr - Chronic	Arsenite	Mouse	2.5	NA	1.26	Byron et al. 1967	1.35	NA	1.47	5.74	NA	1.02	8	NA	0.94	0.044	NA	3.46	4.5	NA	1.09	0.015	NA	4.53	0.022	NA	4.11	
Barium, Total	Oral-gavage	Growth, Mortality	16mo/10day	Barium Chloride	Rat	0.435	13.8	19.8	Borselleca et al., 1988; Sample et al., 1996	1.35	10.397	14.92	5.74	7.241	10.39	8	6.664	9.56	0.044	24.470	35.11	4.5	7.695	11.04	0.015	32.024	45.95	0.022	29.100	41.75	
Beryllium, Total	Oral-Water	Longevity, weight loss	lifetime (>1yr)	Beryllium Sulfate	Rat	0.35	0.66	NA	Sample et al., 1996	1.35	0.471	NA	5.74	0.328	NA	8	0.302	NA	0.044	1.108	NA	4.5	0.349	NA	0.015	1.451	NA	0.022	1.318	NA	
Cadmium, Total	Oral-gavage	Reproduction	6 weeks	Cadmium Chloride	Rat	0.303	1	10	Sample et al., 1996	1.35	0.688	6.88	5.74	0.479	4.79	8	0.441	4.41	0.044	1.620	16.20	4.5	0.509	5.09	0.015	2.120	21.20	0.022	1.926	19.26	
Chromium, Total	Oral-diet	Reprod/Longevity	90d/2years	Trivalent Chromium	Rat	0.35	2737	NA	Sample et al., 1996	1.35	1953	NA	5.74	1360	NA	8	1252	NA	0.044	4597	NA	4.5	1445	NA	0.015	6015	NA	0.022	5466	NA	
Cobalt, Total	Oral-diet	Reproduction and Growth					7.33	NA	USEPA, 2005, EcoSSL	1.35	0.000	NA	5.74	0.000	NA	8	0.000	NA	0.044	0.000	NA	4.5	0.000	NA	0.015	0.000	NA	0.022	0.000	NA	
Copper, Total	Oral-Gavage	Reproduction	357	Copper Sulfate	Mink	1	11.7	15.14	Sample et al., 1996	1.35	10.854	14.05	5.74	7.559	9.78	8	6.957	9.00	0.044	25.546	33.06	4.5	8.033	10.39	0.015	33.432	43.26	0.022	30.379	39.31	
Cyanide, Total	Oral-diet	Reproduction	Gestation and lactation	Potassium Cyanide	Rat	0.273	68.7	NA	Sample et al., 1996	1.35	46.070	NA	5.74	32.083	NA	8	29.527	NA	0.044	108.426	NA	4.5	34.095	NA	0.015	141.897	NA	0.022	128.941	NA	
Iron, Total							NA	NA	Sample et al., 1996	1.35	NA	NA	5.74	NA	NA	8	NA	NA	0.044	NA	NA	4.5	NA	NA	0.015	NA	NA	0.022	NA	NA	
Lead, Total	Oral-Gavage	Reproduction	3 generations	Lead Acetate	Rat	0.35	8	80	Sample et al., 1996	1.35	5.709	57.09	5.74	3.975	39.75	8	3.659	36.59	0.044	13.435	134.35	4.5	4.225	42.25	0.015	17.583	175.83	0.022	15.977	159.77	
Manganese, Total	Oral-diet	Reproduction	224 days	Manganese Oxide	Rat	0.35	88	284	Sample et al., 1996	1.35	62.794	202.65	5.74	43.729	141.13	8	40.246	129.89	0.044	147.787	476.95	4.5	46.473	149.98	0.015	193.409	624.18	0.022	175.749	567.19	
Mercury, Total	Oral-diet	Reproduction	168	Mercuric Chloride	Mink	1	1	NA	Sample et al., 1996	1.35	0.928	NA	5.74	0.646	NA	8	0.595	NA	0.044	2.183	NA	4.5	0.687	NA	0.015	2.857	NA	0.022	2.597	NA	
Methyl mercury	Oral-diet	Reproduction	3 generations	Chloride	Rat	0.35	0.032	0.16	Sample et al., 1996	1.35	0.023	0.11	5.74	0.016	0.08	8	0.015	0.07	0.044	0.054	0.27	4.5	0.017	0.08	0.015	0.070	0.35	0.022	0.064	0.32	
Molybdenum, Total	Oral - water	Reproduction	3 generations	Molybdate	Mouse	0.03	0.26	2.6	Sample et al., 1996	1.35	0.100	1.00	5.74	0.070	0.70	8	0.064	0.64	0.044	0.236	2.36	4.5	0.074	0.74	0.015	0.309	3.09	0.022	0.281	2.81	
Nickel, Total	Oral-Gavage	Reproduction	3 generations	Nickel Sulfate	Rat	0.35	40	80	Sample et al., 1996	1.35	28.543	57.09	5.74	20	40	8	18.294	36.59	0.044	67.176	134.35	4.5	21.124	42.25	0.015	87.913	175.83	0.022	79.886	159.77	
Selenium, Total	Oral-water	Reproduction	1yr, 2 generations	Potassium Selenate	Rat	0.35	0.2	0.33	Sample et al., 1996	1.35	0.143	0.24	5.74	0.099	0.16	8	0.091	0.15	0.044	0.336	0.55	4.5	0.106	0.17	0.015	0.44	0.73	0.022	0.399	0.66	
Silver, Total	Oral-water	Mortality	14	NA	Rat	0.35	180	360	Sample et al., 1996	1.35	128.442	256.88	5.74	89	179	8	82.322	164.64	0.044	302.292	604.58	4.5	95.057	190.11	0.015	396	791	0.022	359.488	718.98	
Strontium (stable), Total	Oral-water	Body Weight & bone changes	3 years	Strontium Chloride	Rat	0.35	263	NA	Sample et al., 1996	1.35	187.668	NA	5.74	131	NA	8	120.282	NA	0.044	441.682	NA	4.5	138.890	NA	0.015	578	NA	0.022	525.251	NA	
Thallium, Total	Oral-water	Reproduction	60	Thallium Sulfate	Rat	0.365	0.0074	0.074	Sample et al., 1996	1.35	0.005	0.05	5.74	0.004	0.04	8	0.003	0.03	0.044	0.013	0.13	4.5	0.004	0.04	0.015	0.016	0.16	0.022	0.015	0.15	
Vanadium, Total	Oral-intubation	Reproduction	>60	Sodium Metavanadate	Rat	0.26	0.21	2.1	Sample et al., 1996	1.35	0.139	1.39	5.74	0.097	0.97	8	0.089	0.89	0.044	0.327	3.27	4.5	0.103	1.03	0.015	0.428	4.28	0.022	0.389	3.89	
Zinc, Total	Oral-diet	Reproduction	16 of gestation	Zinc Oxide	Rat	0.35	160	320	Sample et al., 1996	1.35	114.170	228.34	5.74	80	159	8	73.175	146.35	0.044	268.704	537.41	4.5	84.496	168.99	0.015	352	703	0.022	319.544	639.09	
Semivolatiles																															
Naphthalene	Oral-gavage	Body Weight	65-applied ACR	NA	Rat	0.35	7.1	14	IRIS	1.35	5.066	9.99	5.74	3.528	6.96	8	3.247	6.40	0.044	11.924	23.51	4.5	3.749	7.39	0.015	15.605	30.77	0.022	14.180	27.96	
Acenaphthylene				NA	NA		NA	NA		1.35	NA	NA	5.74	NA	NA	8	NA	NA	0.044	NA	NA	4.5	NA	NA	0.015	NA	NA	0.022	NA	NA	
Acenaphthene	Oral-gavage	Reproduction	91	NA	Mouse	0.03	350	700	ATSDR	1.35	135.134	270.27	5.74	94.107	188.21	8	86.612	173.22	0.044	318.043	636.09	4.5	100.010	200.02	0.015	416.222	832.44	0.022	378.218	756.44	
Fluorene	Oral-gavage	Reproduction	91	NA	Mouse	0.03	500	NA	ATSDR	1.35	193.049	NA	5.74	134.438	NA	8	123.731	NA	0.044	454.346	NA	4.5	142.872	NA	0.015	594.604	NA	0.022	540.312	NA	
Phenanthrene				NA	NA		NA	NA		1.35	NA	NA	5.74	NA	NA	8	NA	NA	0.044	NA	NA	4.5	NA	NA	0.015	NA	NA	0.022	NA	NA	
Anthracene	Oral-gavage	Mortality, Body Weight	90-applied ACR	NA	Mouse	0.03	100	NA	IRIS	1.35	38.610	NA	5.74	26.888	NA	8	24.746	NA	0.044	90.869	NA	4.5	28.574	NA	0.015	118.921	NA	0.022	108.062	NA	
Fluoranthene	Oral-gavage	Reproduction	91	NA	Mouse	0.03	500	NA	ATSDR	1.35	193.049	NA	5.74	134.438	NA	8	123.731	NA	0.044	454.346	NA	4.5	142.872	NA	0.015	594.604	NA	0.022	540.312	NA	
Pyrene	Oral-gavage	Kidney effects	91-applied ACR	NA	Mouse	0.03	7.5	13	IRIS	1.35	2.896	5.02	5.74	2.017	3.50	8	1.856	3.22	0.044	6.815	11.81	4.5	2.143	3.71	0.015	8.919	15.46	0.022	8.105	14.05	
Benzo[a]anthracene				NA	NA		NA	NA		1.35	NA	NA	5.74	NA	NA	8	NA	NA	0.044	NA	NA	4.5	NA	NA	0.015	NA	NA	0.022	NA	NA	
Chrysene				NA	NA		NA	NA		1.35	NA	NA	5.74	NA	NA	8	NA	NA	0.044	NA	NA	4.5	NA	NA	0.015	NA	NA	0.022	NA	NA	
Benzo[b]fluoranthene				NA	NA		NA	NA		1.35	NA	NA	5.74	NA	NA	8	NA	NA	0.044	NA	NA	4.5	NA	NA	0.015	NA	NA	0.022	NA	NA	
Benzo[k]fluoranthene				NA	NA		NA	NA		1.35	NA	NA	5.74	NA	NA	8	NA	NA	0.044	NA	NA	4.5	NA	NA	0.015	NA	NA	0.022	NA	NA	
Benzo[a]pyrene	Oral-intubation	Reproduction	10 of gestation	NA	Mouse	0.03	1	10	Sample et al., 1996	1.35	0.386	3.86	5.74	0.269	2.69	8	0.247	2.47	0.044	0.909	9.09	4.5	0.286	2.86	0.015	1.189	11.89	0.022	1.081	10.81	
Indeno[1,2,3-cd]pyrene				NA	NA		NA	NA		1.35	NA	NA	5.74	NA	NA	8	NA	NA	0.044	NA	NA	4.5	NA	NA	0.015	NA	NA	0.022	NA	NA	
Dibenzo[a,h]anthracene				NA	NA		NA	NA		1.35	NA	NA	5.74	NA	NA	8	NA	NA	0.044	NA	NA	4.5	NA	NA	0.015	NA	NA	0.022	NA	NA	
Benzo[g,h,i]perylene				NA	NA		NA	NA		1.35	NA	NA	5.74	NA	NA	8	NA	NA	0.044	NA	NA	4.5	NA	NA	0.015	NA	NA	0.022	NA	NA	
2-Methylnaphthalene				NA	NA		NA	NA		1.35	NA	NA	5.74	NA	NA	8	NA	NA	0.044	NA	NA	4.5	NA	NA	0.015	NA	NA	0.022	NA	NA	
Total PAH				NA	NA		NA	NA		1.35	NA	NA	5.74	NA	NA	8	NA	NA	0.044	NA	NA	4.5	NA	NA	0.015	NA	NA	0.022	NA	NA	
2,3,7,8-tetrachlorodibenzodioxin (TCDD)	Oral-diet	Pup Weight, Litter Size	3 generations	2,3,7,8-TCDD	Rat	0.35	0.001	0.01	Murray et al., 1979	1.35	0.001	0.01	5.74	0.000	0.00	8	0.000	0.00	0.044	0.002	0.02	4.5	0.001	0.01	0.015	0.002	0.02	0.022	0.002	0.02	
2,3,7,8-tetrachlorodibenzodioxin (TCDD)	Oral-Diet	Reproduction	3 generations (>1 yr - Chronic)		Rate	0.35	0.001	0.01	Murray et al. 1979																						



Appendix D

March 21, 2022



Ted WICKWIRE

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And

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Coastal Scientist

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Dear Mr. Wickwire and Ms. Lavallee:

Attached please find an electronic copy (PDF) of our report and data package on sediment toxicity tests conducted with samples associated with the Belmont, MA Landfill Project. This report contains the results of project samples tested following EPA Method 100.4 (*Hyaella azteca* 42-day Survival, Growth, and Reproduction Test). A report Index is attached to this cover letter.

Our mission: Strive to produce high quality data that meet quality control standards, stand up to rigorous review, are traceable, and timely.

Please do not hesitate to contact me if you have any questions, concerns, or feel we are not meeting these objectives. We welcome your direct feedback, positive or negative, regarding any aspect of the services that we offer to you.

Sincerely,

John Williams

John Williams, Director

SDG 16245 includes Pages 1 - 354

Aquatec Environmental, Inc.

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***Hyalella azteca* 42-Day Survival, Growth, and Reproduction Test.**

EPA Method 100.4

Woods Hole Group Belmont Landfill Toxicity Assessment

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Project: Belmont Landfill

TOXICITY SUMMARY REPORT:

100.4 Amphipod, *H. azteca*, 42-D Survival, Growth, and Reproduction Test

Species: *Hyalella azteca*

Reference: EPA/600/R-99/064

SOP: SED-A-003

Test Start: 1/6/2022 3:25:00 PM

Test End: 2/17/2022 12:00:00 PM

Sample Identification	Percent Survival (%)			Growth (mg)		Biomass (mg)		Repro. (#/F)
	DAY 28	DAY 35	DAY 42	DAY 28	DAY 42	DAY 28	DAY 42	DAY 42
53040 CTRL (Natural Sediment)	83.3	76.3	73.8	0.347 ^c	0.536 ^c	0.292 ^c	0.387 ^c	4.32 ^c
53041 TOX - 4	93.3	88.8	70.0 ^c	0.327 ^c	0.426 ^{abc}	0.302 ^c	0.309 ^{bc}	1.92 ^{abc}
53042 TOX - 1	83.3 ^c	73.8 ^{bc}	61.3 ^{bc}	0.284 ^{abc}	0.545 ^c	0.263 ^c	0.332 ^c	2.45 ^c
53043 TOX - 2	95.8	90.0	88.8	0.341 ^c	0.583 ^c	0.341 ^c	0.515	3.80 ^c
53044 TOX - 3	94.2	90.0	85.0	0.313 ^c	0.506 ^c	0.280 ^c	0.426 ^c	4.69 ^c
53045 TOX - 5	94.2	87.5	82.5	0.495	0.585	0.457 ^c	0.493	6.52
53046 TOX - 6 (Reference Sediment)	96.7	93.8	86.3	0.537	0.662	0.537	0.569	8.08

a) Indicates a statistically significant reduction ($P < 0.05$) in the response relative to the corresponding response in the laboratory control sample (CTRL; 53040).

b) Indicates a statistically significant reduction ($P < 0.05$) in the response relative to the corresponding response in the laboratory control sample with outlier removed (53040 w/o replicate D). Exclusion of Replicate D brings survival rates to 90.9% (Day 28), 87.1% (Day 35), and 84.3% (Day 42).

c) Indicates a statistically significant reduction ($P < 0.05$) in the response relative to the corresponding response in the reference sample (TOX-6; 53046).

SAMPLES RECEIVED:

Number	Sample Name	Date Time and Collected	Type
53040	CTRL (Natural Sediment)	1/4/2022 7:00:00 AM	Control Sed.
53041	TOX - 4	12/21/2021 9:05:00 AM	Sediment
53042	TOX - 1	12/21/2021 1:38:00 PM	Sediment
53043	TOX - 2	12/21/2021 12:35:00 PM	Sediment
53044	TOX - 3	12/21/2021 11:25:00 AM	Sediment
53045	TOX - 5	12/21/2021 2:22:00 PM	Sediment
53046	TOX - 6	12/21/2021 3:54:00 PM	Ref. Sediment

Submitted By:

John Williams

1 of 1

Aquatec Environmental, Inc.

Reviewed by: JW Date: 3/21/22

1

Monday, March 7, 2022

SDG: 16245

Project 21055



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Project: Belmont Landfill

TOXICITY DETAIL REPORT:

100.4 Amphipod, *H. azteca*, 42-D Survival, Growth, and Reproduction Test

Species: *Hyalella azteca*

Reference: EPA/600/R-99/064

SOP: SED-A-003

Test Start: 1/6/2022 3:25:00 PM

Test End: 2/17/2022 12:00:00 PM

Sample ID: 53040 CTRL (Natural Sediment)																								
REP	START COUNT	DAY 28						DAY 35			DAY 42													
		SURVIVAL	% SURVIVAL	# WEIGHED	INITIAL (mg)	FINAL (mg)	MEAN WEIGHT	MEAN BIOMASS	SURVIVAL	% SURVIVAL	# OF YOUNG	SURVIVAL	% SURVIVAL	# OF YOUNG	TOTAL YOUNG	# OF FEMALES	YOUNG PER FEMALE	# WEIGHED	INITIAL (mg)	FINAL (mg)	MEAN WEIGHT	MEAN BIOMASS		
A	10	9	90%					7	70%	13	6	60%	13	26	4	6.5	6	21.89	25.85	0.660	0.396			
B	10	10	100%					10	100%	14	10	100%	7	21	7	3.0	10	20.95	26.08	0.513	0.513			
C	10	10	100%					10	100%	7	10	100%	1	8	2	4.0	10	16.86	21.74	0.488	0.488			
D	10	0	0%					0	0%	0	0	0%	0	0	0	0.0	0	0.00	0.00		0.000			
E	10	10	100%					10	100%	3	10	100%	30	33	8	4.1	10	18.97	23.36	0.439	0.439			
F	10	10	100%					8	80%	13	8	80%	15	28	5	5.6	8	22.59	26.43	0.480	0.384			
G	10	8	80%					8	80%	4	7	70%	3	7	1	7.0	7	21.36	25.83	0.639	0.447			
H	10	9	90%					8	80%	0	8	80%	0	0	3	0.0	8	16.51	20.78	0.534	0.427			
I	10	8	80%	8	19.80	22.76	0.370	0.296																
J	10	9	90%	9	22.45	25.10	0.294	0.265																
K	10	7	70%	7	22.03	24.77	0.391	0.274																
L	11	11	100%	11	20.77	24.42	0.332	0.332																
MEAN PERCENT SURVIVING - DAY 28 (%):							83.3%	MEAN DRY WEIGHT - DAY 28:							0.347	MEAN DRY WEIGHT - DAY 42:							0.536	
MEAN PERCENT SURVIVING - DAY 35 (%):							76.3%	MEAN BIOMASS - DAY 28:							0.292	MEAN BIOMASS - DAY 42:							0.387	
MEAN PERCENT SURVIVING - DAY 42 (%):							73.8%	MEAN NEONATES (DAYS 35 + 42) PER FEMALE:											4.32					

Sample ID: 53040 CTRL Replicate D Removed (Natural Sediment)

MEAN PERCENT SURVIVING - DAY 28 (%):	90.9%	MEAN DRY WEIGHT - DAY 28:	0.347	MEAN DRY WEIGHT - DAY 42:	0.536
MEAN PERCENT SURVIVING - DAY 35 (%):	87.1%	MEAN BIOMASS - DAY 28:	0.292	MEAN BIOMASS - DAY 42:	0.442
MEAN PERCENT SURVIVING - DAY 42 (%):	84.3%	MEAN NEONATES (DAYS 35 + 42) PER FEMALE:			4.32

Project: Belmont Landfill

TOXICITY DETAIL REPORT:

100.4 Amphipod, H. azteca, 42-D Survival, Growth, and Reproduction Test

Species: *Hyalella azteca*

Reference: EPA/600/R-99/064

SOP: SED-A-003

Test Start: 1/6/2022 3:25:00 PM

Test End: 2/17/2022 12:00:00 PM

Sample ID: 53041 TOX - 4		DAY 28							DAY 35			DAY 42											
REP	START COUNT	SURVIVAL	% SURVIVAL	# WEIGHED	INITIAL (mg)	FINAL (mg)	MEAN WEIGHT	MEAN BIOMASS	SURVIVAL	% SURVIVAL	# OF YOUNG	SURVIVAL	% SURVIVAL	# OF YOUNG	TOTAL YOUNG	# OF FEMALES	YOUNG PER FEMALE	# WEIGHED	INITIAL (mg)	FINAL (mg)	MEAN WEIGHT	MEAN BIOMASS	
A	10	10	100%						10	100%	0	9	90%	0	0	0	0.0	9	17.34	19.20	0.207	0.186	
B	10	10	100%						9	90%	4	8	80%	0	4	2	2.0	8	16.40	20.89	0.561	0.449	
C	10	10	100%						10	100%	3	8	80%	0	3	3	1.0	8	21.22	24.84	0.453	0.362	
D	10	9	90%						9	90%	7	7	70%	3	10	5	2.0	7	20.25	23.22	0.424	0.297	
E	10	7	70%						7	70%	5	7	70%	2	7	2	3.5	7	18.74	22.57	0.547	0.383	
F	10	9	90%						9	90%	0	6	60%	0	0	1	0.0	6	15.22	17.92	0.450	0.270	
G	10	10	100%						7	70%	0	2	20%	0	0	0	0.0	2	18.87	19.33	0.230	0.046	
H	10	10	100%						10	100%	7	9	90%	5	12	4	3.0	9	22.75	27.58	0.537	0.483	
I	10	9	90%	9	20.29	22.89	0.289	0.260															
J	10	10	100%	10	18.53	21.88	0.335	0.335															
K	10	9	90%	9	21.90	24.88	0.331	0.298															
L	10	9	90%	9	19.75	22.92	0.352	0.317															
MEAN PERCENT SURVIVING - DAY 28 (%):							93.3%		MEAN DRY WEIGHT - DAY 28:				0.327		MEAN DRY WEIGHT - DAY 42:				0.426				
MEAN PERCENT SURVIVING - DAY 35 (%):							88.8%		MEAN BIOMASS - DAY 28:				0.302		MEAN BIOMASS - DAY 42:				0.309				
MEAN PERCENT SURVIVING - DAY 42 (%):							70.0%		MEAN NEONATES (DAYS 35 + 42) PER FEMALE:				1.92										

Sample ID: 53042 TOX - 1		DAY 28							DAY 35			DAY 42										
REP	START COUNT	SURVIVAL	% SURVIVAL	# WEIGHED	INITIAL (mg)	FINAL (mg)	MEAN WEIGHT	MEAN BIOMASS	SURVIVAL	% SURVIVAL	# OF YOUNG	SURVIVAL	% SURVIVAL	# OF YOUNG	TOTAL YOUNG	# OF FEMALES	YOUNG PER FEMALE	# WEIGHED	INITIAL (mg)	FINAL (mg)	MEAN WEIGHT	MEAN BIOMASS
A	10	7	70%						7	70%	0	6	60%	4	4	2	2.0	6	21.71	25.70	0.665	0.399
B	10	8	80%						8	80%	13	8	80%	8	21	6	3.5	8	21.01	25.88	0.609	0.487
C	10	9	90%						8	80%	0	5	50%	0	0	0	0.0	5	20.09	21.53	0.288	0.144
D	10	7	70%						4	40%	0	1	10%	0	0	0	0.0	1	21.07	21.81	0.740	0.074
E	10	8	80%						8	80%	9	8	80%	14	23	4	5.8	8	19.84	24.74	0.612	0.490
F	10	9	90%						9	90%	0	9	90%	4	4	4	1.0	9	19.07	23.66	0.510	0.459
G	10	9	90%						9	90%	0	9	90%	0	0	9	0.0	9	20.07	24.94	0.541	0.487
H	10	6	60%						6	60%	0	3	30%	0	0	0	0.0	3	19.40	20.59	0.397	0.119
I	10	10	100%	10	21.03	23.77	0.274	0.274														
J	10	9	90%	9	20.62	22.85	0.248	0.223														
K	10	9	90%	9	19.81	22.65	0.316	0.284														
L	10	9	90%	9	20.17	22.86	0.299	0.269														
MEAN PERCENT SURVIVING - DAY 28 (%):							83.3%		MEAN DRY WEIGHT - DAY 28:			0.284		MEAN DRY WEIGHT - DAY 42:			0.545					
MEAN PERCENT SURVIVING - DAY 35 (%):							73.8%		MEAN BIOMASS - DAY 28:			0.263		MEAN BIOMASS - DAY 42:			0.332					
MEAN PERCENT SURVIVING - DAY 42 (%):							61.3%		MEAN NEONATES (DAYS 35 + 42) PER FEMALE:			2.45										

Project: Belmont Landfill

TOXICITY DETAIL REPORT:**100.4 Amphipod, H. azteca, 42-D Survival, Growth, and Reproduction Test**Species: *Hyalella azteca*

Reference: EPA/600/R-99/064

SOP: SED-A-003

Test Start: 1/6/2022 3:25:00 PM**Test End:** 2/17/2022 12:00:00 PM

Sample ID: 53043 TOX - 2

Sample ID: 53043 TOX - 2

REP	START COUNT	DAY 28							DAY 35			DAY 42											
		SURVIVAL	% SURVIVAL	# WEIGHED	INITIAL (mg)	FINAL (mg)	MEAN WEIGHT	MEAN BIOMASS	SURVIVAL	% SURVIVAL	# OF YOUNG	SURVIVAL	% SURVIVAL	# OF YOUNG	TOTAL YOUNG	# OF FEMALES	YOUNG PER FEMALE	# WEIGHED	INITIAL (mg)	FINAL (mg)	MEAN WEIGHT	MEAN BIOMASS	
A	10	10	100%					10	100%	11	10	100%	10	21	2	10.5	10	19.88	25.91	0.603	0.603		
B	10	10	100%					10	100%	0	9	90%	6	6	3	2.0	9	16.15	21.48	0.592	0.533		
C	10	9	90%					9	90%	5	9	90%	0	5	2	2.5	9	19.50	24.68	0.576	0.518		
D	10	10	100%					10	100%	12	10	100%	21	33	6	5.5	10	19.74	25.54	0.580	0.580		
E	10	10	100%					10	100%	0	10	100%	14	14	7	2.0	10	19.02	24.32	0.530	0.530		
F	10	7	70%					7	70%	2	7	70%	7	9	3	3.0	7	20.94	25.50	0.651	0.456		
G	10	10	100%					10	100%	2	10	100%	7	9	4	2.3	10	19.57	25.05	0.548	0.548		
H	10	9	90%					6	60%	6	6	60%	2	8	3	2.7	6	19.19	22.68	0.582	0.349		
I	10	10	100%	10	20.01	23.29	0.328	0.328															
J	10	10	100%	10	19.88	23.28	0.340	0.340															
K	10	10	100%	10	20.93	24.10	0.317	0.317															
L	10	10	100%	10	20.83	24.62	0.379	0.379															
MEAN PERCENT SURVIVING - DAY 28 (%):							95.8%	MEAN DRY WEIGHT - DAY 28:							0.341	MEAN DRY WEIGHT - DAY 42:							0.583
MEAN PERCENT SURVIVING - DAY 35 (%):							90.0%	MEAN BIOMASS - DAY 28:							0.341	MEAN BIOMASS - DAY 42:							0.515
MEAN PERCENT SURVIVING - DAY 42 (%):							88.8%	MEAN NEONATES (DAYS 35 + 42) PER FEMALE:							3.80								

Sample ID: 53044 TOX - 3

Sample ID:		53044		TOX - 3		DAY 28						DAY 35			DAY 42								
REP	START COUNT	SURVIVAL	% SURVIVAL	# WEIGHED	INITIAL (mg)	FINAL (mg)	MEAN WEIGHT	MEAN BIOMASS	SURVIVAL	% SURVIVAL	# OF YOUNG	SURVIVAL	% SURVIVAL	# OF YOUNG	TOTAL YOUNG	# OF FEMALES	YOUNG PER FEMALE	# WEIGHED	INITIAL (mg)	FINAL (mg)	MEAN WEIGHT	MEAN BIOMASS	
A	10	9	90%						9	90%	8	8	80%	1	9	3	3.0	8	21.18	26.26	0.635	0.508	
B	10	10	100%						10	100%	4	10	100%	23	27	5	5.4	10	19.61	24.23	0.462	0.462	
C	10	10	100%						9	90%	0	7	70%	4	4	1	4.0	7	20.16	24.40	0.606	0.424	
D	10	9	90%						9	90%	9	8	80%	1	10	2	5.0	8	22.01	25.62	0.451	0.361	
E	10	10	100%						9	90%	0	9	90%	14	14	3	4.7	9	21.03	23.46	0.270	0.243	
F	10	10	100%						8	80%	14	8	80%	12	26	4	6.5	8	17.00	21.49	0.561	0.449	
G	10	9	90%						9	90%	8	9	90%	5	13	3	4.3	9	20.57	25.38	0.534	0.481	
H	10	10	100%						9	90%	11	9	90%	12	23	5	4.6	9	22.29	27.07	0.531	0.478	
I	10	10	100%	10	19.93	22.84	0.291	0.291															
J	10	8	80%	8	21.16	24.15	0.374	0.299															
K	10	10	100%	10	20.08	23.01	0.293	0.293															
L	10	8	80%	8	20.14	22.50	0.295	0.236															
MEAN PERCENT SURVIVING - DAY 28 (%):							94.2%	MEAN DRY WEIGHT - DAY 28:							0.313	MEAN DRY WEIGHT - DAY 42:							0.506
MEAN PERCENT SURVIVING - DAY 35 (%):							90.0%	MEAN BIOMASS - DAY 28:							0.280	MEAN BIOMASS - DAY 42:							0.426
MEAN PERCENT SURVIVING - DAY 42 (%):							85.0%	MEAN NEONATES (DAYS 35 + 42) PER FEMALE:							4.69								

Project: Belmont Landfill

TOXICITY DETAIL REPORT:

100.4 Amphipod, H. azteca, 42-D Survival, Growth, and Reproduction Test

Species: Hyalella azteca

Reference: EPA/600/R-99/064

SOP: SED-A-003

Test Start: 1/6/2022 3:25:00 PM

Test End: 2/17/2022 12:00:00 PM

Sample ID: 53045 TOX - 5		DAY 28							DAY 35			DAY 42												
REP	START COUNT	SURVIVAL	% SURVIVAL	# WEIGHED	INITIAL (mg)	FINAL (mg)	MEAN WEIGHT	MEAN BIOMASS	SURVIVAL	% SURVIVAL	# OF YOUNG	SURVIVAL	% SURVIVAL	# OF YOUNG	TOTAL YOUNG	# OF FEMALES	YOUNG PER FEMALE	# WEIGHED	INITIAL (mg)	FINAL (mg)	MEAN WEIGHT	MEAN BIOMASS		
A	10	10	100%						8	80%	0	7	70%	0	0	1	0.0	7	20.13	24.75	0.660	0.462		
B	10	9	90%						9	90%	13	9	90%	33	46	6	7.7	9	20.41	25.29	0.542	0.488		
C	10	10	100%						10	100%	17	10	100%	8	25	3	8.3	10	20.65	27.20	0.655	0.655		
D	10	10	100%						9	90%	18	9	90%	7	25	5	5.0	9	20.46	27.19	0.748	0.673		
E	10	10	100%						10	100%	23	10	100%	15	38	6	6.3	10	20.90	26.55	0.565	0.565		
F	10	9	90%						8	80%	4	8	80%	17	21	2	10.5	8	19.88	25.14	0.658	0.526		
G	10	8	80%						8	80%	3	8	80%	10	13	3	4.3	8	19.95	24.03	0.510	0.408		
H	10	10	100%						8	80%	0	5	50%	10	10	0	10.0	5	19.66	21.36	0.340	0.170		
I	10	9	90%	9	19.57	24.10	0.503	0.453																
J	10	10	100%	10	19.45	23.84	0.439	0.439																
K	10	8	80%	8	20.53	24.64	0.514	0.411																
L	10	10	100%	10	20.08	25.32	0.524	0.524																
MEAN PERCENT SURVIVING - DAY 28 (%):							94.2%		MEAN DRY WEIGHT - DAY 28:			0.495			MEAN DRY WEIGHT - DAY 42:							0.585		
MEAN PERCENT SURVIVING - DAY 35 (%):							87.5%		MEAN BIOMASS - DAY 28:			0.457			MEAN BIOMASS - DAY 42:							0.493		
MEAN PERCENT SURVIVING - DAY 42 (%):							82.5%		MEAN NEONATES (DAYS 35 + 42) PER FEMALE:														6.52	

Sample ID:		53046		TOX - 6					DAY 35			DAY 42											
REP	START COUNT	SURVIVAL	% SURVIVAL	# WEIGHED	DAY 28 INITIAL (mg)	FINAL (mg)	MEAN WEIGHT	MEAN BIOMASS	SURVIVAL	% SURVIVAL	# OF YOUNG	SURVIVAL	% SURVIVAL	# OF YOUNG	TOTAL YOUNG	# OF FEMALES	YOUNG PER FEMALE	# WEIGHED	INITIAL (mg)	FINAL (mg)	MEAN WEIGHT	MEAN BIOMASS	
A	10	9	90%						9	90%	15	9	90%	45	60	6	10.0	9	20.44	26.50	0.673	0.606	
B	10	10	100%						10	100%	4	10	100%	20	24	4	6.0	10	19.40	26.20	0.680	0.680	
C	10	9	90%						9	90%	16	7	70%	13	29	2	14.5	7	19.45	24.43	0.711	0.498	
D	10	9	90%						8	80%	0	8	80%	14	14	3	4.7	8	20.34	25.82	0.685	0.548	
E	10	10	100%						10	100%	8	9	90%	18	26	3	8.7	9	20.25	26.37	0.680	0.612	
F	10	10	100%						10	100%	9	8	80%	15	24	3	8.0	8	20.13	25.59	0.683	0.546	
G	10	9	90%						9	90%	16	9	90%	8	24	4	6.0	9	20.01	25.13	0.569	0.512	
H	10	10	100%						10	100%	2	9	90%	32	34	5	6.8	9	19.54	25.06	0.613	0.552	
I	10	10	100%	10	19.24	24.53	0.529	0.529															
J	10	10	100%	10	19.82	25.22	0.540	0.540															
K	10	10	100%	10	21.23	26.97	0.574	0.574															
L	10	10	100%	10	19.52	24.58	0.506	0.506															
MEAN PERCENT SURVIVING - DAY 28 (%):							96.7%		MEAN DRY WEIGHT - DAY 28:			0.537			MEAN DRY WEIGHT - DAY 42:						0.662		
MEAN PERCENT SURVIVING - DAY 35 (%):							93.8%		MEAN BIOMASS - DAY 28:			0.537			MEAN BIOMASS - DAY 42:						0.569		
MEAN PERCENT SURVIVING - DAY 42 (%):							86.3%		MEAN NEONATES (DAYS 35 + 42) PER FEMALE:													8.08	

Submitted By:

John Williams

4 of 4

Aquatec Environmental, Inc.
Reviewed by: JW Date: 3/21/22

Monday, March 7, 2022
SDG: 16245
Project 21055



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E-Mail: klavallee@woodsholegroup.com

Bourne, MA 02532

Project: Belmont Landfill

Narrative

Six sediment samples collected on December 21, 2021. The samples were picked up and transported by Aquatec Environmental, Inc. (Aquatec) and delivered to Aquatec on the same day. All samples were in one gallon HDPE buckets, shipped nested in ice. The ambient temperatures within the coolers ranged from 0.3-0.6°C.

On December 30, 2021 and January 1, 2022, samples were removed from refrigerated storage. Each sample was press-sieved through a 1mm SS mesh sieve to remove indigenous organisms, vegetative material, pebbles, stones, and debris. Chironomid larvae, amphipods, and earthworms were observed in Sample 53042 (TOX-4). Isopods and earthworms were observed in Sample 53045 (TOX-5). Small amphipods were observed in Sample 53046 (TOX-6). Visual characterizations of the sediment samples were recorded on the Sediment Characterization bench sheet included within the data package in the Bench Sheet subsection. Dates below refer to Year 2022.

Control sediment (Sample 53040) was a mix of natural sand and silt collected from the Browns River, Vermont on January 4. The control sediment was press sieved in the laboratory through a 0.5mm stainless mesh before use in the toxicity tests. The average survival for Control sediment (Brown's River sediment) over several recent studies (April 2020 to December 2021 consisting of nine experimental groups) was 93.5% with a standard deviation of 2.7% indicating reliably stable performance for use as a Control.

Project site samples and the control sediment were loaded into test beakers on January 5, twelve replicates per sample. Overlying water was added to replicates and they were randomly distributed to temperature-controlled water baths with automated overlying water renewals programmed at 12h intervals. The *Hyaella azteca* 42-day survival, growth, and reproduction tests (EPA Method 100.4) were started on the following day, January 6, by distribution of ten eight-day old amphipods to each replicate. The first renewal (midnight of January 6), the overlying water renewal was suspended to allow the juvenile amphipods some time to burrow into sediment undisturbed by water exchange.

On Day 28 (February 3), surviving organisms were recovered from Replicates I, J, K, and L by sieving sediments through a 0.5mm SS sieve. Replicates A, B, C, D, E, F, G, and H were also sieved from sediment and surviving adult amphipods were returned to the original replicate container with water-and Nitex screen substrate for the reproduction phase of the test. After completion of survival counts on Day 28, organisms from Replicates I, J, K, and L were transferred to pre-weighed aluminum pans for growth determinations. The primary test acceptance criterion is based upon survival on Day 28. Control survival on Day 28 (all replicates) was 83.3% which exceeded the minimum average survival of 80% specified in the EPA Protocol,

Project: Belmont Landfill

therefore project testing was judged to be acceptable. The average daily temperature was within the target range of 23C + 1C.

Replicate D in the Control (53040) was identified as an outlier with zero amphipods recovered on Day 28. Indigenous oligochaetes or other tube-dwelling organisms were observed in the sample on Day 28 and could have adversely affected amphipod survival in that replicate however a definitive explanation for complete mortality was not determined. With replicate D removed, Day 28 Control survival was 90.9% which exceeds test criteria of 80% survival and provides a more sensitive endpoint for statistical comparisons.

On Day 35 (February 10, 2022), adult survival and neonate counts were completed. The adults were returned to the replicate beakers and the neonates were removed. On Day 42 (February 17, 2022), the tests were ended by recording the number of adult survivors, the number of males and females, and the number of neonates present in each replicate. Surviving adults were transferred to pre-weighed aluminum pans for growth determinations.

Growth determinations (Days 28 and 42) were based on average dry weight per replicate and average biomass per replicate. Dry weight determinations were calculated by dividing the organism dry weight by the number of surviving amphipods in a replicate. Biomass determinations were calculated by dividing the organism dry weight by the original number of amphipods allocated to each replicate.

Statistical analyses and determinations of significant effects (<0.05 significance level) were based upon Equal or Unequal Variance t Two-Sample Tests or Wilcoxon Rank Sum Two-Sample Tests (based on the EPA statistical decision tree) with the responses of each sample compared individually to the corresponding independent response in the Control (Sample 53040). Replicate D of the Control was identified as an outlier by Grubbs Outlier test. Statistical comparisons both including and excluding Replicate D have been included in the data package.

Sample 53046 (TOX-6) was identified by the client as a Reference or background sample. This sample had 96.7% survival on Day 28, measurable growth, and the highest reproduction rate of all samples. This sample met acceptance criteria for use as a "Site Control". Statistical comparisons of amphipod responses of Sample 53046 (TOX-6) vs. all other samples are included in the data package.

For calculation of the reproduction endpoint, any replicates having no females and no reproduction identified on Day 42 were not included in the calculation of mean number of neonates per female. As an example, Sample 53041 (TOX-4) had two replicates with no females on Day 42 and no neonates produced during the test. In calculating the mean number of neonates per female, these replicates were excluded (young per female divided by 6 rather than 8). High variability associated with the reproduction endpoint observed during testing is consistent with findings in Section 14.4.5.6 of EPA600-R99-064. This variation affects the sensitivity of statistical comparisons between test replicates and the control.

If a replicate had no females identified at the end of the test but neonates were produced in that replicate,

Project: Belmont Landfill

the number of females was scored as "1" for the calculation since at least one female must have been present at some point during the test to yield neonates. This occurred for Sample 53045 (TOX-5) Replicate H where ten neonates were present on Day 35 but no females were scored as surviving on Day 42.

100.4 - Amphipod, *H. azteca*, 42-D Survival, Growth, and Reproduction Test Qualifiers

Replicate D of Sample 53040 (Control) was viewed to be an outlier (no surviving amphipods). It is possible that survival in this replicate was affected by observed indigenous organisms that were not removed by the 0.5-mm press sieving. Statistical comparisons of site samples to the Control were performed both including and excluding this replicate.

REPORT CERTIFICATION:

The results reported relate only to the the samples submitted as received.

I certify under penalty of law that this document and all ATTACHMENTS were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Executed on: March 21, 2022
(Date)

John Williams
(Authorized signature)

John Williams
Director
Aquatec Environmental, Inc.

CHAIN OF CUSTODY(s) & SAMPLE INFORMATION

Aquatec COC
Test Sample COCs
Sample Notes
Sediment Characterization
Alkalinity & Hardness Report
Ammonia Report



Aquatec Environmental, Inc.

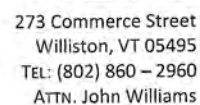
Chain-of-Custody

Page: 1 of 2
 273 Commerce Street
 Williston, VT 05495
 TEL: (802) 860-2960
 ATTN: John Williams

COMPANY INFORMATION		PROJECT INFORMATION					VOLUME/CONTAINER TYPE/						
NAME: Woods Hole Group		PROJECT: Belmont Landfill					HYALLELA/TOXICITY: 1 GAL HDPE	EARTHWORM BIOACCUMULATION: 1 GAL HDPE				Temperature at delivery	
ADDRESS: 107 Waterhouse Road													
Bourne, MA 02532		PROJECT #: 21055											
TEL: (508) 495-6224		SAMPLERS NAME(S):											
CONTACT: Katie Lavallee		Katie Lavallee											
E-MAIL: klavallee@woodsholegroup.com		Zac Duval Kali Roberts											
SAMPLE IDENTIFICATION		FINAL COLLECTION		GRAB	COMPOSITE	MATRIX	NUMBER OF CONTAINERS						
		DATE	TIME										
TOX-4		12/21/21	0905	✓		SED	1					0.3	
WORM-4		12/21/21	0922	✓		SOIL		1				0.3	
WORM-1		12/21/21	1326	✓		SOIL		1				0.6	
WORM-2		12/21/21	1236	✓		SOIL		1				0.6	
WORM-3		12/21/21	1101	✓		SOIL		1				0.3	
WORM-5		12/21/21	0957	✓		SOIL		1				0.3	
WORM-6		12/21/21	1510	✓		SOIL		1				0.3	
TOX-1		12/21/21	1338	✓		SED	1					0.6	
TOX-2		12/21/21	1235	✓		SED	1					0.6	
ANALYSIS SEDIMENT: EPA METHOD 100.4 (AMPHIPOD, HYALLELA AZTECA 42-DAY SURVIVAL, GROWTH, AND REPRODUCTION) ANALYSIS SOIL: ASTM METHOD E 1676 (EARTHWORM BIOACCUMULATION)													
RELINQUISHED BY: (Signature)		DATE:	TIME:	RECEIVED BY: (Signature or carrier)		TEMPERATURE ON DELIVERY (°C):							
RELINQUISHED BY: (Signature or carrier)		DATE:	TIME:	RECEIVED BY: (Signature)		NOTES: Please ship sample containers well nested in ice. Target temperature on delivery is 0°C-6°C. Each sample must be clearly and indelibly labeled with Sample ID, date, and time of collection.							
RELINQUISHED BY: (Signature)		DATE:	TIME:	RECEIVED BY: (Signature)									

SAMPLE ACCEPTANCE POLICY AND RECOMMENDATIONS:

- 1) Proper, full, and complete documentation on the Chain-of-Custody (sample ID, location, date and time of collection, sampler's name, preservation type, sample type (matrix) and any special remarks concerning the sample);
 - 2) Proper and legible sample labeling with initials, date and time and use of appropriate containers;
 - 3) Ship samples with sufficient ice to maintain acceptable shipping temperature range of 0-6°C;
- Samples NOT meeting the above conditions (per applicable regulatory protocols) will be qualified in the report.



1) Proper, full, and complete documentation on the Chain-of-Custody (sample ID, location, date and time of collection, sampler's name, preservation type, sample type (matrix) and any special remarks concerning the sample);

2) Proper and legible sample labeling with initials, date and time and use of appropriate containers;

3) Ship samples with sufficient ice to maintain acceptable shipping temperature range of 0-6°C;

Samples NOT meeting the above conditions (per applicable regulatory protocols) will be qualified in the report.



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Bourne, MA 02532

Client ID: Woods Hole Group/Lavallee

SEDIMENT CHARACTERIZATION:

Sample #	Client Sample ID	Sediment Characteristics	Page: 1 of 1		
			Pore Water pH	Organisms Present	Initial/Date
53040 CTRL (Natural Sediment)		Fine sand and silt Browns River collected 1/4/22.	6.7	None Seen	1/5/22 JP
53041 TOX - 4		Soft/sticky brown silt w/ vegetation, detritus, twigs, & a few stones. No Odors detected	6.4	NO	12/30/21 KP
53042 TOX - 1		Soft brown silt w/ twigs, leaves, & detritus. No Odors detected.	6.3	YES	12/30/21 KP
53043 TOX - 2		Soft brown silt w/ twigs, detritus, & grassy vegetation. No Odors detected	6.4	NO	12/30/21 KP
53044 TOX - 3		Soft/sticky brown silt w/ twigs, detritus, grassy vegetation. No Odors detected	6.5	NO	12/30/21 KP
53045 TOX - 5		Soft brown silt/sand w/ rocks, twigs, broken glass, detritus No Odors detected	6.4	YES	1/1/22 KP
53046 TOX - 6		Soft brown silt w/ twigs, leaves, & detritus. No Odors detected	6.5	YES	1/1/22 KP



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Bourne, MA 02532

Client ID: Woods Hole Group/Lavallee

ALKALINITY AND HARDNESS REPORT:

100.4 Amphipod, *H. azteca*, 42-D Survival, Growth, and Reproduction Test

Species: *Hyalella azteca*

Reference: EPA/600/R-99/064

SOP: SED-A-003

Day 0

Sample ID:	Analysis Date:	Alkalinity: (mg/L)	Hardness: (mg/L)
53040 - CTRL (Natural Sediment)	1/6/2022	64.0	96.0
53041 - TOX - 4	1/6/2022	52.0	96.0
53042 - TOX - 1	1/6/2022	76.0	100.0
53043 - TOX - 2	1/6/2022	68.0	100.0
53044 - TOX - 3	1/6/2022	52.0	88.0
53045 - TOX - 5	1/6/2022	76.0	112.0
53046 - TOX - 6	1/6/2022	56.0	96.0

INF: Interference. The color endpoint was reached immediately

Day 27

Sample ID:	Analysis Date:	Alkalinity: (mg/L)	Hardness: (mg/L)
53040 - CTRL (Natural Sediment)	2/2/2022	36.0	100.0
53041 - TOX - 4	2/2/2022	44.0	108.0
53042 - TOX - 1	2/2/2022	40.0	104.0
53043 - TOX - 2	2/2/2022	44.0	112.0
53044 - TOX - 3	2/2/2022	40.0	100.0
53045 - TOX - 5	2/2/2022	44.0	112.0
53046 - TOX - 6	2/2/2022	40.0	104.0

INF: Interference. The color endpoint was reached immediately

Day 34

Sample ID:	Analysis Date:	Alkalinity: (mg/L)	Hardness: (mg/L)
53040 - CTRL (Natural Sediment)	2/9/2022	64.0	108.0
53041 - TOX - 4	2/9/2022	56.0	96.0
53042 - TOX - 1	2/9/2022	52.0	92.0
53043 - TOX - 2	2/9/2022	60.0	100.0
53044 - TOX - 3	2/9/2022	72.0	96.0
53045 - TOX - 5	2/9/2022	56.0	100.0
53046 - TOX - 6	2/9/2022	64.0	96.0

INF: Interference. The color endpoint was reached immediately

1 of 2

Aquatec Environmental, Inc.

Reviewed by: KL Date: 2/24/22

14

SDG: 16245

Project 21055



Aquatec Environmental, Inc.

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Bourne, MA 02532

Client ID: Woods Hole Group/Lavallee

ALKALINITY AND HARDNESS REPORT:

100.4 Amphipod, *H. azteca*, 42-D Survival, Growth, and Reproduction Test

Species: *Hyalella azteca*

Reference: EPA/600/R-99/064

SOP: SED-A-003

Day 41

Sample ID:

Analysis Date:

Alkalinity: Hardness:

(mg/L)

(mg/L)

53040 - CTRL (Natural Sediment)

2/16/2022

64.0

96.0

53041 - TOX - 4

2/16/2022

52.0

88.0

53042 - TOX - 1

2/16/2022

64.0

88.0

53043 - TOX - 2

2/16/2022

72.0

96.0

53044 - TOX - 3

2/16/2022

68.0

88.0

53045 - TOX - 5

2/16/2022

64.0

84.0

53046 - TOX - 6

2/16/2022

72.0

92.0

INF: Interference. The color endpoint was reached immediately



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100.4 Amphipod, *H. azteca*, 42-D Survival, Growth, and Reproduction Test

Species: *Hyalella azteca*

Reference: EPA/600/R-99/064

SOP: SED-A-003

Project: Belmont Landfill

AMMONIA ANALYSIS REPORT:

Sample:	Pore Water (mg/L)	Overlying Water (mg/L)		
	1/6/2022	1/6/2022	2/2/2022	2/16/2022
CONTROL GROUP:				
53040 / CTRL (Natural Sediment)	1.9	1.1	1.0	0.3
53041 / TOX - 4	3.6	1.0	0.3	0.2
53042 / TOX - 1	11.8	2.5	0.3	0.2
53043 / TOX - 2	1.6	0.5	0.3	0.3
53044 / TOX - 3	3.7	0.9	0.3	0.2
53045 / TOX - 5	6.8	1.0	0.3	0.2
53046 / TOX - 6	4.5	0.9	0.3	0.2

BD - Indicates a concentration value below the reporting limit (<0.1).

TOXICITY TEST METHOD

100.4 Amphipod, *H. azteca*, 42-D Survival, Growth, and Reproduction Test

Species: *Hyalella azteca*

Reference: EPA/600/R-99/064

SOP: SED-A-003

Project: Belmont Landfill

1 Test type:	Whole-sediment toxicity test with renewal of overlying water
2 Temperature:	23±1°C, (Instantaneous range 23±3°C)
3 Light quality:	Wide-spectrum fluorescent lights
4 Illuminance:	About 100 to 1000lux
5 Photoperiod:	16L:8D
6 Test chamber:	300mL high-form lipless beaker
7 Sediment volume:	100mL
8 Overlying water volume:	175mL
9 Renewal of overlying water:	2 volume additions/day; continuous or intermittent (e.g. 1 volume addition every 12h)
10 Age of organisms:	7 to 8 day old at the start of the test
11 No. of organisms/chamber:	10
12 No. of replicate chambers/treatment:	12 (4 for 28-day survival and growth and 8 for 35-day & 42-day survival, growth, and reproduction).
13 Feeding:	YCT food, fed 1.0mL daily
14 Aeration:	None, unless dissolved oxygen in overlying water drops below 2.5mg/L
15 Overlying water:	1:1 mix Natural and Reconstituted Water
16 Test chamber cleaning:	If screens become clogged during a test, gently brush the outside of the screen
17 Overlying water quality:	A&H, conductivity, pH, and ammonia at the beginning and end of sediment exposure (Day 0 and 27 or 28). Temp. daily. Conductivity weekly. DO and pH three times/week. During reproductive phase, A&H weekly, ammonia on Day 41.
18 Test duration:	42 days
19 Endpoints:	28 day survival and growth; 35 day survival; and 42 day survival, growth, and reproduction (neonates per surviving female)
20 Test acceptability:	Minimum mean control survival of 80% on Day 28.

**100.4-28Ha – Amphipod, *H. azteca*, 28 Day
Survival, Growth, and Reproduction Test**

CETIS™ Test Data

CETIS Test Data Worksheet

Report Date: 06 Mar-22 12:20 (p 1 of 2)
Test Code/ID: 16245 CTRL / 10-1800-7441

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test											Aquatec Environmental, Inc.				
Start Date: 06 Jan-22 15:25			Species: Hyalella azteca			Sample Code: 53040									
End Date: 17 Feb-22 12:00			Protocol: EPA/600/R-99/064 (2000)			Sample Source: Internal Laboratory Testing									
Sample Date: 04 Jan-22 07:00			Material: Control Sediment			Sample Station: Control									
Sample	Rep	Pos	# Exposed	Survival 28d	Survival 35d	Survival 42d	28d Total Weight-mg	28d Tare Weight-mg	Pan Count 28d	42d Total Weight-mg	42d Tare Weight-mg	Pan Count 42d	# Young 35d	# Young 42d	# Females
53040	1	75	10	9	7	6				25.85	21.89	6	13	13	4
53040	2	46	10	10	10	10				26.08	20.95	10	14	7	7
53040	3	37	10	10	10	10				21.74	16.86	10	7	1	2
53040	4	78	10	0	0	0				0	0	0	0	0	0
53040	5	69	10	10	10	10				23.36	18.97	10	3	30	8
53040	6	22	10	10	8	8				26.43	22.59	8	13	15	5
53040	7	29	10	8	8	7				25.83	21.36	7	4	3	1
53040	8	52	10	9	8	8				20.78	16.51	8	0	0	3
53040	9	15	10	8			22.76	19.8	8						
53040	10	45	10	9			25.1	22.45	9						
53040	11	67	10	7			24.77	22.03	7						
53040	12	7	11	11			24.42	20.77	11						
53041	1	58	10	10	10	9				19.2	17.34	9	0	0	0
53041	2	65	10	10	9	8				20.89	16.4	8	4	0	2
53041	3	28	10	10	10	8				24.84	21.22	8	3	0	3
53041	4	12	10	9	9	7				23.22	20.25	7	7	3	5
53041	5	79	10	7	7	7				22.57	18.74	7	5	2	2
53041	6	18	10	9	9	6				17.92	15.22	6	0	0	1
53041	7	60	10	10	7	2				19.33	18.87	2	0	0	0
53041	8	16	10	10	10	9				27.58	22.75	9	7	5	4
53041	9	23	10	9			22.89	20.29	9						
53041	10	32	10	10			21.88	18.53	10						
53041	11	51	10	9			24.88	21.9	9						
53041	12	21	10	9			22.92	19.75	9						
53042	1	49	10	7	7	6				25.7	21.71	6	0	4	2
53042	2	14	10	8	8	8				25.88	21.01	8	13	8	6
53042	3	70	10	9	8	5				21.53	20.09	5	0	0	0
53042	4	62	10	7	4	1				21.81	21.07	1	0	0	0
53042	5	33	10	8	8	8				24.74	19.84	8	9	14	4
53042	6	38	10	9	9	9				23.66	19.07	9	0	4	4
53042	7	13	10	9	9	9				24.94	20.07	9	0	0	9
53042	8	61	10	6	6	3				20.59	19.4	3	0	0	0
53042	9	77	10	10			23.77	21.03	10						
53042	10	66	10	9			22.85	20.62	9						
53042	11	19	10	9			22.65	19.81	9						
53042	12	20	10	9			22.86	20.17	9						
53043	1	83	10	10	10	10				25.91	19.88	10	11	10	2
53043	2	64	10	10	10	9				21.48	16.15	9	0	6	3
53043	3	84	10	9	9	9				24.68	19.5	9	5	0	2
53043	4	30	10	10	10	10				25.54	19.74	10	12	21	6

CETIS Test Data Worksheet

Report Date:

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Test Code/ID:

16245 CTRL / 10-1800-7441

Sample	Rep	Pos	# Exposed	Survival 28d	Survival 35d	Survival 42d	28d Total Weight-mg	28d Tare Weight-mg	Pan Count 28d	42d Total Weight-mg	42d Tare Weight-mg	Pan Count 42d	# Young 35d	# Young 42d	# Females
53043	5	39	10	10	10	10				24.32	19.02	10	0	14	7
53043	6	2	10	7	7	7				25.5	20.94	7	2	7	3
53043	7	24	10	10	10	10				25.05	19.57	10	2	7	4
53043	8	8	10	9	6	6				22.68	19.19	6	6	2	3
53043	9	36	10	10			23.29	20.01	10						
53043	10	48	10	10			23.28	19.88	10						
53043	11	5	10	10			24.1	20.93	10						
53043	12	27	10	10			24.62	20.83	10						
53044	1	9	10	9	9	8				26.26	21.18	8	8	1	3
53044	2	56	10	10	10	10				24.23	19.61	10	4	23	5
53044	3	74	10	10	9	7				24.4	20.16	7	0	4	1
53044	4	3	10	9	9	8				25.62	22.01	8	9	1	2
53044	5	6	10	10	9	9				23.46	21.03	9	0	14	3
53044	6	40	10	10	8	8				21.49	17	8	14	12	4
53044	7	63	10	9	9	9				25.38	20.57	9	8	5	3
53044	8	34	10	10	9	9				27.07	22.29	9	11	12	5
53044	9	11	10	10			22.84	19.93	10						
53044	10	54	10	8			24.15	21.16	8						
53044	11	10	10	10			23.01	20.08	10						
53044	12	82	10	8			22.5	20.14	8						
53045	1	43	10	10	8	7				24.75	20.13	7	0	0	1
53045	2	25	10	9	9	9				25.29	20.41	9	13	33	6
53045	3	41	10	10	10	10				27.2	20.65	10	17	8	3
53045	4	1	10	10	9	9				27.19	20.46	9	18	7	5
53045	5	17	10	10	10	10				26.55	20.9	10	23	15	6
53045	6	76	10	9	8	8				25.14	19.88	8	4	17	2
53045	7	31	10	8	8	8				24.03	19.95	8	3	10	3
53045	8	55	10	10	8	5				21.36	19.66	5	0	10	1
53045	9	35	10	9			24.1	19.57	9						
53045	10	50	10	10			23.84	19.45	10						
53045	11	80	10	8			24.64	20.53	8						
53045	12	68	10	10			25.32	20.08	10						
53046	1	72	10	9	9	9				26.5	20.44	9	15	45	6
53046	2	44	10	10	10	10				26.2	19.4	10	4	20	4
53046	3	47	10	9	9	7				24.43	19.45	7	16	13	2
53046	4	42	10	9	8	8				25.82	20.34	8	0	14	3
53046	5	81	10	10	10	9				26.37	20.25	9	8	18	3
53046	6	53	10	10	10	8				25.59	20.13	8	9	15	3
53046	7	4	10	9	9	9				25.13	20.01	9	16	8	4
53046	8	73	10	10	10	9				25.06	19.54	9	2	32	5
53046	9	26	10	10			24.53	19.24	10						
53046	10	71	10	10			25.22	19.82	10						
53046	11	59	10	10			26.97	21.23	10						
53046	12	57	10	10			24.58	19.52	10						

CTRL (53040) vs. Samples

- CETIS™ Summary Report
- CETIS™ Analytical Reports

CETIS Summary Report

Report Date: 07 Mar-22 11:51 (p 1 of 7)
Test Code/ID: 16245 CTRL / 10-1800-7441

Hyaella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Batch ID: 08-4000-1972	Test Type: Hyaella (42d)	Analyst: C. Matthaus Ayers
Start Date: 06 Jan-22 15:25	Protocol: EPA/600/R-99/064 (2000)	Diluent: Reconstituted Water
Ending Date: 17 Feb-22 12:00	Species: Hyaella azteca	Brine:
Test Length: 41d 21h	Taxon: Malacostraca	Source: Aquatic Research Organism Age: 8d
Sample ID: 16-3107-9284	Code: 53040	Project: Sediment Testing
Sample Date: 04 Jan-22 07:00	Material: Control Sediment	Source: Internal Laboratory Testing
Receipt Date: 04 Jan-22 08:00	CAS (PC):	Station: Control
Sample Age: 56h	Client: Aquatec Environmental, Inc.	

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, In	Sediment Testing
53041	03-8171-1181	21 Dec-21 09:05	21 Dec-21 20:00	16d 6h (0.3 °C)	Woods Hole Group	
53042	04-7178-2695	21 Dec-21 13:38	21 Dec-21 20:00	16d 2h (0.6 °C)		
53043	20-0010-4712	21 Dec-21 12:35	21 Dec-21 20:00	16d 3h (0.6 °C)		
53044	00-4677-6467	21 Dec-21 11:25	21 Dec-21 20:00	16d 4h (0.6 °C)		
53045	13-5487-4433	21 Dec-21 14:22	21 Dec-21 20:00	16d 1h (0.3 °C)		
53046	12-3611-8332	21 Dec-21 15:54	21 Dec-21 20:00	16d (0.3 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53041	Sediment	Belmont Landfill	TOX-4	
53042	Sediment	Belmont Landfill	TOX-1	
53043	Sediment	Belmont Landfill	TOX-2	
53044	Sediment	Belmont Landfill	TOX-3	
53045	Sediment	Belmont Landfill	TOX-5	
53046	Reference sediment	Belmont Landfill	TOX-6	

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
15-6042-9039	28d Biomass	Equal Variance t Two-Sample Test	0.6803	53041 passed 28d biomass	1
07-4508-1043	28d Biomass	Equal Variance t Two-Sample Test	0.0983	53042 passed 28d biomass	1
10-7728-7009	28d Biomass	Equal Variance t Two-Sample Test	0.9752	53043 passed 28d biomass	1
08-2400-5496	28d Biomass	Equal Variance t Two-Sample Test	0.2940	53044 passed 28d biomass	1
14-8471-5356	28d Biomass	Equal Variance t Two-Sample Test	0.9994	53045 passed 28d biomass	1
15-4087-4357	28d Biomass	Equal Variance t Two-Sample Test	1.0000	53046 passed 28d biomass	1
11-8503-7706	28d Mean Dry Weight	Equal Variance t Two-Sample Test	0.2282	53041 passed 28d mean dry weight	1
18-7060-3058	28d Mean Dry Weight	Equal Variance t Two-Sample Test	0.0261	53042 failed 28d mean dry weight	1
05-9760-8796	28d Mean Dry Weight	Equal Variance t Two-Sample Test	0.4114	53043 passed 28d mean dry weight	1
10-7803-5769	28d Mean Dry Weight	Equal Variance t Two-Sample Test	0.1477	53044 passed 28d mean dry weight	1
18-5949-4807	28d Mean Dry Weight	Equal Variance t Two-Sample Test	0.9990	53045 passed 28d mean dry weight	1
11-6550-6980	28d Mean Dry Weight	Equal Variance t Two-Sample Test	0.9998	53046 passed 28d mean dry weight	1
08-2303-6960	28d Survival Rate	Wilcoxon Rank Sum Two-Sample Test	0.8086	53041 passed 28d survival rate	1
16-4098-7499	28d Survival Rate	Wilcoxon Rank Sum Two-Sample Test	0.1271	53042 passed 28d survival rate	1
10-2799-0445	28d Survival Rate	Wilcoxon Rank Sum Two-Sample Test	0.9598	53043 passed 28d survival rate	1
18-1408-7013	28d Survival Rate	Wilcoxon Rank Sum Two-Sample Test	0.8685	53044 passed 28d survival rate	1
11-8482-1743	28d Survival Rate	Wilcoxon Rank Sum Two-Sample Test	0.8685	53045 passed 28d survival rate	1
06-3019-3058	28d Survival Rate	Wilcoxon Rank Sum Two-Sample Test	0.9605	53046 passed 28d survival rate	1
07-3997-3781	35d Survival Rate	Wilcoxon Rank Sum Two-Sample Test	0.7506	53041 passed 35d survival rate	1
16-7551-2902	35d Survival Rate	Wilcoxon Rank Sum Two-Sample Test	0.1983	53042 passed 35d survival rate	1
13-3368-5230	35d Survival Rate	Wilcoxon Rank Sum Two-Sample Test	0.8209	53043 passed 35d survival rate	1
01-6665-9042	35d Survival Rate	Wilcoxon Rank Sum Two-Sample Test	0.8305	53044 passed 35d survival rate	1
19-5609-4298	35d Survival Rate	Wilcoxon Rank Sum Two-Sample Test	0.7529	53045 passed 35d survival rate	1
08-5909-7312	35d Survival Rate	Wilcoxon Rank Sum Two-Sample Test	0.9193	53046 passed 35d survival rate	1
10-0336-8037	42d Biomass	Equal Variance t Two-Sample Test	0.1649	53041 passed 42d biomass	1
13-3463-8408	42d Biomass	Wilcoxon Rank Sum Two-Sample Test	0.4796	53042 passed 42d biomass	1
02-0751-5666	42d Biomass	Wilcoxon Rank Sum Two-Sample Test	0.9948	53043 passed 42d biomass	1

CETIS Summary Report

Report Date: 07 Mar-22 11:51 (p 2 of 7)
Test Code/ID: 16245 CTRL / 10-1800-7441

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test

Aquatec Environmental, Inc.

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
12-4364-8901	42d Biomass	Wilcoxon Rank Sum Two-Sample Test	0.6773	53044 passed 42d biomass	1
14-6870-4968	42d Biomass	Wilcoxon Rank Sum Two-Sample Test	0.9675	53045 passed 42d biomass	1
07-5488-4980	42d Biomass	Wilcoxon Rank Sum Two-Sample Test	0.9998	53046 passed 42d biomass	1
06-8367-2119	42d Mean Dry Weight	Equal Variance t Two-Sample Test	0.0447	53041 failed 42d mean dry weight	1
04-4513-1486	42d Mean Dry Weight	Equal Variance t Two-Sample Test	0.5571	53042 passed 42d mean dry weight	1
08-1889-0111	42d Mean Dry Weight	Equal Variance t Two-Sample Test	0.9142	53043 passed 42d mean dry weight	1
09-9294-0449	42d Mean Dry Weight	Equal Variance t Two-Sample Test	0.2901	53044 passed 42d mean dry weight	1
02-3831-3072	42d Mean Dry Weight	Equal Variance t Two-Sample Test	0.8002	53045 passed 42d mean dry weight	1
09-8383-2614	42d Mean Dry Weight	Equal Variance t Two-Sample Test	0.9986	53046 passed 42d mean dry weight	1
09-8937-0001	42d Reproduction	Equal Variance t Two-Sample Test	0.0250	53041 failed 42d reproduction	1
16-2630-7199	42d Reproduction	Equal Variance t Two-Sample Test	0.1007	53042 passed 42d reproduction	1
07-2807-7410	42d Reproduction	Equal Variance t Two-Sample Test	0.3587	53043 passed 42d reproduction	1
14-4449-2950	42d Reproduction	Equal Variance t Two-Sample Test	0.6521	53044 passed 42d reproduction	1
04-5319-0410	42d Reproduction	Equal Variance t Two-Sample Test	0.9109	53045 passed 42d reproduction	1
02-5413-8376	42d Reproduction	Equal Variance t Two-Sample Test	0.9891	53046 passed 42d reproduction	1
10-7951-2039	42d Survival Rate	Equal Variance t Two-Sample Test	0.3769	53041 passed 42d survival rate	1
09-3118-6769	42d Survival Rate	Equal Variance t Two-Sample Test	0.2202	53042 passed 42d survival rate	1
20-2053-3015	42d Survival Rate	Equal Variance t Two-Sample Test	0.8679	53043 passed 42d survival rate	1
05-6832-6513	42d Survival Rate	Wilcoxon Rank Sum Two-Sample Test	0.6788	53044 passed 42d survival rate	1
00-4262-1246	42d Survival Rate	Equal Variance t Two-Sample Test	0.7283	53045 passed 42d survival rate	1
14-5644-1465	42d Survival Rate	Wilcoxon Rank Sum Two-Sample Test	0.7211	53046 passed 42d survival rate	1

CETIS Summary Report

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Test Code/ID: 16245 CTRL / 10-1800-7441

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test

Aquatec Environmental, Inc.

28d Biomass Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
53040	CS	4	0.2917	0.2444	0.339	0.265	0.3318	0.01487	0.02974	10.20%	0.00%
53041		4	0.3025	0.2514	0.3536	0.26	0.335	0.01605	0.03211	10.61%	-3.70%
53042		4	0.2625	0.2194	0.3056	0.223	0.284	0.01353	0.02706	10.31%	10.01%
53043		4	0.341	0.298	0.384	0.317	0.379	0.01351	0.02702	7.92%	-16.90%
53044		4	0.2798	0.233	0.3265	0.236	0.299	0.01468	0.02936	10.50%	4.10%
53045		4	0.4567	0.3802	0.5333	0.411	0.524	0.02406	0.04811	10.53%	-56.58%
53046		4	0.5372	0.4922	0.5823	0.506	0.574	0.01415	0.0283	5.27%	-84.18%

28d Mean Dry Weight Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
53040	CS	4	0.3469	0.2788	0.415	0.2944	0.3914	0.0214	0.0428	12.34%	0.00%
53041		4	0.3268	0.284	0.3696	0.2889	0.3522	0.01345	0.02689	8.23%	5.80%
53042		4	0.2841	0.2369	0.3312	0.2478	0.3156	0.0148	0.02961	10.42%	18.12%
53043		4	0.341	0.298	0.384	0.317	0.379	0.01351	0.02702	7.92%	1.71%
53044		4	0.3132	0.2489	0.3775	0.291	0.3737	0.0202	0.04041	12.90%	9.72%
53045		4	0.495	0.4341	0.5559	0.439	0.524	0.01914	0.03829	7.73%	-42.69%
53046		4	0.5372	0.4922	0.5823	0.506	0.574	0.01415	0.0283	5.27%	-54.86%

28d Survival Rate Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
53040	CS	12	0.8333	0.6550	1.0120	0.0000	1.0000	0.0810	0.2807	33.68%	0.00%
53041		12	0.9333	0.8769	0.9897	0.7000	1.0000	0.0256	0.0888	9.51%	-12.00%
53042		12	0.8333	0.7600	0.9067	0.6000	1.0000	0.0333	0.1155	13.86%	0.00%
53043		12	0.9583	0.9011	1.0160	0.7000	1.0000	0.0260	0.0900	9.39%	-15.00%
53044		12	0.9417	0.8913	0.9920	0.8000	1.0000	0.0229	0.0793	8.42%	-13.00%
53045		12	0.9417	0.8913	0.9920	0.8000	1.0000	0.0229	0.0793	8.42%	-13.00%
53046		12	0.9667	0.9354	0.9980	0.9000	1.0000	0.0142	0.0492	5.09%	-16.00%

35d Survival Rate Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
53040	CS	8	0.7625	0.4873	1.0380	0.0000	1.0000	0.1164	0.3292	43.18%	0.00%
53041		8	0.8875	0.7833	0.9917	0.7000	1.0000	0.0441	0.1246	14.04%	-16.39%
53042		8	0.7375	0.5966	0.8784	0.4000	0.9000	0.0596	0.1685	22.85%	3.28%
53043		8	0.9000	0.7659	1.0340	0.6000	1.0000	0.0567	0.1604	17.82%	-18.03%
53044		8	0.9000	0.8553	0.9447	0.8000	1.0000	0.0189	0.0535	5.94%	-18.03%
53045		8	0.8750	0.8009	0.9491	0.8000	1.0000	0.0313	0.0886	10.13%	-14.75%
53046		8	0.9375	0.8753	0.9997	0.8000	1.0000	0.0263	0.0744	7.94%	-22.95%

42d Biomass Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
53040	CS	8	0.3868	0.2513	0.5222	0	0.513	0.0573	0.1621	41.90%	0.00%
53041		8	0.3095	0.1895	0.4295	0.046	0.483	0.05073	0.1435	46.36%	19.97%
53042		8	0.3324	0.1773	0.4875	0.074	0.49	0.06559	0.1855	55.81%	14.06%
53043		8	0.5146	0.4479	0.5814	0.349	0.603	0.02824	0.07987	15.52%	-33.06%
53044		8	0.4257	0.3537	0.4978	0.243	0.508	0.03047	0.08619	20.24%	-10.08%
53045		8	0.4934	0.3603	0.6265	0.17	0.673	0.05629	0.1592	32.27%	-27.57%
53046		8	0.5693	0.5192	0.6193	0.498	0.68	0.02117	0.05987	10.52%	-47.19%

42d Mean Dry Weight Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
53040	CS	7	0.536	0.4593	0.6128	0.439	0.66	0.03135	0.08295	15.47%	0.00%
53041		8	0.4261	0.3108	0.5413	0.2067	0.5612	0.04874	0.1379	32.35%	20.52%
53042		8	0.5453	0.4227	0.6678	0.288	0.74	0.05181	0.1465	26.88%	-1.72%
53043		8	0.5827	0.5523	0.6132	0.53	0.6514	0.01286	0.03639	6.24%	-8.71%
53044		8	0.5063	0.4107	0.602	0.27	0.635	0.04047	0.1145	22.60%	5.54%
53045		8	0.5847	0.4798	0.6896	0.34	0.7478	0.04435	0.1254	21.46%	-9.07%
53046		8	0.6618	0.6228	0.7008	0.5689	0.7114	0.01648	0.04661	7.04%	-23.46%

CETIS Summary Report

Report Date: 07 Mar-22 11:51 (p 4 of 7)
 Test Code/ID: 16245 CTRL / 10-1800-7441

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test

Aquatec Environmental, Inc.

42d Reproduction Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
53040	CS	7	4.318	2.112	6.523	0	7	0.9013	2.385	55.23%	0.00%
53041		6	1.917	0.5721	3.261	0	3.5	0.5231	1.281	66.85%	55.61%
53042		5	2.45	-0.3472	5.247	0	5.75	1.007	2.253	91.95%	43.26%
53043		8	3.802	1.349	6.255	2	10.5	1.037	2.934	77.18%	11.95%
53044		8	4.688	3.831	5.544	3	6.5	0.3621	1.024	21.85%	-8.56%
53045		8	6.521	3.656	9.386	0	10.5	1.211	3.427	52.55%	-51.02%
53046		8	8.079	5.489	10.67	4.667	14.5	1.095	3.098	38.35%	-87.11%

42d Survival Rate Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
53040	CS	8	0.7375	0.4587	1.0160	0.0000	1.0000	0.1179	0.3335	45.23%	0.00%
53041		8	0.7000	0.5104	0.8896	0.2000	0.9000	0.0802	0.2268	32.40%	5.08%
53042		8	0.6125	0.3660	0.8590	0.1000	0.9000	0.1043	0.2949	48.15%	16.95%
53043		8	0.8875	0.7577	1.0170	0.6000	1.0000	0.0549	0.1553	17.49%	-20.34%
53044		8	0.8500	0.7726	0.9274	0.7000	1.0000	0.0327	0.0926	10.89%	-15.25%
53045		8	0.8250	0.6855	0.9645	0.5000	1.0000	0.0590	0.1669	20.23%	-11.86%
53046		8	0.8625	0.7859	0.9391	0.7000	1.0000	0.0324	0.0916	10.62%	-16.95%

CETIS Summary Report

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 Test Code/ID: 16245 CTRL / 10-1800-7441

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test

Aquatec Environmental, Inc.

28d Biomass Detail

MD5: 6A35889FAC82A0083A4C34F25C79D9CB

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53040	CS	---	---	---	---	---	---	---	---	0.296	0.265
		0.274	0.3318								
53041		---	---	---	---	---	---	---	---	0.26	0.335
		0.298	0.317								
53042		---	---	---	---	---	---	---	---	0.274	0.223
		0.284	0.269								
53043		---	---	---	---	---	---	---	---	0.328	0.34
		0.317	0.379								
53044		---	---	---	---	---	---	---	---	0.291	0.299
		0.293	0.236								
53045		---	---	---	---	---	---	---	---	0.453	0.439
		0.411	0.524								
53046		---	---	---	---	---	---	---	---	0.529	0.54
		0.574	0.506								

28d Mean Dry Weight Detail

MD5: 0356DD1DC72BF990214254847863A120

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53040	CS	---	---	---	---	---	---	---	---	0.37	0.2944
		0.3914	0.3318								
53041		---	---	---	---	---	---	---	---	0.2889	0.335
		0.3311	0.3522								
53042		---	---	---	---	---	---	---	---	0.274	0.2478
		0.3156	0.2989								
53043		---	---	---	---	---	---	---	---	0.328	0.34
		0.317	0.379								
53044		---	---	---	---	---	---	---	---	0.291	0.3737
		0.293	0.295								
53045		---	---	---	---	---	---	---	---	0.5033	0.439
		0.5137	0.524								
53046		---	---	---	---	---	---	---	---	0.529	0.54
		0.574	0.506								

28d Survival Rate Detail

MD5: EBD456A7A3163E9A27D60224D8A78003

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53040	CS	0.9000	1.0000	1.0000	0.0000	1.0000	1.0000	0.8000	0.9000	0.8000	0.9000
		0.7000	1.0000								
53041		1.0000	1.0000	1.0000	0.9000	0.7000	0.9000	1.0000	1.0000	0.9000	1.0000
		0.9000	0.9000								
53042		0.7000	0.8000	0.9000	0.7000	0.8000	0.9000	0.9000	0.6000	1.0000	0.9000
		0.9000	0.9000								
53043		1.0000	1.0000	0.9000	1.0000	1.0000	0.7000	1.0000	0.9000	1.0000	1.0000
		1.0000	1.0000								
53044		0.9000	1.0000	1.0000	0.9000	1.0000	1.0000	0.9000	1.0000	1.0000	0.8000
		1.0000	0.8000								
53045		1.0000	0.9000	1.0000	1.0000	1.0000	0.9000	0.8000	1.0000	0.9000	1.0000
		0.8000	1.0000								
53046		0.9000	1.0000	0.9000	0.9000	1.0000	1.0000	0.9000	1.0000	1.0000	1.0000
		1.0000	1.0000								

CETIS Summary Report

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 Test Code/ID: 16245 CTRL / 10-1800-7441

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test **Aquatec Environmental, Inc.**

35d Survival Rate Detail											MD5: 9F607551CC383723F2C15253DD6CC88A
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53040	CS	0.7000	1.0000	1.0000	0.0000	1.0000	0.8000	0.8000	0.8000	---	---
		---	---								
53041		1.0000	0.9000	1.0000	0.9000	0.7000	0.9000	0.7000	1.0000	---	---
		---	---								
53042		0.7000	0.8000	0.8000	0.4000	0.8000	0.9000	0.9000	0.6000	---	---
		---	---								
53043		1.0000	1.0000	0.9000	1.0000	1.0000	0.7000	1.0000	0.6000	---	---
		---	---								
53044		0.9000	1.0000	0.9000	0.9000	0.9000	0.8000	0.9000	0.9000	---	---
		---	---								
53045		0.8000	0.9000	1.0000	0.9000	1.0000	0.8000	0.8000	0.8000	---	---
		---	---								
53046		0.9000	1.0000	0.9000	0.8000	1.0000	1.0000	0.9000	1.0000	---	---
		---	---								

42d Biomass Detail											MD5: 6F5F117B671B57260133B73D78DFA4A3
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53040	CS	0.396	0.513	0.488	0	0.439	0.384	0.447	0.427	---	---
		---	---								
53041		0.186	0.449	0.362	0.297	0.383	0.27	0.046	0.483	---	---
		---	---								
53042		0.399	0.487	0.144	0.074	0.49	0.459	0.487	0.119	---	---
		---	---								
53043		0.603	0.533	0.518	0.58	0.53	0.456	0.548	0.349	---	---
		---	---								
53044		0.508	0.462	0.424	0.361	0.243	0.449	0.481	0.478	---	---
		---	---								
53045		0.462	0.488	0.655	0.673	0.565	0.526	0.408	0.17	---	---
		---	---								
53046		0.606	0.68	0.498	0.548	0.612	0.546	0.512	0.552	---	---
		---	---								

42d Mean Dry Weight Detail											MD5: 32F7580CAD2FEEB03C10AAFAEF5D6EAE
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53040	CS	0.66	0.513	0.488	---	0.439	0.48	0.6386	0.5338	---	---
		---	---								
53041		0.2067	0.5612	0.4525	0.4243	0.5471	0.45	0.23	0.5367	---	---
		---	---								
53042		0.665	0.6087	0.288	0.74	0.6125	0.51	0.5411	0.3967	---	---
		---	---								
53043		0.603	0.5922	0.5756	0.58	0.53	0.6514	0.548	0.5817	---	---
		---	---								
53044		0.635	0.462	0.6057	0.4513	0.27	0.5612	0.5344	0.5311	---	---
		---	---								
53045		0.66	0.5422	0.655	0.7478	0.565	0.6575	0.51	0.34	---	---
		---	---								
53046		0.6733	0.68	0.7114	0.685	0.68	0.6825	0.5689	0.6133	---	---
		---	---								

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Report Date: 07 Mar-22 11:51 (p 7 of 7)
 Test Code/ID: 16245 CTRL / 10-1800-7441

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

42d Reproduction Detail											MD5: 0D103FCAFE929F7381943442E0CA664
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53040	CS	6.5	3	4	---	4.125	5.6	7	0	---	---
		---	---								
53041		---	2	1	2	3.5	0	---	3	---	---
		---	---								
53042		2	3.5	---	---	5.75	1	0	---	---	---
		---	---								
53043		10.5	2	2.5	5.5	2	3	2.25	2.667	---	---
		---	---								
53044		3	5.4	4	5	4.667	6.5	4.333	4.6	---	---
		---	---								
53045		0	7.667	8.333	5	6.333	10.5	4.333	10	---	---
		---	---								
53046		10	6	14.5	4.667	8.667	8	6	6.8	---	---
		---	---								

42d Survival Rate Detail											MD5: 135CA402BE0382EAC359354050735441
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53040	CS	0.6000	1.0000	1.0000	0.0000	1.0000	0.8000	0.7000	0.8000	---	---
		---	---								
53041		0.9000	0.8000	0.8000	0.7000	0.7000	0.6000	0.2000	0.9000	---	---
		---	---								
53042		0.6000	0.8000	0.5000	0.1000	0.8000	0.9000	0.9000	0.3000	---	---
		---	---								
53043		1.0000	0.9000	0.9000	1.0000	1.0000	0.7000	1.0000	0.6000	---	---
		---	---								
53044		0.8000	1.0000	0.7000	0.8000	0.9000	0.8000	0.9000	0.9000	---	---
		---	---								
53045		0.7000	0.9000	1.0000	0.9000	1.0000	0.8000	0.8000	0.5000	---	---
		---	---								
53046		0.9000	1.0000	0.7000	0.8000	0.9000	0.8000	0.9000	0.9000	---	---
		---	---								

CETIS Analytical Report

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Test Code/ID: 16245 CTRL / 10-1800-7441

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID: 15-6042-9039	Endpoint: 28d Biomass	CETIS Version: CETISv2.1.1
Analyzed: 06 Mar-22 12:22	Analysis: Parametric-Two Sample	Status Level: 1
Edit Date: 04 Mar-22 11:59	MD5 Hash: 3E90ACE19A5B4EA57461AC8D5C4708B2	Editor ID:
Batch ID: 08-4000-1972	Test Type: Hyalella (42d)	Analyst: C. Matthaues Ayers
Start Date: 06 Jan-22 15:25	Protocol: EPA/600/R-99/064 (2000)	Diluent: Reconstituted Water
Ending Date: 17 Feb-22 12:00	Species: Hyalella azteca	Brine:
Test Length: 41d 21h	Taxon: Malacostraca	Source: Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, Inc	Sediment Testing
53041	03-8171-1181	21 Dec-21 09:05	21 Dec-21 20:00	16d 6h (0.3 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53041	Sediment	Belmont Landfill	TOX-4	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53041 passed 28d biomass endpoint	14.58%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Control Sed		53041	6	-0.4933	1.943	0.04253	CDF	0.6803	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.00023308	0.00023308	1	0.2433	0.6393	Non-Significant Effect
Error	0.00574714	0.00095786	6			
Total	0.00598022		7			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.165	47.47	0.9029	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9748	0.6451	0.9328	Normal Distribution

28d Biomass Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	4	0.2917	0.2444	0.339	0.285	0.265	0.3318	0.01487	10.20%	0.00%
53041		4	0.3025	0.2514	0.3536	0.3075	0.26	0.335	0.01605	10.61%	-3.70%

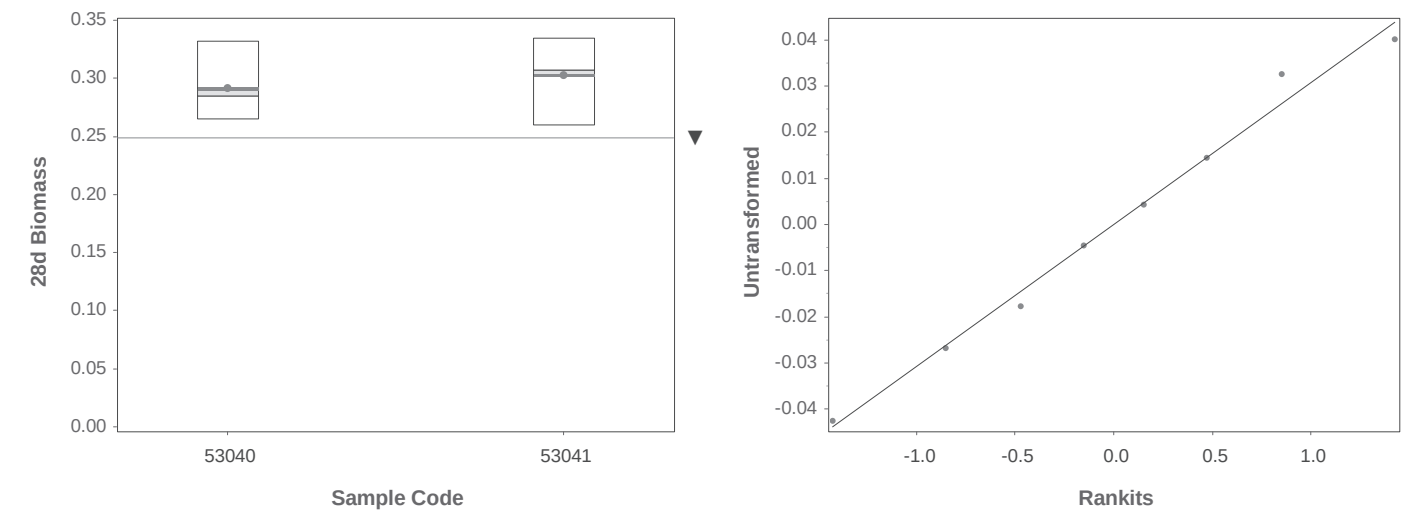
28d Biomass Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53040	CS	0.296	0.265	0.274	0.3318						
53041		0.26	0.335	0.298	0.317						

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID:	15-6042-9039	Endpoint:	28d Biomass	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 12:22	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 11:59	MD5 Hash:	3E90ACE19A5B4EA57461AC8D5C4708B2	Editor ID:	

Graphics



CETIS Analytical Report

Report Date: 07 Mar-22 11:50 (p 3 of 96)
Test Code/ID: 16245 CTRL / 10-1800-7441

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID: 07-4508-1043	Endpoint: 28d Biomass	CETIS Version: CETISv2.1.1
Analyzed: 06 Mar-22 12:22	Analysis: Parametric-Two Sample	Status Level: 1
Edit Date: 04 Mar-22 11:59	MD5 Hash: B7A5F87A42825969862817956F8E6583	Editor ID:
Batch ID: 08-4000-1972	Test Type: Hyalella (42d)	Analyst: C. Mattheus Ayers
Start Date: 06 Jan-22 15:25	Protocol: EPA/600/R-99/064 (2000)	Diluent: Reconstituted Water
Ending Date: 17 Feb-22 12:00	Species: Hyalella azteca	Brine:
Test Length: 41d 21h	Taxon: Malacostraca	Source: Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, Inc	Sediment Testing
53042	04-7178-2695	21 Dec-21 13:38	21 Dec-21 20:00	16d 2h (0.6 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53042	Sediment	Belmont Landfill	TOX-1	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53042 passed 28d biomass endpoint	13.39%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Control Sed		53042	6	1.453	1.943	0.03907	CDF	0.0983	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.00170581	0.00170581	1	2.11	0.1966	Non-Significant Effect
Error	0.00485114	0.00080852	6			
Total	0.00655695		7			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.208	47.47	0.8802	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9717	0.6451	0.9109	Normal Distribution

28d Biomass Summary

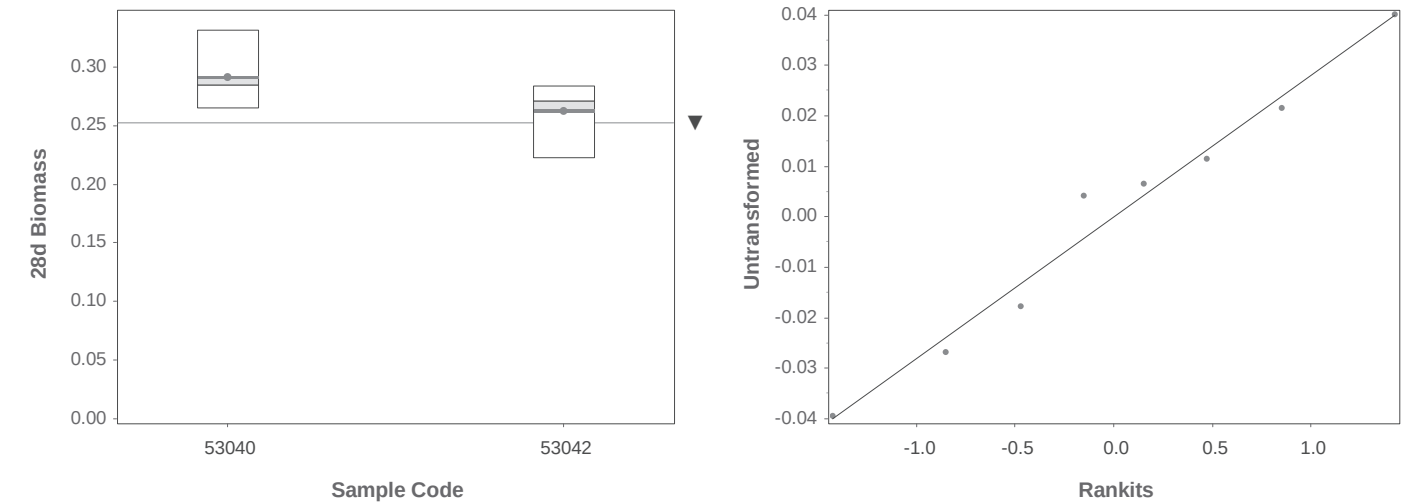
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	4	0.2917	0.2444	0.339	0.285	0.265	0.3318	0.01487	10.20%	0.00%
53042		4	0.2625	0.2194	0.3056	0.2715	0.223	0.284	0.01353	10.31%	10.01%

28d Biomass Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53040	CS	0.296	0.265	0.274	0.3318						
53042		0.274	0.223	0.284	0.269						

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test			Aquatec Environmental, Inc.	
Analysis ID:	07-4508-1043	Endpoint:	28d Biomass	CETIS Version: CETISv2.1.1
Analyzed:	06 Mar-22 12:22	Analysis:	Parametric-Two Sample	Status Level: 1
Edit Date:	04 Mar-22 11:59	MD5 Hash:	B7A5F87A42825969862817956F8E6583	Editor ID:

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CETIS Analytical Report

Report Date: 07 Mar-22 11:50 (p 5 of 96)
Test Code/ID: 16245 CTRL / 10-1800-7441

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test				Aquatec Environmental, Inc.	
Analysis ID:	10-7728-7009	Endpoint:	28d Biomass	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 12:22	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 11:59	MD5 Hash:	365B418D83078F58AC1CCA4AC414D957	Editor ID:	
Batch ID:	08-4000-1972	Test Type:	Hyalella (42d)	Analyst:	C. Matthaues Ayers
Start Date:	06 Jan-22 15:25	Protocol:	EPA/600/R-99/064 (2000)	Diluent:	Reconstituted Water
Ending Date:	17 Feb-22 12:00	Species:	Hyalella azteca	Brine:	
Test Length:	41d 21h	Taxon:	Malacostraca	Source:	Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, Inc	Sediment Testing
53043	20-0010-4712	21 Dec-21 12:35	21 Dec-21 20:00	16d 3h (0.6 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53043	Sediment	Belmont Landfill	TOX-2	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53043 passed 28d biomass endpoint	13.38%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Control Sed		53043	6	-2.454	1.943	0.03904	CDF	0.9752	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0048601	0.0048601	1	6.02	0.0496	Significant Effect
Error	0.00484414	0.00080736	6			
Total	0.00970424		7			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.212	47.47	0.8782	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.8607	0.6451	0.1220	Normal Distribution

28d Biomass Summary

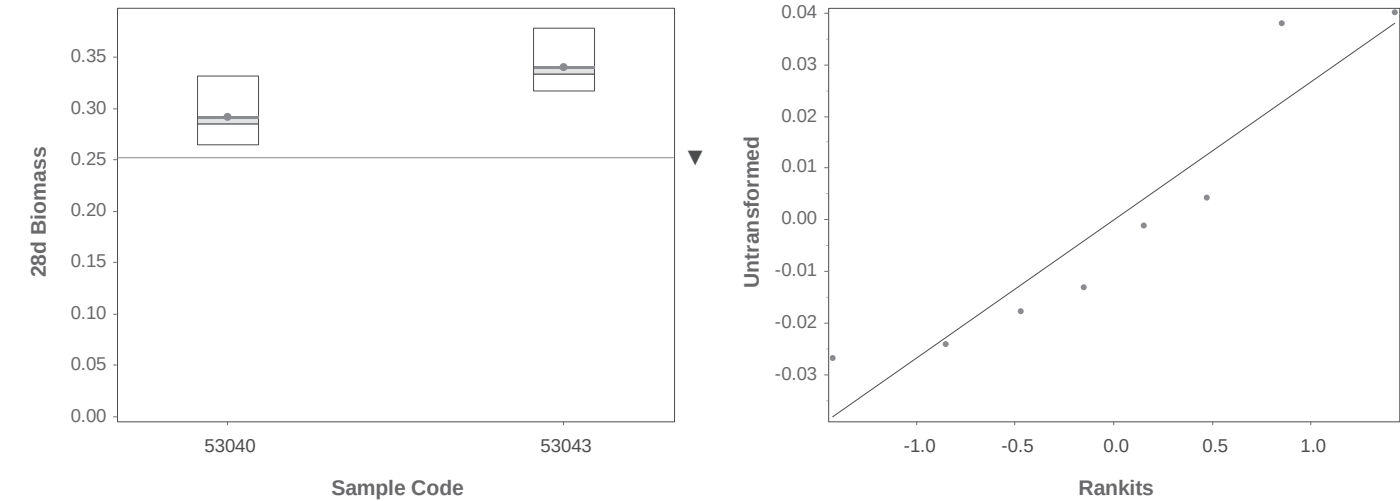
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	4	0.2917	0.2444	0.339	0.285	0.265	0.3318	0.01487	10.20%	0.00%
53043		4	0.341	0.298	0.384	0.334	0.317	0.379	0.01351	7.92%	-16.90%

28d Biomass Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53040	CS	0.296	0.265	0.274	0.3318						
53043		0.328	0.34	0.317	0.379						

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test			Aquatec Environmental, Inc.	
Analysis ID:	10-7728-7009	Endpoint:	28d Biomass	CETIS Version: CETISv2.1.1
Analyzed:	06 Mar-22 12:22	Analysis:	Parametric-Two Sample	Status Level: 1
Edit Date:	04 Mar-22 11:59	MD5 Hash:	365B418D83078F58AC1CCA4AC414D957	Editor ID:

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CETIS Analytical Report

Report Date: 07 Mar-22 11:50 (p 7 of 96)
Test Code/ID: 16245 CTRL / 10-1800-7441

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID: 08-2400-5496	Endpoint: 28d Biomass	CETIS Version: CETISv2.1.1
Analyzed: 06 Mar-22 12:22	Analysis: Parametric-Two Sample	Status Level: 1
Edit Date: 04 Mar-22 11:59	MD5 Hash: D95CE8BB530F480A0C1579E7A86E976E	Editor ID:
Batch ID: 08-4000-1972	Test Type: Hyalella (42d)	Analyst: C. Matthaues Ayers
Start Date: 06 Jan-22 15:25	Protocol: EPA/600/R-99/064 (2000)	Diluent: Reconstituted Water
Ending Date: 17 Feb-22 12:00	Species: Hyalella azteca	Brine:
Test Length: 41d 21h	Taxon: Malacostraca	Source: Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, In	Sediment Testing
53044	00-4677-6467	21 Dec-21 11:25	21 Dec-21 20:00	16d 4h (0.6 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53044	Sediment	Belmont Landfill	TOX-3	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53044 passed 28d biomass endpoint	13.92%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Control Sed		53044	6	0.572	1.943	0.04061	CDF	0.2940	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.00028582	0.00028582	1	0.3272	0.5881	Non-Significant Effect
Error	0.00524088	0.00087348	6			
Total	0.0055267		7			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.026	47.47	0.9836	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9643	0.6451	0.8503	Normal Distribution

28d Biomass Summary

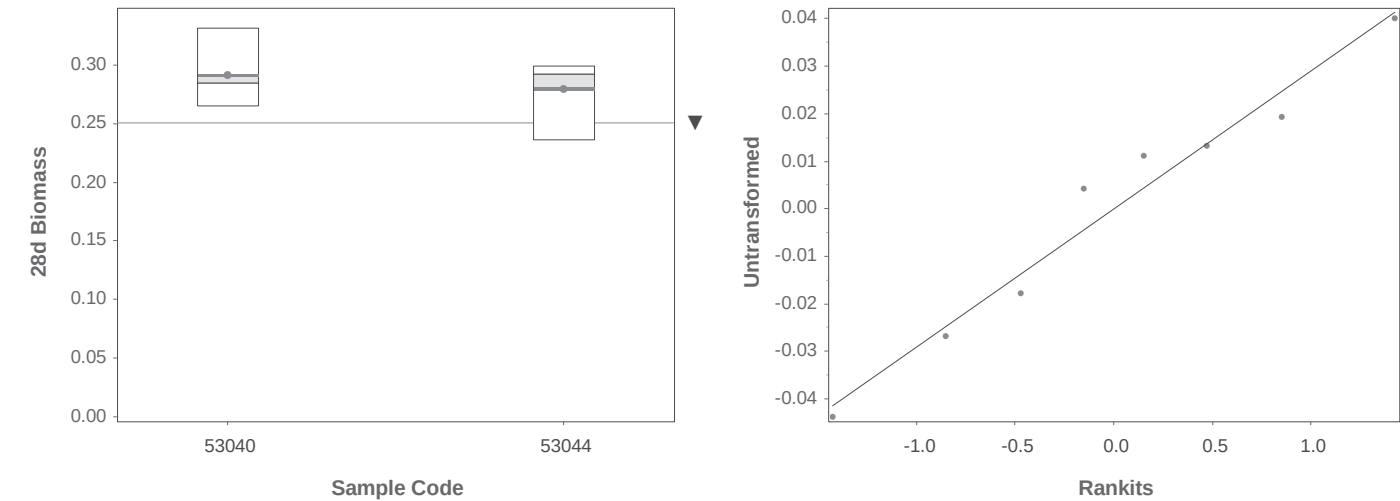
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	4	0.2917	0.2444	0.339	0.285	0.265	0.3318	0.01487	10.20%	0.00%
53044		4	0.2798	0.233	0.3265	0.292	0.236	0.299	0.01468	10.50%	4.10%

28d Biomass Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53040	CS	0.296	0.265	0.274	0.3318						
53044		0.291	0.299	0.293	0.236						

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test			Aquatec Environmental, Inc.	
Analysis ID:	08-2400-5496	Endpoint:	28d Biomass	CETIS Version: CETISv2.1.1
Analyzed:	06 Mar-22 12:22	Analysis:	Parametric-Two Sample	Status Level: 1
Edit Date:	04 Mar-22 11:59	MD5 Hash:	D95CE8BB530F480A0C1579E7A86E976E	Editor ID:

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CETIS Analytical Report

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 Test Code/ID: 16245 CTRL / 10-1800-7441

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test **Aquatec Environmental, Inc.**

Analysis ID:	14-8471-5356	Endpoint:	28d Biomass	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 12:22	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 11:59	MD5 Hash:	C2D72645708D86C176993D84148FA69D	Editor ID:	
Batch ID:	08-4000-1972	Test Type:	Hyalella (42d)	Analyst:	C. Matthaues Ayers
Start Date:	06 Jan-22 15:25	Protocol:	EPA/600/R-99/064 (2000)	Diluent:	Reconstituted Water
Ending Date:	17 Feb-22 12:00	Species:	Hyalella azteca	Brine:	
Test Length:	41d 21h	Taxon:	Malacostraca	Source:	Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, In	Sediment Testing
53045	13-5487-4433	21 Dec-21 14:22	21 Dec-21 20:00	16d 1h (0.3 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53045	Sediment	Belmont Landfill	TOX-5	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53045 passed 28d biomass endpoint	18.84%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Control Sed		53045	6	-5.836	1.943	0.05496	CDF	0.9994	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.05448	0.05448	1	34.05	0.0011	Significant Effect
Error	0.0095989	0.00159982	6			
Total	0.0640789		7			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	2.617	47.47	0.4504	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9236	0.6451	0.4595	Normal Distribution

28d Biomass Summary

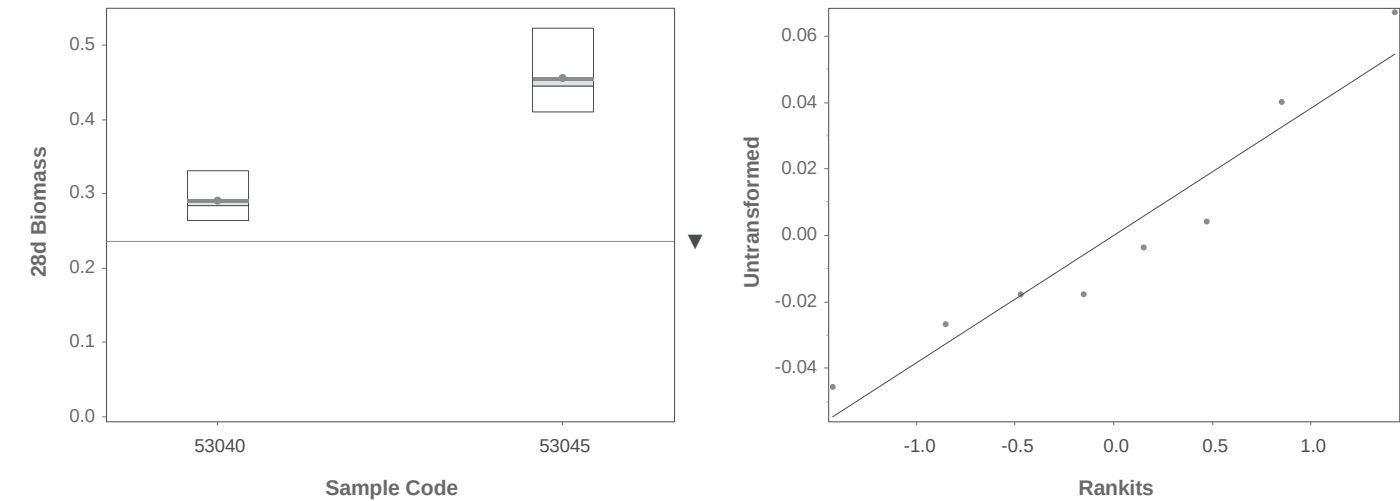
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	4	0.2917	0.2444	0.339	0.285	0.265	0.3318	0.01487	10.20%	0.00%
53045		4	0.4567	0.3802	0.5333	0.446	0.411	0.524	0.02406	10.53%	-56.58%

28d Biomass Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53040	CS	0.296	0.265	0.274	0.3318						
53045		0.453	0.439	0.411	0.524						

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test			Aquatec Environmental, Inc.	
Analysis ID:	14-8471-5356	Endpoint:	28d Biomass	CETIS Version: CETISv2.1.1
Analyzed:	06 Mar-22 12:22	Analysis:	Parametric-Two Sample	Status Level: 1
Edit Date:	04 Mar-22 11:59	MD5 Hash:	C2D72645708D86C176993D84148FA69D	Editor ID:

Graphics



CETIS Analytical Report

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Test Code/ID: 16245 CTRL / 10-1800-7441

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID: 15-4087-4357	Endpoint: 28d Biomass	CETIS Version: CETISv2.1.1
Analyzed: 06 Mar-22 12:23	Analysis: Parametric-Two Sample	Status Level: 1
Edit Date: 04 Mar-22 11:59	MD5 Hash: C73A3251112F1921C68A18D5DF52FCA6	Editor ID:
Batch ID: 08-4000-1972	Test Type: Hyalella (42d)	Analyst: C. Mattheus Ayers
Start Date: 06 Jan-22 15:25	Protocol: EPA/600/R-99/064 (2000)	Diluent: Reconstituted Water
Ending Date: 17 Feb-22 12:00	Species: Hyalella azteca	Brine:
Test Length: 41d 21h	Taxon: Malacostraca	Source: Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, In	Sediment Testing
53046	12-3611-8332	21 Dec-21 15:54	21 Dec-21 20:00	16d (0.3 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53046	Reference sediment	Belmont Landfill	TOX-6	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53046 passed 28d biomass endpoint	13.67%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Control Sed		53046	6	-11.96	1.943	0.03989	CDF	1.0000	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.120585	0.120585	1	143.1	2.1E-05	Significant Effect
Error	0.00505689	0.00084282	6			
Total	0.125642		7			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.105	47.47	0.9367	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.907	0.6451	0.3333	Normal Distribution

28d Biomass Summary

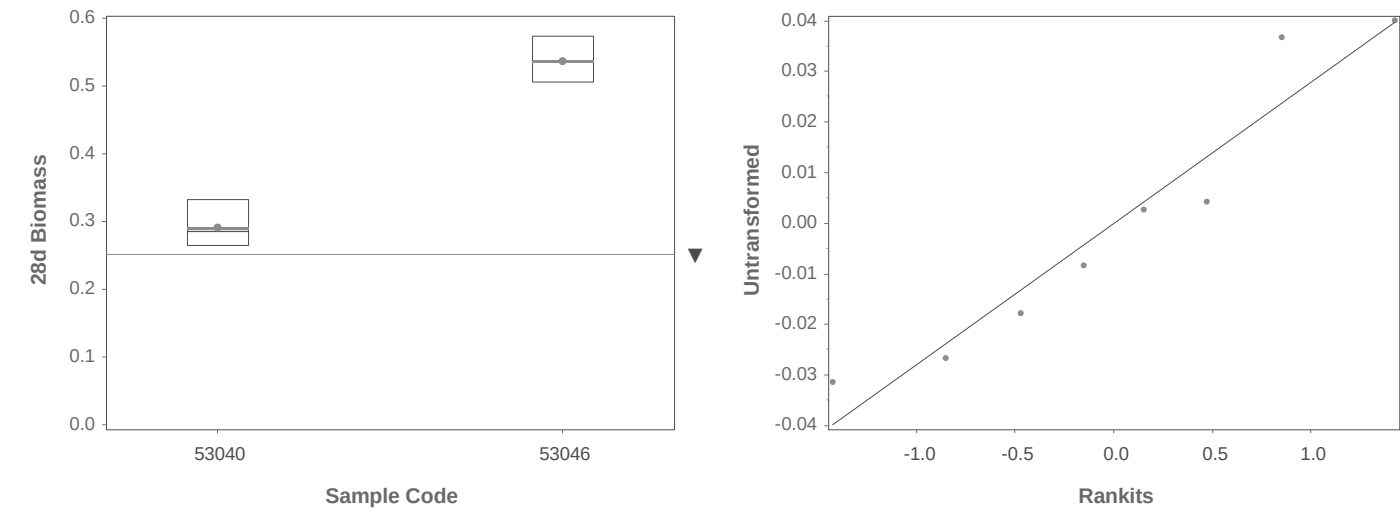
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	4	0.2917	0.2444	0.339	0.285	0.265	0.3318	0.01487	10.20%	0.00%
53046		4	0.5372	0.4922	0.5823	0.5345	0.506	0.574	0.01415	5.27%	-84.18%

28d Biomass Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53040	CS	0.296	0.265	0.274	0.3318						
53046		0.529	0.54	0.574	0.506						

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test					Aquatec Environmental, Inc.
Analysis ID:	15-4087-4357	Endpoint:	28d Biomass	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 12:23	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 11:59	MD5 Hash:	C73A3251112F1921C68A18D5DF52FCA6	Editor ID:	

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 Test Code/ID: 16245 CTRL / 10-1800-7441

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID: 11-8503-7706	Endpoint: 28d Mean Dry Weight	CETIS Version: CETISv2.1.1
Analyzed: 06 Mar-22 12:22	Analysis: Parametric-Two Sample	Status Level: 1
Edit Date: 04 Mar-22 11:59	MD5 Hash: A3E8320572E95DAC73B90D5EFD727491	Editor ID:
Batch ID: 08-4000-1972	Test Type: Hyalella (42d)	Analyst: C. Mattheus Ayers
Start Date: 06 Jan-22 15:25	Protocol: EPA/600/R-99/064 (2000)	Diluent: Reconstituted Water
Ending Date: 17 Feb-22 12:00	Species: Hyalella azteca	Brine:
Test Length: 41d 21h	Taxon: Malacostraca	Source: Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, Inc.	Sediment Testing
53041	03-8171-1181	21 Dec-21 09:05	21 Dec-21 20:00	16d 6h (0.3 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53041	Sediment	Belmont Landfill	TOX-4	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53041 passed 28d mean dry weight endpoint	14.16%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Control Sed		53041	6	0.796	1.943	0.04911	CDF	0.2282	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.00080941	0.00080941	1	0.6336	0.4564	Non-Significant Effect
Error	0.00766483	0.00127747	6			
Total	0.00847425		7			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	2.533	47.47	0.4654	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9564	0.6451	0.7753	Normal Distribution

28d Mean Dry Weight Summary

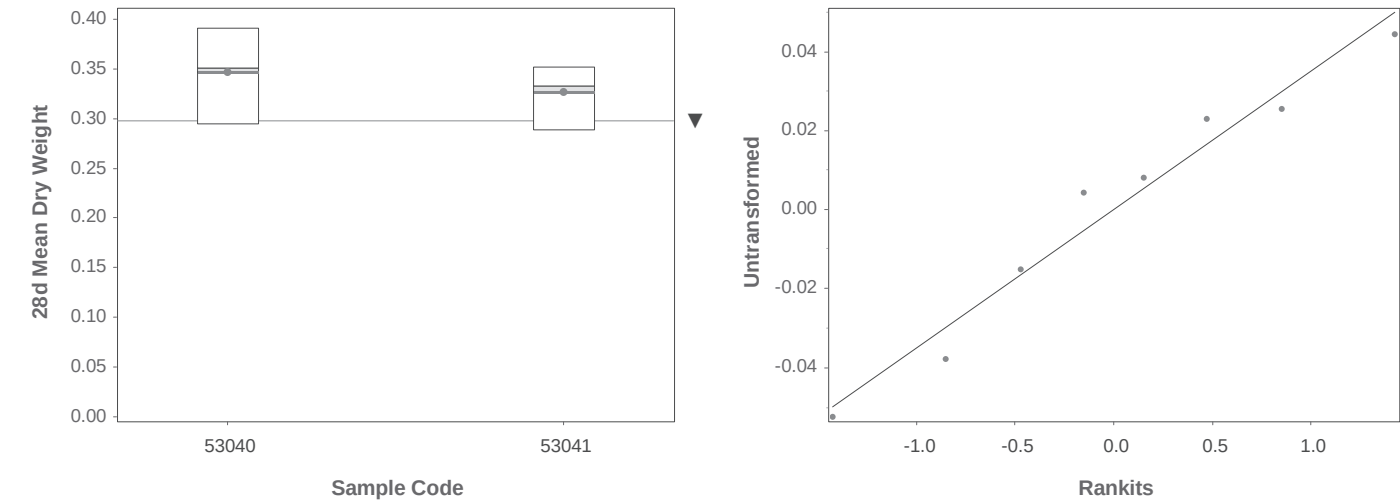
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	4	0.3469	0.2788	0.415	0.3509	0.2944	0.3914	0.0214	12.34%	0.00%
53041		4	0.3268	0.284	0.3696	0.3331	0.2889	0.3522	0.01345	8.23%	5.80%

28d Mean Dry Weight Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53040	CS	0.37	0.2944	0.3914	0.3318						
53041		0.2889	0.335	0.3311	0.3522						

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test			Aquatec Environmental, Inc.	
Analysis ID:	11-8503-7706	Endpoint:	28d Mean Dry Weight	CETIS Version: CETISv2.1.1
Analyzed:	06 Mar-22 12:22	Analysis:	Parametric-Two Sample	Status Level: 1
Edit Date:	04 Mar-22 11:59	MD5 Hash:	A3E8320572E95DAC73B90D5EFD727491	Editor ID:

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CETIS Analytical Report

Report Date: 07 Mar-22 11:50 (p 15 of 96)
Test Code/ID: 16245 CTRL / 10-1800-7441

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID: 18-7060-3058	Endpoint: 28d Mean Dry Weight	CETIS Version: CETISv2.1.1
Analyzed: 06 Mar-22 12:22	Analysis: Parametric-Two Sample	Status Level: 1
Edit Date: 04 Mar-22 11:59	MD5 Hash: 47D0DEAD7E39FD0D3CDF2CF53CE9BD3	Editor ID:
Batch ID: 08-4000-1972	Test Type: Hyalella (42d)	Analyst: C. Mattheus Ayers
Start Date: 06 Jan-22 15:25	Protocol: EPA/600/R-99/064 (2000)	Diluent: Reconstituted Water
Ending Date: 17 Feb-22 12:00	Species: Hyalella azteca	Brine:
Test Length: 41d 21h	Taxon: Malacostraca	Source: Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, In	Sediment Testing
53042	04-7178-2695	21 Dec-21 13:38	21 Dec-21 20:00	16d 2h (0.6 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53042	Sediment	Belmont Landfill	TOX-1	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53042 failed 28d mean dry weight endpoint	14.57%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Control Sed		53042*	6	2.416	1.943	0.05056	CDF	0.0261	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.00790458	0.00790458	1	5.837	0.0521	Non-Significant Effect
Error	0.00812493	0.00135416	6			
Total	0.0160295		7			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	2.09	47.47	0.5604	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9577	0.6451	0.7880	Normal Distribution

28d Mean Dry Weight Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	4	0.3469	0.2788	0.415	0.3509	0.2944	0.3914	0.0214	12.34%	0.00%
53042		4	0.2841	0.2369	0.3312	0.2864	0.2478	0.3156	0.0148	10.42%	18.12%

28d Mean Dry Weight Detail

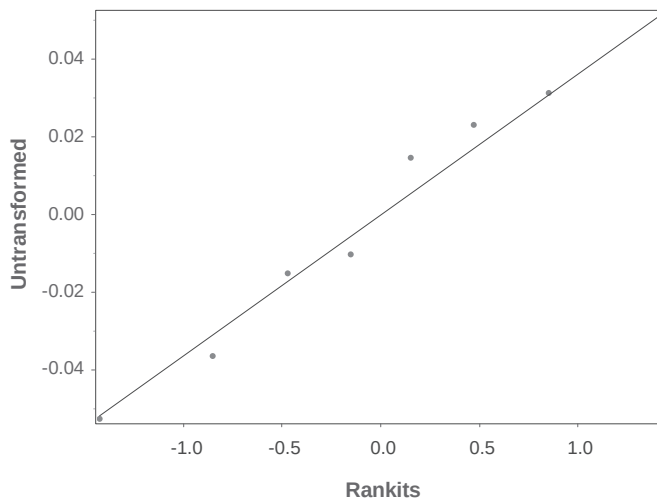
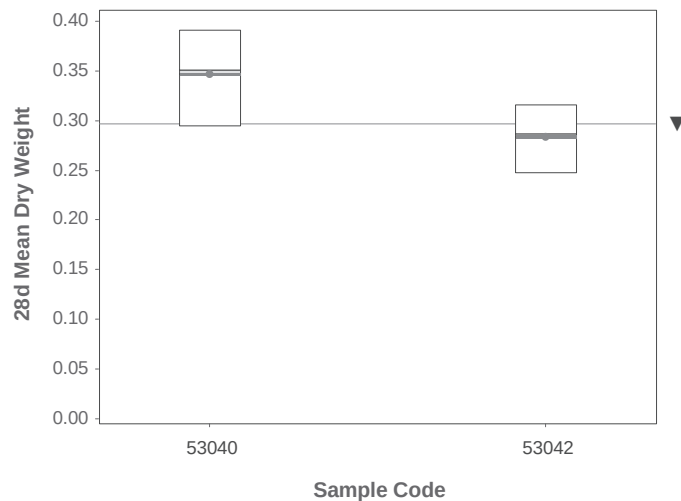
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53040	CS	0.37	0.2944	0.3914	0.3318						
53042		0.274	0.2478	0.3156	0.2989						

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test

Aquatec Environmental, Inc.

Analysis ID:	18-7060-3058	Endpoint:	28d Mean Dry Weight	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 12:22	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 11:59	MD5 Hash:	47D0DEAD7E39FD0D3CDF2CF53CE9BD3	Editor ID:	

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Report Date: 07 Mar-22 11:50 (p 17 of 96)
Test Code/ID: 16245 CTRL / 10-1800-7441

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID: 05-9760-8796	Endpoint: 28d Mean Dry Weight	CETIS Version: CETISv2.1.1
Analyzed: 06 Mar-22 12:22	Analysis: Parametric-Two Sample	Status Level: 1
Edit Date: 04 Mar-22 11:59	MD5 Hash: 155FE02C51FA91E4FFDCF14C2BC67AA3	Editor ID:
Batch ID: 08-4000-1972	Test Type: Hyalella (42d)	Analyst: C. Matthaues Ayers
Start Date: 06 Jan-22 15:25	Protocol: EPA/600/R-99/064 (2000)	Diluent: Reconstituted Water
Ending Date: 17 Feb-22 12:00	Species: Hyalella azteca	Brine:
Test Length: 41d 21h	Taxon: Malacostraca	Source: Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, Inc	Sediment Testing
53043	20-0010-4712	21 Dec-21 12:35	21 Dec-21 20:00	16d 3h (0.6 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53043	Sediment	Belmont Landfill	TOX-2	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53043 passed 28d mean dry weight endpoint	14.18%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Control Sed		53043	6	0.234	1.943	0.04918	CDF	0.4114	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	7.0157E-05	7.0157E-05	1	0.05477	0.8227	Non-Significant Effect
Error	0.00768546	0.00128091	6			
Total	0.00775562		7			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	2.509	47.47	0.4698	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9547	0.6451	0.7579	Normal Distribution

28d Mean Dry Weight Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	4	0.3469	0.2788	0.415	0.3509	0.2944	0.3914	0.0214	12.34%	0.00%
53043		4	0.341	0.298	0.384	0.334	0.317	0.379	0.01351	7.92%	1.71%

28d Mean Dry Weight Detail

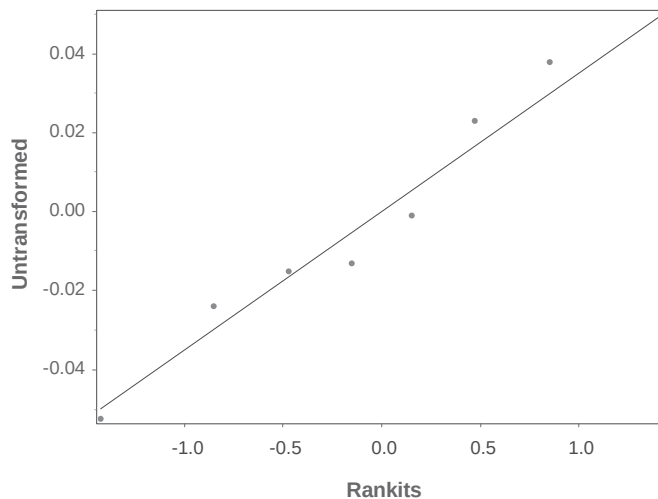
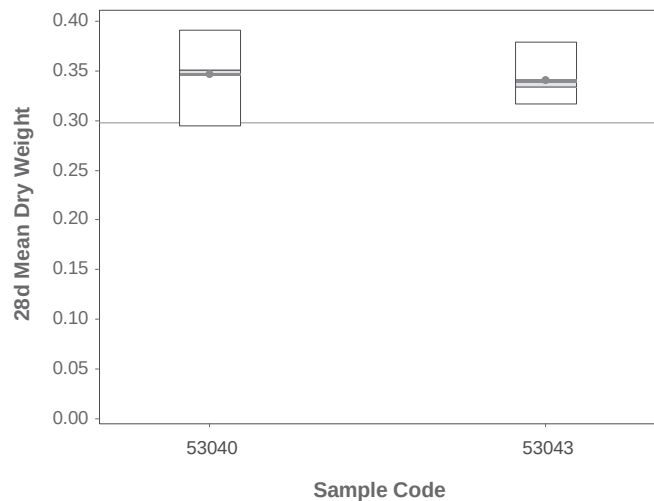
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53040	CS	0.37	0.2944	0.3914	0.3318						
53043		0.328	0.34	0.317	0.379						

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test

Aquatec Environmental, Inc.

Analysis ID:	05-9760-8796	Endpoint:	28d Mean Dry Weight	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 12:22	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 11:59	MD5 Hash:	155FE02C51FA91E4FFDCF14C2BC67AA3	Editor ID:	

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Report Date: 07 Mar-22 11:50 (p 19 of 96)
Test Code/ID: 16245 CTRL / 10-1800-7441

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID:	10-7803-5769	Endpoint:	28d Mean Dry Weight	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 12:22	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 11:59	MD5 Hash:	0C88FB813C8872F99026CC4E8EEFC4B6	Editor ID:	
Batch ID:	08-4000-1972	Test Type:	Hyalella (42d)	Analyst:	C. Matthaues Ayers
Start Date:	06 Jan-22 15:25	Protocol:	EPA/600/R-99/064 (2000)	Diluent:	Reconstituted Water
Ending Date:	17 Feb-22 12:00	Species:	Hyalella azteca	Brine:	
Test Length:	41d 21h	Taxon:	Malacostraca	Source:	Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, Inc	Sediment Testing
53044	00-4677-6467	21 Dec-21 11:25	21 Dec-21 20:00	16d 4h (0.6 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53044	Sediment	Belmont Landfill	TOX-3	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53044 passed 28d mean dry weight endpoint	16.48%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Control Sed		53044	6	1.146	1.943	0.05719	CDF	0.1477	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.00227614	0.00227614	1	1.314	0.2953	Non-Significant Effect
Error	0.0103939	0.00173231	6			
Total	0.01267		7			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.122	47.47	0.9269	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9098	0.6451	0.3524	Normal Distribution

28d Mean Dry Weight Summary

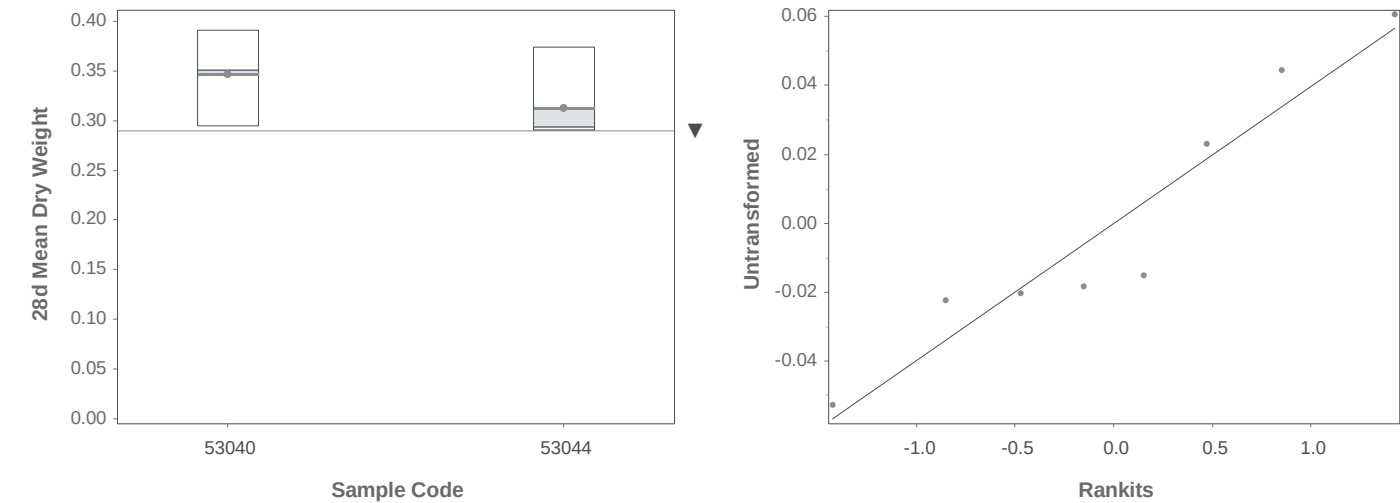
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	4	0.3469	0.2788	0.415	0.3509	0.2944	0.3914	0.0214	12.34%	0.00%
53044		4	0.3132	0.2489	0.3775	0.294	0.291	0.3738	0.0202	12.90%	9.72%

28d Mean Dry Weight Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53040	CS	0.37	0.2944	0.3914	0.3318						
53044		0.291	0.3738	0.293	0.295						

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test			Aquatec Environmental, Inc.	
Analysis ID:	10-7803-5769	Endpoint:	28d Mean Dry Weight	CETIS Version: CETISv2.1.1
Analyzed:	06 Mar-22 12:22	Analysis:	Parametric-Two Sample	Status Level: 1
Edit Date:	04 Mar-22 11:59	MD5 Hash:	0C88FB813C8872F99026CC4E8EEFC4B6	Editor ID:

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CETIS Analytical Report

Report Date: 07 Mar-22 11:50 (p 21 of 96)
Test Code/ID: 16245 CTRL / 10-1800-7441

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID: 18-5949-4807	Endpoint: 28d Mean Dry Weight	CETIS Version: CETISv2.1.1
Analyzed: 06 Mar-22 12:23	Analysis: Parametric-Two Sample	Status Level: 1
Edit Date: 04 Mar-22 11:59	MD5 Hash: 1124467705A4D94F03369CB2EEDFD6A5	Editor ID:
Batch ID: 08-4000-1972	Test Type: Hyalella (42d)	Analyst: C. Mattheus Ayers
Start Date: 06 Jan-22 15:25	Protocol: EPA/600/R-99/064 (2000)	Diluent: Reconstituted Water
Ending Date: 17 Feb-22 12:00	Species: Hyalella azteca	Brine:
Test Length: 41d 21h	Taxon: Malacostraca	Source: Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, Inc	Sediment Testing
53045	13-5487-4433	21 Dec-21 14:22	21 Dec-21 20:00	16d 1h (0.3 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53045	Sediment	Belmont Landfill	TOX-5	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53045 passed 28d mean dry weight endpoint	16.08%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Control Sed		53045	6	-5.158	1.943	0.0558	CDF	0.9990	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.043866	0.043866	1	26.6	0.0021	Significant Effect
Error	0.00989346	0.00164891	6			
Total	0.0537595		7			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.25	47.47	0.8591	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.8905	0.6451	0.2367	Normal Distribution

28d Mean Dry Weight Summary

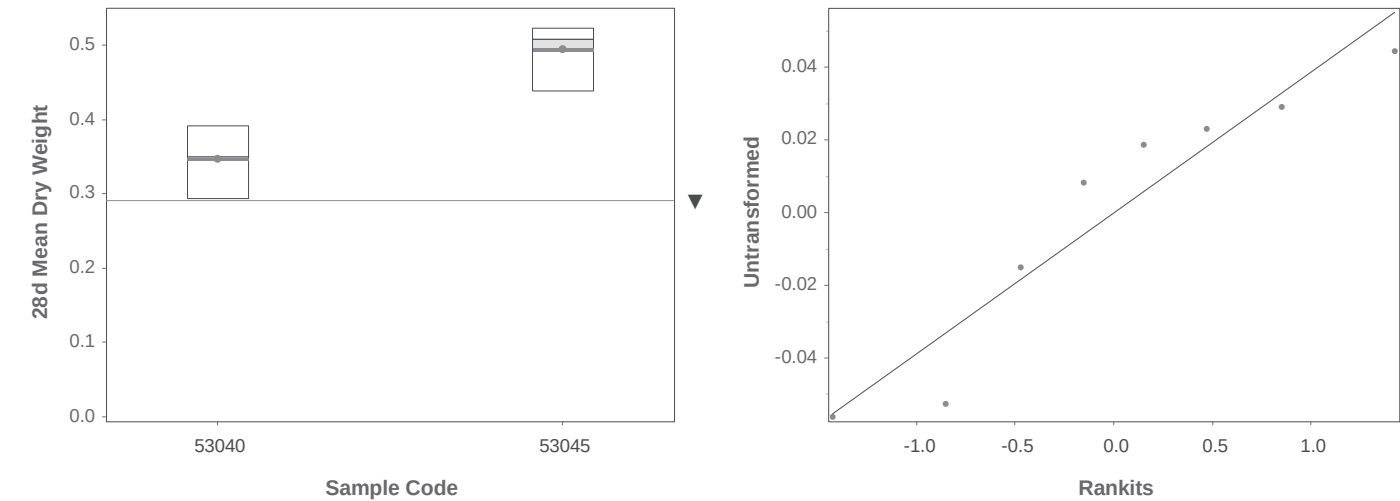
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	4	0.3469	0.2788	0.415	0.3509	0.2944	0.3914	0.0214	12.34%	0.00%
53045		4	0.495	0.4341	0.5559	0.5085	0.439	0.524	0.01914	7.73%	-42.69%

28d Mean Dry Weight Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53040	CS	0.37	0.2944	0.3914	0.3318						
53045		0.5033	0.439	0.5137	0.524						

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test			Aquatec Environmental, Inc.	
Analysis ID:	18-5949-4807	Endpoint:	28d Mean Dry Weight	CETIS Version: CETISv2.1.1
Analyzed:	06 Mar-22 12:23	Analysis:	Parametric-Two Sample	Status Level: 1
Edit Date:	04 Mar-22 11:59	MD5 Hash:	1124467705A4D94F03369CB2EEDFD6A5	Editor ID:

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CETIS Analytical Report

Report Date: 07 Mar-22 11:50 (p 23 of 96)
Test Code/ID: 16245 CTRL / 10-1800-7441

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test				Aquatec Environmental, Inc.	
Analysis ID:	11-6550-6980	Endpoint:	28d Mean Dry Weight	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 12:23	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 11:59	MD5 Hash:	507EBFF68E628577787604967EB78EC1	Editor ID:	
Batch ID:	08-4000-1972	Test Type:	Hyalella (42d)	Analyst:	C. Mattheus Ayers
Start Date:	06 Jan-22 15:25	Protocol:	EPA/600/R-99/064 (2000)	Diluent:	Reconstituted Water
Ending Date:	17 Feb-22 12:00	Species:	Hyalella azteca	Brine:	
Test Length:	41d 21h	Taxon:	Malacostraca	Source:	Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, In	Sediment Testing
53046	12-3611-8332	21 Dec-21 15:54	21 Dec-21 20:00	16d (0.3 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53046	Reference sediment	Belmont Landfill	TOX-6	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53046 passed 28d mean dry weight endpoint	14.37%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Control Sed		53046	6	-7.419	1.943	0.04985	CDF	0.9998	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0724489	0.0724489	1	55.04	0.0003	Significant Effect
Error	0.00789821	0.00131637	6			
Total	0.0803471		7			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	2.287	47.47	0.5145	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9693	0.6451	0.8925	Normal Distribution

28d Mean Dry Weight Summary

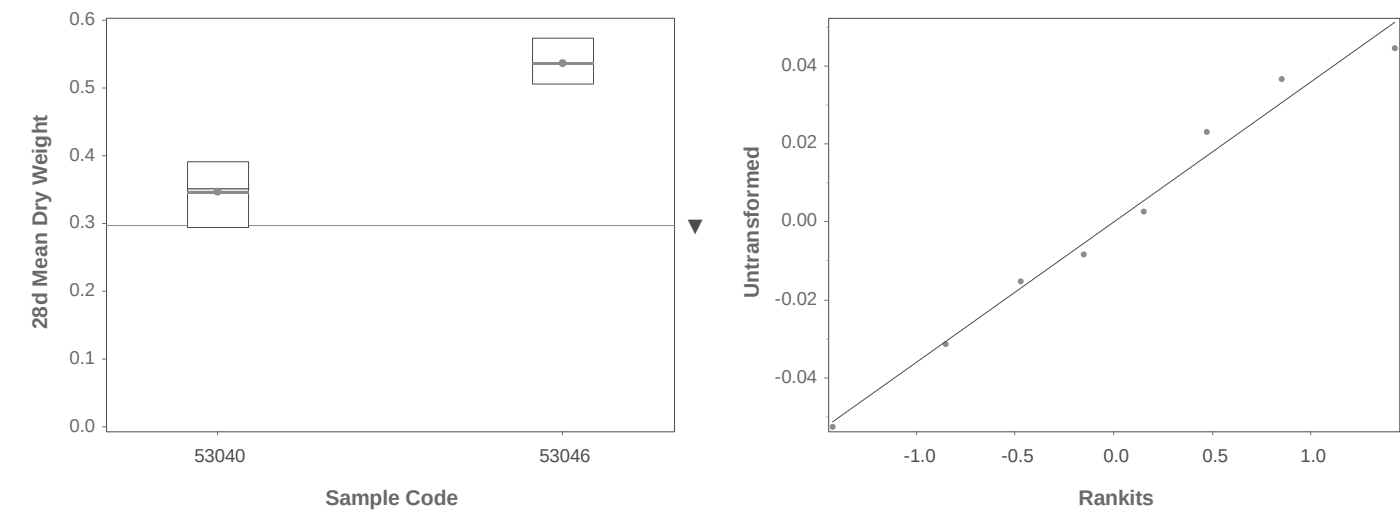
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	4	0.3469	0.2788	0.415	0.3509	0.2944	0.3914	0.0214	12.34%	0.00%
53046		4	0.5372	0.4922	0.5823	0.5345	0.506	0.574	0.01415	5.27%	-54.86%

28d Mean Dry Weight Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53040	CS	0.37	0.2944	0.3914	0.3318						
53046		0.529	0.54	0.574	0.506						

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test			Aquatec Environmental, Inc.	
Analysis ID:	11-6550-6980	Endpoint:	28d Mean Dry Weight	CETIS Version: CETISv2.1.1
Analyzed:	06 Mar-22 12:23	Analysis:	Parametric-Two Sample	Status Level: 1
Edit Date:	04 Mar-22 11:59	MD5 Hash:	507EBFF68E628577787604967EB78EC1	Editor ID:

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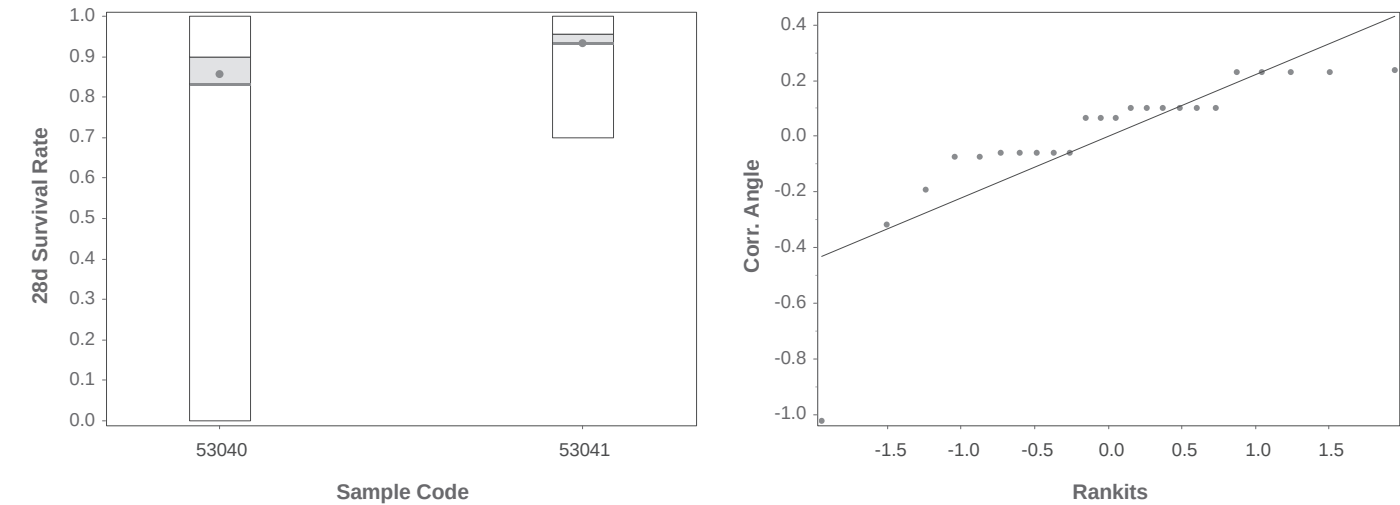
CETIS Analytical Report

Report Date: 07 Mar-22 11:50 (p 25 of 96)
 Test Code/ID: 16245 CTRL / 10-1800-7441

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test								Aquatec Environmental, Inc.			
Analysis ID:	08-2303-6960		Endpoint:	28d Survival Rate				CETIS Version:	CETISv2.1.1		
Analyzed:	06 Mar-22 12:22		Analysis:	Nonparametric-Two Sample				Status Level:	1		
Edit Date:	04 Mar-22 11:59		MD5 Hash:	777DB8BE9496F1462F612CBFB1568875				Editor ID:			
Batch ID:	08-4000-1972		Test Type:	Hyalella (42d)				Analyst:	C. Mattheus Ayers		
Start Date:	06 Jan-22 15:25		Protocol:	EPA/600/R-99/064 (2000)				Diluent:	Reconstituted Water		
Ending Date:	17 Feb-22 12:00		Species:	Hyalella azteca				Brine:			
Test Length:	41d 21h		Taxon:	Malacostraca				Source:	Aquatic Research Organism Age: 8d		
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, Inc.	Sediment Testing					
53041	03-8171-1181	21 Dec-21 09:05	21 Dec-21 20:00	16d 6h (0.3 °C)	Woods Hole Group						
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
53040	Control Sediment	Internal Laboratory Testing	Control								
53041	Sediment	Belmont Landfill	TOX-4								
Data Transform		Alt Hyp	Comparison Result					PMSD			
Angular (Corrected)		C > T	53041 passed 28d survival rate endpoint					15.58%			
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	df	Test Stat	Critical	Ties	P-Type	P-Value	Decision(α:5%)		
Control Sed		53041	22	164	---	3	Exact	0.8086	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(α:5%)			
Between	0.0974843		0.0974843		1	1.376	0.2534	Non-Significant Effect			
Error	1.55878		0.0708536		22						
Total	1.65626				23						
ANOVA Assumptions Tests											
Attribute	Test				Test Stat	Critical	P-Value	Decision(α:1%)			
Variance	Variance Ratio F Test				7.533	5.32	0.0023	Unequal Variances			
Distribution	Shapiro-Wilk W Normality Test				0.7034	0.884	1.1E-05	Non-Normal Distribution			
28d Survival Rate Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	12	0.8333	0.6550	1.0000	0.9000	0.0000	1.0000	0.0810	33.68%	0.00%
53041		12	0.9333	0.8769	0.9897	0.9545	0.7000	1.0000	0.0256	9.51%	-12.00%
Angular (Corrected) Transformed Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	12	1.1820	0.9568	1.4060	1.2490	0.1588	1.4190	0.1021	29.93%	0.00%
53041		12	1.3090	1.2270	1.3910	1.3380	0.9912	1.4120	0.0372	9.84%	-10.79%
28d Survival Rate Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53040	CS	0.9000	1.0000	1.0000	0.0000	1.0000	1.0000	0.8000	0.9000	0.8000	0.9000
		0.7000	1.0000								
53041		1.0000	1.0000	1.0000	0.9000	0.7000	0.9000	1.0000	1.0000	0.9000	1.0000
		0.9000	0.9000								
Angular (Corrected) Transformed Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53040	CS	1.2490	1.4120	1.4120	0.1588	1.4120	1.4120	1.1070	1.2490	1.1070	1.2490
		0.9912	1.4190								
53041		1.4120	1.4120	1.4120	1.2490	0.9912	1.2490	1.4120	1.4120	1.2490	1.4120
		1.2490	1.2490								

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test			Aquatec Environmental, Inc.	
Analysis ID:	08-2303-6960	Endpoint:	28d Survival Rate	CETIS Version: CETISv2.1.1
Analyzed:	06 Mar-22 12:22	Analysis:	Nonparametric-Two Sample	Status Level: 1
Edit Date:	04 Mar-22 11:59	MD5 Hash:	777DB8BE9496F1462F612CBFB1568875	Editor ID:

Graphics



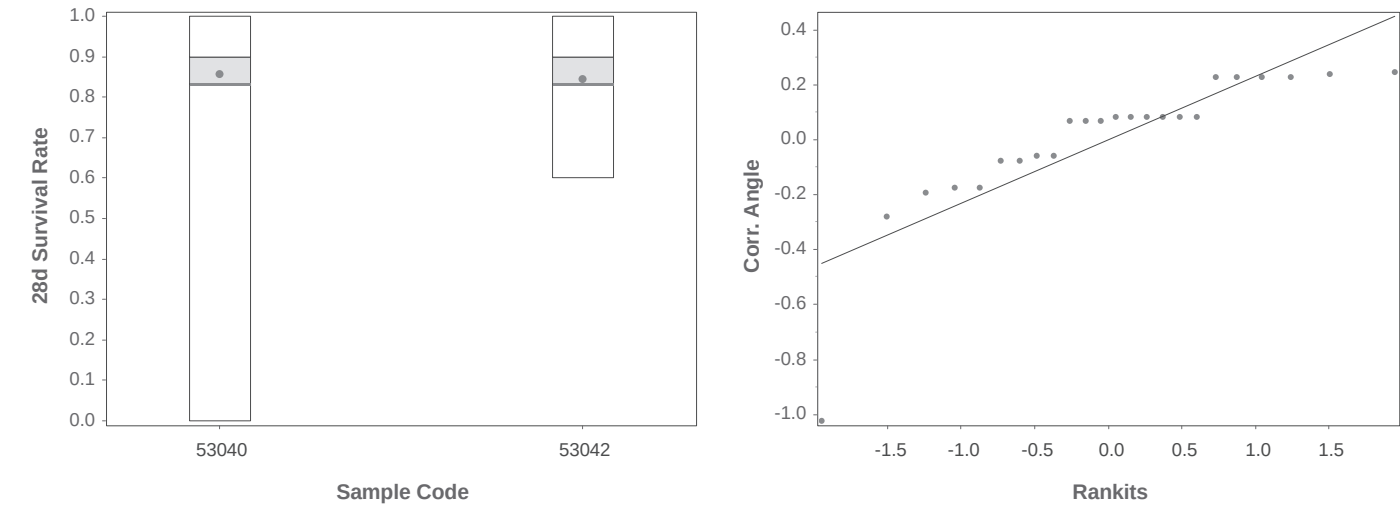
CETIS Analytical Report

Report Date: 07 Mar-22 11:50 (p 27 of 96)
 Test Code/ID: 16245 CTRL / 10-1800-7441

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test								Aquatec Environmental, Inc.			
Analysis ID:	16-4098-7499		Endpoint:	28d Survival Rate				CETIS Version:	CETISv2.1.1		
Analyzed:	06 Mar-22 12:22		Analysis:	Nonparametric-Two Sample				Status Level:	1		
Edit Date:	04 Mar-22 11:59		MD5 Hash:	7CC5829BAE42CBF60239FE2C2665D450				Editor ID:			
Batch ID:	08-4000-1972		Test Type:	Hyalella (42d)				Analyst:	C. Mattheus Ayers		
Start Date:	06 Jan-22 15:25		Protocol:	EPA/600/R-99/064 (2000)				Diluent:	Reconstituted Water		
Ending Date:	17 Feb-22 12:00		Species:	Hyalella azteca				Brine:			
Test Length:	41d 21h		Taxon:	Malacostraca				Source:	Aquatic Research Organism		Age: 8d
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name		Project				
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, Inc.		Sediment Testing				
53042	04-7178-2695	21 Dec-21 13:38	21 Dec-21 20:00	16d 2h (0.6 °C)	Woods Hole Group						
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
53040	Control Sediment	Internal Laboratory Testing	Control								
53042	Sediment	Belmont Landfill	TOX-1								
Data Transform		Alt Hyp	Comparison Result					PMSD			
Angular (Corrected)		C > T	53042 passed 28d survival rate endpoint					16.01%			
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	df	Test Stat	Critical	Ties	P-Type	P-Value	Decision(α:5%)		
Control Sed		53042	22	130.5	---	4	Exact	0.1271	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(α:5%)			
Between	0.00150292		0.00150292		1	0.02035	0.8879	Non-Significant Effect			
Error	1.62443		0.0738379		22						
Total	1.62594				23						
ANOVA Assumptions Tests											
Attribute	Test				Test Stat	Critical	P-Value	Decision(α:1%)			
Variance	Variance Ratio F Test				5.542	5.32	0.0085	Unequal Variances			
Distribution	Shapiro-Wilk W Normality Test				0.7306	0.884	2.6E-05	Non-Normal Distribution			
28d Survival Rate Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	12	0.8333	0.6550	1.0000	0.9000	0.0000	1.0000	0.0810	33.68%	0.00%
53042		12	0.8333	0.7600	0.9067	0.9000	0.6000	1.0000	0.0333	13.86%	0.00%
Angular (Corrected) Transformed Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	12	1.1820	0.9568	1.4060	1.2490	0.1588	1.4190	0.1021	29.93%	0.00%
53042		12	1.1660	1.0700	1.2610	1.2490	0.8861	1.4120	0.0434	12.89%	1.34%
28d Survival Rate Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53040	CS	0.9000	1.0000	1.0000	0.0000	1.0000	1.0000	0.8000	0.9000	0.8000	0.9000
		0.7000	1.0000								
53042		0.7000	0.8000	0.9000	0.7000	0.8000	0.9000	0.9000	0.6000	1.0000	0.9000
		0.9000	0.9000								
Angular (Corrected) Transformed Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53040	CS	1.2490	1.4120	1.4120	0.1588	1.4120	1.4120	1.1070	1.2490	1.1070	1.2490
		0.9912	1.4190								
53042		0.9912	1.1070	1.2490	0.9912	1.1070	1.2490	1.2490	0.8861	1.4120	1.2490
		1.2490	1.2490								

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test			Aquatec Environmental, Inc.	
Analysis ID:	16-4098-7499	Endpoint:	28d Survival Rate	CETIS Version: CETISv2.1.1
Analyzed:	06 Mar-22 12:22	Analysis:	Nonparametric-Two Sample	Status Level: 1
Edit Date:	04 Mar-22 11:59	MD5 Hash:	7CC5829BAE42CBF60239FE2C2665D450	Editor ID:

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Hyalella 42-d Survival, Growth, and Reproduction Sediment Test					Aquatec Environmental, Inc.	
Analysis ID:	10-2799-0445	Endpoint:	28d Survival Rate	CETIS Version:	CETISv2.1.1	
Analyzed:	06 Mar-22 12:22	Analysis:	Nonparametric-Two Sample	Status Level:	1	
Edit Date:	04 Mar-22 11:59	MD5 Hash:	577FCA3F16489F4905996A8B23CEF8AC	Editor ID:		
Batch ID:	08-4000-1972	Test Type:	Hyalella (42d)	Analyst:	C. Matthaues Ayers	
Start Date:	06 Jan-22 15:25	Protocol:	EPA/600/R-99/064 (2000)	Diluent:	Reconstituted Water	
Ending Date:	17 Feb-22 12:00	Species:	Hyalella azteca	Brine:		
Test Length:	41d 21h	Taxon:	Malacostraca	Source:	Aquatic Research Organism	Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, In	Sediment Testing
53043	20-0010-4712	21 Dec-21 12:35	21 Dec-21 20:00	16d 3h (0.6 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53043	Sediment	Belmont Landfill	TOX-2	

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	53043 passed 28d survival rate endpoint	15.59%

Wilcoxon Rank Sum Two-Sample Test									
Sample I	vs	Sample II	df	Test Stat	Critical	Ties	P-Type	P-Value	Decision(α:5%)
Control Sed		53043	22	176	---	3	Exact	0.9598	Non-Significant Effect

ANOVA Table						
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.169763	0.169763	1	2.394	0.1360	Non-Significant Effect
Error	1.55987	0.0709033	22			
Total	1.72964		23			

ANOVA Assumptions Tests					
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	7.488	5.32	0.0023	Unequal Variances
Distribution	Shapiro-Wilk W Normality Test	0.6753	0.884	<1.0E-05	Non-Normal Distribution

28d Survival Rate Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	12	0.8333	0.6550	1.0000	0.9000	0.0000	1.0000	0.0810	33.68%	0.00%
53043		12	0.9583	0.9011	1.0000	1.0000	0.7000	1.0000	0.0260	9.39%	-15.00%

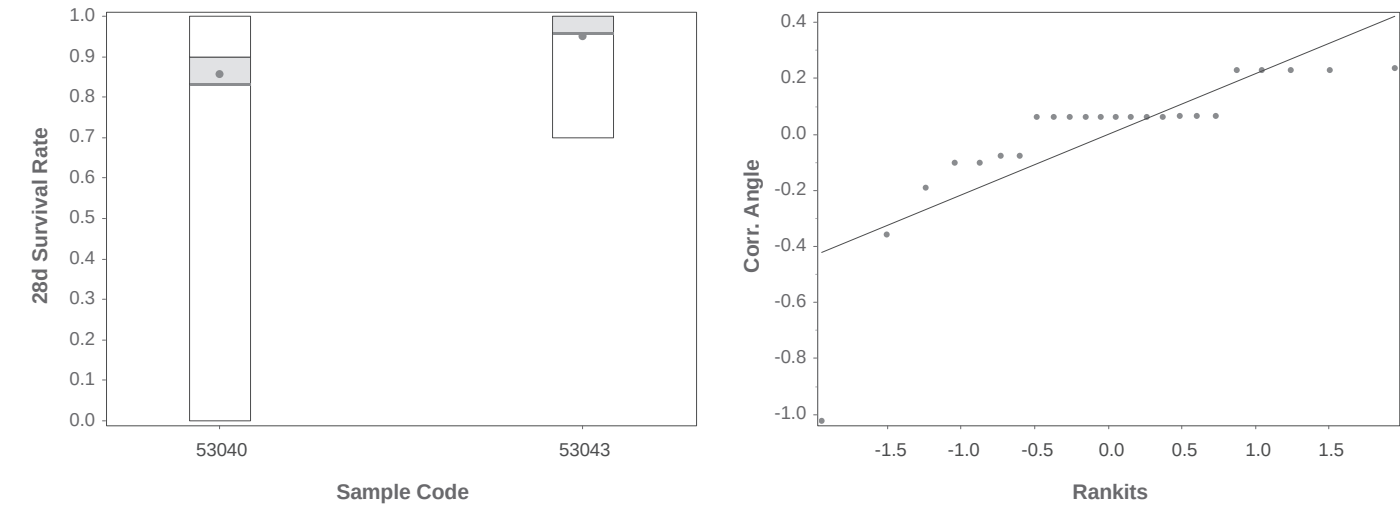
Angular (Corrected) Transformed Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	12	1.1820	0.9568	1.4060	1.2490	0.1588	1.4190	0.1021	29.93%	0.00%
53043		12	1.3500	1.2680	1.4320	1.4120	0.9912	1.4120	0.0373	9.58%	-14.24%

28d Survival Rate Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53040	CS	0.9000	1.0000	1.0000	0.0000	1.0000	1.0000	0.8000	0.9000	0.8000	0.9000
		0.7000	1.0000								
53043		1.0000	1.0000	0.9000	1.0000	1.0000	0.7000	1.0000	0.9000	1.0000	1.0000
		1.0000	1.0000								

Angular (Corrected) Transformed Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53040	CS	1.2490	1.4120	1.4120	0.1588	1.4120	1.4120	1.1070	1.2490	1.1070	1.2490
		0.9912	1.4190								
53043		1.4120	1.4120	1.2490	1.4120	1.4120	0.9912	1.4120	1.2490	1.4120	1.4120
		1.4120	1.4120								

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test			Aquatec Environmental, Inc.	
Analysis ID:	10-2799-0445	Endpoint:	28d Survival Rate	CETIS Version: CETISv2.1.1
Analyzed:	06 Mar-22 12:22	Analysis:	Nonparametric-Two Sample	Status Level: 1
Edit Date:	04 Mar-22 11:59	MD5 Hash:	577FCA3F16489F4905996A8B23CEF8AC	Editor ID:

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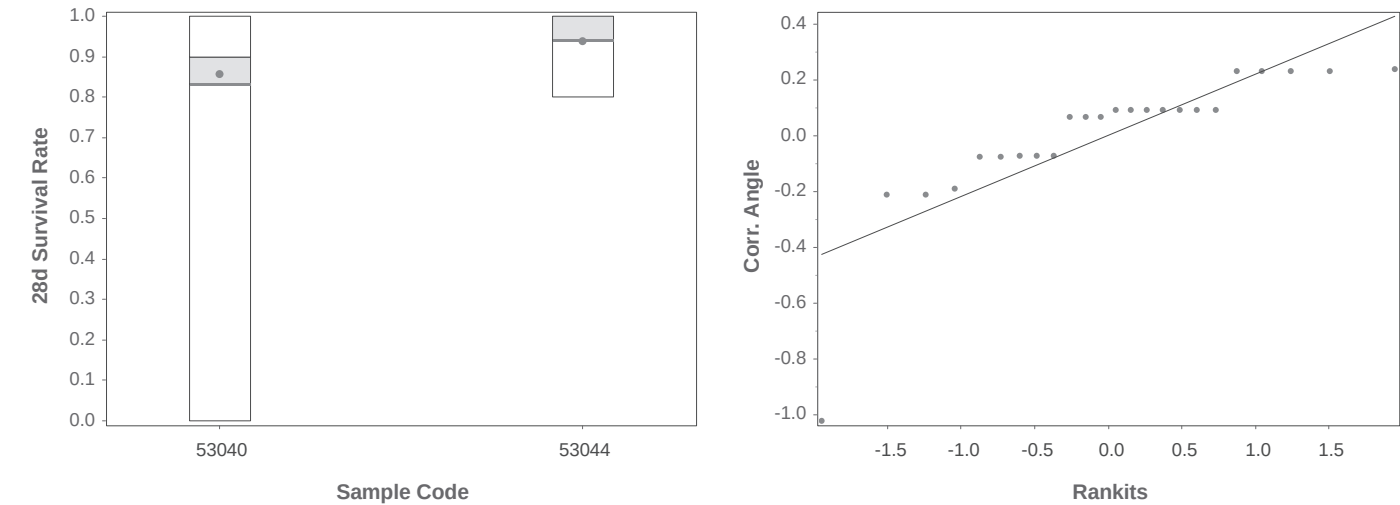
CETIS Analytical Report

Report Date: 07 Mar-22 11:50 (p 31 of 96)
 Test Code/ID: 16245 CTRL / 10-1800-7441

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test								Aquatec Environmental, Inc.			
Analysis ID:	18-1408-7013		Endpoint:	28d Survival Rate				CETIS Version:	CETISv2.1.1		
Analyzed:	06 Mar-22 12:22		Analysis:	Nonparametric-Two Sample				Status Level:	1		
Edit Date:	04 Mar-22 11:59		MD5 Hash:	BB4325D3B857E56936736A8817776496				Editor ID:			
Batch ID:	08-4000-1972		Test Type:	Hyalella (42d)				Analyst:	C. Mattheus Ayers		
Start Date:	06 Jan-22 15:25		Protocol:	EPA/600/R-99/064 (2000)				Diluent:	Reconstituted Water		
Ending Date:	17 Feb-22 12:00		Species:	Hyalella azteca				Brine:			
Test Length:	41d 21h		Taxon:	Malacostraca				Source:	Aquatic Research Organism		Age: 8d
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, Inc	Sediment Testing					
53044	00-4677-6467	21 Dec-21 11:25	21 Dec-21 20:00	16d 4h (0.6 °C)	Woods Hole Group						
Sample Code	Material Type	Sample Source		Station Location		Lat/Long					
53040	Control Sediment	Internal Laboratory Testing		Control							
53044	Sediment	Belmont Landfill		TOX-3							
Data Transform		Alt Hyp		Comparison Result						PMSD	
Angular (Corrected)		C > T		53044 passed 28d survival rate endpoint						15.46%	
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	df	Test Stat	Critical	Ties	P-Type	P-Value	Decision(α:5%)		
Control Sed		53044	22	167	---	3	Exact	0.8685	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(α:5%)			
Between	0.115738		0.115738		1	1.652	0.2120	Non-Significant Effect			
Error	1.54109		0.0700495		22						
Total	1.65683				23						
ANOVA Assumptions Tests											
Attribute	Test				Test Stat	Critical	P-Value	Decision(α:1%)			
Variance	Variance Ratio F Test				8.341	5.32	0.0014	Unequal Variances			
Distribution	Shapiro-Wilk W Normality Test				0.699	0.884	<1.0E-05	Non-Normal Distribution			
28d Survival Rate Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	12	0.8333	0.6550	1.0000	0.9000	0.0000	1.0000	0.0810	33.68%	0.00%
53044		12	0.9417	0.8913	0.9920	1.0000	0.8000	1.0000	0.0229	8.42%	-13.00%
Angular (Corrected) Transformed Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	12	1.1820	0.9568	1.4060	1.2490	0.1588	1.4190	0.1021	29.93%	0.00%
53044		12	1.3200	1.2430	1.3980	1.4120	1.1070	1.4120	0.0354	9.27%	-11.75%
28d Survival Rate Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53040	CS	0.9000	1.0000	1.0000	0.0000	1.0000	1.0000	0.8000	0.9000	0.8000	0.9000
		0.7000	1.0000								
53044		0.9000	1.0000	1.0000	0.9000	1.0000	1.0000	0.9000	1.0000	1.0000	0.8000
		1.0000	0.8000								
Angular (Corrected) Transformed Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53040	CS	1.2490	1.4120	1.4120	0.1588	1.4120	1.4120	1.1070	1.2490	1.1070	1.2490
		0.9912	1.4190								
53044		1.2490	1.4120	1.4120	1.2490	1.4120	1.4120	1.2490	1.4120	1.4120	1.1070
		1.4120	1.1070								

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test			Aquatec Environmental, Inc.	
Analysis ID:	18-1408-7013	Endpoint:	28d Survival Rate	CETIS Version: CETISv2.1.1
Analyzed:	06 Mar-22 12:22	Analysis:	Nonparametric-Two Sample	Status Level: 1
Edit Date:	04 Mar-22 11:59	MD5 Hash:	BB4325D3B857E56936736A8817776496	Editor ID:

Graphics



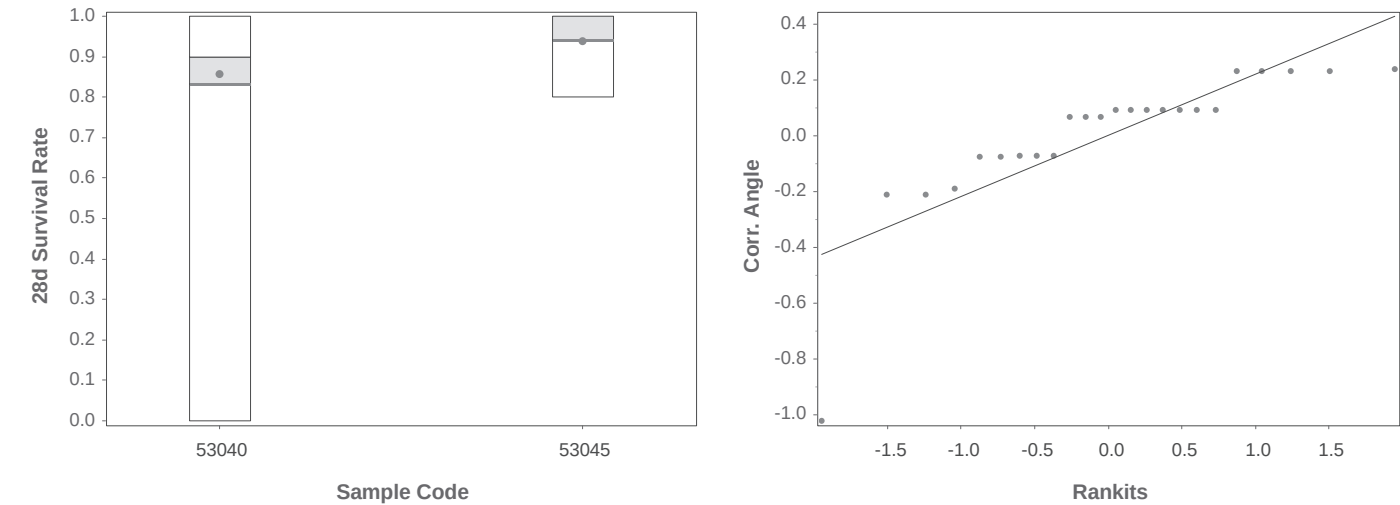
CETIS Analytical Report

Report Date: 07 Mar-22 11:50 (p 33 of 96)
Test Code/ID: 16245 CTRL / 10-1800-7441

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test								Aquatec Environmental, Inc.			
Analysis ID:	11-8482-1743		Endpoint:	28d Survival Rate				CETIS Version:	CETISv2.1.1		
Analyzed:	06 Mar-22 12:23		Analysis:	Nonparametric-Two Sample				Status Level:	1		
Edit Date:	04 Mar-22 11:59		MD5 Hash:	08656D1A5D018BB8934787DD1F64A234				Editor ID:			
Batch ID:	08-4000-1972		Test Type:	Hyalella (42d)				Analyst:	C. Mattheus Ayers		
Start Date:	06 Jan-22 15:25		Protocol:	EPA/600/R-99/064 (2000)				Diluent:	Reconstituted Water		
Ending Date:	17 Feb-22 12:00		Species:	Hyalella azteca				Brine:			
Test Length:	41d 21h		Taxon:	Malacostraca				Source:	Aquatic Research Organism		Age: 8d
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, In	Sediment Testing					
53045	13-5487-4433	21 Dec-21 14:22	21 Dec-21 20:00	16d 1h (0.3 °C)	Woods Hole Group						
Sample Code	Material Type	Sample Source		Station Location		Lat/Long					
53040	Control Sediment	Internal Laboratory Testing		Control							
53045	Sediment	Belmont Landfill		TOX-5							
Data Transform		Alt Hyp		Comparison Result					PMSD		
Angular (Corrected)		C > T		53045 passed 28d survival rate endpoint					15.46%		
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	df	Test Stat	Critical	Ties	P-Type	P-Value	Decision(α:5%)		
Control Sed		53045	22	167	---	3	Exact	0.8685	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(α:5%)			
Between	0.115738		0.115738		1	1.652	0.2120	Non-Significant Effect			
Error	1.54109		0.0700495		22						
Total	1.65683				23						
ANOVA Assumptions Tests											
Attribute	Test				Test Stat	Critical	P-Value	Decision(α:1%)			
Variance	Variance Ratio F Test				8.341	5.32	0.0014	Unequal Variances			
Distribution	Shapiro-Wilk W Normality Test				0.699	0.884	<1.0E-05	Non-Normal Distribution			
28d Survival Rate Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	12	0.8333	0.6550	1.0000	0.9000	0.0000	1.0000	0.0810	33.68%	0.00%
53045		12	0.9417	0.8913	0.9920	1.0000	0.8000	1.0000	0.0229	8.42%	-13.00%
Angular (Corrected) Transformed Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	12	1.1820	0.9568	1.4060	1.2490	0.1588	1.4190	0.1021	29.93%	0.00%
53045		12	1.3200	1.2430	1.3980	1.4120	1.1070	1.4120	0.0354	9.27%	-11.75%
28d Survival Rate Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53040	CS	0.9000	1.0000	1.0000	0.0000	1.0000	1.0000	0.8000	0.9000	0.8000	0.9000
		0.7000	1.0000								
53045		1.0000	0.9000	1.0000	1.0000	1.0000	0.9000	0.8000	1.0000	0.9000	1.0000
		0.8000	1.0000								
Angular (Corrected) Transformed Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53040	CS	1.2490	1.4120	1.4120	0.1588	1.4120	1.4120	1.1070	1.2490	1.1070	1.2490
		0.9912	1.4190								
53045		1.4120	1.2490	1.4120	1.4120	1.4120	1.2490	1.1070	1.4120	1.2490	1.4120
		1.1070	1.4120								

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test			Aquatec Environmental, Inc.	
Analysis ID:	11-8482-1743	Endpoint:	28d Survival Rate	CETIS Version: CETISv2.1.1
Analyzed:	06 Mar-22 12:23	Analysis:	Nonparametric-Two Sample	Status Level: 1
Edit Date:	04 Mar-22 11:59	MD5 Hash:	08656D1A5D018BB8934787DD1F64A234	Editor ID:

Graphics



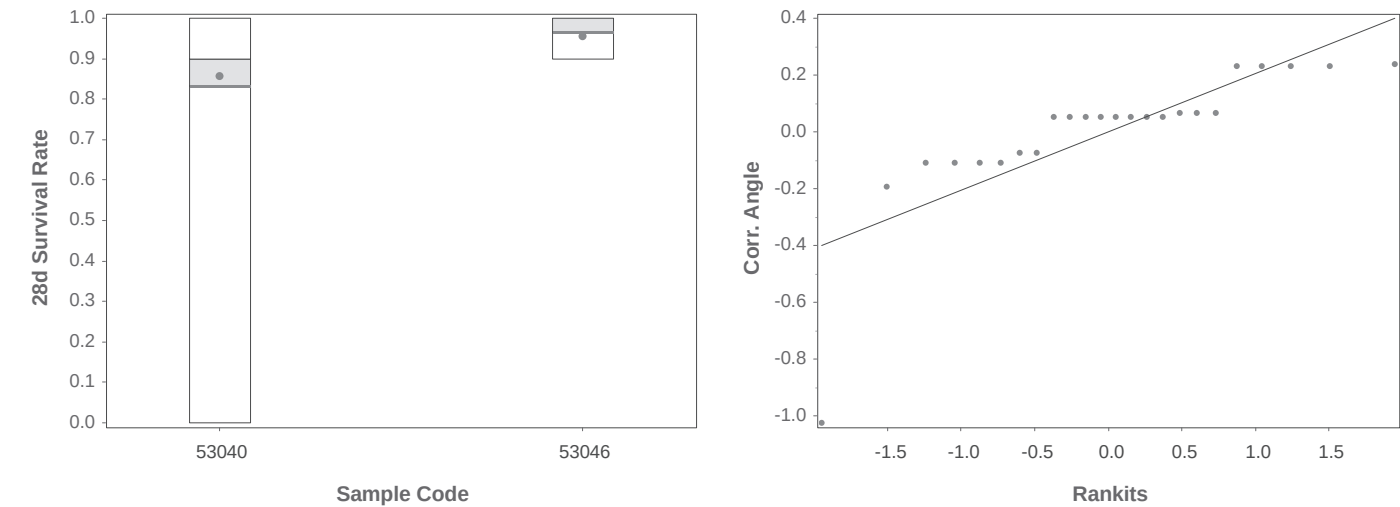
CETIS Analytical Report

Report Date: 07 Mar-22 11:50 (p 35 of 96)
 Test Code/ID: 16245 CTRL / 10-1800-7441

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test								Aquatec Environmental, Inc.			
Analysis ID:	06-3019-3058		Endpoint:	28d Survival Rate				CETIS Version:	CETISv2.1.1		
Analyzed:	06 Mar-22 12:23		Analysis:	Nonparametric-Two Sample				Status Level:	1		
Edit Date:	04 Mar-22 11:59		MD5 Hash:	93E1831927627E2970B150B3DBE4B51A				Editor ID:			
Batch ID:	08-4000-1972		Test Type:	Hyalella (42d)				Analyst:	C. Matthaues Ayers		
Start Date:	06 Jan-22 15:25		Protocol:	EPA/600/R-99/064 (2000)				Diluent:	Reconstituted Water		
Ending Date:	17 Feb-22 12:00		Species:	Hyalella azteca				Brine:			
Test Length:	41d 21h		Taxon:	Malacostraca				Source:	Aquatic Research Organism		Age: 8d
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, Inc.	Sediment Testing					
53046	12-3611-8332	21 Dec-21 15:54	21 Dec-21 20:00	16d (0.3 °C)	Woods Hole Group						
Sample Code	Material Type		Sample Source		Station Location		Lat/Long				
53040	Control Sediment		Internal Laboratory Testing		Control						
53046	Reference sediment		Belmont Landfill		TOX-6						
Data Transform		Alt Hyp			Comparison Result					PMSD	
Angular (Corrected)		C > T			53046 passed 28d survival rate endpoint					14.84%	
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	df	Test Stat	Critical	Ties	P-Type	P-Value	Decision(α:5%)		
Control Sed		53046	22	176	---	2	Exact	0.9605	Non-Significant Effect		
ANOVA Table											
Source		Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(α:5%)		
Between		0.186105		0.186105		1	2.83	0.1067	Non-Significant Effect		
Error		1.44693		0.0657696		22					
Total		1.63304				23					
ANOVA Assumptions Tests											
Attribute		Test				Test Stat	Critical	P-Value	Decision(α:1%)		
Variance		Variance Ratio F Test				19.43	5.32	2.5E-05	Unequal Variances		
Distribution		Shapiro-Wilk W Normality Test				0.6566	0.884	<1.0E-05	Non-Normal Distribution		
28d Survival Rate Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	12	0.8333	0.6550	1.0000	0.9000	0.0000	1.0000	0.0810	33.68%	0.00%
53046		12	0.9667	0.9354	0.9980	1.0000	0.9000	1.0000	0.0142	5.09%	-16.00%
Angular (Corrected) Transformed Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	12	1.1820	0.9568	1.4060	1.2490	0.1588	1.4190	0.1021	29.93%	0.00%
53046		12	1.3580	1.3070	1.4090	1.4120	1.2490	1.4120	0.0232	5.91%	-14.91%
28d Survival Rate Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53040	CS	0.9000	1.0000	1.0000	0.0000	1.0000	1.0000	0.8000	0.9000	0.8000	0.9000
		0.7000	1.0000								
53046		0.9000	1.0000	0.9000	0.9000	1.0000	1.0000	0.9000	1.0000	1.0000	1.0000
		1.0000	1.0000								
Angular (Corrected) Transformed Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53040	CS	1.2490	1.4120	1.4120	0.1588	1.4120	1.4120	1.1070	1.2490	1.1070	1.2490
		0.9912	1.4190								
53046		1.2490	1.4120	1.2490	1.2490	1.4120	1.4120	1.2490	1.4120	1.4120	1.4120
		1.4120	1.4120								

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test			Aquatec Environmental, Inc.	
Analysis ID:	06-3019-3058	Endpoint:	28d Survival Rate	CETIS Version: CETISv2.1.1
Analyzed:	06 Mar-22 12:23	Analysis:	Nonparametric-Two Sample	Status Level: 1
Edit Date:	04 Mar-22 11:59	MD5 Hash:	93E1831927627E2970B150B3DBE4B51A	Editor ID:

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Report Date: 07 Mar-22 11:50 (p 37 of 96)
 Test Code/ID: 16245 CTRL / 10-1800-7441

Hyaella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID: 07-3997-3781	Endpoint: 35d Survival Rate	CETIS Version: CETISv2.1.1
Analyzed: 06 Mar-22 12:22	Analysis: Nonparametric-Two Sample	Status Level: 1
Edit Date: 04 Mar-22 11:59	MD5 Hash: D2EC76C7CB5DB48012807AF5E2469E23	Editor ID:
Batch ID: 08-4000-1972	Test Type: Hyaella (42d)	Analyst: C. Mattheus Ayers
Start Date: 06 Jan-22 15:25	Protocol: EPA/600/R-99/064 (2000)	Diluent: Reconstituted Water
Ending Date: 17 Feb-22 12:00	Species: Hyaella azteca	Brine:
Test Length: 41d 21h	Taxon: Malacostraca	Source: Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, In	Sediment Testing
53041	03-8171-1181	21 Dec-21 09:05	21 Dec-21 20:00	16d 6h (0.3 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53041	Sediment	Belmont Landfill	TOX-4	

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	53041 passed 35d survival rate endpoint	31.23%

Wilcoxon Rank Sum Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	Ties	P-Type	P-Value	Decision(α:5%)
Control Sed		53041	14	73.5	---	2	Exact	0.7506	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0989209	0.0989209	1	0.9882	0.3371	Non-Significant Effect
Error	1.40149	0.100106	14			
Total	1.50041		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	5.592	8.885	0.0371	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.804	0.8408	0.0031	Non-Normal Distribution

35d Survival Rate Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	8	0.7625	0.4873	1.0000	0.8000	0.0000	1.0000	0.1164	43.18%	0.00%
53041		8	0.8875	0.7833	0.9917	0.9000	0.7000	1.0000	0.0441	14.04%	-16.39%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	8	1.0880	0.7439	1.4330	1.1070	0.1588	1.4120	0.1457	37.86%	0.00%
53041		8	1.2460	1.1000	1.3910	1.2490	0.9912	1.4120	0.0616	13.99%	-14.45%

35d Survival Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040	CS	0.7000	1.0000	1.0000	0.0000	1.0000	0.8000	0.8000	0.8000
53041		1.0000	0.9000	1.0000	0.9000	0.7000	0.9000	0.7000	1.0000

Angular (Corrected) Transformed Detail

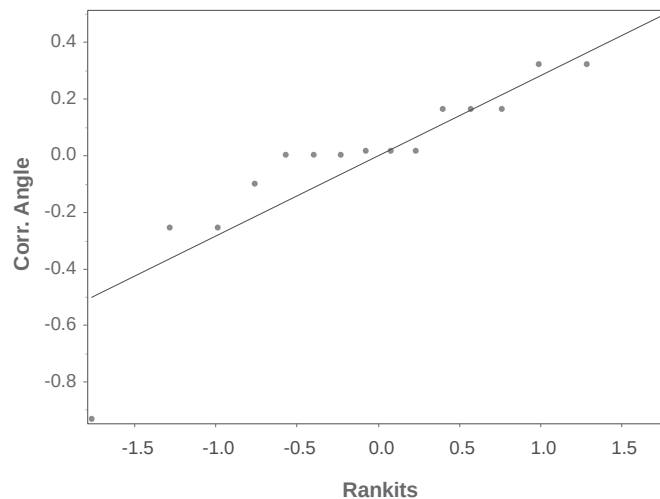
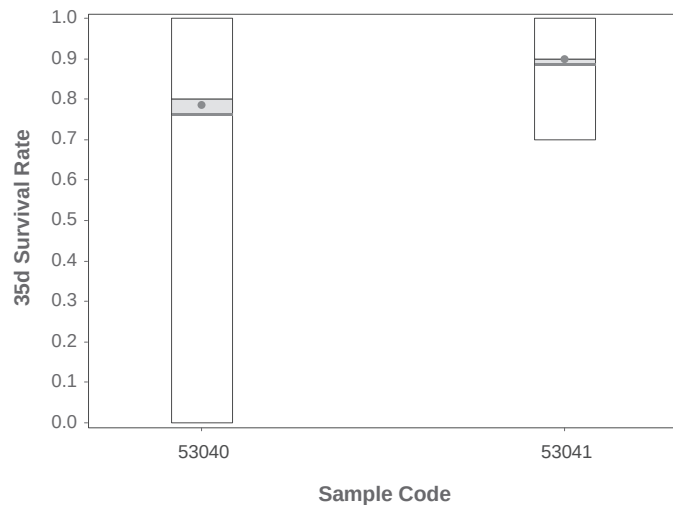
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040	CS	0.9912	1.4120	1.4120	0.1588	1.4120	1.1070	1.1070	1.1070
53041		1.4120	1.2490	1.4120	1.2490	0.9912	1.2490	0.9912	1.4120

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test

Aquatec Environmental, Inc.

Analysis ID:	07-3997-3781	Endpoint:	35d Survival Rate	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 12:22	Analysis:	Nonparametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 11:59	MD5 Hash:	D2EC76C7CB5DB48012807AF5E2469E23	Editor ID:	

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Report Date: 07 Mar-22 11:50 (p 39 of 96)
Test Code/ID: 16245 CTRL / 10-1800-7441

Hyaella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID: 16-7551-2902	Endpoint: 35d Survival Rate	CETIS Version: CETISv2.1.1
Analyzed: 06 Mar-22 12:22	Analysis: Nonparametric-Two Sample	Status Level: 1
Edit Date: 04 Mar-22 11:59	MD5 Hash: AB9EC8E08544BD93F5030AC417534592	Editor ID:
Batch ID: 08-4000-1972	Test Type: Hyaella (42d)	Analyst: C. Mattheus Ayers
Start Date: 06 Jan-22 15:25	Protocol: EPA/600/R-99/064 (2000)	Diluent: Reconstituted Water
Ending Date: 17 Feb-22 12:00	Species: Hyaella azteca	Brine:
Test Length: 41d 21h	Taxon: Malacostraca	Source: Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, In	Sediment Testing
53042	04-7178-2695	21 Dec-21 13:38	21 Dec-21 20:00	16d 2h (0.6 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53042	Sediment	Belmont Landfill	TOX-1	

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	53042 passed 35d survival rate endpoint	31.75%

Wilcoxon Rank Sum Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	Ties	P-Type	P-Value	Decision(α:5%)
Control Sed		53042	14	60	---	2	Exact	0.1983	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.00663983	0.00663983	1	0.06448	0.8032	Non-Significant Effect
Error	1.44164	0.102975	14			
Total	1.44828		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	4.704	8.885	0.0584	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.8156	0.8408	0.0044	Non-Normal Distribution

35d Survival Rate Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	8	0.7625	0.4873	1.0000	0.8000	0.0000	1.0000	0.1164	43.18%	0.00%
53042		8	0.7375	0.5966	0.8784	0.8000	0.4000	0.9000	0.0596	22.85%	3.28%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	8	1.0880	0.7439	1.4330	1.1070	0.1588	1.4120	0.1457	37.86%	0.00%
53042		8	1.0480	0.8888	1.2070	1.1070	0.6847	1.2490	0.0672	18.14%	3.74%

35d Survival Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040	CS	0.7000	1.0000	1.0000	0.0000	1.0000	0.8000	0.8000	0.8000
53042		0.7000	0.8000	0.8000	0.4000	0.8000	0.9000	0.9000	0.6000

Angular (Corrected) Transformed Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040	CS	0.9912	1.4120	1.4120	0.1588	1.4120	1.1070	1.1070	1.1070
53042		0.9912	1.1070	1.1070	0.6847	1.1070	1.2490	1.2490	0.8861

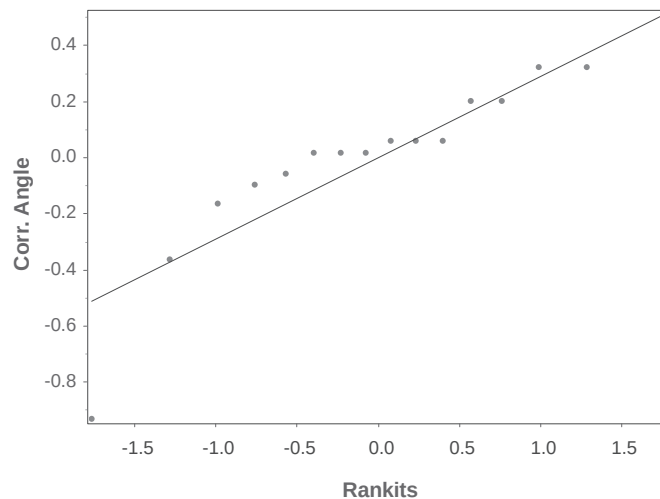
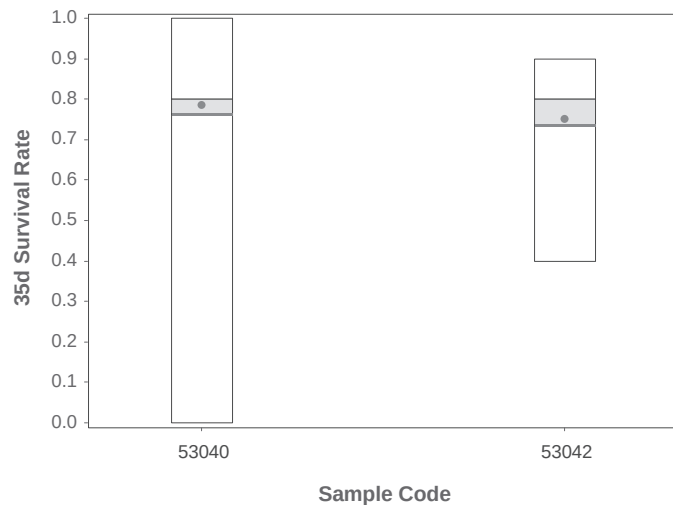
Hyalella 42-d Survival, Growth, and Reproduction Sediment Test

Aquatec Environmental, Inc.

Analysis ID: 16-7551-2902 Endpoint: 35d Survival Rate
Analyzed: 06 Mar-22 12:22 Analysis: Nonparametric-Two Sample
Edit Date: 04 Mar-22 11:59 MD5 Hash: AB9EC8E08544BD93F5030AC417534592

CETIS Version: CETISv2.1.1
Status Level: 1
Editor ID:

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CETIS Analytical Report

Report Date: 07 Mar-22 11:50 (p 41 of 96)
Test Code/ID: 16245 CTRL / 10-1800-7441

Hyaella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID: 13-3368-5230	Endpoint: 35d Survival Rate	CETIS Version: CETISv2.1.1
Analyzed: 06 Mar-22 12:22	Analysis: Nonparametric-Two Sample	Status Level: 1
Edit Date: 04 Mar-22 11:59	MD5 Hash: 48A470F267CC542254096075A04507AD	Editor ID:
Batch ID: 08-4000-1972	Test Type: Hyaella (42d)	Analyst: C. Mattheus Ayers
Start Date: 06 Jan-22 15:25	Protocol: EPA/600/R-99/064 (2000)	Diluent: Reconstituted Water
Ending Date: 17 Feb-22 12:00	Species: Hyaella azteca	Brine:
Test Length: 41d 21h	Taxon: Malacostraca	Source: Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, Inc	Sediment Testing
53043	20-0010-4712	21 Dec-21 12:35	21 Dec-21 20:00	16d 3h (0.6 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53043	Sediment	Belmont Landfill	TOX-2	

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	53043 passed 35d survival rate endpoint	32.68%

Wilcoxon Rank Sum Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	Ties	P-Type	P-Value	Decision(α:5%)
Control Sed		53043	14	76	---	2	Exact	0.8209	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.136702	0.136702	1	1.263	0.2800	Non-Significant Effect
Error	1.51523	0.108231	14			
Total	1.65193		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	3.643	8.885	0.1096	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.8147	0.8408	0.0043	Non-Normal Distribution

35d Survival Rate Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	8	0.7625	0.4873	1.0000	0.8000	0.0000	1.0000	0.1164	43.18%	0.00%
53043		8	0.9000	0.7659	1.0000	1.0000	0.6000	1.0000	0.0567	17.82%	-18.03%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	8	1.0880	0.7439	1.4330	1.1070	0.1588	1.4120	0.1457	37.86%	0.00%
53043		8	1.2730	1.0930	1.4540	1.4120	0.8861	1.4120	0.0763	16.96%	-16.98%

35d Survival Rate Detail

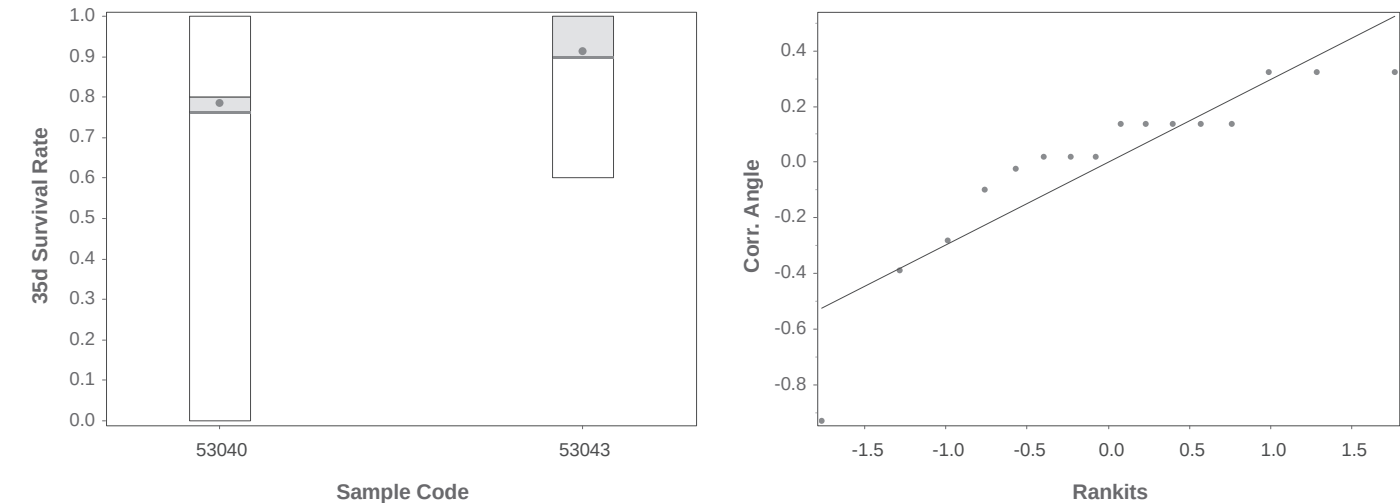
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040	CS	0.7000	1.0000	1.0000	0.0000	1.0000	0.8000	0.8000	0.8000
53043		1.0000	1.0000	0.9000	1.0000	1.0000	0.7000	1.0000	0.6000

Angular (Corrected) Transformed Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040	CS	0.9912	1.4120	1.4120	0.1588	1.4120	1.1070	1.1070	1.1070
53043		1.4120	1.4120	1.2490	1.4120	1.4120	0.9912	1.4120	0.8861

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test			Aquatec Environmental, Inc.	
Analysis ID:	13-3368-5230	Endpoint:	35d Survival Rate	CETIS Version: CETISv2.1.1
Analyzed:	06 Mar-22 12:22	Analysis:	Nonparametric-Two Sample	Status Level: 1
Edit Date:	04 Mar-22 11:59	MD5 Hash:	48A470F267CC542254096075A04507AD	Editor ID:

Graphics



CETIS Analytical Report

Report Date: 07 Mar-22 11:50 (p 43 of 96)
 Test Code/ID: 16245 CTRL / 10-1800-7441

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test **Aquatec Environmental, Inc.**

Analysis ID:	01-6665-9042	Endpoint:	35d Survival Rate	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 12:22	Analysis:	Nonparametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 11:59	MD5 Hash:	3CA9EEB1E8BC64A9EC8CB5DD4F07ABF	Editor ID:	
Batch ID:	08-4000-1972	Test Type:	Hyalella (42d)	Analyst:	C. Mattheus Ayers
Start Date:	06 Jan-22 15:25	Protocol:	EPA/600/R-99/064 (2000)	Diluent:	Reconstituted Water
Ending Date:	17 Feb-22 12:00	Species:	Hyalella azteca	Brine:	
Test Length:	41d 21h	Taxon:	Malacostraca	Source:	Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, Inc	Sediment Testing
53044	00-4677-6467	21 Dec-21 11:25	21 Dec-21 20:00	16d 4h (0.6 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53044	Sediment	Belmont Landfill	TOX-3	

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	53044 passed 35d survival rate endpoint	29.00%

Wilcoxon Rank Sum Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	Ties	P-Type	P-Value	Decision(α:5%)
Control Sed		53044	14	76	---	2	Exact	0.8305	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.106604	0.106604	1	1.208	0.2903	Non-Significant Effect
Error	1.23553	0.0882518	14			
Total	1.34213		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	25.49	8.885	0.0004	Unequal Variances
Distribution	Shapiro-Wilk W Normality Test	0.7027	0.8408	0.0002	Non-Normal Distribution

35d Survival Rate Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	8	0.7625	0.4873	1.0000	0.8000	0.0000	1.0000	0.1164	43.18%	0.00%
53044		8	0.9000	0.8553	0.9447	0.9000	0.8000	1.0000	0.0189	5.94%	-18.03%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	8	1.0880	0.7439	1.4330	1.1070	0.1588	1.4120	0.1457	37.86%	0.00%
53044		8	1.2520	1.1830	1.3200	1.2490	1.1070	1.4120	0.0289	6.52%	-15.00%

35d Survival Rate Detail

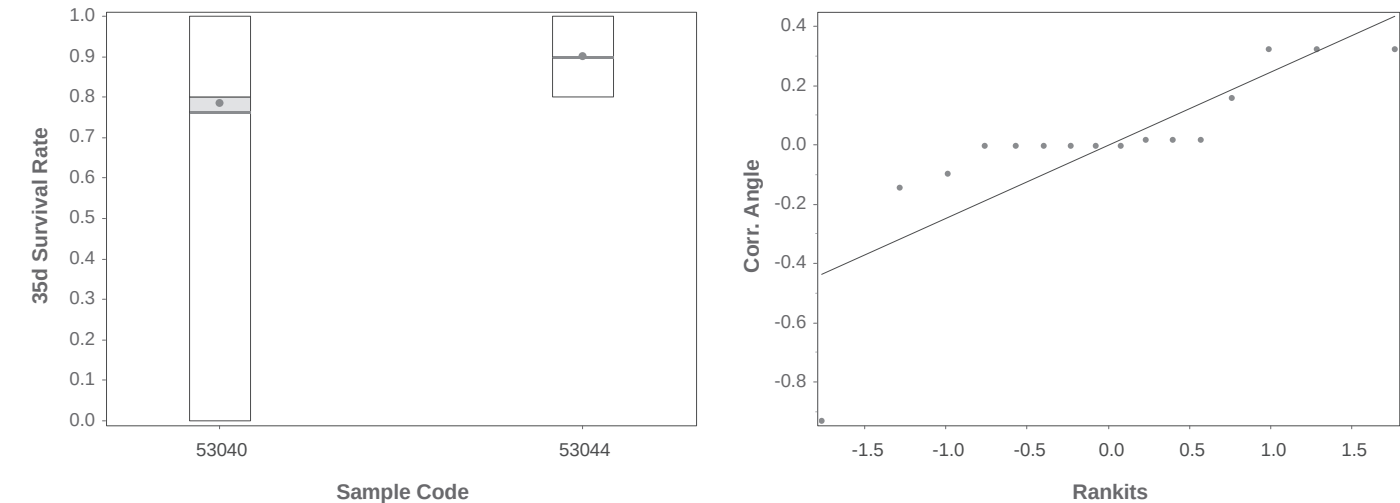
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040	CS	0.7000	1.0000	1.0000	0.0000	1.0000	0.8000	0.8000	0.8000
53044		0.9000	1.0000	0.9000	0.9000	0.9000	0.8000	0.9000	0.9000

Angular (Corrected) Transformed Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040	CS	0.9912	1.4120	1.4120	0.1588	1.4120	1.1070	1.1070	1.1070
53044		1.2490	1.4120	1.2490	1.2490	1.2490	1.1070	1.2490	1.2490

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test			Aquatec Environmental, Inc.	
Analysis ID:	01-6665-9042	Endpoint:	35d Survival Rate	CETIS Version: CETISv2.1.1
Analyzed:	06 Mar-22 12:22	Analysis:	Nonparametric-Two Sample	Status Level: 1
Edit Date:	04 Mar-22 11:59	MD5 Hash:	3CA9EEB1E8BC64A9EC8CB5DD4F07ABF	Editor ID:

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CETIS Analytical Report

Report Date: 07 Mar-22 11:50 (p 45 of 96)
Test Code/ID: 16245 CTRL / 10-1800-7441

Hyaella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID: 19-5609-4298	Endpoint: 35d Survival Rate	CETIS Version: CETISv2.1.1
Analyzed: 06 Mar-22 12:23	Analysis: Nonparametric-Two Sample	Status Level: 1
Edit Date: 04 Mar-22 11:59	MD5 Hash: 6CBFE4AB0EB98C1712D960C50811C834	Editor ID:
Batch ID: 08-4000-1972	Test Type: Hyaella (42d)	Analyst: C. Mattheus Ayers
Start Date: 06 Jan-22 15:25	Protocol: EPA/600/R-99/064 (2000)	Diluent: Reconstituted Water
Ending Date: 17 Feb-22 12:00	Species: Hyaella azteca	Brine:
Test Length: 41d 21h	Taxon: Malacostraca	Source: Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, In	Sediment Testing
53045	13-5487-4433	21 Dec-21 14:22	21 Dec-21 20:00	16d 1h (0.3 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53045	Sediment	Belmont Landfill	TOX-5	

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	53045 passed 35d survival rate endpoint	30.09%

Wilcoxon Rank Sum Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	Ties	P-Type	P-Value	Decision(α:5%)
Control Sed		53045	14	73	---	2	Exact	0.7529	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.068028	0.068028	1	0.7241	0.4091	Non-Significant Effect
Error	1.31524	0.093946	14			
Total	1.38327		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	9.409	8.885	0.0084	Unequal Variances
Distribution	Shapiro-Wilk W Normality Test	0.7653	0.8408	0.0010	Non-Normal Distribution

35d Survival Rate Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	8	0.7625	0.4873	1.0000	0.8000	0.0000	1.0000	0.1164	43.18%	0.00%
53045		8	0.8750	0.8009	0.9491	0.8333	0.8000	1.0000	0.0313	10.13%	-14.75%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	8	1.0880	0.7439	1.4330	1.1070	0.1588	1.4120	0.1457	37.86%	0.00%
53045		8	1.2190	1.1070	1.3310	1.1540	1.1070	1.4120	0.0475	11.02%	-11.98%

35d Survival Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040	CS	0.7000	1.0000	1.0000	0.0000	1.0000	0.8000	0.8000	0.8000
53045		0.8000	0.9000	1.0000	0.9000	1.0000	0.8000	0.8000	0.8000

Angular (Corrected) Transformed Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040	CS	0.9912	1.4120	1.4120	0.1588	1.4120	1.1070	1.1070	1.1070
53045		1.1070	1.2490	1.4120	1.2490	1.4120	1.1070	1.1070	1.1070

CETIS Analytical Report

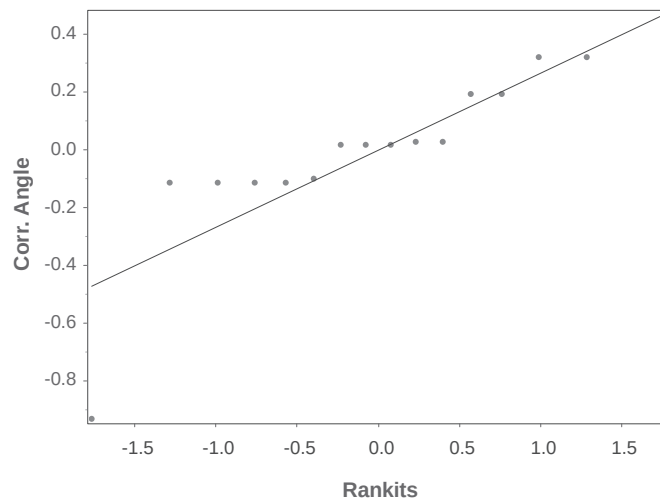
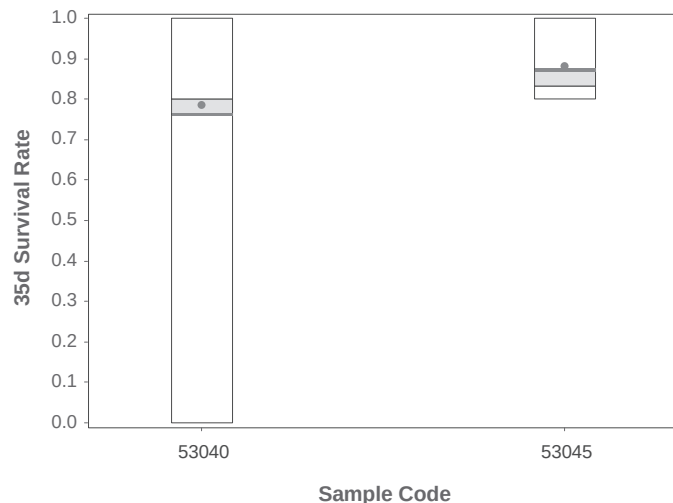
Report Date: 07 Mar-22 11:50 (p 46 of 96)
Test Code/ID: 16245 CTRL / 10-1800-7441

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test

Aquatec Environmental, Inc.

Analysis ID: 19-5609-4298	Endpoint: 35d Survival Rate	CETIS Version: CETISv2.1.1
Analyzed: 06 Mar-22 12:23	Analysis: Nonparametric-Two Sample	Status Level: 1
Edit Date: 04 Mar-22 11:59	MD5 Hash: 6CBFE4AB0EB98C1712D960C50811C834	Editor ID:

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CETIS Analytical Report

Report Date: 07 Mar-22 11:50 (p 47 of 96)
 Test Code/ID: 16245 CTRL / 10-1800-7441

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test **Aquatec Environmental, Inc.**

Analysis ID:	08-5909-7312	Endpoint:	35d Survival Rate	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 12:23	Analysis:	Nonparametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 11:59	MD5 Hash:	DCDA1493D2B994C11D3EBBF2203AF9D3	Editor ID:	
Batch ID:	08-4000-1972	Test Type:	Hyalella (42d)	Analyst:	C. Mattheus Ayers
Start Date:	06 Jan-22 15:25	Protocol:	EPA/600/R-99/064 (2000)	Diluent:	Reconstituted Water
Ending Date:	17 Feb-22 12:00	Species:	Hyalella azteca	Brine:	
Test Length:	41d 21h	Taxon:	Malacostraca	Source:	Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, Inc	Sediment Testing
53046	12-3611-8332	21 Dec-21 15:54	21 Dec-21 20:00	16d (0.3 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53046	Reference sediment	Belmont Landfill	TOX-6	

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	53046 passed 35d survival rate endpoint	29.65%

Wilcoxon Rank Sum Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	Ties	P-Type	P-Value	Decision(α:5%)
Control Sed		53046	14	80.5	---	2	Exact	0.9193	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.201358	0.201358	1	2.198	0.1604	Non-Significant Effect
Error	1.28275	0.0916248	14			
Total	1.48411		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	12.67	8.885	0.0034	Unequal Variances
Distribution	Shapiro-Wilk W Normality Test	0.7644	0.8408	0.0010	Non-Normal Distribution

35d Survival Rate Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	8	0.7625	0.4873	1.0000	0.8000	0.0000	1.0000	0.1164	43.18%	0.00%
53046		8	0.9375	0.8753	0.9997	0.9571	0.8000	1.0000	0.0263	7.94%	-22.95%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	8	1.0880	0.7439	1.4330	1.1070	0.1588	1.4120	0.1457	37.86%	0.00%
53046		8	1.3130	1.2160	1.4100	1.3420	1.1070	1.4120	0.0409	8.82%	-20.61%

35d Survival Rate Detail

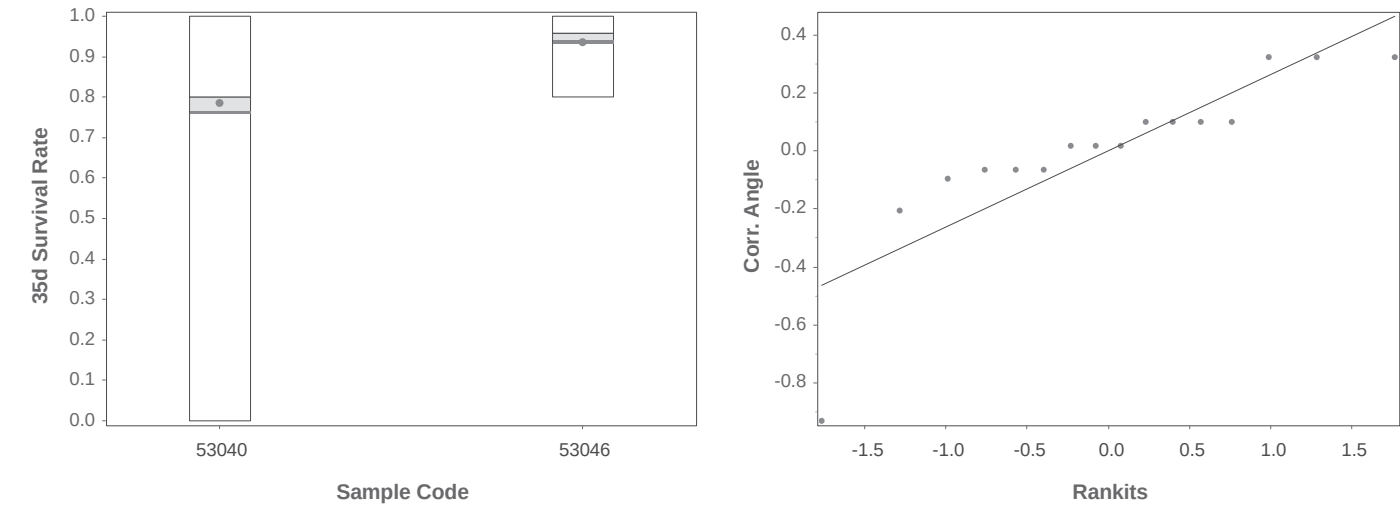
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040	CS	0.7000	1.0000	1.0000	0.0000	1.0000	0.8000	0.8000	0.8000
53046		0.9000	1.0000	0.9000	0.8000	1.0000	1.0000	0.9000	1.0000

Angular (Corrected) Transformed Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040	CS	0.9912	1.4120	1.4120	0.1588	1.4120	1.1070	1.1070	1.1070
53046		1.2490	1.4120	1.2490	1.1070	1.4120	1.4120	1.2490	1.4120

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test			Aquatec Environmental, Inc.	
Analysis ID:	08-5909-7312	Endpoint:	35d Survival Rate	CETIS Version: CETISv2.1.1
Analyzed:	06 Mar-22 12:23	Analysis:	Nonparametric-Two Sample	Status Level: 1
Edit Date:	04 Mar-22 11:59	MD5 Hash:	DCDA1493D2B994C11D3EBBF2203AF9D3	Editor ID:

Graphics



CETIS Analytical Report

Report Date: 07 Mar-22 11:50 (p 49 of 96)
Test Code/ID: 16245 CTRL / 10-1800-7441

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID:	10-0336-8037	Endpoint:	42d Biomass	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 12:22	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 11:59	MD5 Hash:	B0BD7F0D309B61AE18B72973B309396D	Editor ID:	
Batch ID:	08-4000-1972	Test Type:	Hyalella (42d)	Analyst:	C. Matthaues Ayers
Start Date:	06 Jan-22 15:25	Protocol:	EPA/600/R-99/064 (2000)	Diluent:	Reconstituted Water
Ending Date:	17 Feb-22 12:00	Species:	Hyalella azteca	Brine:	
Test Length:	41d 21h	Taxon:	Malacostraca	Source:	Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, Inc	Sediment Testing
53041	03-8171-1181	21 Dec-21 09:05	21 Dec-21 20:00	16d 6h (0.3 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53041	Sediment	Belmont Landfill	TOX-4	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53041 passed 42d biomass endpoint	34.85%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Control Sed		53041	14	1.009	1.761	0.1348	CDF	0.1649	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0238703	0.0238703	1	1.019	0.3299	Non-Significant Effect
Error	0.327962	0.0234258	14			
Total	0.351832		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.276	8.885	0.7563	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.8491	0.8408	0.0132	Normal Distribution

42d Biomass Summary

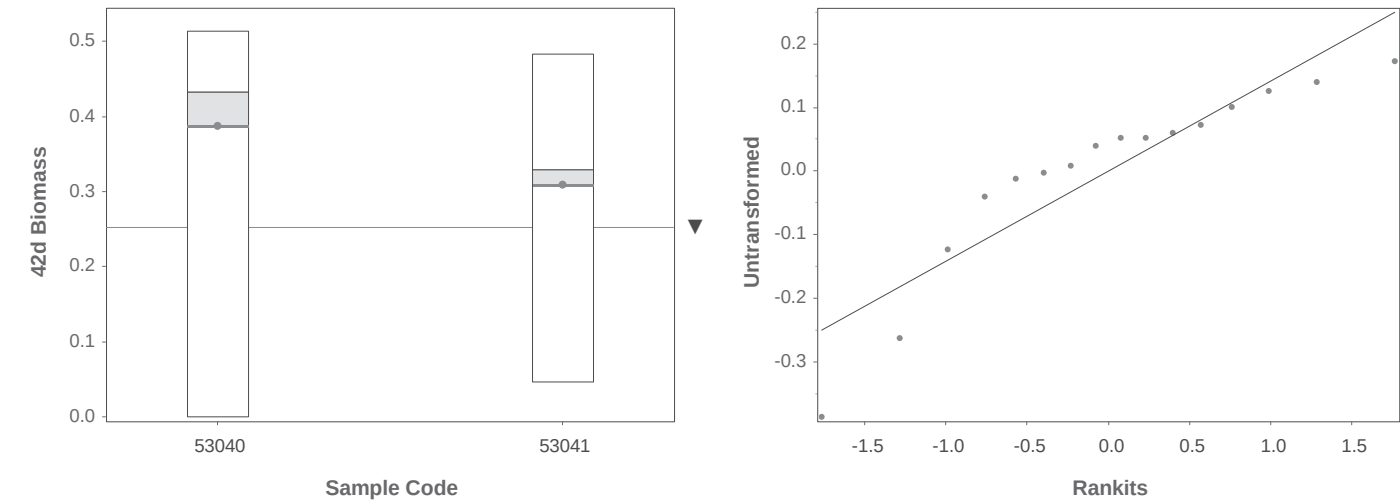
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	8	0.3868	0.2513	0.5222	0.433	0	0.513	0.0573	41.90%	0.00%
53041		8	0.3095	0.1895	0.4295	0.3295	0.046	0.483	0.05073	46.36%	19.97%

42d Biomass Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040	CS	0.396	0.513	0.488	0	0.439	0.384	0.447	0.427
53041		0.186	0.449	0.362	0.297	0.383	0.27	0.046	0.483

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test			Aquatec Environmental, Inc.	
Analysis ID:	10-0336-8037	Endpoint:	42d Biomass	CETIS Version: CETISv2.1.1
Analyzed:	06 Mar-22 12:22	Analysis:	Parametric-Two Sample	Status Level: 1
Edit Date:	04 Mar-22 11:59	MD5 Hash:	B0BD7F0D309B61AE18B72973B309396D	Editor ID:

Graphics



CETIS Analytical Report

Report Date: 07 Mar-22 11:50 (p 51 of 96)
Test Code/ID: 16245 CTRL / 10-1800-7441

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID: 13-3463-8408	Endpoint: 42d Biomass	CETIS Version: CETISv2.1.1
Analyzed: 06 Mar-22 12:22	Analysis: Nonparametric-Two Sample	Status Level: 1
Edit Date: 04 Mar-22 11:59	MD5 Hash: 0829E02B22BC7F9BE5F2D72E93AD97E7	Editor ID:
Batch ID: 08-4000-1972	Test Type: Hyalella (42d)	Analyst: C. Mattheus Ayers
Start Date: 06 Jan-22 15:25	Protocol: EPA/600/R-99/064 (2000)	Diluent: Reconstituted Water
Ending Date: 17 Feb-22 12:00	Species: Hyalella azteca	Brine:
Test Length: 41d 21h	Taxon: Malacostraca	Source: Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, Inc	Sediment Testing
53042	04-7178-2695	21 Dec-21 13:38	21 Dec-21 20:00	16d 2h (0.6 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53042	Sediment	Belmont Landfill	TOX-1	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53042 passed 42d biomass endpoint	39.66%

Wilcoxon Rank Sum Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	Ties	P-Type	P-Value	Decision(α:5%)
Control Sed		53042	14	67	---	0	Exact	0.4796	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0118266	0.0118266	1	0.3898	0.5424	Non-Significant Effect
Error	0.424747	0.0303391	14			
Total	0.436574		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.31	8.885	0.7304	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.8323	0.8408	0.0076	Non-Normal Distribution

42d Biomass Summary

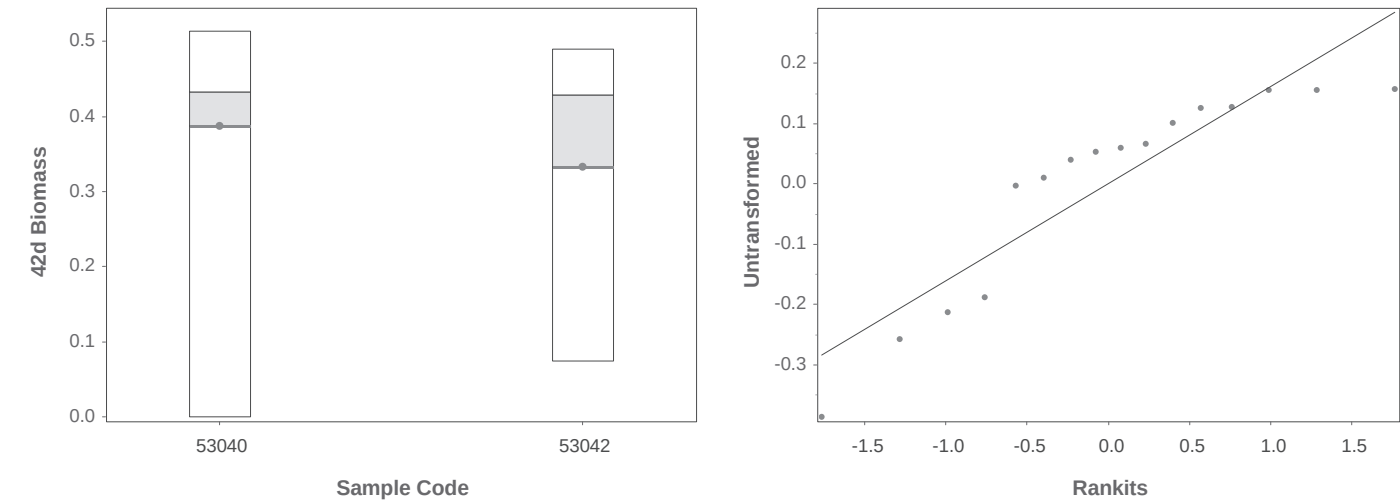
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	8	0.3868	0.2513	0.5222	0.433	0	0.513	0.0573	41.90%	0.00%
53042		8	0.3324	0.1773	0.4875	0.429	0.074	0.49	0.06559	55.81%	14.06%

42d Biomass Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040	CS	0.396	0.513	0.488	0	0.439	0.384	0.447	0.427
53042		0.399	0.487	0.144	0.074	0.49	0.459	0.487	0.119

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test			Aquatec Environmental, Inc.	
Analysis ID:	13-3463-8408	Endpoint:	42d Biomass	CETIS Version: CETISv2.1.1
Analyzed:	06 Mar-22 12:22	Analysis:	Nonparametric-Two Sample	Status Level: 1
Edit Date:	04 Mar-22 11:59	MD5 Hash:	0829E02B22BC7F9BE5F2D72E93AD97E7	Editor ID:

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Test Code/ID: 16245 CTRL / 10-1800-7441

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test						Aquatec Environmental, Inc.	
Analysis ID:	02-0751-5666	Endpoint:	42d Biomass	CETIS Version:	CETISv2.1.1		
Analyzed:	06 Mar-22 12:22	Analysis:	Nonparametric-Two Sample	Status Level:	1		
Edit Date:	04 Mar-22 11:59	MD5 Hash:	8BBBA2DC855E8DD63D200E2804F59E89	Editor ID:			
Batch ID:	08-4000-1972	Test Type:	Hyalella (42d)	Analyst:	C. Mattheus Ayers		
Start Date:	06 Jan-22 15:25	Protocol:	EPA/600/R-99/064 (2000)	Diluent:	Reconstituted Water		
Ending Date:	17 Feb-22 12:00	Species:	Hyalella azteca	Brine:			
Test Length:	41d 21h	Taxon:	Malacostraca	Source:	Aquatic Research Organism	Age:	8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, In	Sediment Testing
53043	20-0010-4712	21 Dec-21 12:35	21 Dec-21 20:00	16d 3h (0.6 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53043	Sediment	Belmont Landfill	TOX-2	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53043 passed 42d biomass endpoint	29.09%

Wilcoxon Rank Sum Two-Sample Test									
Sample I	vs	Sample II	df	Test Stat	Critical	Ties	P-Type	P-Value	Decision(α:5%)
Control Sed		53043	14	91	---	0	Exact	0.9948	Non-Significant Effect

ANOVA Table						
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0654081	0.0654081	1	4.008	0.0651	Non-Significant Effect
Error	0.228491	0.0163208	14			
Total	0.293899		15			

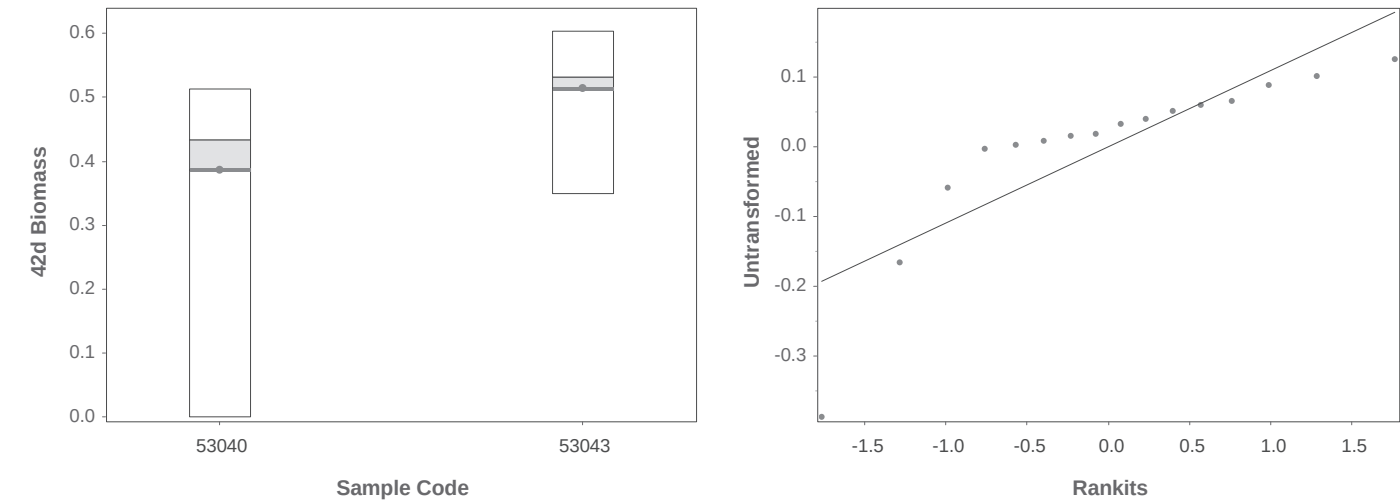
ANOVA Assumptions Tests					
Attribute	Test	Test Stat	Critical	P-Value	Decision(α :1%)
Variance	Variance Ratio F Test	4.117	8.885	0.0816	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.7422	0.8408	0.0005	Non-Normal Distribution

42d Biomass Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	8	0.3868	0.2513	0.5222	0.433	0	0.513	0.0573	41.90%	0.00%
53043		8	0.5146	0.4479	0.5814	0.5315	0.349	0.603	0.02824	15.52%	-33.06%

42d Biomass Detail									
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040	CS	0.396	0.513	0.488	0	0.439	0.384	0.447	0.427
53043		0.603	0.533	0.518	0.58	0.53	0.456	0.548	0.349

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test			Aquatec Environmental, Inc.	
Analysis ID:	02-0751-5666	Endpoint:	42d Biomass	CETIS Version: CETISv2.1.1
Analyzed:	06 Mar-22 12:22	Analysis:	Nonparametric-Two Sample	Status Level: 1
Edit Date:	04 Mar-22 11:59	MD5 Hash:	8BBBA2DC855E8DD63D200E2804F59E89	Editor ID:

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Report Date: 07 Mar-22 11:50 (p 55 of 96)
Test Code/ID: 16245 CTRL / 10-1800-7441

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID: 12-4364-8901	Endpoint: 42d Biomass	CETIS Version: CETISv2.1.1
Analyzed: 06 Mar-22 12:22	Analysis: Nonparametric-Two Sample	Status Level: 1
Edit Date: 04 Mar-22 11:59	MD5 Hash: AAA99F016F3DA86B965A39C26667AFBA	Editor ID:
Batch ID: 08-4000-1972	Test Type: Hyalella (42d)	Analyst: C. Mattheus Ayers
Start Date: 06 Jan-22 15:25	Protocol: EPA/600/R-99/064 (2000)	Diluent: Reconstituted Water
Ending Date: 17 Feb-22 12:00	Species: Hyalella azteca	Brine:
Test Length: 41d 21h	Taxon: Malacostraca	Source: Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, In	Sediment Testing
53044	00-4677-6467	21 Dec-21 11:25	21 Dec-21 20:00	16d 4h (0.6 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53044	Sediment	Belmont Landfill	TOX-3	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53044 passed 42d biomass endpoint	29.55%

Wilcoxon Rank Sum Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	Ties	P-Type	P-Value	Decision(α:5%)
Control Sed		53044	14	72	---	0	Exact	0.6773	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.00608398	0.00608398	1	0.3612	0.5575	Non-Significant Effect
Error	0.235835	0.0168454	14			
Total	0.241919		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	3.536	8.885	0.1176	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.7355	0.8408	0.0004	Non-Normal Distribution

42d Biomass Summary

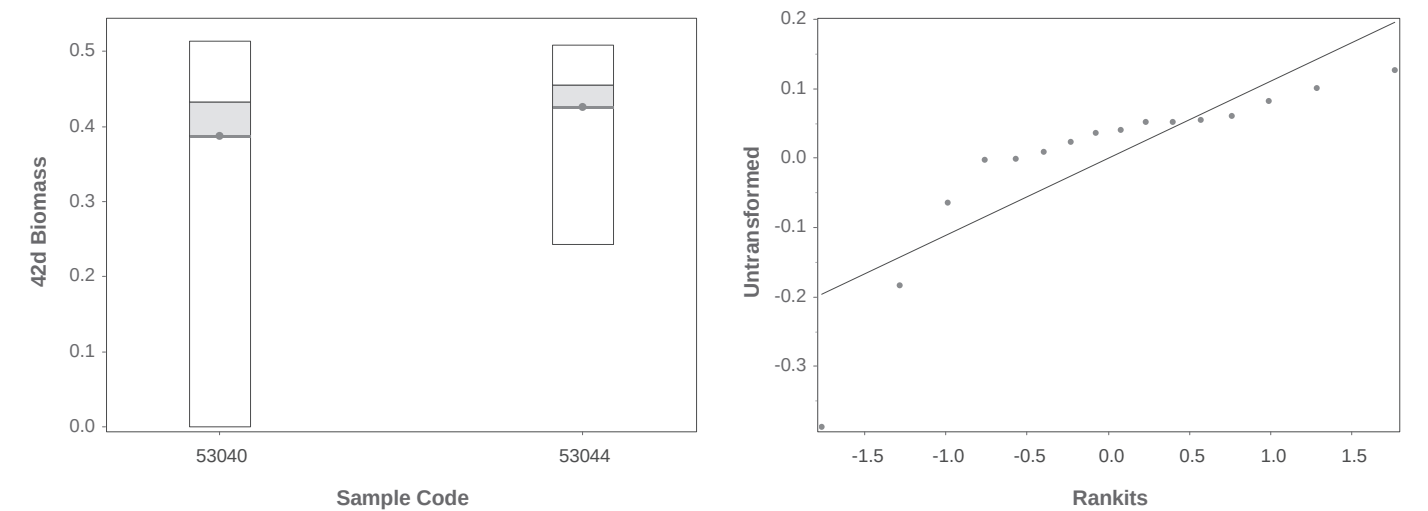
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	8	0.3868	0.2513	0.5222	0.433	0	0.513	0.0573	41.90%	0.00%
53044		8	0.4257	0.3537	0.4978	0.4555	0.243	0.508	0.03047	20.24%	-10.08%

42d Biomass Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040	CS	0.396	0.513	0.488	0	0.439	0.384	0.447	0.427
53044		0.508	0.462	0.424	0.361	0.243	0.449	0.481	0.478

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test			Aquatec Environmental, Inc.	
Analysis ID:	12-4364-8901	Endpoint:	42d Biomass	CETIS Version: CETISv2.1.1
Analyzed:	06 Mar-22 12:22	Analysis:	Nonparametric-Two Sample	Status Level: 1
Edit Date:	04 Mar-22 11:59	MD5 Hash:	AAA99F016F3DA86B965A39C26667AFBA	Editor ID:

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Test Code/ID: 16245 CTRL / 10-1800-7441

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID:	14-6870-4968	Endpoint:	42d Biomass	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 12:23	Analysis:	Nonparametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 11:59	MD5 Hash:	DFEFE83B4B10A63AD1524724CF6A4BFB	Editor ID:	
Batch ID:	08-4000-1972	Test Type:	Hyalella (42d)	Analyst:	C. Matthaues Ayers
Start Date:	06 Jan-22 15:25	Protocol:	EPA/600/R-99/064 (2000)	Diluent:	Reconstituted Water
Ending Date:	17 Feb-22 12:00	Species:	Hyalella azteca	Brine:	
Test Length:	41d 21h	Taxon:	Malacostraca	Source:	Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, In	Sediment Testing
53045	13-5487-4433	21 Dec-21 14:22	21 Dec-21 20:00	16d 1h (0.3 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53045	Sediment	Belmont Landfill	TOX-5	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53045 passed 42d biomass endpoint	36.58%

Wilcoxon Rank Sum Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	Ties	P-Type	P-Value	Decision(α:5%)
Control Sed		53045	14	85	---	0	Exact	0.9675	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0454756	0.0454756	1	1.762	0.2056	Non-Significant Effect
Error	0.361295	0.0258068	14			
Total	0.406771		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.036	8.885	0.9640	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.8229	0.8408	0.0056	Non-Normal Distribution

42d Biomass Summary

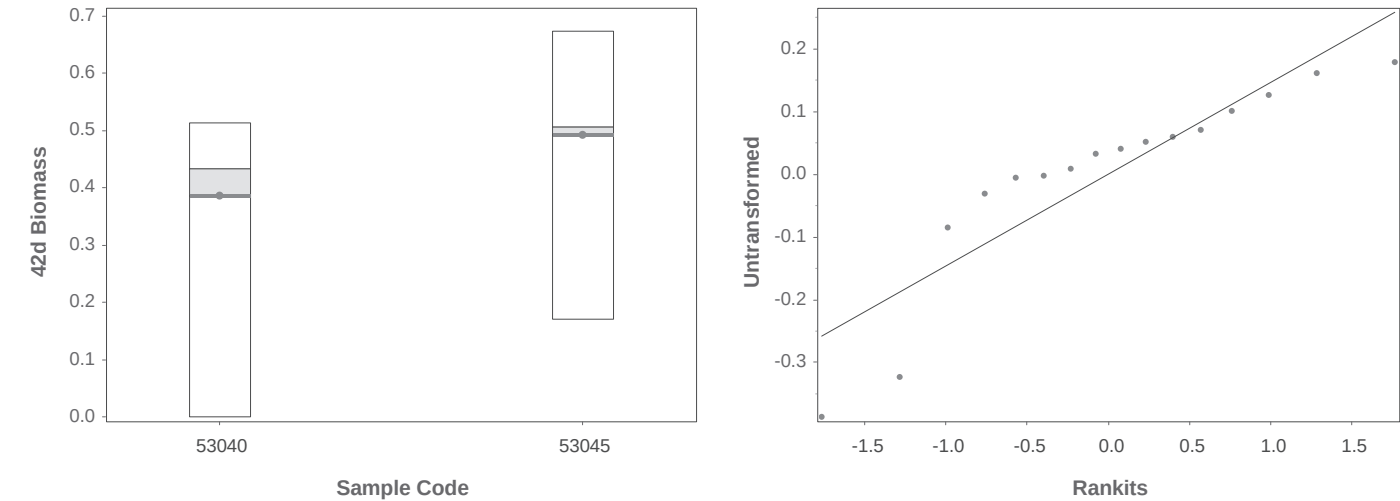
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	8	0.3868	0.2513	0.5222	0.433	0	0.513	0.0573	41.90%	0.00%
53045		8	0.4934	0.3603	0.6265	0.507	0.17	0.673	0.05629	32.27%	-27.57%

42d Biomass Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040	CS	0.396	0.513	0.488	0	0.439	0.384	0.447	0.427
53045		0.462	0.488	0.655	0.673	0.565	0.526	0.408	0.17

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test					Aquatec Environmental, Inc.
Analysis ID:	14-6870-4968	Endpoint:	42d Biomass	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 12:23	Analysis:	Nonparametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 11:59	MD5 Hash:	DFEFE83B4B10A63AD1524724CF6A4BFB	Editor ID:	

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Test Code/ID: 16245 CTRL / 10-1800-7441

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID: 07-5488-4980	Endpoint: 42d Biomass	CETIS Version: CETISv2.1.1
Analyzed: 06 Mar-22 12:23	Analysis: Nonparametric-Two Sample	Status Level: 1
Edit Date: 04 Mar-22 11:59	MD5 Hash: 9EEA6F6F44921E2D8AE32E3CF35B033A	Editor ID:
Batch ID: 08-4000-1972	Test Type: Hyalella (42d)	Analyst: C. Matthaues Ayers
Start Date: 06 Jan-22 15:25	Protocol: EPA/600/R-99/064 (2000)	Diluent: Reconstituted Water
Ending Date: 17 Feb-22 12:00	Species: Hyalella azteca	Brine:
Test Length: 41d 21h	Taxon: Malacostraca	Source: Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, Inc	Sediment Testing
53046	12-3611-8332	21 Dec-21 15:54	21 Dec-21 20:00	16d (0.3 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53046	Reference sediment	Belmont Landfill	TOX-6	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53046 passed 42d biomass endpoint	27.82%

Wilcoxon Rank Sum Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	Ties	P-Type	P-Value	Decision(α:5%)
Control Sed		53046	14	98	---	0	Exact	0.9998	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.133225	0.133225	1	8.927	0.0098	Significant Effect
Error	0.208927	0.0149234	14			
Total	0.342152		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	7.328	8.885	0.0175	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.7474	0.8408	0.0006	Non-Normal Distribution

42d Biomass Summary

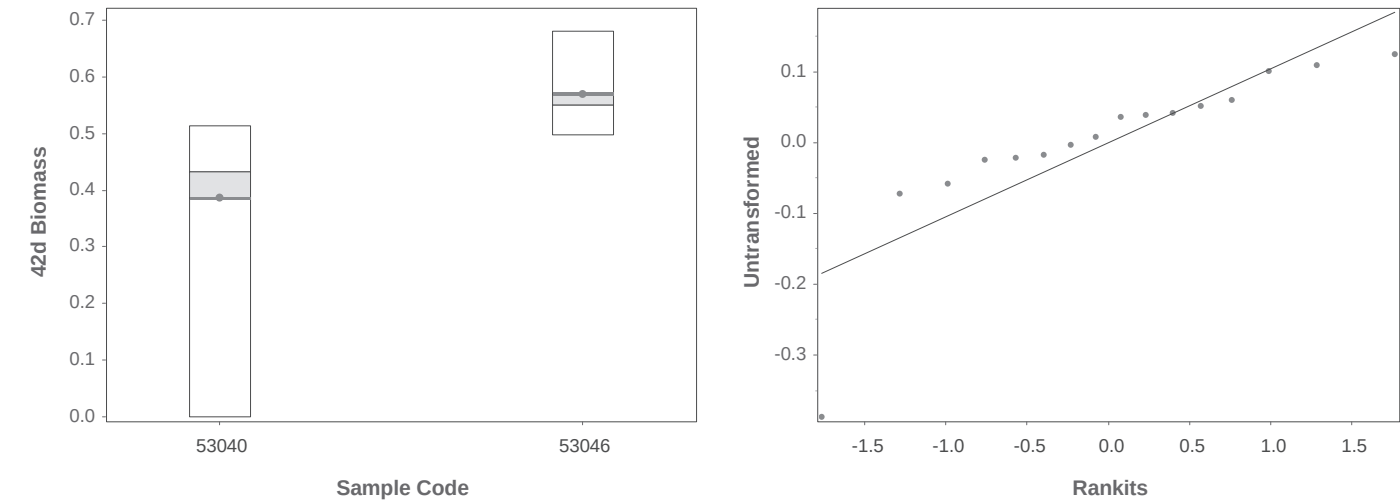
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	8	0.3868	0.2513	0.5222	0.433	0	0.513	0.0573	41.90%	0.00%
53046		8	0.5693	0.5192	0.6193	0.55	0.498	0.68	0.02117	10.52%	-47.19%

42d Biomass Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040	CS	0.396	0.513	0.488	0	0.439	0.384	0.447	0.427
53046		0.606	0.68	0.498	0.548	0.612	0.546	0.512	0.552

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test					Aquatec Environmental, Inc.
Analysis ID:	07-5488-4980	Endpoint:	42d Biomass	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 12:23	Analysis:	Nonparametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 11:59	MD5 Hash:	9EEA6F6F44921E2D8AE32E3CF35B033A	Editor ID:	

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Report Date: 07 Mar-22 11:50 (p 61 of 96)
 Test Code/ID: 16245 CTRL / 10-1800-7441

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID: 06-8367-2119	Endpoint: 42d Mean Dry Weight	CETIS Version: CETISv2.1.1
Analyzed: 06 Mar-22 12:22	Analysis: Parametric-Two Sample	Status Level: 1
Edit Date: 04 Mar-22 11:59	MD5 Hash: E566568FC05137CA82BA2C9183E0A235	Editor ID:
Batch ID: 08-4000-1972	Test Type: Hyalella (42d)	Analyst: C. Mattheus Ayers
Start Date: 06 Jan-22 15:25	Protocol: EPA/600/R-99/064 (2000)	Diluent: Reconstituted Water
Ending Date: 17 Feb-22 12:00	Species: Hyalella azteca	Brine:
Test Length: 41d 21h	Taxon: Malacostraca	Source: Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, Inc.	Sediment Testing
53041	03-8171-1181	21 Dec-21 09:05	21 Dec-21 20:00	16d 6h (0.3 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53041	Sediment	Belmont Landfill	TOX-4	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53041 failed 42d mean dry weight endpoint	19.80%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Control Sed		53041*	13	1.835	1.771	0.1061	CDF	0.0447	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0451586	0.0451586	1	3.368	0.0894	Non-Significant Effect
Error	0.1743	0.0134077	13			
Total	0.219458		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	2.762	10.79	0.2366	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9181	0.8328	0.1799	Normal Distribution

42d Mean Dry Weight Summary

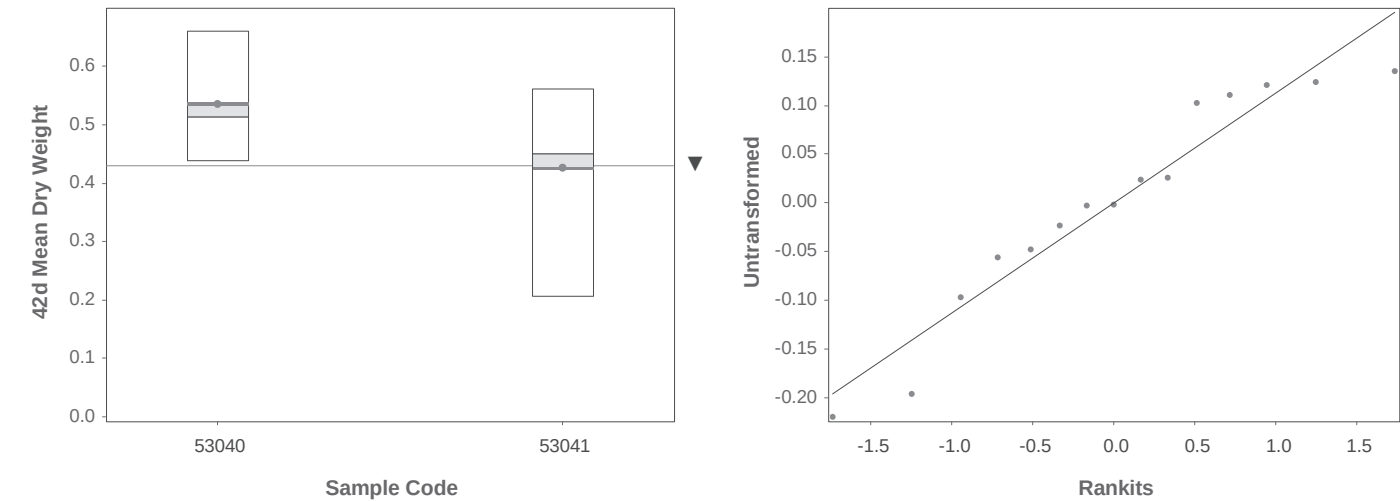
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	7	0.536	0.4593	0.6128	0.513	0.439	0.66	0.03135	15.47%	0.00%
53041		8	0.4261	0.3108	0.5413	0.4513	0.2067	0.5613	0.04874	32.35%	20.52%

42d Mean Dry Weight Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040	CS	0.66	0.513	0.488	0.439	0.48	0.6386	0.5338	
53041		0.2067	0.5613	0.4525	0.4243	0.5471	0.45	0.23	0.5367

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test			Aquatec Environmental, Inc.	
Analysis ID:	06-8367-2119	Endpoint:	42d Mean Dry Weight	CETIS Version: CETISv2.1.1
Analyzed:	06 Mar-22 12:22	Analysis:	Parametric-Two Sample	Status Level: 1
Edit Date:	04 Mar-22 11:59	MD5 Hash:	E566568FC05137CA82BA2C9183E0A235	Editor ID:

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 Test Code/ID: 16245 CTRL / 10-1800-7441

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID:	04-4513-1486	Endpoint:	42d Mean Dry Weight	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 12:22	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 11:59	MD5 Hash:	88297626BD58A132675565B141DD563E	Editor ID:	
Batch ID:	08-4000-1972	Test Type:	Hyalella (42d)	Analyst:	C. Matthaues Ayers
Start Date:	06 Jan-22 15:25	Protocol:	EPA/600/R-99/064 (2000)	Diluent:	Reconstituted Water
Ending Date:	17 Feb-22 12:00	Species:	Hyalella azteca	Brine:	
Test Length:	41d 21h	Taxon:	Malacostraca	Source:	Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, Inc.	Sediment Testing
53042	04-7178-2695	21 Dec-21 13:38	21 Dec-21 20:00	16d 2h (0.6 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53042	Sediment	Belmont Landfill	TOX-1	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53042 passed 42d mean dry weight endpoint	20.76%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Control Sed		53042	13	-0.1465	1.771	0.1113	CDF	0.5571	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.00031651	0.00031651	1	0.02147	0.8857	Non-Significant Effect
Error	0.191617	0.0147397	13			
Total	0.191933		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	3.122	10.79	0.1867	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9737	0.8328	0.9087	Normal Distribution

42d Mean Dry Weight Summary

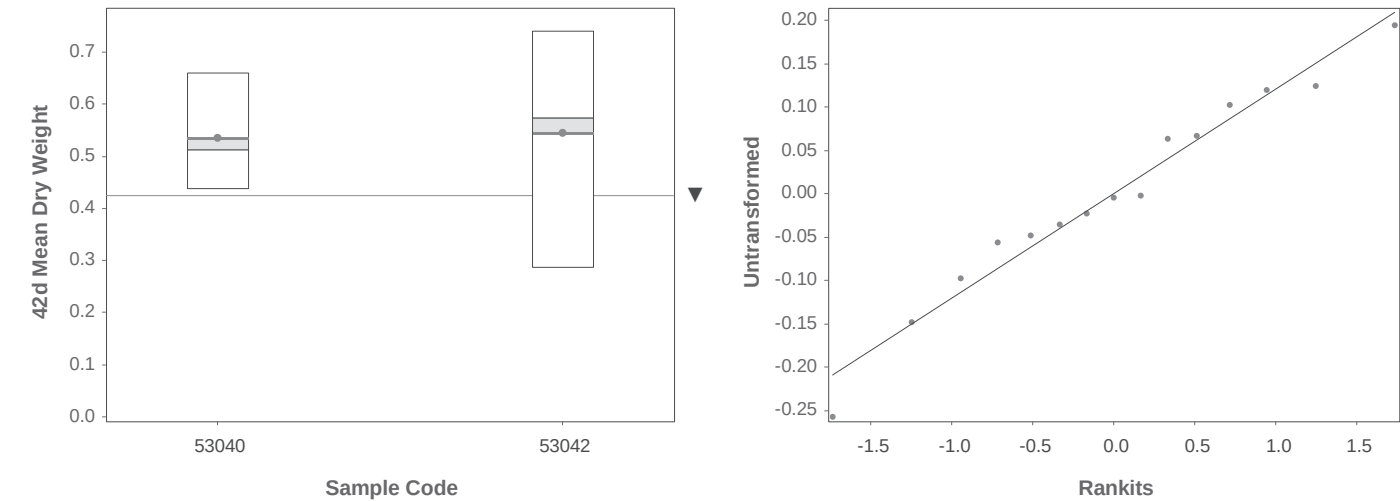
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	7	0.536	0.4593	0.6128	0.513	0.439	0.66	0.03135	15.47%	0.00%
53042		8	0.5453	0.4227	0.6678	0.5749	0.288	0.74	0.05181	26.88%	-1.72%

42d Mean Dry Weight Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040	CS	0.66	0.513	0.488	0.439	0.48	0.6386	0.5338	
53042		0.665	0.6087	0.288	0.74	0.6125	0.51	0.5411	0.3967

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test			Aquatec Environmental, Inc.	
Analysis ID:	04-4513-1486	Endpoint:	42d Mean Dry Weight	CETIS Version: CETISv2.1.1
Analyzed:	06 Mar-22 12:22	Analysis:	Parametric-Two Sample	Status Level: 1
Edit Date:	04 Mar-22 11:59	MD5 Hash:	88297626BD58A132675565B141DD563E	Editor ID:

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 Test Code/ID: 16245 CTRL / 10-1800-7441

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID: 08-1889-0111	Endpoint: 42d Mean Dry Weight	CETIS Version: CETISv2.1.1
Analyzed: 06 Mar-22 12:22	Analysis: Parametric-Two Sample	Status Level: 1
Edit Date: 04 Mar-22 11:59	MD5 Hash: 9C8AAD85C19927FFE73ADF969D0DD5DB	Editor ID:
Batch ID: 08-4000-1972	Test Type: Hyalella (42d)	Analyst: C. Mattheus Ayers
Start Date: 06 Jan-22 15:25	Protocol: EPA/600/R-99/064 (2000)	Diluent: Reconstituted Water
Ending Date: 17 Feb-22 12:00	Species: Hyalella azteca	Brine:
Test Length: 41d 21h	Taxon: Malacostraca	Source: Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, Inc.	Sediment Testing
53043	20-0010-4712	21 Dec-21 12:35	21 Dec-21 20:00	16d 3h (0.6 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53043	Sediment	Belmont Landfill	TOX-2	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53043 passed 42d mean dry weight endpoint	10.66%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Control Sed		53043	13	-1.447	1.771	0.05715	CDF	0.9142	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.00813787	0.00813787	1	2.093	0.1717	Non-Significant Effect
Error	0.0505471	0.00388824	13			
Total	0.058685		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	5.197	9.155	0.0481	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9358	0.8328	0.3324	Normal Distribution

42d Mean Dry Weight Summary

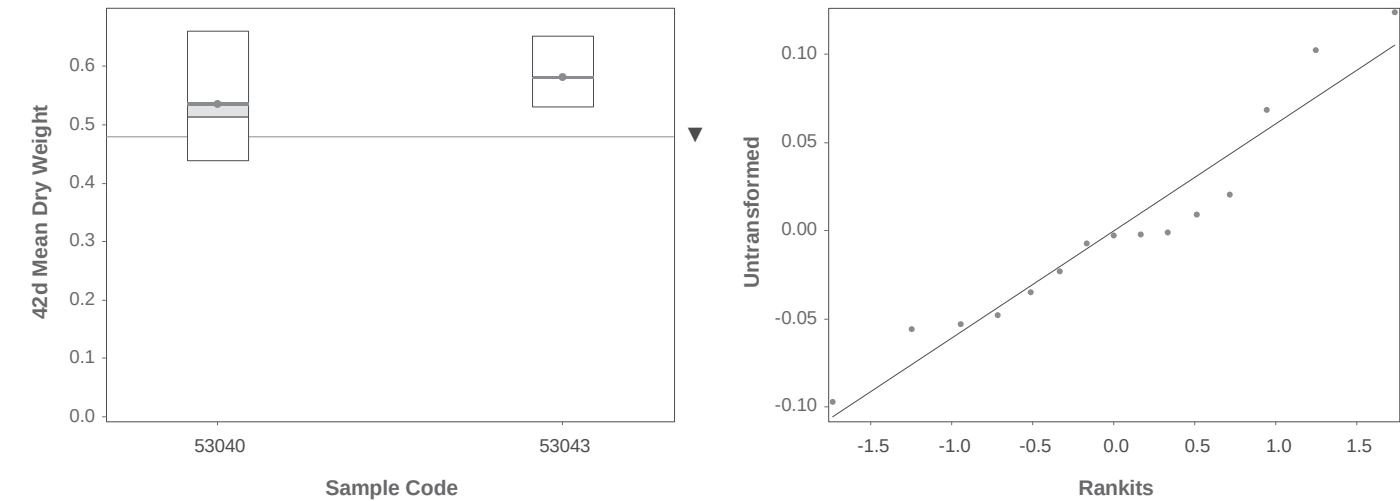
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	7	0.536	0.4593	0.6128	0.513	0.439	0.66	0.03135	15.47%	0.00%
53043		8	0.5827	0.5523	0.6132	0.5808	0.53	0.6514	0.01286	6.24%	-8.71%

42d Mean Dry Weight Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040	CS	0.66	0.513	0.488	0.439	0.48	0.6386	0.5338	
53043		0.603	0.5922	0.5756	0.58	0.53	0.6514	0.548	0.5817

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test			Aquatec Environmental, Inc.	
Analysis ID:	08-1889-0111	Endpoint:	42d Mean Dry Weight	CETIS Version: CETISv2.1.1
Analyzed:	06 Mar-22 12:22	Analysis:	Parametric-Two Sample	Status Level: 1
Edit Date:	04 Mar-22 11:59	MD5 Hash:	9C8AAD85C19927FFE73ADF969D0DD5DB	Editor ID:

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 Test Code/ID: 16245 CTRL / 10-1800-7441

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID:	09-9294-0449	Endpoint:	42d Mean Dry Weight	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 12:22	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 11:59	MD5 Hash:	08AF2291E9DFB35E9625850516FDB697	Editor ID:	
Batch ID:	08-4000-1972	Test Type:	Hyalella (42d)	Analyst:	C. Matthaues Ayers
Start Date:	06 Jan-22 15:25	Protocol:	EPA/600/R-99/064 (2000)	Diluent:	Reconstituted Water
Ending Date:	17 Feb-22 12:00	Species:	Hyalella azteca	Brine:	
Test Length:	41d 21h	Taxon:	Malacostraca	Source:	Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, Inc.	Sediment Testing
53044	00-4677-6467	21 Dec-21 11:25	21 Dec-21 20:00	16d 4h (0.6 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53044	Sediment	Belmont Landfill	TOX-3	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53044 passed 42d mean dry weight endpoint	17.29%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Control Sed		53044	13	0.5674	1.771	0.0927	CDF	0.2901	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.00329308	0.00329308	1	0.3219	0.5801	Non-Significant Effect
Error	0.132985	0.0102296	13			
Total	0.136278		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.904	10.79	0.4504	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9318	0.8328	0.2899	Normal Distribution

42d Mean Dry Weight Summary

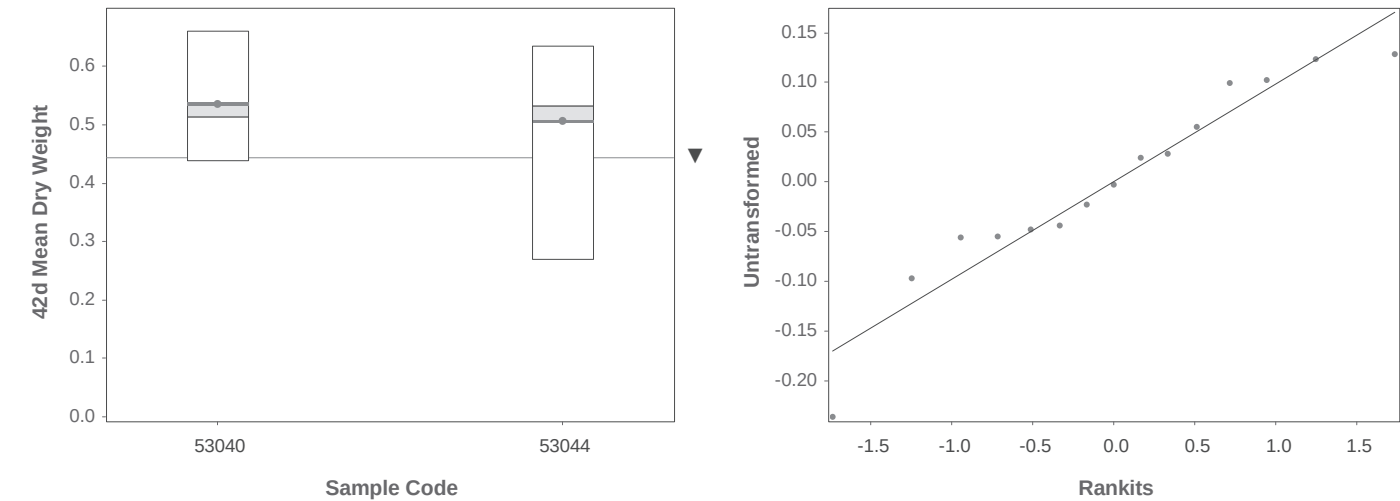
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	7	0.536	0.4593	0.6128	0.513	0.439	0.66	0.03135	15.47%	0.00%
53044		8	0.5063	0.4107	0.602	0.5328	0.27	0.635	0.04047	22.60%	5.54%

42d Mean Dry Weight Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040	CS	0.66	0.513	0.488	0.439	0.48	0.6386	0.5338	
53044		0.635	0.462	0.6057	0.4513	0.27	0.5613	0.5344	0.5311

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test				Aquatec Environmental, Inc.	
Analysis ID:	09-9294-0449	Endpoint:	42d Mean Dry Weight	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 12:22	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 11:59	MD5 Hash:	08AF2291E9DFB35E9625850516FDB697	Editor ID:	

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 Test Code/ID: 16245 CTRL / 10-1800-7441

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID: 02-3831-3072	Endpoint: 42d Mean Dry Weight	CETIS Version: CETISv2.1.1
Analyzed: 06 Mar-22 12:23	Analysis: Parametric-Two Sample	Status Level: 1
Edit Date: 04 Mar-22 11:59	MD5 Hash: 49E534DBAD014D5D193C1F7B25CC334E	Editor ID:
Batch ID: 08-4000-1972	Test Type: Hyalella (42d)	Analyst: C. Mattheus Ayers
Start Date: 06 Jan-22 15:25	Protocol: EPA/600/R-99/064 (2000)	Diluent: Reconstituted Water
Ending Date: 17 Feb-22 12:00	Species: Hyalella azteca	Brine:
Test Length: 41d 21h	Taxon: Malacostraca	Source: Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, Inc.	Sediment Testing
53045	13-5487-4433	21 Dec-21 14:22	21 Dec-21 20:00	16d 1h (0.3 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53045	Sediment	Belmont Landfill	TOX-5	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53045 passed 42d mean dry weight endpoint	18.45%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Control Sed		53045	13	-0.8708	1.771	0.09892	CDF	0.8002	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.00883311	0.00883311	1	0.7583	0.3997	Non-Significant Effect
Error	0.151437	0.011649	13			
Total	0.16027		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	2.287	10.79	0.3329	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9492	0.8328	0.5127	Normal Distribution

42d Mean Dry Weight Summary

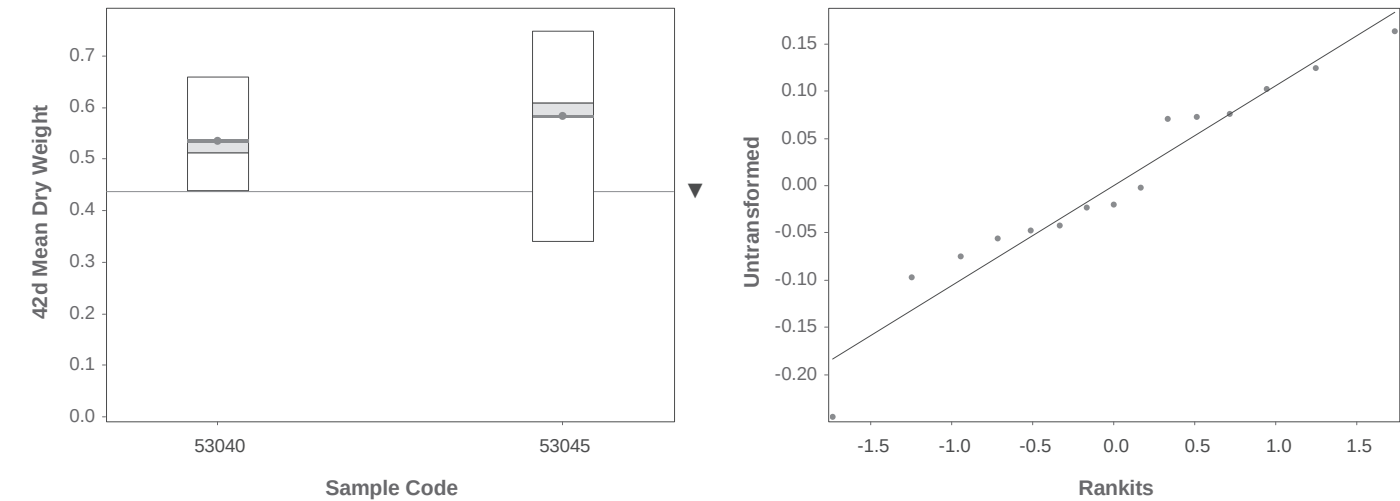
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	7	0.536	0.4593	0.6128	0.513	0.439	0.66	0.03135	15.47%	0.00%
53045		8	0.5847	0.4798	0.6896	0.61	0.34	0.7478	0.04435	21.46%	-9.07%

42d Mean Dry Weight Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040	CS	0.66	0.513	0.488	0.439	0.48	0.6386	0.5338	
53045		0.66	0.5422	0.655	0.7478	0.565	0.6575	0.51	0.34

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test			Aquatec Environmental, Inc.	
Analysis ID:	02-3831-3072	Endpoint:	42d Mean Dry Weight	CETIS Version: CETISv2.1.1
Analyzed:	06 Mar-22 12:23	Analysis:	Parametric-Two Sample	Status Level: 1
Edit Date:	04 Mar-22 11:59	MD5 Hash:	49E534DBAD014D5D193C1F7B25CC334E	Editor ID:

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Test Code/ID: 16245 CTRL / 10-1800-7441

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID: 09-8383-2614	Endpoint: 42d Mean Dry Weight	CETIS Version: CETISv2.1.1
Analyzed: 06 Mar-22 12:23	Analysis: Parametric-Two Sample	Status Level: 1
Edit Date: 04 Mar-22 11:59	MD5 Hash: D71230BE8E6DA2E1A63FBC436DB50200	Editor ID:
Batch ID: 08-4000-1972	Test Type: Hyalella (42d)	Analyst: C. Matthaues Ayers
Start Date: 06 Jan-22 15:25	Protocol: EPA/600/R-99/064 (2000)	Diluent: Reconstituted Water
Ending Date: 17 Feb-22 12:00	Species: Hyalella azteca	Brine:
Test Length: 41d 21h	Taxon: Malacostraca	Source: Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, Inc	Sediment Testing
53046	12-3611-8332	21 Dec-21 15:54	21 Dec-21 20:00	16d (0.3 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53046	Reference sediment	Belmont Landfill	TOX-6	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53046 passed 42d mean dry weight endpoint	11.27%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Control Sed		53046	13	-3.686	1.771	0.06042	CDF	0.9986	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0590491	0.0590491	1	13.59	0.0027	Significant Effect
Error	0.0564867	0.00434513	13			
Total	0.115536		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	3.167	9.155	0.1572	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9537	0.8328	0.5837	Normal Distribution

42d Mean Dry Weight Summary

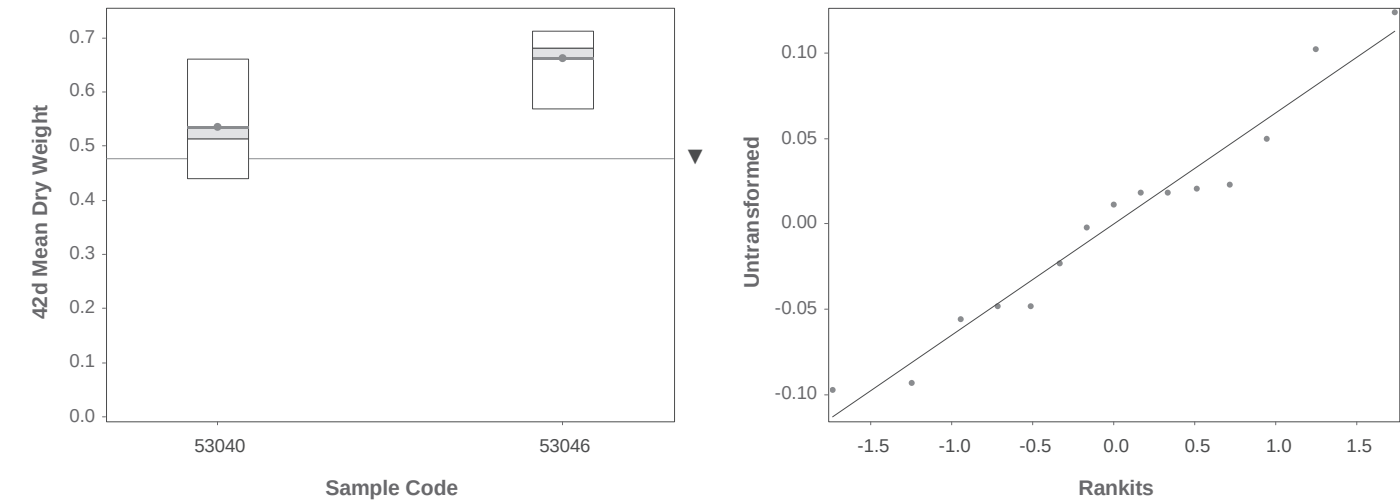
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	7	0.536	0.4593	0.6128	0.513	0.439	0.66	0.03135	15.47%	0.00%
53046		8	0.6618	0.6228	0.7008	0.68	0.5689	0.7114	0.01648	7.04%	-23.46%

42d Mean Dry Weight Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040	CS	0.66	0.513	0.488	0.439	0.48	0.6386	0.5338	
53046		0.6733	0.68	0.7114	0.685	0.68	0.6825	0.5689	0.6133

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test			Aquatec Environmental, Inc.	
Analysis ID:	09-8383-2614	Endpoint:	42d Mean Dry Weight	CETIS Version: CETISv2.1.1
Analyzed:	06 Mar-22 12:23	Analysis:	Parametric-Two Sample	Status Level: 1
Edit Date:	04 Mar-22 11:59	MD5 Hash:	D71230BE8E6DA2E1A63FBC436DB50200	Editor ID:

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Report Date: 07 Mar-22 11:50 (p 73 of 96)
Test Code/ID: 16245 CTRL / 10-1800-7441

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID: 09-8937-0001	Endpoint: 42d Reproduction	CETIS Version: CETISv2.1.1
Analyzed: 06 Mar-22 12:22	Analysis: Parametric-Two Sample	Status Level: 1
Edit Date: 04 Mar-22 11:59	MD5 Hash: A9E89E1F8813F468BF16E10EE56F68AD	Editor ID:
Batch ID: 08-4000-1972	Test Type: Hyalella (42d)	Analyst: C. Mattheus Ayers
Start Date: 06 Jan-22 15:25	Protocol: EPA/600/R-99/064 (2000)	Diluent: Reconstituted Water
Ending Date: 17 Feb-22 12:00	Species: Hyalella azteca	Brine:
Test Length: 41d 21h	Taxon: Malacostraca	Source: Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, Inc	Sediment Testing
53041	03-8171-1181	21 Dec-21 09:05	21 Dec-21 20:00	16d 6h (0.3 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53041	Sediment	Belmont Landfill	TOX-4	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53041 failed 42d reproduction endpoint	45.39%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Control Sed		53041*	11	2.2	1.796	1.96	CDF	0.0250	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	18.6277	18.6277	1	4.841	0.0501	Non-Significant Effect
Error	42.3267	3.84788	11			
Total	60.9544		12			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	3.464	14.51	0.1940	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.955	0.8138	0.6755	Normal Distribution

42d Reproduction Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	7	4.318	2.112	6.523	4.125	0	7	0.9013	55.23%	0.00%
53041		6	1.917	0.5721	3.261	2	0	3.5	0.5231	66.85%	55.61%

42d Reproduction Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040	CS	6.5	3	4	4.125	5.6	7	0	
53041		2	1	2	3.5	0	3		

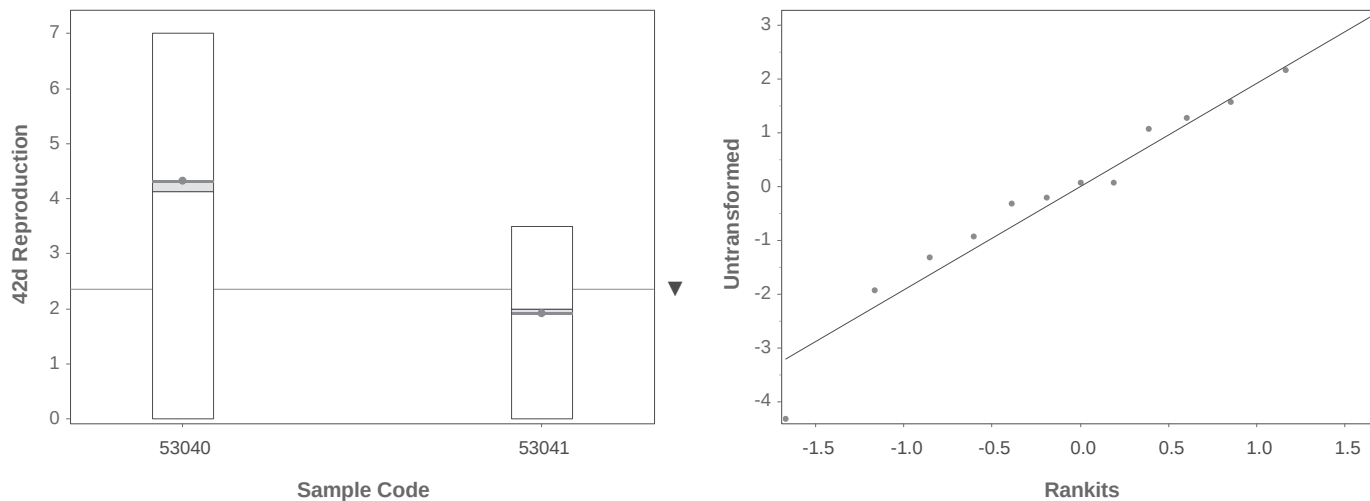
Hyalella 42-d Survival, Growth, and Reproduction Sediment Test

Aquatec Environmental, Inc.

Analysis ID: 09-8937-0001 Endpoint: 42d Reproduction
Analyzed: 06 Mar-22 12:22 Analysis: Parametric-Two Sample
Edit Date: 04 Mar-22 11:59 MD5 Hash: A9E89E1F8813F468BF16E10EE56F68AD

CETIS Version: CETISv2.1.1
Status Level: 1
Editor ID:

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Report Date: 07 Mar-22 11:50 (p 75 of 96)
Test Code/ID: 16245 CTRL / 10-1800-7441

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test						Aquatec Environmental, Inc.	
Analysis ID:	16-2630-7199	Endpoint:	42d Reproduction	CETIS Version:	CETISv2.1.1		
Analyzed:	06 Mar-22 12:22	Analysis:	Parametric-Two Sample	Status Level:	1		
Edit Date:	04 Mar-22 11:59	MD5 Hash:	1081BA6F13C520D8A5715E06C1B39C31	Editor ID:			
Batch ID:	08-4000-1972	Test Type:	Hyalella (42d)	Analyst:	C. Mattheus Ayers		
Start Date:	06 Jan-22 15:25	Protocol:	EPA/600/R-99/064 (2000)	Diluent:	Reconstituted Water		
Ending Date:	17 Feb-22 12:00	Species:	Hyalella azteca	Brine:			
Test Length:	41d 21h	Taxon:	Malacostraca	Source:	Aquatic Research Organism	Age:	8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, Inc	Sediment Testing
53042	04-7178-2695	21 Dec-21 13:38	21 Dec-21 20:00	16d 2h (0.6 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53042	Sediment	Belmont Landfill	TOX-1	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53042 passed 42d reproduction endpoint	57.34%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Control Sed		53042	10	1.367	1.812	2.476	CDF	0.1007	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	10.1759	10.1759	1	1.87	0.2014	Non-Significant Effect
Error	54.4184	5.44184	10			
Total	64.5943		11			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.12	21.97	0.9555	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9751	0.8025	0.9562	Normal Distribution

42d Reproduction Summary

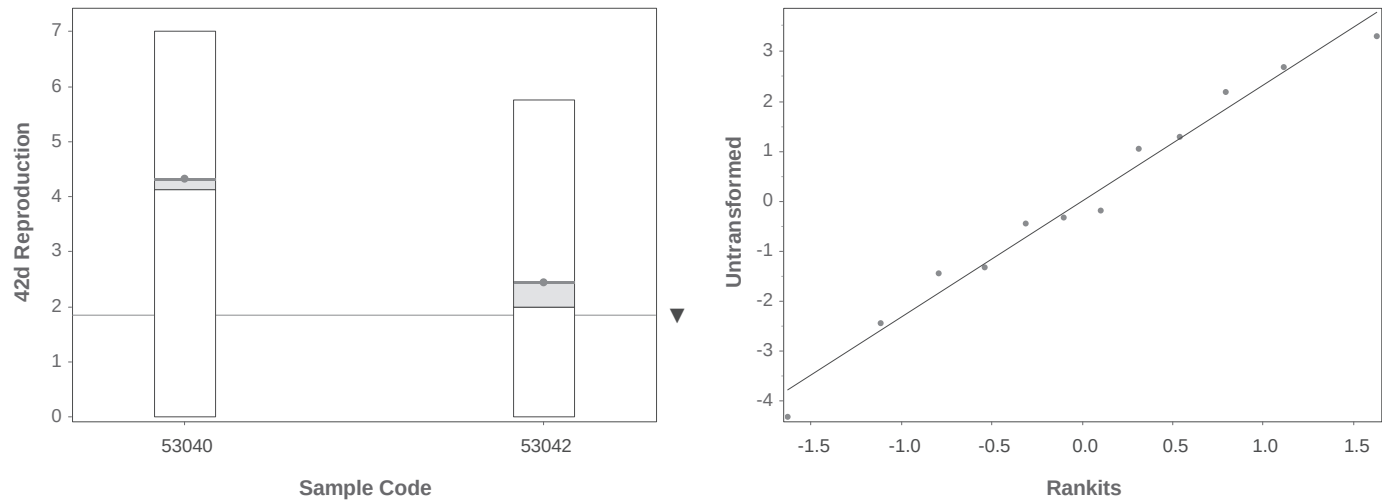
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	7	4.318	2.112	6.523	4.125	0	7	0.9013	55.23%	0.00%
53042		5	2.45	-0.3472	5.247	2	0	5.75	1.007	91.95%	43.26%

42d Reproduction Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040	CS	6.5	3	4	4.125	5.6	7	0	
53042		2	3.5	5.75	1	0			

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test			Aquatec Environmental, Inc.	
Analysis ID:	16-2630-7199	Endpoint:	42d Reproduction	CETIS Version: CETISv2.1.1
Analyzed:	06 Mar-22 12:22	Analysis:	Parametric-Two Sample	Status Level: 1
Edit Date:	04 Mar-22 11:59	MD5 Hash:	1081BA6F13C520D8A5715E06C1B39C31	Editor ID:

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Report Date: 07 Mar-22 11:50 (p 77 of 96)
Test Code/ID: 16245 CTRL / 10-1800-7441

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID: 07-2807-7410	Endpoint: 42d Reproduction	CETIS Version: CETISv2.1.1
Analyzed: 06 Mar-22 12:22	Analysis: Parametric-Two Sample	Status Level: 1
Edit Date: 04 Mar-22 11:59	MD5 Hash: BBEABD9E1AB7CBAC27AF6EFC006EEA3	Editor ID:
Batch ID: 08-4000-1972	Test Type: Hyalella (42d)	Analyst: C. Mattheus Ayers
Start Date: 06 Jan-22 15:25	Protocol: EPA/600/R-99/064 (2000)	Diluent: Reconstituted Water
Ending Date: 17 Feb-22 12:00	Species: Hyalella azteca	Brine:
Test Length: 41d 21h	Taxon: Malacostraca	Source: Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, In	Sediment Testing
53043	20-0010-4712	21 Dec-21 12:35	21 Dec-21 20:00	16d 3h (0.6 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53043	Sediment	Belmont Landfill	TOX-2	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53043 passed 42d reproduction endpoint	57.20%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Control Sed		53043	13	0.3698	1.771	2.47	CDF	0.3587	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.993151	0.993151	1	0.1368	0.7175	Non-Significant Effect
Error	94.3953	7.26118	13			
Total	95.3885		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.514	10.79	0.6293	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9054	0.8328	0.1152	Normal Distribution

42d Reproduction Summary

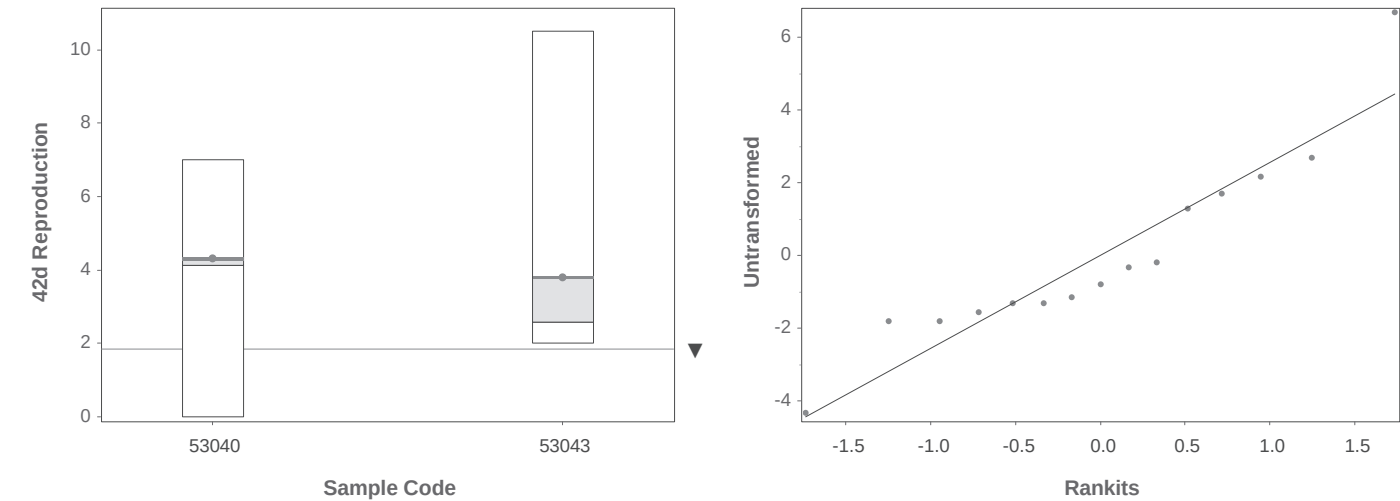
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	7	4.318	2.112	6.523	4.125	0	7	0.9013	55.23%	0.00%
53043		8	3.802	1.349	6.255	2.583	2	10.5	1.037	77.18%	11.95%

42d Reproduction Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040	CS	6.5	3	4	4.125	5.6	7	0	
53043		10.5	2	2.5	5.5	2	3	2.25	2.667

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test			Aquatec Environmental, Inc.	
Analysis ID:	07-2807-7410	Endpoint:	42d Reproduction	CETIS Version: CETISv2.1.1
Analyzed:	06 Mar-22 12:22	Analysis:	Parametric-Two Sample	Status Level: 1
Edit Date:	04 Mar-22 11:59	MD5 Hash:	BBEABD9E1AB7CBAC27AF6EFC006EEA3	Editor ID:

Graphics



CETIS Analytical Report

Report Date: 07 Mar-22 11:50 (p 79 of 96)
Test Code/ID: 16245 CTRL / 10-1800-7441

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test				Aquatec Environmental, Inc.	
Analysis ID:	14-4449-2950	Endpoint:	42d Reproduction	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 12:22	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 11:59	MD5 Hash:	B7654CA19B69CC904B7CB58FC0147950	Editor ID:	
Batch ID:	08-4000-1972	Test Type:	Hyalella (42d)	Analyst:	C. Mattheus Ayers
Start Date:	06 Jan-22 15:25	Protocol:	EPA/600/R-99/064 (2000)	Diluent:	Reconstituted Water
Ending Date:	17 Feb-22 12:00	Species:	Hyalella azteca	Brine:	
Test Length:	41d 21h	Taxon:	Malacostraca	Source:	Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, In	Sediment Testing
53044	00-4677-6467	21 Dec-21 11:25	21 Dec-21 20:00	16d 4h (0.6 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53044	Sediment	Belmont Landfill	TOX-3	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53044 passed 42d reproduction endpoint	37.91%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Control Sed		53044	13	-0.3999	1.771	1.637	CDF	0.6521	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.510107	0.510107	1	0.1599	0.6957	Non-Significant Effect
Error	41.4627	3.18944	13			
Total	41.9728		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	5.42	9.155	0.0431	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9398	0.8328	0.3796	Normal Distribution

42d Reproduction Summary

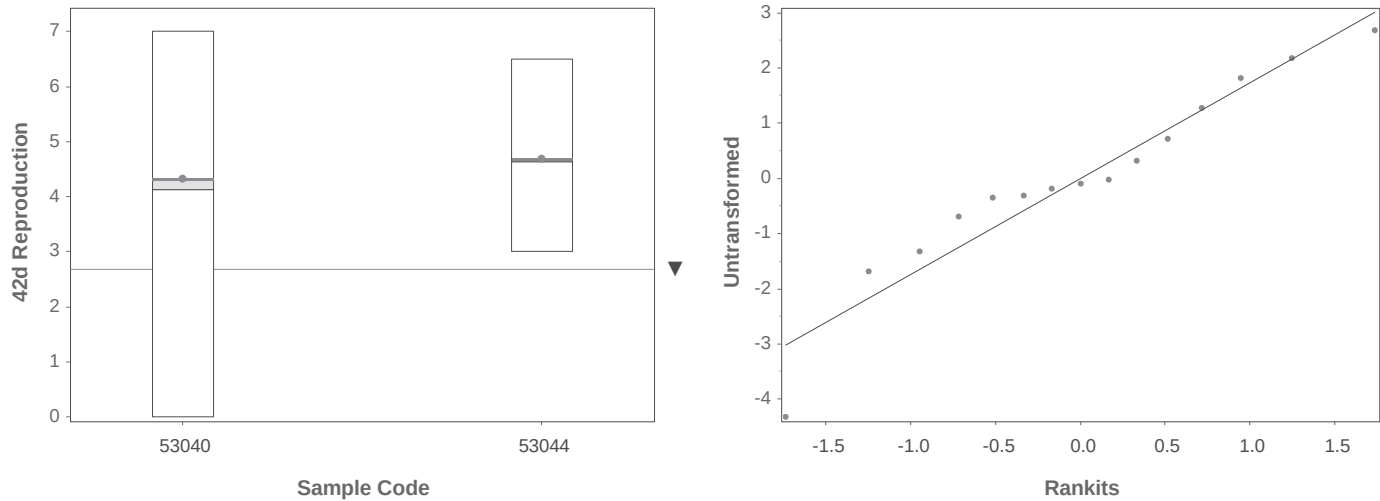
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	7	4.318	2.112	6.523	4.125	0	7	0.9013	55.23%	0.00%
53044		8	4.688	3.831	5.544	4.633	3	6.5	0.3621	21.85%	-8.56%

42d Reproduction Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040	CS	6.5	3	4	4.125	5.6	7	0	
53044		3	5.4	4	5	4.667	6.5	4.333	4.6

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test			Aquatec Environmental, Inc.	
Analysis ID:	14-4449-2950	Endpoint:	42d Reproduction	CETIS Version: CETISv2.1.1
Analyzed:	06 Mar-22 12:22	Analysis:	Parametric-Two Sample	Status Level: 1
Edit Date:	04 Mar-22 11:59	MD5 Hash:	B7654CA19B69CC904B7CB58FC0147950	Editor ID:

Graphics



CETIS Analytical Report

Report Date: 07 Mar-22 11:50 (p 81 of 96)
Test Code/ID: 16245 CTRL / 10-1800-7441

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID: 04-5319-0410	Endpoint: 42d Reproduction	CETIS Version: CETISv2.1.1
Analyzed: 06 Mar-22 12:23	Analysis: Parametric-Two Sample	Status Level: 1
Edit Date: 04 Mar-22 11:59	MD5 Hash: E403D0574A468E9C229375E7E485FD5B	Editor ID:
Batch ID: 08-4000-1972	Test Type: Hyalella (42d)	Analyst: C. Mattheus Ayers
Start Date: 06 Jan-22 15:25	Protocol: EPA/600/R-99/064 (2000)	Diluent: Reconstituted Water
Ending Date: 17 Feb-22 12:00	Species: Hyalella azteca	Brine:
Test Length: 41d 21h	Taxon: Malacostraca	Source: Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, Inc	Sediment Testing
53045	13-5487-4433	21 Dec-21 14:22	21 Dec-21 20:00	16d 1h (0.3 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53045	Sediment	Belmont Landfill	TOX-5	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53045 passed 42d reproduction endpoint	63.49%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Control Sed		53045	13	-1.423	1.771	2.742	CDF	0.9109	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	18.1183	18.1183	1	2.025	0.1783	Non-Significant Effect
Error	116.309	8.94688	13			
Total	134.428		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	2.065	10.79	0.3956	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9513	0.8328	0.5453	Normal Distribution

42d Reproduction Summary

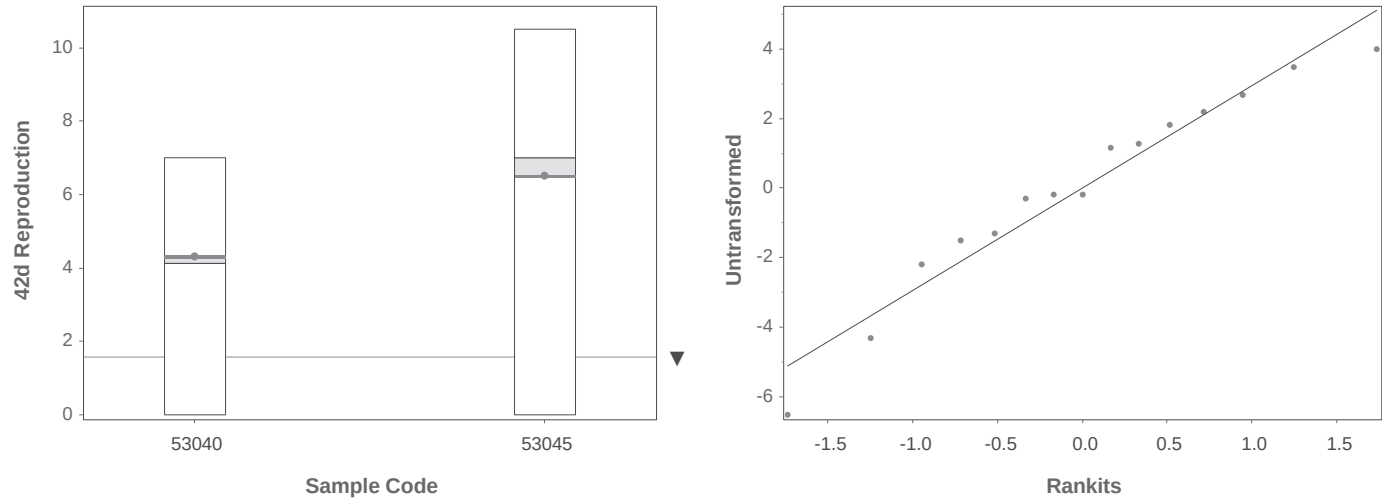
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	7	4.318	2.112	6.523	4.125	0	7	0.9013	55.23%	0.00%
53045		8	6.521	3.656	9.386	7	0	10.5	1.211	52.55%	-51.02%

42d Reproduction Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040	CS	6.5	3	4	4.125	5.6	7	0	
53045		0	7.667	8.333	5	6.333	10.5	4.333	10

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test			Aquatec Environmental, Inc.	
Analysis ID:	04-5319-0410	Endpoint:	42d Reproduction	CETIS Version: CETISv2.1.1
Analyzed:	06 Mar-22 12:23	Analysis:	Parametric-Two Sample	Status Level: 1
Edit Date:	04 Mar-22 11:59	MD5 Hash:	E403D0574A468E9C229375E7E485FD5B	Editor ID:

Graphics



CETIS Analytical Report

Report Date: 07 Mar-22 11:50 (p 83 of 96)
Test Code/ID: 16245 CTRL / 10-1800-7441

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID: 02-5413-8376	Endpoint: 42d Reproduction	CETIS Version: CETISv2.1.1
Analyzed: 06 Mar-22 12:23	Analysis: Parametric-Two Sample	Status Level: 1
Edit Date: 04 Mar-22 11:59	MD5 Hash: 2B64121BE8E9A350A74FACE68F4C5CE3	Editor ID:
Batch ID: 08-4000-1972	Test Type: Hyalella (42d)	Analyst: C. Matthaues Ayers
Start Date: 06 Jan-22 15:25	Protocol: EPA/600/R-99/064 (2000)	Diluent: Reconstituted Water
Ending Date: 17 Feb-22 12:00	Species: Hyalella azteca	Brine:
Test Length: 41d 21h	Taxon: Malacostraca	Source: Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, Inc	Sediment Testing
53046	12-3611-8332	21 Dec-21 15:54	21 Dec-21 20:00	16d (0.3 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53046	Reference sediment	Belmont Landfill	TOX-6	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53046 passed 42d reproduction endpoint	59.26%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Control Sed		53046	13	-2.603	1.771	2.559	CDF	0.9891	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	52.8171	52.8171	1	6.777	0.0219	Significant Effect
Error	101.314	7.79337	13			
Total	154.131		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.688	10.79	0.5403	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9648	0.8328	0.7744	Normal Distribution

42d Reproduction Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	7	4.318	2.112	6.523	4.125	0	7	0.9013	55.23%	0.00%
53046		8	8.079	5.489	10.67	7.4	4.667	14.5	1.095	38.35%	-87.11%

42d Reproduction Detail

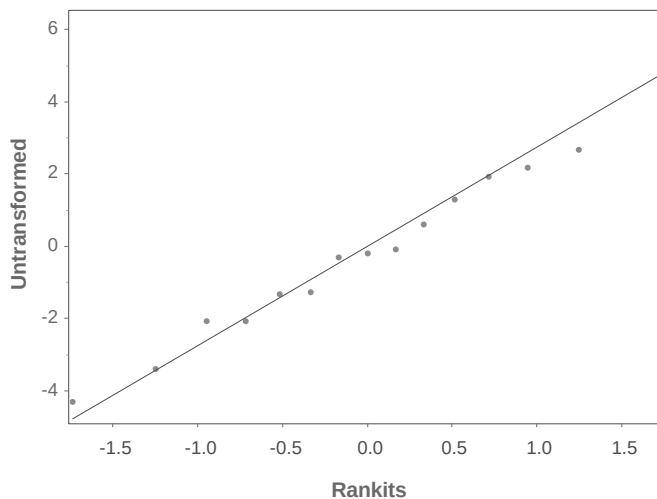
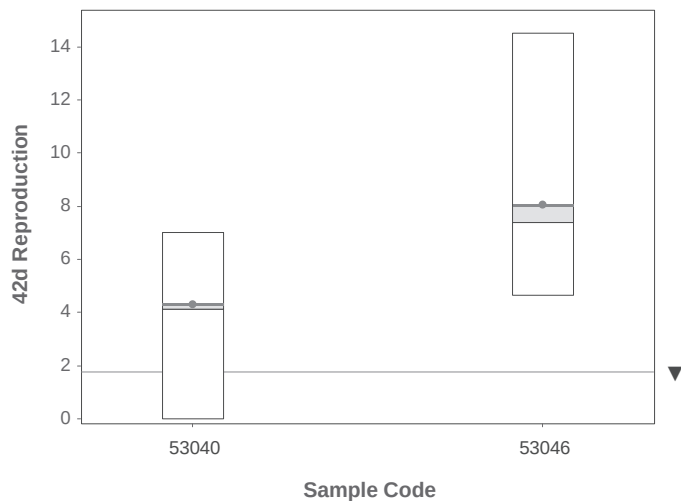
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040	CS	6.5	3	4	4.125	5.6	7	0	
53046		10	6	14.5	4.667	8.667	8	6	6.8

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test

Aquatec Environmental, Inc.

Analysis ID:	02-5413-8376	Endpoint:	42d Reproduction	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 12:23	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 11:59	MD5 Hash:	2B64121BE8E9A350A74FACE68F4C5CE3	Editor ID:	

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CETIS Analytical Report

Report Date: 07 Mar-22 11:50 (p 85 of 96)
Test Code/ID: 16245 CTRL / 10-1800-7441

Hyaella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID: 10-7951-2039	Endpoint: 42d Survival Rate	CETIS Version: CETISv2.1.1
Analyzed: 06 Mar-22 12:22	Analysis: Parametric-Two Sample	Status Level: 1
Edit Date: 04 Mar-22 11:59	MD5 Hash: 6AE82762D14E5182763523832F6B8D77	Editor ID:
Batch ID: 08-4000-1972	Test Type: Hyaella (42d)	Analyst: C. Mattheus Ayers
Start Date: 06 Jan-22 15:25	Protocol: EPA/600/R-99/064 (2000)	Diluent: Reconstituted Water
Ending Date: 17 Feb-22 12:00	Species: Hyaella azteca	Brine:
Test Length: 41d 21h	Taxon: Malacostraca	Source: Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, In	Sediment Testing
53041	03-8171-1181	21 Dec-21 09:05	21 Dec-21 20:00	16d 6h (0.3 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53041	Sediment	Belmont Landfill	TOX-4	

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	53041 passed 42d survival rate endpoint	36.11%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Control Sed		53041	14	0.3198	1.761	0.3042	CDF	0.3769	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0122065	0.0122065	1	0.1023	0.7538	Non-Significant Effect
Error	1.67094	0.119353	14			
Total	1.68315		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	2.733	8.885	0.2080	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.8538	0.8408	0.0155	Normal Distribution

42d Survival Rate Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	8	0.7375	0.4587	1.0000	0.8000	0.0000	1.0000	0.1179	45.23%	0.00%
53041		8	0.7000	0.5104	0.8896	0.7500	0.2000	0.9000	0.0802	32.40%	5.08%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	8	1.0610	0.7113	1.4100	1.1070	0.1588	1.4120	0.1478	39.41%	0.00%
53041		8	1.0060	0.7942	1.2170	1.0490	0.4636	1.2490	0.0894	25.15%	5.21%

42d Survival Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040	CS	0.6000	1.0000	1.0000	0.0000	1.0000	0.8000	0.7000	0.8000
53041		0.9000	0.8000	0.8000	0.7000	0.7000	0.6000	0.2000	0.9000

Angular (Corrected) Transformed Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040	CS	0.8861	1.4120	1.4120	0.1588	1.4120	1.1070	0.9912	1.1070
53041		1.2490	1.1070	1.1070	0.9912	0.9912	0.8861	0.4636	1.2490

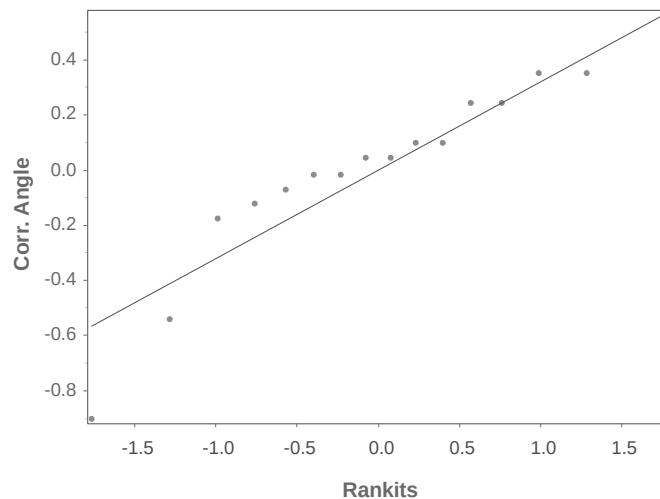
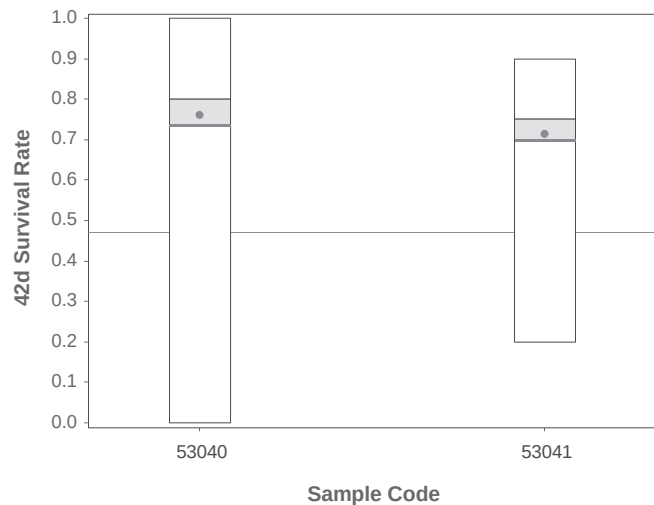
Hyalella 42-d Survival, Growth, and Reproduction Sediment Test

Aquatec Environmental, Inc.

Analysis ID: 10-7951-2039 Endpoint: 42d Survival Rate
Analyzed: 06 Mar-22 12:22 Analysis: Parametric-Two Sample
Edit Date: 04 Mar-22 11:59 MD5 Hash: 6AE82762D14E5182763523832F6B8D77

CETIS Version: CETISv2.1.1
Status Level: 1
Editor ID:

Graphics



CETIS Analytical Report

Report Date: 07 Mar-22 11:50 (p 87 of 96)
Test Code/ID: 16245 CTRL / 10-1800-7441

Hyaella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID: 09-3118-6769	Endpoint: 42d Survival Rate	CETIS Version: CETISv2.1.1
Analyzed: 06 Mar-22 12:22	Analysis: Parametric-Two Sample	Status Level: 1
Edit Date: 04 Mar-22 11:59	MD5 Hash: C317418865A07C93B46A2B21486AA099	Editor ID:
Batch ID: 08-4000-1972	Test Type: Hyaella (42d)	Analyst: C. Mattheus Ayers
Start Date: 06 Jan-22 15:25	Protocol: EPA/600/R-99/064 (2000)	Diluent: Reconstituted Water
Ending Date: 17 Feb-22 12:00	Species: Hyaella azteca	Brine:
Test Length: 41d 21h	Taxon: Malacostraca	Source: Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, In	Sediment Testing
53042	04-7178-2695	21 Dec-21 13:38	21 Dec-21 20:00	16d 2h (0.6 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53042	Sediment	Belmont Landfill	TOX-1	

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	53042 passed 42d survival rate endpoint	40.00%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Control Sed		53042	14	0.794	1.761	0.333	CDF	0.2202	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0901659	0.0901659	1	0.6304	0.4404	Non-Significant Effect
Error	2.00228	0.14302	14			
Total	2.09245		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.571	8.885	0.5659	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.8721	0.8408	0.0293	Normal Distribution

42d Survival Rate Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	8	0.7375	0.4587	1.0000	0.8000	0.0000	1.0000	0.1179	45.23%	0.00%
53042		8	0.6125	0.3660	0.8590	0.7333	0.1000	0.9000	0.1043	48.15%	16.95%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	8	1.0610	0.7113	1.4100	1.1070	0.1588	1.4120	0.1478	39.41%	0.00%
53042		8	0.9107	0.6318	1.1900	1.0330	0.3218	1.2490	0.1179	36.63%	14.15%

42d Survival Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040	CS	0.6000	1.0000	1.0000	0.0000	1.0000	0.8000	0.7000	0.8000
53042		0.6000	0.8000	0.5000	0.1000	0.8000	0.9000	0.9000	0.3000

Angular (Corrected) Transformed Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040	CS	0.8861	1.4120	1.4120	0.1588	1.4120	1.1070	0.9912	1.1070
53042		0.8861	1.1070	0.7854	0.3218	1.1070	1.2490	1.2490	0.5796

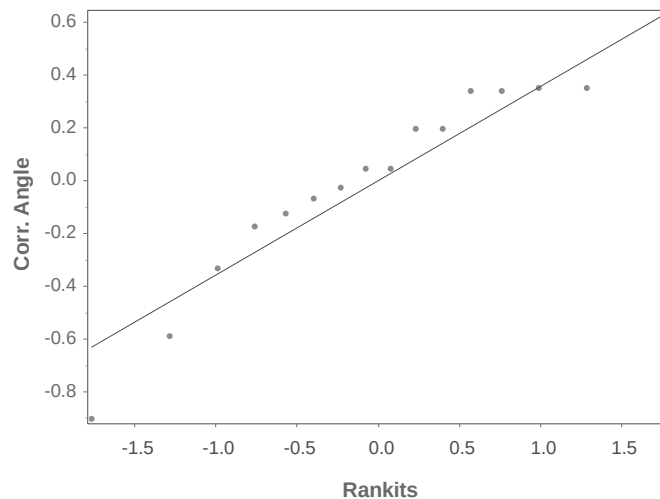
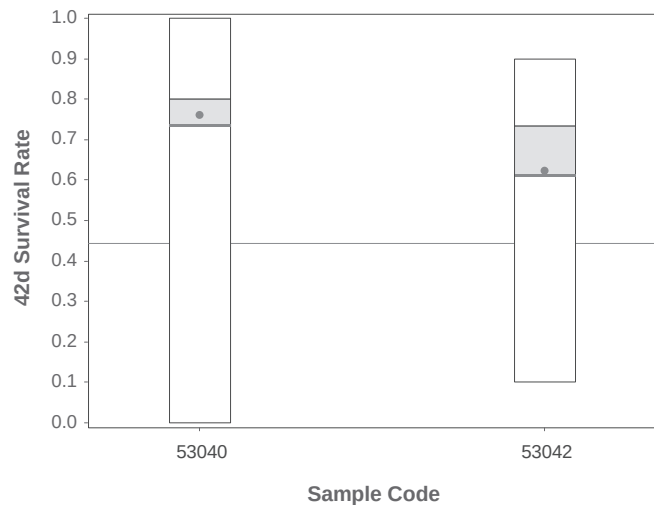
Hyalella 42-d Survival, Growth, and Reproduction Sediment Test

Aquatec Environmental, Inc.

Analysis ID: 09-3118-6769 Endpoint: 42d Survival Rate
Analyzed: 06 Mar-22 12:22 Analysis: Parametric-Two Sample
Edit Date: 04 Mar-22 11:59 MD5 Hash: C317418865A07C93B46A2B21486AA099

CETIS Version: CETISv2.1.1
Status Level: 1
Editor ID:

Graphics



CETIS Analytical Report

Report Date: 07 Mar-22 11:50 (p 89 of 96)
 Test Code/ID: 16245 CTRL / 10-1800-7441

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test **Aquatec Environmental, Inc.**

Analysis ID:	20-2053-3015	Endpoint:	42d Survival Rate	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 12:22	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 11:59	MD5 Hash:	F4C48337C324A5552BC477BACF220468	Editor ID:	
Batch ID:	08-4000-1972	Test Type:	Hyalella (42d)	Analyst:	C. Mattheus Ayers
Start Date:	06 Jan-22 15:25	Protocol:	EPA/600/R-99/064 (2000)	Diluent:	Reconstituted Water
Ending Date:	17 Feb-22 12:00	Species:	Hyalella azteca	Brine:	
Test Length:	41d 21h	Taxon:	Malacostraca	Source:	Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, Inc	Sediment Testing
53043	20-0010-4712	21 Dec-21 12:35	21 Dec-21 20:00	16d 3h (0.6 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53043	Sediment	Belmont Landfill	TOX-2	

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	53043 passed 42d survival rate endpoint	34.31%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Control Sed		53043	14	-1.163	1.761	0.2909	CDF	0.8679	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.147654	0.147654	1	1.353	0.2642	Non-Significant Effect
Error	1.52774	0.109125	14			
Total	1.6754		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	4.019	8.885	0.0866	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.863	0.8408	0.0213	Normal Distribution

42d Survival Rate Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	8	0.7375	0.4587	1.0000	0.8000	0.0000	1.0000	0.1179	45.23%	0.00%
53043		8	0.8875	0.7577	1.0000	0.9667	0.6000	1.0000	0.0549	17.49%	-20.34%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	8	1.0610	0.7113	1.4100	1.1070	0.1588	1.4120	0.1478	39.41%	0.00%
53043		8	1.2530	1.0790	1.4270	1.3580	0.8861	1.4120	0.0737	16.64%	-18.11%

42d Survival Rate Detail

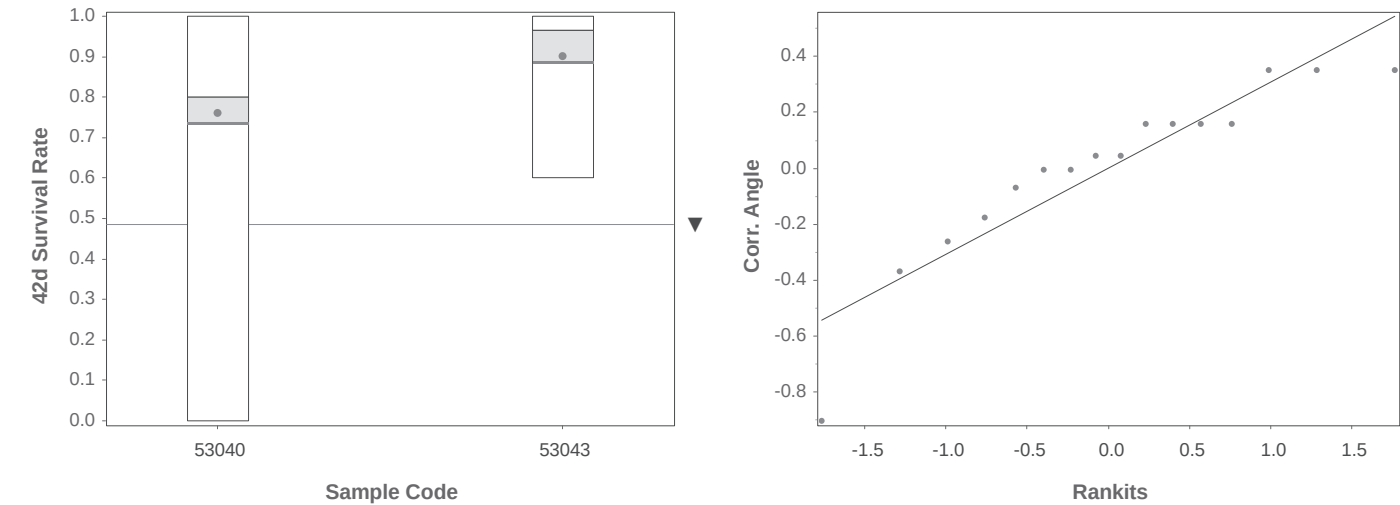
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040	CS	0.6000	1.0000	1.0000	0.0000	1.0000	0.8000	0.7000	0.8000
53043		1.0000	0.9000	0.9000	1.0000	1.0000	0.7000	1.0000	0.6000

Angular (Corrected) Transformed Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040	CS	0.8861	1.4120	1.4120	0.1588	1.4120	1.1070	0.9912	1.1070
53043		1.4120	1.2490	1.2490	1.4120	1.4120	0.9912	1.4120	0.8861

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test			Aquatec Environmental, Inc.	
Analysis ID:	20-2053-3015	Endpoint:	42d Survival Rate	CETIS Version: CETISv2.1.1
Analyzed:	06 Mar-22 12:22	Analysis:	Parametric-Two Sample	Status Level: 1
Edit Date:	04 Mar-22 11:59	MD5 Hash:	F4C48337C324A5552BC477BACF220468	Editor ID:

Graphics



CETIS Analytical Report

Report Date: 07 Mar-22 11:50 (p 91 of 96)
Test Code/ID: 16245 CTRL / 10-1800-7441

Hyaella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID: 05-6832-6513	Endpoint: 42d Survival Rate	CETIS Version: CETISv2.1.1
Analyzed: 06 Mar-22 12:22	Analysis: Nonparametric-Two Sample	Status Level: 1
Edit Date: 04 Mar-22 11:59	MD5 Hash: B5DA9F09A53B379B68C50F05621FA445	Editor ID:
Batch ID: 08-4000-1972	Test Type: Hyaella (42d)	Analyst: C. Mattheus Ayers
Start Date: 06 Jan-22 15:25	Protocol: EPA/600/R-99/064 (2000)	Diluent: Reconstituted Water
Ending Date: 17 Feb-22 12:00	Species: Hyaella azteca	Brine:
Test Length: 41d 21h	Taxon: Malacostraca	Source: Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, In	Sediment Testing
53044	00-4677-6467	21 Dec-21 11:25	21 Dec-21 20:00	16d 4h (0.6 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53044	Sediment	Belmont Landfill	TOX-3	

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	53044 passed 42d survival rate endpoint	31.85%

Wilcoxon Rank Sum Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	Ties	P-Type	P-Value	Decision(α:5%)
Control Sed		53044	14	72	---	3	Exact	0.6788	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0606879	0.0606879	1	0.6327	0.4397	Non-Significant Effect
Error	1.34296	0.095926	14			
Total	1.40365		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	10.23	8.885	0.0066	Unequal Variances
Distribution	Shapiro-Wilk W Normality Test	0.8163	0.8408	0.0045	Non-Normal Distribution

42d Survival Rate Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	8	0.7375	0.4587	1.0000	0.8000	0.0000	1.0000	0.1179	45.23%	0.00%
53044		8	0.8500	0.7726	0.9274	0.8500	0.7000	1.0000	0.0327	10.89%	-15.25%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	8	1.0610	0.7113	1.4100	1.1070	0.1588	1.4120	0.1478	39.41%	0.00%
53044		8	1.1840	1.0750	1.2930	1.1780	0.9912	1.4120	0.0462	11.04%	-11.61%

42d Survival Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040	CS	0.6000	1.0000	1.0000	0.0000	1.0000	0.8000	0.7000	0.8000
53044		0.8000	1.0000	0.7000	0.8000	0.9000	0.8000	0.9000	0.9000

Angular (Corrected) Transformed Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040	CS	0.8861	1.4120	1.4120	0.1588	1.4120	1.1070	0.9912	1.1070
53044		1.1070	1.4120	0.9912	1.1070	1.2490	1.1070	1.2490	1.2490

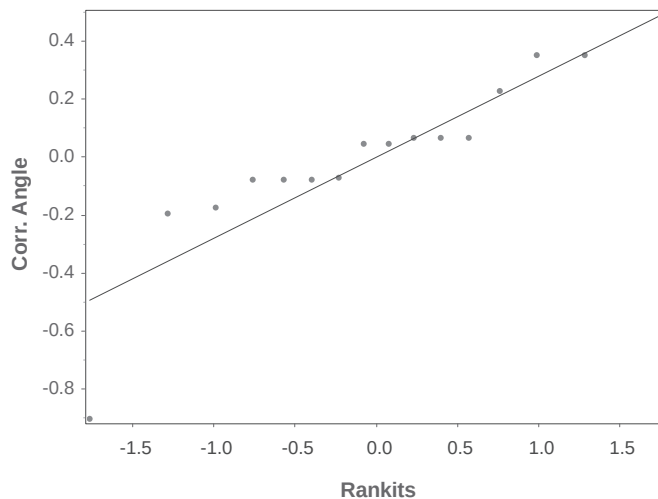
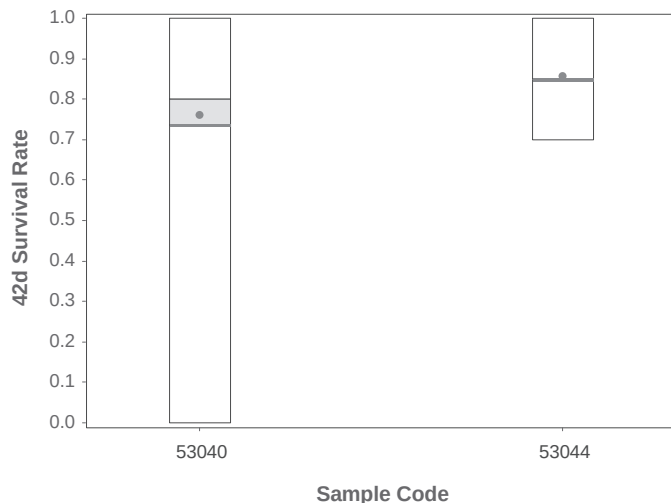
Hyalella 42-d Survival, Growth, and Reproduction Sediment Test

Aquatec Environmental, Inc.

Analysis ID: 05-6832-6513 Endpoint: 42d Survival Rate
Analyzed: 06 Mar-22 12:22 Analysis: Nonparametric-Two Sample
Edit Date: 04 Mar-22 11:59 MD5 Hash: B5DA9F09A53B379B68C50F05621FA445

CETIS Version: CETISv2.1.1
Status Level: 1
Editor ID:

Graphics



CETIS Analytical Report

Report Date: 07 Mar-22 11:50 (p 93 of 96)
Test Code/ID: 16245 CTRL / 10-1800-7441

Hyaella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID: 00-4262-1246	Endpoint: 42d Survival Rate	CETIS Version: CETISv2.1.1
Analyzed: 06 Mar-22 12:23	Analysis: Parametric-Two Sample	Status Level: 1
Edit Date: 04 Mar-22 11:59	MD5 Hash: E45C29BF794128239264B0D9EA16E27A	Editor ID:
Batch ID: 08-4000-1972	Test Type: Hyaella (42d)	Analyst: C. Mattheus Ayers
Start Date: 06 Jan-22 15:25	Protocol: EPA/600/R-99/064 (2000)	Diluent: Reconstituted Water
Ending Date: 17 Feb-22 12:00	Species: Hyaella azteca	Brine:
Test Length: 41d 21h	Taxon: Malacostraca	Source: Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, In	Sediment Testing
53045	13-5487-4433	21 Dec-21 14:22	21 Dec-21 20:00	16d 1h (0.3 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53045	Sediment	Belmont Landfill	TOX-5	

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	53045 passed 42d survival rate endpoint	34.47%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Control Sed		53045	14	-0.623	1.761	0.2921	CDF	0.7283	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0427059	0.0427059	1	0.3881	0.5433	Non-Significant Effect
Error	1.54054	0.110039	14			
Total	1.58325		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	3.857	8.885	0.0957	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.8684	0.8408	0.0257	Normal Distribution

42d Survival Rate Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	8	0.7375	0.4587	1.0000	0.8000	0.0000	1.0000	0.1179	45.23%	0.00%
53045		8	0.8250	0.6855	0.9645	0.8500	0.5000	1.0000	0.0590	20.23%	-11.86%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	8	1.0610	0.7113	1.4100	1.1070	0.1588	1.4120	0.1478	39.41%	0.00%
53045		8	1.1640	0.9862	1.3420	1.1780	0.7854	1.4120	0.0753	18.29%	-9.74%

42d Survival Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040	CS	0.6000	1.0000	1.0000	0.0000	1.0000	0.8000	0.7000	0.8000
53045		0.7000	0.9000	1.0000	0.9000	1.0000	0.8000	0.8000	0.5000

Angular (Corrected) Transformed Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040	CS	0.8861	1.4120	1.4120	0.1588	1.4120	1.1070	0.9912	1.1070
53045		0.9912	1.2490	1.4120	1.2490	1.4120	1.1070	1.1070	0.7854

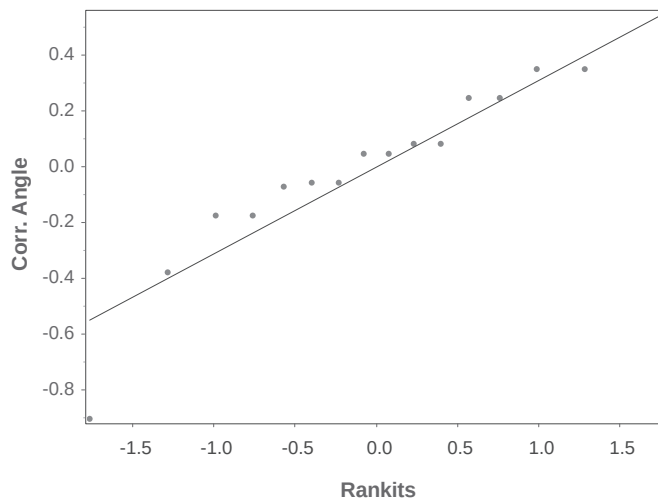
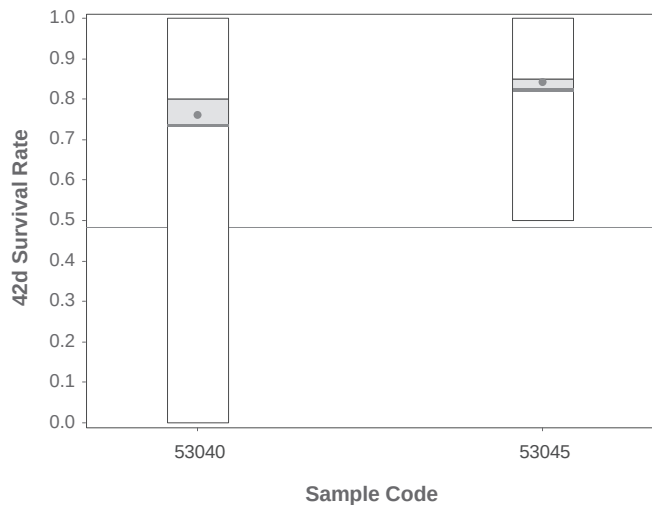
Hyalella 42-d Survival, Growth, and Reproduction Sediment Test

Aquatec Environmental, Inc.

Analysis ID: 00-4262-1246 Endpoint: 42d Survival Rate
Analyzed: 06 Mar-22 12:23 Analysis: Parametric-Two Sample
Edit Date: 04 Mar-22 11:59 MD5 Hash: E45C29BF794128239264B0D9EA16E27A

CETIS Version: CETISv2.1.1
Status Level: 1
Editor ID:

Graphics



CETIS Analytical Report

Report Date: 07 Mar-22 11:50 (p 95 of 96)
 Test Code/ID: 16245 CTRL / 10-1800-7441

Hyaella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID:	14-5644-1465	Endpoint:	42d Survival Rate	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 12:23	Analysis:	Nonparametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 11:59	MD5 Hash:	37FD002B0C7A4603C5A52EAA702380DA	Editor ID:	
Batch ID:	08-4000-1972	Test Type:	Hyaella (42d)	Analyst:	C. Mattheus Ayers
Start Date:	06 Jan-22 15:25	Protocol:	EPA/600/R-99/064 (2000)	Diluent:	Reconstituted Water
Ending Date:	17 Feb-22 12:00	Species:	Hyaella azteca	Brine:	
Test Length:	41d 21h	Taxon:	Malacostraca	Source:	Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, In	Sediment Testing
53046	12-3611-8332	21 Dec-21 15:54	21 Dec-21 20:00	16d (0.3 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53046	Reference sediment	Belmont Landfill	TOX-6	

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	53046 passed 42d survival rate endpoint	31.79%

Wilcoxon Rank Sum Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	Ties	P-Type	P-Value	Decision(α:5%)
Control Sed		53046	14	73	---	3	Exact	0.7211	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0794244	0.0794244	1	0.8306	0.3775	Non-Significant Effect
Error	1.33878	0.0956272	14			
Total	1.4182		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	10.6	8.885	0.0059	Unequal Variances
Distribution	Shapiro-Wilk W Normality Test	0.8117	0.8408	0.0039	Non-Normal Distribution

42d Survival Rate Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	8	0.7375	0.4587	1.0000	0.8000	0.0000	1.0000	0.1179	45.23%	0.00%
53046		8	0.8625	0.7859	0.9391	0.9000	0.7000	1.0000	0.0324	10.62%	-16.95%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	8	1.0610	0.7113	1.4100	1.1070	0.1588	1.4120	0.1478	39.41%	0.00%
53046		8	1.2020	1.0940	1.3090	1.2490	0.9912	1.4120	0.0454	10.68%	-13.28%

42d Survival Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040	CS	0.6000	1.0000	1.0000	0.0000	1.0000	0.8000	0.7000	0.8000
53046		0.9000	1.0000	0.7000	0.8000	0.9000	0.8000	0.9000	0.9000

Angular (Corrected) Transformed Detail

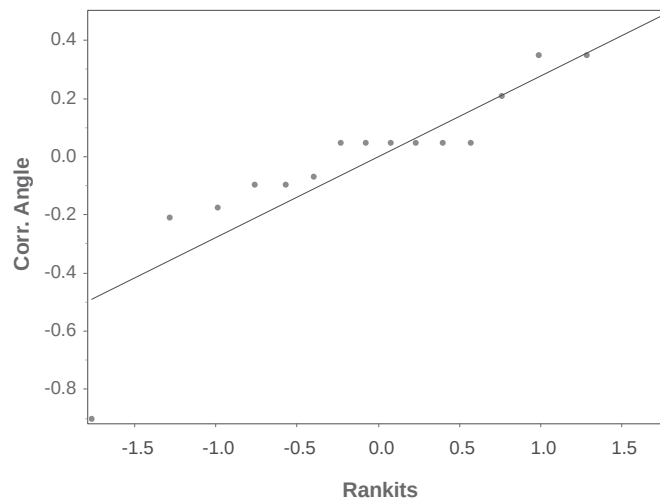
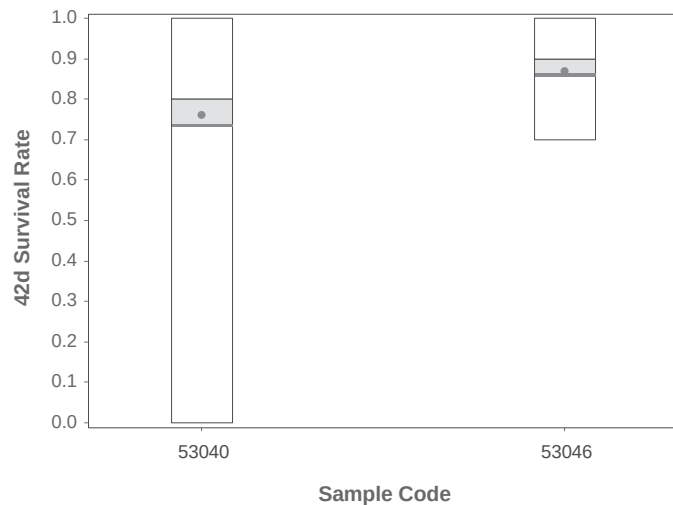
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040	CS	0.8861	1.4120	1.4120	0.1588	1.4120	1.1070	0.9912	1.1070
53046		1.2490	1.4120	0.9912	1.1070	1.2490	1.1070	1.2490	1.2490

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test

Aquatec Environmental, Inc.

Analysis ID:	14-5644-1465	Endpoint:	42d Survival Rate	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 12:23	Analysis:	Nonparametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 11:59	MD5 Hash:	37FD002B0C7A4603C5A52EAA702380DA	Editor ID:	

Graphics



CTRL (53040) w/o Rep D vs. Samples

- CETIS™ Summary Report
- CETIS™ Analytical Reports

CETIS Summary Report

Report Date: 07 Mar-22 12:01 (p 1 of 7)
Test Code/ID: 16245 OUT / 18-8933-1045

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test				Aquatec Environmental, Inc.	
Batch ID:	16-7279-9191	Test Type:	Hyalella (42d)	Analyst:	C. Matthaus Ayers
Start Date:	06 Jan-22 15:25	Protocol:	EPA/600/R-99/064 (2000)	Diluent:	Reconstituted Water
Ending Date:	17 Feb-22 12:00	Species:	Hyalella azteca	Brine:	
Test Length:	41d 21h	Taxon:	Malacostraca	Source:	Aquatic Research Organism Age: 8d
Sample ID:	16-3107-9284	Code:	53040	Project:	Sediment Testing
Sample Date:	04 Jan-22 07:00	Material:	Control Sediment	Source:	Internal Laboratory Testing
Receipt Date:	04 Jan-22 08:00	CAS (PC):		Station:	Control
Sample Age:	56h	Client:	Aquatec Environmental, Inc.		

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, In	Sediment Testing
53041	03-8171-1181	21 Dec-21 09:05	21 Dec-21 20:00	16d 6h (0.3 °C)	Woods Hole Group	
53042	04-7178-2695	21 Dec-21 13:38	21 Dec-21 20:00	16d 2h (0.6 °C)		
53043	20-0010-4712	21 Dec-21 12:35	21 Dec-21 20:00	16d 3h (0.6 °C)		
53044	00-4677-6467	21 Dec-21 11:25	21 Dec-21 20:00	16d 4h (0.6 °C)		
53045	13-5487-4433	21 Dec-21 14:22	21 Dec-21 20:00	16d 1h (0.3 °C)		
53046	12-3611-8332	21 Dec-21 15:54	21 Dec-21 20:00	16d (0.3 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53041	Sediment	Belmont Landfill	TOX-4	
53042	Sediment	Belmont Landfill	TOX-1	
53043	Sediment	Belmont Landfill	TOX-2	
53044	Sediment	Belmont Landfill	TOX-3	
53045	Sediment	Belmont Landfill	TOX-5	
53046	Reference sediment	Belmont Landfill	TOX-6	

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
09-9944-2496	28d Biomass	Equal Variance t Two-Sample Test	0.6803	53041 passed 28d biomass	1
16-3707-1742	28d Biomass	Equal Variance t Two-Sample Test	0.0983	53042 passed 28d biomass	1
17-5279-1967	28d Biomass	Equal Variance t Two-Sample Test	0.9752	53043 passed 28d biomass	1
04-9166-0240	28d Biomass	Equal Variance t Two-Sample Test	0.2940	53044 passed 28d biomass	1
21-0466-8562	28d Biomass	Equal Variance t Two-Sample Test	0.9994	53045 passed 28d biomass	1
14-8765-0859	28d Biomass	Equal Variance t Two-Sample Test	1.0000	53046 passed 28d biomass	1
02-1413-5167	28d Mean Dry Weight	Equal Variance t Two-Sample Test	0.2282	53041 passed 28d mean dry weight	1
12-4052-2591	28d Mean Dry Weight	Equal Variance t Two-Sample Test	0.0261	53042 failed 28d mean dry weight	1
07-8649-5635	28d Mean Dry Weight	Equal Variance t Two-Sample Test	0.4114	53043 passed 28d mean dry weight	1
06-9311-8690	28d Mean Dry Weight	Equal Variance t Two-Sample Test	0.1477	53044 passed 28d mean dry weight	1
19-9269-1964	28d Mean Dry Weight	Equal Variance t Two-Sample Test	0.9990	53045 passed 28d mean dry weight	1
01-8044-8909	28d Mean Dry Weight	Equal Variance t Two-Sample Test	0.9998	53046 passed 28d mean dry weight	1
20-2074-3842	28d Survival Rate	Wilcoxon Rank Sum Two-Sample Test	0.7063	53041 passed 28d survival rate	1
00-7981-5644	28d Survival Rate	Equal Variance t Two-Sample Test	0.0502	53042 passed 28d survival rate	1
05-3578-2602	28d Survival Rate	Wilcoxon Rank Sum Two-Sample Test	0.9190	53043 passed 28d survival rate	1
01-2270-4961	28d Survival Rate	Wilcoxon Rank Sum Two-Sample Test	0.7708	53044 passed 28d survival rate	1
13-3916-9274	28d Survival Rate	Wilcoxon Rank Sum Two-Sample Test	0.7708	53045 passed 28d survival rate	1
06-2655-6996	28d Survival Rate	Equal Variance t Two-Sample Test	0.9432	53046 passed 28d survival rate	1
18-6087-0611	35d Survival Rate	Equal Variance t Two-Sample Test	0.6023	53041 passed 35d survival rate	1
21-0198-0609	35d Survival Rate	Equal Variance t Two-Sample Test	0.0480	53042 failed 35d survival rate	1
00-2166-7010	35d Survival Rate	Equal Variance t Two-Sample Test	0.6871	53043 passed 35d survival rate	1
19-5040-5406	35d Survival Rate	Equal Variance t Two-Sample Test	0.6615	53044 passed 35d survival rate	1
11-3701-9996	35d Survival Rate	Wilcoxon Rank Sum Two-Sample Test	0.5734	53045 passed 35d survival rate	1
09-7383-6621	35d Survival Rate	Equal Variance t Two-Sample Test	0.8693	53046 passed 35d survival rate	1
19-7212-9542	42d Biomass	Equal Variance t Two-Sample Test	0.0183	53041 failed 42d biomass	1
03-1579-9877	42d Biomass	Unequal Variance t Two-Sample Test	0.0752	53042 passed 42d biomass	1
01-4634-8455	42d Biomass	Equal Variance t Two-Sample Test	0.9725	53043 passed 42d biomass	1

CETIS Summary Report

Report Date: 07 Mar-22 12:01 (p 2 of 7)
Test Code/ID: 16245 OUT / 18-8933-1045

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test

Aquatec Environmental, Inc.

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
14-2853-6076	42d Biomass	Equal Variance t Two-Sample Test	0.3320	53044 passed 42d biomass	1
16-5003-3901	42d Biomass	Unequal Variance t Two-Sample Test	0.7955	53045 passed 42d biomass	1
20-6420-3425	42d Biomass	Equal Variance t Two-Sample Test	0.9997	53046 passed 42d biomass	1
00-5359-3530	42d Mean Dry Weight	Equal Variance t Two-Sample Test	0.0447	53041 failed 42d mean dry weight	1
17-1253-2939	42d Mean Dry Weight	Equal Variance t Two-Sample Test	0.5571	53042 passed 42d mean dry weight	1
02-7101-8630	42d Mean Dry Weight	Equal Variance t Two-Sample Test	0.9142	53043 passed 42d mean dry weight	1
05-7354-4555	42d Mean Dry Weight	Equal Variance t Two-Sample Test	0.2901	53044 passed 42d mean dry weight	1
16-7053-6393	42d Mean Dry Weight	Equal Variance t Two-Sample Test	0.8002	53045 passed 42d mean dry weight	1
16-1413-9098	42d Mean Dry Weight	Equal Variance t Two-Sample Test	0.9986	53046 passed 42d mean dry weight	1
03-5931-7836	42d Reproduction	Equal Variance t Two-Sample Test	0.0250	53041 failed 42d reproduction	1
09-6173-0750	42d Reproduction	Equal Variance t Two-Sample Test	0.1007	53042 passed 42d reproduction	1
15-0785-7601	42d Reproduction	Equal Variance t Two-Sample Test	0.3587	53043 passed 42d reproduction	1
11-6380-6705	42d Reproduction	Equal Variance t Two-Sample Test	0.6521	53044 passed 42d reproduction	1
21-0092-0398	42d Reproduction	Equal Variance t Two-Sample Test	0.9109	53045 passed 42d reproduction	1
20-7902-7207	42d Reproduction	Equal Variance t Two-Sample Test	0.9891	53046 passed 42d reproduction	1
04-4945-9872	42d Survival Rate	Equal Variance t Two-Sample Test	0.0801	53041 passed 42d survival rate	1
11-0752-4344	42d Survival Rate	Equal Variance t Two-Sample Test	0.0416	53042 failed 42d survival rate	1
10-0713-8544	42d Survival Rate	Equal Variance t Two-Sample Test	0.7108	53043 passed 42d survival rate	1
07-7130-4223	42d Survival Rate	Equal Variance t Two-Sample Test	0.4759	53044 passed 42d survival rate	1
16-9034-3377	42d Survival Rate	Equal Variance t Two-Sample Test	0.4117	53045 passed 42d survival rate	1
09-5994-4623	42d Survival Rate	Equal Variance t Two-Sample Test	0.5512	53046 passed 42d survival rate	1

CETIS Summary Report

Report Date: 07 Mar-22 12:01 (p 3 of 7)
Test Code/ID: 16245 OUT / 18-8933-1045

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test

Aquatec Environmental, Inc.

28d Biomass Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
53040	CS	4	0.2917	0.2444	0.339	0.265	0.3318	0.01487	0.02974	10.20%	0.00%
53041		4	0.3025	0.2514	0.3536	0.26	0.335	0.01605	0.03211	10.61%	-3.70%
53042		4	0.2625	0.2194	0.3056	0.223	0.284	0.01353	0.02706	10.31%	10.01%
53043		4	0.341	0.298	0.384	0.317	0.379	0.01351	0.02702	7.92%	-16.90%
53044		4	0.2798	0.233	0.3265	0.236	0.299	0.01468	0.02936	10.50%	4.10%
53045		4	0.4567	0.3802	0.5333	0.411	0.524	0.02406	0.04811	10.53%	-56.58%
53046		4	0.5372	0.4922	0.5823	0.506	0.574	0.01415	0.0283	5.27%	-84.18%

28d Mean Dry Weight Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
53040	CS	4	0.3469	0.2788	0.415	0.2944	0.3914	0.0214	0.0428	12.34%	0.00%
53041		4	0.3268	0.284	0.3696	0.2889	0.3522	0.01345	0.02689	8.23%	5.80%
53042		4	0.2841	0.2369	0.3312	0.2478	0.3156	0.0148	0.02961	10.42%	18.12%
53043		4	0.341	0.298	0.384	0.317	0.379	0.01351	0.02702	7.92%	1.71%
53044		4	0.3132	0.2489	0.3775	0.291	0.3737	0.0202	0.04041	12.90%	9.72%
53045		4	0.495	0.4341	0.5559	0.439	0.524	0.01914	0.03829	7.73%	-42.69%
53046		4	0.5372	0.4922	0.5823	0.506	0.574	0.01415	0.0283	5.27%	-54.86%

28d Survival Rate Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
53040	CS	11	0.9091	0.8389	0.9793	0.7000	1.0000	0.0315	0.1044	11.49%	0.00%
53041		12	0.9333	0.8769	0.9897	0.7000	1.0000	0.0256	0.0888	9.51%	-2.67%
53042		12	0.8333	0.7600	0.9067	0.6000	1.0000	0.0333	0.1155	13.86%	8.33%
53043		12	0.9583	0.9011	1.0160	0.7000	1.0000	0.0260	0.0900	9.39%	-5.42%
53044		12	0.9417	0.8913	0.9920	0.8000	1.0000	0.0229	0.0793	8.42%	-3.58%
53045		12	0.9417	0.8913	0.9920	0.8000	1.0000	0.0229	0.0793	8.42%	-3.58%
53046		12	0.9667	0.9354	0.9980	0.9000	1.0000	0.0142	0.0492	5.09%	-6.33%

35d Survival Rate Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
53040	CS	7	0.8714	0.7555	0.9874	0.7000	1.0000	0.0474	0.1254	14.39%	0.00%
53041		8	0.8875	0.7833	0.9917	0.7000	1.0000	0.0441	0.1246	14.04%	-1.84%
53042		8	0.7375	0.5966	0.8784	0.4000	0.9000	0.0596	0.1685	22.85%	15.37%
53043		8	0.9000	0.7659	1.0340	0.6000	1.0000	0.0567	0.1604	17.82%	-3.28%
53044		8	0.9000	0.8553	0.9447	0.8000	1.0000	0.0189	0.0535	5.94%	-3.28%
53045		8	0.8750	0.8009	0.9491	0.8000	1.0000	0.0313	0.0886	10.13%	-0.41%
53046		8	0.9375	0.8753	0.9997	0.8000	1.0000	0.0263	0.0744	7.94%	-7.58%

42d Biomass Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
53040	CS	7	0.442	0.3991	0.4849	0.384	0.513	0.01752	0.04636	10.49%	0.00%
53041		8	0.3095	0.1895	0.4295	0.046	0.483	0.05073	0.1435	46.36%	29.98%
53042		8	0.3324	0.1773	0.4875	0.074	0.49	0.06559	0.1855	55.81%	24.80%
53043		8	0.5146	0.4479	0.5814	0.349	0.603	0.02824	0.07987	15.52%	-16.43%
53044		8	0.4257	0.3537	0.4978	0.243	0.508	0.03047	0.08619	20.24%	3.68%
53045		8	0.4934	0.3603	0.6265	0.17	0.673	0.05629	0.1592	32.27%	-11.62%
53046		8	0.5693	0.5192	0.6193	0.498	0.68	0.02117	0.05987	10.52%	-28.79%

42d Mean Dry Weight Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
53040	CS	7	0.536	0.4593	0.6128	0.439	0.66	0.03135	0.08295	15.47%	0.00%
53041		8	0.4261	0.3108	0.5413	0.2067	0.5612	0.04874	0.1379	32.35%	20.52%
53042		8	0.5453	0.4227	0.6678	0.288	0.74	0.05181	0.1465	26.88%	-1.72%
53043		8	0.5827	0.5523	0.6132	0.53	0.6514	0.01286	0.03639	6.24%	-8.71%
53044		8	0.5063	0.4107	0.602	0.27	0.635	0.04047	0.1145	22.60%	5.54%
53045		8	0.5847	0.4798	0.6896	0.34	0.7478	0.04435	0.1254	21.46%	-9.07%
53046		8	0.6618	0.6228	0.7008	0.5689	0.7114	0.01648	0.04661	7.04%	-23.46%

CETIS Summary Report

Report Date: 07 Mar-22 12:01 (p 4 of 7)
Test Code/ID: 16245 OUT / 18-8933-1045

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test

Aquatec Environmental, Inc.

42d Reproduction Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
53040	CS	7	4.318	2.112	6.523	0	7	0.9013	2.385	55.23%	0.00%
53041		6	1.917	0.5721	3.261	0	3.5	0.5231	1.281	66.85%	55.61%
53042		5	2.45	-0.3472	5.247	0	5.75	1.007	2.253	91.95%	43.26%
53043		8	3.802	1.349	6.255	2	10.5	1.037	2.934	77.18%	11.95%
53044		8	4.688	3.831	5.544	3	6.5	0.3621	1.024	21.85%	-8.56%
53045		8	6.521	3.656	9.386	0	10.5	1.211	3.427	52.55%	-51.02%
53046		8	8.079	5.489	10.67	4.667	14.5	1.095	3.098	38.35%	-87.11%

42d Survival Rate Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
53040	CS	7	0.8429	0.6932	0.9925	0.6000	1.0000	0.0612	0.1618	19.20%	0.00%
53041		8	0.7000	0.5104	0.8896	0.2000	0.9000	0.0802	0.2268	32.40%	16.95%
53042		8	0.6125	0.3660	0.8590	0.1000	0.9000	0.1043	0.2949	48.15%	27.33%
53043		8	0.8875	0.7577	1.0170	0.6000	1.0000	0.0549	0.1553	17.49%	-5.30%
53044		8	0.8500	0.7726	0.9274	0.7000	1.0000	0.0327	0.0926	10.89%	-0.85%
53045		8	0.8250	0.6855	0.9645	0.5000	1.0000	0.0590	0.1669	20.23%	2.12%
53046		8	0.8625	0.7859	0.9391	0.7000	1.0000	0.0324	0.0916	10.62%	-2.33%

CETIS Summary Report

Report Date: 07 Mar-22 12:01 (p 5 of 7)
Test Code/ID: 16245 OUT / 18-8933-1045

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test										Aquatec Environmental, Inc.	
28d Biomass Detail										MD5: 6A35889FAC82A0083A4C34F25C79D9CB	
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53040	CS	---	---	---	---	---	---	---	0.296	0.265	0.274
		0.3318									
53041		---	---	---	---	---	---	---	---	0.26	0.335
		0.298	0.317								
53042		---	---	---	---	---	---	---	---	0.274	0.223
		0.284	0.269								
53043		---	---	---	---	---	---	---	---	0.328	0.34
		0.317	0.379								
53044		---	---	---	---	---	---	---	---	0.291	0.299
		0.293	0.236								
53045		---	---	---	---	---	---	---	---	0.453	0.439
		0.411	0.524								
53046		---	---	---	---	---	---	---	---	0.529	0.54
		0.574	0.506								
28d Mean Dry Weight Detail										MD5: 0356DD1DC72BF990214254847863A120	
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53040	CS	---	---	---	---	---	---	---	0.37	0.2944	0.3914
		0.3318									
53041		---	---	---	---	---	---	---	---	0.2889	0.335
		0.3311	0.3522								
53042		---	---	---	---	---	---	---	---	0.274	0.2478
		0.3156	0.2989								
53043		---	---	---	---	---	---	---	---	0.328	0.34
		0.317	0.379								
53044		---	---	---	---	---	---	---	---	0.291	0.3737
		0.293	0.295								
53045		---	---	---	---	---	---	---	---	0.5033	0.439
		0.5137	0.524								
53046		---	---	---	---	---	---	---	---	0.529	0.54
		0.574	0.506								
28d Survival Rate Detail										MD5: 352242461C8C57CF09347DE0593F0FF6	
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53040	CS	0.9000	1.0000	1.0000	1.0000	1.0000	0.8000	0.9000	0.8000	0.9000	0.7000
		1.0000									
53041		1.0000	1.0000	1.0000	0.9000	0.7000	0.9000	1.0000	1.0000	0.9000	1.0000
		0.9000	0.9000								
53042		0.7000	0.8000	0.9000	0.7000	0.8000	0.9000	0.9000	0.6000	1.0000	0.9000
		0.9000	0.9000								
53043		1.0000	1.0000	0.9000	1.0000	1.0000	0.7000	1.0000	0.9000	1.0000	1.0000
		1.0000	1.0000								
53044		0.9000	1.0000	1.0000	0.9000	1.0000	1.0000	0.9000	1.0000	1.0000	0.8000
		1.0000	0.8000								
53045		1.0000	0.9000	1.0000	1.0000	1.0000	0.9000	0.8000	1.0000	0.9000	1.0000
		0.8000	1.0000								
53046		0.9000	1.0000	0.9000	0.9000	1.0000	1.0000	0.9000	1.0000	1.0000	1.0000
		1.0000	1.0000								

CETIS Summary Report

Report Date: 07 Mar-22 12:01 (p 6 of 7)
Test Code/ID: 16245 OUT / 18-8933-1045

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test										Aquatec Environmental, Inc.	
35d Survival Rate Detail										MD5: 54EBDFCF939745A41FD85627ADB8F7B8	
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53040	CS	0.7000	1.0000	1.0000	1.0000	0.8000	0.8000	0.8000	---	---	---

53041		1.0000	0.9000	1.0000	0.9000	0.7000	0.9000	0.7000	1.0000	---	---
		---	---								
53042		0.7000	0.8000	0.8000	0.4000	0.8000	0.9000	0.9000	0.6000	---	---
		---	---								
53043		1.0000	1.0000	0.9000	1.0000	1.0000	0.7000	1.0000	0.6000	---	---
		---	---								
53044		0.9000	1.0000	0.9000	0.9000	0.9000	0.8000	0.9000	0.9000	---	---
		---	---								
53045		0.8000	0.9000	1.0000	0.9000	1.0000	0.8000	0.8000	0.8000	---	---
		---	---								
53046		0.9000	1.0000	0.9000	0.8000	1.0000	1.0000	0.9000	1.0000	---	---
		---	---								
42d Biomass Detail										MD5: A0FA61EB6A264212887013414D2EFCCF	
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53040	CS	0.396	0.513	0.488	0.439	0.384	0.447	0.427	---	---	---

53041		0.186	0.449	0.362	0.297	0.383	0.27	0.046	0.483	---	---
		---	---								
53042		0.399	0.487	0.144	0.074	0.49	0.459	0.487	0.119	---	---
		---	---								
53043		0.603	0.533	0.518	0.58	0.53	0.456	0.548	0.349	---	---
		---	---								
53044		0.508	0.462	0.424	0.361	0.243	0.449	0.481	0.478	---	---
		---	---								
53045		0.462	0.488	0.655	0.673	0.565	0.526	0.408	0.17	---	---
		---	---								
53046		0.606	0.68	0.498	0.548	0.612	0.546	0.512	0.552	---	---
		---	---								
42d Mean Dry Weight Detail										MD5: 32F7580CAD2FEEB03C10AAFAEF5D6EAE	
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53040	CS	0.66	0.513	0.488	0.439	0.48	0.6386	0.5338	---	---	---

53041		0.2067	0.5612	0.4525	0.4243	0.5471	0.45	0.23	0.5367	---	---
		---	---								
53042		0.665	0.6087	0.288	0.74	0.6125	0.51	0.5411	0.3967	---	---
		---	---								
53043		0.603	0.5922	0.5756	0.58	0.53	0.6514	0.548	0.5817	---	---
		---	---								
53044		0.635	0.462	0.6057	0.4513	0.27	0.5612	0.5344	0.5311	---	---
		---	---								
53045		0.66	0.5422	0.655	0.7478	0.565	0.6575	0.51	0.34	---	---
		---	---								
53046		0.6733	0.68	0.7114	0.685	0.68	0.6825	0.5689	0.6133	---	---
		---	---								

CETIS Summary Report

Report Date: 07 Mar-22 12:01 (p 7 of 7)
 Test Code/ID: 16245 OUT / 18-8933-1045

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

42d Reproduction Detail											MD5: 0D103FCAFE929F7381943442E0CA664
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53040	CS	6.5	3	4	4.125	5.6	7	0	---	---	---

53041		---	2	1	2	3.5	0	---	3	---	---
		---	---								
53042		2	3.5	---	---	5.75	1	0	---	---	---
		---	---								
53043		10.5	2	2.5	5.5	2	3	2.25	2.667	---	---
		---	---								
53044		3	5.4	4	5	4.667	6.5	4.333	4.6	---	---
		---	---								
53045		0	7.667	8.333	5	6.333	10.5	4.333	10	---	---
		---	---								
53046		10	6	14.5	4.667	8.667	8	6	6.8	---	---
		---	---								

42d Survival Rate Detail											MD5: 99C8CCAB5426864572BB8CC4CC8664FB
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53040	CS	0.6000	1.0000	1.0000	1.0000	0.8000	0.7000	0.8000	---	---	---

53041		0.9000	0.8000	0.8000	0.7000	0.7000	0.6000	0.2000	0.9000	---	---
		---	---								
53042		0.6000	0.8000	0.5000	0.1000	0.8000	0.9000	0.9000	0.3000	---	---
		---	---								
53043		1.0000	0.9000	0.9000	1.0000	1.0000	0.7000	1.0000	0.6000	---	---
		---	---								
53044		0.8000	1.0000	0.7000	0.8000	0.9000	0.8000	0.9000	0.9000	---	---
		---	---								
53045		0.7000	0.9000	1.0000	0.9000	1.0000	0.8000	0.8000	0.5000	---	---
		---	---								
53046		0.9000	1.0000	0.7000	0.8000	0.9000	0.8000	0.9000	0.9000	---	---
		---	---								

CETIS Analytical Report

Report Date: 07 Mar-22 12:00 (p 1 of 96)
 Test Code/ID: 16245 OUT / 18-8933-1045

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID:	09-9944-2496	Endpoint:	28d Biomass	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 13:47	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 14:38	MD5 Hash:	3E90ACE19A5B4EA57461AC8D5C4708B2	Editor ID:	007-856-968-0
Batch ID:	16-7279-9191	Test Type:	Hyalella (42d)	Analyst:	C. Matthauss Ayers
Start Date:	06 Jan-22 15:25	Protocol:	EPA/600/R-99/064 (2000)	Diluent:	Reconstituted Water
Ending Date:	17 Feb-22 12:00	Species:	Hyalella azteca	Brine:	
Test Length:	41d 21h	Taxon:	Malacostraca	Source:	Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, Inc.	Sediment Testing
53041	03-8171-1181	21 Dec-21 09:05	21 Dec-21 20:00	16d 6h (0.3 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53041	Sediment	Belmont Landfill	TOX-4	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53041 passed 28d biomass endpoint	14.58%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Control Sed		53041	6	-0.4933	1.943	0.04253	CDF	0.6803	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.00023308	0.00023308	1	0.2433	0.6393	Non-Significant Effect
Error	0.00574714	0.00095786	6			
Total	0.00598022		7			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.165	47.47	0.9029	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9748	0.6451	0.9328	Normal Distribution

28d Biomass Summary

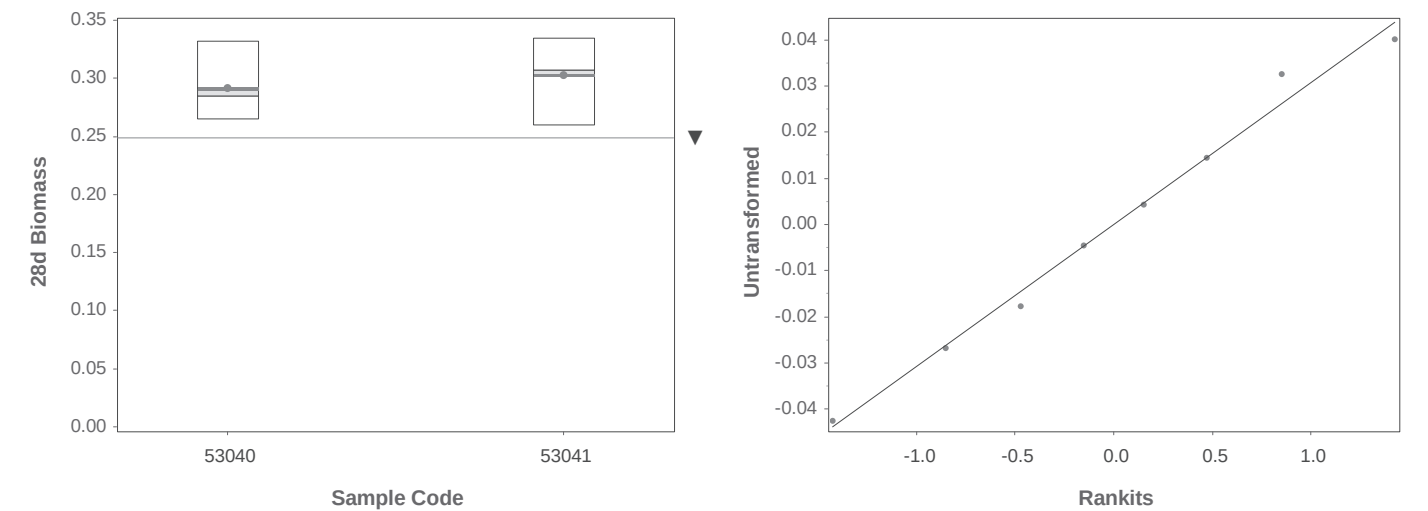
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	4	0.2917	0.2444	0.339	0.285	0.265	0.3318	0.01487	10.20%	0.00%
53041		4	0.3025	0.2514	0.3536	0.3075	0.26	0.335	0.01605	10.61%	-3.70%

28d Biomass Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53040	CS	0.296	0.265	0.274	0.3318						
53041		0.26	0.335	0.298	0.317						

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test					Aquatec Environmental, Inc.
Analysis ID:	09-9944-2496	Endpoint:	28d Biomass	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 13:47	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 14:38	MD5 Hash:	3E90ACE19A5B4EA57461AC8D5C4708B2	Editor ID:	007-856-968-0

Graphics



CETIS Analytical Report

Report Date: 07 Mar-22 12:00 (p 3 of 96)
Test Code/ID: 16245 OUT / 18-8933-1045

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test					Aquatec Environmental, Inc.	
Analysis ID:	16-3707-1742	Endpoint:	28d Biomass	CETIS Version:	CETISv2.1.1	
Analyzed:	06 Mar-22 13:48	Analysis:	Parametric-Two Sample	Status Level:	1	
Edit Date:	04 Mar-22 14:38	MD5 Hash:	B7A5F87A42825969862817956F8E6583	Editor ID:	007-856-968-0	
Batch ID:	16-7279-9191	Test Type:	Hyalella (42d)	Analyst:	C. Matthaues Ayers	
Start Date:	06 Jan-22 15:25	Protocol:	EPA/600/R-99/064 (2000)	Diluent:	Reconstituted Water	
Ending Date:	17 Feb-22 12:00	Species:	Hyalella azteca	Brine:		
Test Length:	41d 21h	Taxon:	Malacostraca	Source:	Aquatic Research Organism	Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, Inc	Sediment Testing
53042	04-7178-2695	21 Dec-21 13:38	21 Dec-21 20:00	16d 2h (0.6 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53042	Sediment	Belmont Landfill	TOX-1	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53042 passed 28d biomass endpoint	13.39%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Control Sed		53042	6	1.453	1.943	0.03907	CDF	0.0983	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.00170581	0.00170581	1	2.11	0.1966	Non-Significant Effect
Error	0.00485114	0.00080852	6			
Total	0.00655695		7			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.208	47.47	0.8802	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9717	0.6451	0.9109	Normal Distribution

28d Biomass Summary

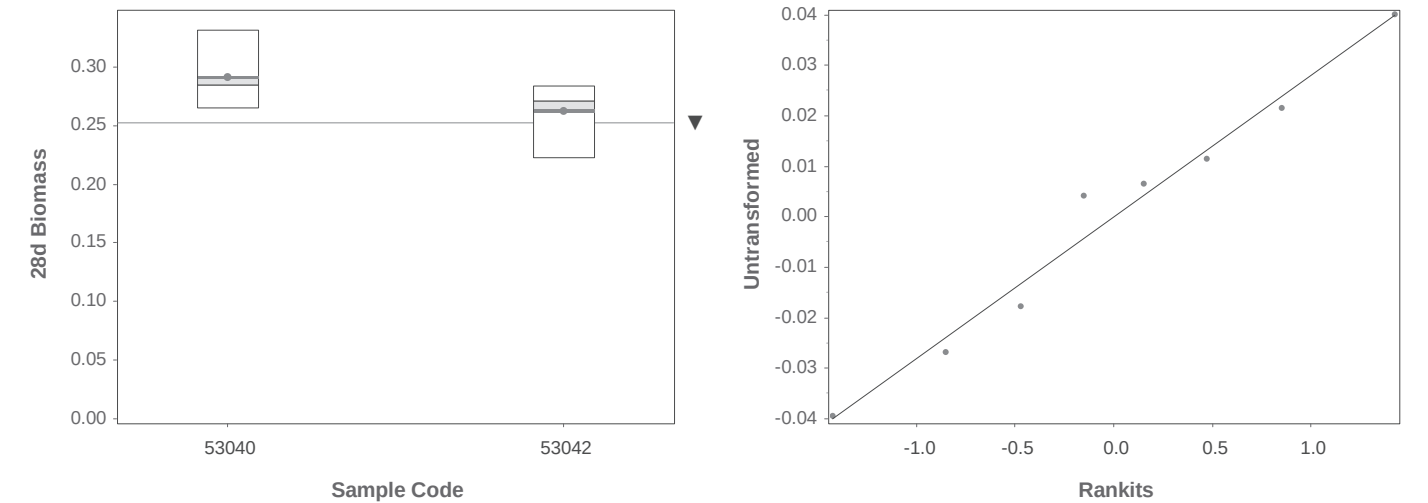
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	4	0.2917	0.2444	0.339	0.285	0.265	0.3318	0.01487	10.20%	0.00%
53042		4	0.2625	0.2194	0.3056	0.2715	0.223	0.284	0.01353	10.31%	10.01%

28d Biomass Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53040	CS	0.296	0.265	0.274	0.3318						
53042		0.274	0.223	0.284	0.269						

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test					Aquatec Environmental, Inc.
Analysis ID:	16-3707-1742	Endpoint:	28d Biomass	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 13:48	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 14:38	MD5 Hash:	B7A5F87A42825969862817956F8E6583	Editor ID:	007-856-968-0

Graphics



CETIS Analytical Report

Report Date: 07 Mar-22 12:00 (p 5 of 96)
Test Code/ID: 16245 OUT / 18-8933-1045

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID: 17-5279-1967	Endpoint: 28d Biomass	CETIS Version: CETISv2.1.1
Analyzed: 06 Mar-22 13:48	Analysis: Parametric-Two Sample	Status Level: 1
Edit Date: 04 Mar-22 14:38	MD5 Hash: 365B418D83078F58AC1CCA4AC414D957	Editor ID: 007-856-968-0
Batch ID: 16-7279-9191	Test Type: Hyalella (42d)	Analyst: C. Matthaues Ayers
Start Date: 06 Jan-22 15:25	Protocol: EPA/600/R-99/064 (2000)	Diluent: Reconstituted Water
Ending Date: 17 Feb-22 12:00	Species: Hyalella azteca	Brine:
Test Length: 41d 21h	Taxon: Malacostraca	Source: Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, Inc	Sediment Testing
53043	20-0010-4712	21 Dec-21 12:35	21 Dec-21 20:00	16d 3h (0.6 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53043	Sediment	Belmont Landfill	TOX-2	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53043 passed 28d biomass endpoint	13.38%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Control Sed		53043	6	-2.454	1.943	0.03904	CDF	0.9752	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0048601	0.0048601	1	6.02	0.0496	Significant Effect
Error	0.00484414	0.00080736	6			
Total	0.00970424		7			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.212	47.47	0.8782	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.8607	0.6451	0.1220	Normal Distribution

28d Biomass Summary

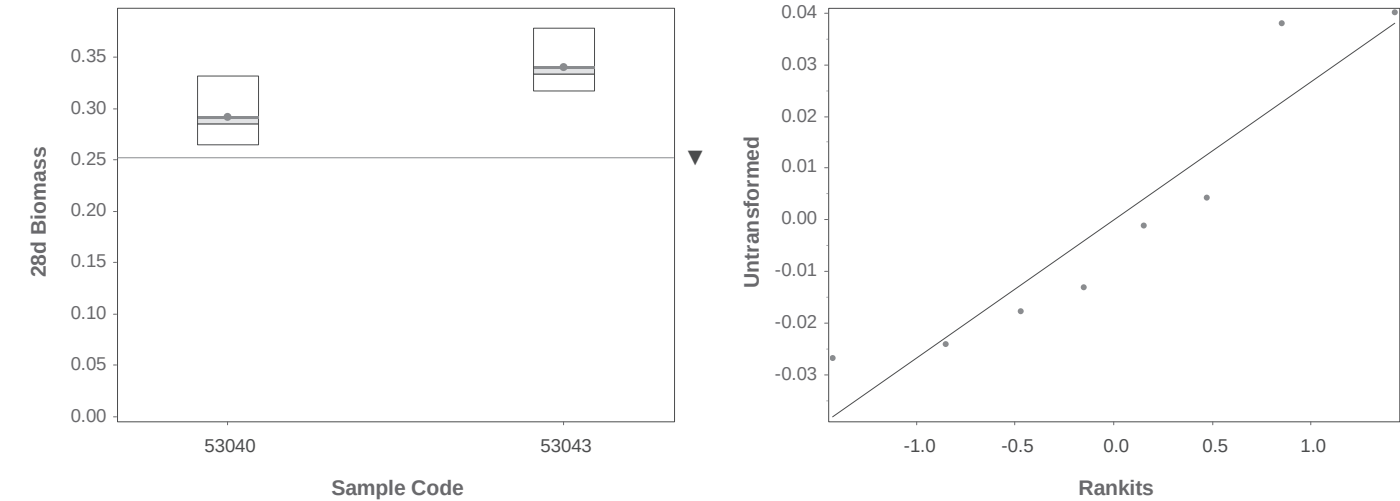
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	4	0.2917	0.2444	0.339	0.285	0.265	0.3318	0.01487	10.20%	0.00%
53043		4	0.341	0.298	0.384	0.334	0.317	0.379	0.01351	7.92%	-16.90%

28d Biomass Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53040	CS	0.296	0.265	0.274	0.3318						
53043		0.328	0.34	0.317	0.379						

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test					Aquatec Environmental, Inc.
Analysis ID:	17-5279-1967	Endpoint:	28d Biomass	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 13:48	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 14:38	MD5 Hash:	365B418D83078F58AC1CCA4AC414D957	Editor ID:	007-856-968-0

Graphics



CETIS Analytical Report

Report Date: 07 Mar-22 12:00 (p 7 of 96)
Test Code/ID: 16245 OUT / 18-8933-1045

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID:	04-9166-0240	Endpoint:	28d Biomass	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 13:48	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 14:38	MD5 Hash:	D95CE8BB530F480A0C1579E7A86E976E	Editor ID:	007-856-968-0
Batch ID:	16-7279-9191	Test Type:	Hyalella (42d)	Analyst:	C. Matthaues Ayers
Start Date:	06 Jan-22 15:25	Protocol:	EPA/600/R-99/064 (2000)	Diluent:	Reconstituted Water
Ending Date:	17 Feb-22 12:00	Species:	Hyalella azteca	Brine:	
Test Length:	41d 21h	Taxon:	Malacostraca	Source:	Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, Inc	Sediment Testing
53044	00-4677-6467	21 Dec-21 11:25	21 Dec-21 20:00	16d 4h (0.6 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53044	Sediment	Belmont Landfill	TOX-3	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53044 passed 28d biomass endpoint	13.92%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Control Sed		53044	6	0.572	1.943	0.04061	CDF	0.2940	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.00028582	0.00028582	1	0.3272	0.5881	Non-Significant Effect
Error	0.00524088	0.00087348	6			
Total	0.0055267		7			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.026	47.47	0.9836	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9643	0.6451	0.8503	Normal Distribution

28d Biomass Summary

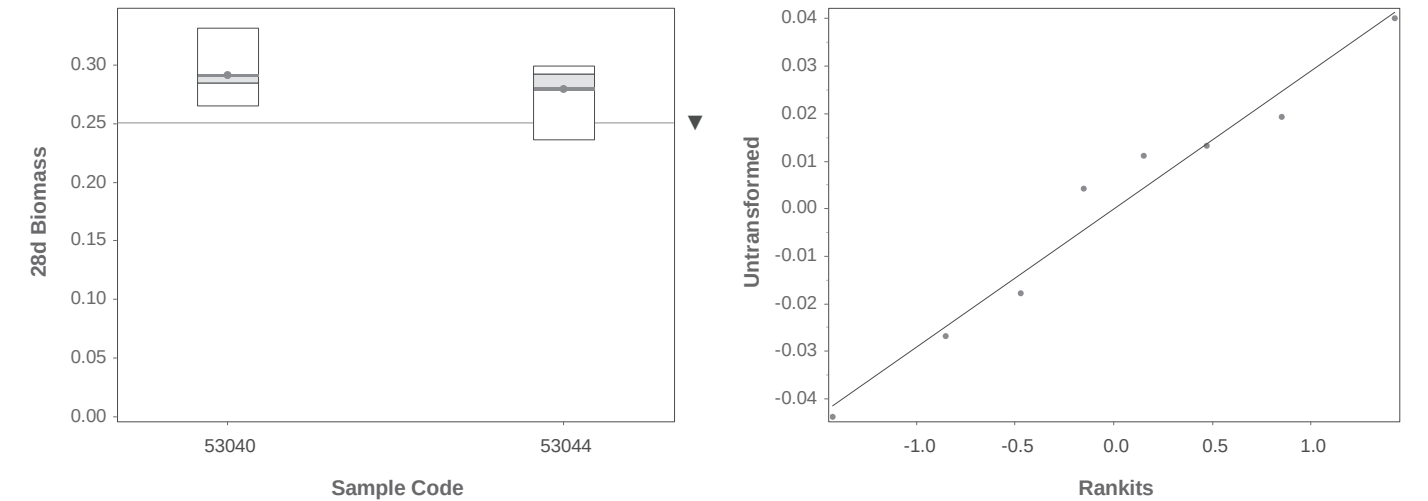
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	4	0.2917	0.2444	0.339	0.285	0.265	0.3318	0.01487	10.20%	0.00%
53044		4	0.2798	0.233	0.3265	0.292	0.236	0.299	0.01468	10.50%	4.10%

28d Biomass Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53040	CS	0.296	0.265	0.274	0.3318						
53044		0.291	0.299	0.293	0.236						

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test					Aquatec Environmental, Inc.
Analysis ID:	04-9166-0240	Endpoint:	28d Biomass	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 13:48	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 14:38	MD5 Hash:	D95CE8BB530F480A0C1579E7A86E976E	Editor ID:	007-856-968-0

Graphics



CETIS Analytical Report

Report Date: 07 Mar-22 12:00 (p 9 of 96)
Test Code/ID: 16245 OUT / 18-8933-1045

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID:	21-0466-8562	Endpoint:	28d Biomass	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 13:48	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 14:38	MD5 Hash:	C2D72645708D86C176993D84148FA69D	Editor ID:	007-856-968-0
Batch ID:	16-7279-9191	Test Type:	Hyalella (42d)	Analyst:	C. Matthaues Ayers
Start Date:	06 Jan-22 15:25	Protocol:	EPA/600/R-99/064 (2000)	Diluent:	Reconstituted Water
Ending Date:	17 Feb-22 12:00	Species:	Hyalella azteca	Brine:	
Test Length:	41d 21h	Taxon:	Malacostraca	Source:	Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, Inc	Sediment Testing
53045	13-5487-4433	21 Dec-21 14:22	21 Dec-21 20:00	16d 1h (0.3 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53045	Sediment	Belmont Landfill	TOX-5	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53045 passed 28d biomass endpoint	18.84%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Control Sed		53045	6	-5.836	1.943	0.05496	CDF	0.9994	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.05448	0.05448	1	34.05	0.0011	Significant Effect
Error	0.0095989	0.00159982	6			
Total	0.0640789		7			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	2.617	47.47	0.4504	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9236	0.6451	0.4595	Normal Distribution

28d Biomass Summary

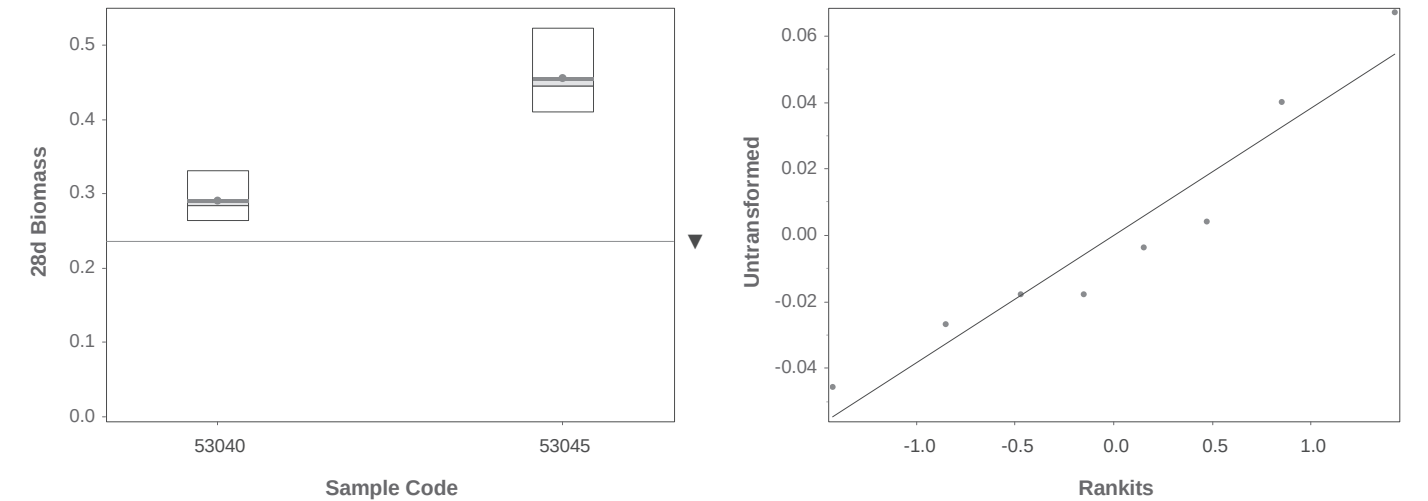
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	4	0.2917	0.2444	0.339	0.285	0.265	0.3318	0.01487	10.20%	0.00%
53045		4	0.4567	0.3802	0.5333	0.446	0.411	0.524	0.02406	10.53%	-56.58%

28d Biomass Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53040	CS	0.296	0.265	0.274	0.3318						
53045		0.453	0.439	0.411	0.524						

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test					Aquatec Environmental, Inc.
Analysis ID:	21-0466-8562	Endpoint:	28d Biomass	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 13:48	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 14:38	MD5 Hash:	C2D72645708D86C176993D84148FA69D	Editor ID:	007-856-968-0

Graphics



CETIS Analytical Report

Report Date: 07 Mar-22 12:00 (p 11 of 96)
Test Code/ID: 16245 OUT / 18-8933-1045

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID:	14-8765-0859	Endpoint:	28d Biomass	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 13:48	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 14:38	MD5 Hash:	C73A3251112F1921C68A18D5DF52FCA6	Editor ID:	007-856-968-0
Batch ID:	16-7279-9191	Test Type:	Hyalella (42d)	Analyst:	C. Matthaues Ayers
Start Date:	06 Jan-22 15:25	Protocol:	EPA/600/R-99/064 (2000)	Diluent:	Reconstituted Water
Ending Date:	17 Feb-22 12:00	Species:	Hyalella azteca	Brine:	
Test Length:	41d 21h	Taxon:	Malacostraca	Source:	Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, In	Sediment Testing
53046	12-3611-8332	21 Dec-21 15:54	21 Dec-21 20:00	16d (0.3 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53046	Reference sediment	Belmont Landfill	TOX-6	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53046 passed 28d biomass endpoint	13.67%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Control Sed		53046	6	-11.96	1.943	0.03989	CDF	1.0000	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.120585	0.120585	1	143.1	2.1E-05	Significant Effect
Error	0.00505689	0.00084282	6			
Total	0.125642		7			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.105	47.47	0.9367	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.907	0.6451	0.3333	Normal Distribution

28d Biomass Summary

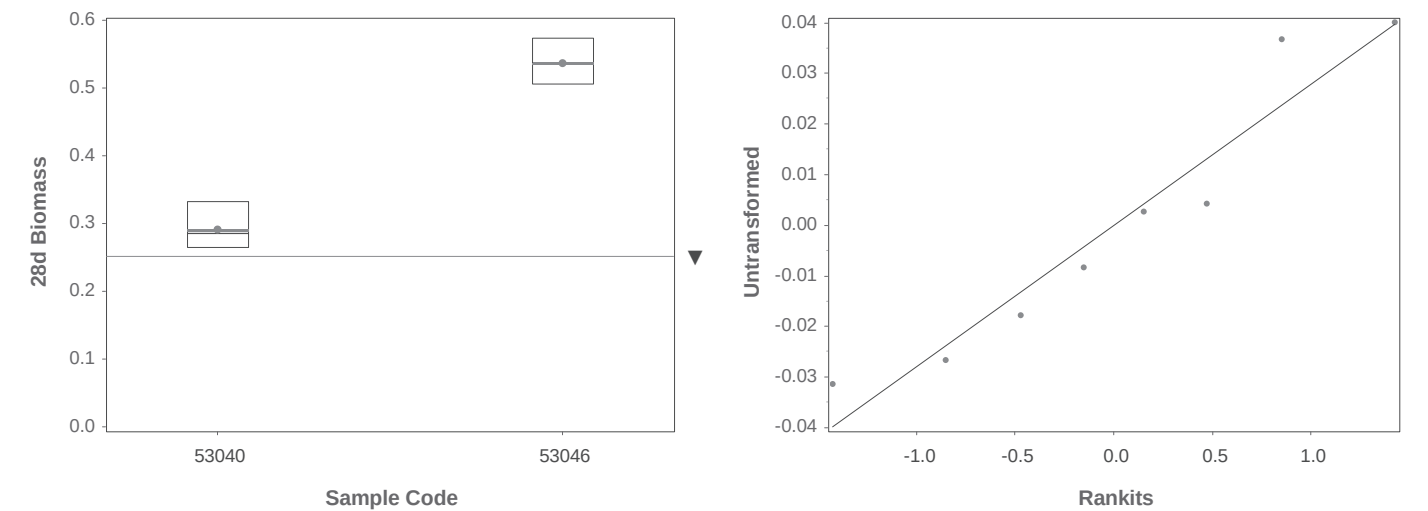
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	4	0.2917	0.2444	0.339	0.285	0.265	0.3318	0.01487	10.20%	0.00%
53046		4	0.5372	0.4922	0.5823	0.5345	0.506	0.574	0.01415	5.27%	-84.18%

28d Biomass Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53040	CS	0.296	0.265	0.274	0.3318						
53046		0.529	0.54	0.574	0.506						

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test					Aquatec Environmental, Inc.
Analysis ID:	14-8765-0859	Endpoint:	28d Biomass	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 13:48	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 14:38	MD5 Hash:	C73A3251112F1921C68A18D5DF52FCA6	Editor ID:	007-856-968-0

Graphics



CETIS Analytical Report

Report Date: 07 Mar-22 12:00 (p 13 of 96)
Test Code/ID: 16245 OUT / 18-8933-1045

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID: 02-1413-5167	Endpoint: 28d Mean Dry Weight	CETIS Version: CETISv2.1.1
Analyzed: 06 Mar-22 13:47	Analysis: Parametric-Two Sample	Status Level: 1
Edit Date: 04 Mar-22 14:38	MD5 Hash: A3E8320572E95DAC73B90D5EFD727491	Editor ID: 007-856-968-0
Batch ID: 16-7279-9191	Test Type: Hyalella (42d)	Analyst: C. Mattheus Ayers
Start Date: 06 Jan-22 15:25	Protocol: EPA/600/R-99/064 (2000)	Diluent: Reconstituted Water
Ending Date: 17 Feb-22 12:00	Species: Hyalella azteca	Brine:
Test Length: 41d 21h	Taxon: Malacostraca	Source: Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, Inc	Sediment Testing
53041	03-8171-1181	21 Dec-21 09:05	21 Dec-21 20:00	16d 6h (0.3 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53041	Sediment	Belmont Landfill	TOX-4	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53041 passed 28d mean dry weight endpoint	14.16%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Control Sed		53041	6	0.796	1.943	0.04911	CDF	0.2282	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.00080941	0.00080941	1	0.6336	0.4564	Non-Significant Effect
Error	0.00766483	0.00127747	6			
Total	0.00847425		7			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	2.533	47.47	0.4654	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9564	0.6451	0.7753	Normal Distribution

28d Mean Dry Weight Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	4	0.3469	0.2788	0.415	0.3509	0.2944	0.3914	0.0214	12.34%	0.00%
53041		4	0.3268	0.284	0.3696	0.3331	0.2889	0.3522	0.01345	8.23%	5.80%

28d Mean Dry Weight Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53040	CS	0.37	0.2944	0.3914	0.3318						
53041		0.2889	0.335	0.3311	0.3522						

CETIS Analytical Report

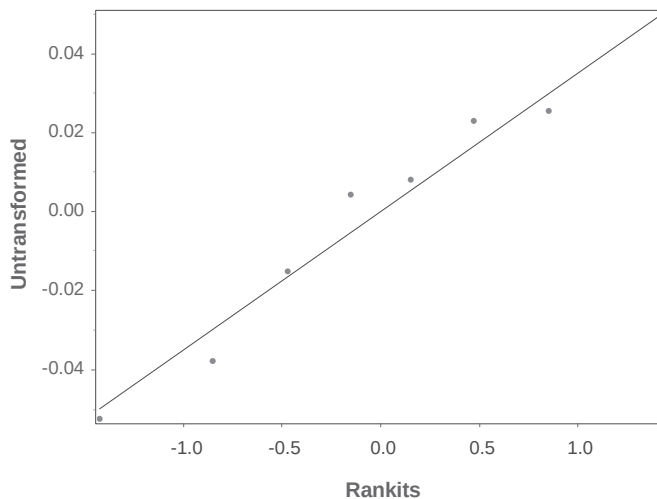
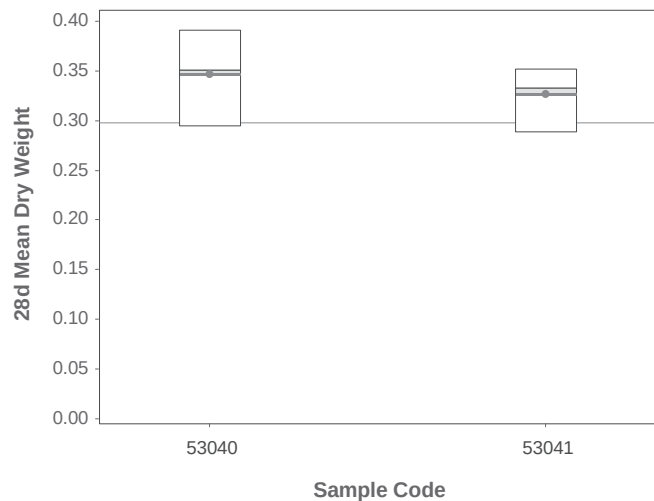
Report Date: 07 Mar-22 12:00 (p 14 of 96)
Test Code/ID: 16245 OUT / 18-8933-1045

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test

Aquatec Environmental, Inc.

Analysis ID: 02-1413-5167	Endpoint: 28d Mean Dry Weight	CETIS Version: CETISv2.1.1
Analyzed: 06 Mar-22 13:47	Analysis: Parametric-Two Sample	Status Level: 1
Edit Date: 04 Mar-22 14:38	MD5 Hash: A3E8320572E95DAC73B90D5EFD727491	Editor ID: 007-856-968-0

Graphics



CETIS Analytical Report

Report Date: 07 Mar-22 12:00 (p 15 of 96)
Test Code/ID: 16245 OUT / 18-8933-1045

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID: 12-4052-2591	Endpoint: 28d Mean Dry Weight	CETIS Version: CETISv2.1.1
Analyzed: 06 Mar-22 13:48	Analysis: Parametric-Two Sample	Status Level: 1
Edit Date: 04 Mar-22 14:38	MD5 Hash: 47D0DEAD7E39FD0D3CDF2CF53CE9BD3	Editor ID: 007-856-968-0
Batch ID: 16-7279-9191	Test Type: Hyalella (42d)	Analyst: C. Mattheus Ayers
Start Date: 06 Jan-22 15:25	Protocol: EPA/600/R-99/064 (2000)	Diluent: Reconstituted Water
Ending Date: 17 Feb-22 12:00	Species: Hyalella azteca	Brine:
Test Length: 41d 21h	Taxon: Malacostraca	Source: Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, In	Sediment Testing
53042	04-7178-2695	21 Dec-21 13:38	21 Dec-21 20:00	16d 2h (0.6 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53042	Sediment	Belmont Landfill	TOX-1	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53042 failed 28d mean dry weight endpoint	14.57%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Control Sed		53042*	6	2.416	1.943	0.05056	CDF	0.0261	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.00790458	0.00790458	1	5.837	0.0521	Non-Significant Effect
Error	0.00812493	0.00135416	6			
Total	0.0160295		7			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	2.09	47.47	0.5604	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9577	0.6451	0.7880	Normal Distribution

28d Mean Dry Weight Summary

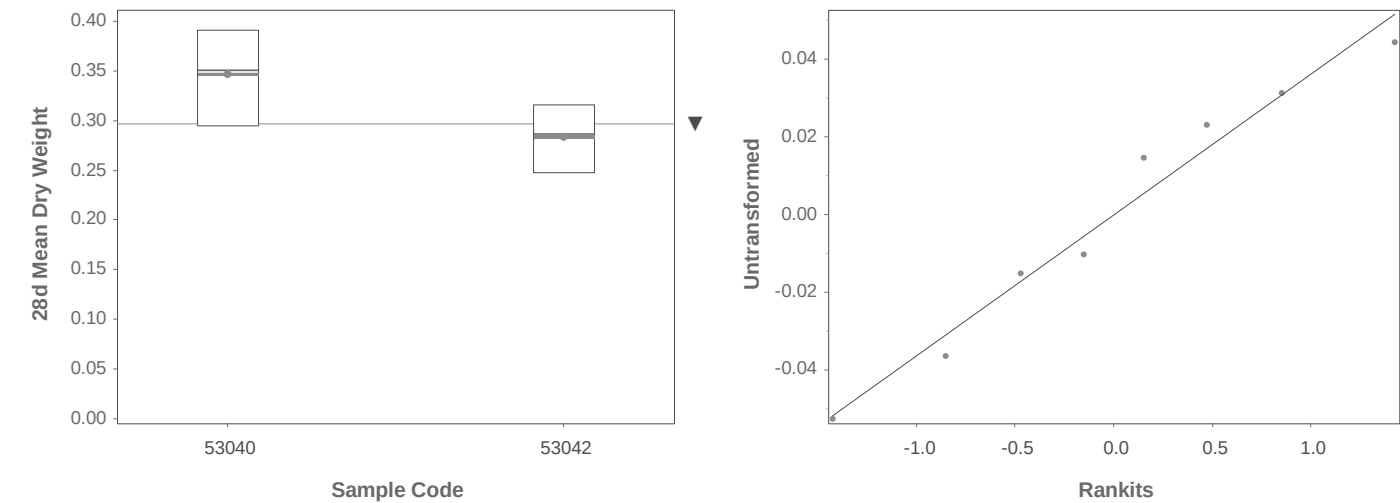
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	4	0.3469	0.2788	0.415	0.3509	0.2944	0.3914	0.0214	12.34%	0.00%
53042		4	0.2841	0.2369	0.3312	0.2864	0.2478	0.3156	0.0148	10.42%	18.12%

28d Mean Dry Weight Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53040	CS	0.37	0.2944	0.3914	0.3318						
53042		0.274	0.2478	0.3156	0.2989						

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test			Aquatec Environmental, Inc.	
Analysis ID:	12-4052-2591	Endpoint:	28d Mean Dry Weight	CETIS Version: CETISv2.1.1
Analyzed:	06 Mar-22 13:48	Analysis:	Parametric-Two Sample	Status Level: 1
Edit Date:	04 Mar-22 14:38	MD5 Hash:	47D0DEAD7E39FD0D3CDF2CF53CE9BD3	Editor ID: 007-856-968-0

Graphics



CETIS Analytical Report

Report Date: 07 Mar-22 12:00 (p 17 of 96)
Test Code/ID: 16245 OUT / 18-8933-1045

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID: 07-8649-5635	Endpoint: 28d Mean Dry Weight	CETIS Version: CETISv2.1.1
Analyzed: 06 Mar-22 13:48	Analysis: Parametric-Two Sample	Status Level: 1
Edit Date: 04 Mar-22 14:38	MD5 Hash: 155FE02C51FA91E4FFDCF14C2BC67AA3	Editor ID: 007-856-968-0
Batch ID: 16-7279-9191	Test Type: Hyalella (42d)	Analyst: C. Mattheus Ayers
Start Date: 06 Jan-22 15:25	Protocol: EPA/600/R-99/064 (2000)	Diluent: Reconstituted Water
Ending Date: 17 Feb-22 12:00	Species: Hyalella azteca	Brine:
Test Length: 41d 21h	Taxon: Malacostraca	Source: Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, Inc	Sediment Testing
53043	20-0010-4712	21 Dec-21 12:35	21 Dec-21 20:00	16d 3h (0.6 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53043	Sediment	Belmont Landfill	TOX-2	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53043 passed 28d mean dry weight endpoint	14.18%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Control Sed		53043	6	0.234	1.943	0.04918	CDF	0.4114	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	7.0157E-05	7.0157E-05	1	0.05477	0.8227	Non-Significant Effect
Error	0.00768546	0.00128091	6			
Total	0.00775562		7			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	2.509	47.47	0.4698	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9547	0.6451	0.7579	Normal Distribution

28d Mean Dry Weight Summary

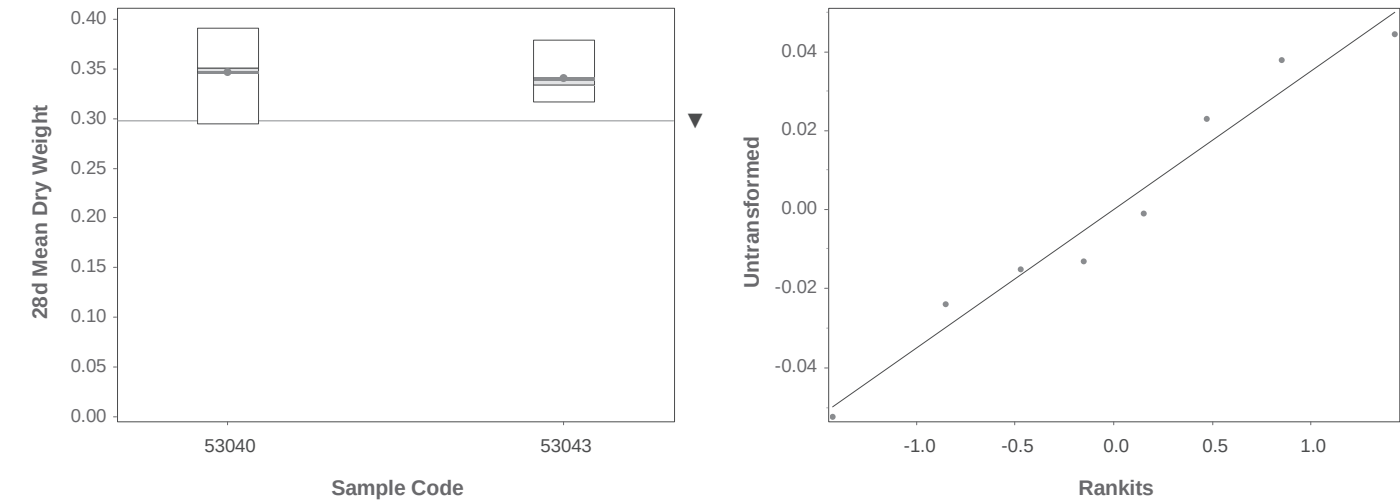
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	4	0.3469	0.2788	0.415	0.3509	0.2944	0.3914	0.0214	12.34%	0.00%
53043		4	0.341	0.298	0.384	0.334	0.317	0.379	0.01351	7.92%	1.71%

28d Mean Dry Weight Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53040	CS	0.37	0.2944	0.3914	0.3318						
53043		0.328	0.34	0.317	0.379						

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test			Aquatec Environmental, Inc.	
Analysis ID:	07-8649-5635	Endpoint:	28d Mean Dry Weight	CETIS Version: CETISv2.1.1
Analyzed:	06 Mar-22 13:48	Analysis:	Parametric-Two Sample	Status Level: 1
Edit Date:	04 Mar-22 14:38	MD5 Hash:	155FE02C51FA91E4FFDCF14C2BC67AA3	Editor ID: 007-856-968-0

Graphics



CETIS Analytical Report

Report Date: 07 Mar-22 12:00 (p 19 of 96)
Test Code/ID: 16245 OUT / 18-8933-1045

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID:	06-9311-8690	Endpoint:	28d Mean Dry Weight	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 13:48	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 14:38	MD5 Hash:	0C88FB813C8872F99026CC4E8EEFC4B6	Editor ID:	007-856-968-0
Batch ID:	16-7279-9191	Test Type:	Hyalella (42d)	Analyst:	C. Matthaues Ayers
Start Date:	06 Jan-22 15:25	Protocol:	EPA/600/R-99/064 (2000)	Diluent:	Reconstituted Water
Ending Date:	17 Feb-22 12:00	Species:	Hyalella azteca	Brine:	
Test Length:	41d 21h	Taxon:	Malacostraca	Source:	Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, Inc	Sediment Testing
53044	00-4677-6467	21 Dec-21 11:25	21 Dec-21 20:00	16d 4h (0.6 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53044	Sediment	Belmont Landfill	TOX-3	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53044 passed 28d mean dry weight endpoint	16.48%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Control Sed		53044	6	1.146	1.943	0.05719	CDF	0.1477	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.00227614	0.00227614	1	1.314	0.2953	Non-Significant Effect
Error	0.0103939	0.00173231	6			
Total	0.01267		7			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.122	47.47	0.9269	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9098	0.6451	0.3524	Normal Distribution

28d Mean Dry Weight Summary

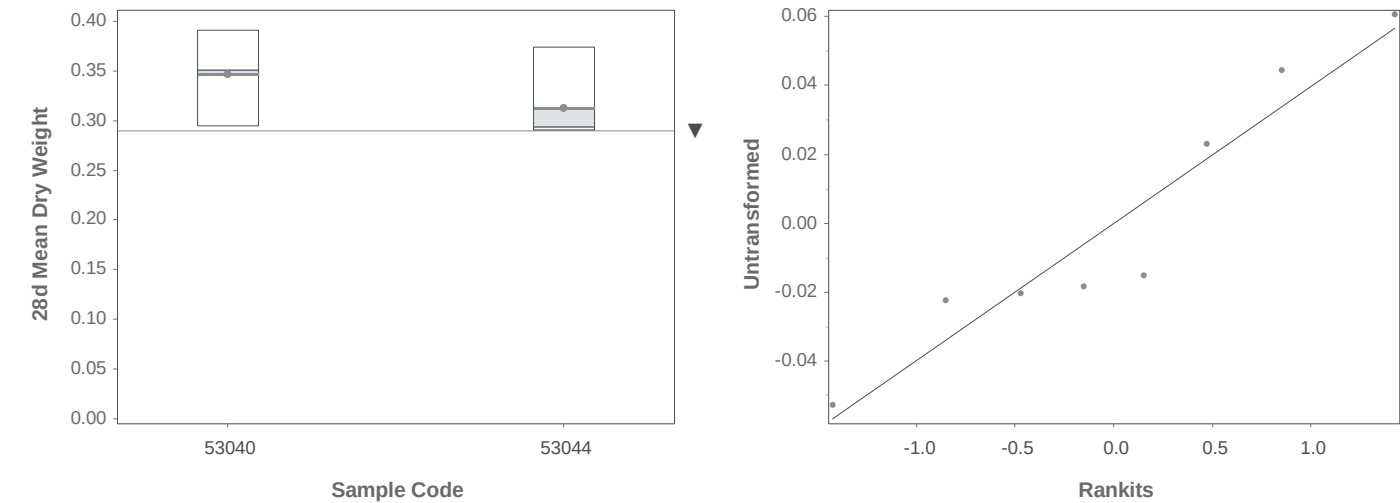
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	4	0.3469	0.2788	0.415	0.3509	0.2944	0.3914	0.0214	12.34%	0.00%
53044		4	0.3132	0.2489	0.3775	0.294	0.291	0.3738	0.0202	12.90%	9.72%

28d Mean Dry Weight Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53040	CS	0.37	0.2944	0.3914	0.3318						
53044		0.291	0.3738	0.293	0.295						

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test			Aquatec Environmental, Inc.	
Analysis ID:	06-9311-8690	Endpoint:	28d Mean Dry Weight	CETIS Version: CETISv2.1.1
Analyzed:	06 Mar-22 13:48	Analysis:	Parametric-Two Sample	Status Level: 1
Edit Date:	04 Mar-22 14:38	MD5 Hash:	0C88FB813C8872F99026CC4E8EEFC4B6	Editor ID: 007-856-968-0

Graphics



CETIS Analytical Report

Report Date: 07 Mar-22 12:00 (p 21 of 96)
Test Code/ID: 16245 OUT / 18-8933-1045

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID:	19-9269-1964	Endpoint:	28d Mean Dry Weight	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 13:48	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 14:38	MD5 Hash:	1124467705A4D94F03369CB2EEDFD6A5	Editor ID:	007-856-968-0
Batch ID:	16-7279-9191	Test Type:	Hyalella (42d)	Analyst:	C. Mattheus Ayers
Start Date:	06 Jan-22 15:25	Protocol:	EPA/600/R-99/064 (2000)	Diluent:	Reconstituted Water
Ending Date:	17 Feb-22 12:00	Species:	Hyalella azteca	Brine:	
Test Length:	41d 21h	Taxon:	Malacostraca	Source:	Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, Inc	Sediment Testing
53045	13-5487-4433	21 Dec-21 14:22	21 Dec-21 20:00	16d 1h (0.3 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53045	Sediment	Belmont Landfill	TOX-5	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53045 passed 28d mean dry weight endpoint	16.08%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Control Sed		53045	6	-5.158	1.943	0.0558	CDF	0.9990	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.043866	0.043866	1	26.6	0.0021	Significant Effect
Error	0.00989346	0.00164891	6			
Total	0.0537595		7			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.25	47.47	0.8591	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.8905	0.6451	0.2367	Normal Distribution

28d Mean Dry Weight Summary

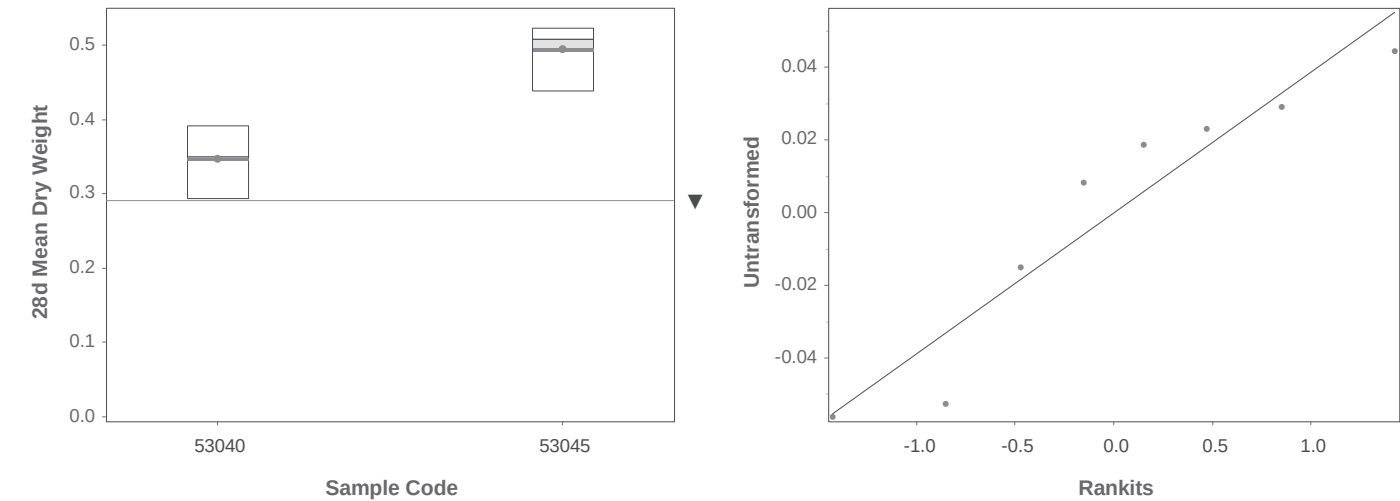
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	4	0.3469	0.2788	0.415	0.3509	0.2944	0.3914	0.0214	12.34%	0.00%
53045		4	0.495	0.4341	0.5559	0.5085	0.439	0.524	0.01914	7.73%	-42.69%

28d Mean Dry Weight Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53040	CS	0.37	0.2944	0.3914	0.3318						
53045		0.5033	0.439	0.5137	0.524						

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test				Aquatec Environmental, Inc.	
Analysis ID:	19-9269-1964	Endpoint:	28d Mean Dry Weight	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 13:48	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 14:38	MD5 Hash:	1124467705A4D94F03369CB2EEDFD6A5	Editor ID:	007-856-968-0

Graphics



CETIS Analytical Report

Report Date: 07 Mar-22 12:00 (p 23 of 96)
Test Code/ID: 16245 OUT / 18-8933-1045

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID:	01-8044-8909	Endpoint:	28d Mean Dry Weight	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 13:48	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 14:38	MD5 Hash:	507EBFF68E628577787604967EB78EC1	Editor ID:	007-856-968-0
Batch ID:	16-7279-9191	Test Type:	Hyalella (42d)	Analyst:	C. Matthaues Ayers
Start Date:	06 Jan-22 15:25	Protocol:	EPA/600/R-99/064 (2000)	Diluent:	Reconstituted Water
Ending Date:	17 Feb-22 12:00	Species:	Hyalella azteca	Brine:	
Test Length:	41d 21h	Taxon:	Malacostraca	Source:	Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, In	Sediment Testing
53046	12-3611-8332	21 Dec-21 15:54	21 Dec-21 20:00	16d (0.3 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53046	Reference sediment	Belmont Landfill	TOX-6	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53046 passed 28d mean dry weight endpoint	14.37%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Control Sed		53046	6	-7.419	1.943	0.04985	CDF	0.9998	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0724489	0.0724489	1	55.04	0.0003	Significant Effect
Error	0.00789821	0.00131637	6			
Total	0.0803471		7			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	2.287	47.47	0.5145	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9693	0.6451	0.8925	Normal Distribution

28d Mean Dry Weight Summary

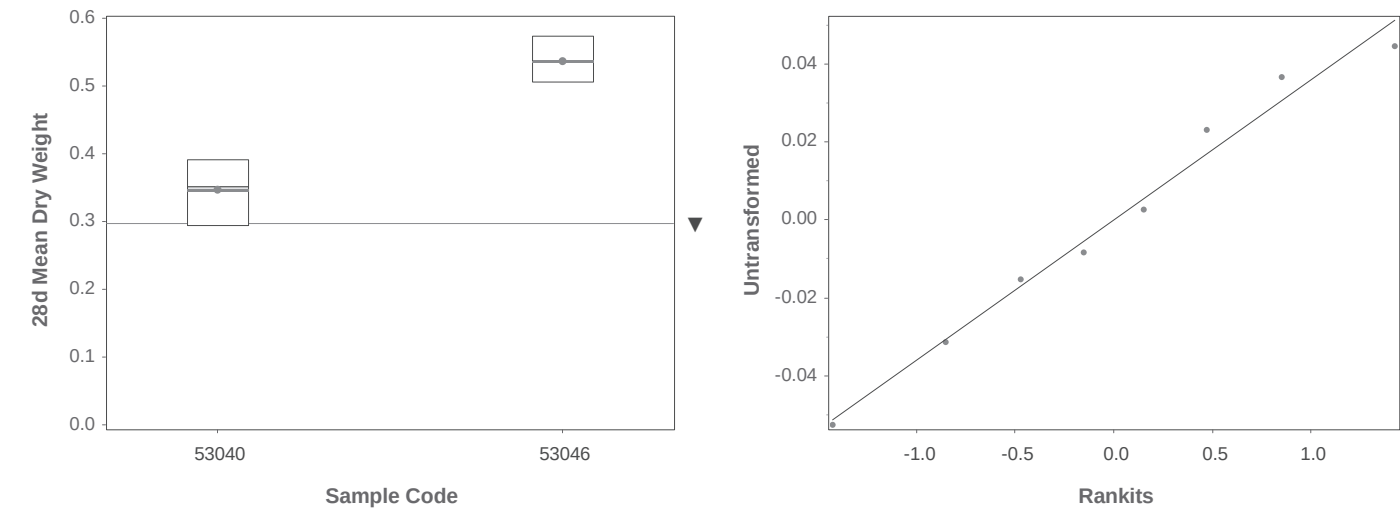
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	4	0.3469	0.2788	0.415	0.3509	0.2944	0.3914	0.0214	12.34%	0.00%
53046		4	0.5372	0.4922	0.5823	0.5345	0.506	0.574	0.01415	5.27%	-54.86%

28d Mean Dry Weight Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53040	CS	0.37	0.2944	0.3914	0.3318						
53046		0.529	0.54	0.574	0.506						

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test			Aquatec Environmental, Inc.	
Analysis ID:	01-8044-8909	Endpoint:	28d Mean Dry Weight	CETIS Version: CETISv2.1.1
Analyzed:	06 Mar-22 13:48	Analysis:	Parametric-Two Sample	Status Level: 1
Edit Date:	04 Mar-22 14:38	MD5 Hash:	507EBFF68E628577787604967EB78EC1	Editor ID: 007-856-968-0

Graphics



CETIS Analytical Report

Report Date: 07 Mar-22 12:00 (p 25 of 96)
Test Code/ID: 16245 OUT / 18-8933-1045

Hyaella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID: 20-2074-3842	Endpoint: 28d Survival Rate	CETIS Version: CETISv2.1.1
Analyzed: 06 Mar-22 13:47	Analysis: Nonparametric-Two Sample	Status Level: 1
Edit Date: 04 Mar-22 14:38	MD5 Hash: C6A2D5E92A0FD45DC999ADF9A680C691	Editor ID: 007-856-968-0
Batch ID: 16-7279-9191	Test Type: Hyaella (42d)	Analyst: C. Mattheus Ayers
Start Date: 06 Jan-22 15:25	Protocol: EPA/600/R-99/064 (2000)	Diluent: Reconstituted Water
Ending Date: 17 Feb-22 12:00	Species: Hyaella azteca	Brine:
Test Length: 41d 21h	Taxon: Malacostraca	Source: Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, In	Sediment Testing
53041	03-8171-1181	21 Dec-21 09:05	21 Dec-21 20:00	16d 6h (0.3 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53041	Sediment	Belmont Landfill	TOX-4	

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	53041 passed 28d survival rate endpoint	6.49%

Wilcoxon Rank Sum Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	Ties	P-Type	P-Value	Decision(α:5%)
Control Sed		53041	21	152	---	3	Exact	0.7063	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.00682461	0.00682461	1	0.3432	0.5642	Non-Significant Effect
Error	0.417568	0.0198842	21			
Total	0.424393		22			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.414	5.418	0.5768	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.8612	0.88	0.0044	Non-Normal Distribution

28d Survival Rate Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	11	0.9091	0.8389	0.9793	0.9000	0.7000	1.0000	0.0315	11.49%	0.00%
53041		12	0.9333	0.8769	0.9897	0.9545	0.7000	1.0000	0.0256	9.51%	-2.67%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	11	1.2750	1.1720	1.3780	1.2490	0.9912	1.4190	0.0462	12.02%	0.00%
53041		12	1.3090	1.2270	1.3910	1.3380	0.9912	1.4120	0.0372	9.84%	-2.71%

28d Survival Rate Detail

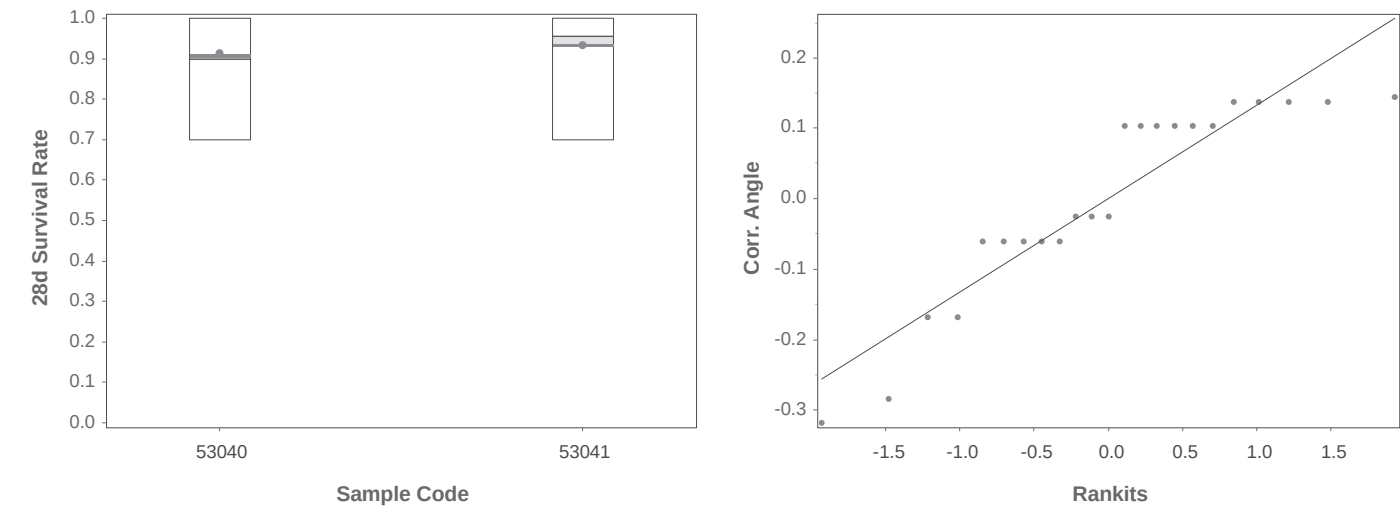
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53040	CS	0.9000	1.0000	1.0000	1.0000	1.0000	0.8000	0.9000	0.8000	0.9000	0.7000
		1.0000									
53041		1.0000	1.0000	1.0000	0.9000	0.7000	0.9000	1.0000	1.0000	0.9000	1.0000
		0.9000	0.9000								

Angular (Corrected) Transformed Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53040	CS	1.2490	1.4120	1.4120	1.4120	1.4120	1.1070	1.2490	1.1070	1.2490	0.9912
		1.4190									
53041		1.4120	1.4120	1.4120	1.2490	0.9912	1.2490	1.4120	1.4120	1.2490	1.4120
		1.2490	1.2490								

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test			Aquatec Environmental, Inc.	
Analysis ID:	20-2074-3842	Endpoint:	28d Survival Rate	CETIS Version: CETISv2.1.1
Analyzed:	06 Mar-22 13:47	Analysis:	Nonparametric-Two Sample	Status Level: 1
Edit Date:	04 Mar-22 14:38	MD5 Hash:	C6A2D5E92A0FD45DC999ADF9A680C691	Editor ID: 007-856-968-0

Graphics



CETIS Analytical Report

Report Date: 07 Mar-22 12:00 (p 27 of 96)
Test Code/ID: 16245 OUT / 18-8933-1045

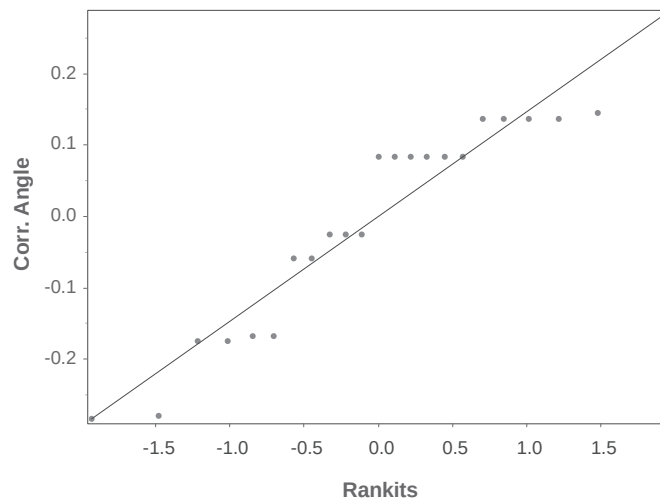
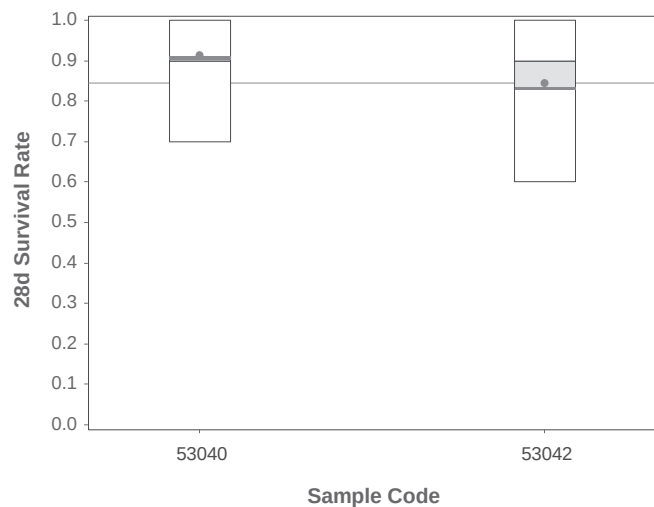
Hyalella 42-d Survival, Growth, and Reproduction Sediment Test								Aquatec Environmental, Inc.			
Analysis ID:	00-7981-5644		Endpoint:	28d Survival Rate				CETIS Version:	CETISv2.1.1		
Analyzed:	06 Mar-22 13:48		Analysis:	Parametric-Two Sample				Status Level:	1		
Edit Date:	04 Mar-22 14:38		MD5 Hash:	0D26785E8AF048D1D2C915935031160B				Editor ID:	007-856-968-0		
Batch ID:	16-7279-9191		Test Type:	Hyalella (42d)				Analyst:	C. Mattheus Ayers		
Start Date:	06 Jan-22 15:25		Protocol:	EPA/600/R-99/064 (2000)				Diluent:	Reconstituted Water		
Ending Date:	17 Feb-22 12:00		Species:	Hyalella azteca				Brine:			
Test Length:	41d 21h		Taxon:	Malacostraca				Source:	Aquatic Research Organism		Age: 8d
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, Inc	Sediment Testing					
53042	04-7178-2695	21 Dec-21 13:38	21 Dec-21 20:00	16d 2h (0.6 °C)	Woods Hole Group						
Sample Code	Material Type		Sample Source		Station Location		Lat/Long				
53040	Control Sediment		Internal Laboratory Testing		Control						
53042	Sediment		Belmont Landfill		TOX-1						
Data Transform		Alt Hyp			Comparison Result					PMSD	
Angular (Corrected)		C > T			53042 passed 28d survival rate endpoint					7.09%	
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)		
Control Sed		53042	21	1.718	1.721	0.109	CDF	0.0502	Non-Significant Effect		
ANOVA Table											
Source		Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(α:5%)		
Between		0.0679467		0.0679467		1	2.953	0.1004	Non-Significant Effect		
Error		0.483224		0.0230107		21					
Total		0.551171				22					
ANOVA Assumptions Tests											
Attribute		Test				Test Stat	Critical	P-Value	Decision(α:1%)		
Variance		Variance Ratio F Test				1.041	5.418	0.9420	Equal Variances		
Distribution		Shapiro-Wilk W Normality Test				0.9153	0.88	0.0528	Normal Distribution		
28d Survival Rate Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	11	0.9091	0.8389	0.9793	0.9000	0.7000	1.0000	0.0315	11.49%	0.00%
53042		12	0.8333	0.7600	0.9067	0.9000	0.6000	1.0000	0.0333	13.86%	8.33%
Angular (Corrected) Transformed Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	11	1.2750	1.1720	1.3780	1.2490	0.9912	1.4190	0.0462	12.02%	0.00%
53042		12	1.1660	1.0700	1.2610	1.2490	0.8861	1.4120	0.0434	12.89%	8.54%
28d Survival Rate Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53040	CS	0.9000	1.0000	1.0000	1.0000	1.0000	0.8000	0.9000	0.8000	0.9000	0.7000
		1.0000									
53042		0.7000	0.8000	0.9000	0.7000	0.8000	0.9000	0.9000	0.6000	1.0000	0.9000
		0.9000	0.9000								
Angular (Corrected) Transformed Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53040	CS	1.2490	1.4120	1.4120	1.4120	1.4120	1.1070	1.2490	1.1070	1.2490	0.9912
		1.4190									
53042		0.9912	1.1070	1.2490	0.9912	1.1070	1.2490	1.2490	0.8861	1.4120	1.2490
		1.2490	1.2490								

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test

Aquatec Environmental, Inc.

Analysis ID:	00-7981-5644	Endpoint:	28d Survival Rate	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 13:48	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 14:38	MD5 Hash:	0D26785E8AF048D1D2C915935031160B	Editor ID:	007-856-968-0

Graphics



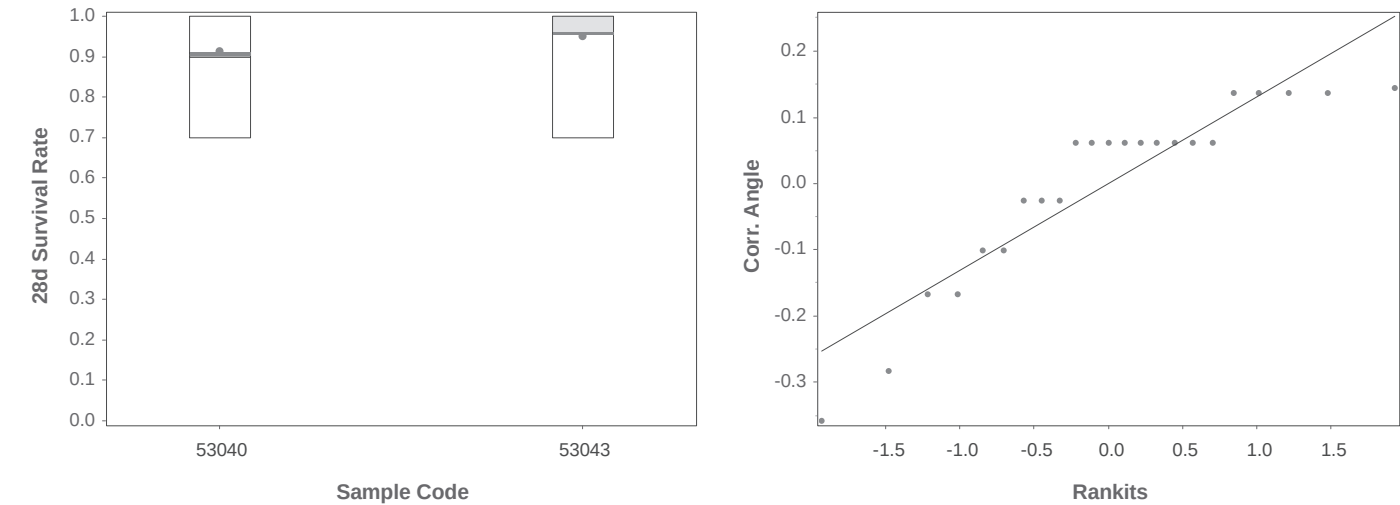
CETIS Analytical Report

Report Date: 07 Mar-22 12:00 (p 29 of 96)
Test Code/ID: 16245 OUT / 18-8933-1045

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test								Aquatec Environmental, Inc.			
Analysis ID:	05-3578-2602		Endpoint:	28d Survival Rate				CETIS Version:	CETISv2.1.1		
Analyzed:	06 Mar-22 13:48		Analysis:	Nonparametric-Two Sample				Status Level:	1		
Edit Date:	04 Mar-22 14:38		MD5 Hash:	E1B9EC32267284659A61AB898E25CC6D				Editor ID:	007-856-968-0		
Batch ID:	16-7279-9191		Test Type:	Hyalella (42d)				Analyst:	C. Mattheus Ayers		
Start Date:	06 Jan-22 15:25		Protocol:	EPA/600/R-99/064 (2000)				Diluent:	Reconstituted Water		
Ending Date:	17 Feb-22 12:00		Species:	Hyalella azteca				Brine:			
Test Length:	41d 21h		Taxon:	Malacostraca				Source:	Aquatic Research Organism		Age: 8d
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, Inc	Sediment Testing					
53043	20-0010-4712	21 Dec-21 12:35	21 Dec-21 20:00	16d 3h (0.6 °C)	Woods Hole Group						
Sample Code	Material Type	Sample Source		Station Location		Lat/Long					
53040	Control Sediment	Internal Laboratory Testing		Control							
53043	Sediment	Belmont Landfill		TOX-2							
Data Transform		Alt Hyp		Comparison Result						PMSD	
Angular (Corrected)		C > T		53043 passed 28d survival rate endpoint						6.50%	
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	df	Test Stat	Critical	Ties	P-Type	P-Value	Decision(α:5%)		
Control Sed		53043	21	164	---	3	Exact	0.9190	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(α:5%)			
Between	0.0324778		0.0324778		1	1.629	0.2158	Non-Significant Effect			
Error	0.418663		0.0199363		21						
Total	0.451141				22						
ANOVA Assumptions Tests											
Attribute	Test				Test Stat	Critical	P-Value	Decision(α:1%)			
Variance	Variance Ratio F Test				1.406	5.418	0.5832	Equal Variances			
Distribution	Shapiro-Wilk W Normality Test				0.8465	0.88	0.0024	Non-Normal Distribution			
28d Survival Rate Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	11	0.9091	0.8389	0.9793	0.9000	0.7000	1.0000	0.0315	11.49%	0.00%
53043		12	0.9583	0.9011	1.0000	1.0000	0.7000	1.0000	0.0260	9.39%	-5.42%
Angular (Corrected) Transformed Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	11	1.2750	1.1720	1.3780	1.2490	0.9912	1.4190	0.0462	12.02%	0.00%
53043		12	1.3500	1.2680	1.4320	1.4120	0.9912	1.4120	0.0373	9.58%	-5.90%
28d Survival Rate Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53040	CS	0.9000	1.0000	1.0000	1.0000	1.0000	0.8000	0.9000	0.8000	0.9000	0.7000
		1.0000									
53043		1.0000	1.0000	0.9000	1.0000	1.0000	0.7000	1.0000	0.9000	1.0000	1.0000
		1.0000	1.0000								
Angular (Corrected) Transformed Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53040	CS	1.2490	1.4120	1.4120	1.4120	1.4120	1.1070	1.2490	1.1070	1.2490	0.9912
		1.4190									
53043		1.4120	1.4120	1.2490	1.4120	1.4120	0.9912	1.4120	1.2490	1.4120	1.4120
		1.4120	1.4120								

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test			Aquatec Environmental, Inc.	
Analysis ID:	05-3578-2602	Endpoint:	28d Survival Rate	CETIS Version: CETISv2.1.1
Analyzed:	06 Mar-22 13:48	Analysis:	Nonparametric-Two Sample	Status Level: 1
Edit Date:	04 Mar-22 14:38	MD5 Hash:	E1B9EC32267284659A61AB898E25CC6D	Editor ID: 007-856-968-0

Graphics



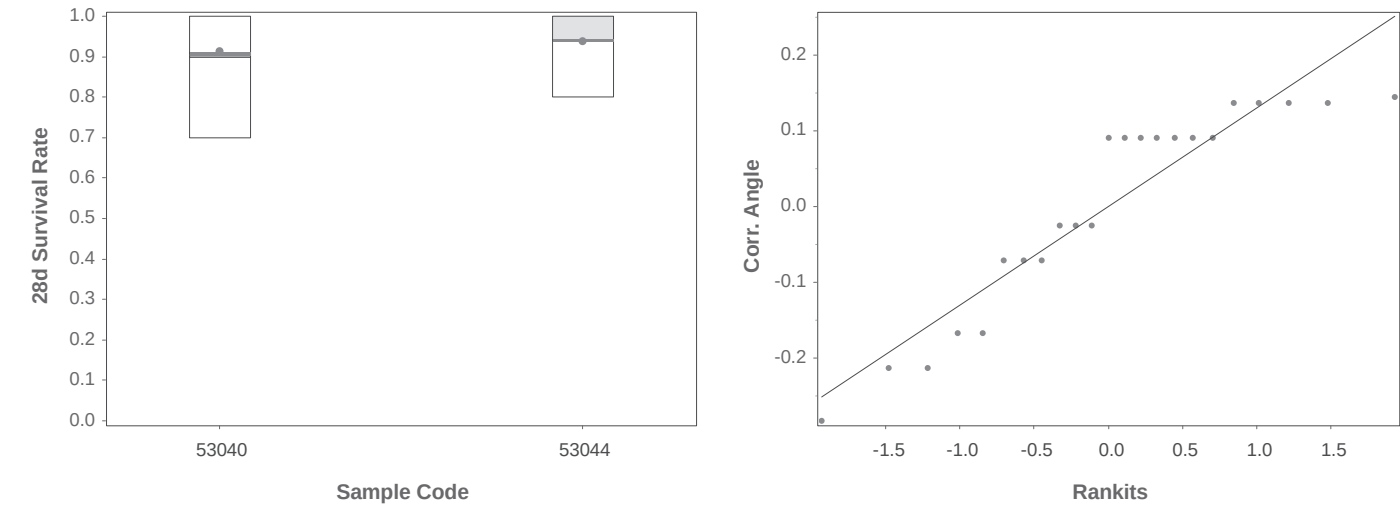
CETIS Analytical Report

Report Date: 07 Mar-22 12:00 (p 31 of 96)
 Test Code/ID: 16245 OUT / 18-8933-1045

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test									Aquatec Environmental, Inc.			
Analysis ID:	01-2270-4961		Endpoint:	28d Survival Rate				CETIS Version:	CETISv2.1.1			
Analyzed:	06 Mar-22 13:48		Analysis:	Nonparametric-Two Sample				Status Level:	1			
Edit Date:	04 Mar-22 14:38		MD5 Hash:	E4718AED499199206FF26F4EA975E472				Editor ID:	007-856-968-0			
Batch ID:	16-7279-9191		Test Type:	Hyalella (42d)				Analyst:	C. Mattheus Ayers			
Start Date:	06 Jan-22 15:25		Protocol:	EPA/600/R-99/064 (2000)				Diluent:	Reconstituted Water			
Ending Date:	17 Feb-22 12:00		Species:	Hyalella azteca				Brine:				
Test Length:	41d 21h		Taxon:	Malacostraca				Source:	Aquatic Research Organism		Age:	8d
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name		Project					
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, Inc.		Sediment Testing					
53044	00-4677-6467	21 Dec-21 11:25	21 Dec-21 20:00	16d 4h (0.6 °C)	Woods Hole Group							
Sample Code	Material Type	Sample Source		Station Location		Lat/Long						
53040	Control Sediment	Internal Laboratory Testing		Control								
53044	Sediment	Belmont Landfill		TOX-3								
Data Transform		Alt Hyp		Comparison Result						PMSD		
Angular (Corrected)		C > T		53044 passed 28d survival rate endpoint						6.32%		
Wilcoxon Rank Sum Two-Sample Test												
Sample I	vs	Sample II	df	Test Stat	Critical	Ties	P-Type	P-Value	Decision(α:5%)			
Control Sed		53044	21	155	---	3	Exact	0.7708	Non-Significant Effect			
ANOVA Table												
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(α:5%)				
Between	0.0120944		0.0120944		1	0.6351	0.4344	Non-Significant Effect				
Error	0.399878		0.0190418		21							
Total	0.411973				22							
ANOVA Assumptions Tests												
Attribute	Test				Test Stat	Critical	P-Value	Decision(α:1%)				
Variance	Variance Ratio F Test				1.566	5.418	0.4724	Equal Variances				
Distribution	Shapiro-Wilk W Normality Test				0.8672	0.88	0.0057	Non-Normal Distribution				
28d Survival Rate Summary												
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect	
53040	CS	11	0.9091	0.8389	0.9793	0.9000	0.7000	1.0000	0.0315	11.49%	0.00%	
53044		12	0.9417	0.8913	0.9920	1.0000	0.8000	1.0000	0.0229	8.42%	-3.58%	
Angular (Corrected) Transformed Summary												
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect	
53040	CS	11	1.2750	1.1720	1.3780	1.2490	0.9912	1.4190	0.0462	12.02%	0.00%	
53044		12	1.3200	1.2430	1.3980	1.4120	1.1070	1.4120	0.0354	9.27%	-3.60%	
28d Survival Rate Detail												
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10	
53040	CS	0.9000	1.0000	1.0000	1.0000	1.0000	0.8000	0.9000	0.8000	0.9000	0.7000	
		1.0000										
53044		0.9000	1.0000	1.0000	0.9000	1.0000	1.0000	0.9000	1.0000	1.0000	0.8000	
		1.0000	0.8000									
Angular (Corrected) Transformed Detail												
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10	
53040	CS	1.2490	1.4120	1.4120	1.4120	1.4120	1.1070	1.2490	1.1070	1.2490	0.9912	
		1.4190										
53044		1.2490	1.4120	1.4120	1.2490	1.4120	1.4120	1.2490	1.4120	1.4120	1.1070	
		1.4120	1.1070									

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test			Aquatec Environmental, Inc.	
Analysis ID:	01-2270-4961	Endpoint:	28d Survival Rate	CETIS Version: CETISv2.1.1
Analyzed:	06 Mar-22 13:48	Analysis:	Nonparametric-Two Sample	Status Level: 1
Edit Date:	04 Mar-22 14:38	MD5 Hash:	E4718AED499199206FF26F4EA975E472	Editor ID: 007-856-968-0

Graphics



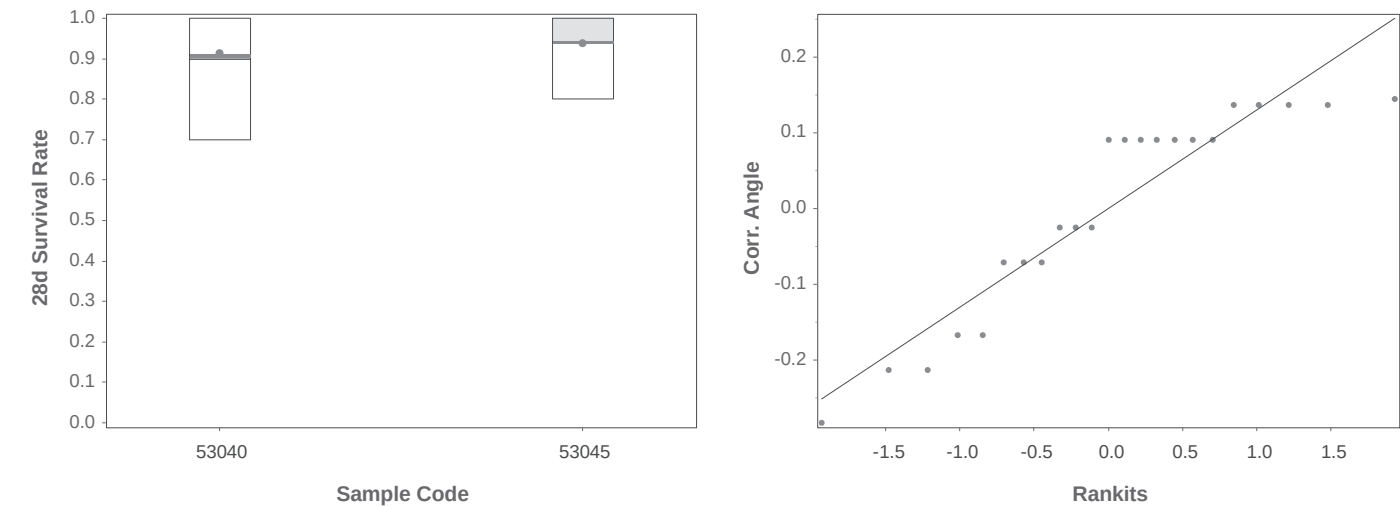
CETIS Analytical Report

Report Date: 07 Mar-22 12:00 (p 33 of 96)
Test Code/ID: 16245 OUT / 18-8933-1045

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test								Aquatec Environmental, Inc.			
Analysis ID:	13-3916-9274		Endpoint:	28d Survival Rate				CETIS Version:	CETISv2.1.1		
Analyzed:	06 Mar-22 13:48		Analysis:	Nonparametric-Two Sample				Status Level:	1		
Edit Date:	04 Mar-22 14:38		MD5 Hash:	1AE61D9A50AF91C6104162B606B9F6F1				Editor ID:	007-856-968-0		
Batch ID:	16-7279-9191		Test Type:	Hyalella (42d)				Analyst:	C. Mattheus Ayers		
Start Date:	06 Jan-22 15:25		Protocol:	EPA/600/R-99/064 (2000)				Diluent:	Reconstituted Water		
Ending Date:	17 Feb-22 12:00		Species:	Hyalella azteca				Brine:			
Test Length:	41d 21h		Taxon:	Malacostraca				Source:	Aquatic Research Organism		Age: 8d
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, In	Sediment Testing					
53045	13-5487-4433	21 Dec-21 14:22	21 Dec-21 20:00	16d 1h (0.3 °C)	Woods Hole Group						
Sample Code	Material Type	Sample Source		Station Location		Lat/Long					
53040	Control Sediment	Internal Laboratory Testing		Control							
53045	Sediment	Belmont Landfill		TOX-5							
Data Transform		Alt Hyp		Comparison Result						PMSD	
Angular (Corrected)		C > T		53045 passed 28d survival rate endpoint						6.32%	
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	df	Test Stat	Critical	Ties	P-Type	P-Value	Decision(α:5%)		
Control Sed		53045	21	155	---	3	Exact	0.7708	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(α:5%)			
Between	0.0120944		0.0120944		1	0.6351	0.4344	Non-Significant Effect			
Error	0.399878		0.0190418		21						
Total	0.411973				22						
ANOVA Assumptions Tests											
Attribute	Test				Test Stat	Critical	P-Value	Decision(α:1%)			
Variance	Variance Ratio F Test				1.566	5.418	0.4724	Equal Variances			
Distribution	Shapiro-Wilk W Normality Test				0.8672	0.88	0.0057	Non-Normal Distribution			
28d Survival Rate Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	11	0.9091	0.8389	0.9793	0.9000	0.7000	1.0000	0.0315	11.49%	0.00%
53045		12	0.9417	0.8913	0.9920	1.0000	0.8000	1.0000	0.0229	8.42%	-3.58%
Angular (Corrected) Transformed Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	11	1.2750	1.1720	1.3780	1.2490	0.9912	1.4190	0.0462	12.02%	0.00%
53045		12	1.3200	1.2430	1.3980	1.4120	1.1070	1.4120	0.0354	9.27%	-3.60%
28d Survival Rate Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53040	CS	0.9000	1.0000	1.0000	1.0000	1.0000	0.8000	0.9000	0.8000	0.9000	0.7000
		1.0000									
53045		1.0000	0.9000	1.0000	1.0000	1.0000	0.9000	0.8000	1.0000	0.9000	1.0000
		0.8000	1.0000								
Angular (Corrected) Transformed Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53040	CS	1.2490	1.4120	1.4120	1.4120	1.4120	1.1070	1.2490	1.1070	1.2490	0.9912
		1.4190									
53045		1.4120	1.2490	1.4120	1.4120	1.4120	1.2490	1.1070	1.4120	1.2490	1.4120
		1.1070	1.4120								

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test			Aquatec Environmental, Inc.	
Analysis ID:	13-3916-9274	Endpoint:	28d Survival Rate	CETIS Version: CETISv2.1.1
Analyzed:	06 Mar-22 13:48	Analysis:	Nonparametric-Two Sample	Status Level: 1
Edit Date:	04 Mar-22 14:38	MD5 Hash:	1AE61D9A50AF91C6104162B606B9F6F1	Editor ID: 007-856-968-0

Graphics



CETIS Analytical Report

Report Date: 07 Mar-22 12:00 (p 35 of 96)
 Test Code/ID: 16245 OUT / 18-8933-1045

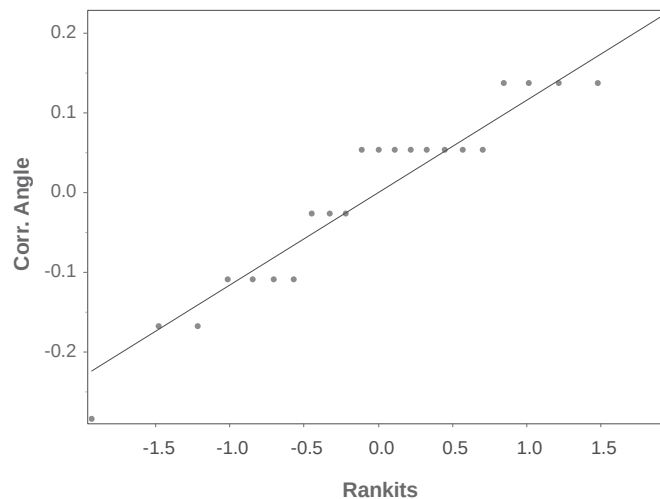
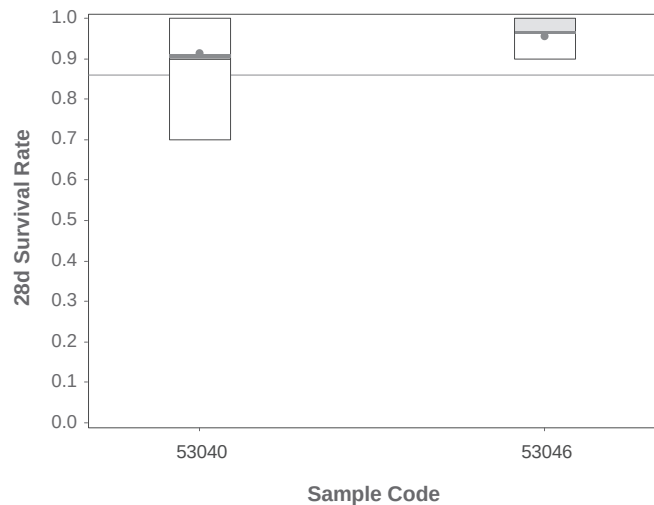
Hyalella 42-d Survival, Growth, and Reproduction Sediment Test								Aquatec Environmental, Inc.			
Analysis ID:	06-2655-6996		Endpoint:	28d Survival Rate			CETIS Version:	CETISv2.1.1			
Analyzed:	06 Mar-22 13:48		Analysis:	Parametric-Two Sample			Status Level:	1			
Edit Date:	04 Mar-22 14:38		MD5 Hash:	E3669233C80A1AEE68679B671D932F01			Editor ID:	007-856-968-0			
Batch ID:	16-7279-9191		Test Type:	Hyalella (42d)			Analyst:	C. Mattheus Ayers			
Start Date:	06 Jan-22 15:25		Protocol:	EPA/600/R-99/064 (2000)			Diluent:	Reconstituted Water			
Ending Date:	17 Feb-22 12:00		Species:	Hyalella azteca			Brine:				
Test Length:	41d 21h		Taxon:	Malacostraca			Source:	Aquatic Research Organism		Age:	8d
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, Inc.	Sediment Testing					
53046	12-3611-8332	21 Dec-21 15:54	21 Dec-21 20:00	16d (0.3 °C)	Woods Hole Group						
Sample Code	Material Type		Sample Source		Station Location		Lat/Long				
53040	Control Sediment		Internal Laboratory Testing		Control						
53046	Reference sediment		Belmont Landfill		TOX-6						
Data Transform		Alt Hyp			Comparison Result					PMSD	
Angular (Corrected)		C > T			53046 passed 28d survival rate endpoint					5.35%	
Equal Variance t Two-Sample Test											
Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)		
Control Sed		53046	21	-1.651	1.721	0.08667	CDF	0.9432	Non-Significant Effect		
ANOVA Table											
Source		Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(α:5%)		
Between		0.0396669		0.0396669		1	2.725	0.1137	Non-Significant Effect		
Error		0.305722		0.0145582		21					
Total		0.345389				22					
ANOVA Assumptions Tests											
Attribute		Test				Test Stat	Critical	P-Value	Decision(α:1%)		
Variance		Variance Ratio F Test				3.648	5.418	0.0444	Equal Variances		
Distribution		Shapiro-Wilk W Normality Test				0.9012	0.88	0.0267	Normal Distribution		
28d Survival Rate Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	11	0.9091	0.8389	0.9793	0.9000	0.7000	1.0000	0.0315	11.49%	0.00%
53046		12	0.9667	0.9354	0.9980	1.0000	0.9000	1.0000	0.0142	5.09%	-6.33%
Angular (Corrected) Transformed Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	11	1.2750	1.1720	1.3780	1.2490	0.9912	1.4190	0.0462	12.02%	0.00%
53046		12	1.3580	1.3070	1.4090	1.4120	1.2490	1.4120	0.0232	5.91%	-6.52%
28d Survival Rate Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53040	CS	0.9000	1.0000	1.0000	1.0000	1.0000	0.8000	0.9000	0.8000	0.9000	0.7000
		1.0000									
53046		0.9000	1.0000	0.9000	0.9000	1.0000	1.0000	0.9000	1.0000	1.0000	1.0000
		1.0000	1.0000								
Angular (Corrected) Transformed Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53040	CS	1.2490	1.4120	1.4120	1.4120	1.4120	1.1070	1.2490	1.1070	1.2490	0.9912
		1.4190									
53046		1.2490	1.4120	1.2490	1.2490	1.4120	1.4120	1.2490	1.4120	1.4120	1.4120
		1.4120	1.4120								

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test

Aquatec Environmental, Inc.

Analysis ID:	06-2655-6996	Endpoint:	28d Survival Rate	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 13:48	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 14:38	MD5 Hash:	E3669233C80A1AEE68679B671D932F01	Editor ID:	007-856-968-0

Graphics



CETIS Analytical Report

Report Date: 07 Mar-22 12:00 (p 37 of 96)
Test Code/ID: 16245 OUT / 18-8933-1045

Hyaella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID: 18-6087-0611	Endpoint: 35d Survival Rate	CETIS Version: CETISv2.1.1
Analyzed: 06 Mar-22 13:47	Analysis: Parametric-Two Sample	Status Level: 1
Edit Date: 04 Mar-22 14:38	MD5 Hash: 3960A5949F4EEF892219FE35EC3214F5	Editor ID: 007-856-968-0
Batch ID: 16-7279-9191	Test Type: Hyaella (42d)	Analyst: C. Mattheus Ayers
Start Date: 06 Jan-22 15:25	Protocol: EPA/600/R-99/064 (2000)	Diluent: Reconstituted Water
Ending Date: 17 Feb-22 12:00	Species: Hyaella azteca	Brine:
Test Length: 41d 21h	Taxon: Malacostraca	Source: Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, In	Sediment Testing
53041	03-8171-1181	21 Dec-21 09:05	21 Dec-21 20:00	16d 6h (0.3 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53041	Sediment	Belmont Landfill	TOX-4	

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	53041 passed 35d survival rate endpoint	12.90%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Control Sed		53041	13	-0.2648	1.771	0.1635	CDF	0.6023	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.00223207	0.00223207	1	0.07013	0.7953	Non-Significant Effect
Error	0.413777	0.031829	13			
Total	0.416009		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.104	9.155	0.8874	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.861	0.8328	0.0249	Normal Distribution

35d Survival Rate Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	7	0.8714	0.7555	0.9874	0.8000	0.7000	1.0000	0.0474	14.39%	0.00%
53041		8	0.8875	0.7833	0.9917	0.9000	0.7000	1.0000	0.0441	14.04%	-1.84%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	7	1.2210	1.0520	1.3910	1.1070	0.9912	1.4120	0.0692	14.99%	0.00%
53041		8	1.2460	1.1000	1.3910	1.2490	0.9912	1.4120	0.0616	13.99%	-2.00%

35d Survival Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040	CS	0.7000	1.0000	1.0000	1.0000	0.8000	0.8000	0.8000	
53041		1.0000	0.9000	1.0000	0.9000	0.7000	0.9000	0.7000	1.0000

Angular (Corrected) Transformed Detail

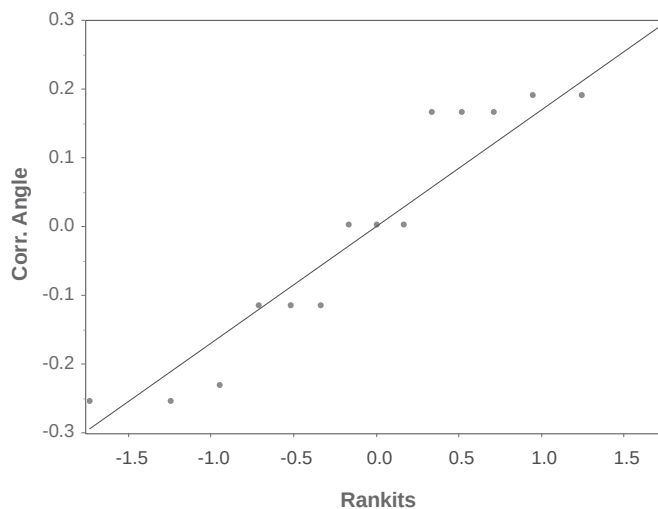
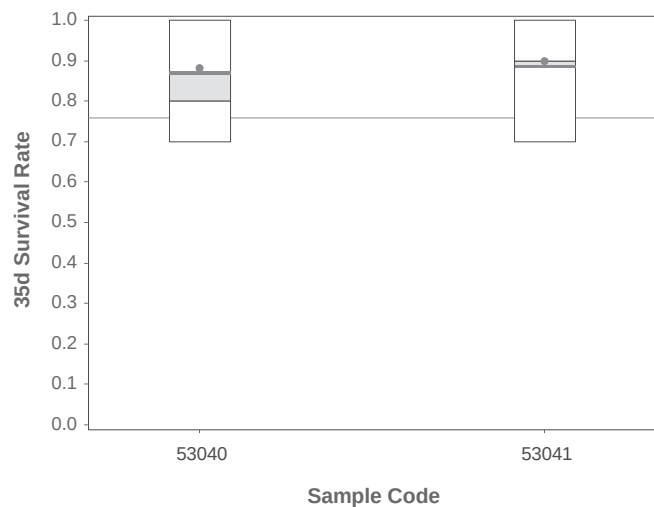
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040	CS	0.9912	1.4120	1.4120	1.4120	1.1070	1.1070	1.1070	
53041		1.4120	1.2490	1.4120	1.2490	0.9912	1.2490	0.9912	1.4120

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test

Aquatec Environmental, Inc.

Analysis ID: 18-6087-0611
Analyzed: 06 Mar-22 13:47
Edit Date: 04 Mar-22 14:38Endpoint: 35d Survival Rate
Analysis: Parametric-Two Sample
MD5 Hash: 3960A5949F4EEF892219FE35EC3214F5CETIS Version: CETISv2.1.1
Status Level: 1
Editor ID: 007-856-968-0

Graphics



CETIS Analytical Report

Report Date: 07 Mar-22 12:00 (p 39 of 96)
Test Code/ID: 16245 OUT / 18-8933-1045

Hyaella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID:	21-0198-0609	Endpoint:	35d Survival Rate	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 13:48	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 14:38	MD5 Hash:	6E1E72D0BF258F05AE3EA056C9B94879	Editor ID:	007-856-968-0
Batch ID:	16-7279-9191	Test Type:	Hyaella (42d)	Analyst:	C. Mattheus Ayers
Start Date:	06 Jan-22 15:25	Protocol:	EPA/600/R-99/064 (2000)	Diluent:	Reconstituted Water
Ending Date:	17 Feb-22 12:00	Species:	Hyaella azteca	Brine:	
Test Length:	41d 21h	Taxon:	Malacostraca	Source:	Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, In	Sediment Testing
53042	04-7178-2695	21 Dec-21 13:38	21 Dec-21 20:00	16d 2h (0.6 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53042	Sediment	Belmont Landfill	TOX-1	

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	53042 failed 35d survival rate endpoint	13.66%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Control Sed		53042*	13	1.795	1.771	0.1713	CDF	0.0480	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.112446	0.112446	1	3.22	0.0960	Non-Significant Effect
Error	0.453932	0.0349179	13			
Total	0.566378		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.077	10.79	0.9442	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9025	0.8328	0.1038	Normal Distribution

35d Survival Rate Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	7	0.8714	0.7555	0.9874	0.8000	0.7000	1.0000	0.0474	14.39%	0.00%
53042		8	0.7375	0.5966	0.8784	0.8000	0.4000	0.9000	0.0596	22.85%	15.37%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	7	1.2210	1.0520	1.3910	1.1070	0.9912	1.4120	0.0692	14.99%	0.00%
53042		8	1.0480	0.8888	1.2070	1.1070	0.6847	1.2490	0.0672	18.14%	14.21%

35d Survival Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040	CS	0.7000	1.0000	1.0000	1.0000	0.8000	0.8000	0.8000	
53042		0.7000	0.8000	0.8000	0.4000	0.8000	0.9000	0.9000	0.6000

Angular (Corrected) Transformed Detail

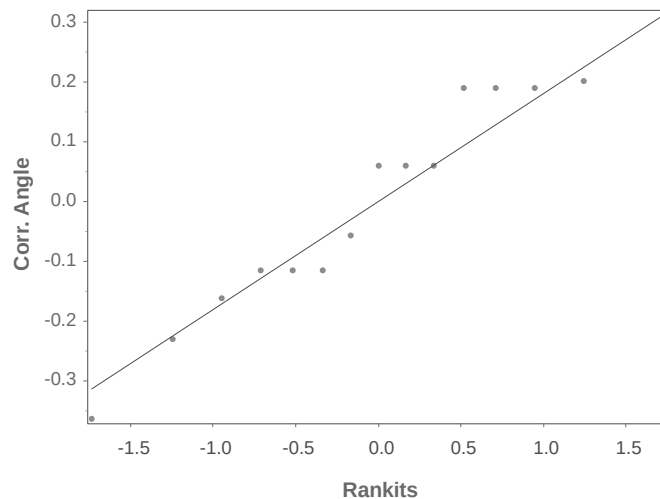
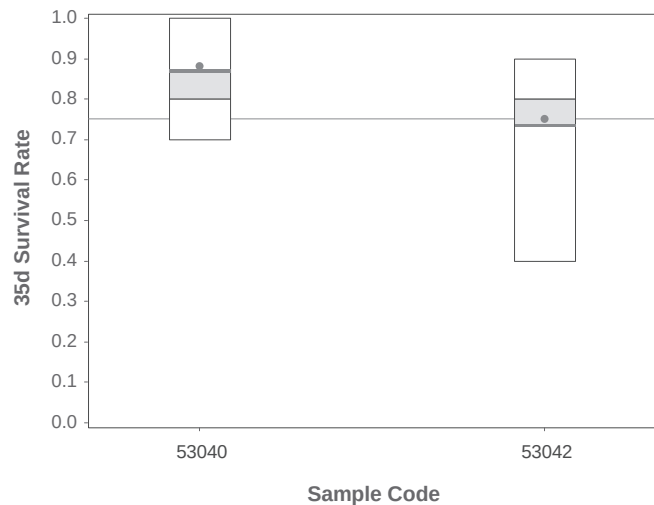
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040	CS	0.9912	1.4120	1.4120	1.4120	1.1070	1.1070	1.1070	
53042		0.9912	1.1070	1.1070	0.6847	1.1070	1.2490	1.2490	0.8861

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test

Aquatec Environmental, Inc.

Analysis ID:	21-0198-0609	Endpoint:	35d Survival Rate	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 13:48	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 14:38	MD5 Hash:	6E1E72D0BF258F05AE3EA056C9B94879	Editor ID:	007-856-968-0

Graphics



CETIS Analytical Report

Report Date: 07 Mar-22 12:00 (p 41 of 96)
Test Code/ID: 16245 OUT / 18-8933-1045

Hyaella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID: 00-2166-7010	Endpoint: 35d Survival Rate	CETIS Version: CETISv2.1.1
Analyzed: 06 Mar-22 13:48	Analysis: Parametric-Two Sample	Status Level: 1
Edit Date: 04 Mar-22 14:38	MD5 Hash: BDF09EDB52A3F15AB41672D0E85A6CEC	Editor ID: 007-856-968-0
Batch ID: 16-7279-9191	Test Type: Hyaella (42d)	Analyst: C. Mattheus Ayers
Start Date: 06 Jan-22 15:25	Protocol: EPA/600/R-99/064 (2000)	Diluent: Reconstituted Water
Ending Date: 17 Feb-22 12:00	Species: Hyaella azteca	Brine:
Test Length: 41d 21h	Taxon: Malacostraca	Source: Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, In	Sediment Testing
53043	20-0010-4712	21 Dec-21 12:35	21 Dec-21 20:00	16d 3h (0.6 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53043	Sediment	Belmont Landfill	TOX-2	

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	53043 passed 35d survival rate endpoint	14.99%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Control Sed		53043	13	-0.4993	1.771	0.1846	CDF	0.6871	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0101179	0.0101179	1	0.2493	0.6259	Non-Significant Effect
Error	0.527521	0.0405785	13			
Total	0.537639		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.39	10.79	0.7039	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.8511	0.8328	0.0180	Normal Distribution

35d Survival Rate Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	7	0.8714	0.7555	0.9874	0.8000	0.7000	1.0000	0.0474	14.39%	0.00%
53043		8	0.9000	0.7659	1.0000	1.0000	0.6000	1.0000	0.0567	17.82%	-3.28%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	7	1.2210	1.0520	1.3910	1.1070	0.9912	1.4120	0.0692	14.99%	0.00%
53043		8	1.2730	1.0930	1.4540	1.4120	0.8861	1.4120	0.0763	16.96%	-4.26%

35d Survival Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040	CS	0.7000	1.0000	1.0000	1.0000	0.8000	0.8000	0.8000	
53043		1.0000	1.0000	0.9000	1.0000	1.0000	0.7000	1.0000	0.6000

Angular (Corrected) Transformed Detail

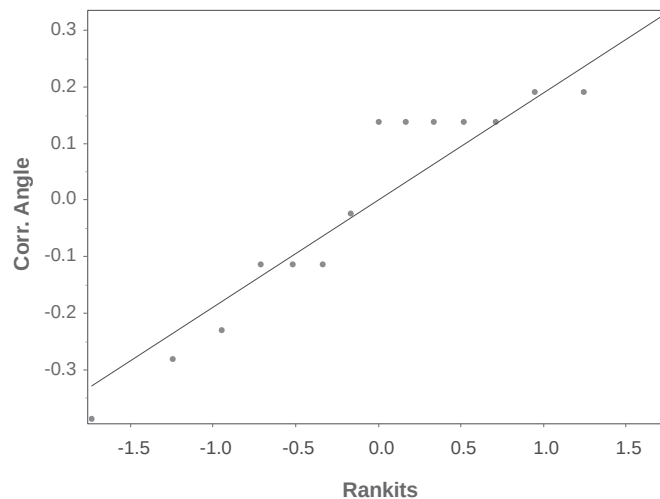
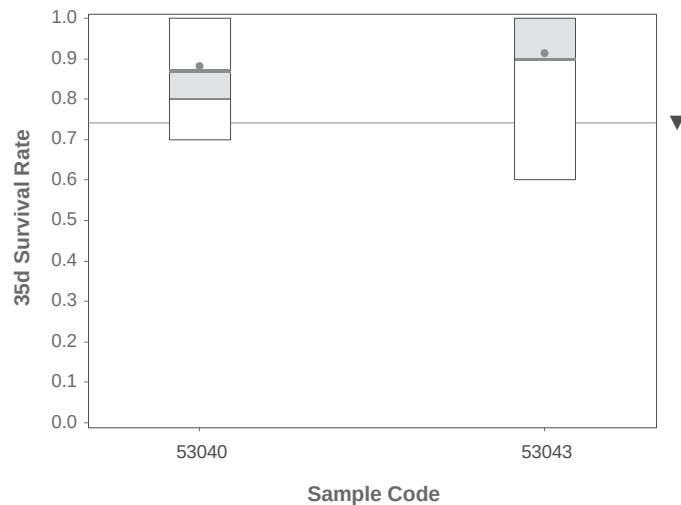
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040	CS	0.9912	1.4120	1.4120	1.4120	1.1070	1.1070	1.1070	
53043		1.4120	1.4120	1.2490	1.4120	1.4120	0.9912	1.4120	0.8861

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test

Aquatec Environmental, Inc.

Analysis ID:	00-2166-7010	Endpoint:	35d Survival Rate	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 13:48	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 14:38	MD5 Hash:	BDF09EDB52A3F15AB41672D0E85A6CEC	Editor ID:	007-856-968-0

Graphics



CETIS Analytical Report

Report Date: 07 Mar-22 12:00 (p 43 of 96)
 Test Code/ID: 16245 OUT / 18-8933-1045

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test **Aquatec Environmental, Inc.**

Analysis ID:	19-5040-5406	Endpoint:	35d Survival Rate	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 13:48	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 14:38	MD5 Hash:	FFC7819F2DD17034134D56405A2AF2E3	Editor ID:	007-856-968-0
Batch ID:	16-7279-9191	Test Type:	Hyalella (42d)	Analyst:	C. Mattheus Ayers
Start Date:	06 Jan-22 15:25	Protocol:	EPA/600/R-99/064 (2000)	Diluent:	Reconstituted Water
Ending Date:	17 Feb-22 12:00	Species:	Hyalella azteca	Brine:	
Test Length:	41d 21h	Taxon:	Malacostraca	Source:	Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, Inc	Sediment Testing
53044	00-4677-6467	21 Dec-21 11:25	21 Dec-21 20:00	16d 4h (0.6 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53044	Sediment	Belmont Landfill	TOX-3	

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	53044 passed 35d survival rate endpoint	9.35%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Control Sed		53044	13	-0.426	1.771	0.1265	CDF	0.6615	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.00346021	0.00346021	1	0.1815	0.6770	Non-Significant Effect
Error	0.247814	0.0190626	13			
Total	0.251274		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	5.032	9.155	0.0522	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.8923	0.8328	0.0727	Normal Distribution

35d Survival Rate Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	7	0.8714	0.7555	0.9874	0.8000	0.7000	1.0000	0.0474	14.39%	0.00%
53044		8	0.9000	0.8553	0.9447	0.9000	0.8000	1.0000	0.0189	5.94%	-3.28%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	7	1.2210	1.0520	1.3910	1.1070	0.9912	1.4120	0.0692	14.99%	0.00%
53044		8	1.2520	1.1830	1.3200	1.2490	1.1070	1.4120	0.0289	6.52%	-2.49%

35d Survival Rate Detail

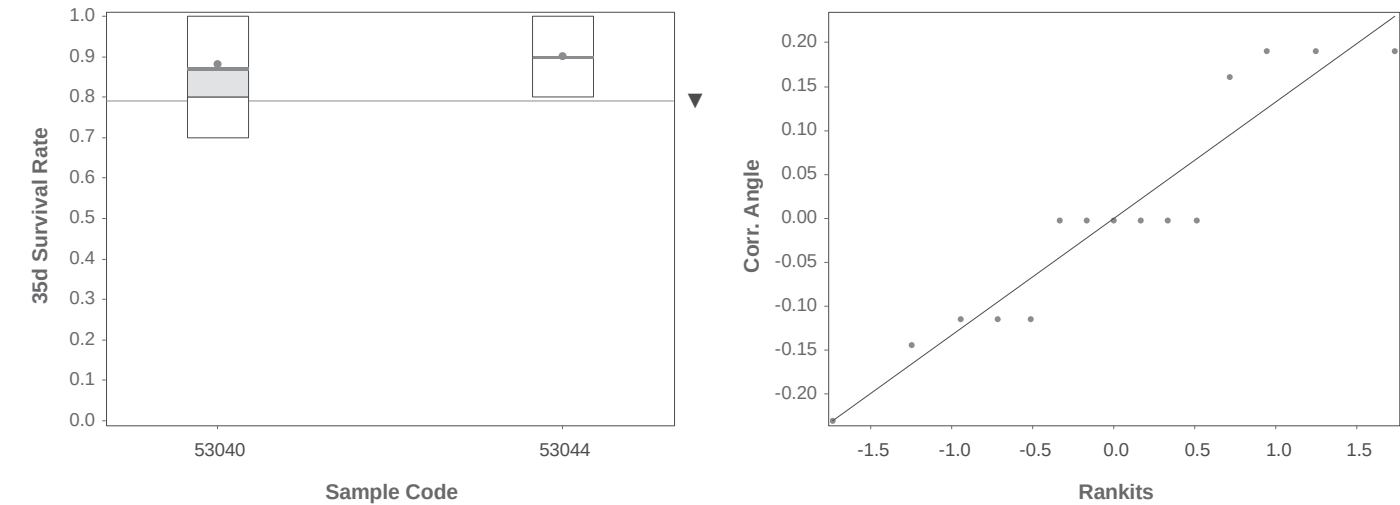
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040	CS	0.7000	1.0000	1.0000	1.0000	0.8000	0.8000	0.8000	
53044		0.9000	1.0000	0.9000	0.9000	0.9000	0.8000	0.9000	0.9000

Angular (Corrected) Transformed Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040	CS	0.9912	1.4120	1.4120	1.4120	1.1070	1.1070	1.1070	
53044		1.2490	1.4120	1.2490	1.2490	1.2490	1.1070	1.2490	1.2490

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test			Aquatec Environmental, Inc.	
Analysis ID:	19-5040-5406	Endpoint:	35d Survival Rate	CETIS Version: CETISv2.1.1
Analyzed:	06 Mar-22 13:48	Analysis:	Parametric-Two Sample	Status Level: 1
Edit Date:	04 Mar-22 14:38	MD5 Hash:	FFC7819F2DD17034134D56405A2AF2E3	Editor ID: 007-856-968-0

Graphics



CETIS Analytical Report

Report Date: 07 Mar-22 12:00 (p 45 of 96)
 Test Code/ID: 16245 OUT / 18-8933-1045

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test **Aquatec Environmental, Inc.**

Analysis ID:	11-3701-9996	Endpoint:	35d Survival Rate	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 13:48	Analysis:	Nonparametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 14:38	MD5 Hash:	FE1192C674F6FEED6CAAFF55109EC723	Editor ID:	007-856-968-0
Batch ID:	16-7279-9191	Test Type:	Hyalella (42d)	Analyst:	C. Matthaus Ayers
Start Date:	06 Jan-22 15:25	Protocol:	EPA/600/R-99/064 (2000)	Diluent:	Reconstituted Water
Ending Date:	17 Feb-22 12:00	Species:	Hyalella azteca	Brine:	
Test Length:	41d 21h	Taxon:	Malacostraca	Source:	Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, Inc.	Sediment Testing
53045	13-5487-4433	21 Dec-21 14:22	21 Dec-21 20:00	16d 1h (0.3 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53045	Sediment	Belmont Landfill	TOX-5	

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	53045 passed 35d survival rate endpoint	11.14%

Wilcoxon Rank Sum Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	Ties	P-Type	P-Value	Decision(α:5%)
Control Sed		53045	13	65	---	2	Exact	0.5734	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	2.1433E-05	2.1433E-05	1	0.0008507	0.9772	Non-Significant Effect
Error	0.327534	0.0251949	13			
Total	0.327555		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.857	9.155	0.4366	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.8019	0.8328	0.0039	Non-Normal Distribution

35d Survival Rate Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	7	0.8714	0.7555	0.9874	0.8000	0.7000	1.0000	0.0474	14.39%	0.00%
53045		8	0.8750	0.8009	0.9491	0.8333	0.8000	1.0000	0.0313	10.13%	-0.41%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	7	1.2210	1.0520	1.3910	1.1070	0.9912	1.4120	0.0692	14.99%	0.00%
53045		8	1.2190	1.1070	1.3310	1.1540	1.1070	1.4120	0.0475	11.02%	0.20%

35d Survival Rate Detail

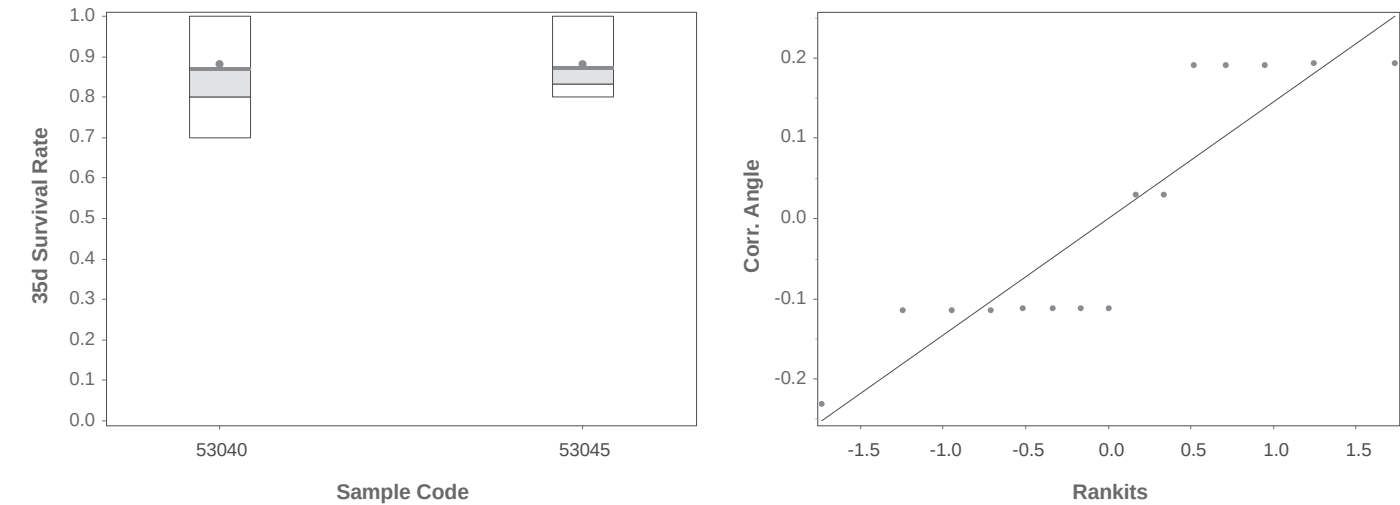
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040	CS	0.7000	1.0000	1.0000	1.0000	0.8000	0.8000	0.8000	
53045		0.8000	0.9000	1.0000	0.9000	1.0000	0.8000	0.8000	0.8000

Angular (Corrected) Transformed Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040	CS	0.9912	1.4120	1.4120	1.4120	1.1070	1.1070	1.1070	
53045		1.1070	1.2490	1.4120	1.2490	1.4120	1.1070	1.1070	1.1070

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test			Aquatec Environmental, Inc.	
Analysis ID:	11-3701-9996	Endpoint:	35d Survival Rate	CETIS Version: CETISv2.1.1
Analyzed:	06 Mar-22 13:48	Analysis:	Nonparametric-Two Sample	Status Level: 1
Edit Date:	04 Mar-22 14:38	MD5 Hash:	FE1192C674F6FEED6CAAFF55109EC723	Editor ID: 007-856-968-0

Graphics



CETIS Analytical Report

Report Date: 07 Mar-22 12:00 (p 47 of 96)
 Test Code/ID: 16245 OUT / 18-8933-1045

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test **Aquatec Environmental, Inc.**

Analysis ID:	09-7383-6621	Endpoint:	35d Survival Rate	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 13:48	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 14:38	MD5 Hash:	5D6C6B78D094791A40F75DED2FB0D68D	Editor ID:	007-856-968-0
Batch ID:	16-7279-9191	Test Type:	Hyalella (42d)	Analyst:	C. Mattheus Ayers
Start Date:	06 Jan-22 15:25	Protocol:	EPA/600/R-99/064 (2000)	Diluent:	Reconstituted Water
Ending Date:	17 Feb-22 12:00	Species:	Hyalella azteca	Brine:	
Test Length:	41d 21h	Taxon:	Malacostraca	Source:	Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, Inc	Sediment Testing
53046	12-3611-8332	21 Dec-21 15:54	21 Dec-21 20:00	16d (0.3 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53046	Reference sediment	Belmont Landfill	TOX-6	

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	53046 passed 35d survival rate endpoint	10.44%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Control Sed		53046	13	-1.174	1.771	0.1381	CDF	0.8693	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.031296	0.031296	1	1.379	0.2613	Non-Significant Effect
Error	0.295037	0.0226952	13			
Total	0.326333		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	2.501	9.155	0.2560	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.8963	0.8328	0.0836	Normal Distribution

35d Survival Rate Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	7	0.8714	0.7555	0.9874	0.8000	0.7000	1.0000	0.0474	14.39%	0.00%
53046		8	0.9375	0.8753	0.9997	0.9571	0.8000	1.0000	0.0263	7.94%	-7.58%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	7	1.2210	1.0520	1.3910	1.1070	0.9912	1.4120	0.0692	14.99%	0.00%
53046		8	1.3130	1.2160	1.4100	1.3420	1.1070	1.4120	0.0409	8.82%	-7.50%

35d Survival Rate Detail

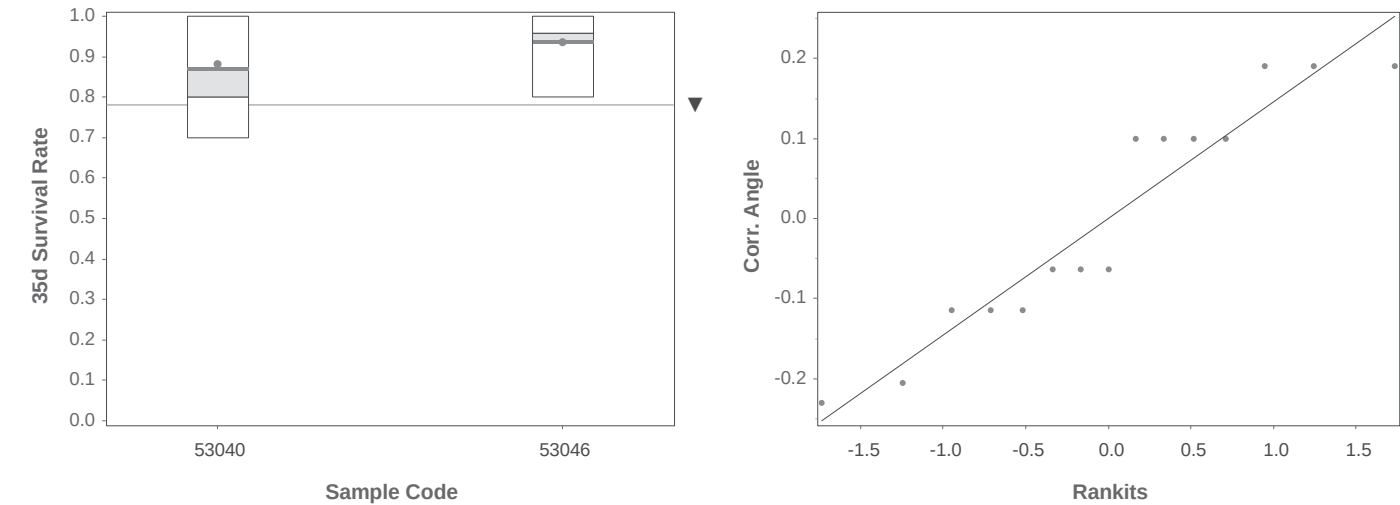
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040	CS	0.7000	1.0000	1.0000	1.0000	0.8000	0.8000	0.8000	
53046		0.9000	1.0000	0.9000	0.8000	1.0000	1.0000	0.9000	1.0000

Angular (Corrected) Transformed Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040	CS	0.9912	1.4120	1.4120	1.4120	1.1070	1.1070	1.1070	
53046		1.2490	1.4120	1.2490	1.1070	1.4120	1.4120	1.2490	1.4120

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test			Aquatec Environmental, Inc.	
Analysis ID:	09-7383-6621	Endpoint:	35d Survival Rate	CETIS Version: CETISv2.1.1
Analyzed:	06 Mar-22 13:48	Analysis:	Parametric-Two Sample	Status Level: 1
Edit Date:	04 Mar-22 14:38	MD5 Hash:	5D6C6B78D094791A40F75DED2FB0D68D	Editor ID: 007-856-968-0

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Report Date: 07 Mar-22 12:00 (p 49 of 96)
 Test Code/ID: 16245 OUT / 18-8933-1045

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID:	19-7212-9542	Endpoint:	42d Biomass	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 13:47	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 14:38	MD5 Hash:	AFC7774B5CC3B75A0690BFA9198B5D3B	Editor ID:	007-856-968-0
Batch ID:	16-7279-9191	Test Type:	Hyalella (42d)	Analyst:	C. Matthaues Ayers
Start Date:	06 Jan-22 15:25	Protocol:	EPA/600/R-99/064 (2000)	Diluent:	Reconstituted Water
Ending Date:	17 Feb-22 12:00	Species:	Hyalella azteca	Brine:	
Test Length:	41d 21h	Taxon:	Malacostraca	Source:	Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, Inc.	Sediment Testing
53041	03-8171-1181	21 Dec-21 09:05	21 Dec-21 20:00	16d 6h (0.3 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53041	Sediment	Belmont Landfill	TOX-4	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53041 failed 42d biomass endpoint	22.79%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Control Sed		53041*	13	2.329	1.771	0.1007	CDF	0.0183	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0655434	0.0655434	1	5.427	0.0366	Significant Effect
Error	0.157018	0.0120783	13			
Total	0.222561		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	9.579	10.79	0.0137	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.946	0.8328	0.4631	Normal Distribution

42d Biomass Summary

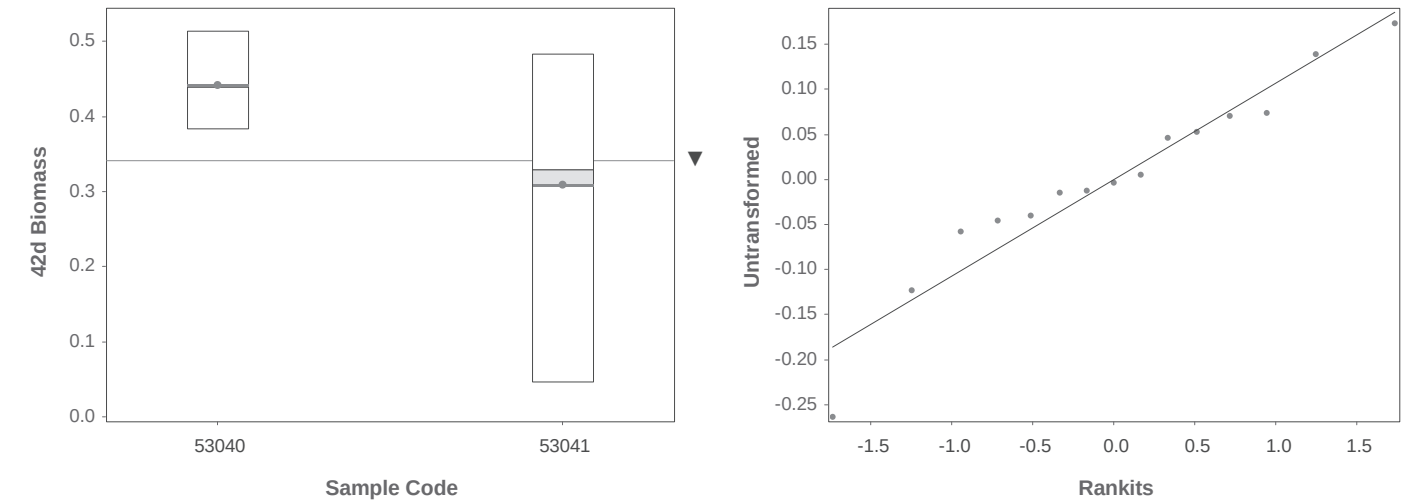
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	7	0.442	0.3991	0.4849	0.439	0.384	0.513	0.01752	10.49%	0.00%
53041		8	0.3095	0.1895	0.4295	0.3295	0.046	0.483	0.05073	46.36%	29.98%

42d Biomass Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040	CS	0.396	0.513	0.488	0.439	0.384	0.447	0.427	
53041		0.186	0.449	0.362	0.297	0.383	0.27	0.046	0.483

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test					Aquatec Environmental, Inc.
Analysis ID:	19-7212-9542	Endpoint:	42d Biomass	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 13:47	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 14:38	MD5 Hash:	AFC7774B5CC3B75A0690BFA9198B5D3B	Editor ID:	007-856-968-0

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Report Date: 07 Mar-22 12:00 (p 51 of 96)
Test Code/ID: 16245 OUT / 18-8933-1045

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test						Aquatec Environmental, Inc.	
Analysis ID:	03-1579-9877	Endpoint:	42d Biomass	CETIS Version:	CETISv2.1.1		
Analyzed:	06 Mar-22 13:48	Analysis:	Parametric-Two Sample	Status Level:	1		
Edit Date:	04 Mar-22 14:38	MD5 Hash:	BA9FA263104CC6FC356C01A9997AC65A	Editor ID:	007-856-968-0		
Batch ID:	16-7279-9191	Test Type:	Hyalella (42d)	Analyst:	C. Matthaues Ayers		
Start Date:	06 Jan-22 15:25	Protocol:	EPA/600/R-99/064 (2000)	Diluent:	Reconstituted Water		
Ending Date:	17 Feb-22 12:00	Species:	Hyalella azteca	Brine:			
Test Length:	41d 21h	Taxon:	Malacostraca	Source:	Aquatic Research Organism	Age:	8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, Inc.	Sediment Testing
53042	04-7178-2695	21 Dec-21 13:38	21 Dec-21 20:00	16d 2h (0.6 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53042	Sediment	Belmont Landfill	TOX-1	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53042 passed 42d biomass endpoint	29.10%

Unequal Variance t Two-Sample Test									
Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Control Sed		53042	7	1.615	1.895	0.1286	CDF	0.0752	Non-Significant Effect

ANOVA Table						
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0448658	0.0448658	1	2.298	0.1535	Non-Significant Effect
Error	0.253804	0.0195234	13			
Total	0.29867		14			

ANOVA Assumptions Tests					
Attribute	Test	Test Stat	Critical	P-Value	Decision(α :1%)
Variance	Variance Ratio F Test	16.01	10.79	0.0034	Unequal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9126	0.8328	0.1483	Normal Distribution

42d Biomass Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	7	0.442	0.3991	0.4849	0.439	0.384	0.513	0.01752	10.49%	0.00%
53042		8	0.3324	0.1773	0.4875	0.429	0.074	0.49	0.06559	55.81%	24.80%

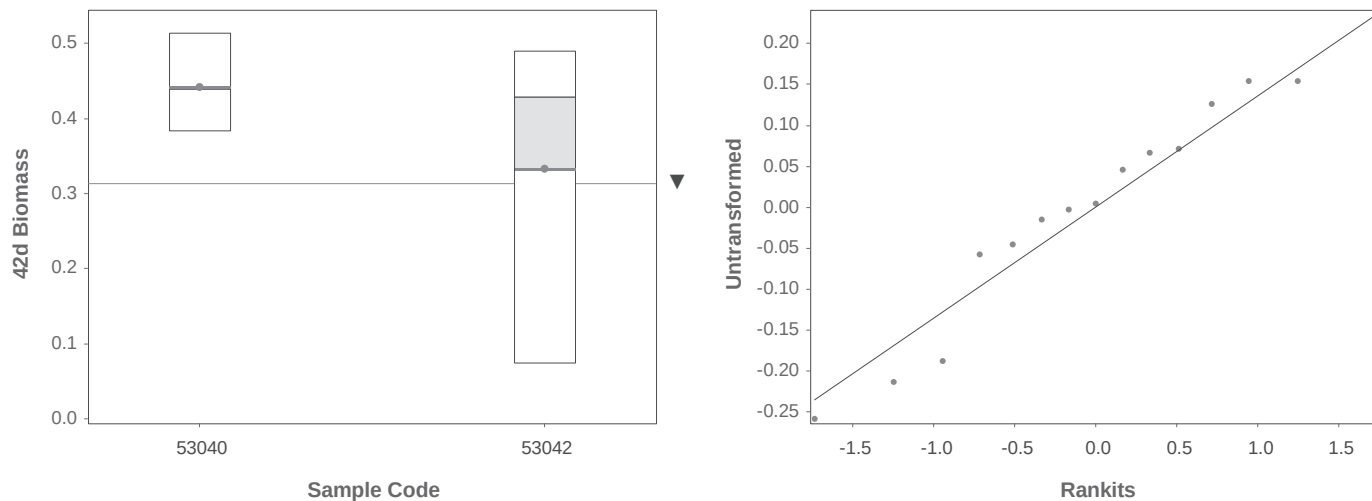
42d Biomass Detail									
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040	CS	0.396	0.513	0.488	0.439	0.384	0.447	0.427	
53042		0.399	0.487	0.144	0.074	0.49	0.459	0.487	0.119

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test

Aquatec Environmental, Inc.

Analysis ID:	03-1579-9877	Endpoint:	42d Biomass	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 13:48	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 14:38	MD5 Hash:	BA9FA263104CC6FC356C01A9997AC65A	Editor ID:	007-856-968-0

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CETIS Analytical Report

Report Date: 07 Mar-22 12:01 (p 53 of 96)
Test Code/ID: 16245 OUT / 18-8933-1045

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test						Aquatec Environmental, Inc.	
Analysis ID:	01-4634-8455	Endpoint:	42d Biomass	CETIS Version:	CETISv2.1.1		
Analyzed:	06 Mar-22 13:48	Analysis:	Parametric-Two Sample	Status Level:	1		
Edit Date:	04 Mar-22 14:38	MD5 Hash:	1A52EB96B05596E43B4134D10132414F	Editor ID:	007-856-968-0		
Batch ID:	16-7279-9191	Test Type:	Hyalella (42d)	Analyst:	C. Mattheus Ayers		
Start Date:	06 Jan-22 15:25	Protocol:	EPA/600/R-99/064 (2000)	Diluent:	Reconstituted Water		
Ending Date:	17 Feb-22 12:00	Species:	Hyalella azteca	Brine:			
Test Length:	41d 21h	Taxon:	Malacostraca	Source:	Aquatic Research Organism	Age:	8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, Inc.	Sediment Testing
53043	20-0010-4712	21 Dec-21 12:35	21 Dec-21 20:00	16d 3h (0.6 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53043	Sediment	Belmont Landfill	TOX-2	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53043 passed 42d biomass endpoint	13.80%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Control Sed		53043	13	-2.109	1.771	0.06098	CDF	0.9725	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0196911	0.0196911	1	4.448	0.0549	Non-Significant Effect
Error	0.0575479	0.00442676	13			
Total	0.0772389		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	2.968	10.79	0.2062	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9245	0.8328	0.2255	Normal Distribution

42d Biomass Summary

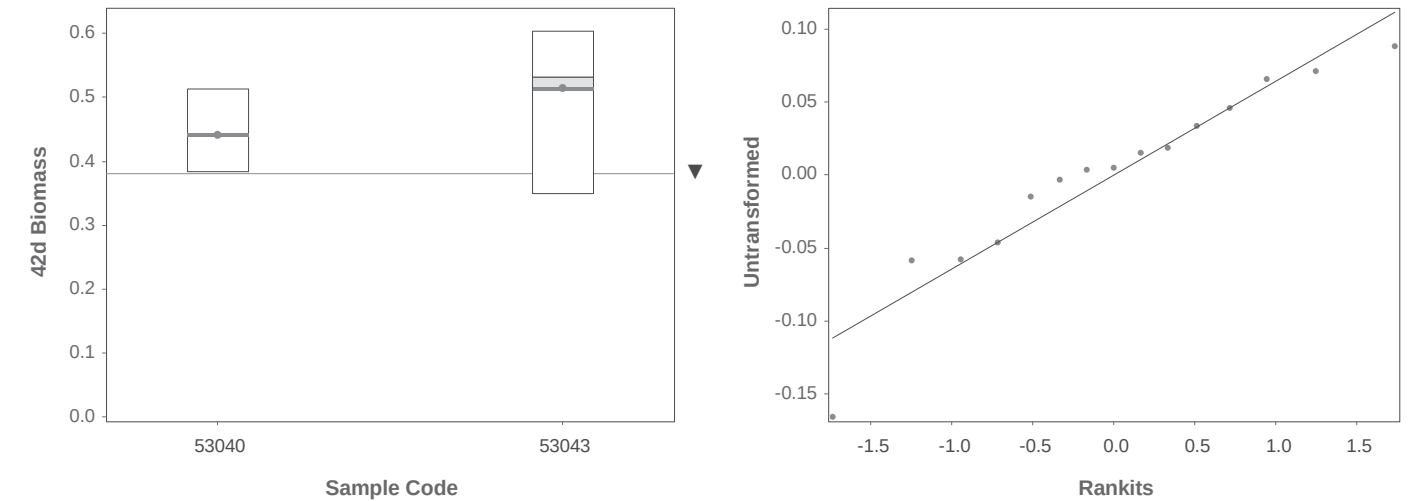
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	7	0.442	0.3991	0.4849	0.439	0.384	0.513	0.01752	10.49%	0.00%
53043		8	0.5146	0.4479	0.5814	0.5315	0.349	0.603	0.02824	15.52%	-16.43%

42d Biomass Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040	CS	0.396	0.513	0.488	0.439	0.384	0.447	0.427	
53043		0.603	0.533	0.518	0.58	0.53	0.456	0.548	0.349

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test					Aquatec Environmental, Inc.
Analysis ID:	01-4634-8455	Endpoint:	42d Biomass	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 13:48	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 14:38	MD5 Hash:	1A52EB96B05596E43B4134D10132414F	Editor ID:	007-856-968-0

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Report Date: 07 Mar-22 12:01 (p 55 of 96)
Test Code/ID: 16245 OUT / 18-8933-1045

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID: 14-2853-6076	Endpoint: 42d Biomass	CETIS Version: CETISv2.1.1
Analyzed: 06 Mar-22 13:48	Analysis: Parametric-Two Sample	Status Level: 1
Edit Date: 04 Mar-22 14:38	MD5 Hash: 5CF75447E3328DAFE30C185101FECF4C	Editor ID: 007-856-968-0
Batch ID: 16-7279-9191	Test Type: Hyalella (42d)	Analyst: C. Mattheus Ayers
Start Date: 06 Jan-22 15:25	Protocol: EPA/600/R-99/064 (2000)	Diluent: Reconstituted Water
Ending Date: 17 Feb-22 12:00	Species: Hyalella azteca	Brine:
Test Length: 41d 21h	Taxon: Malacostraca	Source: Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, Inc.	Sediment Testing
53044	00-4677-6467	21 Dec-21 11:25	21 Dec-21 20:00	16d 4h (0.6 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53044	Sediment	Belmont Landfill	TOX-3	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53044 passed 42d biomass endpoint	14.65%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Control Sed		53044	13	0.4444	1.771	0.06476	CDF	0.3320	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.00098584	0.00098584	1	0.1975	0.6641	Non-Significant Effect
Error	0.0648915	0.00499165	13			
Total	0.0658773		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	3.456	10.79	0.1520	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.894	0.8328	0.0770	Normal Distribution

42d Biomass Summary

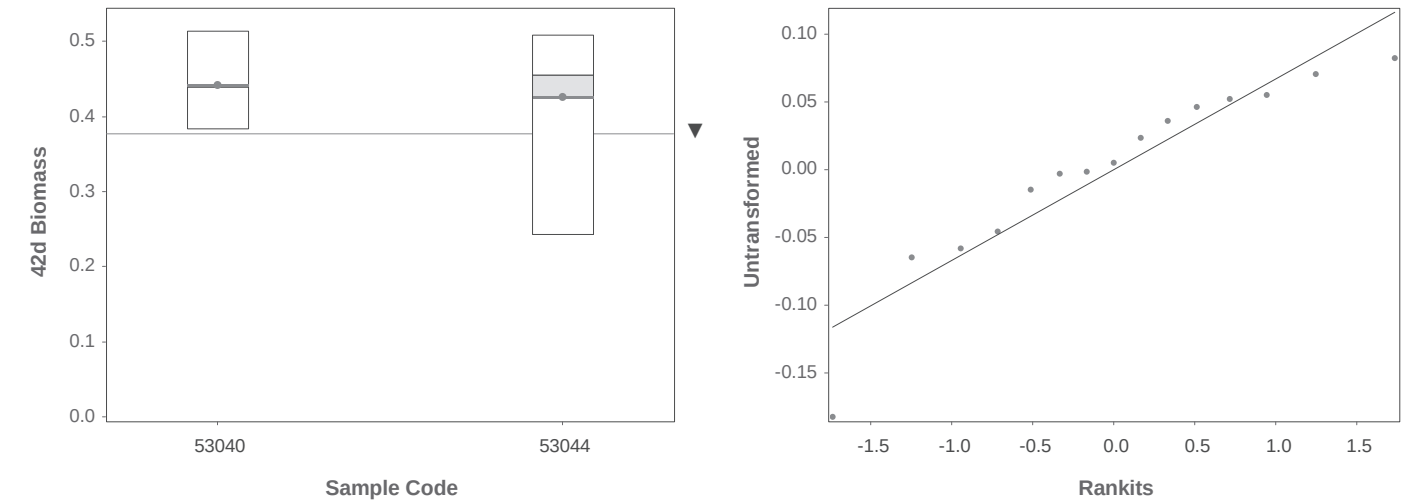
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	7	0.442	0.3991	0.4849	0.439	0.384	0.513	0.01752	10.49%	0.00%
53044		8	0.4257	0.3537	0.4978	0.4555	0.243	0.508	0.03047	20.24%	3.68%

42d Biomass Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040	CS	0.396	0.513	0.488	0.439	0.384	0.447	0.427	
53044		0.508	0.462	0.424	0.361	0.243	0.449	0.481	0.478

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test					Aquatec Environmental, Inc.
Analysis ID:	14-2853-6076	Endpoint:	42d Biomass	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 13:48	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 14:38	MD5 Hash:	5CF75447E3328DAFE30C185101FECF4C	Editor ID:	007-856-968-0

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Report Date: 07 Mar-22 12:01 (p 57 of 96)
 Test Code/ID: 16245 OUT / 18-8933-1045

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID: 16-5003-3901	Endpoint: 42d Biomass	CETIS Version: CETISv2.1.1
Analyzed: 06 Mar-22 13:48	Analysis: Parametric-Two Sample	Status Level: 1
Edit Date: 04 Mar-22 14:38	MD5 Hash: 94BD57F690D5F0B41CCE4FE0097E8A23	Editor ID: 007-856-968-0
Batch ID: 16-7279-9191	Test Type: Hyalella (42d)	Analyst: C. Matthaues Ayers
Start Date: 06 Jan-22 15:25	Protocol: EPA/600/R-99/064 (2000)	Diluent: Reconstituted Water
Ending Date: 17 Feb-22 12:00	Species: Hyalella azteca	Brine:
Test Length: 41d 21h	Taxon: Malacostraca	Source: Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, Inc.	Sediment Testing
53045	13-5487-4433	21 Dec-21 14:22	21 Dec-21 20:00	16d 1h (0.3 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53045	Sediment	Belmont Landfill	TOX-5	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53045 passed 42d biomass endpoint	24.80%

Unequal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Control Sed		53045	8	-0.8714	1.86	0.1096	CDF	0.7955	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.00985375	0.00985375	1	0.673	0.4268	Non-Significant Effect
Error	0.190352	0.0146425	13			
Total	0.200206		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	11.79	10.79	0.0079	Unequal Variances
Distribution	Shapiro-Wilk W Normality Test	0.8838	0.8328	0.0540	Normal Distribution

42d Biomass Summary

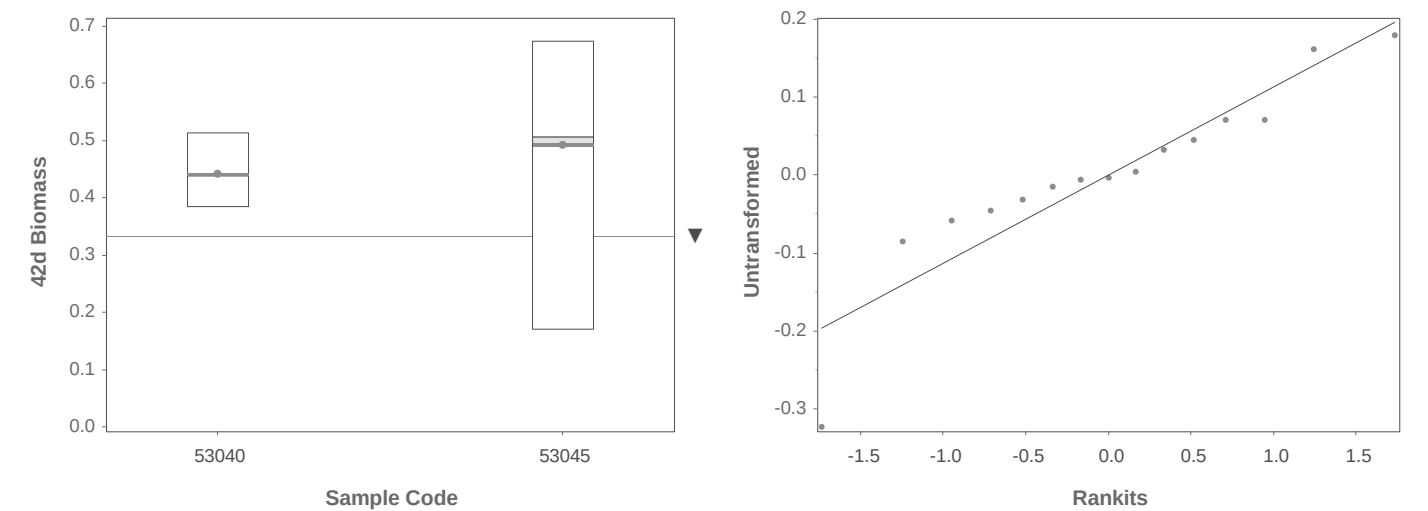
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	7	0.442	0.3991	0.4849	0.439	0.384	0.513	0.01752	10.49%	0.00%
53045		8	0.4934	0.3603	0.6265	0.507	0.17	0.673	0.05629	32.27%	-11.62%

42d Biomass Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040	CS	0.396	0.513	0.488	0.439	0.384	0.447	0.427	
53045		0.462	0.488	0.655	0.673	0.565	0.526	0.408	0.17

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test					Aquatec Environmental, Inc.
Analysis ID:	16-5003-3901	Endpoint:	42d Biomass	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 13:48	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 14:38	MD5 Hash:	94BD57F690D5F0B41CCE4FE0097E8A23	Editor ID:	007-856-968-0

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Report Date: 07 Mar-22 12:01 (p 59 of 96)
Test Code/ID: 16245 OUT / 18-8933-1045

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test						Aquatec Environmental, Inc.	
Analysis ID:	20-6420-3425	Endpoint:	42d Biomass	CETIS Version:	CETISv2.1.1		
Analyzed:	06 Mar-22 13:48	Analysis:	Parametric-Two Sample	Status Level:	1		
Edit Date:	04 Mar-22 14:38	MD5 Hash:	8639F9F431D9D3BD39E31F520301DB1B	Editor ID:	007-856-968-0		
Batch ID:	16-7279-9191	Test Type:	Hyalella (42d)	Analyst:	C. Matthaues Ayers		
Start Date:	06 Jan-22 15:25	Protocol:	EPA/600/R-99/064 (2000)	Diluent:	Reconstituted Water		
Ending Date:	17 Feb-22 12:00	Species:	Hyalella azteca	Brine:			
Test Length:	41d 21h	Taxon:	Malacostraca	Source:	Aquatic Research Organism	Age:	8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, Inc.	Sediment Testing
53046	12-3611-8332	21 Dec-21 15:54	21 Dec-21 20:00	16d (0.3 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53046	Reference sediment	Belmont Landfill	TOX-6	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53046 passed 42d biomass endpoint	11.21%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Control Sed		53046	13	-4.549	1.771	0.04954	CDF	0.9997	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0604522	0.0604522	1	20.69	0.0005	Significant Effect
Error	0.0379835	0.00292181	13			
Total	0.0984357		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.667	10.79	0.5500	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.949	0.8328	0.5084	Normal Distribution

42d Biomass Summary

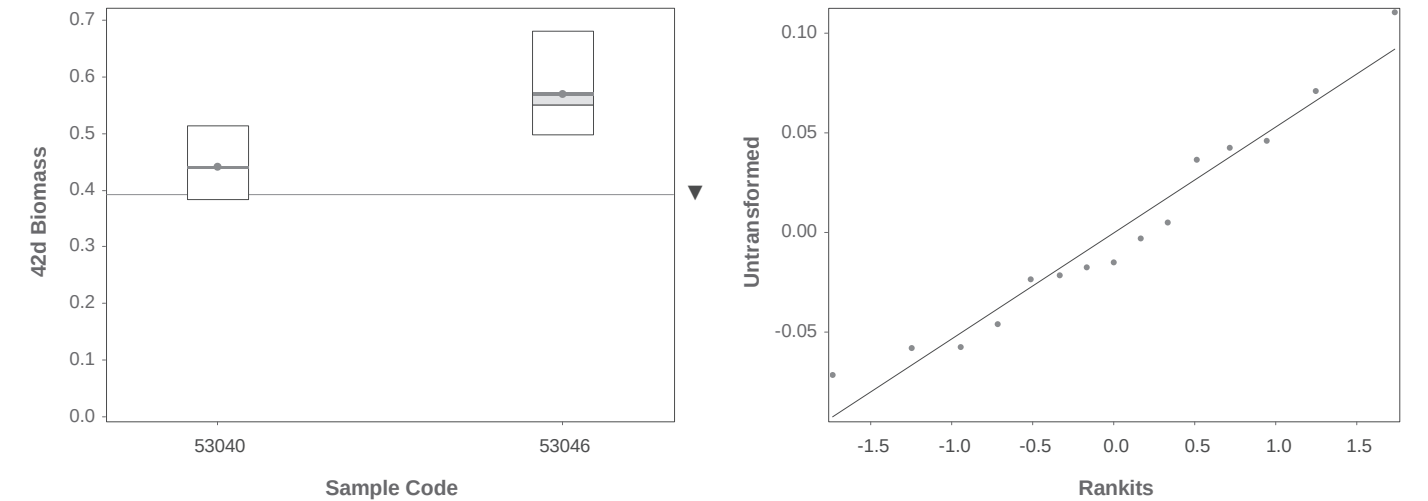
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	7	0.442	0.3991	0.4849	0.439	0.384	0.513	0.01752	10.49%	0.00%
53046		8	0.5693	0.5192	0.6193	0.55	0.498	0.68	0.02117	10.52%	-28.79%

42d Biomass Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040	CS	0.396	0.513	0.488	0.439	0.384	0.447	0.427	
53046		0.606	0.68	0.498	0.548	0.612	0.546	0.512	0.552

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test					Aquatec Environmental, Inc.
Analysis ID:	20-6420-3425	Endpoint:	42d Biomass	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 13:48	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 14:38	MD5 Hash:	8639F9F431D9D3BD39E31F520301DB1B	Editor ID:	007-856-968-0

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Report Date: 07 Mar-22 12:01 (p 61 of 96)
Test Code/ID: 16245 OUT / 18-8933-1045

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID:	00-5359-3530	Endpoint:	42d Mean Dry Weight	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 13:47	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 14:38	MD5 Hash:	D8269871DA91B4A7DD71CBABDC1E56B1	Editor ID:	007-856-968-0
Batch ID:	16-7279-9191	Test Type:	Hyalella (42d)	Analyst:	C. Mattheus Ayers
Start Date:	06 Jan-22 15:25	Protocol:	EPA/600/R-99/064 (2000)	Diluent:	Reconstituted Water
Ending Date:	17 Feb-22 12:00	Species:	Hyalella azteca	Brine:	
Test Length:	41d 21h	Taxon:	Malacostraca	Source:	Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, Inc.	Sediment Testing
53041	03-8171-1181	21 Dec-21 09:05	21 Dec-21 20:00	16d 6h (0.3 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53041	Sediment	Belmont Landfill	TOX-4	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53041 failed 42d mean dry weight endpoint	19.80%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Control Sed		53041*	13	1.835	1.771	0.1061	CDF	0.0447	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0451586	0.0451586	1	3.368	0.0894	Non-Significant Effect
Error	0.1743	0.0134077	13			
Total	0.219458		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	2.762	10.79	0.2366	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9181	0.8328	0.1799	Normal Distribution

42d Mean Dry Weight Summary

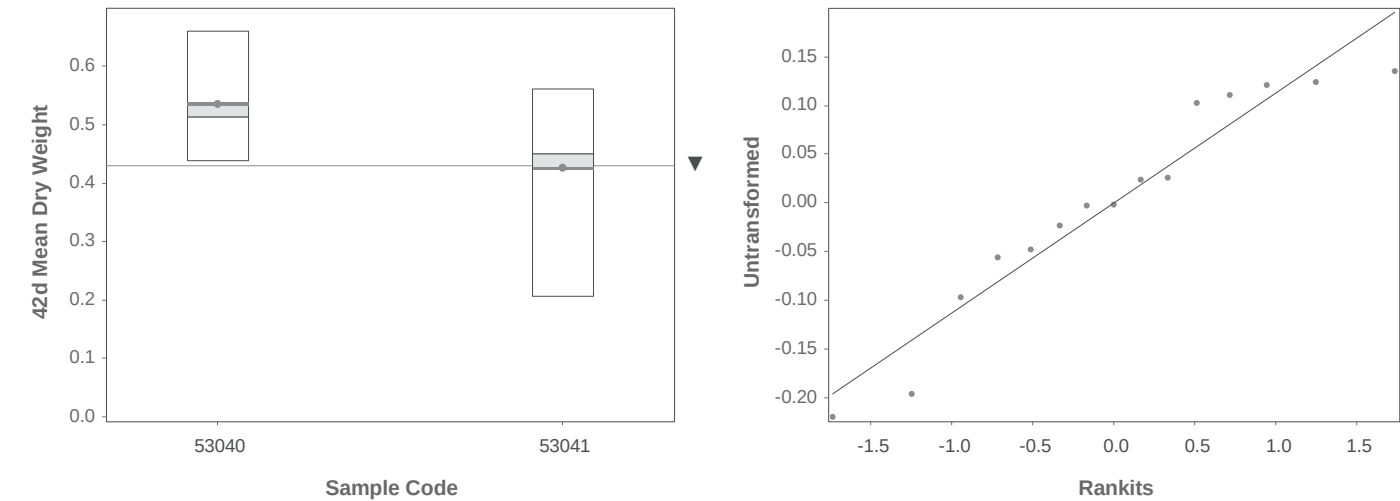
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	7	0.536	0.4593	0.6128	0.513	0.439	0.66	0.03135	15.47%	0.00%
53041		8	0.4261	0.3108	0.5413	0.4513	0.2067	0.5613	0.04874	32.35%	20.52%

42d Mean Dry Weight Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040	CS	0.66	0.513	0.488	0.439	0.48	0.6386	0.5338	
53041		0.2067	0.5613	0.4525	0.4243	0.5471	0.45	0.23	0.5367

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test			Aquatec Environmental, Inc.	
Analysis ID:	00-5359-3530	Endpoint:	42d Mean Dry Weight	CETIS Version: CETISv2.1.1
Analyzed:	06 Mar-22 13:47	Analysis:	Parametric-Two Sample	Status Level: 1
Edit Date:	04 Mar-22 14:38	MD5 Hash:	D8269871DA91B4A7DD71CBABDC1E56B1	Editor ID: 007-856-968-0

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Report Date: 07 Mar-22 12:01 (p 63 of 96)
 Test Code/ID: 16245 OUT / 18-8933-1045

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID: 17-1253-2939	Endpoint: 42d Mean Dry Weight	CETIS Version: CETISv2.1.1
Analyzed: 06 Mar-22 13:48	Analysis: Parametric-Two Sample	Status Level: 1
Edit Date: 04 Mar-22 14:38	MD5 Hash: 5D11576FA6A55199BB44445C15F0AA62	Editor ID: 007-856-968-0
Batch ID: 16-7279-9191	Test Type: Hyalella (42d)	Analyst: C. Mattheus Ayers
Start Date: 06 Jan-22 15:25	Protocol: EPA/600/R-99/064 (2000)	Diluent: Reconstituted Water
Ending Date: 17 Feb-22 12:00	Species: Hyalella azteca	Brine:
Test Length: 41d 21h	Taxon: Malacostraca	Source: Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, Inc.	Sediment Testing
53042	04-7178-2695	21 Dec-21 13:38	21 Dec-21 20:00	16d 2h (0.6 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53042	Sediment	Belmont Landfill	TOX-1	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53042 passed 42d mean dry weight endpoint	20.76%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Control Sed		53042	13	-0.1465	1.771	0.1113	CDF	0.5571	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.00031651	0.00031651	1	0.02147	0.8857	Non-Significant Effect
Error	0.191617	0.0147397	13			
Total	0.191933		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	3.122	10.79	0.1867	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9737	0.8328	0.9087	Normal Distribution

42d Mean Dry Weight Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	7	0.536	0.4593	0.6128	0.513	0.439	0.66	0.03135	15.47%	0.00%
53042		8	0.5453	0.4227	0.6678	0.5749	0.288	0.74	0.05181	26.88%	-1.72%

42d Mean Dry Weight Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040	CS	0.66	0.513	0.488	0.439	0.48	0.6386	0.5338	
53042		0.665	0.6087	0.288	0.74	0.6125	0.51	0.5411	0.3967

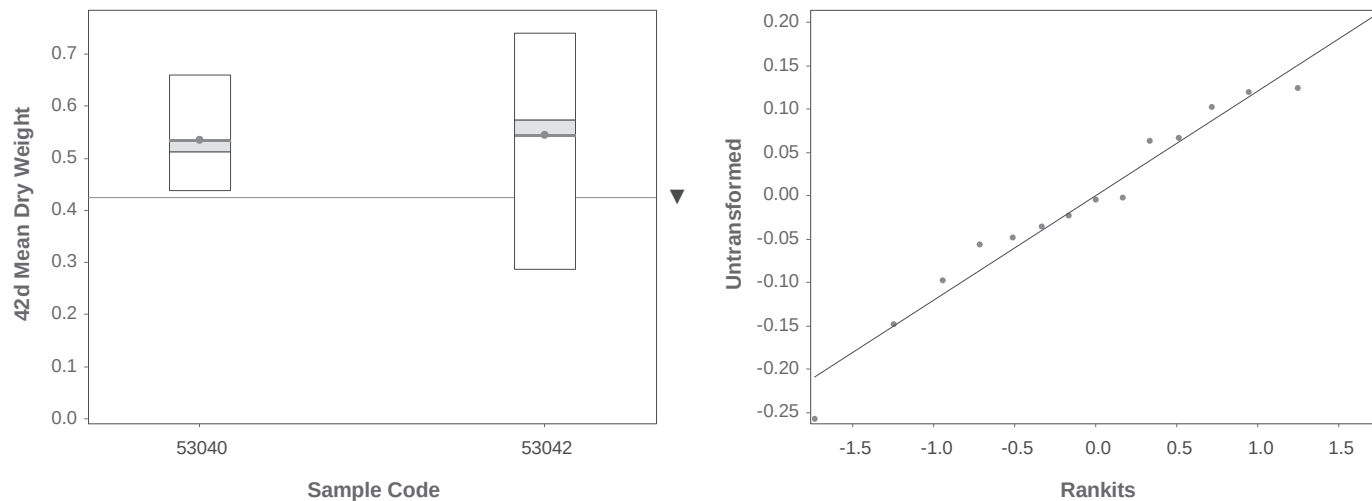
Hyalella 42-d Survival, Growth, and Reproduction Sediment Test

Aquatec Environmental, Inc.

Analysis ID: 17-1253-2939 Endpoint: 42d Mean Dry Weight
Analyzed: 06 Mar-22 13:48 Analysis: Parametric-Two Sample
Edit Date: 04 Mar-22 14:38 MD5 Hash: 5D11576FA6A55199BB44445C15F0AA62

CETIS Version: CETISv2.1.1
Status Level: 1
Editor ID: 007-856-968-0

Graphics



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Report Date: 07 Mar-22 12:01 (p 65 of 96)
Test Code/ID: 16245 OUT / 18-8933-1045

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID: 02-7101-8630	Endpoint: 42d Mean Dry Weight	CETIS Version: CETISv2.1.1
Analyzed: 06 Mar-22 13:48	Analysis: Parametric-Two Sample	Status Level: 1
Edit Date: 04 Mar-22 14:38	MD5 Hash: 402ABECFD16D01FAFE79218976161A8F	Editor ID: 007-856-968-0
Batch ID: 16-7279-9191	Test Type: Hyalella (42d)	Analyst: C. Mattheus Ayers
Start Date: 06 Jan-22 15:25	Protocol: EPA/600/R-99/064 (2000)	Diluent: Reconstituted Water
Ending Date: 17 Feb-22 12:00	Species: Hyalella azteca	Brine:
Test Length: 41d 21h	Taxon: Malacostraca	Source: Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, Inc	Sediment Testing
53043	20-0010-4712	21 Dec-21 12:35	21 Dec-21 20:00	16d 3h (0.6 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53043	Sediment	Belmont Landfill	TOX-2	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53043 passed 42d mean dry weight endpoint	10.66%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Control Sed		53043	13	-1.447	1.771	0.05715	CDF	0.9142	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.00813787	0.00813787	1	2.093	0.1717	Non-Significant Effect
Error	0.0505471	0.00388824	13			
Total	0.058685		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	5.197	9.155	0.0481	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9358	0.8328	0.3324	Normal Distribution

42d Mean Dry Weight Summary

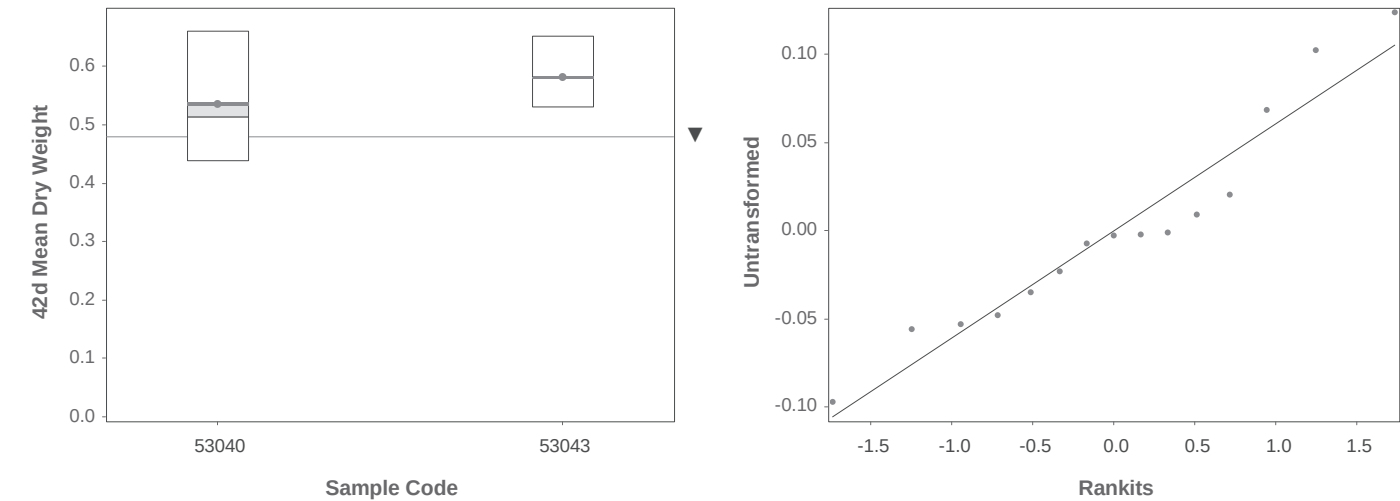
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	7	0.536	0.4593	0.6128	0.513	0.439	0.66	0.03135	15.47%	0.00%
53043		8	0.5827	0.5523	0.6132	0.5808	0.53	0.6514	0.01286	6.24%	-8.71%

42d Mean Dry Weight Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040	CS	0.66	0.513	0.488	0.439	0.48	0.6386	0.5338	
53043		0.603	0.5922	0.5756	0.58	0.53	0.6514	0.548	0.5817

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test			Aquatec Environmental, Inc.	
Analysis ID:	02-7101-8630	Endpoint:	42d Mean Dry Weight	CETIS Version: CETISv2.1.1
Analyzed:	06 Mar-22 13:48	Analysis:	Parametric-Two Sample	Status Level: 1
Edit Date:	04 Mar-22 14:38	MD5 Hash:	402ABECFD16D01FAFE79218976161A8F	Editor ID: 007-856-968-0

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Report Date: 07 Mar-22 12:01 (p 67 of 96)
Test Code/ID: 16245 OUT / 18-8933-1045

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID:	05-7354-4555	Endpoint:	42d Mean Dry Weight	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 13:48	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 14:38	MD5 Hash:	CD18CC627C876C05ACE39949EDB7AFC1	Editor ID:	007-856-968-0
Batch ID:	16-7279-9191	Test Type:	Hyalella (42d)	Analyst:	C. Matthaues Ayers
Start Date:	06 Jan-22 15:25	Protocol:	EPA/600/R-99/064 (2000)	Diluent:	Reconstituted Water
Ending Date:	17 Feb-22 12:00	Species:	Hyalella azteca	Brine:	
Test Length:	41d 21h	Taxon:	Malacostraca	Source:	Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, Inc.	Sediment Testing
53044	00-4677-6467	21 Dec-21 11:25	21 Dec-21 20:00	16d 4h (0.6 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53044	Sediment	Belmont Landfill	TOX-3	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53044 passed 42d mean dry weight endpoint	17.29%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Control Sed		53044	13	0.5674	1.771	0.0927	CDF	0.2901	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.00329308	0.00329308	1	0.3219	0.5801	Non-Significant Effect
Error	0.132985	0.0102296	13			
Total	0.136278		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.904	10.79	0.4504	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9318	0.8328	0.2899	Normal Distribution

42d Mean Dry Weight Summary

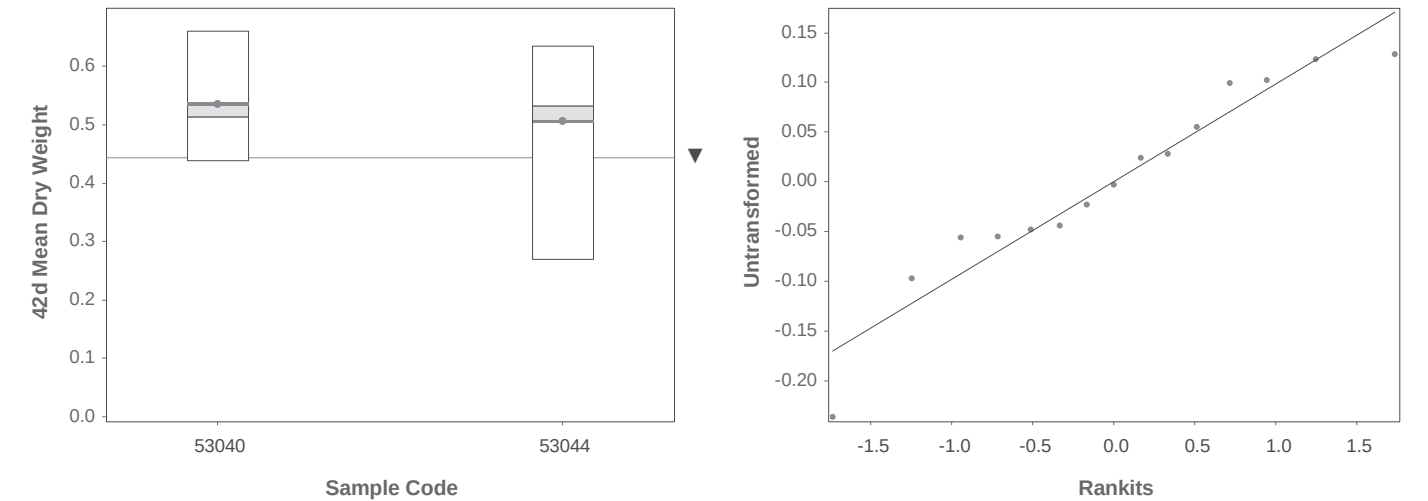
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	7	0.536	0.4593	0.6128	0.513	0.439	0.66	0.03135	15.47%	0.00%
53044		8	0.5063	0.4107	0.602	0.5328	0.27	0.635	0.04047	22.60%	5.54%

42d Mean Dry Weight Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040	CS	0.66	0.513	0.488	0.439	0.48	0.6386	0.5338	
53044		0.635	0.462	0.6057	0.4513	0.27	0.5613	0.5344	0.5311

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test			Aquatec Environmental, Inc.	
Analysis ID:	05-7354-4555	Endpoint:	42d Mean Dry Weight	CETIS Version: CETISv2.1.1
Analyzed:	06 Mar-22 13:48	Analysis:	Parametric-Two Sample	Status Level: 1
Edit Date:	04 Mar-22 14:38	MD5 Hash:	CD18CC627C876C05ACE39949EDB7AFC1	Editor ID: 007-856-968-0

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Report Date: 07 Mar-22 12:01 (p 69 of 96)
Test Code/ID: 16245 OUT / 18-8933-1045

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID: 16-7053-6393	Endpoint: 42d Mean Dry Weight	CETIS Version: CETISv2.1.1
Analyzed: 06 Mar-22 13:48	Analysis: Parametric-Two Sample	Status Level: 1
Edit Date: 04 Mar-22 14:38	MD5 Hash: 9ED78A53558F5052468B25F2720A219F	Editor ID: 007-856-968-0
Batch ID: 16-7279-9191	Test Type: Hyalella (42d)	Analyst: C. Mattheus Ayers
Start Date: 06 Jan-22 15:25	Protocol: EPA/600/R-99/064 (2000)	Diluent: Reconstituted Water
Ending Date: 17 Feb-22 12:00	Species: Hyalella azteca	Brine:
Test Length: 41d 21h	Taxon: Malacostraca	Source: Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, Inc	Sediment Testing
53045	13-5487-4433	21 Dec-21 14:22	21 Dec-21 20:00	16d 1h (0.3 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53045	Sediment	Belmont Landfill	TOX-5	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53045 passed 42d mean dry weight endpoint	18.45%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Control Sed		53045	13	-0.8708	1.771	0.09892	CDF	0.8002	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.00883311	0.00883311	1	0.7583	0.3997	Non-Significant Effect
Error	0.151437	0.011649	13			
Total	0.16027		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	2.287	10.79	0.3329	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9492	0.8328	0.5127	Normal Distribution

42d Mean Dry Weight Summary

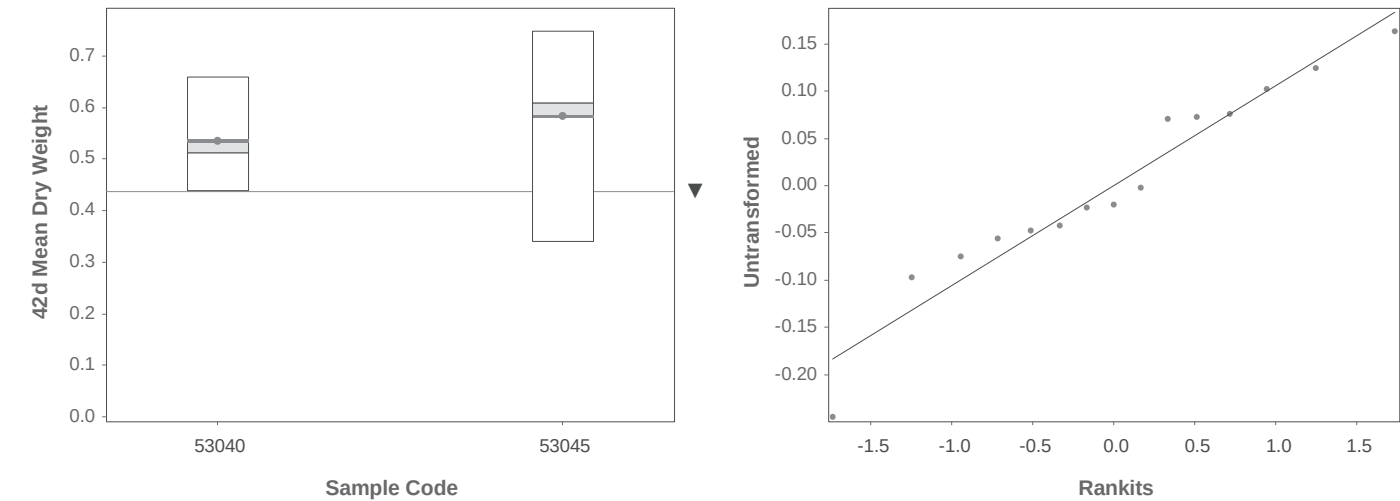
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	7	0.536	0.4593	0.6128	0.513	0.439	0.66	0.03135	15.47%	0.00%
53045		8	0.5847	0.4798	0.6896	0.61	0.34	0.7478	0.04435	21.46%	-9.07%

42d Mean Dry Weight Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040	CS	0.66	0.513	0.488	0.439	0.48	0.6386	0.5338	
53045		0.66	0.5422	0.655	0.7478	0.565	0.6575	0.51	0.34

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test			Aquatec Environmental, Inc.	
Analysis ID:	16-7053-6393	Endpoint:	42d Mean Dry Weight	CETIS Version: CETISv2.1.1
Analyzed:	06 Mar-22 13:48	Analysis:	Parametric-Two Sample	Status Level: 1
Edit Date:	04 Mar-22 14:38	MD5 Hash:	9ED78A53558F5052468B25F2720A219F	Editor ID: 007-856-968-0

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Report Date: 07 Mar-22 12:01 (p 71 of 96)
Test Code/ID: 16245 OUT / 18-8933-1045

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID:	16-1413-9098	Endpoint:	42d Mean Dry Weight	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 13:48	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 14:38	MD5 Hash:	C5E0BA5C7100DC00F92C32AD1CC4CBA1	Editor ID:	007-856-968-0
Batch ID:	16-7279-9191	Test Type:	Hyalella (42d)	Analyst:	C. Matthaues Ayers
Start Date:	06 Jan-22 15:25	Protocol:	EPA/600/R-99/064 (2000)	Diluent:	Reconstituted Water
Ending Date:	17 Feb-22 12:00	Species:	Hyalella azteca	Brine:	
Test Length:	41d 21h	Taxon:	Malacostraca	Source:	Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, In	Sediment Testing
53046	12-3611-8332	21 Dec-21 15:54	21 Dec-21 20:00	16d (0.3 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53046	Reference sediment	Belmont Landfill	TOX-6	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53046 passed 42d mean dry weight endpoint	11.27%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Control Sed		53046	13	-3.686	1.771	0.06042	CDF	0.9986	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0590491	0.0590491	1	13.59	0.0027	Significant Effect
Error	0.0564867	0.00434513	13			
Total	0.115536		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	3.167	9.155	0.1572	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9537	0.8328	0.5837	Normal Distribution

42d Mean Dry Weight Summary

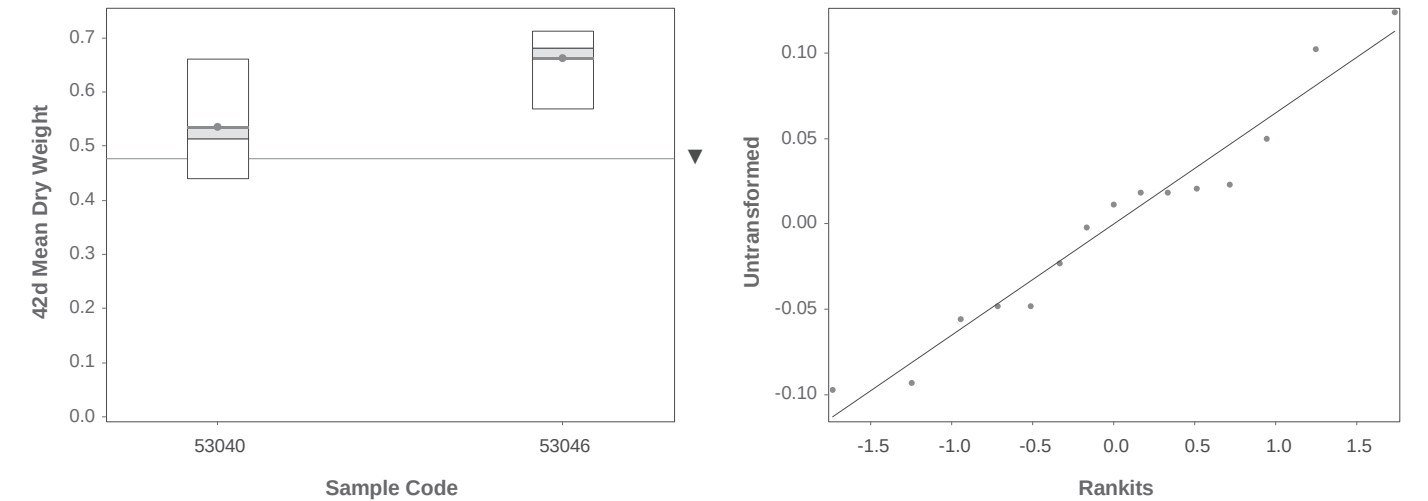
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	7	0.536	0.4593	0.6128	0.513	0.439	0.66	0.03135	15.47%	0.00%
53046		8	0.6618	0.6228	0.7008	0.68	0.5689	0.7114	0.01648	7.04%	-23.46%

42d Mean Dry Weight Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040	CS	0.66	0.513	0.488	0.439	0.48	0.6386	0.5338	
53046		0.6733	0.68	0.7114	0.685	0.68	0.6825	0.5689	0.6133

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test			Aquatec Environmental, Inc.	
Analysis ID:	16-1413-9098	Endpoint:	42d Mean Dry Weight	CETIS Version: CETISv2.1.1
Analyzed:	06 Mar-22 13:48	Analysis:	Parametric-Two Sample	Status Level: 1
Edit Date:	04 Mar-22 14:38	MD5 Hash:	C5E0BA5C7100DC00F92C32AD1CC4CBA1	Editor ID: 007-856-968-0

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Test Code/ID: 16245 OUT / 18-8933-1045

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test						Aquatec Environmental, Inc.	
Analysis ID:	03-5931-7836	Endpoint:	42d Reproduction	CETIS Version:	CETISv2.1.1		
Analyzed:	06 Mar-22 13:47	Analysis:	Parametric-Two Sample	Status Level:	1		
Edit Date:	04 Mar-22 14:38	MD5 Hash:	F6F0D404DC9CCE7F0CE8FD817E45C581	Editor ID:	007-856-968-0		
Batch ID:	16-7279-9191	Test Type:	Hyalella (42d)	Analyst:	C. Matthaues Ayers		
Start Date:	06 Jan-22 15:25	Protocol:	EPA/600/R-99/064 (2000)	Diluent:	Reconstituted Water		
Ending Date:	17 Feb-22 12:00	Species:	Hyalella azteca	Brine:			
Test Length:	41d 21h	Taxon:	Malacostraca	Source:	Aquatic Research Organism	Age:	8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, Inc.	Sediment Testing
53041	03-8171-1181	21 Dec-21 09:05	21 Dec-21 20:00	16d 6h (0.3 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53041	Sediment	Belmont Landfill	TOX-4	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53041 failed 42d reproduction endpoint	45.39%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Control Sed		53041*	11	2.2	1.796	1.96	CDF	0.0250	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	18.6277	18.6277	1	4.841	0.0501	Non-Significant Effect
Error	42.3267	3.84788	11			
Total	60.9544		12			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	3.464	14.51	0.1940	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.955	0.8138	0.6755	Normal Distribution

42d Reproduction Summary

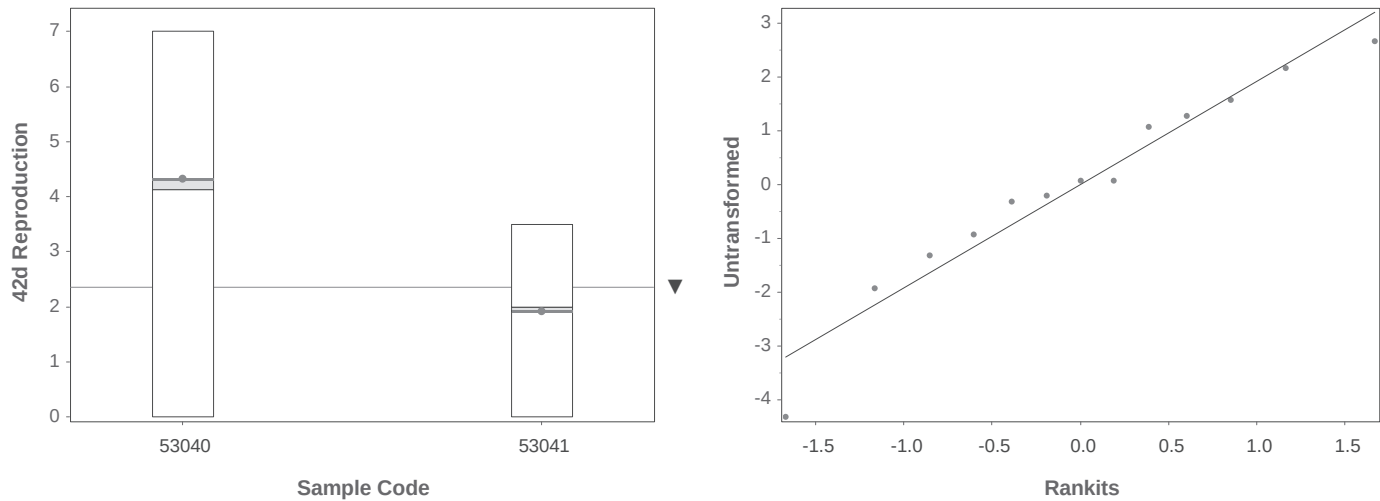
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	7	4.318	2.112	6.523	4.125	0	7	0.9013	55.23%	0.00%
53041		6	1.917	0.5721	3.261	2	0	3.5	0.5231	66.85%	55.61%

42d Reproduction Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040	CS	6.5	3	4	4.125	5.6	7	0	
53041		2	1	2	3.5	0	3		

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test				Aquatec Environmental, Inc.	
Analysis ID:	03-5931-7836	Endpoint:	42d Reproduction	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 13:47	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 14:38	MD5 Hash:	F6F0D404DC9CCE7F0CE8FD817E45C581	Editor ID:	007-856-968-0

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Report Date: 07 Mar-22 12:01 (p 75 of 96)
Test Code/ID: 16245 OUT / 18-8933-1045

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test						Aquatec Environmental, Inc.	
Analysis ID:	09-6173-0750	Endpoint:	42d Reproduction	CETIS Version:	CETISv2.1.1		
Analyzed:	06 Mar-22 13:48	Analysis:	Parametric-Two Sample	Status Level:	1		
Edit Date:	04 Mar-22 14:38	MD5 Hash:	6088069D237D737E7E1E17D840D74C23	Editor ID:	007-856-968-0		
Batch ID:	16-7279-9191	Test Type:	Hyalella (42d)	Analyst:	C. Mattheus Ayers		
Start Date:	06 Jan-22 15:25	Protocol:	EPA/600/R-99/064 (2000)	Diluent:	Reconstituted Water		
Ending Date:	17 Feb-22 12:00	Species:	Hyalella azteca	Brine:			
Test Length:	41d 21h	Taxon:	Malacostraca	Source:	Aquatic Research Organism	Age:	8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, Inc	Sediment Testing
53042	04-7178-2695	21 Dec-21 13:38	21 Dec-21 20:00	16d 2h (0.6 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53042	Sediment	Belmont Landfill	TOX-1	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53042 passed 42d reproduction endpoint	57.34%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Control Sed		53042	10	1.367	1.812	2.476	CDF	0.1007	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	10.1759	10.1759	1	1.87	0.2014	Non-Significant Effect
Error	54.4184	5.44184	10			
Total	64.5943		11			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.12	21.97	0.9555	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9751	0.8025	0.9562	Normal Distribution

42d Reproduction Summary

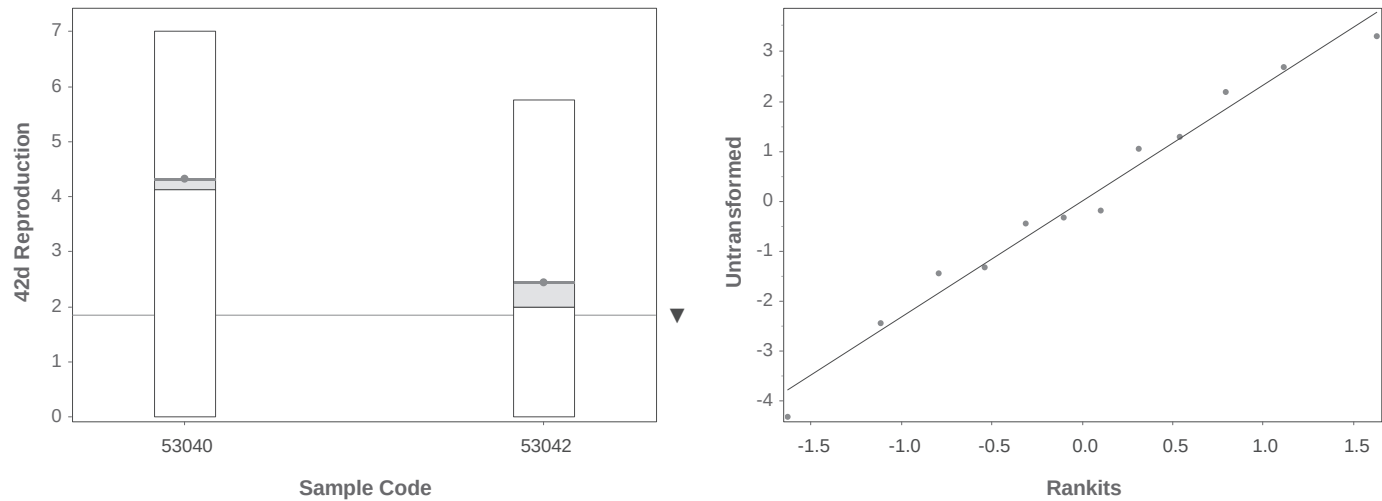
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	7	4.318	2.112	6.523	4.125	0	7	0.9013	55.23%	0.00%
53042		5	2.45	-0.3472	5.247	2	0	5.75	1.007	91.95%	43.26%

42d Reproduction Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040	CS	6.5	3	4	4.125	5.6	7	0	
53042		2	3.5	5.75	1	0			

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test					Aquatec Environmental, Inc.
Analysis ID:	09-6173-0750	Endpoint:	42d Reproduction	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 13:48	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 14:38	MD5 Hash:	6088069D237D737E7E1E17D840D74C23	Editor ID:	007-856-968-0

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Report Date: 07 Mar-22 12:01 (p 77 of 96)
Test Code/ID: 16245 OUT / 18-8933-1045

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test						Aquatec Environmental, Inc.	
Analysis ID:	15-0785-7601	Endpoint:	42d Reproduction	CETIS Version:	CETISv2.1.1		
Analyzed:	06 Mar-22 13:48	Analysis:	Parametric-Two Sample	Status Level:	1		
Edit Date:	04 Mar-22 14:38	MD5 Hash:	94EDFC2635F97BEFE8B9ED506851D78C	Editor ID:	007-856-968-0		
Batch ID:	16-7279-9191	Test Type:	Hyalella (42d)	Analyst:	C. Mattheus Ayers		
Start Date:	06 Jan-22 15:25	Protocol:	EPA/600/R-99/064 (2000)	Diluent:	Reconstituted Water		
Ending Date:	17 Feb-22 12:00	Species:	Hyalella azteca	Brine:			
Test Length:	41d 21h	Taxon:	Malacostraca	Source:	Aquatic Research Organism	Age:	8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, Inc	Sediment Testing
53043	20-0010-4712	21 Dec-21 12:35	21 Dec-21 20:00	16d 3h (0.6 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53043	Sediment	Belmont Landfill	TOX-2	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53043 passed 42d reproduction endpoint	57.20%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Control Sed		53043	13	0.3698	1.771	2.47	CDF	0.3587	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.993151	0.993151	1	0.1368	0.7175	Non-Significant Effect
Error	94.3953	7.26118	13			
Total	95.3885		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.514	10.79	0.6293	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9054	0.8328	0.1152	Normal Distribution

42d Reproduction Summary

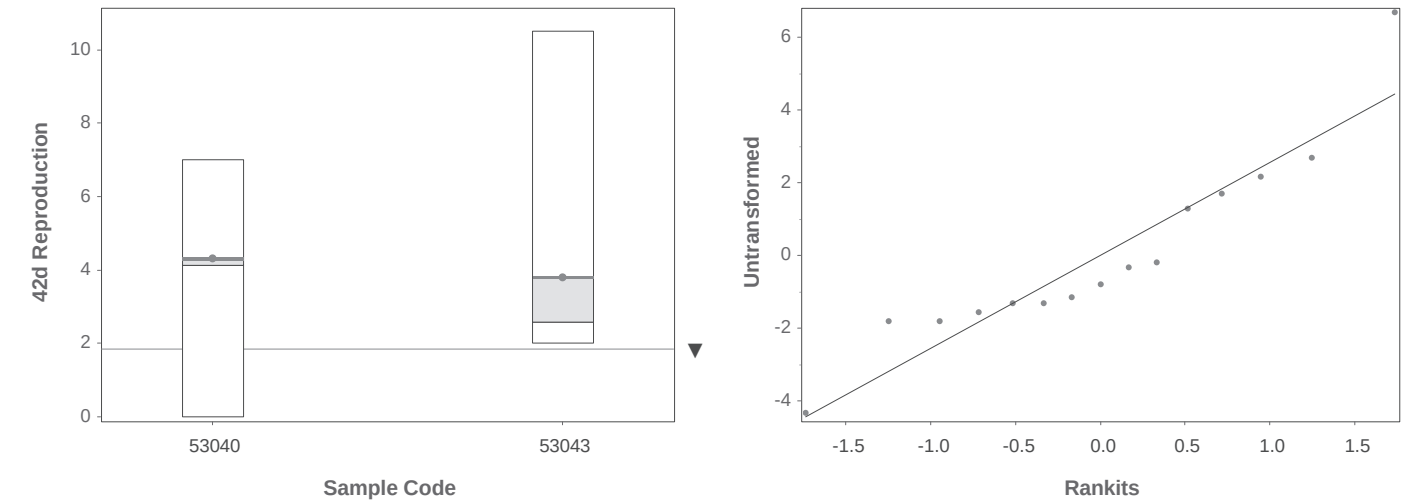
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	7	4.318	2.112	6.523	4.125	0	7	0.9013	55.23%	0.00%
53043		8	3.802	1.349	6.255	2.583	2	10.5	1.037	77.18%	11.95%

42d Reproduction Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040	CS	6.5	3	4	4.125	5.6	7	0	
53043		10.5	2	2.5	5.5	2	3	2.25	2.667

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test			Aquatec Environmental, Inc.	
Analysis ID:	15-0785-7601	Endpoint:	42d Reproduction	CETIS Version: CETISv2.1.1
Analyzed:	06 Mar-22 13:48	Analysis:	Parametric-Two Sample	Status Level: 1
Edit Date:	04 Mar-22 14:38	MD5 Hash:	94EDFC2635F97BEFE8B9ED506851D78C	Editor ID: 007-856-968-0

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Report Date: 07 Mar-22 12:01 (p 79 of 96)
Test Code/ID: 16245 OUT / 18-8933-1045

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID: 11-6380-6705	Endpoint: 42d Reproduction	CETIS Version: CETISv2.1.1
Analyzed: 06 Mar-22 13:48	Analysis: Parametric-Two Sample	Status Level: 1
Edit Date: 04 Mar-22 14:38	MD5 Hash: 251126246A24EFC8BEBDB64A15937DCB	Editor ID: 007-856-968-0
Batch ID: 16-7279-9191	Test Type: Hyalella (42d)	Analyst: C. Mattheus Ayers
Start Date: 06 Jan-22 15:25	Protocol: EPA/600/R-99/064 (2000)	Diluent: Reconstituted Water
Ending Date: 17 Feb-22 12:00	Species: Hyalella azteca	Brine:
Test Length: 41d 21h	Taxon: Malacostraca	Source: Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, Inc	Sediment Testing
53044	00-4677-6467	21 Dec-21 11:25	21 Dec-21 20:00	16d 4h (0.6 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53044	Sediment	Belmont Landfill	TOX-3	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53044 passed 42d reproduction endpoint	37.91%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Control Sed		53044	13	-0.3999	1.771	1.637	CDF	0.6521	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.510107	0.510107	1	0.1599	0.6957	Non-Significant Effect
Error	41.4627	3.18944	13			
Total	41.9728		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	5.42	9.155	0.0431	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9398	0.8328	0.3796	Normal Distribution

42d Reproduction Summary

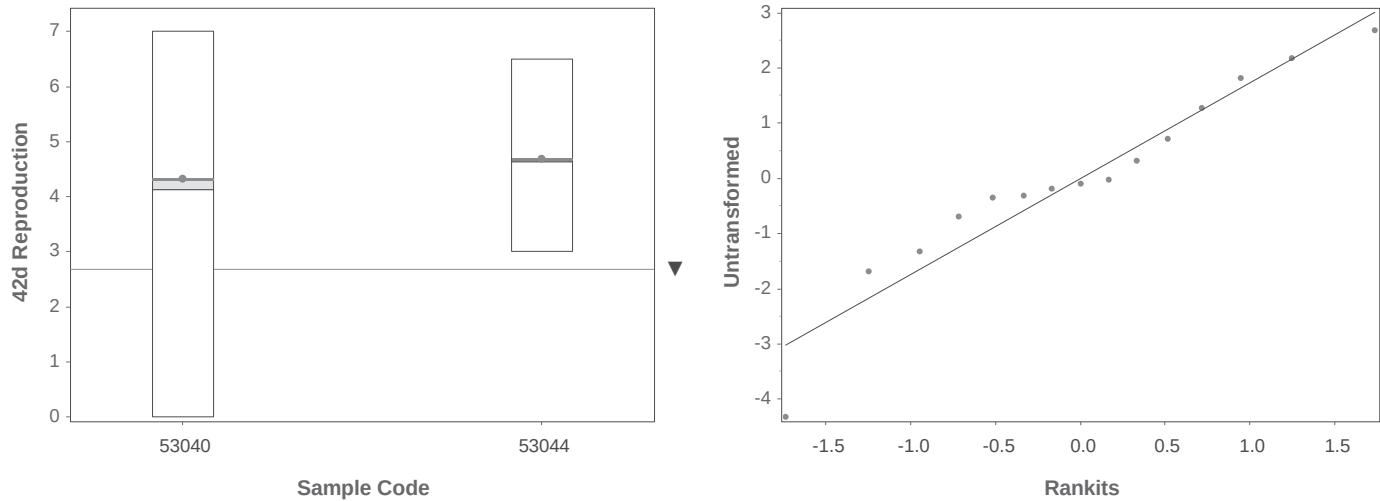
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	7	4.318	2.112	6.523	4.125	0	7	0.9013	55.23%	0.00%
53044		8	4.688	3.831	5.544	4.633	3	6.5	0.3621	21.85%	-8.56%

42d Reproduction Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040	CS	6.5	3	4	4.125	5.6	7	0	
53044		3	5.4	4	5	4.667	6.5	4.333	4.6

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test					Aquatec Environmental, Inc.
Analysis ID:	11-6380-6705	Endpoint:	42d Reproduction	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 13:48	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 14:38	MD5 Hash:	251126246A24EFC8BEBDB64A15937DCB	Editor ID:	007-856-968-0

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Test Code/ID: 16245 OUT / 18-8933-1045

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test						Aquatec Environmental, Inc.	
Analysis ID:	21-0092-0398	Endpoint:	42d Reproduction	CETIS Version:	CETISv2.1.1		
Analyzed:	06 Mar-22 13:48	Analysis:	Parametric-Two Sample	Status Level:	1		
Edit Date:	04 Mar-22 14:38	MD5 Hash:	6AD574B47E06422514A8008A2ABD52D1	Editor ID:	007-856-968-0		
Batch ID:	16-7279-9191	Test Type:	Hyalella (42d)	Analyst:	C. Matthauss Ayers		
Start Date:	06 Jan-22 15:25	Protocol:	EPA/600/R-99/064 (2000)	Diluent:	Reconstituted Water		
Ending Date:	17 Feb-22 12:00	Species:	Hyalella azteca	Brine:			
Test Length:	41d 21h	Taxon:	Malacostraca	Source:	Aquatic Research Organism	Age:	8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, Inc	Sediment Testing
53045	13-5487-4433	21 Dec-21 14:22	21 Dec-21 20:00	16d 1h (0.3 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53045	Sediment	Belmont Landfill	TOX-5	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53045 passed 42d reproduction endpoint	63.49%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Control Sed		53045	13	-1.423	1.771	2.742	CDF	0.9109	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	18.1183	18.1183	1	2.025	0.1783	Non-Significant Effect
Error	116.309	8.94688	13			
Total	134.428		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	2.065	10.79	0.3956	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9513	0.8328	0.5453	Normal Distribution

42d Reproduction Summary

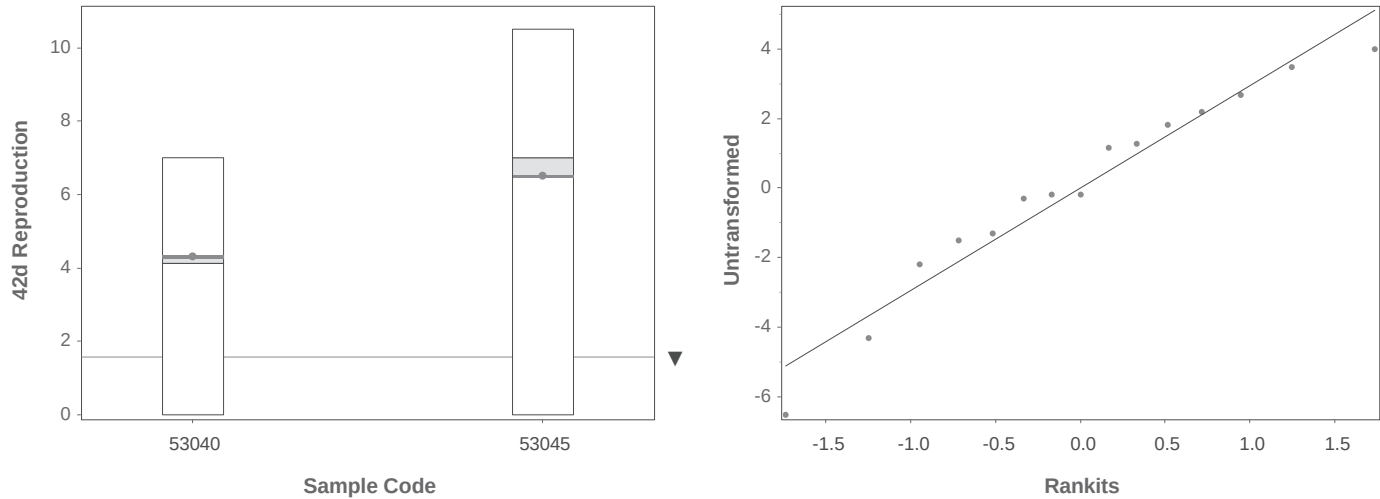
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	7	4.318	2.112	6.523	4.125	0	7	0.9013	55.23%	0.00%
53045		8	6.521	3.656	9.386	7	0	10.5	1.211	52.55%	-51.02%

42d Reproduction Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040	CS	6.5	3	4	4.125	5.6	7	0	
53045		0	7.667	8.333	5	6.333	10.5	4.333	10

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test				Aquatec Environmental, Inc.	
Analysis ID:	21-0092-0398	Endpoint:	42d Reproduction	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 13:48	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 14:38	MD5 Hash:	6AD574B47E06422514A8008A2ABD52D1	Editor ID:	007-856-968-0

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Test Code/ID: 16245 OUT / 18-8933-1045

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID: 20-7902-7207	Endpoint: 42d Reproduction	CETIS Version: CETISv2.1.1
Analyzed: 06 Mar-22 13:48	Analysis: Parametric-Two Sample	Status Level: 1
Edit Date: 04 Mar-22 14:38	MD5 Hash: 45383747B7EE67F940A47CB00DBDE6A3	Editor ID: 007-856-968-0
Batch ID: 16-7279-9191	Test Type: Hyalella (42d)	Analyst: C. Mattheus Ayers
Start Date: 06 Jan-22 15:25	Protocol: EPA/600/R-99/064 (2000)	Diluent: Reconstituted Water
Ending Date: 17 Feb-22 12:00	Species: Hyalella azteca	Brine:
Test Length: 41d 21h	Taxon: Malacostraca	Source: Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, Inc	Sediment Testing
53046	12-3611-8332	21 Dec-21 15:54	21 Dec-21 20:00	16d (0.3 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53046	Reference sediment	Belmont Landfill	TOX-6	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53046 passed 42d reproduction endpoint	59.26%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Control Sed		53046	13	-2.603	1.771	2.559	CDF	0.9891	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	52.8171	52.8171	1	6.777	0.0219	Significant Effect
Error	101.314	7.79337	13			
Total	154.131		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.688	10.79	0.5403	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9648	0.8328	0.7744	Normal Distribution

42d Reproduction Summary

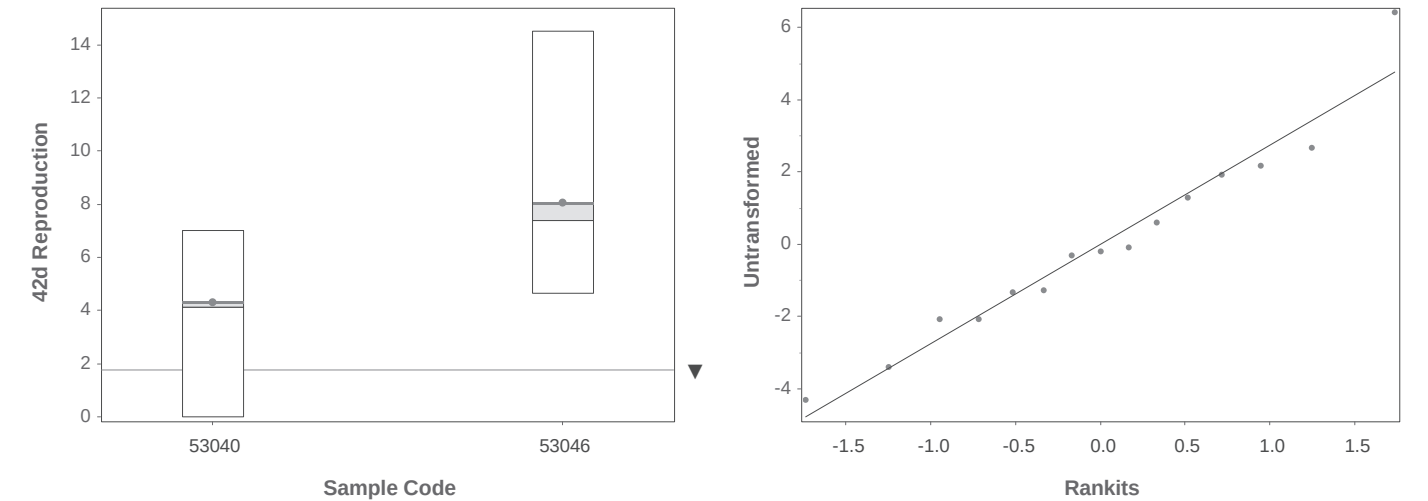
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	7	4.318	2.112	6.523	4.125	0	7	0.9013	55.23%	0.00%
53046		8	8.079	5.489	10.67	7.4	4.667	14.5	1.095	38.35%	-87.11%

42d Reproduction Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040	CS	6.5	3	4	4.125	5.6	7	0	
53046		10	6	14.5	4.667	8.667	8	6	6.8

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test					Aquatec Environmental, Inc.
Analysis ID:	20-7902-7207	Endpoint:	42d Reproduction	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 13:48	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 14:38	MD5 Hash:	45383747B7EE67F940A47CB00DBDE6A3	Editor ID:	007-856-968-0

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Test Code/ID: 16245 OUT / 18-8933-1045

Hyaella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID:	04-4945-9872	Endpoint:	42d Survival Rate	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 13:47	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 14:38	MD5 Hash:	4CB9BE114A6EF2C2C260998A0B82BDB0	Editor ID:	007-856-968-0
Batch ID:	16-7279-9191	Test Type:	Hyaella (42d)	Analyst:	C. Mattheus Ayers
Start Date:	06 Jan-22 15:25	Protocol:	EPA/600/R-99/064 (2000)	Diluent:	Reconstituted Water
Ending Date:	17 Feb-22 12:00	Species:	Hyaella azteca	Brine:	
Test Length:	41d 21h	Taxon:	Malacostraca	Source:	Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, In	Sediment Testing
53041	03-8171-1181	21 Dec-21 09:05	21 Dec-21 20:00	16d 6h (0.3 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53041	Sediment	Belmont Landfill	TOX-4	

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	53041 passed 42d survival rate endpoint	19.18%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Control Sed		53041	13	1.49	1.771	0.2188	CDF	0.0801	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.126534	0.126534	1	2.22	0.1601	Non-Significant Effect
Error	0.74108	0.0570062	13			
Total	0.867615		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.307	10.79	0.7601	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9009	0.8328	0.0981	Normal Distribution

42d Survival Rate Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	7	0.8429	0.6932	0.9925	0.8000	0.6000	1.0000	0.0612	19.20%	0.00%
53041		8	0.7000	0.5104	0.8896	0.7500	0.2000	0.9000	0.0802	32.40%	16.95%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	7	1.1900	0.9851	1.3940	1.1070	0.8861	1.4120	0.0836	18.59%	0.00%
53041		8	1.0060	0.7942	1.2170	1.0490	0.4636	1.2490	0.0894	25.15%	15.48%

42d Survival Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040	CS	0.6000	1.0000	1.0000	1.0000	0.8000	0.7000	0.8000	
53041		0.9000	0.8000	0.8000	0.7000	0.7000	0.6000	0.2000	0.9000

Angular (Corrected) Transformed Detail

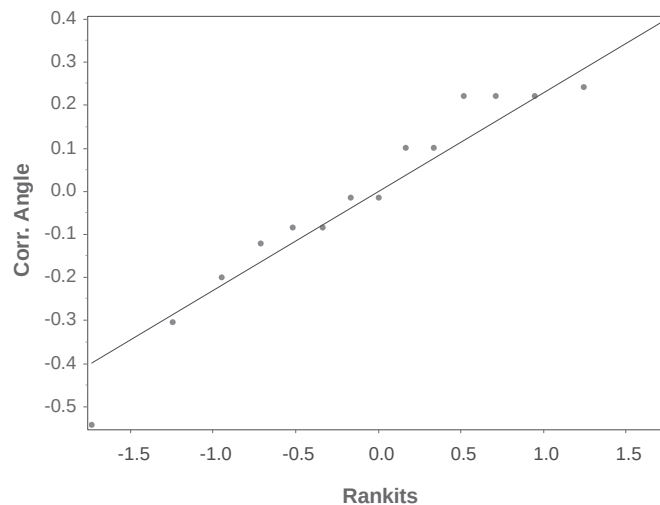
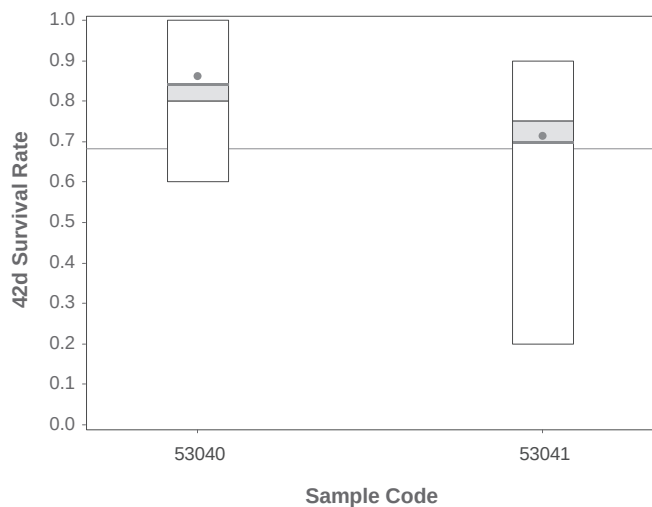
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040	CS	0.8861	1.4120	1.4120	1.4120	1.1070	0.9912	1.1070	
53041		1.2490	1.1070	1.1070	0.9912	0.9912	0.8861	0.4636	1.2490

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test

Aquatec Environmental, Inc.

Analysis ID:	04-4945-9872	Endpoint:	42d Survival Rate	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 13:47	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 14:38	MD5 Hash:	4CB9BE114A6EF2C2C260998A0B82BDB0	Editor ID:	007-856-968-0

Graphics



CETIS Analytical Report

Report Date: 07 Mar-22 12:01 (p 87 of 96)
Test Code/ID: 16245 OUT / 18-8933-1045

Hyaella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID:	11-0752-4344	Endpoint:	42d Survival Rate	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 13:48	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 14:38	MD5 Hash:	42B9C797C5F842D0A39EE8324C362905	Editor ID:	007-856-968-0
Batch ID:	16-7279-9191	Test Type:	Hyaella (42d)	Analyst:	C. Mattheus Ayers
Start Date:	06 Jan-22 15:25	Protocol:	EPA/600/R-99/064 (2000)	Diluent:	Reconstituted Water
Ending Date:	17 Feb-22 12:00	Species:	Hyaella azteca	Brine:	
Test Length:	41d 21h	Taxon:	Malacostraca	Source:	Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, In	Sediment Testing
53042	04-7178-2695	21 Dec-21 13:38	21 Dec-21 20:00	16d 2h (0.6 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53042	Sediment	Belmont Landfill	TOX-1	

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	53042 failed 42d survival rate endpoint	24.17%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Control Sed		53042*	13	1.877	1.771	0.2632	CDF	0.0416	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.290601	0.290601	1	3.523	0.0832	Non-Significant Effect
Error	1.07242	0.0824937	13			
Total	1.36302		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	2.275	10.79	0.3361	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9192	0.8328	0.1876	Normal Distribution

42d Survival Rate Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	7	0.8429	0.6932	0.9925	0.8000	0.6000	1.0000	0.0612	19.20%	0.00%
53042		8	0.6125	0.3660	0.8590	0.7333	0.1000	0.9000	0.1043	48.15%	27.33%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	7	1.1900	0.9851	1.3940	1.1070	0.8861	1.4120	0.0836	18.59%	0.00%
53042		8	0.9107	0.6318	1.1900	1.0330	0.3218	1.2490	0.1179	36.63%	23.45%

42d Survival Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040	CS	0.6000	1.0000	1.0000	1.0000	0.8000	0.7000	0.8000	
53042		0.6000	0.8000	0.5000	0.1000	0.8000	0.9000	0.9000	0.3000

Angular (Corrected) Transformed Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040	CS	0.8861	1.4120	1.4120	1.4120	1.1070	0.9912	1.1070	
53042		0.8861	1.1070	0.7854	0.3218	1.1070	1.2490	1.2490	0.5796

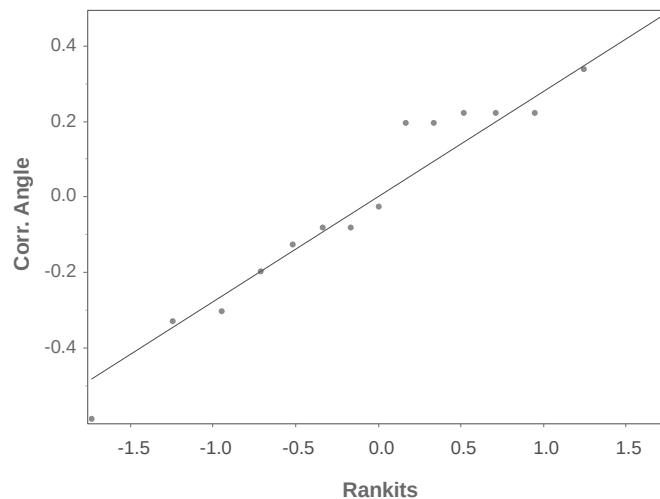
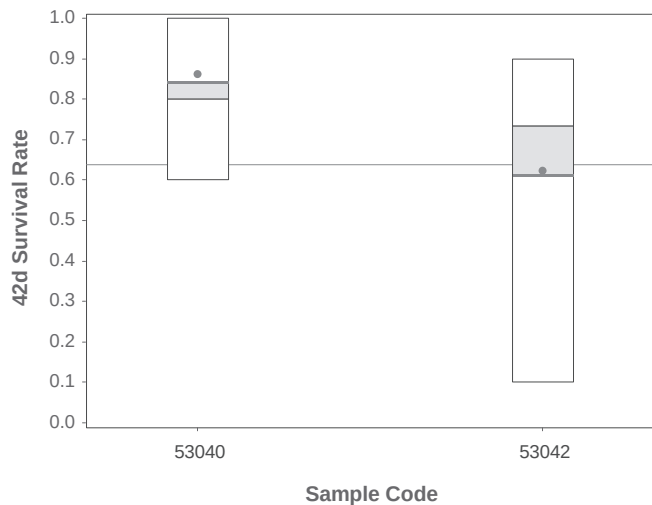
Hyalella 42-d Survival, Growth, and Reproduction Sediment Test

Aquatec Environmental, Inc.

Analysis ID: 11-0752-4344 Endpoint: 42d Survival Rate
Analyzed: 06 Mar-22 13:48 Analysis: Parametric-Two Sample
Edit Date: 04 Mar-22 14:38 MD5 Hash: 42B9C797C5F842D0A39EE8324C362905

CETIS Version: CETISv2.1.1
Status Level: 1
Editor ID: 007-856-968-0

Graphics



CETIS Analytical Report

Report Date: 07 Mar-22 12:01 (p 89 of 96)
Test Code/ID: 16245 OUT / 18-8933-1045

Hyaella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID:	10-0713-8544	Endpoint:	42d Survival Rate	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 13:48	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 14:38	MD5 Hash:	17471D0DACDCC344C25887400C3AF882	Editor ID:	007-856-968-0
Batch ID:	16-7279-9191	Test Type:	Hyaella (42d)	Analyst:	C. Matthaues Ayers
Start Date:	06 Jan-22 15:25	Protocol:	EPA/600/R-99/064 (2000)	Diluent:	Reconstituted Water
Ending Date:	17 Feb-22 12:00	Species:	Hyaella azteca	Brine:	
Test Length:	41d 21h	Taxon:	Malacostraca	Source:	Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, In	Sediment Testing
53043	20-0010-4712	21 Dec-21 12:35	21 Dec-21 20:00	16d 3h (0.6 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53043	Sediment	Belmont Landfill	TOX-2	

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	53043 passed 42d survival rate endpoint	16.74%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Control Sed		53043	13	-0.57	1.771	0.1966	CDF	0.7108	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0149446	0.0149446	1	0.3249	0.5784	Non-Significant Effect
Error	0.597879	0.0459907	13			
Total	0.612824		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.125	9.155	0.8691	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.8823	0.8328	0.0513	Normal Distribution

42d Survival Rate Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	7	0.8429	0.6932	0.9925	0.8000	0.6000	1.0000	0.0612	19.20%	0.00%
53043		8	0.8875	0.7577	1.0000	0.9667	0.6000	1.0000	0.0549	17.49%	-5.30%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	7	1.1900	0.9851	1.3940	1.1070	0.8861	1.4120	0.0836	18.59%	0.00%
53043		8	1.2530	1.0790	1.4270	1.3580	0.8861	1.4120	0.0737	16.64%	-5.32%

42d Survival Rate Detail

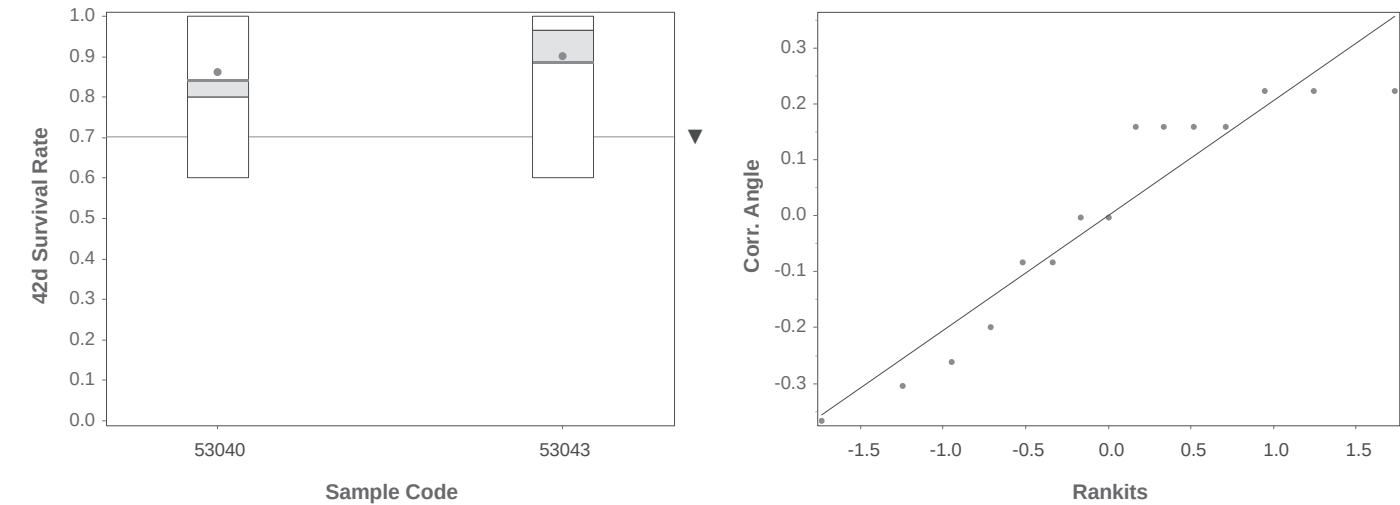
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040	CS	0.6000	1.0000	1.0000	1.0000	0.8000	0.7000	0.8000	
53043		1.0000	0.9000	0.9000	1.0000	1.0000	0.7000	1.0000	0.6000

Angular (Corrected) Transformed Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040	CS	0.8861	1.4120	1.4120	1.4120	1.1070	0.9912	1.1070	
53043		1.4120	1.2490	1.2490	1.4120	1.4120	0.9912	1.4120	0.8861

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test			Aquatec Environmental, Inc.	
Analysis ID:	10-0713-8544	Endpoint:	42d Survival Rate	CETIS Version: CETISv2.1.1
Analyzed:	06 Mar-22 13:48	Analysis:	Parametric-Two Sample	Status Level: 1
Edit Date:	04 Mar-22 14:38	MD5 Hash:	17471D0DACDCC344C25887400C3AF882	Editor ID: 007-856-968-0

Graphics



CETIS Analytical Report

Report Date: 07 Mar-22 12:01 (p 91 of 96)
 Test Code/ID: 16245 OUT / 18-8933-1045

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test **Aquatec Environmental, Inc.**

Analysis ID:	07-7130-4223	Endpoint:	42d Survival Rate	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 13:48	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 14:38	MD5 Hash:	4DA2699A7571BD2767BC304B387960A4	Editor ID:	007-856-968-0
Batch ID:	16-7279-9191	Test Type:	Hyalella (42d)	Analyst:	C. Matthaues Ayers
Start Date:	06 Jan-22 15:25	Protocol:	EPA/600/R-99/064 (2000)	Diluent:	Reconstituted Water
Ending Date:	17 Feb-22 12:00	Species:	Hyalella azteca	Brine:	
Test Length:	41d 21h	Taxon:	Malacostraca	Source:	Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, Inc	Sediment Testing
53044	00-4677-6467	21 Dec-21 11:25	21 Dec-21 20:00	16d 4h (0.6 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53044	Sediment	Belmont Landfill	TOX-3	

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	53044 passed 42d survival rate endpoint	13.19%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Control Sed		53044	13	0.06162	1.771	0.1634	CDF	0.4759	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.00012065	0.00012065	1	0.003797	0.9518	Non-Significant Effect
Error	0.4131	0.0317769	13			
Total	0.413221		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	2.863	9.155	0.1948	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9077	0.8328	0.1248	Normal Distribution

42d Survival Rate Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	7	0.8429	0.6932	0.9925	0.8000	0.6000	1.0000	0.0612	19.20%	0.00%
53044		8	0.8500	0.7726	0.9274	0.8500	0.7000	1.0000	0.0327	10.89%	-0.85%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	7	1.1900	0.9851	1.3940	1.1070	0.8861	1.4120	0.0836	18.59%	0.00%
53044		8	1.1840	1.0750	1.2930	1.1780	0.9912	1.4120	0.0462	11.04%	0.48%

42d Survival Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040	CS	0.6000	1.0000	1.0000	1.0000	0.8000	0.7000	0.8000	
53044		0.8000	1.0000	0.7000	0.8000	0.9000	0.8000	0.9000	0.9000

Angular (Corrected) Transformed Detail

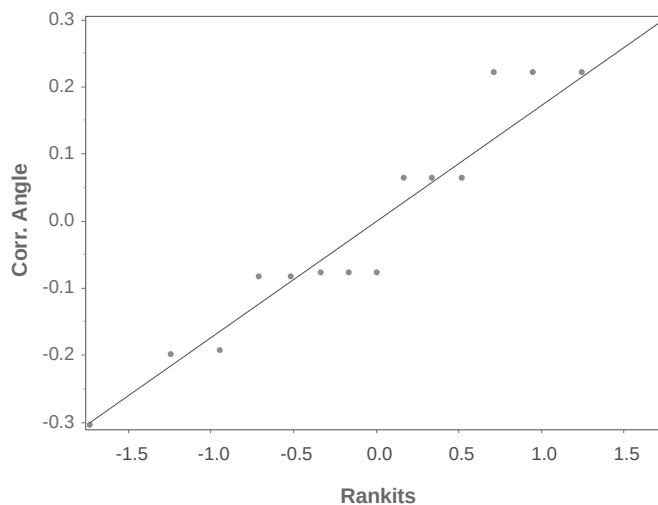
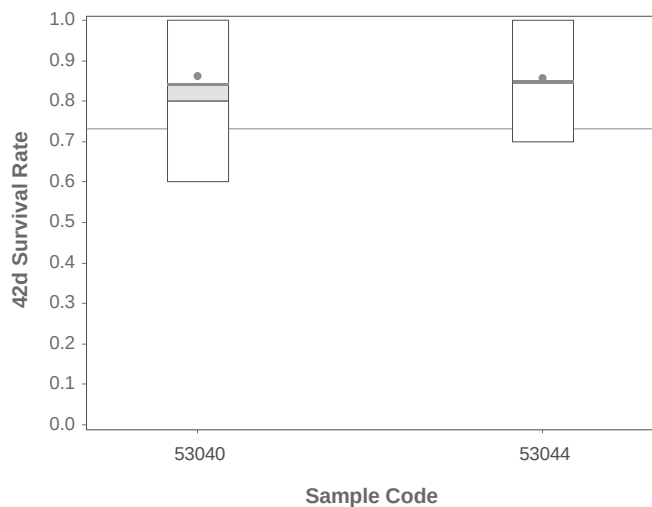
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040	CS	0.8861	1.4120	1.4120	1.4120	1.1070	0.9912	1.1070	
53044		1.1070	1.4120	0.9912	1.1070	1.2490	1.1070	1.2490	1.2490

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test

Aquatec Environmental, Inc.

Analysis ID: 07-7130-4223
Analyzed: 06 Mar-22 13:48
Edit Date: 04 Mar-22 14:38Endpoint: 42d Survival Rate
Analysis: Parametric-Two Sample
MD5 Hash: 4DA2699A7571BD2767BC304B387960A4CETIS Version: CETISv2.1.1
Status Level: 1
Editor ID: 007-856-968-0

Graphics



CETIS Analytical Report

Report Date: 07 Mar-22 12:01 (p 93 of 96)
Test Code/ID: 16245 OUT / 18-8933-1045

Hyaella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID: 16-9034-3377	Endpoint: 42d Survival Rate	CETIS Version: CETISv2.1.1
Analyzed: 06 Mar-22 13:48	Analysis: Parametric-Two Sample	Status Level: 1
Edit Date: 04 Mar-22 14:38	MD5 Hash: BFB04C2FFCF2FA41EF8473FB6088B973	Editor ID: 007-856-968-0
Batch ID: 16-7279-9191	Test Type: Hyaella (42d)	Analyst: C. Mattheus Ayers
Start Date: 06 Jan-22 15:25	Protocol: EPA/600/R-99/064 (2000)	Diluent: Reconstituted Water
Ending Date: 17 Feb-22 12:00	Species: Hyaella azteca	Brine:
Test Length: 41d 21h	Taxon: Malacostraca	Source: Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, In	Sediment Testing
53045	13-5487-4433	21 Dec-21 14:22	21 Dec-21 20:00	16d 1h (0.3 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53045	Sediment	Belmont Landfill	TOX-5	

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	53045 passed 42d survival rate endpoint	16.97%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Control Sed		53045	13	0.2276	1.771	0.1986	CDF	0.4117	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.00243374	0.00243374	1	0.05181	0.8235	Non-Significant Effect
Error	0.610677	0.0469751	13			
Total	0.613111		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.08	9.155	0.9090	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9125	0.8328	0.1477	Normal Distribution

42d Survival Rate Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	7	0.8429	0.6932	0.9925	0.8000	0.6000	1.0000	0.0612	19.20%	0.00%
53045		8	0.8250	0.6855	0.9645	0.8500	0.5000	1.0000	0.0590	20.23%	2.12%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	7	1.1900	0.9851	1.3940	1.1070	0.8861	1.4120	0.0836	18.59%	0.00%
53045		8	1.1640	0.9862	1.3420	1.1780	0.7854	1.4120	0.0753	18.29%	2.15%

42d Survival Rate Detail

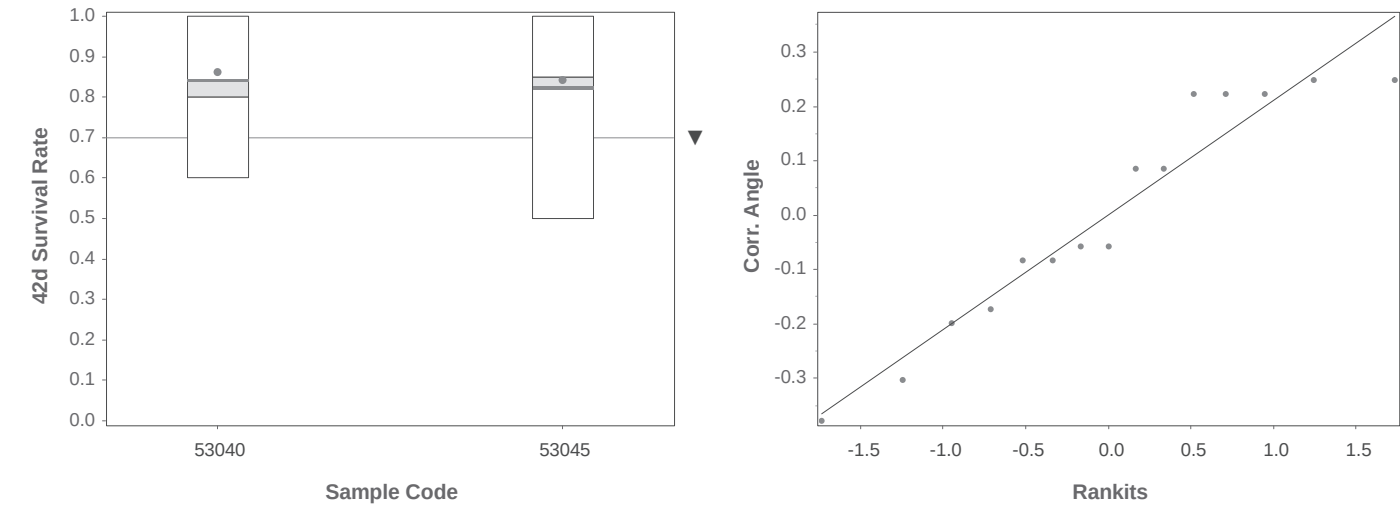
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040	CS	0.6000	1.0000	1.0000	1.0000	0.8000	0.7000	0.8000	
53045		0.7000	0.9000	1.0000	0.9000	1.0000	0.8000	0.8000	0.5000

Angular (Corrected) Transformed Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040	CS	0.8861	1.4120	1.4120	1.4120	1.1070	0.9912	1.1070	
53045		0.9912	1.2490	1.4120	1.2490	1.4120	1.1070	1.1070	0.7854

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test			Aquatec Environmental, Inc.	
Analysis ID:	16-9034-3377	Endpoint:	42d Survival Rate	CETIS Version: CETISv2.1.1
Analyzed:	06 Mar-22 13:48	Analysis:	Parametric-Two Sample	Status Level: 1
Edit Date:	04 Mar-22 14:38	MD5 Hash:	BFB04C2FFCF2FA41EF8473FB6088B973	Editor ID: 007-856-968-0

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CETIS Analytical Report

Report Date: 07 Mar-22 12:01 (p 95 of 96)
 Test Code/ID: 16245 OUT / 18-8933-1045

Hyaella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID:	09-5994-4623	Endpoint:	42d Survival Rate	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 13:49	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 14:38	MD5 Hash:	48331E378D2FD52A94F910F7C23A52AA	Editor ID:	007-856-968-0
Batch ID:	16-7279-9191	Test Type:	Hyaella (42d)	Analyst:	C. Mattheus Ayers
Start Date:	06 Jan-22 15:25	Protocol:	EPA/600/R-99/064 (2000)	Diluent:	Reconstituted Water
Ending Date:	17 Feb-22 12:00	Species:	Hyaella azteca	Brine:	
Test Length:	41d 21h	Taxon:	Malacostraca	Source:	Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, Inc.	Sediment Testing
53046	12-3611-8332	21 Dec-21 15:54	21 Dec-21 20:00	16d (0.3 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53046	Reference sediment	Belmont Landfill	TOX-6	

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	53046 passed 42d survival rate endpoint	13.11%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Control Sed		53046	13	-0.1313	1.771	0.1626	CDF	0.5512	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.00054231	0.00054231	1	0.01724	0.8975	Non-Significant Effect
Error	0.408917	0.0314551	13			
Total	0.409459		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	2.967	9.155	0.1808	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9173	0.8328	0.1755	Normal Distribution

42d Survival Rate Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	7	0.8429	0.6932	0.9925	0.8000	0.6000	1.0000	0.0612	19.20%	0.00%
53046		8	0.8625	0.7859	0.9391	0.9000	0.7000	1.0000	0.0324	10.62%	-2.33%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040	CS	7	1.1900	0.9851	1.3940	1.1070	0.8861	1.4120	0.0836	18.59%	0.00%
53046		8	1.2020	1.0940	1.3090	1.2490	0.9912	1.4120	0.0454	10.68%	-1.01%

42d Survival Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040	CS	0.6000	1.0000	1.0000	1.0000	0.8000	0.7000	0.8000	
53046		0.9000	1.0000	0.7000	0.8000	0.9000	0.8000	0.9000	0.9000

Angular (Corrected) Transformed Detail

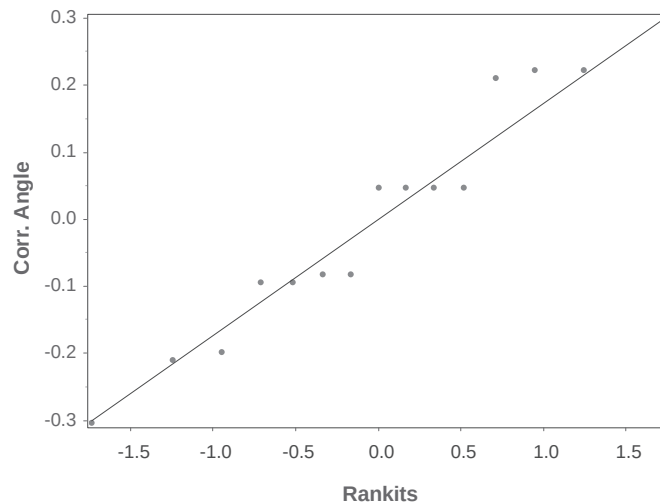
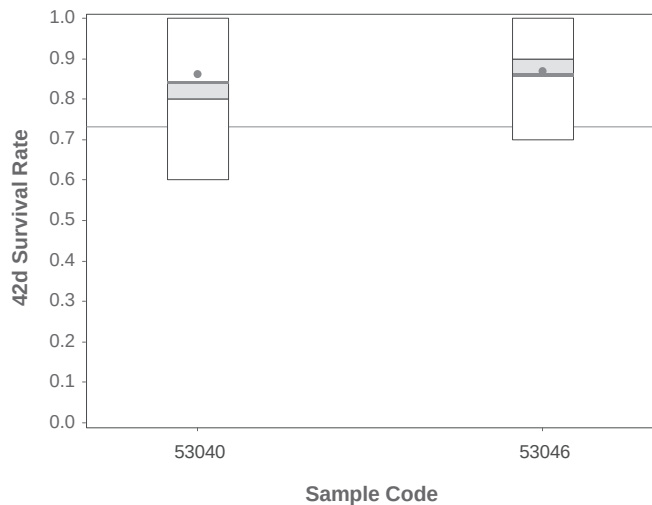
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040	CS	0.8861	1.4120	1.4120	1.4120	1.1070	0.9912	1.1070	
53046		1.2490	1.4120	0.9912	1.1070	1.2490	1.1070	1.2490	1.2490

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test

Aquatec Environmental, Inc.

Analysis ID:	09-5994-4623	Endpoint:	42d Survival Rate	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 13:49	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 14:38	MD5 Hash:	48331E378D2FD52A94F910F7C23A52AA	Editor ID:	007-856-968-0

Graphics



Reference (TOX-6: 53046) vs. Samples

- CETIS™ Summary Report
- CETIS™ Analytical Reports

CETIS Summary Report

Report Date: 07 Mar-22 12:05 (p 1 of 7)
Test Code/ID: 16245 REF 1 / 14-4995-1919

Hyaella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Batch ID: 14-5191-3028	Test Type: Hyaella (42d)	Analyst: C. Matthaus Ayers
Start Date: 06 Jan-22 15:25	Protocol: EPA/600/R-99/064 (2000)	Diluent: Reconstituted Water
Ending Date: 17 Feb-22 12:00	Species: Hyaella azteca	Brine:
Test Length: 41d 21h	Taxon: Malacostraca	Source: Aquatic Research Organism Age: 8d
Sample ID: 12-3611-8332	Code: 53046	Project: Sediment Testing
Sample Date: 21 Dec-21 15:54	Material: Reference sediment	Source: Belmont Landfill
Receipt Date: 21 Dec-21 20:00	CAS (PC):	Station: TOX-6
Sample Age: 16d (0.3 °C)	Client: Woods Hole Group	

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, In	Sediment Testing
53041	03-8171-1181	21 Dec-21 09:05	21 Dec-21 20:00	16d 6h (0.3 °C)	Woods Hole Group	
53042	04-7178-2695	21 Dec-21 13:38	21 Dec-21 20:00	16d 2h (0.6 °C)		
53043	20-0010-4712	21 Dec-21 12:35	21 Dec-21 20:00	16d 3h (0.6 °C)		
53044	00-4677-6467	21 Dec-21 11:25	21 Dec-21 20:00	16d 4h (0.6 °C)		
53045	13-5487-4433	21 Dec-21 14:22	21 Dec-21 20:00	16d 1h (0.3 °C)		
53046	12-3611-8332	21 Dec-21 15:54	21 Dec-21 20:00	16d (0.3 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53041	Sediment	Belmont Landfill	TOX-4	
53042	Sediment	Belmont Landfill	TOX-1	
53043	Sediment	Belmont Landfill	TOX-2	
53044	Sediment	Belmont Landfill	TOX-3	
53045	Sediment	Belmont Landfill	TOX-5	
53046	Reference sediment	Belmont Landfill	TOX-6	

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
03-9802-4583	28d Biomass	Equal Variance t Two-Sample Test	1.0E-05	53040 failed 28d biomass	1
13-7652-6659	28d Biomass	Equal Variance t Two-Sample Test	1.7E-05	53041 failed 28d biomass	1
03-5853-6268	28d Biomass	Equal Variance t Two-Sample Test	<1.0E-05	53042 failed 28d biomass	1
18-7196-4671	28d Biomass	Equal Variance t Two-Sample Test	2.8E-05	53043 failed 28d biomass	1
02-9437-6305	28d Biomass	Equal Variance t Two-Sample Test	<1.0E-05	53044 failed 28d biomass	1
12-6844-6144	28d Biomass	Equal Variance t Two-Sample Test	0.0140	53045 failed 28d biomass	1
03-1490-3000	28d Mean Dry Weight	Equal Variance t Two-Sample Test	0.0002	53040 failed 28d mean dry weight	1
03-5453-6046	28d Mean Dry Weight	Equal Variance t Two-Sample Test	1.9E-05	53041 failed 28d mean dry weight	1
04-2755-6812	28d Mean Dry Weight	Equal Variance t Two-Sample Test	<1.0E-05	53042 failed 28d mean dry weight	1
09-6129-7373	28d Mean Dry Weight	Equal Variance t Two-Sample Test	2.8E-05	53043 failed 28d mean dry weight	1
11-5580-6777	28d Mean Dry Weight	Equal Variance t Two-Sample Test	5.0E-05	53044 failed 28d mean dry weight	1
16-9885-4153	28d Mean Dry Weight	Equal Variance t Two-Sample Test	0.0632	53045 passed 28d mean dry weight	1
04-0509-2041	28d Survival Rate	Wilcoxon Rank Sum Two-Sample Test	0.0561	53040 passed 28d survival rate	1
10-2156-3268	28d Survival Rate	Wilcoxon Rank Sum Two-Sample Test	0.2468	53041 passed 28d survival rate	1
11-7766-8071	28d Survival Rate	Wilcoxon Rank Sum Two-Sample Test	0.0008	53042 failed 28d survival rate	1
13-0085-9733	28d Survival Rate	Wilcoxon Rank Sum Two-Sample Test	0.6348	53043 passed 28d survival rate	1
21-2078-6197	28d Survival Rate	Wilcoxon Rank Sum Two-Sample Test	0.2835	53044 passed 28d survival rate	1
02-1773-7443	28d Survival Rate	Wilcoxon Rank Sum Two-Sample Test	0.2835	53045 passed 28d survival rate	1
12-8060-0929	35d Survival Rate	Wilcoxon Rank Sum Two-Sample Test	0.0915	53040 passed 35d survival rate	1
03-5392-3243	35d Survival Rate	Equal Variance t Two-Sample Test	0.1898	53041 passed 35d survival rate	1
15-9465-1312	35d Survival Rate	Equal Variance t Two-Sample Test	0.0023	53042 failed 35d survival rate	1
03-5569-0775	35d Survival Rate	Wilcoxon Rank Sum Two-Sample Test	0.5392	53043 passed 35d survival rate	1
09-6009-8971	35d Survival Rate	Equal Variance t Two-Sample Test	0.1213	53044 passed 35d survival rate	1
21-0112-3124	35d Survival Rate	Equal Variance t Two-Sample Test	0.0781	53045 passed 35d survival rate	1
06-8967-0852	42d Biomass	Wilcoxon Rank Sum Two-Sample Test	0.0003	53040 failed 42d biomass	1
13-4066-6942	42d Biomass	Equal Variance t Two-Sample Test	0.0002	53041 failed 42d biomass	1
01-9737-1448	42d Biomass	Unequal Variance t Two-Sample Test	0.0044	53042 failed 42d biomass	1

CETIS Summary Report

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Test Code/ID: 16245 REF 1 / 14-4995-1919

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test

Aquatec Environmental, Inc.

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
05-3601-0252	42d Biomass	Equal Variance t Two-Sample Test	0.0720	53043 passed 42d biomass	1
13-9048-2976	42d Biomass	Equal Variance t Two-Sample Test	0.0009	53044 failed 42d biomass	1
10-4399-1271	42d Biomass	Equal Variance t Two-Sample Test	0.1138	53045 passed 42d biomass	1
05-8541-1516	42d Mean Dry Weight	Equal Variance t Two-Sample Test	0.0014	53040 failed 42d mean dry weight	1
09-9982-5448	42d Mean Dry Weight	Equal Variance t Two-Sample Test	0.0002	53041 failed 42d mean dry weight	1
03-2202-6748	42d Mean Dry Weight	Unequal Variance t Two-Sample Test	0.0322	53042 failed 42d mean dry weight	1
15-3618-6039	42d Mean Dry Weight	Equal Variance t Two-Sample Test	0.0010	53043 failed 42d mean dry weight	1
18-9764-6313	42d Mean Dry Weight	Equal Variance t Two-Sample Test	0.0016	53044 failed 42d mean dry weight	1
00-6363-5502	42d Mean Dry Weight	Equal Variance t Two-Sample Test	0.0627	53045 passed 42d mean dry weight	1
08-1432-7272	42d Reproduction	Equal Variance t Two-Sample Test	0.0109	53040 failed 42d reproduction	1
02-4903-1384	42d Reproduction	Equal Variance t Two-Sample Test	0.0003	53041 failed 42d reproduction	1
13-4329-7451	42d Reproduction	Equal Variance t Two-Sample Test	0.0025	53042 failed 42d reproduction	1
11-6784-0086	42d Reproduction	Wilcoxon Rank Sum Two-Sample Test	0.0048	53043 failed 42d reproduction	1
01-8055-8269	42d Reproduction	Unequal Variance t Two-Sample Test	0.0094	53044 failed 42d reproduction	1
06-0529-3498	42d Reproduction	Equal Variance t Two-Sample Test	0.1781	53045 passed 42d reproduction	1
04-9460-1552	42d Survival Rate	Wilcoxon Rank Sum Two-Sample Test	0.3057	53040 passed 42d survival rate	1
15-8957-9405	42d Survival Rate	Equal Variance t Two-Sample Test	0.0353	53041 failed 42d survival rate	1
05-0947-5562	42d Survival Rate	Equal Variance t Two-Sample Test	0.0186	53042 failed 42d survival rate	1
02-1495-6219	42d Survival Rate	Equal Variance t Two-Sample Test	0.7182	53043 passed 42d survival rate	1
03-9540-2609	42d Survival Rate	Equal Variance t Two-Sample Test	0.3941	53044 passed 42d survival rate	1
04-4480-2504	42d Survival Rate	Equal Variance t Two-Sample Test	0.3377	53045 passed 42d survival rate	1

CETIS Summary Report

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Test Code/ID: 16245 REF 1 / 14-4995-1919

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

28d Biomass Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
53046	RS	4	0.5372	0.4922	0.5823	0.506	0.574	0.01415	0.0283	5.27%	0.00%
53040		4	0.2917	0.2444	0.339	0.265	0.3318	0.01487	0.02974	10.20%	45.70%
53041		4	0.3025	0.2514	0.3536	0.26	0.335	0.01605	0.03211	10.61%	43.69%
53042		4	0.2625	0.2194	0.3056	0.223	0.284	0.01353	0.02706	10.31%	51.14%
53043		4	0.341	0.298	0.384	0.317	0.379	0.01351	0.02702	7.92%	36.53%
53044		4	0.2798	0.233	0.3265	0.236	0.299	0.01468	0.02936	10.50%	47.93%
53045		4	0.4567	0.3802	0.5333	0.411	0.524	0.02406	0.04811	10.53%	14.98%

28d Mean Dry Weight Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
53046	RS	4	0.5372	0.4922	0.5823	0.506	0.574	0.01415	0.0283	5.27%	0.00%
53040		4	0.3469	0.2788	0.415	0.2944	0.3914	0.0214	0.0428	12.34%	35.43%
53041		4	0.3268	0.284	0.3696	0.2889	0.3522	0.01345	0.02689	8.23%	39.17%
53042		4	0.2841	0.2369	0.3312	0.2478	0.3156	0.0148	0.02961	10.42%	47.13%
53043		4	0.341	0.298	0.384	0.317	0.379	0.01351	0.02702	7.92%	36.53%
53044		4	0.3132	0.2489	0.3775	0.291	0.3737	0.0202	0.04041	12.90%	41.71%
53045		4	0.495	0.4341	0.5559	0.439	0.524	0.01914	0.03829	7.73%	7.86%

28d Survival Rate Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
53046	RS	12	0.9667	0.9354	0.9980	0.9000	1.0000	0.0142	0.0492	5.09%	0.00%
53040		12	0.8333	0.6550	1.0120	0.0000	1.0000	0.0810	0.2807	33.68%	13.79%
53041		12	0.9333	0.8769	0.9897	0.7000	1.0000	0.0256	0.0888	9.51%	3.45%
53042		12	0.8333	0.7600	0.9067	0.6000	1.0000	0.0333	0.1155	13.86%	13.79%
53043		12	0.9583	0.9011	1.0160	0.7000	1.0000	0.0260	0.0900	9.39%	0.86%
53044		12	0.9417	0.8913	0.9920	0.8000	1.0000	0.0229	0.0793	8.42%	2.59%
53045		12	0.9417	0.8913	0.9920	0.8000	1.0000	0.0229	0.0793	8.42%	2.59%

35d Survival Rate Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
53046	RS	8	0.9375	0.8753	0.9997	0.8000	1.0000	0.0263	0.0744	7.94%	0.00%
53040		8	0.7625	0.4873	1.0380	0.0000	1.0000	0.1164	0.3292	43.18%	18.67%
53041		8	0.8875	0.7833	0.9917	0.7000	1.0000	0.0441	0.1246	14.04%	5.33%
53042		8	0.7375	0.5966	0.8784	0.4000	0.9000	0.0596	0.1685	22.85%	21.33%
53043		8	0.9000	0.7659	1.0340	0.6000	1.0000	0.0567	0.1604	17.82%	4.00%
53044		8	0.9000	0.8553	0.9447	0.8000	1.0000	0.0189	0.0535	5.94%	4.00%
53045		8	0.8750	0.8009	0.9491	0.8000	1.0000	0.0313	0.0886	10.13%	6.67%

42d Biomass Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
53046	RS	8	0.5693	0.5192	0.6193	0.498	0.68	0.02117	0.05987	10.52%	0.00%
53040		8	0.3868	0.2513	0.5222	0	0.513	0.0573	0.1621	41.90%	32.06%
53041		8	0.3095	0.1895	0.4295	0.046	0.483	0.05073	0.1435	46.36%	45.63%
53042		8	0.3324	0.1773	0.4875	0.074	0.49	0.06559	0.1855	55.81%	41.61%
53043		8	0.5146	0.4479	0.5814	0.349	0.603	0.02824	0.07987	15.52%	9.60%
53044		8	0.4257	0.3537	0.4978	0.243	0.508	0.03047	0.08619	20.24%	25.21%
53045		8	0.4934	0.3603	0.6265	0.17	0.673	0.05629	0.1592	32.27%	13.33%

42d Mean Dry Weight Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
53046	RS	8	0.6618	0.6228	0.7008	0.5689	0.7114	0.01648	0.04661	7.04%	0.00%
53040		7	0.536	0.4593	0.6128	0.439	0.66	0.03135	0.08295	15.47%	19.00%
53041		8	0.4261	0.3108	0.5413	0.2067	0.5612	0.04874	0.1379	32.35%	35.62%
53042		8	0.5453	0.4227	0.6678	0.288	0.74	0.05181	0.1465	26.88%	17.61%
53043		8	0.5827	0.5523	0.6132	0.53	0.6514	0.01286	0.03639	6.24%	11.95%
53044		8	0.5063	0.4107	0.602	0.27	0.635	0.04047	0.1145	22.60%	23.49%
53045		8	0.5847	0.4798	0.6896	0.34	0.7478	0.04435	0.1254	21.46%	11.65%

CETIS Summary Report

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 Test Code/ID: 16245 REF 1 / 14-4995-1919

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test

Aquatec Environmental, Inc.

42d Reproduction Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
53046	RS	8	8.079	5.489	10.67	4.667	14.5	1.095	3.098	38.35%	0.00%
53040		7	4.318	2.112	6.523	0	7	0.9013	2.385	55.23%	46.56%
53041		6	1.917	0.5721	3.261	0	3.5	0.5231	1.281	66.85%	76.28%
53042		5	2.45	-0.3472	5.247	0	5.75	1.007	2.253	91.95%	69.68%
53043		8	3.802	1.349	6.255	2	10.5	1.037	2.934	77.18%	52.94%
53044		8	4.688	3.831	5.544	3	6.5	0.3621	1.024	21.85%	41.98%
53045		8	6.521	3.656	9.386	0	10.5	1.211	3.427	52.55%	19.29%

42d Survival Rate Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
53046	RS	8	0.8625	0.7859	0.9391	0.7000	1.0000	0.0324	0.0916	10.62%	0.00%
53040		8	0.7375	0.4587	1.0160	0.0000	1.0000	0.1179	0.3335	45.23%	14.49%
53041		8	0.7000	0.5104	0.8896	0.2000	0.9000	0.0802	0.2268	32.40%	18.84%
53042		8	0.6125	0.3660	0.8590	0.1000	0.9000	0.1043	0.2949	48.15%	28.99%
53043		8	0.8875	0.7577	1.0170	0.6000	1.0000	0.0549	0.1553	17.49%	-2.90%
53044		8	0.8500	0.7726	0.9274	0.7000	1.0000	0.0327	0.0926	10.89%	1.45%
53045		8	0.8250	0.6855	0.9645	0.5000	1.0000	0.0590	0.1669	20.23%	4.35%

CETIS Summary Report

Report Date: 07 Mar-22 12:05 (p 5 of 7)
Test Code/ID: 16245 REF 1 / 14-4995-1919

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test

Aquatec Environmental, Inc.

28d Biomass Detail

MD5: 6A35889FAC82A0083A4C34F25C79D9CB

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53046	RS	---	---	---	---	---	---	---	---	0.529	0.54
		0.574	0.506								
53040		---	---	---	---	---	---	---	---	0.296	0.265
		0.274	0.3318								
53041		---	---	---	---	---	---	---	---	0.26	0.335
		0.298	0.317								
53042		---	---	---	---	---	---	---	---	0.274	0.223
		0.284	0.269								
53043		---	---	---	---	---	---	---	---	0.328	0.34
		0.317	0.379								
53044		---	---	---	---	---	---	---	---	0.291	0.299
		0.293	0.236								
53045		---	---	---	---	---	---	---	---	0.453	0.439
		0.411	0.524								

28d Mean Dry Weight Detail

MD5: 0356DD1DC72BF990214254847863A120

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53046	RS	---	---	---	---	---	---	---	---	0.529	0.54
		0.574	0.506								
53040		---	---	---	---	---	---	---	---	0.37	0.2944
		0.3914	0.3318								
53041		---	---	---	---	---	---	---	---	0.2889	0.335
		0.3311	0.3522								
53042		---	---	---	---	---	---	---	---	0.274	0.2478
		0.3156	0.2989								
53043		---	---	---	---	---	---	---	---	0.328	0.34
		0.317	0.379								
53044		---	---	---	---	---	---	---	---	0.291	0.3737
		0.293	0.295								
53045		---	---	---	---	---	---	---	---	0.5033	0.439
		0.5137	0.524								

28d Survival Rate Detail

MD5: EBD456A7A3163E9A27D60224D8A78003

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53046	RS	0.9000	1.0000	0.9000	0.9000	1.0000	1.0000	0.9000	1.0000	1.0000	1.0000
		1.0000	1.0000								
53040		0.9000	1.0000	1.0000	0.0000	1.0000	1.0000	0.8000	0.9000	0.8000	0.9000
		0.7000	1.0000								
53041		1.0000	1.0000	1.0000	0.9000	0.7000	0.9000	1.0000	1.0000	0.9000	1.0000
		0.9000	0.9000								
53042		0.7000	0.8000	0.9000	0.7000	0.8000	0.9000	0.9000	0.6000	1.0000	0.9000
		0.9000	0.9000								
53043		1.0000	1.0000	0.9000	1.0000	1.0000	0.7000	1.0000	0.9000	1.0000	1.0000
		1.0000	1.0000								
53044		0.9000	1.0000	1.0000	0.9000	1.0000	1.0000	0.9000	1.0000	1.0000	0.8000
		1.0000	0.8000								
53045		1.0000	0.9000	1.0000	1.0000	1.0000	0.9000	0.8000	1.0000	0.9000	1.0000
		0.8000	1.0000								

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Hyalella 42-d Survival, Growth, and Reproduction Sediment Test **Aquatec Environmental, Inc.**

35d Survival Rate Detail											MD5: 9F607551CC383723F2C15253DD6CC88A
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53046	RS	0.9000	1.0000	0.9000	0.8000	1.0000	1.0000	0.9000	1.0000	---	---
		---	---								
53040		0.7000	1.0000	1.0000	0.0000	1.0000	0.8000	0.8000	0.8000	---	---
		---	---								
53041		1.0000	0.9000	1.0000	0.9000	0.7000	0.9000	0.7000	1.0000	---	---
		---	---								
53042		0.7000	0.8000	0.8000	0.4000	0.8000	0.9000	0.9000	0.6000	---	---
		---	---								
53043		1.0000	1.0000	0.9000	1.0000	1.0000	0.7000	1.0000	0.6000	---	---
		---	---								
53044		0.9000	1.0000	0.9000	0.9000	0.9000	0.8000	0.9000	0.9000	---	---
		---	---								
53045		0.8000	0.9000	1.0000	0.9000	1.0000	0.8000	0.8000	0.8000	---	---
		---	---								

42d Biomass Detail											MD5: 6F5F117B671B57260133B73D78DFA4A3
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53046	RS	0.606	0.68	0.498	0.548	0.612	0.546	0.512	0.552	---	---
		---	---								
53040		0.396	0.513	0.488	0	0.439	0.384	0.447	0.427	---	---
		---	---								
53041		0.186	0.449	0.362	0.297	0.383	0.27	0.046	0.483	---	---
		---	---								
53042		0.399	0.487	0.144	0.074	0.49	0.459	0.487	0.119	---	---
		---	---								
53043		0.603	0.533	0.518	0.58	0.53	0.456	0.548	0.349	---	---
		---	---								
53044		0.508	0.462	0.424	0.361	0.243	0.449	0.481	0.478	---	---
		---	---								
53045		0.462	0.488	0.655	0.673	0.565	0.526	0.408	0.17	---	---
		---	---								

42d Mean Dry Weight Detail											MD5: 32F7580CAD2FEEB03C10AAFAEF5D6EAE
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53046	RS	0.6733	0.68	0.7114	0.685	0.68	0.6825	0.5689	0.6133	---	---
		---	---								
53040		0.66	0.513	0.488	---	0.439	0.48	0.6386	0.5338	---	---
		---	---								
53041		0.2067	0.5612	0.4525	0.4243	0.5471	0.45	0.23	0.5367	---	---
		---	---								
53042		0.665	0.6087	0.288	0.74	0.6125	0.51	0.5411	0.3967	---	---
		---	---								
53043		0.603	0.5922	0.5756	0.58	0.53	0.6514	0.548	0.5817	---	---
		---	---								
53044		0.635	0.462	0.6057	0.4513	0.27	0.5612	0.5344	0.5311	---	---
		---	---								
53045		0.66	0.5422	0.655	0.7478	0.565	0.6575	0.51	0.34	---	---
		---	---								

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Hyalella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

42d Reproduction Detail											MD5: 0D103FCAFE929F7381943442E0CA664
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53046	RS	10	6	14.5	4.667	8.667	8	6	6.8	---	---
		---	---								
53040		6.5	3	4	---	4.125	5.6	7	0	---	---
		---	---								
53041		---	2	1	2	3.5	0	---	3	---	---
		---	---								
53042		2	3.5	---	---	5.75	1	0	---	---	---
		---	---								
53043		10.5	2	2.5	5.5	2	3	2.25	2.667	---	---
		---	---								
53044		3	5.4	4	5	4.667	6.5	4.333	4.6	---	---
		---	---								
53045		0	7.667	8.333	5	6.333	10.5	4.333	10	---	---
		---	---								

42d Survival Rate Detail											MD5: 135CA402BE0382EAC359354050735441
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53046	RS	0.9000	1.0000	0.7000	0.8000	0.9000	0.8000	0.9000	0.9000	---	---
		---	---								
53040		0.6000	1.0000	1.0000	0.0000	1.0000	0.8000	0.7000	0.8000	---	---
		---	---								
53041		0.9000	0.8000	0.8000	0.7000	0.7000	0.6000	0.2000	0.9000	---	---
		---	---								
53042		0.6000	0.8000	0.5000	0.1000	0.8000	0.9000	0.9000	0.3000	---	---
		---	---								
53043		1.0000	0.9000	0.9000	1.0000	1.0000	0.7000	1.0000	0.6000	---	---
		---	---								
53044		0.8000	1.0000	0.7000	0.8000	0.9000	0.8000	0.9000	0.9000	---	---
		---	---								
53045		0.7000	0.9000	1.0000	0.9000	1.0000	0.8000	0.8000	0.5000	---	---
		---	---								

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Test Code/ID: 16245 REF 1 / 14-4995-1919

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID: 03-9802-4583	Endpoint: 28d Biomass	CETIS Version: CETISv2.1.1
Analyzed: 06 Mar-22 13:49	Analysis: Parametric-Two Sample	Status Level: 1
Edit Date: 04 Mar-22 13:59	MD5 Hash: CFC7367EF35932233F4A8854F1F4D45C	Editor ID:
Batch ID: 14-5191-3028	Test Type: Hyalella (42d)	Analyst: C. Mattheus Ayers
Start Date: 06 Jan-22 15:25	Protocol: EPA/600/R-99/064 (2000)	Diluent: Reconstituted Water
Ending Date: 17 Feb-22 12:00	Species: Hyalella azteca	Brine:
Test Length: 41d 21h	Taxon: Malacostraca	Source: Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, Inc	Sediment Testing
53046	12-3611-8332	21 Dec-21 15:54	21 Dec-21 20:00	16d (0.3 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53046	Reference sediment	Belmont Landfill	TOX-6	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53040 failed 28d biomass endpoint	7.42%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Reference Sed		53040*	6	11.96	1.943	0.03989	CDF	1.0E-05	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.120585	0.120585	1	143.1	2.1E-05	Significant Effect
Error	0.00505689	0.00084282	6			
Total	0.125642		7			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.105	47.47	0.9367	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.907	0.6451	0.3333	Normal Distribution

28d Biomass Summary

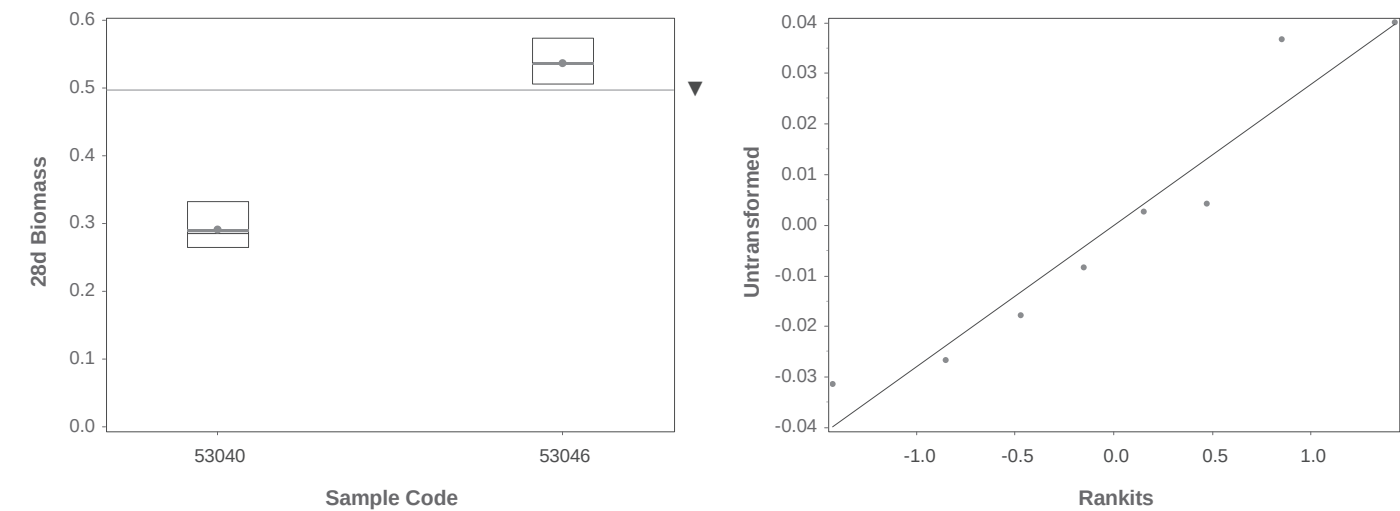
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040		4	0.2917	0.2444	0.339	0.285	0.265	0.3318	0.01487	10.20%	45.70%
53046	RS	4	0.5372	0.4922	0.5823	0.5345	0.506	0.574	0.01415	5.27%	0.00%

28d Biomass Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53040		0.296	0.265	0.274	0.3318						
53046	RS	0.529	0.54	0.574	0.506						

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test			Aquatec Environmental, Inc.	
Analysis ID:	03-9802-4583	Endpoint:	28d Biomass	CETIS Version: CETISv2.1.1
Analyzed:	06 Mar-22 13:49	Analysis:	Parametric-Two Sample	Status Level: 1
Edit Date:	04 Mar-22 13:59	MD5 Hash:	CFC7367EF35932233F4A8854F1F4D45C	Editor ID:

Graphics



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Test Code/ID: 16245 REF 1 / 14-4995-1919

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID: 13-7652-6659	Endpoint: 28d Biomass	CETIS Version: CETISv2.1.1
Analyzed: 06 Mar-22 13:50	Analysis: Parametric-Two Sample	Status Level: 1
Edit Date: 04 Mar-22 13:59	MD5 Hash: A362C4828BC177386DC9CBE68B42CED9	Editor ID:
Batch ID: 14-5191-3028	Test Type: Hyalella (42d)	Analyst: C. Mattheus Ayers
Start Date: 06 Jan-22 15:25	Protocol: EPA/600/R-99/064 (2000)	Diluent: Reconstituted Water
Ending Date: 17 Feb-22 12:00	Species: Hyalella azteca	Brine:
Test Length: 41d 21h	Taxon: Malacostraca	Source: Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53041	03-8171-1181	21 Dec-21 09:05	21 Dec-21 20:00	16d 6h (0.3 °C)	Woods Hole Group	Sediment Testing
53046	12-3611-8332	21 Dec-21 15:54	21 Dec-21 20:00	16d (0.3 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53041	Sediment	Belmont Landfill	TOX-4	
53046	Reference sediment	Belmont Landfill	TOX-6	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53041 failed 28d biomass endpoint	7.74%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Reference Sed		53041*	6	10.97	1.943	0.04158	CDF	1.7E-05	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.110215	0.110215	1	120.3	3.4E-05	Significant Effect
Error	0.00549576	0.00091596	6			
Total	0.115711		7			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.287	47.47	0.8405	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9566	0.6451	0.7776	Normal Distribution

28d Biomass Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53041		4	0.3025	0.2514	0.3536	0.3075	0.26	0.335	0.01605	10.61%	43.69%
53046	RS	4	0.5372	0.4922	0.5823	0.5345	0.506	0.574	0.01415	5.27%	0.00%

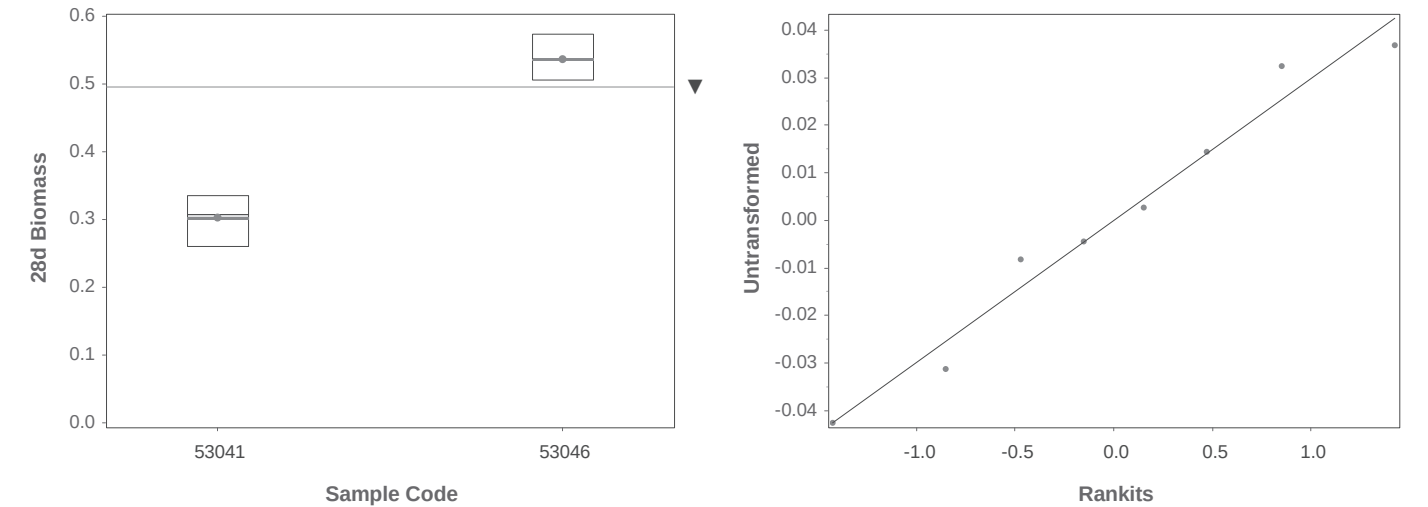
28d Biomass Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53041		0.26	0.335	0.298	0.317						
53046	RS	0.529	0.54	0.574	0.506						

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID:	13-7652-6659	Endpoint:	28d Biomass	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 13:50	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 13:59	MD5 Hash:	A362C4828BC177386DC9CBE68B42CED9	Editor ID:	

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Test Code/ID: 16245 REF 1 / 14-4995-1919

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test				Aquatec Environmental, Inc.	
Analysis ID:	03-5853-6268	Endpoint:	28d Biomass	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 13:50	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 13:59	MD5 Hash:	F9388816A90DBB8439CBC0C53A25D7DB	Editor ID:	
Batch ID:	14-5191-3028	Test Type:	Hyalella (42d)	Analyst:	C. Mattheus Ayers
Start Date:	06 Jan-22 15:25	Protocol:	EPA/600/R-99/064 (2000)	Diluent:	Reconstituted Water
Ending Date:	17 Feb-22 12:00	Species:	Hyalella azteca	Brine:	
Test Length:	41d 21h	Taxon:	Malacostraca	Source:	Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53042	04-7178-2695	21 Dec-21 13:38	21 Dec-21 20:00	16d 2h (0.6 °C)	Woods Hole Group	Sediment Testing
53046	12-3611-8332	21 Dec-21 15:54	21 Dec-21 20:00	16d (0.3 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53042	Sediment	Belmont Landfill	TOX-1	
53046	Reference sediment	Belmont Landfill	TOX-6	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53042 failed 28d biomass endpoint	7.08%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Reference Sed		53042*	6	14.03	1.943	0.03804	CDF	<1.0E-05	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.150975	0.150975	1	196.9	<1.0E-05	Significant Effect
Error	0.00459976	0.00076663	6			
Total	0.155575		7			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.094	47.47	0.9431	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9612	0.6451	0.8210	Normal Distribution

28d Biomass Summary

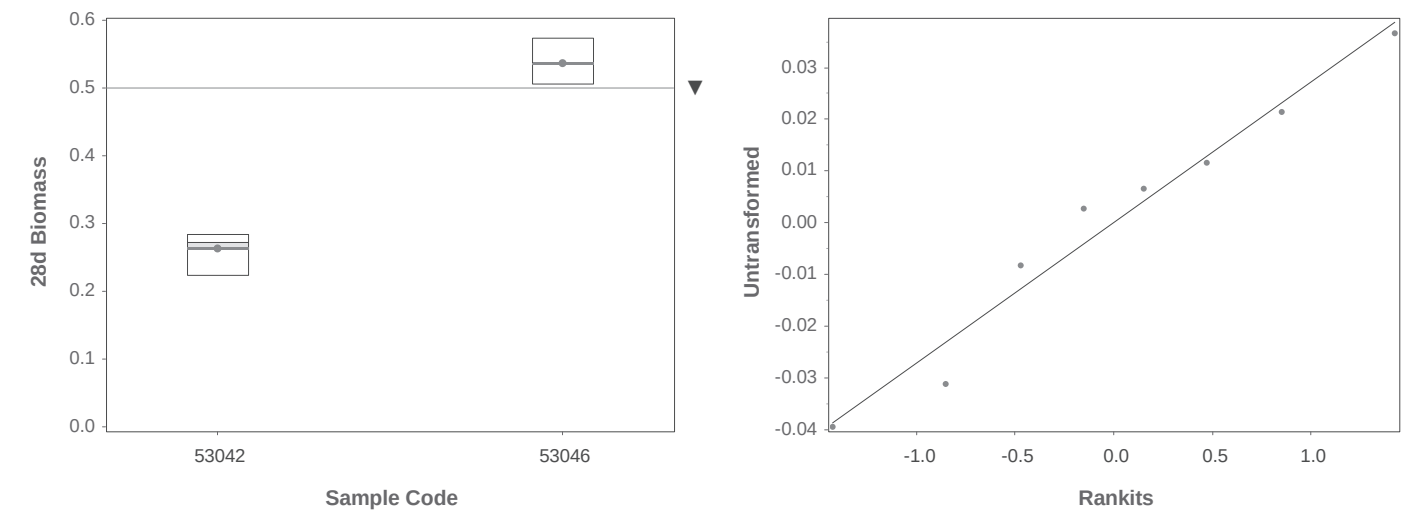
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53042		4	0.2625	0.2194	0.3056	0.2715	0.223	0.284	0.01353	10.31%	51.14%
53046	RS	4	0.5372	0.4922	0.5823	0.5345	0.506	0.574	0.01415	5.27%	0.00%

28d Biomass Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53042		0.274	0.223	0.284	0.269						
53046	RS	0.529	0.54	0.574	0.506						

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test			Aquatec Environmental, Inc.	
Analysis ID:	03-5853-6268	Endpoint:	28d Biomass	CETIS Version: CETISv2.1.1
Analyzed:	06 Mar-22 13:50	Analysis:	Parametric-Two Sample	Status Level: 1
Edit Date:	04 Mar-22 13:59	MD5 Hash:	F9388816A90DBB8439CBC0C53A25D7DB	Editor ID:

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Report Date: 07 Mar-22 12:03 (p 7 of 96)
Test Code/ID: 16245 REF 1 / 14-4995-1919

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID: 18-7196-4671	Endpoint: 28d Biomass	CETIS Version: CETISv2.1.1
Analyzed: 06 Mar-22 13:50	Analysis: Parametric-Two Sample	Status Level: 1
Edit Date: 04 Mar-22 13:59	MD5 Hash: D3B081F5D7CBF96994974AB3236E90EE	Editor ID:
Batch ID: 14-5191-3028	Test Type: Hyalella (42d)	Analyst: C. Mattheus Ayers
Start Date: 06 Jan-22 15:25	Protocol: EPA/600/R-99/064 (2000)	Diluent: Reconstituted Water
Ending Date: 17 Feb-22 12:00	Species: Hyalella azteca	Brine:
Test Length: 41d 21h	Taxon: Malacostraca	Source: Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53043	20-0010-4712	21 Dec-21 12:35	21 Dec-21 20:00	16d 3h (0.6 °C)	Woods Hole Group	Sediment Testing
53046	12-3611-8332	21 Dec-21 15:54	21 Dec-21 20:00	16d (0.3 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53043	Sediment	Belmont Landfill	TOX-2	
53046	Reference sediment	Belmont Landfill	TOX-6	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53043 failed 28d biomass endpoint	7.08%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Reference Sed		53043*	6	10.03	1.943	0.03802	CDF	2.8E-05	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0770281	0.0770281	1	100.6	5.7E-05	Significant Effect
Error	0.00459276	0.00076546	6			
Total	0.0816208		7			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.097	47.47	0.9410	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.8998	0.6451	0.2875	Normal Distribution

28d Biomass Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53043		4	0.341	0.298	0.384	0.334	0.317	0.379	0.01351	7.92%	36.53%
53046	RS	4	0.5372	0.4922	0.5823	0.5345	0.506	0.574	0.01415	5.27%	0.00%

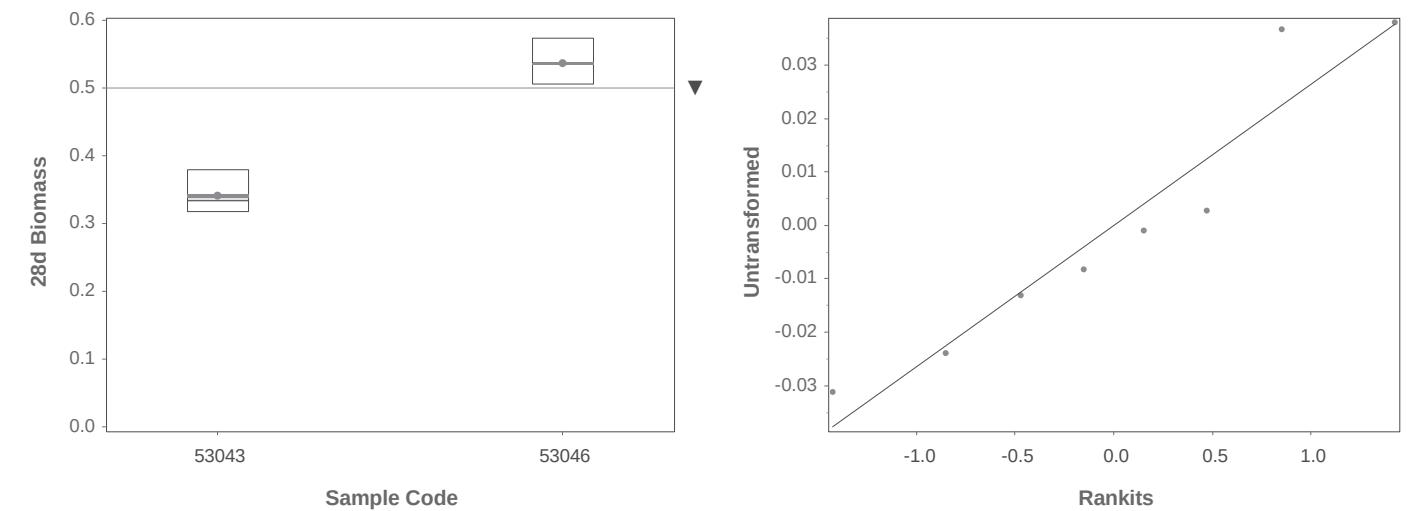
28d Biomass Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53043		0.328	0.34	0.317	0.379						
53046	RS	0.529	0.54	0.574	0.506						

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID:	18-7196-4671	Endpoint:	28d Biomass	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 13:50	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 13:59	MD5 Hash:	D3B081F5D7CBF96994974AB3236E90EE	Editor ID:	

Graphics



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Report Date: 07 Mar-22 12:03 (p 9 of 96)
Test Code/ID: 16245 REF 1 / 14-4995-1919

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test				Aquatec Environmental, Inc.			
Analysis ID:	02-9437-6305	Endpoint:	28d Biomass	CETIS Version:	CETISv2.1.1		
Analyzed:	06 Mar-22 13:50	Analysis:	Parametric-Two Sample	Status Level:	1		
Edit Date:	04 Mar-22 13:59	MD5 Hash:	AC287CA7AAE57C0DD7420D536320C8E5	Editor ID:			
Batch ID:	14-5191-3028	Test Type:	Hyalella (42d)	Analyst:	C. Mattheus Ayers		
Start Date:	06 Jan-22 15:25	Protocol:	EPA/600/R-99/064 (2000)	Diluent:	Reconstituted Water		
Ending Date:	17 Feb-22 12:00	Species:	Hyalella azteca	Brine:			
Test Length:	41d 21h	Taxon:	Malacostraca	Source:	Aquatic Research Organism Age: 8d		

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53044	00-4677-6467	21 Dec-21 11:25	21 Dec-21 20:00	16d 4h (0.6 °C)	Woods Hole Group	Sediment Testing
53046	12-3611-8332	21 Dec-21 15:54	21 Dec-21 20:00	16d (0.3 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53044	Sediment	Belmont Landfill	TOX-3	
53046	Reference sediment	Belmont Landfill	TOX-6	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53044 failed 28d biomass endpoint	7.38%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Reference Sed		53044*	6	12.63	1.943	0.03962	CDF	<1.0E-05	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.132613	0.132613	1	159.5	1.5E-05	Significant Effect
Error	0.0049895	0.00083158	6			
Total	0.137602		7			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.077	47.47	0.9531	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9521	0.6451	0.7329	Normal Distribution

28d Biomass Summary

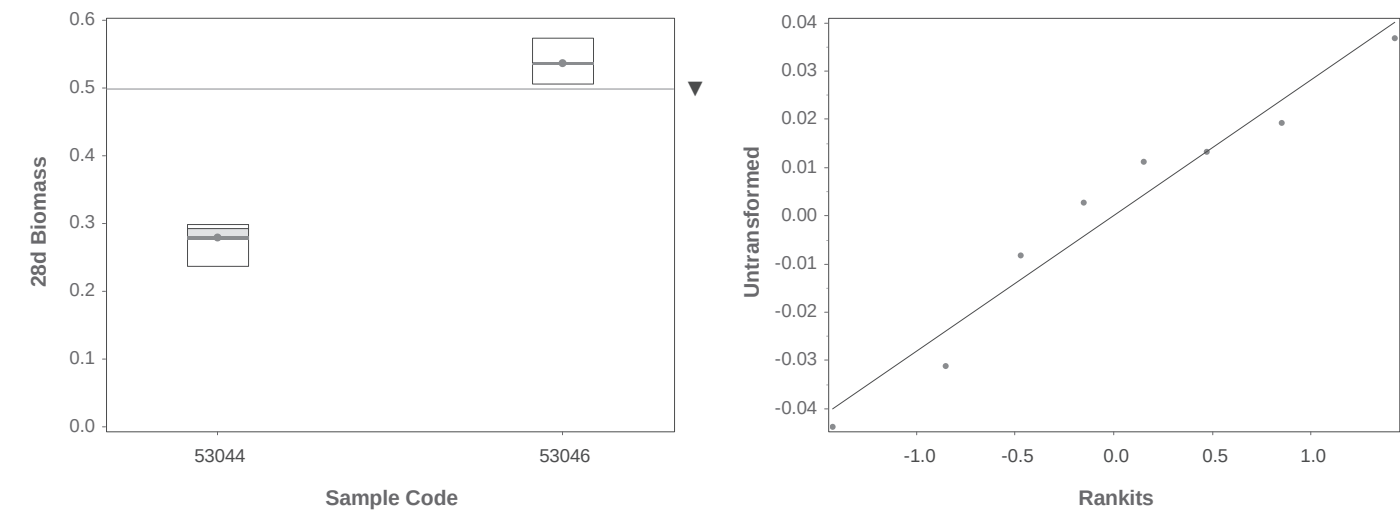
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53044		4	0.2798	0.233	0.3265	0.292	0.236	0.299	0.01468	10.50%	47.93%
53046	RS	4	0.5372	0.4922	0.5823	0.5345	0.506	0.574	0.01415	5.27%	0.00%

28d Biomass Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53044		0.291	0.299	0.293	0.236						
53046	RS	0.529	0.54	0.574	0.506						

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test			Aquatec Environmental, Inc.	
Analysis ID:	02-9437-6305	Endpoint:	28d Biomass	CETIS Version: CETISv2.1.1
Analyzed:	06 Mar-22 13:50	Analysis:	Parametric-Two Sample	Status Level: 1
Edit Date:	04 Mar-22 13:59	MD5 Hash:	AC287CA7AAE57C0DD7420D536320C8E5	Editor ID:

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Hyalella 42-d Survival, Growth, and Reproduction Sediment Test						Aquatec Environmental, Inc.
Analysis ID:	12-6844-6144	Endpoint:	28d Biomass	CETIS Version:	CETISv2.1.1	
Analyzed:	06 Mar-22 13:50	Analysis:	Parametric-Two Sample	Status Level:	1	
Edit Date:	04 Mar-22 13:59	MD5 Hash:	D8BA5ED9450D7B285BB9B24E8C26B2DC	Editor ID:		
Batch ID:	14-5191-3028	Test Type:	Hyalella (42d)	Analyst:	C. Mattheus Ayers	
Start Date:	06 Jan-22 15:25	Protocol:	EPA/600/R-99/064 (2000)	Diluent:	Reconstituted Water	
Ending Date:	17 Feb-22 12:00	Species:	Hyalella azteca	Brine:		
Test Length:	41d 21h	Taxon:	Malacostraca	Source:	Aquatic Research Organism	Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53045	13-5487-4433	21 Dec-21 14:22	21 Dec-21 20:00	16d 1h (0.3 °C)	Woods Hole Group	Sediment Testing
53046	12-3611-8332	21 Dec-21 15:54	21 Dec-21 20:00	16d (0.3 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53045	Sediment	Belmont Landfill	TOX-5	
53046	Reference sediment	Belmont Landfill	TOX-6	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53045 failed 28d biomass endpoint	10.09%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Reference Sed		53045*	6	2.884	1.943	0.05423	CDF	0.0140	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0129605	0.0129605	1	8.319	0.0279	Significant Effect
Error	0.00934752	0.00155792	6			
Total	0.022308		7			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	2.89	47.47	0.4066	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9397	0.6451	0.6086	Normal Distribution

28d Biomass Summary

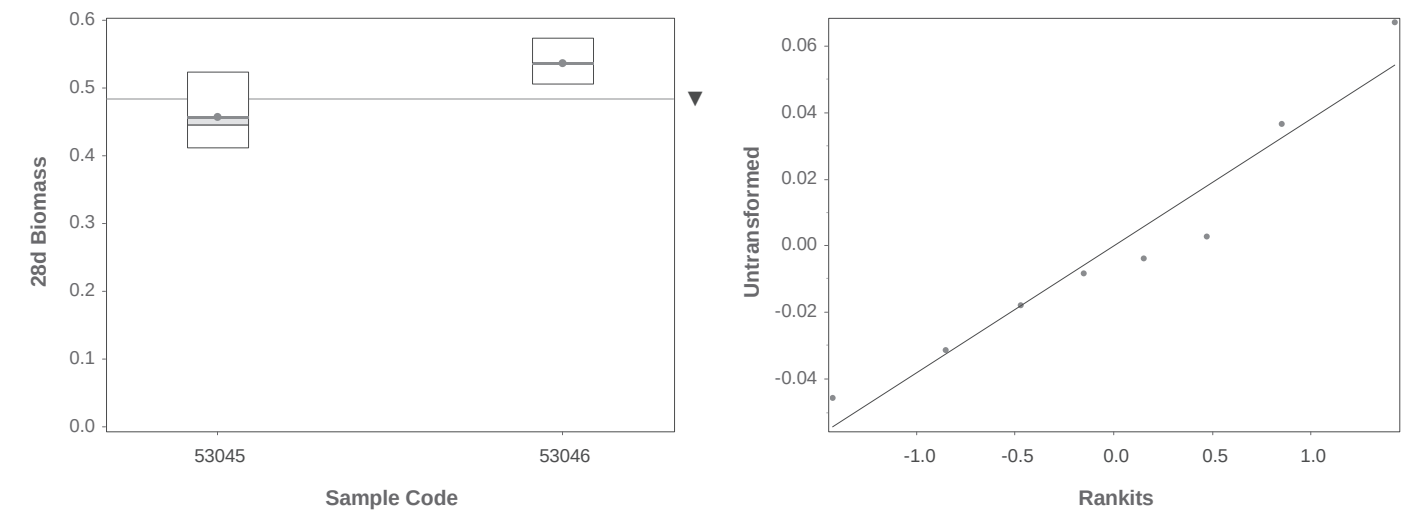
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53045		4	0.4567	0.3802	0.5333	0.446	0.411	0.524	0.02406	10.53%	14.98%
53046	RS	4	0.5372	0.4922	0.5823	0.5345	0.506	0.574	0.01415	5.27%	0.00%

28d Biomass Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53045		0.453	0.439	0.411	0.524						
53046	RS	0.529	0.54	0.574	0.506						

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test			Aquatec Environmental, Inc.	
Analysis ID:	12-6844-6144	Endpoint:	28d Biomass	CETIS Version: CETISv2.1.1
Analyzed:	06 Mar-22 13:50	Analysis:	Parametric-Two Sample	Status Level: 1
Edit Date:	04 Mar-22 13:59	MD5 Hash:	D8BA5ED9450D7B285BB9B24E8C26B2DC	Editor ID:

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Hyalella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID: 03-1490-3000	Endpoint: 28d Mean Dry Weight	CETIS Version: CETISv2.1.1
Analyzed: 06 Mar-22 13:49	Analysis: Parametric-Two Sample	Status Level: 1
Edit Date: 04 Mar-22 13:59	MD5 Hash: 5BE1A25D3DB4C9E8A8F5EF23D3B2D155	Editor ID:
Batch ID: 14-5191-3028	Test Type: Hyalella (42d)	Analyst: C. Mattheus Ayers
Start Date: 06 Jan-22 15:25	Protocol: EPA/600/R-99/064 (2000)	Diluent: Reconstituted Water
Ending Date: 17 Feb-22 12:00	Species: Hyalella azteca	Brine:
Test Length: 41d 21h	Taxon: Malacostraca	Source: Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, In	Sediment Testing
53046	12-3611-8332	21 Dec-21 15:54	21 Dec-21 20:00	16d (0.3 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53046	Reference sediment	Belmont Landfill	TOX-6	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53040 failed 28d mean dry weight endpoint	9.28%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Reference Sed		53040*	6	7.419	1.943	0.04985	CDF	0.0002	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0724489	0.0724489	1	55.04	0.0003	Significant Effect
Error	0.00789821	0.00131637	6			
Total	0.0803471		7			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	2.287	47.47	0.5145	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9693	0.6451	0.8925	Normal Distribution

28d Mean Dry Weight Summary

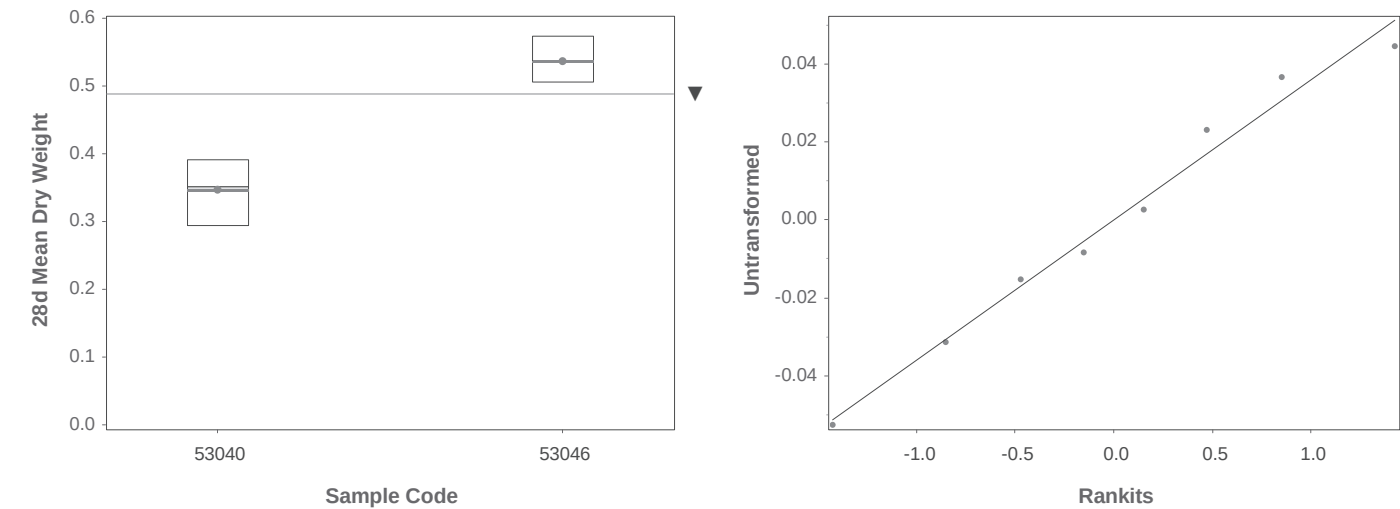
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040		4	0.3469	0.2788	0.415	0.3509	0.2944	0.3914	0.0214	12.34%	35.43%
53046	RS	4	0.5372	0.4922	0.5823	0.5345	0.506	0.574	0.01415	5.27%	0.00%

28d Mean Dry Weight Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53040		0.37	0.2944	0.3914	0.3318						
53046	RS	0.529	0.54	0.574	0.506						

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test			Aquatec Environmental, Inc.	
Analysis ID:	03-1490-3000	Endpoint:	28d Mean Dry Weight	CETIS Version: CETISv2.1.1
Analyzed:	06 Mar-22 13:49	Analysis:	Parametric-Two Sample	Status Level: 1
Edit Date:	04 Mar-22 13:59	MD5 Hash:	5BE1A25D3DB4C9E8A8F5EF23D3B2D155	Editor ID:

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Test Code/ID: 16245 REF 1 / 14-4995-1919

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test				Aquatec Environmental, Inc.	
Analysis ID:	03-5453-6046	Endpoint:	28d Mean Dry Weight	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 13:50	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 13:59	MD5 Hash:	75F01B8A5921EAC55DA32323009D602E	Editor ID:	
Batch ID:	14-5191-3028	Test Type:	Hyalella (42d)	Analyst:	C. Mattheus Ayers
Start Date:	06 Jan-22 15:25	Protocol:	EPA/600/R-99/064 (2000)	Diluent:	Reconstituted Water
Ending Date:	17 Feb-22 12:00	Species:	Hyalella azteca	Brine:	
Test Length:	41d 21h	Taxon:	Malacostraca	Source:	Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53041	03-8171-1181	21 Dec-21 09:05	21 Dec-21 20:00	16d 6h (0.3 °C)	Woods Hole Group	Sediment Testing
53046	12-3611-8332	21 Dec-21 15:54	21 Dec-21 20:00	16d (0.3 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53041	Sediment	Belmont Landfill	TOX-4	
53046	Reference sediment	Belmont Landfill	TOX-6	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53041 failed 28d mean dry weight endpoint	7.06%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Reference Sed		53041*	6	10.78	1.943	0.03793	CDF	1.9E-05	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0885738	0.0885738	1	116.2	3.8E-05	Significant Effect
Error	0.00457213	0.00076202	6			
Total	0.0931459		7			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.108	47.47	0.9350	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9547	0.6451	0.7587	Normal Distribution

28d Mean Dry Weight Summary

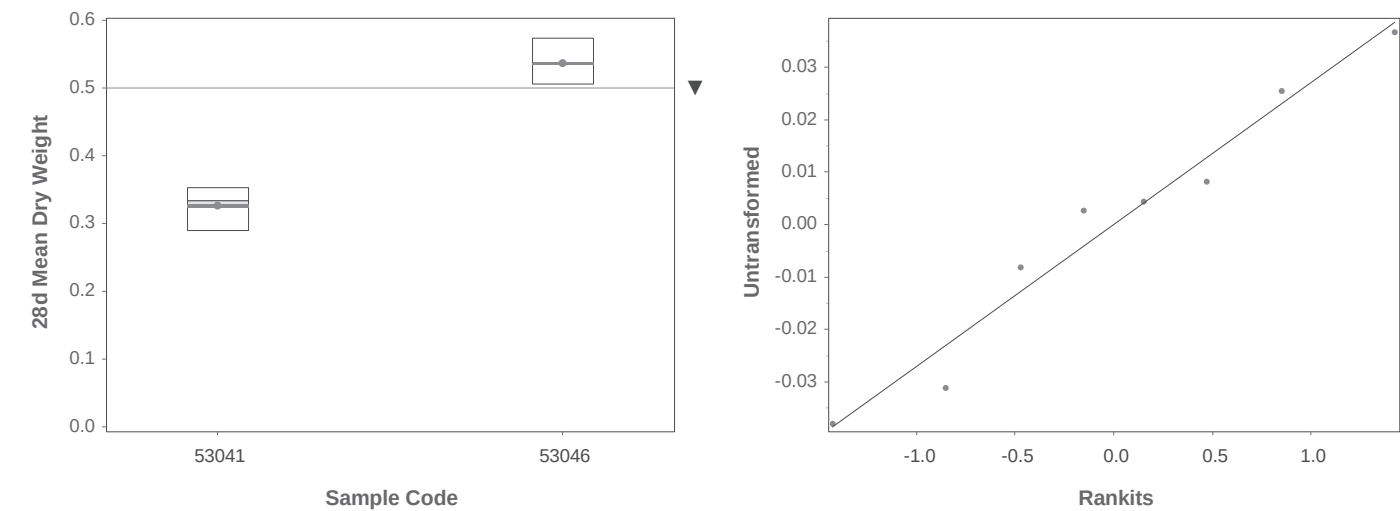
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53041		4	0.3268	0.284	0.3696	0.3331	0.2889	0.3522	0.01345	8.23%	39.17%
53046	RS	4	0.5372	0.4922	0.5823	0.5345	0.506	0.574	0.01415	5.27%	0.00%

28d Mean Dry Weight Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53041		0.2889	0.335	0.3311	0.3522						
53046	RS	0.529	0.54	0.574	0.506						

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test			Aquatec Environmental, Inc.	
Analysis ID:	03-5453-6046	Endpoint:	28d Mean Dry Weight	CETIS Version: CETISv2.1.1
Analyzed:	06 Mar-22 13:50	Analysis:	Parametric-Two Sample	Status Level: 1
Edit Date:	04 Mar-22 13:59	MD5 Hash:	75F01B8A5921EAC55DA32323009D602E	Editor ID:

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Test Code/ID: 16245 REF 1 / 14-4995-1919

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID: 04-2755-6812	Endpoint: 28d Mean Dry Weight	CETIS Version: CETISv2.1.1
Analyzed: 06 Mar-22 13:50	Analysis: Parametric-Two Sample	Status Level: 1
Edit Date: 04 Mar-22 13:59	MD5 Hash: 9EBA470A767026E621FF27B62E491509	Editor ID:
Batch ID: 14-5191-3028	Test Type: Hyalella (42d)	Analyst: C. Mattheus Ayers
Start Date: 06 Jan-22 15:25	Protocol: EPA/600/R-99/064 (2000)	Diluent: Reconstituted Water
Ending Date: 17 Feb-22 12:00	Species: Hyalella azteca	Brine:
Test Length: 41d 21h	Taxon: Malacostraca	Source: Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53042	04-7178-2695	21 Dec-21 13:38	21 Dec-21 20:00	16d 2h (0.6 °C)	Woods Hole Group	Sediment Testing
53046	12-3611-8332	21 Dec-21 15:54	21 Dec-21 20:00	16d (0.3 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53042	Sediment	Belmont Landfill	TOX-1	
53046	Reference sediment	Belmont Landfill	TOX-6	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53042 failed 28d mean dry weight endpoint	7.41%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Reference Sed		53042*	6	12.36	1.943	0.03979	CDF	<1.0E-05	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.128215	0.128215	1	152.9	1.7E-05	Significant Effect
Error	0.00503223	0.00083871	6			
Total	0.133247		7			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.094	47.47	0.9427	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9465	0.6451	0.6758	Normal Distribution

28d Mean Dry Weight Summary

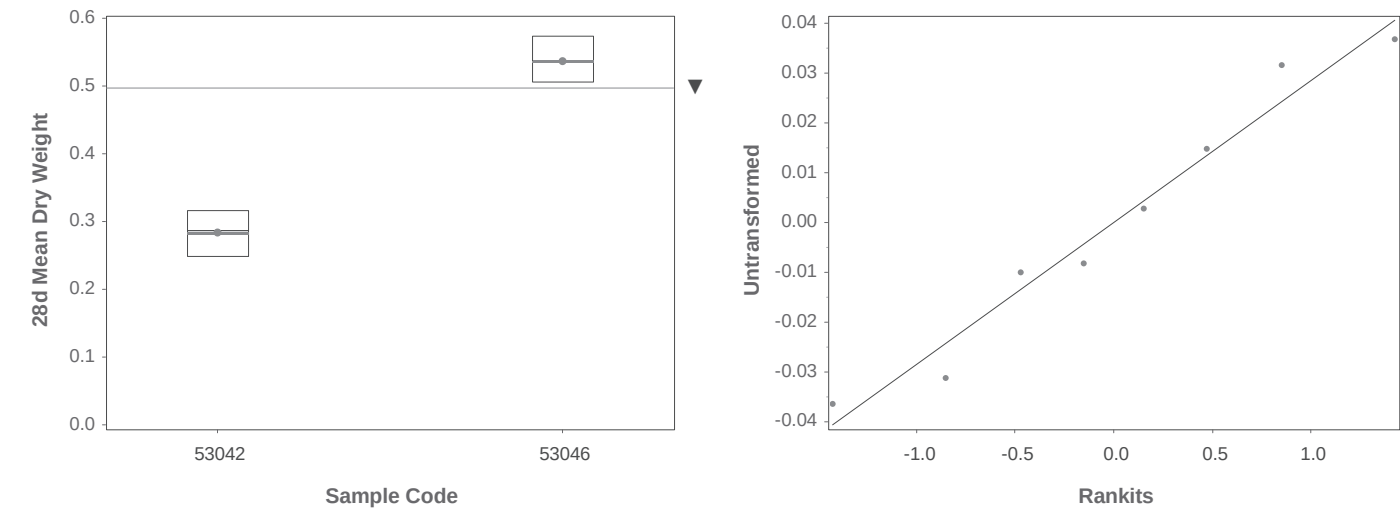
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53042		4	0.2841	0.2369	0.3312	0.2864	0.2478	0.3156	0.0148	10.42%	47.13%
53046	RS	4	0.5372	0.4922	0.5823	0.5345	0.506	0.574	0.01415	5.27%	0.00%

28d Mean Dry Weight Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53042		0.274	0.2478	0.3156	0.2989						
53046	RS	0.529	0.54	0.574	0.506						

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test			Aquatec Environmental, Inc.	
Analysis ID:	04-2755-6812	Endpoint:	28d Mean Dry Weight	CETIS Version: CETISv2.1.1
Analyzed:	06 Mar-22 13:50	Analysis:	Parametric-Two Sample	Status Level: 1
Edit Date:	04 Mar-22 13:59	MD5 Hash:	9EBA470A767026E621FF27B62E491509	Editor ID:

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Test Code/ID: 16245 REF 1 / 14-4995-1919

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID:	09-6129-7373	Endpoint:	28d Mean Dry Weight	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 13:50	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 13:59	MD5 Hash:	D3B081F5D7CBF96994974AB3236E90EE	Editor ID:	
Batch ID:	14-5191-3028	Test Type:	Hyalella (42d)	Analyst:	C. Mattheus Ayers
Start Date:	06 Jan-22 15:25	Protocol:	EPA/600/R-99/064 (2000)	Diluent:	Reconstituted Water
Ending Date:	17 Feb-22 12:00	Species:	Hyalella azteca	Brine:	
Test Length:	41d 21h	Taxon:	Malacostraca	Source:	Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53043	20-0010-4712	21 Dec-21 12:35	21 Dec-21 20:00	16d 3h (0.6 °C)	Woods Hole Group	Sediment Testing
53046	12-3611-8332	21 Dec-21 15:54	21 Dec-21 20:00	16d (0.3 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53043	Sediment	Belmont Landfill	TOX-2	
53046	Reference sediment	Belmont Landfill	TOX-6	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53043 failed 28d mean dry weight endpoint	7.08%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Reference Sed		53043*	6	10.03	1.943	0.03802	CDF	2.8E-05	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0770281	0.0770281	1	100.6	5.7E-05	Significant Effect
Error	0.00459276	0.00076546	6			
Total	0.0816208		7			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.097	47.47	0.9410	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.8998	0.6451	0.2875	Normal Distribution

28d Mean Dry Weight Summary

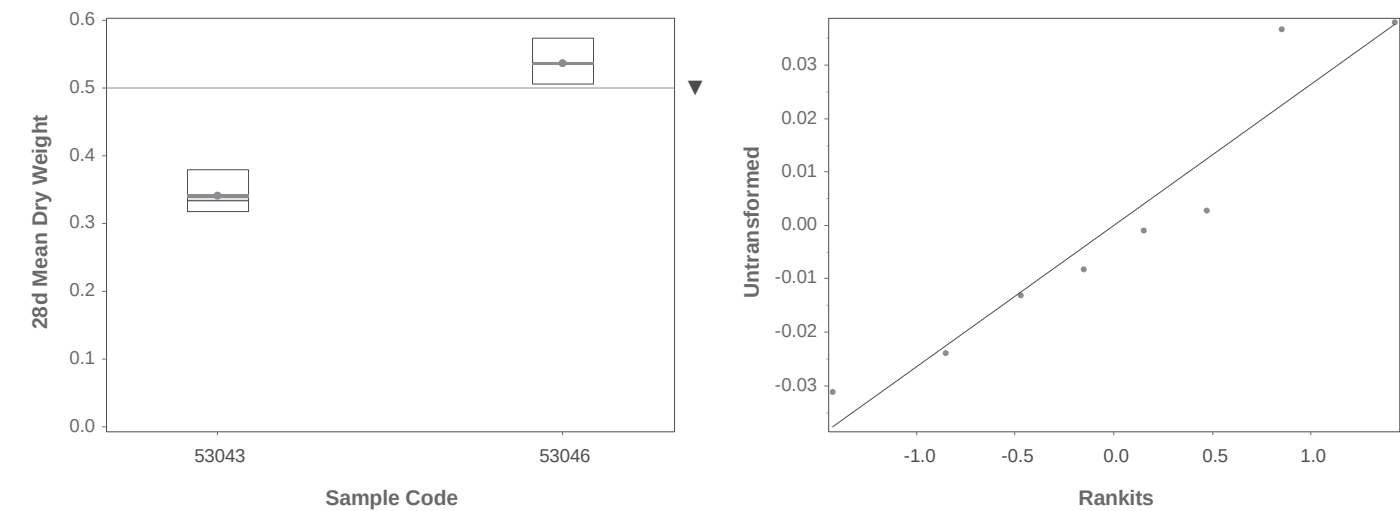
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53043		4	0.341	0.298	0.384	0.334	0.317	0.379	0.01351	7.92%	36.53%
53046	RS	4	0.5372	0.4922	0.5823	0.5345	0.506	0.574	0.01415	5.27%	0.00%

28d Mean Dry Weight Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53043		0.328	0.34	0.317	0.379						
53046	RS	0.529	0.54	0.574	0.506						

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test			Aquatec Environmental, Inc.	
Analysis ID:	09-6129-7373	Endpoint:	28d Mean Dry Weight	CETIS Version: CETISv2.1.1
Analyzed:	06 Mar-22 13:50	Analysis:	Parametric-Two Sample	Status Level: 1
Edit Date:	04 Mar-22 13:59	MD5 Hash:	D3B081F5D7CBF96994974AB3236E90EE	Editor ID:

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Hyalella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID:	11-5580-6777	Endpoint:	28d Mean Dry Weight	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 13:50	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 13:59	MD5 Hash:	90CD007BCC1F5A45CB78E86D99DEEFA0	Editor ID:	
Batch ID:	14-5191-3028	Test Type:	Hyalella (42d)	Analyst:	C. Mattheus Ayers
Start Date:	06 Jan-22 15:25	Protocol:	EPA/600/R-99/064 (2000)	Diluent:	Reconstituted Water
Ending Date:	17 Feb-22 12:00	Species:	Hyalella azteca	Brine:	
Test Length:	41d 21h	Taxon:	Malacostraca	Source:	Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53044	00-4677-6467	21 Dec-21 11:25	21 Dec-21 20:00	16d 4h (0.6 °C)	Woods Hole Group	Sediment Testing
53046	12-3611-8332	21 Dec-21 15:54	21 Dec-21 20:00	16d (0.3 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53044	Sediment	Belmont Landfill	TOX-3	
53046	Reference sediment	Belmont Landfill	TOX-6	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53044 failed 28d mean dry weight endpoint	8.92%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Reference Sed		53044*	6	9.084	1.943	0.04793	CDF	5.0E-05	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.100408	0.100408	1	82.51	1.0E-04	Significant Effect
Error	0.00730117	0.00121686	6			
Total	0.107709		7			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	2.039	47.47	0.5734	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.8499	0.6451	0.0950	Normal Distribution

28d Mean Dry Weight Summary

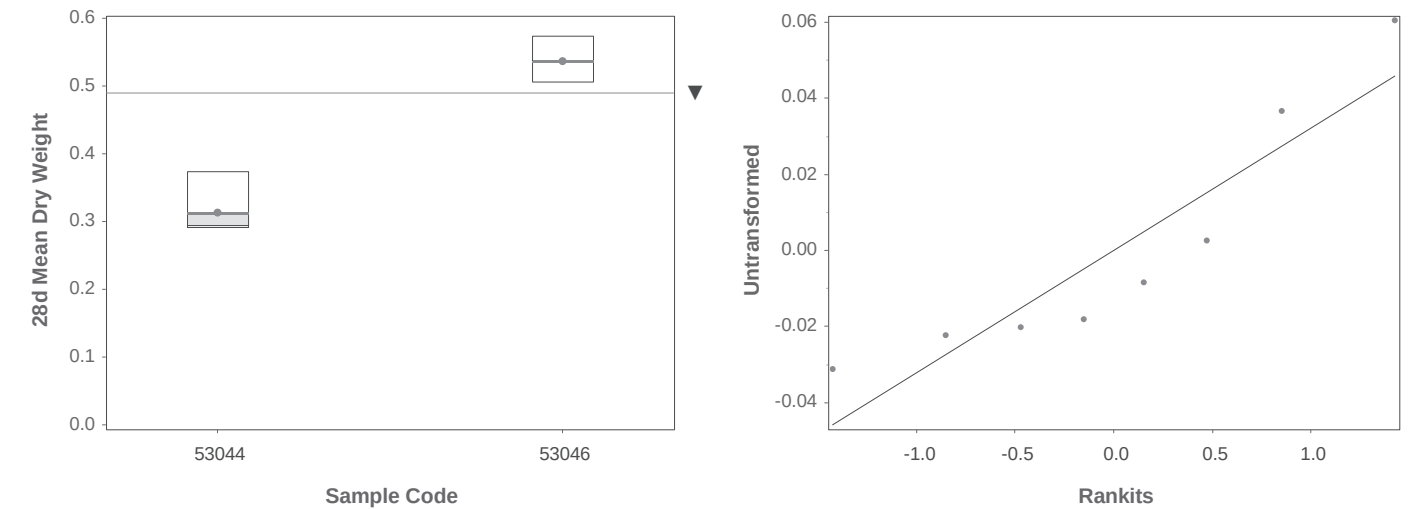
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53044		4	0.3132	0.2489	0.3775	0.294	0.291	0.3738	0.0202	12.90%	41.71%
53046	RS	4	0.5372	0.4922	0.5823	0.5345	0.506	0.574	0.01415	5.27%	0.00%

28d Mean Dry Weight Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53044		0.291	0.3738	0.293	0.295						
53046	RS	0.529	0.54	0.574	0.506						

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test			Aquatec Environmental, Inc.	
Analysis ID:	11-5580-6777	Endpoint:	28d Mean Dry Weight	CETIS Version: CETISv2.1.1
Analyzed:	06 Mar-22 13:50	Analysis:	Parametric-Two Sample	Status Level: 1
Edit Date:	04 Mar-22 13:59	MD5 Hash:	90CD007BCC1F5A45CB78E86D99DEEFA0	Editor ID:

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Report Date: 07 Mar-22 12:03 (p 23 of 96)
Test Code/ID: 16245 REF 1 / 14-4995-1919

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID: 16-9885-4153	Endpoint: 28d Mean Dry Weight	CETIS Version: CETISv2.1.1
Analyzed: 06 Mar-22 13:50	Analysis: Parametric-Two Sample	Status Level: 1
Edit Date: 04 Mar-22 13:59	MD5 Hash: 3470753BB3166E17E5599A68BB5E1BE8	Editor ID:
Batch ID: 14-5191-3028	Test Type: Hyalella (42d)	Analyst: C. Mattheus Ayers
Start Date: 06 Jan-22 15:25	Protocol: EPA/600/R-99/064 (2000)	Diluent: Reconstituted Water
Ending Date: 17 Feb-22 12:00	Species: Hyalella azteca	Brine:
Test Length: 41d 21h	Taxon: Malacostraca	Source: Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53045	13-5487-4433	21 Dec-21 14:22	21 Dec-21 20:00	16d 1h (0.3 °C)	Woods Hole Group	Sediment Testing
53046	12-3611-8332	21 Dec-21 15:54	21 Dec-21 20:00	16d (0.3 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53045	Sediment	Belmont Landfill	TOX-5	
53046	Reference sediment	Belmont Landfill	TOX-6	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53045 passed 28d mean dry weight endpoint	8.61%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Reference Sed		53045	6	1.774	1.943	0.04626	CDF	0.0632	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.00356661	0.00356661	1	3.147	0.1264	Non-Significant Effect
Error	0.00680076	0.00113346	6			
Total	0.0103674		7			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.83	47.47	0.6319	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9463	0.6451	0.6737	Normal Distribution

28d Mean Dry Weight Summary

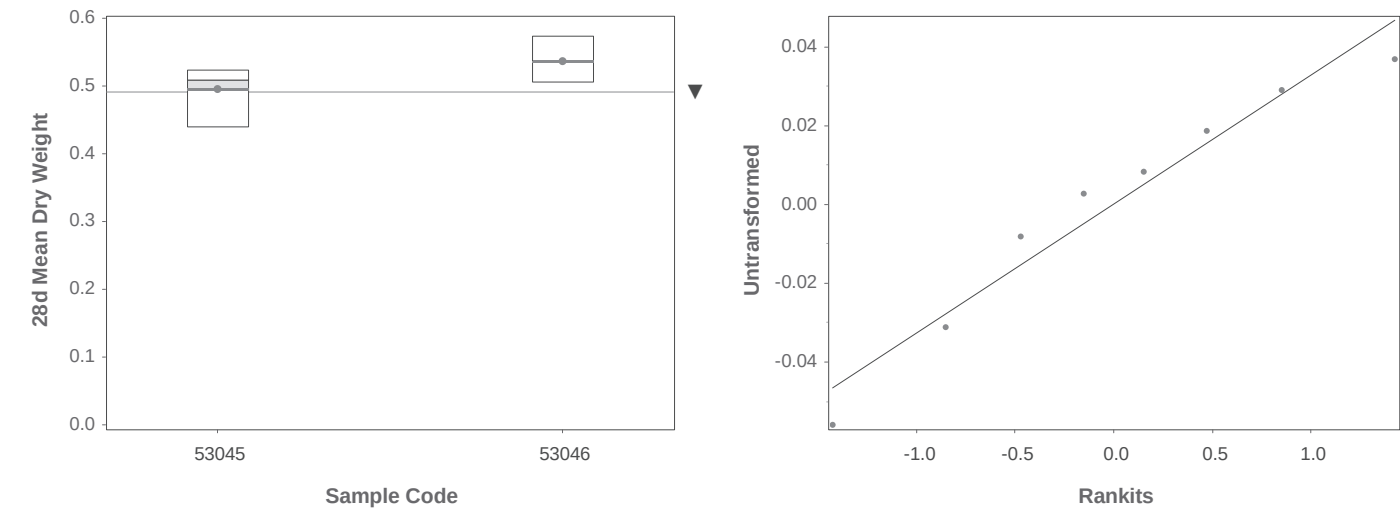
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53045		4	0.495	0.4341	0.5559	0.5085	0.439	0.524	0.01914	7.73%	7.86%
53046	RS	4	0.5372	0.4922	0.5823	0.5345	0.506	0.574	0.01415	5.27%	0.00%

28d Mean Dry Weight Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53045		0.5033	0.439	0.5137	0.524						
53046	RS	0.529	0.54	0.574	0.506						

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test			Aquatec Environmental, Inc.	
Analysis ID:	16-9885-4153	Endpoint:	28d Mean Dry Weight	CETIS Version: CETISv2.1.1
Analyzed:	06 Mar-22 13:50	Analysis:	Parametric-Two Sample	Status Level: 1
Edit Date:	04 Mar-22 13:59	MD5 Hash:	3470753BB3166E17E5599A68BB5E1BE8	Editor ID:

Graphics



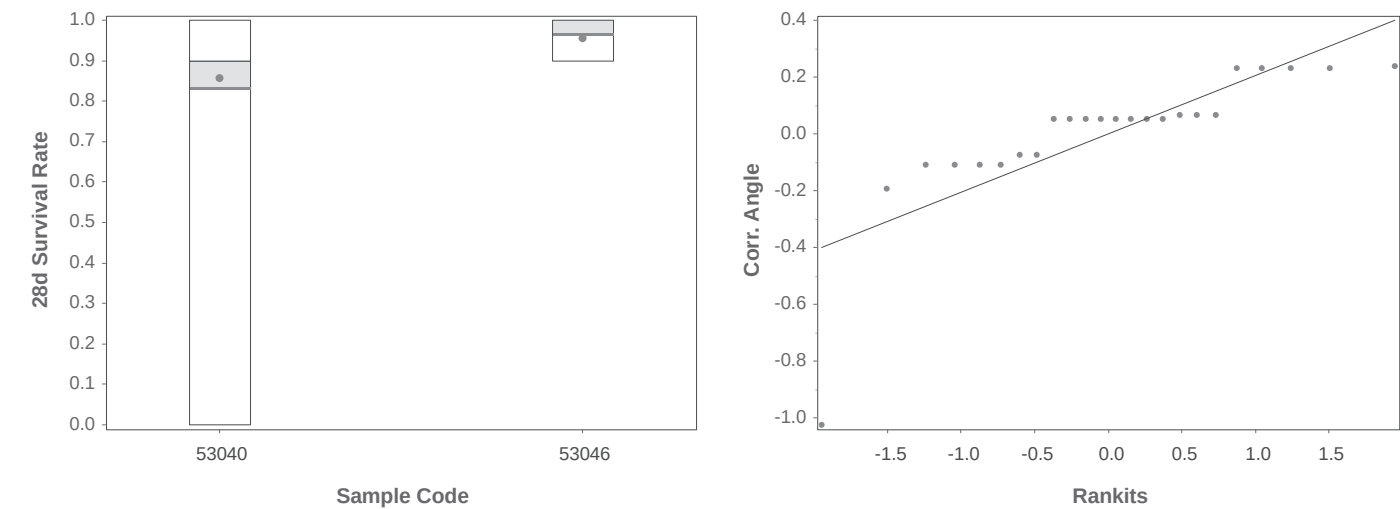
CETIS Analytical Report

Report Date: 07 Mar-22 12:03 (p 25 of 96)
 Test Code/ID: 16245 REF 1 / 14-4995-1919

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test								Aquatec Environmental, Inc.			
Analysis ID:	04-0509-2041		Endpoint:	28d Survival Rate				CETIS Version:	CETISv2.1.1		
Analyzed:	06 Mar-22 13:49		Analysis:	Nonparametric-Two Sample				Status Level:	1		
Edit Date:	04 Mar-22 13:59		MD5 Hash:	FC4B3E50CD97098064069144BE3CEE9A				Editor ID:			
Batch ID:	14-5191-3028		Test Type:	Hyalella (42d)				Analyst:	C. Mattheus Ayers		
Start Date:	06 Jan-22 15:25		Protocol:	EPA/600/R-99/064 (2000)				Diluent:	Reconstituted Water		
Ending Date:	17 Feb-22 12:00		Species:	Hyalella azteca				Brine:			
Test Length:	41d 21h		Taxon:	Malacostraca				Source:	Aquatic Research Organism		Age: 8d
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, Inc.	Sediment Testing					
53046	12-3611-8332	21 Dec-21 15:54	21 Dec-21 20:00	16d (0.3 °C)	Woods Hole Group						
Sample Code	Material Type		Sample Source		Station Location		Lat/Long				
53040	Control Sediment		Internal Laboratory Testing		Control						
53046	Reference sediment		Belmont Landfill		TOX-6						
Data Transform		Alt Hyp			Comparison Result					PMSD	
Angular (Corrected)		C > T			53040 passed 28d survival rate endpoint					11.71%	
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	df	Test Stat	Critical	Ties	P-Type	P-Value	Decision(α:5%)		
Reference Sed		53040	22	124	---	2	Exact	0.0561	Non-Significant Effect		
ANOVA Table											
Source		Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(α:5%)		
Between		0.186105		0.186105		1	2.83	0.1067	Non-Significant Effect		
Error		1.44693		0.0657696		22					
Total		1.63304				23					
ANOVA Assumptions Tests											
Attribute		Test				Test Stat	Critical	P-Value	Decision(α:1%)		
Variance		Variance Ratio F Test				19.43	5.32	2.5E-05	Unequal Variances		
Distribution		Shapiro-Wilk W Normality Test				0.6566	0.884	<1.0E-05	Non-Normal Distribution		
28d Survival Rate Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040		12	0.8333	0.6550	1.0000	0.9000	0.0000	1.0000	0.0810	33.68%	13.79%
53046	RS	12	0.9667	0.9354	0.9980	1.0000	0.9000	1.0000	0.0142	5.09%	0.00%
Angular (Corrected) Transformed Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040		12	1.1820	0.9568	1.4060	1.2490	0.1588	1.4190	0.1021	29.93%	12.97%
53046	RS	12	1.3580	1.3070	1.4090	1.4120	1.2490	1.4120	0.0232	5.91%	0.00%
28d Survival Rate Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53040		0.9000	1.0000	1.0000	0.0000	1.0000	1.0000	0.8000	0.9000	0.8000	0.9000
		0.7000	1.0000								
53046	RS	0.9000	1.0000	0.9000	0.9000	1.0000	1.0000	0.9000	1.0000	1.0000	1.0000
		1.0000	1.0000								
Angular (Corrected) Transformed Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53040		1.2490	1.4120	1.4120	0.1588	1.4120	1.4120	1.1070	1.2490	1.1070	1.2490
		0.9912	1.4190								
53046	RS	1.2490	1.4120	1.2490	1.2490	1.4120	1.4120	1.2490	1.4120	1.4120	1.4120
		1.4120	1.4120								

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test			Aquatec Environmental, Inc.	
Analysis ID:	04-0509-2041	Endpoint:	28d Survival Rate	CETIS Version: CETISv2.1.1
Analyzed:	06 Mar-22 13:49	Analysis:	Nonparametric-Two Sample	Status Level: 1
Edit Date:	04 Mar-22 13:59	MD5 Hash:	FC4B3E50CD97098064069144BE3CEE9A	Editor ID:

Graphics



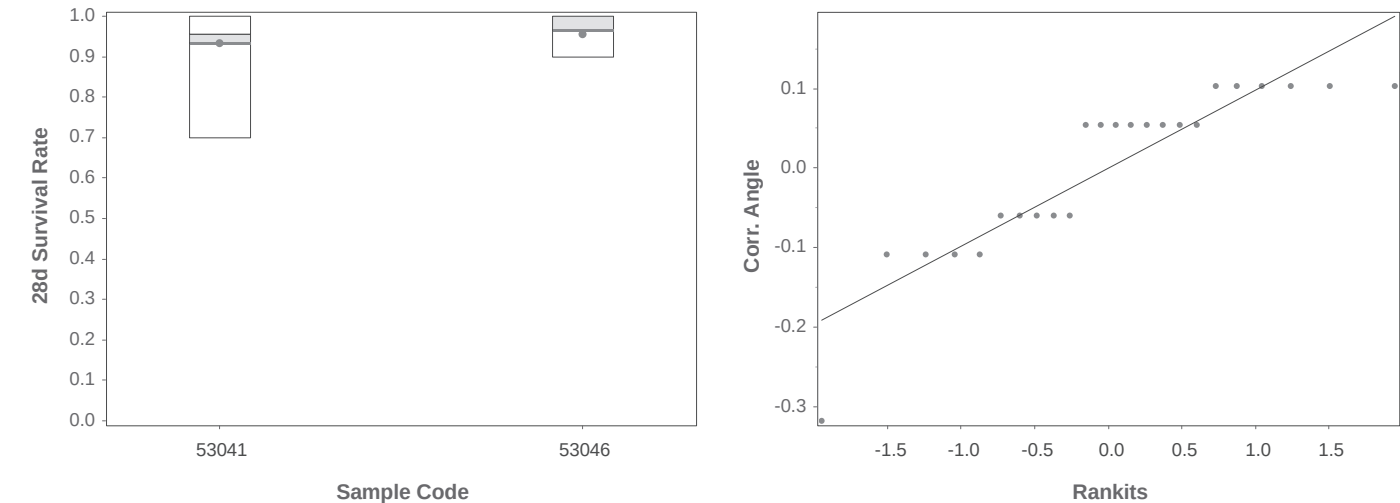
CETIS Analytical Report

Report Date: 07 Mar-22 12:03 (p 27 of 96)
 Test Code/ID: 16245 REF 1 / 14-4995-1919

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test									Aquatec Environmental, Inc.		
Analysis ID:	10-2156-3268		Endpoint:	28d Survival Rate				CETIS Version:	CETISv2.1.1		
Analyzed:	06 Mar-22 13:50		Analysis:	Nonparametric-Two Sample				Status Level:	1		
Edit Date:	04 Mar-22 13:59		MD5 Hash:	055A9266097EEC1A35E2B299F437BF24				Editor ID:			
Batch ID:	14-5191-3028		Test Type:	Hyalella (42d)				Analyst:	C. Mattheus Ayers		
Start Date:	06 Jan-22 15:25		Protocol:	EPA/600/R-99/064 (2000)				Diluent:	Reconstituted Water		
Ending Date:	17 Feb-22 12:00		Species:	Hyalella azteca				Brine:			
Test Length:	41d 21h		Taxon:	Malacostraca				Source:	Aquatic Research Organism		Age: 8d
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
53041	03-8171-1181	21 Dec-21 09:05	21 Dec-21 20:00	16d 6h (0.3 °C)	Woods Hole Group	Sediment Testing					
53046	12-3611-8332	21 Dec-21 15:54	21 Dec-21 20:00	16d (0.3 °C)							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
53041	Sediment	Belmont Landfill	TOX-4								
53046	Reference sediment	Belmont Landfill	TOX-6								
Data Transform		Alt Hyp	Comparison Result						PMSD		
Angular (Corrected)		C > T	53041 passed 28d survival rate endpoint						4.92%		
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	df	Test Stat	Critical	Ties	P-Type	P-Value	Decision(α:5%)		
Reference Sed		53041	22	136	---	2	Exact	0.2468	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(α:5%)			
Between	0.0142024		0.0142024		1	1.233	0.2789	Non-Significant Effect			
Error	0.253496		0.0115225		22						
Total	0.267698				23						
ANOVA Assumptions Tests											
Attribute	Test				Test Stat	Critical	P-Value	Decision(α:1%)			
Variance	Variance Ratio F Test				2.579	5.32	0.1312	Equal Variances			
Distribution	Shapiro-Wilk W Normality Test				0.8249	0.884	0.0008	Non-Normal Distribution			
28d Survival Rate Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53041		12	0.9333	0.8769	0.9897	0.9545	0.7000	1.0000	0.0256	9.51%	3.45%
53046	RS	12	0.9667	0.9354	0.9980	1.0000	0.9000	1.0000	0.0142	5.09%	0.00%
Angular (Corrected) Transformed Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53041		12	1.3090	1.2270	1.3910	1.3380	0.9912	1.4120	0.0372	9.84%	3.58%
53046	RS	12	1.3580	1.3070	1.4090	1.4120	1.2490	1.4120	0.0232	5.91%	0.00%
28d Survival Rate Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53041		1.0000	1.0000	1.0000	0.9000	0.7000	0.9000	1.0000	1.0000	0.9000	1.0000
		0.9000	0.9000								
53046	RS	0.9000	1.0000	0.9000	0.9000	1.0000	1.0000	0.9000	1.0000	1.0000	1.0000
		1.0000	1.0000								
Angular (Corrected) Transformed Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53041		1.4120	1.4120	1.4120	1.2490	0.9912	1.2490	1.4120	1.4120	1.2490	1.4120
		1.2490	1.2490								
53046	RS	1.2490	1.4120	1.2490	1.2490	1.4120	1.4120	1.2490	1.4120	1.4120	1.4120
		1.4120	1.4120								

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test			Aquatec Environmental, Inc.	
Analysis ID:	10-2156-3268	Endpoint:	28d Survival Rate	CETIS Version: CETISv2.1.1
Analyzed:	06 Mar-22 13:50	Analysis:	Nonparametric-Two Sample	Status Level: 1
Edit Date:	04 Mar-22 13:59	MD5 Hash:	055A9266097EEC1A35E2B299F437BF24	Editor ID:

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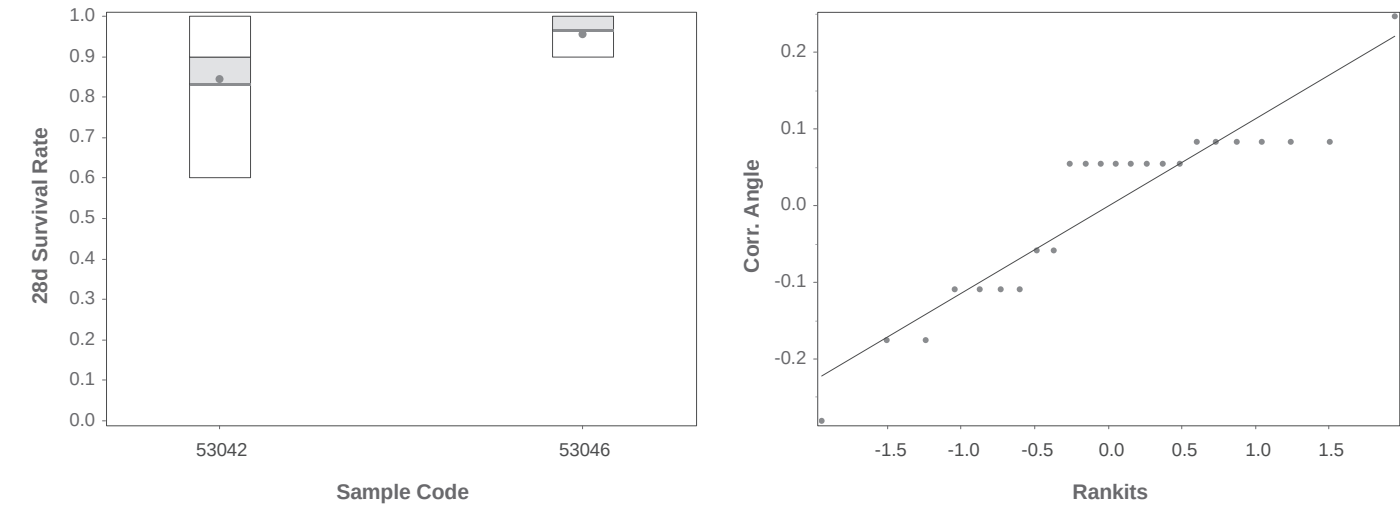
CETIS Analytical Report

Report Date: 07 Mar-22 12:03 (p 29 of 96)
 Test Code/ID: 16245 REF 1 / 14-4995-1919

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test									Aquatec Environmental, Inc.		
Analysis ID:	11-7766-8071		Endpoint:	28d Survival Rate				CETIS Version:	CETISv2.1.1		
Analyzed:	06 Mar-22 13:50		Analysis:	Nonparametric-Two Sample				Status Level:	1		
Edit Date:	04 Mar-22 13:59		MD5 Hash:	B53F7BDF7AB62475EAA29DFF276CE769				Editor ID:			
Batch ID:	14-5191-3028		Test Type:	Hyalella (42d)				Analyst:	C. Mattheus Ayers		
Start Date:	06 Jan-22 15:25		Protocol:	EPA/600/R-99/064 (2000)				Diluent:	Reconstituted Water		
Ending Date:	17 Feb-22 12:00		Species:	Hyalella azteca				Brine:			
Test Length:	41d 21h		Taxon:	Malacostraca				Source:	Aquatic Research Organism Age: 8d		
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
53042	04-7178-2695	21 Dec-21 13:38	21 Dec-21 20:00	16d 2h (0.6 °C)	Woods Hole Group	Sediment Testing					
53046	12-3611-8332	21 Dec-21 15:54	21 Dec-21 20:00	16d (0.3 °C)							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
53042	Sediment	Belmont Landfill	TOX-1								
53046	Reference sediment	Belmont Landfill	TOX-6								
Data Transform		Alt Hyp	Comparison Result						PMSD		
Angular (Corrected)		C > T	53042 failed 28d survival rate endpoint						5.44%		
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	df	Test Stat	Critical	Ties	P-Type	P-Value	Decision(α:5%)		
Reference Sed		53042*	22	98	---	2	Exact	0.0008	Significant Effect		
ANOVA Table											
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(α:5%)			
Between	0.221056		0.221056		1	15.24	0.0008	Significant Effect			
Error	0.319152		0.0145069		22						
Total	0.540208				23						
ANOVA Assumptions Tests											
Attribute	Test				Test Stat	Critical	P-Value	Decision(α:1%)			
Variance	Variance Ratio F Test				3.506	5.32	0.0484	Equal Variances			
Distribution	Shapiro-Wilk W Normality Test				0.8816	0.884	0.0090	Non-Normal Distribution			
28d Survival Rate Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53042		12	0.8333	0.7600	0.9067	0.9000	0.6000	1.0000	0.0333	13.86%	13.79%
53046	RS	12	0.9667	0.9354	0.9980	1.0000	0.9000	1.0000	0.0142	5.09%	0.00%
Angular (Corrected) Transformed Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53042		12	1.1660	1.0700	1.2610	1.2490	0.8861	1.4120	0.0434	12.89%	14.14%
53046	RS	12	1.3580	1.3070	1.4090	1.4120	1.2490	1.4120	0.0232	5.91%	0.00%
28d Survival Rate Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53042		0.7000	0.8000	0.9000	0.7000	0.8000	0.9000	0.9000	0.6000	1.0000	0.9000
		0.9000	0.9000								
53046	RS	0.9000	1.0000	0.9000	0.9000	1.0000	1.0000	0.9000	1.0000	1.0000	1.0000
		1.0000	1.0000								
Angular (Corrected) Transformed Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53042		0.9912	1.1070	1.2490	0.9912	1.1070	1.2490	1.2490	0.8861	1.4120	1.2490
		1.2490	1.2490								
53046	RS	1.2490	1.4120	1.2490	1.2490	1.4120	1.4120	1.2490	1.4120	1.4120	1.4120
		1.4120	1.4120								

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test			Aquatec Environmental, Inc.	
Analysis ID:	11-7766-8071	Endpoint:	28d Survival Rate	CETIS Version: CETISv2.1.1
Analyzed:	06 Mar-22 13:50	Analysis:	Nonparametric-Two Sample	Status Level: 1
Edit Date:	04 Mar-22 13:59	MD5 Hash:	B53F7BDF7AB62475EAA29DFF276CE769	Editor ID:

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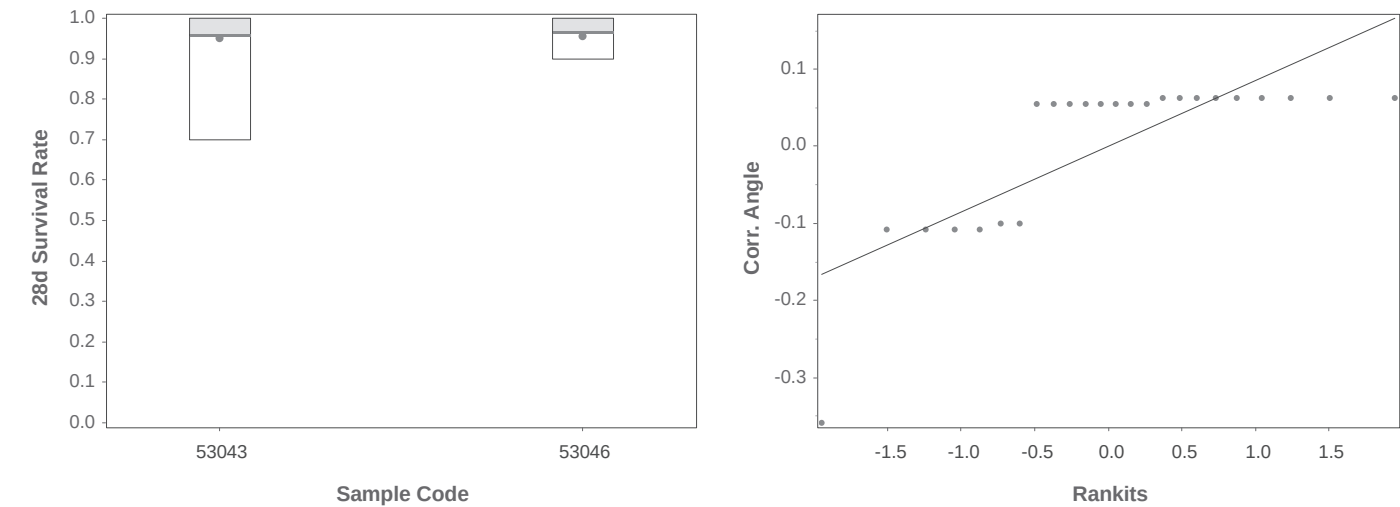
CETIS Analytical Report

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 Test Code/ID: 16245 REF 1 / 14-4995-1919

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test								Aquatec Environmental, Inc.			
Analysis ID:	13-0085-9733		Endpoint:	28d Survival Rate				CETIS Version:	CETISv2.1.1		
Analyzed:	06 Mar-22 13:50		Analysis:	Nonparametric-Two Sample				Status Level:	1		
Edit Date:	04 Mar-22 13:59		MD5 Hash:	1137C53A0C98751C64CC722A950B672C				Editor ID:			
Batch ID:	14-5191-3028		Test Type:	Hyalella (42d)				Analyst:	C. Mattheus Ayers		
Start Date:	06 Jan-22 15:25		Protocol:	EPA/600/R-99/064 (2000)				Diluent:	Reconstituted Water		
Ending Date:	17 Feb-22 12:00		Species:	Hyalella azteca				Brine:			
Test Length:	41d 21h		Taxon:	Malacostraca				Source:	Aquatic Research Organism Age: 8d		
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
53043	20-0010-4712	21 Dec-21 12:35	21 Dec-21 20:00	16d 3h (0.6 °C)	Woods Hole Group	Sediment Testing					
53046	12-3611-8332	21 Dec-21 15:54	21 Dec-21 20:00	16d (0.3 °C)							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
53043	Sediment	Belmont Landfill	TOX-2								
53046	Reference sediment	Belmont Landfill	TOX-6								
Data Transform		Alt Hyp		Comparison Result						PMSD	
Angular (Corrected)		C > T		53043 passed 28d survival rate endpoint						4.93%	
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	df	Test Stat	Critical	Ties	P-Type	P-Value	Decision(α:5%)		
Reference Sed		53043	22	154	---	2	Exact	0.6348	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(α:5%)			
Between	0.0003754		0.0003754		1	0.03244	0.8587	Non-Significant Effect			
Error	0.25459		0.0115723		22						
Total	0.254966				23						
ANOVA Assumptions Tests											
Attribute	Test				Test Stat	Critical	P-Value	Decision(α:1%)			
Variance	Variance Ratio F Test				2.595	5.32	0.1289	Equal Variances			
Distribution	Shapiro-Wilk W Normality Test				0.6259	0.884	<1.0E-05	Non-Normal Distribution			
28d Survival Rate Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53043		12	0.9583	0.9011	1.0000	1.0000	0.7000	1.0000	0.0260	9.39%	0.86%
53046	RS	12	0.9667	0.9354	0.9980	1.0000	0.9000	1.0000	0.0142	5.09%	0.00%
Angular (Corrected) Transformed Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53043		12	1.3500	1.2680	1.4320	1.4120	0.9912	1.4120	0.0373	9.58%	0.58%
53046	RS	12	1.3580	1.3070	1.4090	1.4120	1.2490	1.4120	0.0232	5.91%	0.00%
28d Survival Rate Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53043		1.0000	1.0000	0.9000	1.0000	1.0000	0.7000	1.0000	0.9000	1.0000	1.0000
		1.0000	1.0000								
53046	RS	0.9000	1.0000	0.9000	0.9000	1.0000	1.0000	0.9000	1.0000	1.0000	1.0000
		1.0000	1.0000								
Angular (Corrected) Transformed Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53043		1.4120	1.4120	1.2490	1.4120	1.4120	0.9912	1.4120	1.2490	1.4120	1.4120
		1.4120	1.4120								
53046	RS	1.2490	1.4120	1.2490	1.2490	1.4120	1.4120	1.2490	1.4120	1.4120	1.4120
		1.4120	1.4120								

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test			Aquatec Environmental, Inc.	
Analysis ID:	13-0085-9733	Endpoint:	28d Survival Rate	CETIS Version: CETISv2.1.1
Analyzed:	06 Mar-22 13:50	Analysis:	Nonparametric-Two Sample	Status Level: 1
Edit Date:	04 Mar-22 13:59	MD5 Hash:	1137C53A0C98751C64CC722A950B672C	Editor ID:

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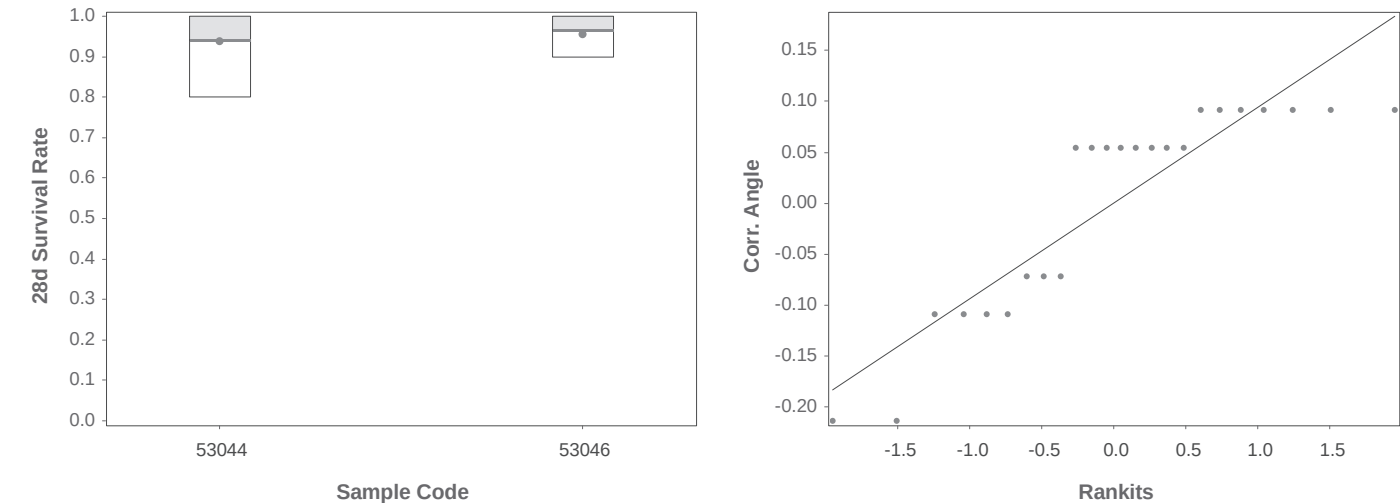
CETIS Analytical Report

Report Date: 07 Mar-22 12:03 (p 33 of 96)
 Test Code/ID: 16245 REF 1 / 14-4995-1919

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test								Aquatec Environmental, Inc.			
Analysis ID:	21-2078-6197		Endpoint:	28d Survival Rate				CETIS Version:	CETISv2.1.1		
Analyzed:	06 Mar-22 13:50		Analysis:	Nonparametric-Two Sample				Status Level:	1		
Edit Date:	04 Mar-22 13:59		MD5 Hash:	FE59FA19CC3399F1156201E62F3BA3C9				Editor ID:			
Batch ID:	14-5191-3028		Test Type:	Hyalella (42d)				Analyst:	C. Mattheus Ayers		
Start Date:	06 Jan-22 15:25		Protocol:	EPA/600/R-99/064 (2000)				Diluent:	Reconstituted Water		
Ending Date:	17 Feb-22 12:00		Species:	Hyalella azteca				Brine:			
Test Length:	41d 21h		Taxon:	Malacostraca				Source:	Aquatic Research Organism Age: 8d		
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
53044	00-4677-6467	21 Dec-21 11:25	21 Dec-21 20:00	16d 4h (0.6 °C)	Woods Hole Group	Sediment Testing					
53046	12-3611-8332	21 Dec-21 15:54	21 Dec-21 20:00	16d (0.3 °C)							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
53044	Sediment	Belmont Landfill	TOX-3								
53046	Reference sediment	Belmont Landfill	TOX-6								
Data Transform		Alt Hyp	Comparison Result						PMSD		
Angular (Corrected)		C > T	53044 passed 28d survival rate endpoint						4.77%		
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	df	Test Stat	Critical	Ties	P-Type	P-Value	Decision(α:5%)		
Reference Sed		53044	22	140	---	2	Exact	0.2835	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(α:5%)			
Between	0.0083166		0.0083166		1	0.7759	0.3879	Non-Significant Effect			
Error	0.235806		0.0107185		22						
Total	0.244123				23						
ANOVA Assumptions Tests											
Attribute	Test				Test Stat	Critical	P-Value	Decision(α:1%)			
Variance	Variance Ratio F Test				2.329	5.32	0.1765	Equal Variances			
Distribution	Shapiro-Wilk W Normality Test				0.8012	0.884	0.0003	Non-Normal Distribution			
28d Survival Rate Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53044		12	0.9417	0.8913	0.9920	1.0000	0.8000	1.0000	0.0229	8.42%	2.59%
53046	RS	12	0.9667	0.9354	0.9980	1.0000	0.9000	1.0000	0.0142	5.09%	0.00%
Angular (Corrected) Transformed Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53044		12	1.3200	1.2430	1.3980	1.4120	1.1070	1.4120	0.0354	9.27%	2.74%
53046	RS	12	1.3580	1.3070	1.4090	1.4120	1.2490	1.4120	0.0232	5.91%	0.00%
28d Survival Rate Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53044		0.9000	1.0000	1.0000	0.9000	1.0000	1.0000	0.9000	1.0000	1.0000	0.8000
		1.0000	0.8000								
53046	RS	0.9000	1.0000	0.9000	0.9000	1.0000	1.0000	0.9000	1.0000	1.0000	1.0000
		1.0000	1.0000								
Angular (Corrected) Transformed Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53044		1.2490	1.4120	1.4120	1.2490	1.4120	1.4120	1.2490	1.4120	1.4120	1.1070
		1.4120	1.1070								
53046	RS	1.2490	1.4120	1.2490	1.2490	1.4120	1.4120	1.2490	1.4120	1.4120	1.4120
		1.4120	1.4120								

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test			Aquatec Environmental, Inc.	
Analysis ID:	21-2078-6197	Endpoint:	28d Survival Rate	CETIS Version: CETISv2.1.1
Analyzed:	06 Mar-22 13:50	Analysis:	Nonparametric-Two Sample	Status Level: 1
Edit Date:	04 Mar-22 13:59	MD5 Hash:	FE59FA19CC3399F1156201E62F3BA3C9	Editor ID:

Graphics



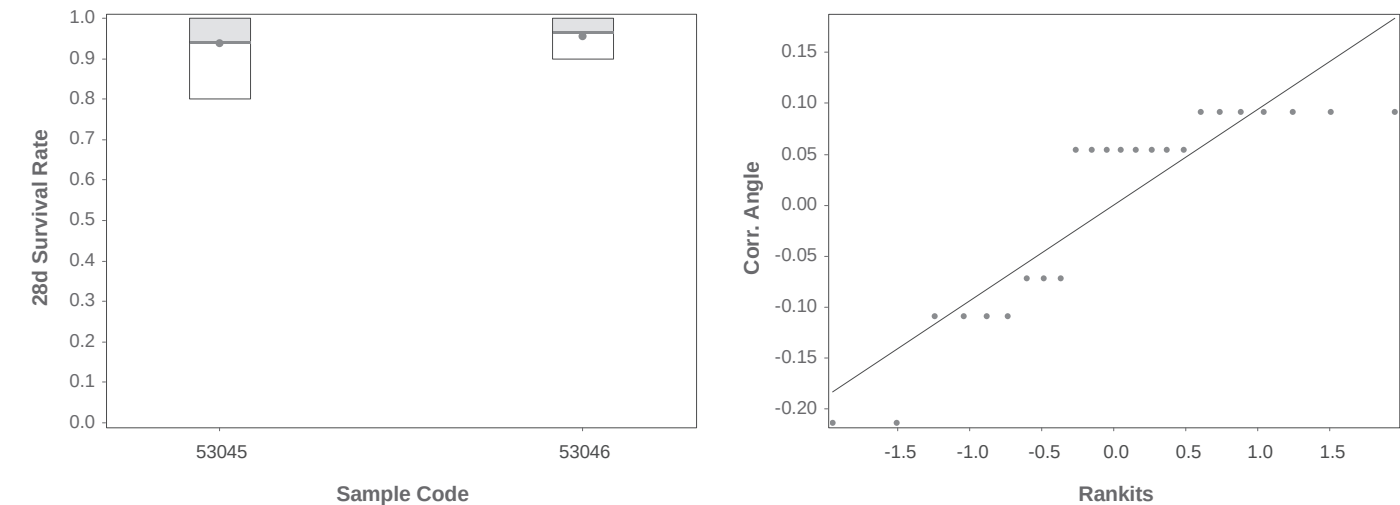
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 Test Code/ID: 16245 REF 1 / 14-4995-1919

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test									Aquatec Environmental, Inc.		
Analysis ID:	02-1773-7443		Endpoint:	28d Survival Rate			CETIS Version:	CETISv2.1.1			
Analyzed:	06 Mar-22 13:51		Analysis:	Nonparametric-Two Sample			Status Level:	1			
Edit Date:	04 Mar-22 13:59		MD5 Hash:	EA0804BF6B3E3E64E38243ECB774F17F			Editor ID:				
Batch ID:	14-5191-3028		Test Type:	Hyalella (42d)			Analyst:	C. Mattheus Ayers			
Start Date:	06 Jan-22 15:25		Protocol:	EPA/600/R-99/064 (2000)			Diluent:	Reconstituted Water			
Ending Date:	17 Feb-22 12:00		Species:	Hyalella azteca			Brine:				
Test Length:	41d 21h		Taxon:	Malacostraca			Source:	Aquatic Research Organism		Age:	8d
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
53045	13-5487-4433	21 Dec-21 14:22	21 Dec-21 20:00	16d 1h (0.3 °C)	Woods Hole Group	Sediment Testing					
53046	12-3611-8332	21 Dec-21 15:54	21 Dec-21 20:00	16d (0.3 °C)							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
53045	Sediment	Belmont Landfill	TOX-5								
53046	Reference sediment	Belmont Landfill	TOX-6								
Data Transform		Alt Hyp	Comparison Result					PMSD			
Angular (Corrected)		C > T	53045 passed 28d survival rate endpoint					4.77%			
Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	df	Test Stat	Critical	Ties	P-Type	P-Value	Decision(α:5%)		
Reference Sed		53045	22	140	---	2	Exact	0.2835	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(α:5%)			
Between	0.0083166		0.0083166		1	0.7759	0.3879	Non-Significant Effect			
Error	0.235806		0.0107185		22						
Total	0.244123				23						
ANOVA Assumptions Tests											
Attribute	Test				Test Stat	Critical	P-Value	Decision(α:1%)			
Variance	Variance Ratio F Test				2.329	5.32	0.1765	Equal Variances			
Distribution	Shapiro-Wilk W Normality Test				0.8012	0.884	0.0003	Non-Normal Distribution			
28d Survival Rate Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53045		12	0.9417	0.8913	0.9920	1.0000	0.8000	1.0000	0.0229	8.42%	2.59%
53046	RS	12	0.9667	0.9354	0.9980	1.0000	0.9000	1.0000	0.0142	5.09%	0.00%
Angular (Corrected) Transformed Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53045		12	1.3200	1.2430	1.3980	1.4120	1.1070	1.4120	0.0354	9.27%	2.74%
53046	RS	12	1.3580	1.3070	1.4090	1.4120	1.2490	1.4120	0.0232	5.91%	0.00%
28d Survival Rate Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53045		1.0000	0.9000	1.0000	1.0000	1.0000	0.9000	0.8000	1.0000	0.9000	1.0000
		0.8000	1.0000								
53046	RS	0.9000	1.0000	0.9000	0.9000	1.0000	1.0000	0.9000	1.0000	1.0000	1.0000
		1.0000	1.0000								
Angular (Corrected) Transformed Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
53045		1.4120	1.2490	1.4120	1.4120	1.4120	1.2490	1.1070	1.4120	1.2490	1.4120
		1.1070	1.4120								
53046	RS	1.2490	1.4120	1.2490	1.2490	1.4120	1.4120	1.2490	1.4120	1.4120	1.4120
		1.4120	1.4120								

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test			Aquatec Environmental, Inc.	
Analysis ID:	02-1773-7443	Endpoint:	28d Survival Rate	CETIS Version: CETISv2.1.1
Analyzed:	06 Mar-22 13:51	Analysis:	Nonparametric-Two Sample	Status Level: 1
Edit Date:	04 Mar-22 13:59	MD5 Hash:	EA0804BF6B3E3E64E38243ECB774F17F	Editor ID:

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Test Code/ID: 16245 REF 1 / 14-4995-1919

Hyaella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID: 12-8060-0929	Endpoint: 35d Survival Rate	CETIS Version: CETISv2.1.1
Analyzed: 06 Mar-22 13:49	Analysis: Nonparametric-Two Sample	Status Level: 1
Edit Date: 04 Mar-22 13:59	MD5 Hash: 5E9241E7282E4CE8ED861CA92B40F965	Editor ID:
Batch ID: 14-5191-3028	Test Type: Hyaella (42d)	Analyst: C. Mattheus Ayers
Start Date: 06 Jan-22 15:25	Protocol: EPA/600/R-99/064 (2000)	Diluent: Reconstituted Water
Ending Date: 17 Feb-22 12:00	Species: Hyaella azteca	Brine:
Test Length: 41d 21h	Taxon: Malacostraca	Source: Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, Inc	Sediment Testing
53046	12-3611-8332	21 Dec-21 15:54	21 Dec-21 20:00	16d (0.3 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53046	Reference sediment	Belmont Landfill	TOX-6	

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	53040 passed 35d survival rate endpoint	20.09%

Wilcoxon Rank Sum Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	Ties	P-Type	P-Value	Decision(α:5%)
Reference Sed		53040	14	55.5	---	2	Exact	0.0915	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.201358	0.201358	1	2.198	0.1604	Non-Significant Effect
Error	1.28275	0.0916248	14			
Total	1.48411		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	12.67	8.885	0.0034	Unequal Variances
Distribution	Shapiro-Wilk W Normality Test	0.7644	0.8408	0.0010	Non-Normal Distribution

35d Survival Rate Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040		8	0.7625	0.4873	1.0000	0.8000	0.0000	1.0000	0.1164	43.18%	18.67%
53046	RS	8	0.9375	0.8753	0.9997	0.9571	0.8000	1.0000	0.0263	7.94%	0.00%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040		8	1.0880	0.7439	1.4330	1.1070	0.1588	1.4120	0.1457	37.86%	17.09%
53046	RS	8	1.3130	1.2160	1.4100	1.3420	1.1070	1.4120	0.0409	8.82%	0.00%

35d Survival Rate Detail

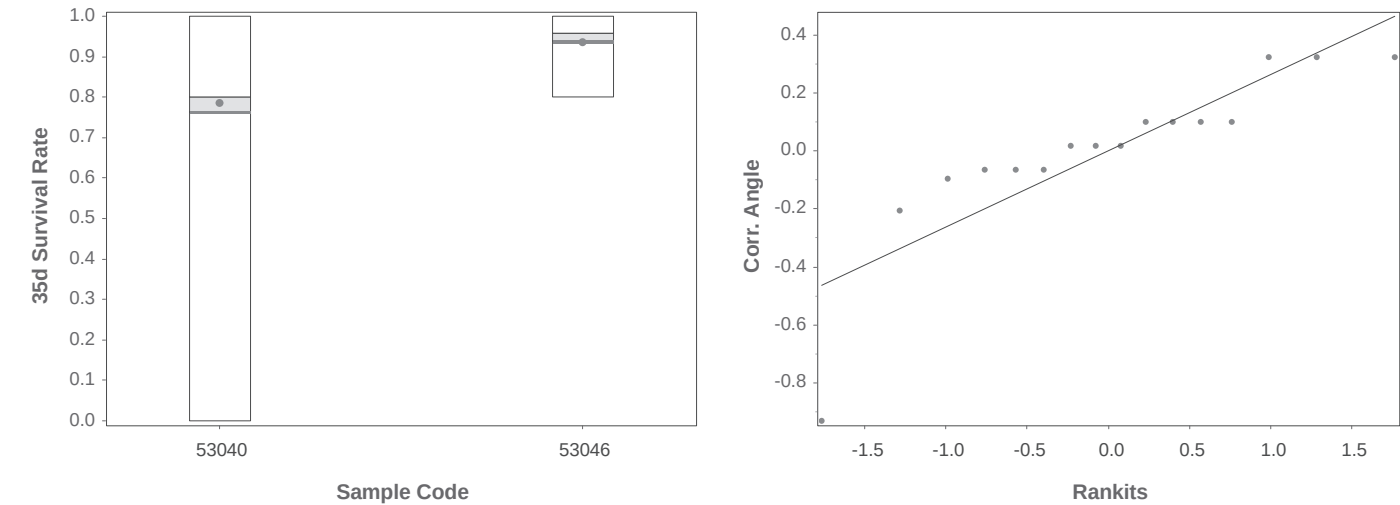
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040		0.7000	1.0000	1.0000	0.0000	1.0000	0.8000	0.8000	0.8000
53046	RS	0.9000	1.0000	0.9000	0.8000	1.0000	1.0000	0.9000	1.0000

Angular (Corrected) Transformed Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040		0.9912	1.4120	1.4120	0.1588	1.4120	1.1070	1.1070	1.1070
53046	RS	1.2490	1.4120	1.2490	1.1070	1.4120	1.4120	1.2490	1.4120

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test			Aquatec Environmental, Inc.	
Analysis ID:	12-8060-0929	Endpoint:	35d Survival Rate	CETIS Version: CETISv2.1.1
Analyzed:	06 Mar-22 13:49	Analysis:	Nonparametric-Two Sample	Status Level: 1
Edit Date:	04 Mar-22 13:59	MD5 Hash:	5E9241E7282E4CE8ED861CA92B40F965	Editor ID:

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Test Code/ID: 16245 REF 1 / 14-4995-1919

Hyaella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID: 03-5392-3243	Endpoint: 35d Survival Rate	CETIS Version: CETISv2.1.1
Analyzed: 06 Mar-22 13:50	Analysis: Parametric-Two Sample	Status Level: 1
Edit Date: 04 Mar-22 13:59	MD5 Hash: DF38A4424AAB92B90DA76AC3638F434E	Editor ID:
Batch ID: 14-5191-3028	Test Type: Hyaella (42d)	Analyst: C. Mattheus Ayers
Start Date: 06 Jan-22 15:25	Protocol: EPA/600/R-99/064 (2000)	Diluent: Reconstituted Water
Ending Date: 17 Feb-22 12:00	Species: Hyaella azteca	Brine:
Test Length: 41d 21h	Taxon: Malacostraca	Source: Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53041	03-8171-1181	21 Dec-21 09:05	21 Dec-21 20:00	16d 6h (0.3 °C)	Woods Hole Group	Sediment Testing
53046	12-3611-8332	21 Dec-21 15:54	21 Dec-21 20:00	16d (0.3 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53041	Sediment	Belmont Landfill	TOX-4	
53046	Reference sediment	Belmont Landfill	TOX-6	

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	53041 passed 35d survival rate endpoint	8.62%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Reference Sed		53041	14	0.9071	1.761	0.1303	CDF	0.1898	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0180131	0.0180131	1	0.8229	0.3797	Non-Significant Effect
Error	0.306463	0.0218902	14			
Total	0.324476		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	2.265	8.885	0.3029	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.8901	0.8408	0.0558	Normal Distribution

35d Survival Rate Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53041		8	0.8875	0.7833	0.9917	0.9000	0.7000	1.0000	0.0441	14.04%	5.33%
53046	RS	8	0.9375	0.8753	0.9997	0.9571	0.8000	1.0000	0.0263	7.94%	0.00%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53041		8	1.2460	1.1000	1.3910	1.2490	0.9912	1.4120	0.0616	13.99%	5.11%
53046	RS	8	1.3130	1.2160	1.4100	1.3420	1.1070	1.4120	0.0409	8.82%	0.00%

35d Survival Rate Detail

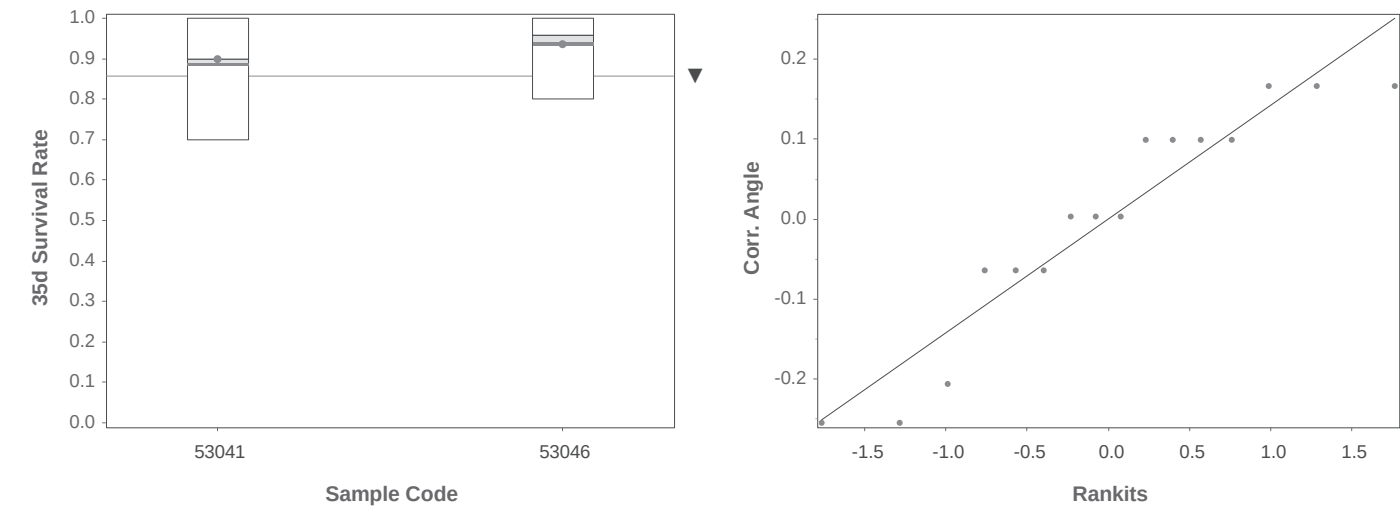
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53041		1.0000	0.9000	1.0000	0.9000	0.7000	0.9000	0.7000	1.0000
53046	RS	0.9000	1.0000	0.9000	0.8000	1.0000	1.0000	0.9000	1.0000

Angular (Corrected) Transformed Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53041		1.4120	1.2490	1.4120	1.2490	0.9912	1.2490	0.9912	1.4120
53046	RS	1.2490	1.4120	1.2490	1.1070	1.4120	1.4120	1.2490	1.4120

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test				Aquatec Environmental, Inc.	
Analysis ID:	03-5392-3243	Endpoint:	35d Survival Rate	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 13:50	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 13:59	MD5 Hash:	DF38A4424AAB92B90DA76AC3638F434E	Editor ID:	

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Report Date: 07 Mar-22 12:03 (p 41 of 96)
Test Code/ID: 16245 REF 1 / 14-4995-1919

Hyaella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID: 15-9465-1312	Endpoint: 35d Survival Rate	CETIS Version: CETISv2.1.1
Analyzed: 06 Mar-22 13:50	Analysis: Parametric-Two Sample	Status Level: 1
Edit Date: 04 Mar-22 13:59	MD5 Hash: 0357C6FAF6EADDB281EA2402109F0E8F	Editor ID:
Batch ID: 14-5191-3028	Test Type: Hyaella (42d)	Analyst: C. Mattheus Ayers
Start Date: 06 Jan-22 15:25	Protocol: EPA/600/R-99/064 (2000)	Diluent: Reconstituted Water
Ending Date: 17 Feb-22 12:00	Species: Hyaella azteca	Brine:
Test Length: 41d 21h	Taxon: Malacostraca	Source: Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53042	04-7178-2695	21 Dec-21 13:38	21 Dec-21 20:00	16d 2h (0.6 °C)	Woods Hole Group	Sediment Testing
53046	12-3611-8332	21 Dec-21 15:54	21 Dec-21 20:00	16d (0.3 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53042	Sediment	Belmont Landfill	TOX-1	
53046	Reference sediment	Belmont Landfill	TOX-6	

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	53042 failed 35d survival rate endpoint	9.25%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Reference Sed		53042*	14	3.37	1.761	0.1386	CDF	0.0023	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.281128	0.281128	1	11.35	0.0046	Significant Effect
Error	0.346619	0.0247585	14			
Total	0.627746		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	2.693	8.885	0.2146	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9161	0.8408	0.1457	Normal Distribution

35d Survival Rate Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53042		8	0.7375	0.5966	0.8784	0.8000	0.4000	0.9000	0.0596	22.85%	21.33%
53046	RS	8	0.9375	0.8753	0.9997	0.9571	0.8000	1.0000	0.0263	7.94%	0.00%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53042		8	1.0480	0.8888	1.2070	1.1070	0.6847	1.2490	0.0672	18.14%	20.19%
53046	RS	8	1.3130	1.2160	1.4100	1.3420	1.1070	1.4120	0.0409	8.82%	0.00%

35d Survival Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53042		0.7000	0.8000	0.8000	0.4000	0.8000	0.9000	0.9000	0.6000
53046	RS	0.9000	1.0000	0.9000	0.8000	1.0000	1.0000	0.9000	1.0000

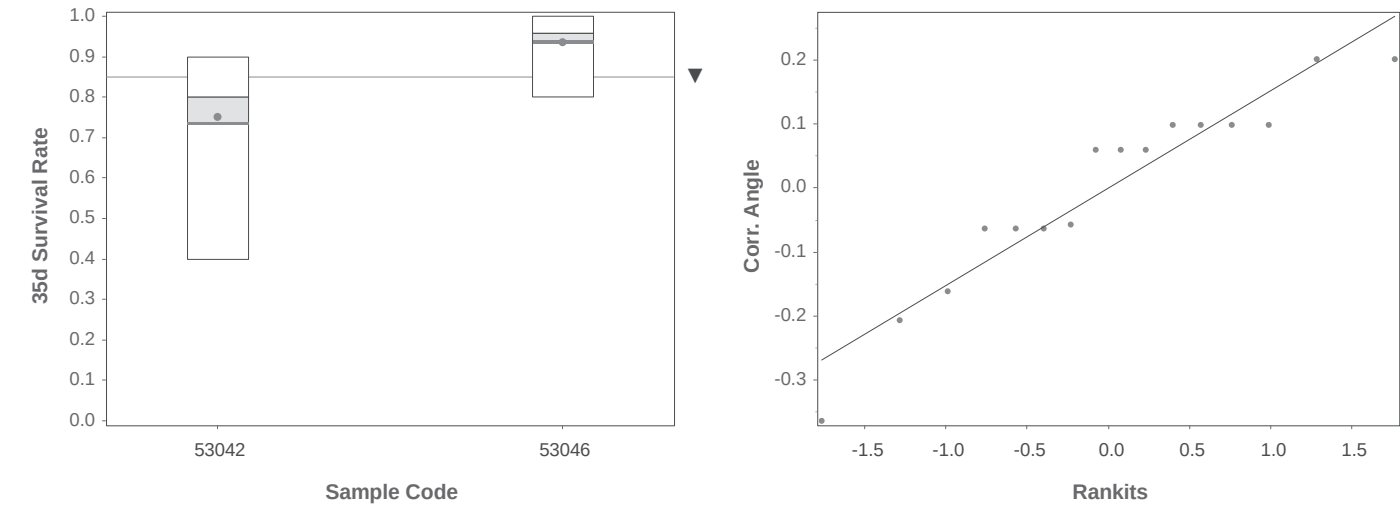
Angular (Corrected) Transformed Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53042		0.9912	1.1070	1.1070	0.6847	1.1070	1.2490	1.2490	0.8861
53046	RS	1.2490	1.4120	1.2490	1.1070	1.4120	1.4120	1.2490	1.4120

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID:	15-9465-1312	Endpoint:	35d Survival Rate	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 13:50	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 13:59	MD5 Hash:	0357C6FAF6EADDB281EA2402109F0E8F	Editor ID:	

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Report Date: 07 Mar-22 12:04 (p 43 of 96)
 Test Code/ID: 16245 REF 1 / 14-4995-1919

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test **Aquatec Environmental, Inc.**

Analysis ID:	03-5569-0775	Endpoint:	35d Survival Rate	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 13:50	Analysis:	Nonparametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 13:59	MD5 Hash:	77031231C11F9FCF1780AA8CCEF5BF39	Editor ID:	
Batch ID:	14-5191-3028	Test Type:	Hyalella (42d)	Analyst:	C. Matthaues Ayers
Start Date:	06 Jan-22 15:25	Protocol:	EPA/600/R-99/064 (2000)	Diluent:	Reconstituted Water
Ending Date:	17 Feb-22 12:00	Species:	Hyalella azteca	Brine:	
Test Length:	41d 21h	Taxon:	Malacostraca	Source:	Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53043	20-0010-4712	21 Dec-21 12:35	21 Dec-21 20:00	16d 3h (0.6 °C)	Woods Hole Group	Sediment Testing
53046	12-3611-8332	21 Dec-21 15:54	21 Dec-21 20:00	16d (0.3 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53043	Sediment	Belmont Landfill	TOX-2	
53046	Reference sediment	Belmont Landfill	TOX-6	

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	53043 passed 35d survival rate endpoint	10.33%

Wilcoxon Rank Sum Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	Ties	P-Type	P-Value	Decision(α:5%)
Reference Sed		53043	14	68.5	---	2	Exact	0.5392	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.00624062	0.00624062	1	0.2079	0.6554	Non-Significant Effect
Error	0.420207	0.0300148	14			
Total	0.426448		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	3.477	8.885	0.1223	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.8102	0.8408	0.0037	Non-Normal Distribution

35d Survival Rate Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53043		8	0.9000	0.7659	1.0000	1.0000	0.6000	1.0000	0.0567	17.82%	4.00%
53046	RS	8	0.9375	0.8753	0.9997	0.9571	0.8000	1.0000	0.0263	7.94%	0.00%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53043		8	1.2730	1.0930	1.4540	1.4120	0.8861	1.4120	0.0763	16.96%	3.01%
53046	RS	8	1.3130	1.2160	1.4100	1.3420	1.1070	1.4120	0.0409	8.82%	0.00%

35d Survival Rate Detail

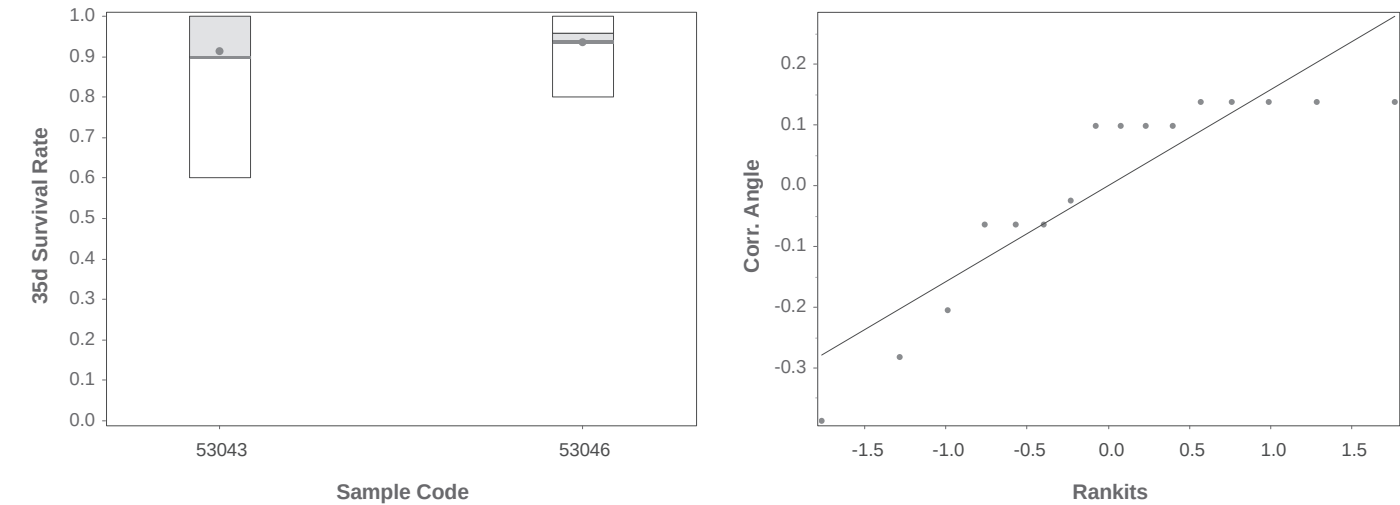
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53043		1.0000	1.0000	0.9000	1.0000	1.0000	0.7000	1.0000	0.6000
53046	RS	0.9000	1.0000	0.9000	0.8000	1.0000	1.0000	0.9000	1.0000

Angular (Corrected) Transformed Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53043		1.4120	1.4120	1.2490	1.4120	1.4120	0.9912	1.4120	0.8861
53046	RS	1.2490	1.4120	1.2490	1.1070	1.4120	1.4120	1.2490	1.4120

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test			Aquatec Environmental, Inc.	
Analysis ID:	03-5569-0775	Endpoint:	35d Survival Rate	CETIS Version: CETISv2.1.1
Analyzed:	06 Mar-22 13:50	Analysis:	Nonparametric-Two Sample	Status Level: 1
Edit Date:	04 Mar-22 13:59	MD5 Hash:	77031231C11F9FCF1780AA8CCEF5BF39	Editor ID:

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 Test Code/ID: 16245 REF 1 / 14-4995-1919

Hyaella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID: 09-6009-8971	Endpoint: 35d Survival Rate	CETIS Version: CETISv2.1.1
Analyzed: 06 Mar-22 13:50	Analysis: Parametric-Two Sample	Status Level: 1
Edit Date: 04 Mar-22 13:59	MD5 Hash: 37107879364CAAD3BFFBB8E5070B4F2E	Editor ID:
Batch ID: 14-5191-3028	Test Type: Hyaella (42d)	Analyst: C. Mattheus Ayers
Start Date: 06 Jan-22 15:25	Protocol: EPA/600/R-99/064 (2000)	Diluent: Reconstituted Water
Ending Date: 17 Feb-22 12:00	Species: Hyaella azteca	Brine:
Test Length: 41d 21h	Taxon: Malacostraca	Source: Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53044	00-4677-6467	21 Dec-21 11:25	21 Dec-21 20:00	16d 4h (0.6 °C)	Woods Hole Group	Sediment Testing
53046	12-3611-8332	21 Dec-21 15:54	21 Dec-21 20:00	16d (0.3 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53044	Sediment	Belmont Landfill	TOX-3	
53046	Reference sediment	Belmont Landfill	TOX-6	

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	53044 passed 35d survival rate endpoint	5.62%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Reference Sed		53044	14	1.22	1.761	0.08822	CDF	0.1213	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0149396	0.0149396	1	1.489	0.2426	Non-Significant Effect
Error	0.1405	0.0100357	14			
Total	0.15544		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	2.013	8.885	0.3765	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9302	0.8408	0.2457	Normal Distribution

35d Survival Rate Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53044		8	0.9000	0.8553	0.9447	0.9000	0.8000	1.0000	0.0189	5.94%	4.00%
53046	RS	8	0.9375	0.8753	0.9997	0.9571	0.8000	1.0000	0.0263	7.94%	0.00%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53044		8	1.2520	1.1830	1.3200	1.2490	1.1070	1.4120	0.0289	6.52%	4.66%
53046	RS	8	1.3130	1.2160	1.4100	1.3420	1.1070	1.4120	0.0409	8.82%	0.00%

35d Survival Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53044		0.9000	1.0000	0.9000	0.9000	0.9000	0.8000	0.9000	0.9000
53046	RS	0.9000	1.0000	0.9000	0.8000	1.0000	1.0000	0.9000	1.0000

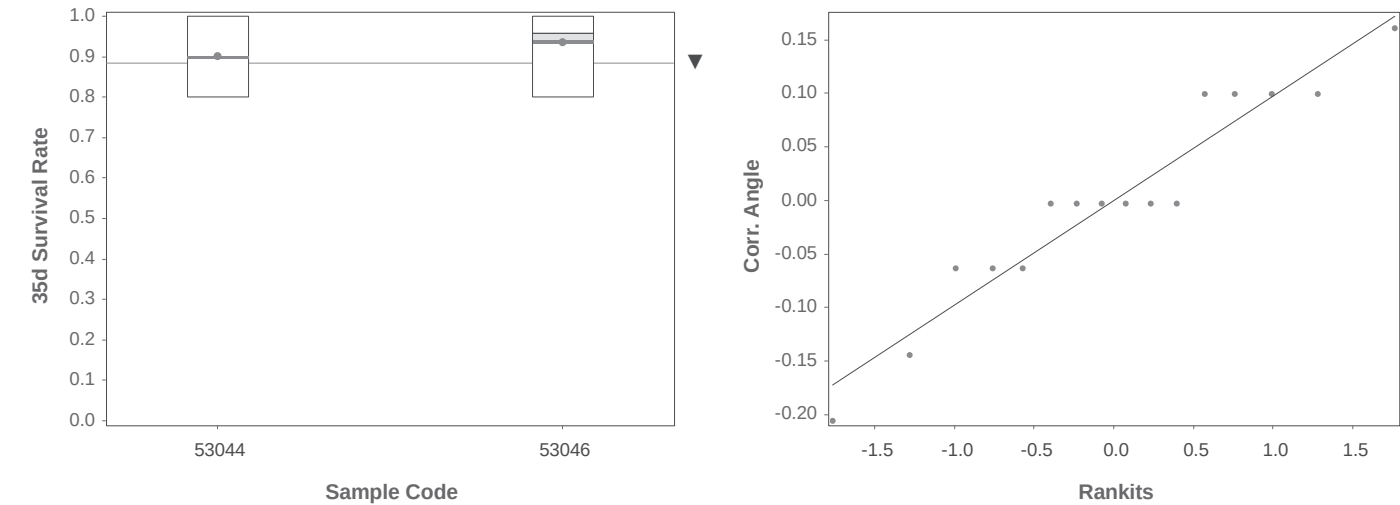
Angular (Corrected) Transformed Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53044		1.2490	1.4120	1.2490	1.2490	1.2490	1.1070	1.2490	1.2490
53046	RS	1.2490	1.4120	1.2490	1.1070	1.4120	1.4120	1.2490	1.4120

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID:	09-6009-8971	Endpoint:	35d Survival Rate	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 13:50	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 13:59	MD5 Hash:	37107879364CAAD3BFFB8E5070B4F2E	Editor ID:	

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Hyalella 42-d Survival, Growth, and Reproduction Sediment Test **Aquatec Environmental, Inc.**

Analysis ID:	21-0112-3124	Endpoint:	35d Survival Rate	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 13:51	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 13:59	MD5 Hash:	9D44475C3E238AD9051B55D9B21253F5	Editor ID:	
Batch ID:	14-5191-3028	Test Type:	Hyalella (42d)	Analyst:	C. Mattheus Ayers
Start Date:	06 Jan-22 15:25	Protocol:	EPA/600/R-99/064 (2000)	Diluent:	Reconstituted Water
Ending Date:	17 Feb-22 12:00	Species:	Hyalella azteca	Brine:	
Test Length:	41d 21h	Taxon:	Malacostraca	Source:	Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53045	13-5487-4433	21 Dec-21 14:22	21 Dec-21 20:00	16d 1h (0.3 °C)	Woods Hole Group	Sediment Testing
53046	12-3611-8332	21 Dec-21 15:54	21 Dec-21 20:00	16d (0.3 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53045	Sediment	Belmont Landfill	TOX-5	
53046	Reference sediment	Belmont Landfill	TOX-6	

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	53045 passed 35d survival rate endpoint	7.17%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Reference Sed		53045	14	1.498	1.761	0.1105	CDF	0.0781	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0353094	0.0353094	1	2.245	0.1563	Non-Significant Effect
Error	0.22022	0.01573	14			
Total	0.25553		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.346	8.885	0.7048	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9211	0.8408	0.1758	Normal Distribution

35d Survival Rate Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53045		8	0.8750	0.8009	0.9491	0.8333	0.8000	1.0000	0.0313	10.13%	6.67%
53046	RS	8	0.9375	0.8753	0.9997	0.9571	0.8000	1.0000	0.0263	7.94%	0.00%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53045		8	1.2190	1.1070	1.3310	1.1540	1.1070	1.4120	0.0475	11.02%	7.16%
53046	RS	8	1.3130	1.2160	1.4100	1.3420	1.1070	1.4120	0.0409	8.82%	0.00%

35d Survival Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53045		0.8000	0.9000	1.0000	0.9000	1.0000	0.8000	0.8000	0.8000
53046	RS	0.9000	1.0000	0.9000	0.8000	1.0000	1.0000	0.9000	1.0000

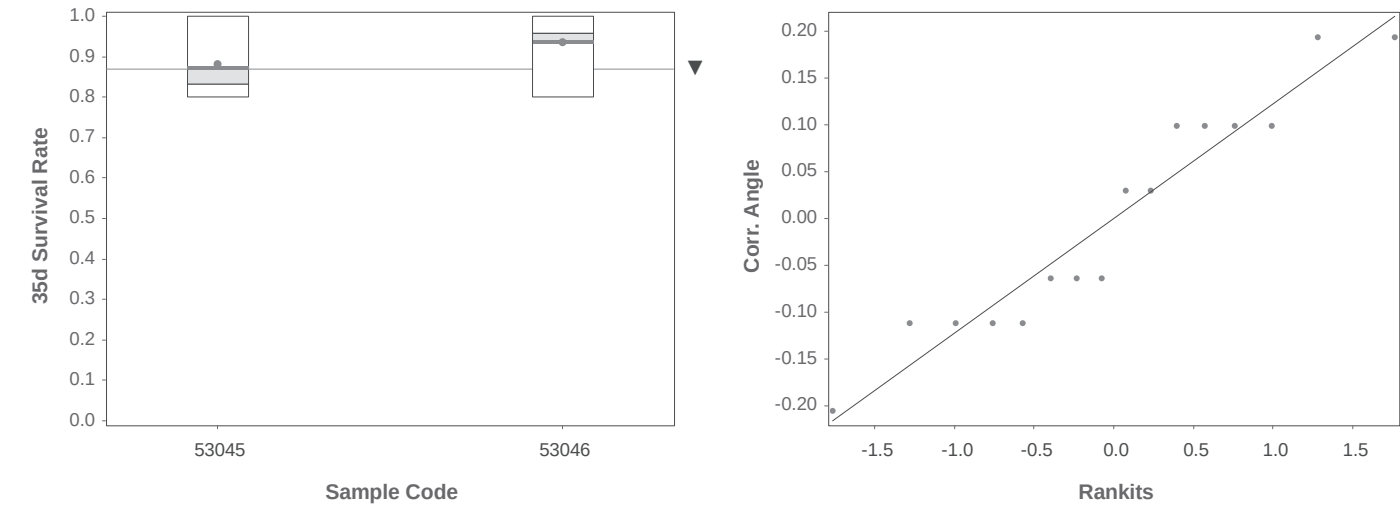
Angular (Corrected) Transformed Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53045		1.1070	1.2490	1.4120	1.2490	1.4120	1.1070	1.1070	1.1070
53046	RS	1.2490	1.4120	1.2490	1.1070	1.4120	1.4120	1.2490	1.4120

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID:	21-0112-3124	Endpoint:	35d Survival Rate	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 13:51	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 13:59	MD5 Hash:	9D44475C3E238AD9051B55D9B21253F5	Editor ID:	

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Hyalella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID: 06-8967-0852	Endpoint: 42d Biomass	CETIS Version: CETISv2.1.1
Analyzed: 06 Mar-22 13:49	Analysis: Nonparametric-Two Sample	Status Level: 1
Edit Date: 04 Mar-22 13:59	MD5 Hash: 461B02AABB9A272EF0050173EB83231C	Editor ID:
Batch ID: 14-5191-3028	Test Type: Hyalella (42d)	Analyst: C. Mattheus Ayers
Start Date: 06 Jan-22 15:25	Protocol: EPA/600/R-99/064 (2000)	Diluent: Reconstituted Water
Ending Date: 17 Feb-22 12:00	Species: Hyalella azteca	Brine:
Test Length: 41d 21h	Taxon: Malacostraca	Source: Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, In	Sediment Testing
53046	12-3611-8332	21 Dec-21 15:54	21 Dec-21 20:00	16d (0.3 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53046	Reference sediment	Belmont Landfill	TOX-6	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53040 failed 42d biomass endpoint	18.90%

Wilcoxon Rank Sum Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	Ties	P-Type	P-Value	Decision(α:5%)
Reference Sed		53040*	14	38	---	0	Exact	0.0003	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.133225	0.133225	1	8.927	0.0098	Significant Effect
Error	0.208927	0.0149234	14			
Total	0.342152		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	7.328	8.885	0.0175	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.7474	0.8408	0.0006	Non-Normal Distribution

42d Biomass Summary

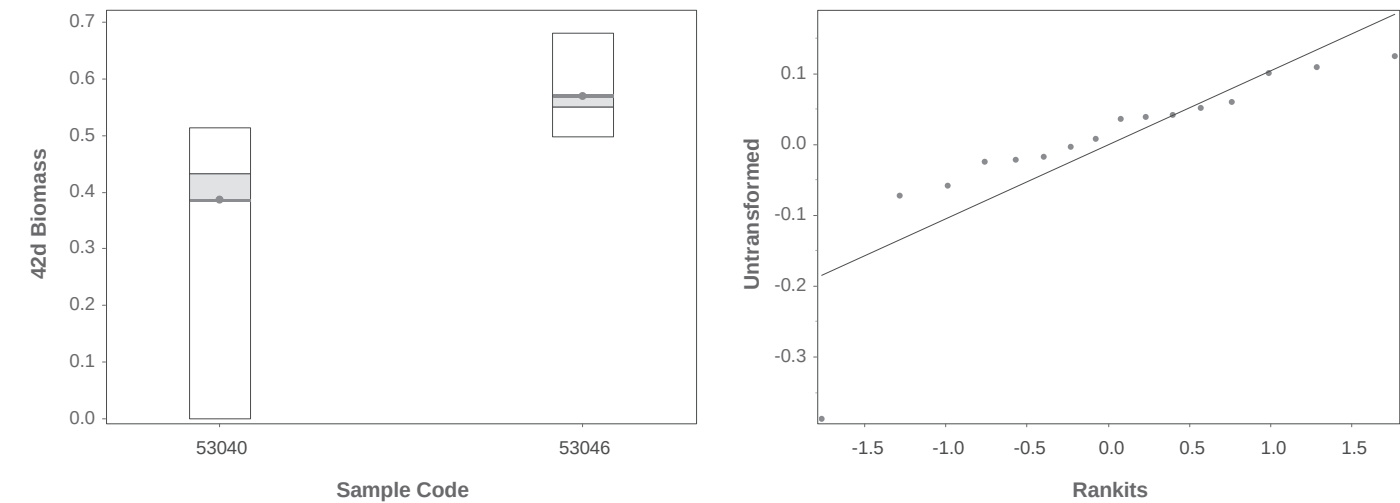
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040		8	0.3868	0.2513	0.5222	0.433	0	0.513	0.0573	41.90%	32.06%
53046	RS	8	0.5693	0.5192	0.6193	0.55	0.498	0.68	0.02117	10.52%	0.00%

42d Biomass Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040		0.396	0.513	0.488	0	0.439	0.384	0.447	0.427
53046	RS	0.606	0.68	0.498	0.548	0.612	0.546	0.512	0.552

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test			Aquatec Environmental, Inc.	
Analysis ID:	06-8967-0852	Endpoint:	42d Biomass	CETIS Version: CETISv2.1.1
Analyzed:	06 Mar-22 13:49	Analysis:	Nonparametric-Two Sample	Status Level: 1
Edit Date:	04 Mar-22 13:59	MD5 Hash:	461B02AABB9A272EF0050173EB83231C	Editor ID:

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Hyalella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID: 13-4066-6942	Endpoint: 42d Biomass	CETIS Version: CETISv2.1.1
Analyzed: 06 Mar-22 13:50	Analysis: Parametric-Two Sample	Status Level: 1
Edit Date: 04 Mar-22 13:59	MD5 Hash: 221ADA8FAB81E2A53A0AFC7B7C42860E	Editor ID:
Batch ID: 14-5191-3028	Test Type: Hyalella (42d)	Analyst: C. Mattheus Ayers
Start Date: 06 Jan-22 15:25	Protocol: EPA/600/R-99/064 (2000)	Diluent: Reconstituted Water
Ending Date: 17 Feb-22 12:00	Species: Hyalella azteca	Brine:
Test Length: 41d 21h	Taxon: Malacostraca	Source: Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53041	03-8171-1181	21 Dec-21 09:05	21 Dec-21 20:00	16d 6h (0.3 °C)	Woods Hole Group	Sediment Testing
53046	12-3611-8332	21 Dec-21 15:54	21 Dec-21 20:00	16d (0.3 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53041	Sediment	Belmont Landfill	TOX-4	
53046	Reference sediment	Belmont Landfill	TOX-6	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53041 failed 42d biomass endpoint	17.01%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Reference Sed		53041*	14	4.725	1.761	0.09682	CDF	0.0002	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.26988	0.26988	1	22.33	0.0003	Significant Effect
Error	0.16921	0.0120864	14			
Total	0.43909		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	5.745	8.885	0.0345	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.956	0.8408	0.5910	Normal Distribution

42d Biomass Summary

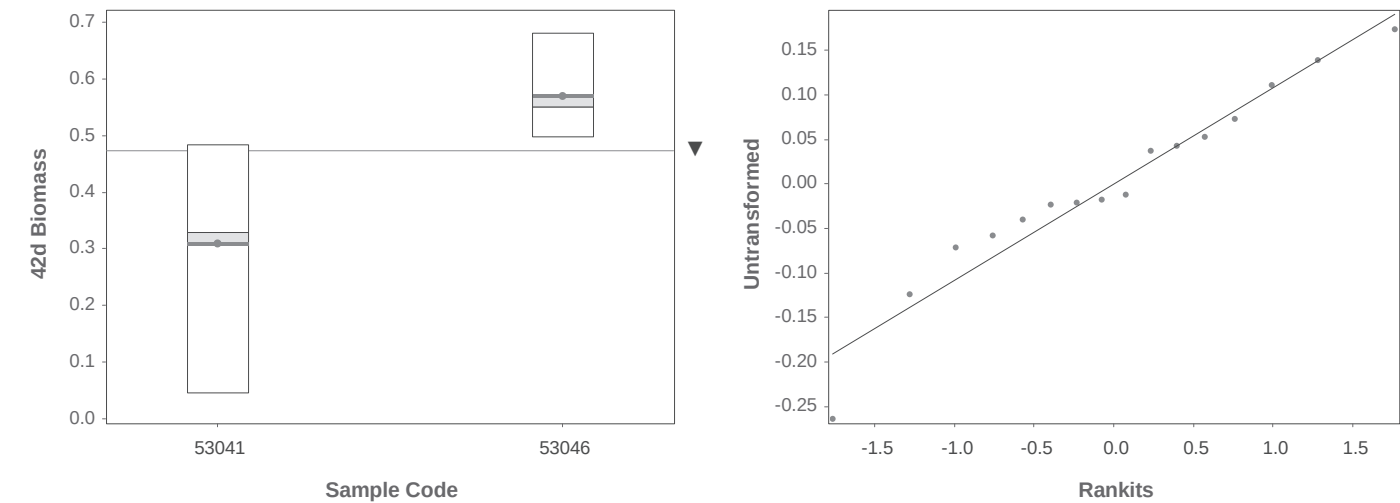
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53041		8	0.3095	0.1895	0.4295	0.3295	0.046	0.483	0.05073	46.36%	45.63%
53046	RS	8	0.5693	0.5192	0.6193	0.55	0.498	0.68	0.02117	10.52%	0.00%

42d Biomass Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53041		0.186	0.449	0.362	0.297	0.383	0.27	0.046	0.483
53046	RS	0.606	0.68	0.498	0.548	0.612	0.546	0.512	0.552

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test			Aquatec Environmental, Inc.	
Analysis ID:	13-4066-6942	Endpoint:	42d Biomass	CETIS Version: CETISv2.1.1
Analyzed:	06 Mar-22 13:50	Analysis:	Parametric-Two Sample	Status Level: 1
Edit Date:	04 Mar-22 13:59	MD5 Hash:	221ADA8FAB81E2A53A0AFC7B7C42860E	Editor ID:

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 Test Code/ID: 16245 REF 1 / 14-4995-1919

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test				Aquatec Environmental, Inc.	
Analysis ID:	01-9737-1448	Endpoint:	42d Biomass	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 13:50	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 13:59	MD5 Hash:	03799BB4893B8DE6A6699FFEBD4E4B9D	Editor ID:	
Batch ID:	14-5191-3028	Test Type:	Hyalella (42d)	Analyst:	C. Matthaues Ayers
Start Date:	06 Jan-22 15:25	Protocol:	EPA/600/R-99/064 (2000)	Diluent:	Reconstituted Water
Ending Date:	17 Feb-22 12:00	Species:	Hyalella azteca	Brine:	
Test Length:	41d 21h	Taxon:	Malacostraca	Source:	Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53042	04-7178-2695	21 Dec-21 13:38	21 Dec-21 20:00	16d 2h (0.6 °C)	Woods Hole Group	Sediment Testing
53046	12-3611-8332	21 Dec-21 15:54	21 Dec-21 20:00	16d (0.3 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53042	Sediment	Belmont Landfill	TOX-1	
53046	Reference sediment	Belmont Landfill	TOX-6	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53042 failed 42d biomass endpoint	22.51%

Unequal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Reference Sed		53042*	8	3.437	1.86	0.1282	CDF	0.0044	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.224439	0.224439	1	11.81	0.0040	Significant Effect
Error	0.265995	0.0189997	14			
Total	0.490434		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	9.603	8.885	0.0079	Unequal Variances
Distribution	Shapiro-Wilk W Normality Test	0.919	0.8408	0.1625	Normal Distribution

42d Biomass Summary

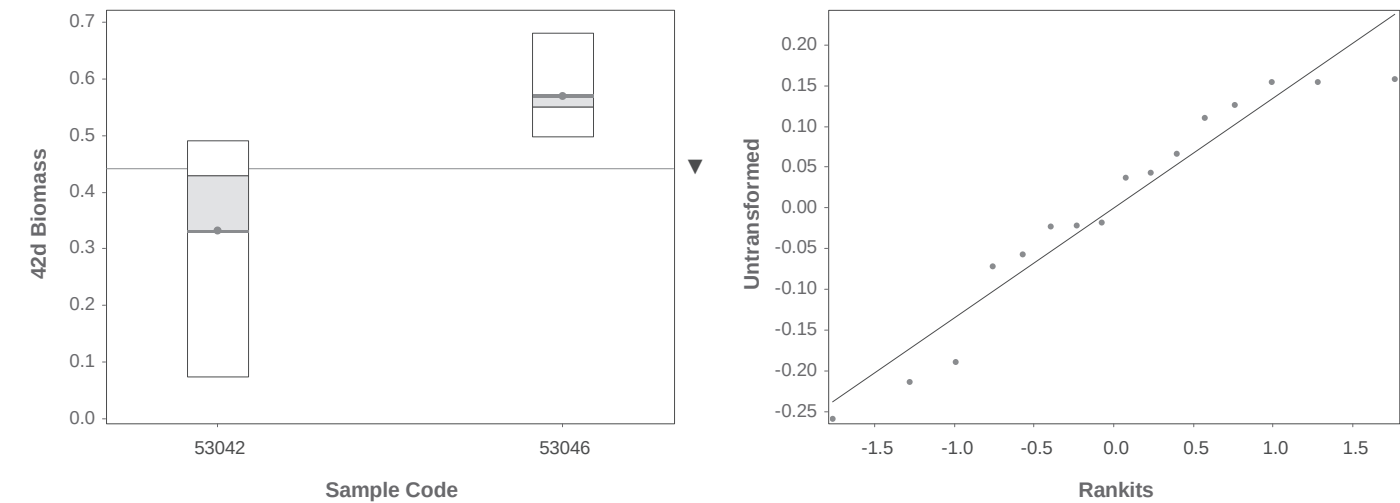
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53042		8	0.3324	0.1773	0.4875	0.429	0.074	0.49	0.06559	55.81%	41.61%
53046	RS	8	0.5693	0.5192	0.6193	0.55	0.498	0.68	0.02117	10.52%	0.00%

42d Biomass Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53042		0.399	0.487	0.144	0.074	0.49	0.459	0.487	0.119
53046	RS	0.606	0.68	0.498	0.548	0.612	0.546	0.512	0.552

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test			Aquatec Environmental, Inc.	
Analysis ID:	01-9737-1448	Endpoint:	42d Biomass	CETIS Version: CETISv2.1.1
Analyzed:	06 Mar-22 13:50	Analysis:	Parametric-Two Sample	Status Level: 1
Edit Date:	04 Mar-22 13:59	MD5 Hash:	03799BB4893B8DE6A6699FFE4B9D	Editor ID:

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Test Code/ID: 16245 REF 1 / 14-4995-1919

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID:	05-3601-0252	Endpoint:	42d Biomass	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 13:50	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 13:59	MD5 Hash:	66433BB13FFC6790E9E050FAAC922DC1	Editor ID:	
Batch ID:	14-5191-3028	Test Type:	Hyalella (42d)	Analyst:	C. Matthaues Ayers
Start Date:	06 Jan-22 15:25	Protocol:	EPA/600/R-99/064 (2000)	Diluent:	Reconstituted Water
Ending Date:	17 Feb-22 12:00	Species:	Hyalella azteca	Brine:	
Test Length:	41d 21h	Taxon:	Malacostraca	Source:	Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53043	20-0010-4712	21 Dec-21 12:35	21 Dec-21 20:00	16d 3h (0.6 °C)	Woods Hole Group	Sediment Testing
53046	12-3611-8332	21 Dec-21 15:54	21 Dec-21 20:00	16d (0.3 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53043	Sediment	Belmont Landfill	TOX-2	
53046	Reference sediment	Belmont Landfill	TOX-6	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53043 passed 42d biomass endpoint	10.92%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Reference Sed		53043	14	1.548	1.761	0.06216	CDF	0.0720	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0119356	0.0119356	1	2.396	0.1439	Non-Significant Effect
Error	0.0697395	0.00498139	14			
Total	0.081675		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.78	8.885	0.4647	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9651	0.8408	0.7539	Normal Distribution

42d Biomass Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53043		8	0.5146	0.4479	0.5814	0.5315	0.349	0.603	0.02824	15.52%	9.60%
53046	RS	8	0.5693	0.5192	0.6193	0.55	0.498	0.68	0.02117	10.52%	0.00%

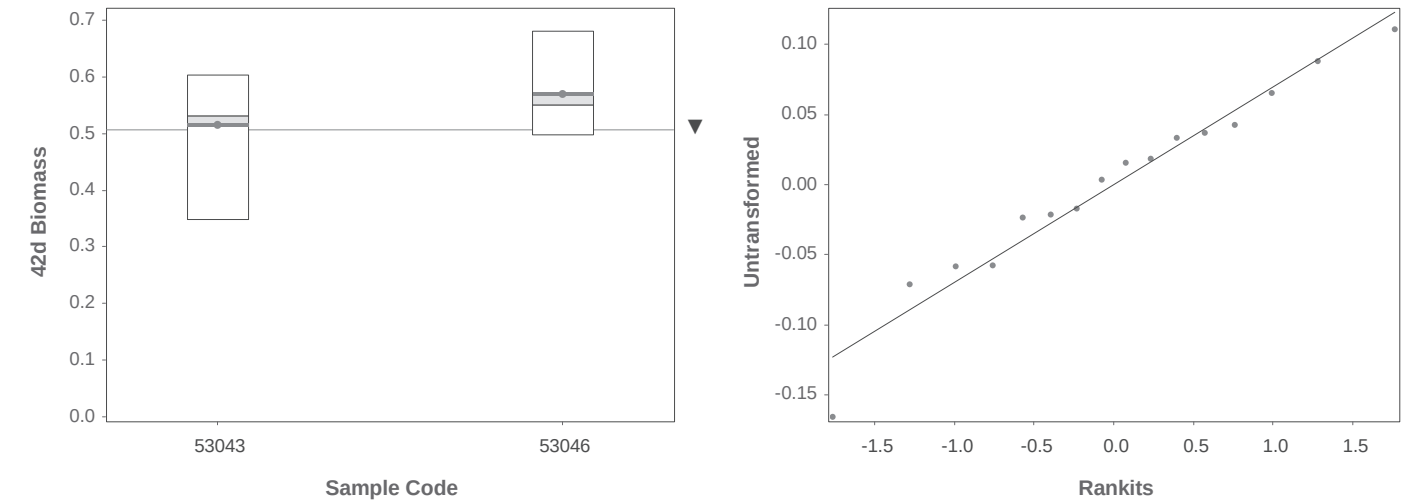
42d Biomass Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53043		0.603	0.533	0.518	0.58	0.53	0.456	0.548	0.349
53046	RS	0.606	0.68	0.498	0.548	0.612	0.546	0.512	0.552

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID:	05-3601-0252	Endpoint:	42d Biomass	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 13:50	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 13:59	MD5 Hash:	66433BB13FFC6790E9E050FAAC922DC1	Editor ID:	

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Report Date: 07 Mar-22 12:04 (p 57 of 96)
Test Code/ID: 16245 REF 1 / 14-4995-1919

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID: 13-9048-2976	Endpoint: 42d Biomass	CETIS Version: CETISv2.1.1
Analyzed: 06 Mar-22 13:50	Analysis: Parametric-Two Sample	Status Level: 1
Edit Date: 04 Mar-22 13:59	MD5 Hash: FC8D725AB7DD59D30B80ED61CEA178C0	Editor ID:
Batch ID: 14-5191-3028	Test Type: Hyalella (42d)	Analyst: C. Mattheus Ayers
Start Date: 06 Jan-22 15:25	Protocol: EPA/600/R-99/064 (2000)	Diluent: Reconstituted Water
Ending Date: 17 Feb-22 12:00	Species: Hyalella azteca	Brine:
Test Length: 41d 21h	Taxon: Malacostraca	Source: Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53044	00-4677-6467	21 Dec-21 11:25	21 Dec-21 20:00	16d 4h (0.6 °C)	Woods Hole Group	Sediment Testing
53046	12-3611-8332	21 Dec-21 15:54	21 Dec-21 20:00	16d (0.3 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53044	Sediment	Belmont Landfill	TOX-3	
53046	Reference sediment	Belmont Landfill	TOX-6	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53044 failed 42d biomass endpoint	11.48%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Reference Sed		53044*	14	3.868	1.761	0.06535	CDF	0.0009	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0823691	0.0823691	1	14.96	0.0017	Significant Effect
Error	0.0770831	0.00550593	14			
Total	0.159452		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	2.073	8.885	0.3572	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9418	0.8408	0.3711	Normal Distribution

42d Biomass Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53044		8	0.4257	0.3537	0.4978	0.4555	0.243	0.508	0.03047	20.24%	25.21%
53046	RS	8	0.5693	0.5192	0.6193	0.55	0.498	0.68	0.02117	10.52%	0.00%

42d Biomass Detail

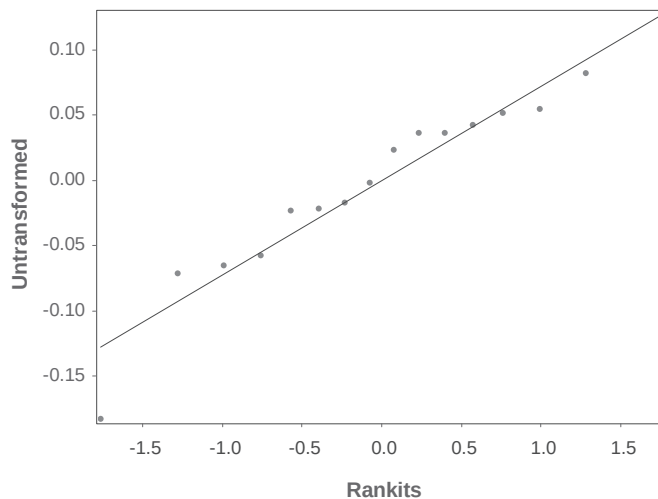
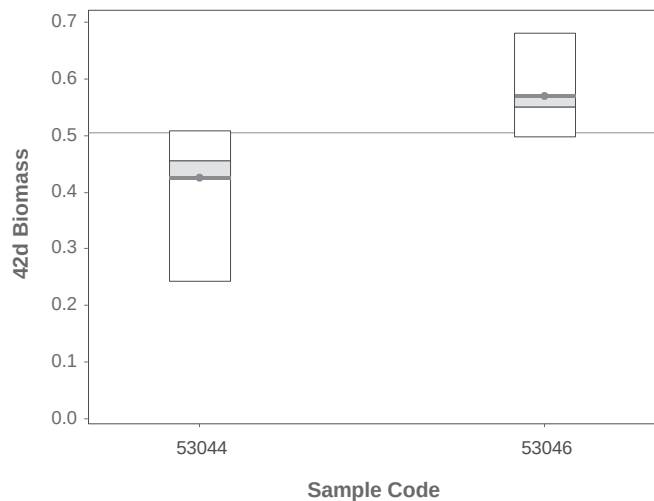
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53044		0.508	0.462	0.424	0.361	0.243	0.449	0.481	0.478
53046	RS	0.606	0.68	0.498	0.548	0.612	0.546	0.512	0.552

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test

Aquatec Environmental, Inc.

Analysis ID:	13-9048-2976	Endpoint:	42d Biomass	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 13:50	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 13:59	MD5 Hash:	FC8D725AB7DD59D30B80ED61CEA178C0	Editor ID:	

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Report Date: 07 Mar-22 12:04 (p 59 of 96)
Test Code/ID: 16245 REF 1 / 14-4995-1919

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID:	10-4399-1271	Endpoint:	42d Biomass	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 13:51	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 13:59	MD5 Hash:	70DB2B422ACEA7B5AD4ED1731AB9C2A2	Editor ID:	
Batch ID:	14-5191-3028	Test Type:	Hyalella (42d)	Analyst:	C. Matthaues Ayers
Start Date:	06 Jan-22 15:25	Protocol:	EPA/600/R-99/064 (2000)	Diluent:	Reconstituted Water
Ending Date:	17 Feb-22 12:00	Species:	Hyalella azteca	Brine:	
Test Length:	41d 21h	Taxon:	Malacostraca	Source:	Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53045	13-5487-4433	21 Dec-21 14:22	21 Dec-21 20:00	16d 1h (0.3 °C)	Woods Hole Group	Sediment Testing
53046	12-3611-8332	21 Dec-21 15:54	21 Dec-21 20:00	16d (0.3 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53045	Sediment	Belmont Landfill	TOX-5	
53046	Reference sediment	Belmont Landfill	TOX-6	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53045 passed 42d biomass endpoint	18.61%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Reference Sed		53045	14	1.262	1.761	0.1059	CDF	0.1138	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.023028	0.023028	1	1.592	0.2277	Non-Significant Effect
Error	0.202544	0.0144674	14			
Total	0.225571		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	7.073	8.885	0.0194	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.8987	0.8408	0.0766	Normal Distribution

42d Biomass Summary

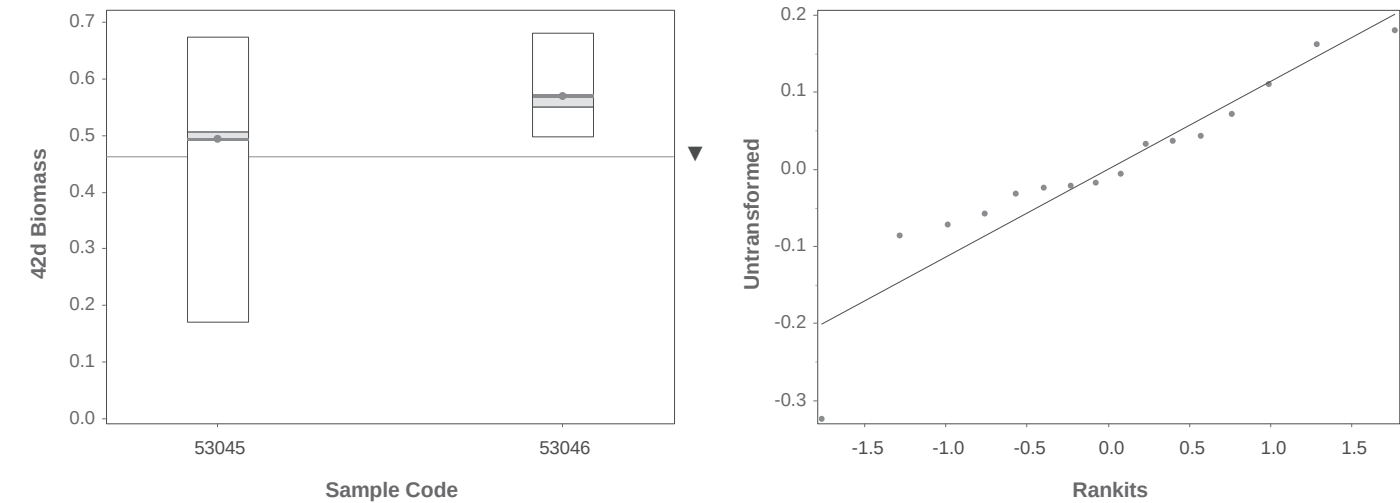
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53045		8	0.4934	0.3603	0.6265	0.507	0.17	0.673	0.05629	32.27%	13.33%
53046	RS	8	0.5693	0.5192	0.6193	0.55	0.498	0.68	0.02117	10.52%	0.00%

42d Biomass Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53045		0.462	0.488	0.655	0.673	0.565	0.526	0.408	0.17
53046	RS	0.606	0.68	0.498	0.548	0.612	0.546	0.512	0.552

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test			Aquatec Environmental, Inc.	
Analysis ID:	10-4399-1271	Endpoint:	42d Biomass	CETIS Version: CETISv2.1.1
Analyzed:	06 Mar-22 13:51	Analysis:	Parametric-Two Sample	Status Level: 1
Edit Date:	04 Mar-22 13:59	MD5 Hash:	70DB2B422ACEA7B5AD4ED1731AB9C2A2	Editor ID:

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Test Code/ID: 16245 REF 1 / 14-4995-1919

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID: 05-8541-1516	Endpoint: 42d Mean Dry Weight	CETIS Version: CETISv2.1.1
Analyzed: 06 Mar-22 13:49	Analysis: Parametric-Two Sample	Status Level: 1
Edit Date: 04 Mar-22 13:59	MD5 Hash: F6C943D3935FE08B8B79C5CA7CB543ED	Editor ID:
Batch ID: 14-5191-3028	Test Type: Hyalella (42d)	Analyst: C. Mattheus Ayers
Start Date: 06 Jan-22 15:25	Protocol: EPA/600/R-99/064 (2000)	Diluent: Reconstituted Water
Ending Date: 17 Feb-22 12:00	Species: Hyalella azteca	Brine:
Test Length: 41d 21h	Taxon: Malacostraca	Source: Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, Inc	Sediment Testing
53046	12-3611-8332	21 Dec-21 15:54	21 Dec-21 20:00	16d (0.3 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53046	Reference sediment	Belmont Landfill	TOX-6	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53040 failed 42d mean dry weight endpoint	9.13%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Reference Sed		53040*	13	3.686	1.771	0.06042	CDF	0.0014	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0590491	0.0590491	1	13.59	0.0027	Significant Effect
Error	0.0564867	0.00434513	13			
Total	0.115536		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	3.167	9.155	0.1572	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9537	0.8328	0.5837	Normal Distribution

42d Mean Dry Weight Summary

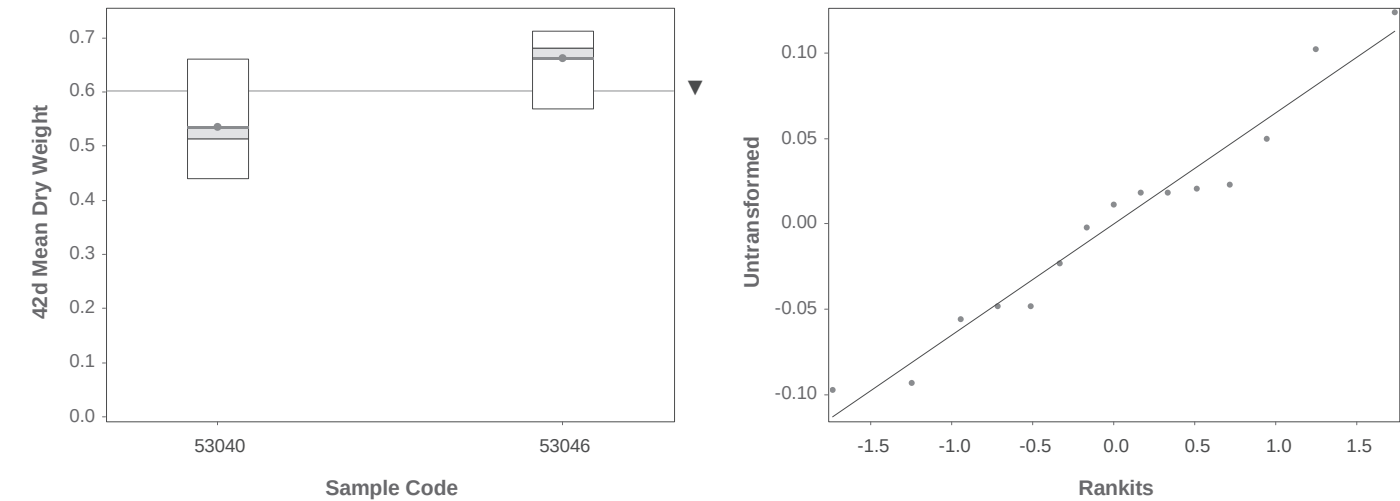
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040		7	0.536	0.4593	0.6128	0.513	0.439	0.66	0.03135	15.47%	19.00%
53046	RS	8	0.6618	0.6228	0.7008	0.68	0.5689	0.7114	0.01648	7.04%	0.00%

42d Mean Dry Weight Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040		0.66	0.513	0.488	0.439	0.48	0.6386	0.5338	
53046	RS	0.6733	0.68	0.7114	0.685	0.68	0.6825	0.5689	0.6133

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test			Aquatec Environmental, Inc.	
Analysis ID:	05-8541-1516	Endpoint:	42d Mean Dry Weight	CETIS Version: CETISv2.1.1
Analyzed:	06 Mar-22 13:49	Analysis:	Parametric-Two Sample	Status Level: 1
Edit Date:	04 Mar-22 13:59	MD5 Hash:	F6C943D3935FE08B8B79C5CA7CB543ED	Editor ID:

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Report Date: 07 Mar-22 12:04 (p 63 of 96)
Test Code/ID: 16245 REF 1 / 14-4995-1919

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID: 09-9982-5448	Endpoint: 42d Mean Dry Weight	CETIS Version: CETISv2.1.1
Analyzed: 06 Mar-22 13:50	Analysis: Parametric-Two Sample	Status Level: 1
Edit Date: 04 Mar-22 13:59	MD5 Hash: F9C5993111AD99213E9D3E3F93794495	Editor ID:
Batch ID: 14-5191-3028	Test Type: Hyalella (42d)	Analyst: C. Mattheus Ayers
Start Date: 06 Jan-22 15:25	Protocol: EPA/600/R-99/064 (2000)	Diluent: Reconstituted Water
Ending Date: 17 Feb-22 12:00	Species: Hyalella azteca	Brine:
Test Length: 41d 21h	Taxon: Malacostraca	Source: Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53041	03-8171-1181	21 Dec-21 09:05	21 Dec-21 20:00	16d 6h (0.3 °C)	Woods Hole Group	Sediment Testing
53046	12-3611-8332	21 Dec-21 15:54	21 Dec-21 20:00	16d (0.3 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53041	Sediment	Belmont Landfill	TOX-4	
53046	Reference sediment	Belmont Landfill	TOX-6	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53041 failed 42d mean dry weight endpoint	13.69%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Reference Sed		53041*	14	4.582	1.761	0.09062	CDF	0.0002	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.222306	0.222306	1	21	0.0004	Significant Effect
Error	0.148226	0.0105876	14			
Total	0.370532		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	8.747	8.885	0.0105	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.8726	0.8408	0.0298	Normal Distribution

42d Mean Dry Weight Summary

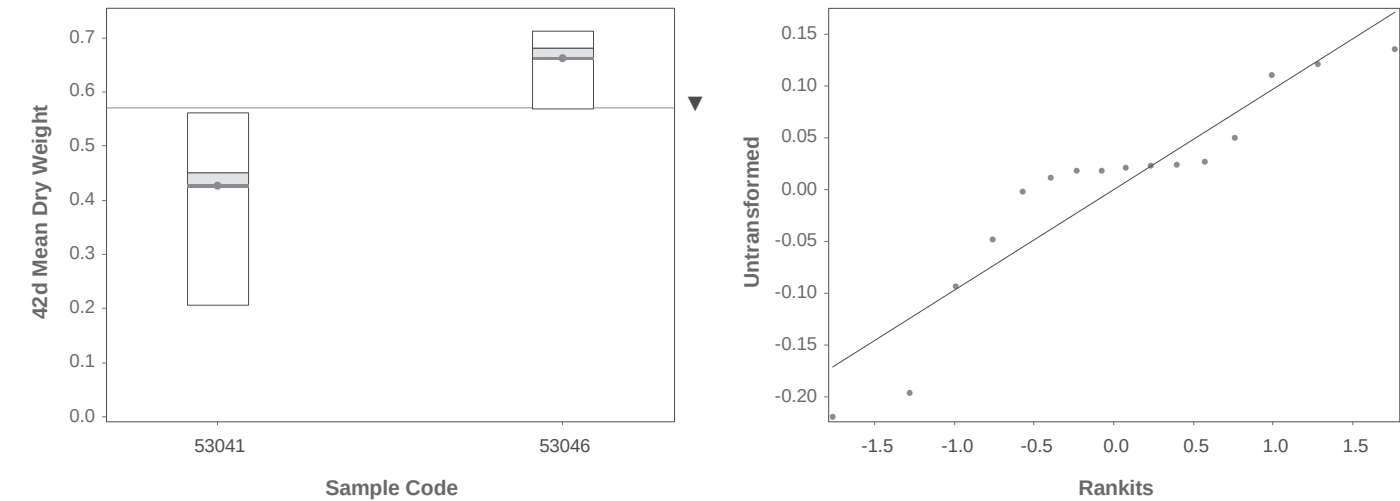
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53041		8	0.4261	0.3108	0.5413	0.4513	0.2067	0.5613	0.04874	32.35%	35.62%
53046	RS	8	0.6618	0.6228	0.7008	0.68	0.5689	0.7114	0.01648	7.04%	0.00%

42d Mean Dry Weight Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53041		0.2067	0.5613	0.4525	0.4243	0.5471	0.45	0.23	0.5367
53046	RS	0.6733	0.68	0.7114	0.685	0.68	0.6825	0.5689	0.6133

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test			Aquatec Environmental, Inc.	
Analysis ID:	09-9982-5448	Endpoint:	42d Mean Dry Weight	CETIS Version: CETISv2.1.1
Analyzed:	06 Mar-22 13:50	Analysis:	Parametric-Two Sample	Status Level: 1
Edit Date:	04 Mar-22 13:59	MD5 Hash:	F9C5993111AD99213E9D3E3F93794495	Editor ID:

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Report Date: 07 Mar-22 12:04 (p 65 of 96)
Test Code/ID: 16245 REF 1 / 14-4995-1919

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID: 03-2202-6748	Endpoint: 42d Mean Dry Weight	CETIS Version: CETISv2.1.1
Analyzed: 06 Mar-22 13:50	Analysis: Parametric-Two Sample	Status Level: 1
Edit Date: 04 Mar-22 13:59	MD5 Hash: 1A9E45B7C7C5ED4820C9F54FEC05650B	Editor ID:
Batch ID: 14-5191-3028	Test Type: Hyalella (42d)	Analyst: C. Mattheus Ayers
Start Date: 06 Jan-22 15:25	Protocol: EPA/600/R-99/064 (2000)	Diluent: Reconstituted Water
Ending Date: 17 Feb-22 12:00	Species: Hyalella azteca	Brine:
Test Length: 41d 21h	Taxon: Malacostraca	Source: Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53042	04-7178-2695	21 Dec-21 13:38	21 Dec-21 20:00	16d 2h (0.6 °C)	Woods Hole Group	Sediment Testing
53046	12-3611-8332	21 Dec-21 15:54	21 Dec-21 20:00	16d (0.3 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53042	Sediment	Belmont Landfill	TOX-1	
53046	Reference sediment	Belmont Landfill	TOX-6	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53042 failed 42d mean dry weight endpoint	15.28%

Unequal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Reference Sed		53042*	8	2.144	1.86	0.1011	CDF	0.0322	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0543421	0.0543421	1	4.596	0.0501	Non-Significant Effect
Error	0.165543	0.0118245	14			
Total	0.219885		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	9.886	8.885	0.0073	Unequal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9401	0.8408	0.3504	Normal Distribution

42d Mean Dry Weight Summary

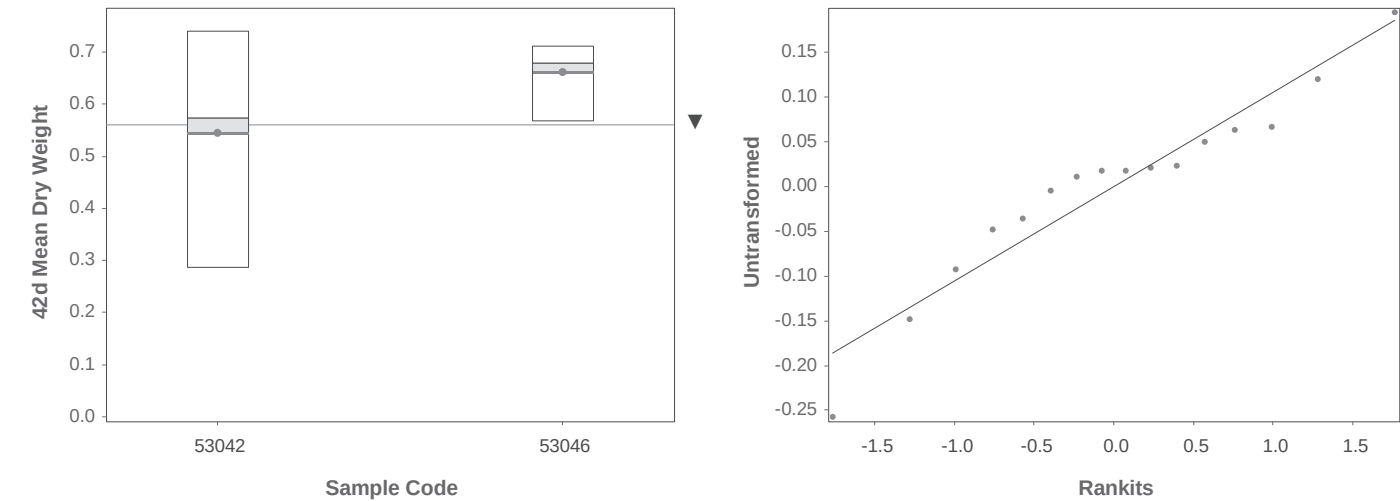
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53042		8	0.5453	0.4227	0.6678	0.5749	0.288	0.74	0.05181	26.88%	17.61%
53046	RS	8	0.6618	0.6228	0.7008	0.68	0.5689	0.7114	0.01648	7.04%	0.00%

42d Mean Dry Weight Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53042		0.665	0.6087	0.288	0.74	0.6125	0.51	0.5411	0.3967
53046	RS	0.6733	0.68	0.7114	0.685	0.68	0.6825	0.5689	0.6133

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test			Aquatec Environmental, Inc.	
Analysis ID:	03-2202-6748	Endpoint:	42d Mean Dry Weight	CETIS Version: CETISv2.1.1
Analyzed:	06 Mar-22 13:50	Analysis:	Parametric-Two Sample	Status Level: 1
Edit Date:	04 Mar-22 13:59	MD5 Hash:	1A9E45B7C7C5ED4820C9F54FEC05650B	Editor ID:

Graphics



CETIS Analytical Report

Report Date: 07 Mar-22 12:04 (p 67 of 96)
Test Code/ID: 16245 REF 1 / 14-4995-1919

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID: 15-3618-6039	Endpoint: 42d Mean Dry Weight	CETIS Version: CETISv2.1.1
Analyzed: 06 Mar-22 13:50	Analysis: Parametric-Two Sample	Status Level: 1
Edit Date: 04 Mar-22 13:59	MD5 Hash: 6AE9461AAC23E12709A2B8360B433BE9	Editor ID:
Batch ID: 14-5191-3028	Test Type: Hyalella (42d)	Analyst: C. Mattheus Ayers
Start Date: 06 Jan-22 15:25	Protocol: EPA/600/R-99/064 (2000)	Diluent: Reconstituted Water
Ending Date: 17 Feb-22 12:00	Species: Hyalella azteca	Brine:
Test Length: 41d 21h	Taxon: Malacostraca	Source: Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53043	20-0010-4712	21 Dec-21 12:35	21 Dec-21 20:00	16d 3h (0.6 °C)	Woods Hole Group	Sediment Testing
53046	12-3611-8332	21 Dec-21 15:54	21 Dec-21 20:00	16d (0.3 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53043	Sediment	Belmont Landfill	TOX-2	
53046	Reference sediment	Belmont Landfill	TOX-6	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53043 failed 42d mean dry weight endpoint	5.56%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Reference Sed		53043*	14	3.783	1.761	0.03682	CDF	0.0010	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0250123	0.0250123	1	14.31	0.0020	Significant Effect
Error	0.0244739	0.00174814	14			
Total	0.0494862		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.641	8.885	0.5292	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9374	0.8408	0.3179	Normal Distribution

42d Mean Dry Weight Summary

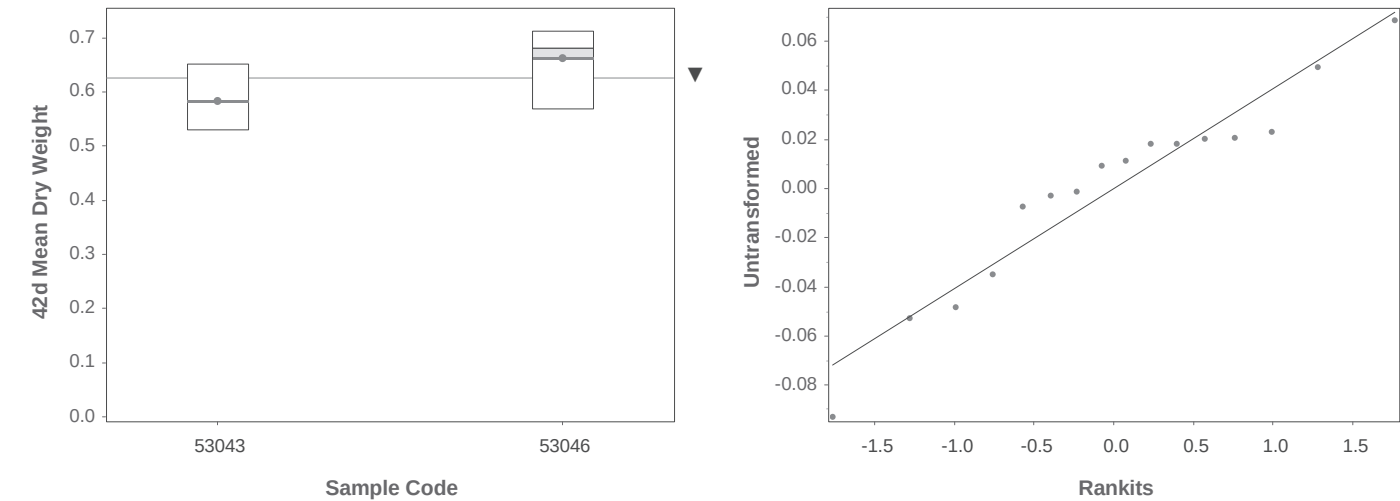
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53043		8	0.5827	0.5523	0.6132	0.5808	0.53	0.6514	0.01286	6.24%	11.95%
53046	RS	8	0.6618	0.6228	0.7008	0.68	0.5689	0.7114	0.01648	7.04%	0.00%

42d Mean Dry Weight Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53043		0.603	0.5922	0.5756	0.58	0.53	0.6514	0.548	0.5817
53046	RS	0.6733	0.68	0.7114	0.685	0.68	0.6825	0.5689	0.6133

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test			Aquatec Environmental, Inc.	
Analysis ID:	15-3618-6039	Endpoint:	42d Mean Dry Weight	CETIS Version: CETISv2.1.1
Analyzed:	06 Mar-22 13:50	Analysis:	Parametric-Two Sample	Status Level: 1
Edit Date:	04 Mar-22 13:59	MD5 Hash:	6AE9461AAC23E12709A2B8360B433BE9	Editor ID:

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Test Code/ID: 16245 REF 1 / 14-4995-1919

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID: 18-9764-6313	Endpoint: 42d Mean Dry Weight	CETIS Version: CETISv2.1.1
Analyzed: 06 Mar-22 13:50	Analysis: Parametric-Two Sample	Status Level: 1
Edit Date: 04 Mar-22 13:59	MD5 Hash: 900D7296D571062A3AB4060D52985E33	Editor ID:
Batch ID: 14-5191-3028	Test Type: Hyalella (42d)	Analyst: C. Mattheus Ayers
Start Date: 06 Jan-22 15:25	Protocol: EPA/600/R-99/064 (2000)	Diluent: Reconstituted Water
Ending Date: 17 Feb-22 12:00	Species: Hyalella azteca	Brine:
Test Length: 41d 21h	Taxon: Malacostraca	Source: Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53044	00-4677-6467	21 Dec-21 11:25	21 Dec-21 20:00	16d 4h (0.6 °C)	Woods Hole Group	Sediment Testing
53046	12-3611-8332	21 Dec-21 15:54	21 Dec-21 20:00	16d (0.3 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53044	Sediment	Belmont Landfill	TOX-3	
53046	Reference sediment	Belmont Landfill	TOX-6	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53044 failed 42d mean dry weight endpoint	11.63%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Reference Sed		53044*	14	3.558	1.761	0.07696	CDF	0.0016	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0966766	0.0966766	1	12.66	0.0032	Significant Effect
Error	0.106912	0.00763654	14			
Total	0.203588		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	6.031	8.885	0.0302	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.8801	0.8408	0.0389	Normal Distribution

42d Mean Dry Weight Summary

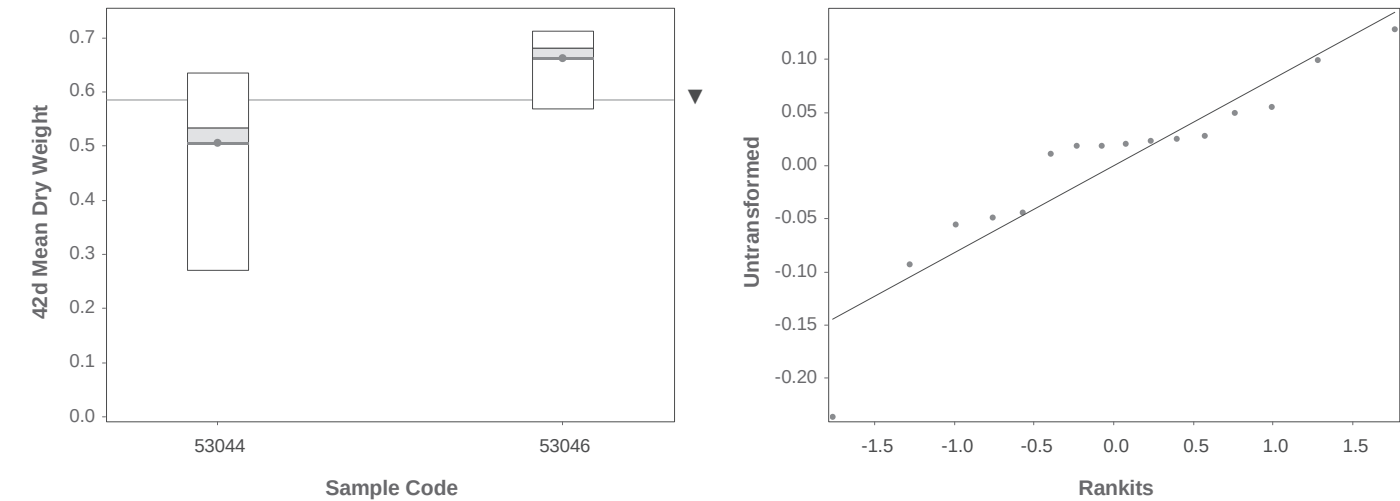
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53044		8	0.5063	0.4107	0.602	0.5328	0.27	0.635	0.04047	22.60%	23.49%
53046	RS	8	0.6618	0.6228	0.7008	0.68	0.5689	0.7114	0.01648	7.04%	0.00%

42d Mean Dry Weight Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53044		0.635	0.462	0.6057	0.4513	0.27	0.5613	0.5344	0.5311
53046	RS	0.6733	0.68	0.7114	0.685	0.68	0.6825	0.5689	0.6133

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test			Aquatec Environmental, Inc.	
Analysis ID:	18-9764-6313	Endpoint:	42d Mean Dry Weight	CETIS Version: CETISv2.1.1
Analyzed:	06 Mar-22 13:50	Analysis:	Parametric-Two Sample	Status Level: 1
Edit Date:	04 Mar-22 13:59	MD5 Hash:	900D7296D571062A3AB4060D52985E33	Editor ID:

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CETIS Analytical Report

Report Date: 07 Mar-22 12:04 (p 71 of 96)
Test Code/ID: 16245 REF 1 / 14-4995-1919

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID: 00-6363-5502	Endpoint: 42d Mean Dry Weight	CETIS Version: CETISv2.1.1
Analyzed: 06 Mar-22 13:51	Analysis: Parametric-Two Sample	Status Level: 1
Edit Date: 04 Mar-22 13:59	MD5 Hash: 633F9871513EE18DA26B7872BC9565C0	Editor ID:
Batch ID: 14-5191-3028	Test Type: Hyalella (42d)	Analyst: C. Mattheus Ayers
Start Date: 06 Jan-22 15:25	Protocol: EPA/600/R-99/064 (2000)	Diluent: Reconstituted Water
Ending Date: 17 Feb-22 12:00	Species: Hyalella azteca	Brine:
Test Length: 41d 21h	Taxon: Malacostraca	Source: Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53045	13-5487-4433	21 Dec-21 14:22	21 Dec-21 20:00	16d 1h (0.3 °C)	Woods Hole Group	Sediment Testing
53046	12-3611-8332	21 Dec-21 15:54	21 Dec-21 20:00	16d (0.3 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53045	Sediment	Belmont Landfill	TOX-5	
53046	Reference sediment	Belmont Landfill	TOX-6	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53045 passed 42d mean dry weight endpoint	12.59%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Reference Sed		53045	14	1.63	1.761	0.08334	CDF	0.0627	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0237918	0.0237918	1	2.657	0.1254	Non-Significant Effect
Error	0.125364	0.00895456	14			
Total	0.149156		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	7.244	8.885	0.0181	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9216	0.8408	0.1791	Normal Distribution

42d Mean Dry Weight Summary

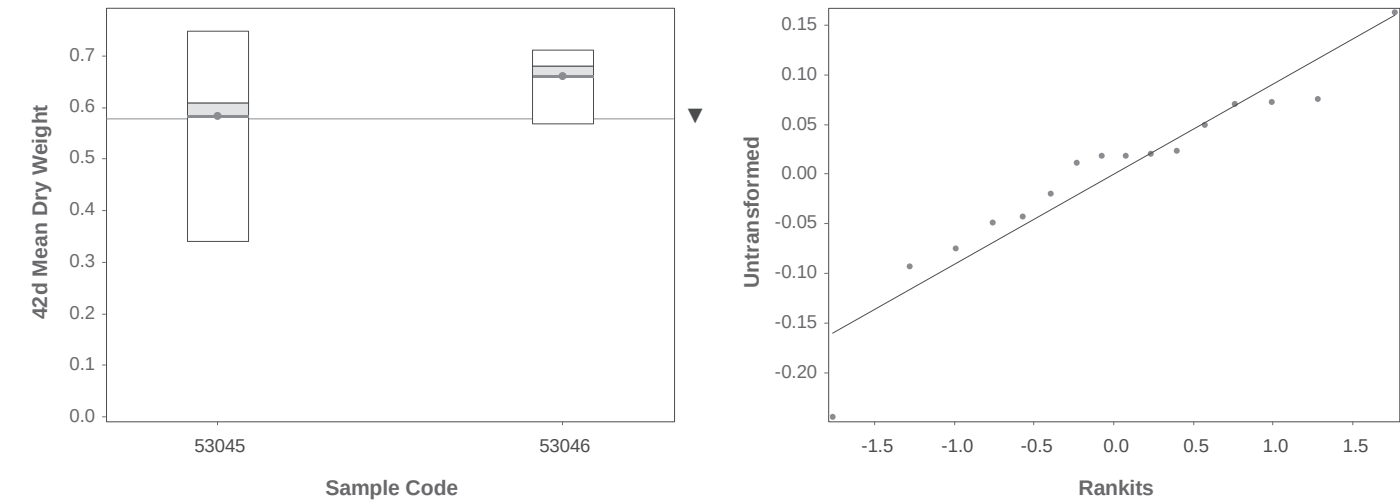
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53045		8	0.5847	0.4798	0.6896	0.61	0.34	0.7478	0.04435	21.46%	11.65%
53046	RS	8	0.6618	0.6228	0.7008	0.68	0.5689	0.7114	0.01648	7.04%	0.00%

42d Mean Dry Weight Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53045		0.66	0.5422	0.655	0.7478	0.565	0.6575	0.51	0.34
53046	RS	0.6733	0.68	0.7114	0.685	0.68	0.6825	0.5689	0.6133

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test			Aquatec Environmental, Inc.	
Analysis ID:	00-6363-5502	Endpoint:	42d Mean Dry Weight	CETIS Version: CETISv2.1.1
Analyzed:	06 Mar-22 13:51	Analysis:	Parametric-Two Sample	Status Level: 1
Edit Date:	04 Mar-22 13:59	MD5 Hash:	633F9871513EE18DA26B7872BC9565C0	Editor ID:

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CETIS Analytical Report

Report Date: 07 Mar-22 12:04 (p 73 of 96)
 Test Code/ID: 16245 REF 1 / 14-4995-1919

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID:	08-1432-7272	Endpoint:	42d Reproduction	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 13:50	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 13:59	MD5 Hash:	24478CAFF482BDDBB3608FF380AFE689	Editor ID:	
Batch ID:	14-5191-3028	Test Type:	Hyalella (42d)	Analyst:	C. Mattheus Ayers
Start Date:	06 Jan-22 15:25	Protocol:	EPA/600/R-99/064 (2000)	Diluent:	Reconstituted Water
Ending Date:	17 Feb-22 12:00	Species:	Hyalella azteca	Brine:	
Test Length:	41d 21h	Taxon:	Malacostraca	Source:	Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, Inc.	Sediment Testing
53046	12-3611-8332	21 Dec-21 15:54	21 Dec-21 20:00	16d (0.3 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53046	Reference sediment	Belmont Landfill	TOX-6	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53040 failed 42d reproduction endpoint	31.67%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Reference Sed		53040*	13	2.603	1.771	2.559	CDF	0.0109	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	52.8171	52.8171	1	6.777	0.0219	Significant Effect
Error	101.314	7.79337	13			
Total	154.131		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.688	10.79	0.5403	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9648	0.8328	0.7744	Normal Distribution

42d Reproduction Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040		7	4.318	2.112	6.523	4.125	0	7	0.9013	55.23%	46.56%
53046	RS	8	8.079	5.489	10.67	7.4	4.667	14.5	1.095	38.35%	0.00%

42d Reproduction Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040		6.5	3	4	4.125	5.6	7	0	
53046	RS	10	6	14.5	4.667	8.667	8	6	6.8

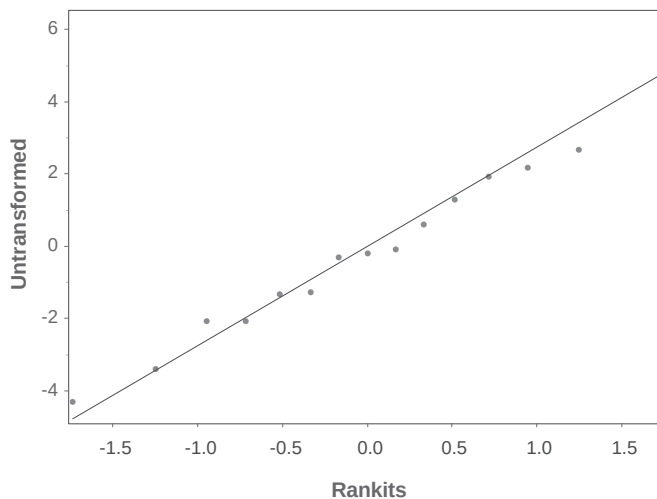
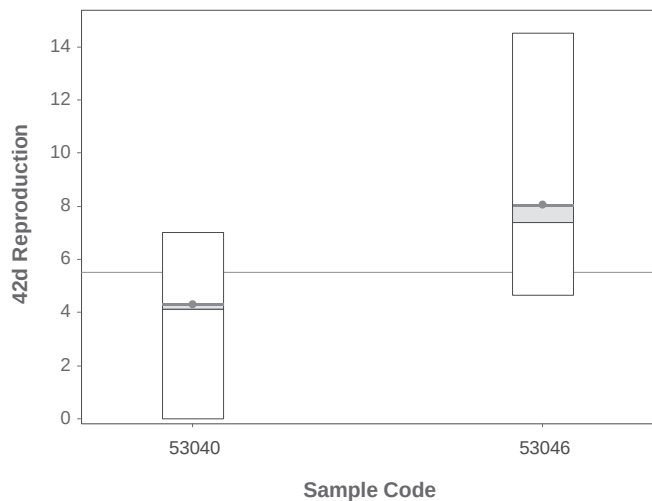
Hyalella 42-d Survival, Growth, and Reproduction Sediment Test

Aquatec Environmental, Inc.

Analysis ID: 08-1432-7272 Endpoint: 42d Reproduction
Analyzed: 06 Mar-22 13:50 Analysis: Parametric-Two Sample
Edit Date: 04 Mar-22 13:59 MD5 Hash: 24478CAFF482BDDBB3608FF380AFE689

CETIS Version: CETISv2.1.1
Status Level: 1
Editor ID:

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CETIS Analytical Report

Report Date: 07 Mar-22 12:04 (p 75 of 96)
Test Code/ID: 16245 REF 1 / 14-4995-1919

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test				Aquatec Environmental, Inc.			
Analysis ID:	02-4903-1384	Endpoint:	42d Reproduction	CETIS Version:	CETISv2.1.1		
Analyzed:	06 Mar-22 13:50	Analysis:	Parametric-Two Sample	Status Level:	1		
Edit Date:	04 Mar-22 13:59	MD5 Hash:	5D45767C4303FB36A86216D04CF7BB21	Editor ID:			
Batch ID:	14-5191-3028	Test Type:	Hyalella (42d)	Analyst:	C. Mattheus Ayers		
Start Date:	06 Jan-22 15:25	Protocol:	EPA/600/R-99/064 (2000)	Diluent:	Reconstituted Water		
Ending Date:	17 Feb-22 12:00	Species:	Hyalella azteca	Brine:			
Test Length:	41d 21h	Taxon:	Malacostraca	Source:	Aquatic Research Organism Age: 8d		

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53041	03-8171-1181	21 Dec-21 09:05	21 Dec-21 20:00	16d 6h (0.3 °C)	Woods Hole Group	Sediment Testing
53046	12-3611-8332	21 Dec-21 15:54	21 Dec-21 20:00	16d (0.3 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53041	Sediment	Belmont Landfill	TOX-4	
53046	Reference sediment	Belmont Landfill	TOX-6	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53041 failed 42d reproduction endpoint	29.86%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Reference Sed		53041*	12	4.552	1.782	2.413	CDF	0.0003	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	130.205	130.205	1	20.72	0.0007	Significant Effect
Error	75.4038	6.28365	12			
Total	205.609		13			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	5.847	14.2	0.0695	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9004	0.8239	0.1142	Normal Distribution

42d Reproduction Summary

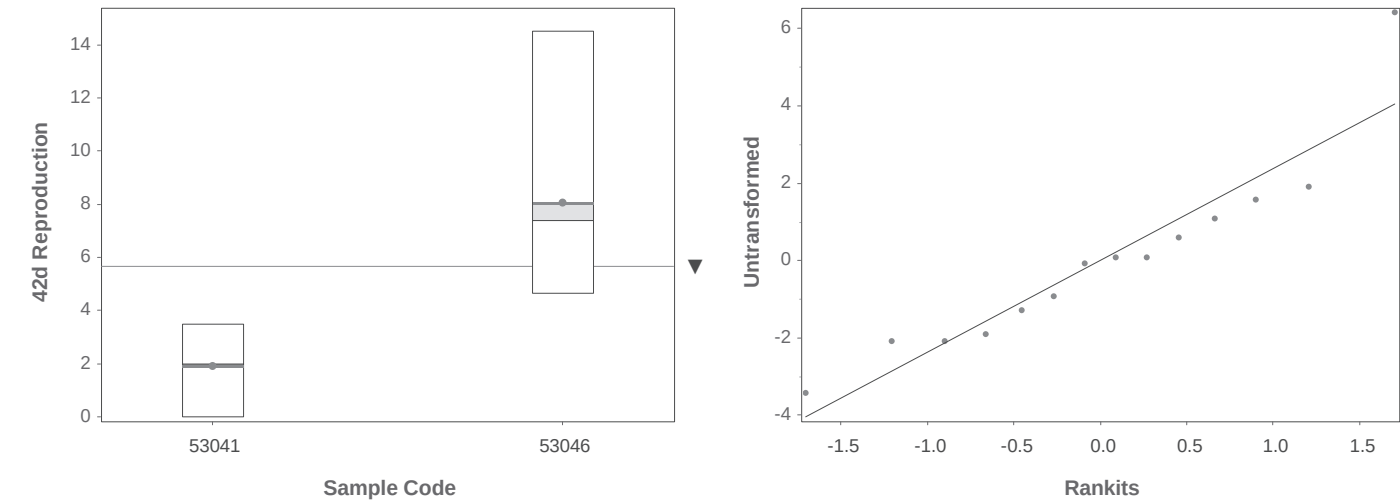
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53041		6	1.917	0.5721	3.261	2	0	3.5	0.5231	66.85%	76.28%
53046	RS	8	8.079	5.489	10.67	7.4	4.667	14.5	1.095	38.35%	0.00%

42d Reproduction Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53041		2	1	2	3.5	0	3		
53046	RS	10	6	14.5	4.667	8.667	8	6	6.8

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test			Aquatec Environmental, Inc.	
Analysis ID:	02-4903-1384	Endpoint:	42d Reproduction	CETIS Version: CETISv2.1.1
Analyzed:	06 Mar-22 13:50	Analysis:	Parametric-Two Sample	Status Level: 1
Edit Date:	04 Mar-22 13:59	MD5 Hash:	5D45767C4303FB36A86216D04CF7BB21	Editor ID:

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Report Date: 07 Mar-22 12:04 (p 77 of 96)
Test Code/ID: 16245 REF 1 / 14-4995-1919

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test				Aquatec Environmental, Inc.			
Analysis ID:	13-4329-7451	Endpoint:	42d Reproduction	CETIS Version:	CETISv2.1.1		
Analyzed:	06 Mar-22 13:50	Analysis:	Parametric-Two Sample	Status Level:	1		
Edit Date:	04 Mar-22 13:59	MD5 Hash:	4B46E1C626810209CF873917157996E2	Editor ID:			
Batch ID:	14-5191-3028	Test Type:	Hyalella (42d)	Analyst:	C. Mattheus Ayers		
Start Date:	06 Jan-22 15:25	Protocol:	EPA/600/R-99/064 (2000)	Diluent:	Reconstituted Water		
Ending Date:	17 Feb-22 12:00	Species:	Hyalella azteca	Brine:			
Test Length:	41d 21h	Taxon:	Malacostraca	Source:	Aquatic Research Organism Age: 8d		

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53042	04-7178-2695	21 Dec-21 13:38	21 Dec-21 20:00	16d 2h (0.6 °C)	Woods Hole Group	Sediment Testing
53046	12-3611-8332	21 Dec-21 15:54	21 Dec-21 20:00	16d (0.3 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53042	Sediment	Belmont Landfill	TOX-1	
53046	Reference sediment	Belmont Landfill	TOX-6	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53042 failed 42d reproduction endpoint	35.74%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Reference Sed		53042*	11	3.501	1.796	2.887	CDF	0.0025	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	97.5001	97.5001	1	12.26	0.0050	Significant Effect
Error	87.4954	7.95413	11			
Total	184.995		12			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.891	21.62	0.5614	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9194	0.8138	0.2459	Normal Distribution

42d Reproduction Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53042		5	2.45	-0.3472	5.247	2	0	5.75	1.007	91.95%	69.68%
53046	RS	8	8.079	5.489	10.67	7.4	4.667	14.5	1.095	38.35%	0.00%

42d Reproduction Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53042		2	3.5	5.75	1	0			
53046	RS	10	6	14.5	4.667	8.667	8	6	6.8

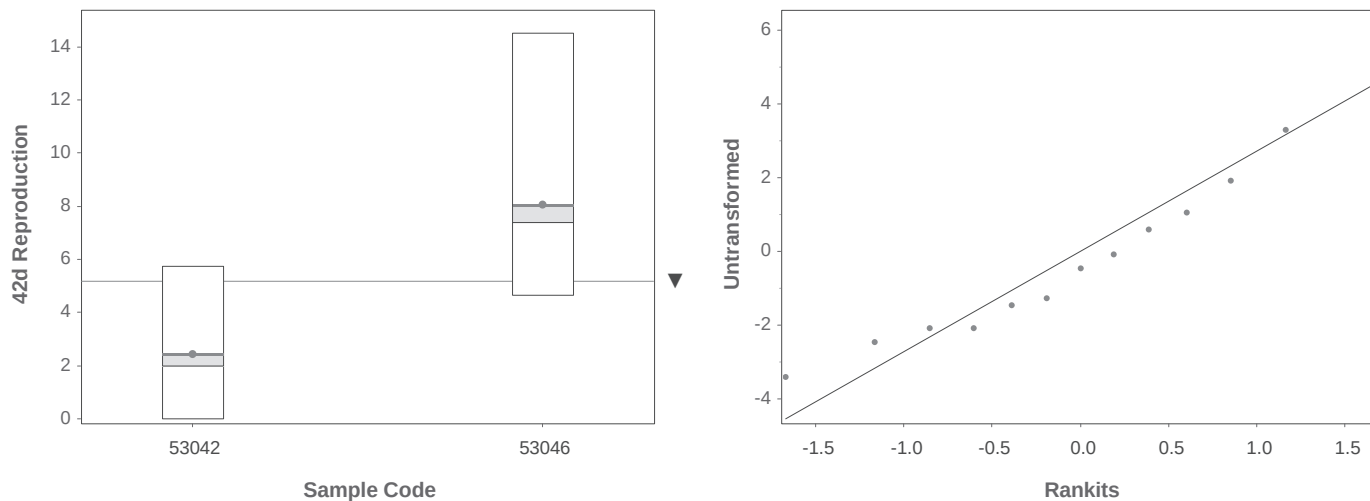
Hyalella 42-d Survival, Growth, and Reproduction Sediment Test

Aquatec Environmental, Inc.

Analysis ID: 13-4329-7451 Endpoint: 42d Reproduction
Analyzed: 06 Mar-22 13:50 Analysis: Parametric-Two Sample
Edit Date: 04 Mar-22 13:59 MD5 Hash: 4B46E1C626810209CF873917157996E2

CETIS Version: CETISv2.1.1
Status Level: 1
Editor ID:

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Report Date: 07 Mar-22 12:04 (p 79 of 96)
 Test Code/ID: 16245 REF 1 / 14-4995-1919

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID:	11-6784-0086	Endpoint:	42d Reproduction	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 13:50	Analysis:	Nonparametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 13:59	MD5 Hash:	862D2933FCE1797F8E229A1A76044AFE	Editor ID:	
Batch ID:	14-5191-3028	Test Type:	Hyalella (42d)	Analyst:	C. Mattheus Ayers
Start Date:	06 Jan-22 15:25	Protocol:	EPA/600/R-99/064 (2000)	Diluent:	Reconstituted Water
Ending Date:	17 Feb-22 12:00	Species:	Hyalella azteca	Brine:	
Test Length:	41d 21h	Taxon:	Malacostraca	Source:	Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53043	20-0010-4712	21 Dec-21 12:35	21 Dec-21 20:00	16d 3h (0.6 °C)	Woods Hole Group	Sediment Testing
53046	12-3611-8332	21 Dec-21 15:54	21 Dec-21 20:00	16d (0.3 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53043	Sediment	Belmont Landfill	TOX-2	
53046	Reference sediment	Belmont Landfill	TOX-6	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53043 failed 42d reproduction endpoint	32.89%

Wilcoxon Rank Sum Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	Ties	P-Type	P-Value	Decision(α:5%)
Reference Sed		53043*	14 44		---	0	Exact	0.0048	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	73.1738	73.1738	1	8.037	0.0132	Significant Effect
Error	127.472	9.10517	14			
Total	200.646		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.115	8.885	0.8897	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.804	0.8408	0.0031	Non-Normal Distribution

42d Reproduction Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53043		8	3.802	1.349	6.255	2.583	2	10.5	1.037	77.18%	52.94%
53046	RS	8	8.079	5.489	10.67	7.4	4.667	14.5	1.095	38.35%	0.00%

42d Reproduction Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53043		10.5	2	2.5	5.5	2	3	2.25	2.667
53046	RS	10	6	14.5	4.667	8.667	8	6	6.8

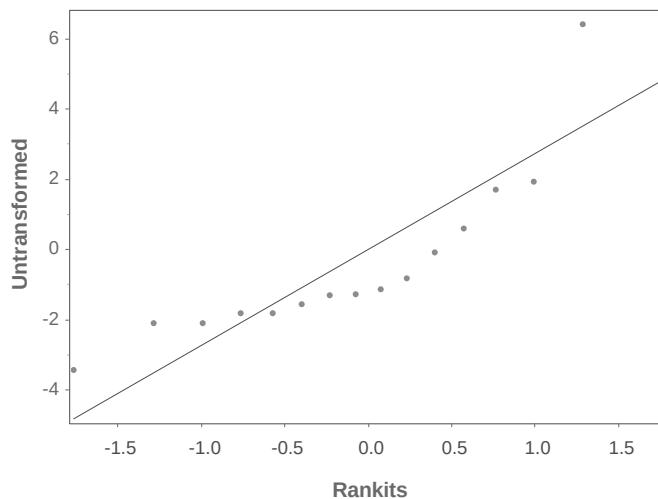
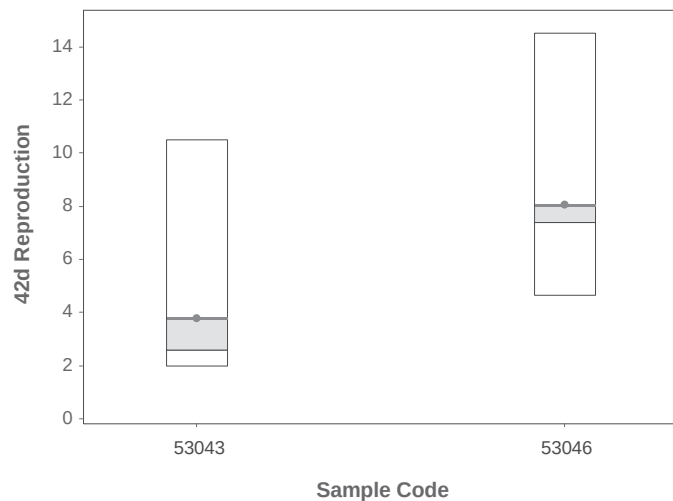
Hyalella 42-d Survival, Growth, and Reproduction Sediment Test

Aquatec Environmental, Inc.

Analysis ID: 11-6784-0086 Endpoint: 42d Reproduction
Analyzed: 06 Mar-22 13:50 Analysis: Nonparametric-Two Sample
Edit Date: 04 Mar-22 13:59 MD5 Hash: 862D2933FCE1797F8E229A1A76044AFE

CETIS Version: CETISv2.1.1
Status Level: 1
Editor ID:

Graphics



CETIS Analytical Report

Report Date: 07 Mar-22 12:04 (p 81 of 96)
Test Code/ID: 16245 REF 1 / 14-4995-1919

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID: 01-8055-8269	Endpoint: 42d Reproduction	CETIS Version: CETISv2.1.1
Analyzed: 06 Mar-22 13:50	Analysis: Parametric-Two Sample	Status Level: 1
Edit Date: 04 Mar-22 13:59	MD5 Hash: B01929069369C1317E79A3E42D9D0BCC	Editor ID:
Batch ID: 14-5191-3028	Test Type: Hyalella (42d)	Analyst: C. Mattheus Ayers
Start Date: 06 Jan-22 15:25	Protocol: EPA/600/R-99/064 (2000)	Diluent: Reconstituted Water
Ending Date: 17 Feb-22 12:00	Species: Hyalella azteca	Brine:
Test Length: 41d 21h	Taxon: Malacostraca	Source: Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53044	00-4677-6467	21 Dec-21 11:25	21 Dec-21 20:00	16d 4h (0.6 °C)	Woods Hole Group	Sediment Testing
53046	12-3611-8332	21 Dec-21 15:54	21 Dec-21 20:00	16d (0.3 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53044	Sediment	Belmont Landfill	TOX-3	
53046	Reference sediment	Belmont Landfill	TOX-6	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53044 failed 42d reproduction endpoint	26.55%

Unequal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Reference Sed		53044*	8	2.94	1.86	2.145	CDF	0.0094	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	46.0136	46.0136	1	8.642	0.0108	Significant Effect
Error	74.5397	5.32427	14			
Total	120.553		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	9.149	8.885	0.0092	Unequal Variances
Distribution	Shapiro-Wilk W Normality Test	0.8855	0.8408	0.0473	Normal Distribution

42d Reproduction Summary

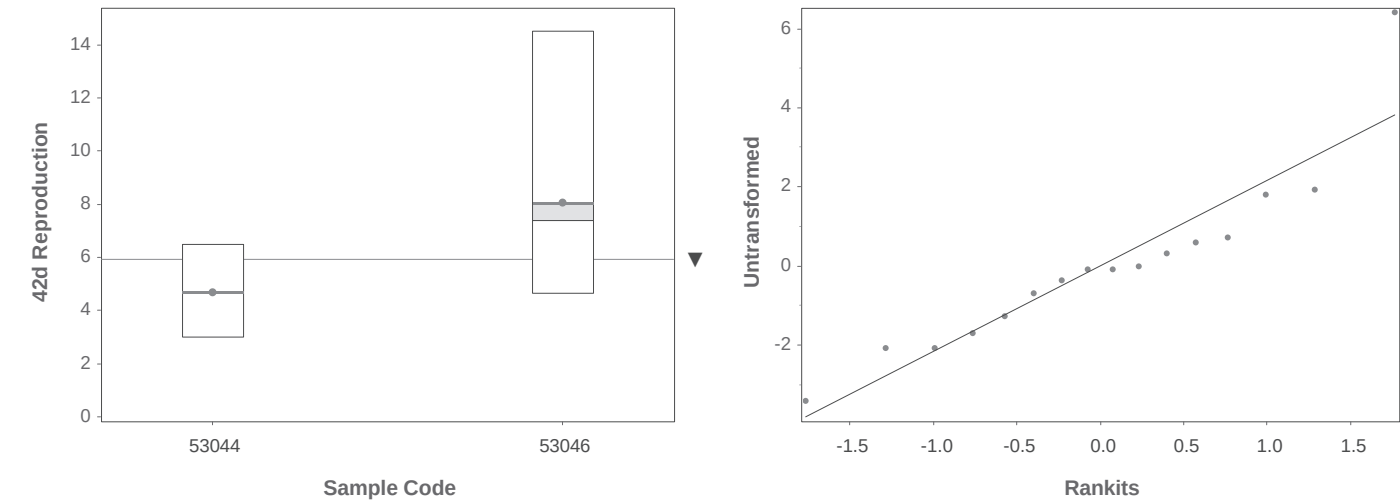
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53044		8	4.688	3.831	5.544	4.633	3	6.5	0.3621	21.85%	41.98%
53046	RS	8	8.079	5.489	10.67	7.4	4.667	14.5	1.095	38.35%	0.00%

42d Reproduction Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53044		3	5.4	4	5	4.667	6.5	4.333	4.6
53046	RS	10	6	14.5	4.667	8.667	8	6	6.8

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test			Aquatec Environmental, Inc.	
Analysis ID:	01-8055-8269	Endpoint:	42d Reproduction	CETIS Version: CETISv2.1.1
Analyzed:	06 Mar-22 13:50	Analysis:	Parametric-Two Sample	Status Level: 1
Edit Date:	04 Mar-22 13:59	MD5 Hash:	B01929069369C1317E79A3E42D9D0BCC	Editor ID:

Graphics



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Report Date: 07 Mar-22 12:04 (p 83 of 96)
Test Code/ID: 16245 REF 1 / 14-4995-1919

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID: 06-0529-3498	Endpoint: 42d Reproduction	CETIS Version: CETISv2.1.1
Analyzed: 06 Mar-22 13:51	Analysis: Parametric-Two Sample	Status Level: 1
Edit Date: 04 Mar-22 13:59	MD5 Hash: 9DBD617F2D2B91BAB961DD19A2CD32C3	Editor ID:
Batch ID: 14-5191-3028	Test Type: Hyalella (42d)	Analyst: C. Mattheus Ayers
Start Date: 06 Jan-22 15:25	Protocol: EPA/600/R-99/064 (2000)	Diluent: Reconstituted Water
Ending Date: 17 Feb-22 12:00	Species: Hyalella azteca	Brine:
Test Length: 41d 21h	Taxon: Malacostraca	Source: Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53045	13-5487-4433	21 Dec-21 14:22	21 Dec-21 20:00	16d 1h (0.3 °C)	Woods Hole Group	Sediment Testing
53046	12-3611-8332	21 Dec-21 15:54	21 Dec-21 20:00	16d (0.3 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53045	Sediment	Belmont Landfill	TOX-5	
53046	Reference sediment	Belmont Landfill	TOX-6	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	53045 passed 42d reproduction endpoint	35.61%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Reference Sed		53045	14	0.9541	1.761	2.877	CDF	0.1781	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	9.71361	9.71361	1	0.9103	0.3562	Non-Significant Effect
Error	149.386	10.6705	14			
Total	159.1		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.223	8.885	0.7972	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9839	0.8408	0.9872	Normal Distribution

42d Reproduction Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53045		8	6.521	3.656	9.386	7	0	10.5	1.211	52.55%	19.29%
53046	RS	8	8.079	5.489	10.67	7.4	4.667	14.5	1.095	38.35%	0.00%

42d Reproduction Detail

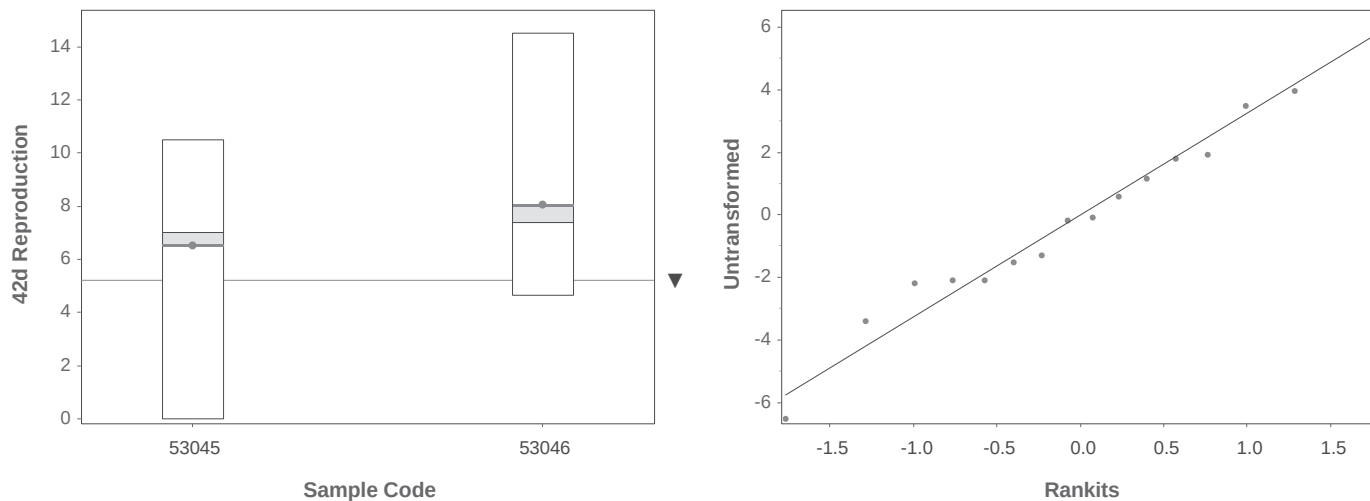
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53045		0	7.667	8.333	5	6.333	10.5	4.333	10
53046	RS	10	6	14.5	4.667	8.667	8	6	6.8

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test

Aquatec Environmental, Inc.

Analysis ID:	06-0529-3498	Endpoint:	42d Reproduction	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 13:51	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 13:59	MD5 Hash:	9DBD617F2D2B91BAB961DD19A2CD32C3	Editor ID:	

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Report Date: 07 Mar-22 12:04 (p 85 of 96)
 Test Code/ID: 16245 REF 1 / 14-4995-1919

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test **Aquatec Environmental, Inc.**

Analysis ID:	04-9460-1552	Endpoint:	42d Survival Rate	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 13:50	Analysis:	Nonparametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 13:59	MD5 Hash:	13DBFB3CD8DEEC2B56DE561751AC6BE	Editor ID:	
Batch ID:	14-5191-3028	Test Type:	Hyalella (42d)	Analyst:	C. Mattheus Ayers
Start Date:	06 Jan-22 15:25	Protocol:	EPA/600/R-99/064 (2000)	Diluent:	Reconstituted Water
Ending Date:	17 Feb-22 12:00	Species:	Hyalella azteca	Brine:	
Test Length:	41d 21h	Taxon:	Malacostraca	Source:	Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53040	16-3107-9284	04 Jan-22 07:00	04 Jan-22 08:00	56h	Aquatec Environmental, Inc	Sediment Testing
53046	12-3611-8332	21 Dec-21 15:54	21 Dec-21 20:00	16d (0.3 °C)	Woods Hole Group	

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53040	Control Sediment	Internal Laboratory Testing	Control	
53046	Reference sediment	Belmont Landfill	TOX-6	

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	53040 passed 42d survival rate endpoint	25.57%

Wilcoxon Rank Sum Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	Ties	P-Type	P-Value	Decision(α:5%)
Reference Sed		53040	14	63	---	3	Exact	0.3057	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0794244	0.0794244	1	0.8306	0.3775	Non-Significant Effect
Error	1.33878	0.0956272	14			
Total	1.4182		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	10.6	8.885	0.0059	Unequal Variances
Distribution	Shapiro-Wilk W Normality Test	0.8117	0.8408	0.0039	Non-Normal Distribution

42d Survival Rate Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040		8	0.7375	0.4587	1.0000	0.8000	0.0000	1.0000	0.1179	45.23%	14.49%
53046	RS	8	0.8625	0.7859	0.9391	0.9000	0.7000	1.0000	0.0324	10.62%	0.00%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53040		8	1.0610	0.7113	1.4100	1.1070	0.1588	1.4120	0.1478	39.41%	11.73%
53046	RS	8	1.2020	1.0940	1.3090	1.2490	0.9912	1.4120	0.0454	10.68%	0.00%

42d Survival Rate Detail

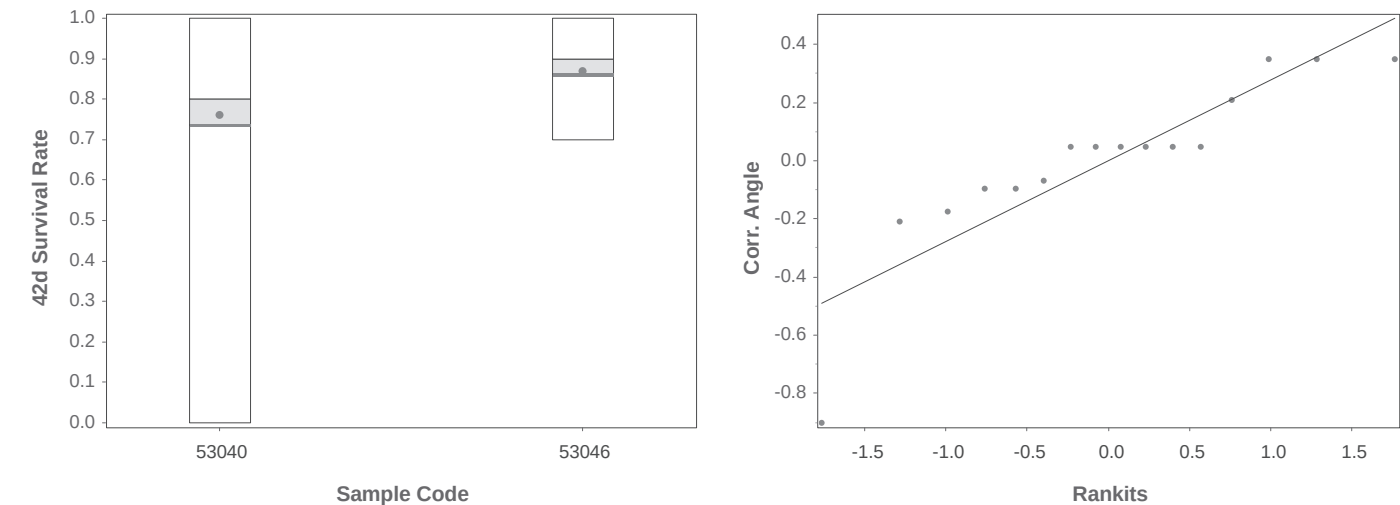
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040		0.6000	1.0000	1.0000	0.0000	1.0000	0.8000	0.7000	0.8000
53046	RS	0.9000	1.0000	0.7000	0.8000	0.9000	0.8000	0.9000	0.9000

Angular (Corrected) Transformed Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53040		0.8861	1.4120	1.4120	0.1588	1.4120	1.1070	0.9912	1.1070
53046	RS	1.2490	1.4120	0.9912	1.1070	1.2490	1.1070	1.2490	1.2490

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test			Aquatec Environmental, Inc.	
Analysis ID:	04-9460-1552	Endpoint:	42d Survival Rate	CETIS Version: CETISv2.1.1
Analyzed:	06 Mar-22 13:50	Analysis:	Nonparametric-Two Sample	Status Level: 1
Edit Date:	04 Mar-22 13:59	MD5 Hash:	13DBFB3CD8DEEC2B56DE561751AC6BE	Editor ID:

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CETIS Analytical Report

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 Test Code/ID: 16245 REF 1 / 14-4995-1919

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test **Aquatec Environmental, Inc.**

Analysis ID:	15-8957-9405	Endpoint:	42d Survival Rate	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 13:50	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 13:59	MD5 Hash:	2E41A4517A9B223A77EBF64003B9A09E	Editor ID:	
Batch ID:	14-5191-3028	Test Type:	Hyalella (42d)	Analyst:	C. Mattheus Ayers
Start Date:	06 Jan-22 15:25	Protocol:	EPA/600/R-99/064 (2000)	Diluent:	Reconstituted Water
Ending Date:	17 Feb-22 12:00	Species:	Hyalella azteca	Brine:	
Test Length:	41d 21h	Taxon:	Malacostraca	Source:	Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53041	03-8171-1181	21 Dec-21 09:05	21 Dec-21 20:00	16d 6h (0.3 °C)	Woods Hole Group	Sediment Testing
53046	12-3611-8332	21 Dec-21 15:54	21 Dec-21 20:00	16d (0.3 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53041	Sediment	Belmont Landfill	TOX-4	
53046	Reference sediment	Belmont Landfill	TOX-6	

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	53041 failed 42d survival rate endpoint	15.29%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Reference Sed		53041*	14	1.956	1.761	0.1766	CDF	0.0353	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.153905	0.153905	1	3.827	0.0707	Non-Significant Effect
Error	0.562979	0.0402128	14			
Total	0.716883		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	3.878	8.885	0.0944	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.8851	0.8408	0.0467	Normal Distribution

42d Survival Rate Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53041		8	0.7000	0.5104	0.8896	0.7500	0.2000	0.9000	0.0802	32.40%	18.84%
53046	RS	8	0.8625	0.7859	0.9391	0.9000	0.7000	1.0000	0.0324	10.62%	0.00%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53041		8	1.0060	0.7942	1.2170	1.0490	0.4636	1.2490	0.0894	25.15%	16.32%
53046	RS	8	1.2020	1.0940	1.3090	1.2490	0.9912	1.4120	0.0454	10.68%	0.00%

42d Survival Rate Detail

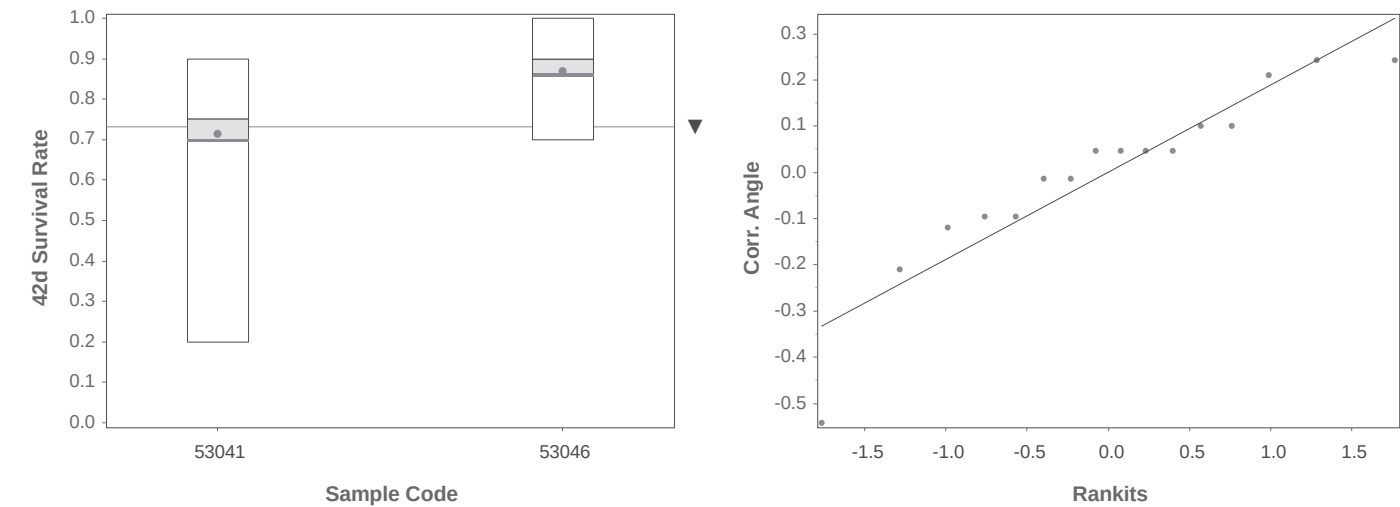
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53041		0.9000	0.8000	0.8000	0.7000	0.7000	0.6000	0.2000	0.9000
53046	RS	0.9000	1.0000	0.7000	0.8000	0.9000	0.8000	0.9000	0.9000

Angular (Corrected) Transformed Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53041		1.2490	1.1070	1.1070	0.9912	0.9912	0.8861	0.4636	1.2490
53046	RS	1.2490	1.4120	0.9912	1.1070	1.2490	1.1070	1.2490	1.2490

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test			Aquatec Environmental, Inc.	
Analysis ID:	15-8957-9405	Endpoint:	42d Survival Rate	CETIS Version: CETISv2.1.1
Analyzed:	06 Mar-22 13:50	Analysis:	Parametric-Two Sample	Status Level: 1
Edit Date:	04 Mar-22 13:59	MD5 Hash:	2E41A4517A9B223A77EBF64003B9A09E	Editor ID:

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 Test Code/ID: 16245 REF 1 / 14-4995-1919

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test **Aquatec Environmental, Inc.**

Analysis ID:	05-0947-5562	Endpoint:	42d Survival Rate	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 13:50	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 13:59	MD5 Hash:	DC799CA500DCAF1A36051DDCBF005707	Editor ID:	
Batch ID:	14-5191-3028	Test Type:	Hyalella (42d)	Analyst:	C. Mattheus Ayers
Start Date:	06 Jan-22 15:25	Protocol:	EPA/600/R-99/064 (2000)	Diluent:	Reconstituted Water
Ending Date:	17 Feb-22 12:00	Species:	Hyalella azteca	Brine:	
Test Length:	41d 21h	Taxon:	Malacostraca	Source:	Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53042	04-7178-2695	21 Dec-21 13:38	21 Dec-21 20:00	16d 2h (0.6 °C)	Woods Hole Group	Sediment Testing
53046	12-3611-8332	21 Dec-21 15:54	21 Dec-21 20:00	16d (0.3 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53042	Sediment	Belmont Landfill	TOX-1	
53046	Reference sediment	Belmont Landfill	TOX-6	

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	53042 failed 42d survival rate endpoint	20.13%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Reference Sed		53042*	14	2.303	1.761	0.2226	CDF	0.0186	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.33884	0.33884	1	5.304	0.0371	Significant Effect
Error	0.894317	0.0638798	14			
Total	1.23316		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	6.749	8.885	0.0221	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9429	0.8408	0.3860	Normal Distribution

42d Survival Rate Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53042		8	0.6125	0.3660	0.8590	0.7333	0.1000	0.9000	0.1043	48.15%	28.99%
53046	RS	8	0.8625	0.7859	0.9391	0.9000	0.7000	1.0000	0.0324	10.62%	0.00%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53042		8	0.9107	0.6318	1.1900	1.0330	0.3218	1.2490	0.1179	36.63%	24.22%
53046	RS	8	1.2020	1.0940	1.3090	1.2490	0.9912	1.4120	0.0454	10.68%	0.00%

42d Survival Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53042		0.6000	0.8000	0.5000	0.1000	0.8000	0.9000	0.9000	0.3000
53046	RS	0.9000	1.0000	0.7000	0.8000	0.9000	0.8000	0.9000	0.9000

Angular (Corrected) Transformed Detail

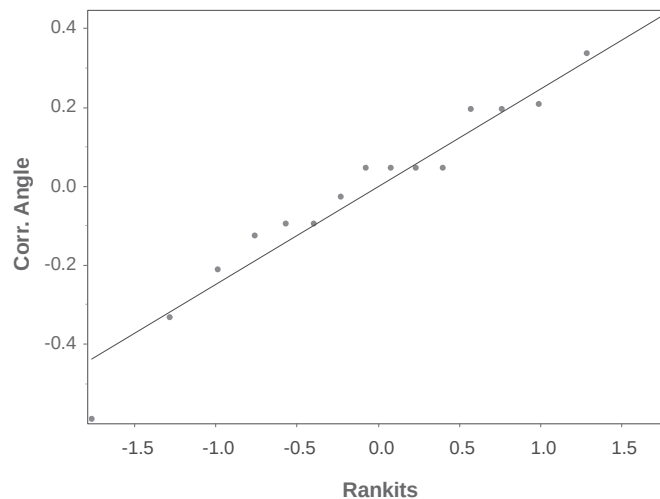
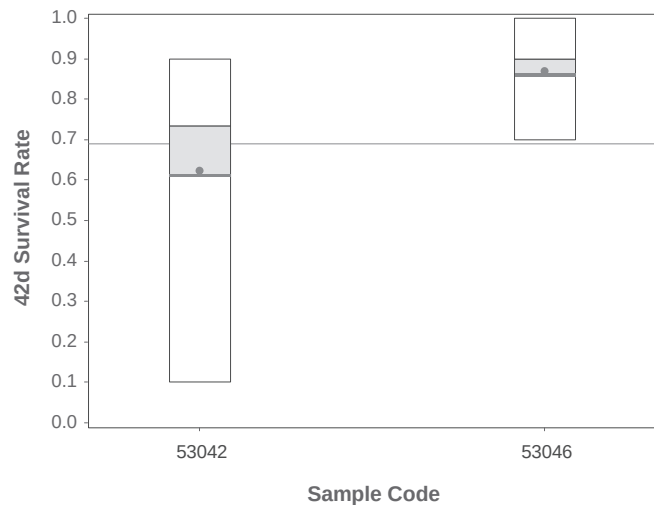
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53042		0.8861	1.1070	0.7854	0.3218	1.1070	1.2490	1.2490	0.5796
53046	RS	1.2490	1.4120	0.9912	1.1070	1.2490	1.1070	1.2490	1.2490

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test

Aquatec Environmental, Inc.

Analysis ID:	05-0947-5562	Endpoint:	42d Survival Rate	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 13:50	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 13:59	MD5 Hash:	DC799CA500DCAF1A36051DDCBF005707	Editor ID:	

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Hyalella 42-d Survival, Growth, and Reproduction Sediment Test **Aquatec Environmental, Inc.**

Analysis ID: 02-1495-6219	Endpoint: 42d Survival Rate	CETIS Version: CETISv2.1.1
Analyzed: 06 Mar-22 13:50	Analysis: Parametric-Two Sample	Status Level: 1
Edit Date: 04 Mar-22 13:59	MD5 Hash: 2BFD44A126B3CA705804E0D75784AAFF	Editor ID:
Batch ID: 14-5191-3028	Test Type: Hyalella (42d)	Analyst: C. Mattheus Ayers
Start Date: 06 Jan-22 15:25	Protocol: EPA/600/R-99/064 (2000)	Diluent: Reconstituted Water
Ending Date: 17 Feb-22 12:00	Species: Hyalella azteca	Brine:
Test Length: 41d 21h	Taxon: Malacostraca	Source: Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53043	20-0010-4712	21 Dec-21 12:35	21 Dec-21 20:00	16d 3h (0.6 °C)	Woods Hole Group	Sediment Testing
53046	12-3611-8332	21 Dec-21 15:54	21 Dec-21 20:00	16d (0.3 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53043	Sediment	Belmont Landfill	TOX-2	
53046	Reference sediment	Belmont Landfill	TOX-6	

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	53043 passed 42d survival rate endpoint	12.84%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Reference Sed		53043	14	-0.5916	1.761	0.1525	CDF	0.7182	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0104928	0.0104928	1	0.3499	0.5636	Non-Significant Effect
Error	0.419778	0.0299841	14			
Total	0.430271		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	2.637	8.885	0.2240	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9084	0.8408	0.1096	Normal Distribution

42d Survival Rate Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53043		8	0.8875	0.7577	1.0000	0.9667	0.6000	1.0000	0.0549	17.49%	-2.90%
53046	RS	8	0.8625	0.7859	0.9391	0.9000	0.7000	1.0000	0.0324	10.62%	0.00%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53043		8	1.2530	1.0790	1.4270	1.3580	0.8861	1.4120	0.0737	16.64%	-4.26%
53046	RS	8	1.2020	1.0940	1.3090	1.2490	0.9912	1.4120	0.0454	10.68%	0.00%

42d Survival Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53043		1.0000	0.9000	0.9000	1.0000	1.0000	0.7000	1.0000	0.6000
53046	RS	0.9000	1.0000	0.7000	0.8000	0.9000	0.8000	0.9000	0.9000

Angular (Corrected) Transformed Detail

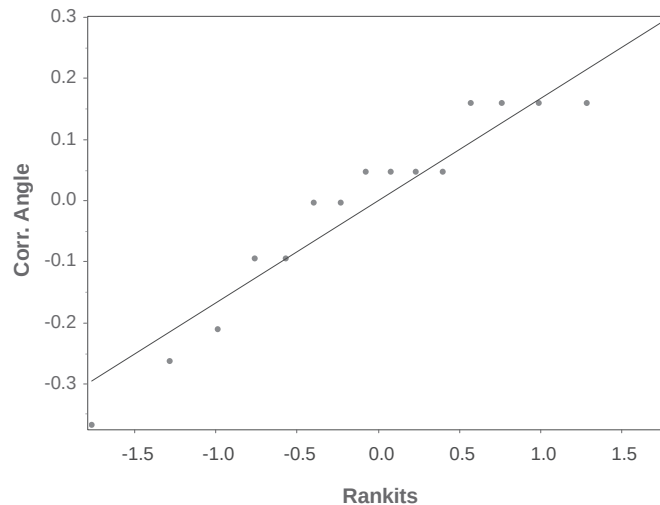
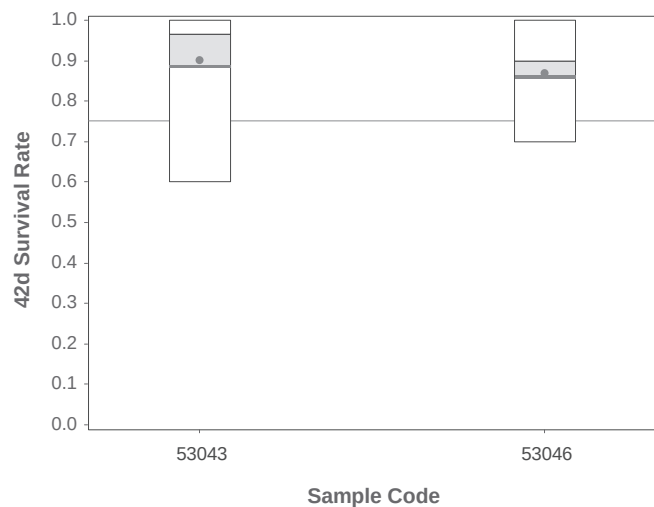
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53043		1.4120	1.2490	1.2490	1.4120	1.4120	0.9912	1.4120	0.8861
53046	RS	1.2490	1.4120	0.9912	1.1070	1.2490	1.1070	1.2490	1.2490

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test

Aquatec Environmental, Inc.

Analysis ID:	02-1495-6219	Endpoint:	42d Survival Rate	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 13:50	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 13:59	MD5 Hash:	2BFD44A126B3CA705804E0D75784AAFF	Editor ID:	

Graphics



CETIS Analytical Report

Report Date: 07 Mar-22 12:04 (p 93 of 96)
Test Code/ID: 16245 REF 1 / 14-4995-1919

Hyaella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID: 03-9540-2609	Endpoint: 42d Survival Rate	CETIS Version: CETISv2.1.1
Analyzed: 06 Mar-22 13:50	Analysis: Parametric-Two Sample	Status Level: 1
Edit Date: 04 Mar-22 13:59	MD5 Hash: F7CA51086A6AB79BA3489EBA30EF81C9	Editor ID:
Batch ID: 14-5191-3028	Test Type: Hyaella (42d)	Analyst: C. Mattheus Ayers
Start Date: 06 Jan-22 15:25	Protocol: EPA/600/R-99/064 (2000)	Diluent: Reconstituted Water
Ending Date: 17 Feb-22 12:00	Species: Hyaella azteca	Brine:
Test Length: 41d 21h	Taxon: Malacostraca	Source: Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53044	00-4677-6467	21 Dec-21 11:25	21 Dec-21 20:00	16d 4h (0.6 °C)	Woods Hole Group	Sediment Testing
53046	12-3611-8332	21 Dec-21 15:54	21 Dec-21 20:00	16d (0.3 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53044	Sediment	Belmont Landfill	TOX-3	
53046	Reference sediment	Belmont Landfill	TOX-6	

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	53044 passed 42d survival rate endpoint	9.08%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Reference Sed		53044	14	0.2738	1.761	0.1141	CDF	0.3941	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.00125842	0.00125842	1	0.07497	0.7882	Non-Significant Effect
Error	0.234999	0.0167856	14			
Total	0.236257		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.036	8.885	0.9637	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9244	0.8408	0.1983	Normal Distribution

42d Survival Rate Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53044		8	0.8500	0.7726	0.9274	0.8500	0.7000	1.0000	0.0327	10.89%	1.45%
53046	RS	8	0.8625	0.7859	0.9391	0.9000	0.7000	1.0000	0.0324	10.62%	0.00%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53044		8	1.1840	1.0750	1.2930	1.1780	0.9912	1.4120	0.0462	11.04%	1.48%
53046	RS	8	1.2020	1.0940	1.3090	1.2490	0.9912	1.4120	0.0454	10.68%	0.00%

42d Survival Rate Detail

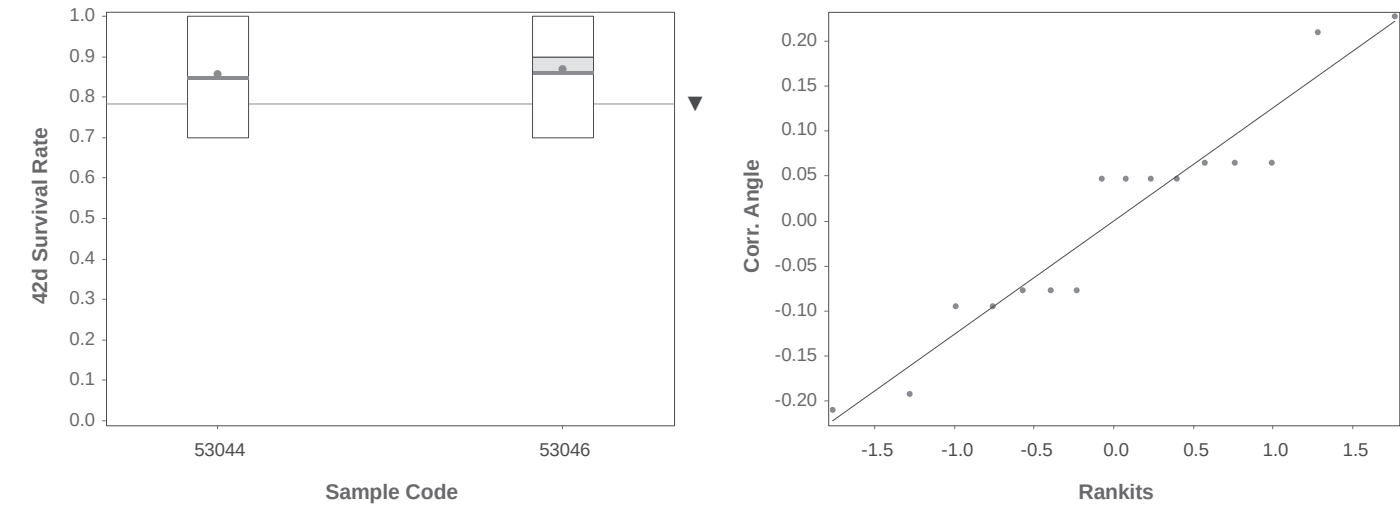
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53044		0.8000	1.0000	0.7000	0.8000	0.9000	0.8000	0.9000	0.9000
53046	RS	0.9000	1.0000	0.7000	0.8000	0.9000	0.8000	0.9000	0.9000

Angular (Corrected) Transformed Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53044		1.1070	1.4120	0.9912	1.1070	1.2490	1.1070	1.2490	1.2490
53046	RS	1.2490	1.4120	0.9912	1.1070	1.2490	1.1070	1.2490	1.2490

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test			Aquatec Environmental, Inc.	
Analysis ID:	03-9540-2609	Endpoint:	42d Survival Rate	CETIS Version: CETISv2.1.1
Analyzed:	06 Mar-22 13:50	Analysis:	Parametric-Two Sample	Status Level: 1
Edit Date:	04 Mar-22 13:59	MD5 Hash:	F7CA51086A6AB79BA3489EBA30EF81C9	Editor ID:

Graphics



CETIS Analytical Report

Report Date: 07 Mar-22 12:04 (p 95 of 96)
 Test Code/ID: 16245 REF 1 / 14-4995-1919

Hyaella 42-d Survival, Growth, and Reproduction Sediment Test Aquatec Environmental, Inc.

Analysis ID:	04-4480-2504	Endpoint:	42d Survival Rate	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 13:51	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 13:59	MD5 Hash:	342FBF74CDB2590112ED4EDF8A10F17A	Editor ID:	
Batch ID:	14-5191-3028	Test Type:	Hyaella (42d)	Analyst:	C. Mattheus Ayers
Start Date:	06 Jan-22 15:25	Protocol:	EPA/600/R-99/064 (2000)	Diluent:	Reconstituted Water
Ending Date:	17 Feb-22 12:00	Species:	Hyaella azteca	Brine:	
Test Length:	41d 21h	Taxon:	Malacostraca	Source:	Aquatic Research Organism Age: 8d

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
53045	13-5487-4433	21 Dec-21 14:22	21 Dec-21 20:00	16d 1h (0.3 °C)	Woods Hole Group	Sediment Testing
53046	12-3611-8332	21 Dec-21 15:54	21 Dec-21 20:00	16d (0.3 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
53045	Sediment	Belmont Landfill	TOX-5	
53046	Reference sediment	Belmont Landfill	TOX-6	

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	53045 passed 42d survival rate endpoint	13.07%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Reference Sed		53045	14	0.4276	1.761	0.1548	CDF	0.3377	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.00565043	0.00565043	1	0.1829	0.6754	Non-Significant Effect
Error	0.432576	0.0308983	14			
Total	0.438226		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	2.748	8.885	0.2057	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.952	0.8408	0.5213	Normal Distribution

42d Survival Rate Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53045		8	0.8250	0.6855	0.9645	0.8500	0.5000	1.0000	0.0590	20.23%	4.35%
53046	RS	8	0.8625	0.7859	0.9391	0.9000	0.7000	1.0000	0.0324	10.62%	0.00%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
53045		8	1.1640	0.9862	1.3420	1.1780	0.7854	1.4120	0.0753	18.29%	3.13%
53046	RS	8	1.2020	1.0940	1.3090	1.2490	0.9912	1.4120	0.0454	10.68%	0.00%

42d Survival Rate Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53045		0.7000	0.9000	1.0000	0.9000	1.0000	0.8000	0.8000	0.5000
53046	RS	0.9000	1.0000	0.7000	0.8000	0.9000	0.8000	0.9000	0.9000

Angular (Corrected) Transformed Detail

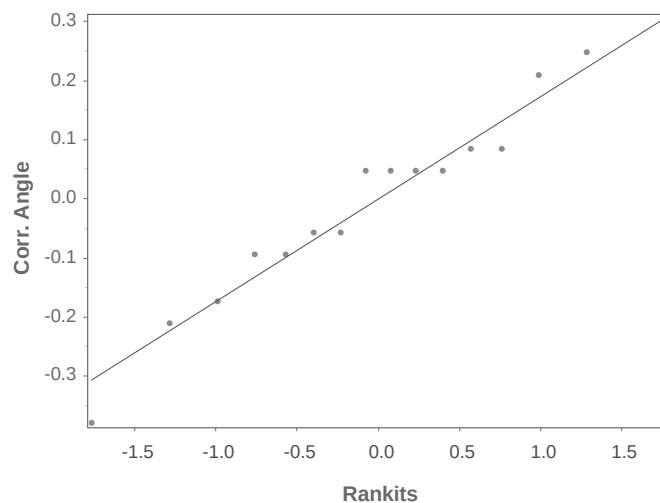
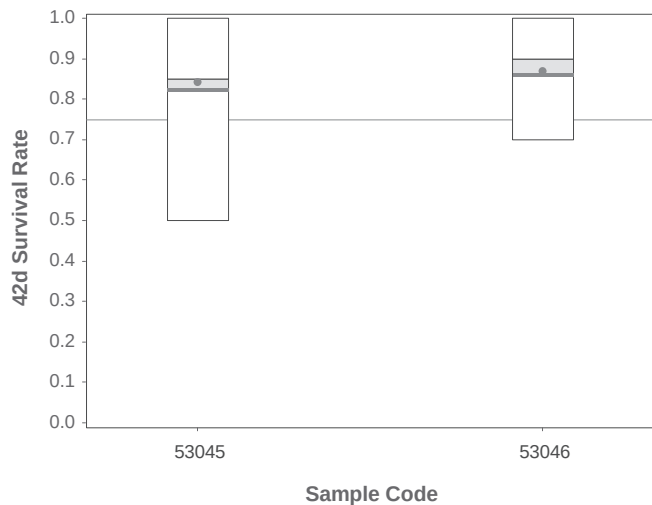
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
53045		0.9912	1.2490	1.4120	1.2490	1.4120	1.1070	1.1070	0.7854
53046	RS	1.2490	1.4120	0.9912	1.1070	1.2490	1.1070	1.2490	1.2490

Hyalella 42-d Survival, Growth, and Reproduction Sediment Test

Aquatec Environmental, Inc.

Analysis ID:	04-4480-2504	Endpoint:	42d Survival Rate	CETIS Version:	CETISv2.1.1
Analyzed:	06 Mar-22 13:51	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	04 Mar-22 13:59	MD5 Hash:	342FBF74CDB2590112ED4EDF8A10F17A	Editor ID:	

Graphics



Bench Sheets

- *SEDIMENT TEST DATA*
 - ♦ *28d Test End*
 - ♦ *42d Test End*
- *HYALELLA AZTECA*
 - ♦ *Organism History*
 - ♦ *Organism Holding & Acclimation*
- *TEST MONITORING*
 - ♦ *Temperature Chart(s)*
 - ♦ *Chemistry Monitoring*
 - ♦ *Daily Sediment Monitoring – Checklist*

100.4

Amphipod, *H. azteca*, 42-D Survival, Growth, and Reproduction TSpecies: *Hyalella azteca*

Reference: EPA/600/R-99/064

SOP: SED-A-003

Client ID: Woods Hole Group/Lavallee

SEDIMENT TEST DATA:

REP	NUMBER SURVIVING	INITIALS	QA RE-PICK	INITIALS	TOTAL SURVIVING	NUMBER WEIGHED	INITIAL WEIGHT (mg)	FINAL WEIGHT (mg)
53040 CTRL (Natural Sediment)								
I	8	CMS	-	CMS	8	8	19.80	22.75 ~~76 CMS~~
J	9	CMS	-	-	9	9	22.45	25.10
K	7	CMS	QXO ~~CMS~~	KP	7 ~~8~~	7	22.03	24.77
L	11	CMS	-	-	11	11	20.77	24.42
53041 TOX - 4								
I	9	CMS	-	-	9	9	20.29	22.89
J	10	CMS	-	-	10	10	18.53	21.88
K	9	CMS	-	-	9	9	21.90	24.88
L	9	CMS	-	-	9	9	19.75	22.92
53042 TOX - 1								
I	10	CMS	-	-	10	10	21.03	23.77
J	9	CMS	-	-	9	9	20.02	22.85
K	9	CMS	-	-	9	9	19.81	22.65
L	9	CMS	-	-	9	9	20.17	22.86
53043 TOX - 2								
I	10	CMS	-	-	10	10	20.01	23.29
J	10	CMS	-	-	10	10	19.88	23.28
K	10	CMS	-	-	10	10	20.93	24.10
L	10	CMS	-	-	10	10	20.83	24.62
53044 TOX - 3								
I	10	CMS	-	-	10	10	19.93	22.84
J	8	CMS	-	-	8	8	21.10	24.15
K	10	CMS	-	-	10	10	20.08	23.01
L	8	CMS	-	-	8	8	20.14	22.50
53045 TOX - 5								
I	9	CMS	-	-	9	9	19.57	24.10
J	10	CMS	-	-	10	10	19.45	23.84
K	8	CMS	-	-	8	8	20.53	24.64
L	10	CMS	-	-	10	10	20.08 ~~20.08~~	25.32
53046 TOX - 6								
I	10	CMS	-	-	10	10	19.24	24.53
J	10	CMS	-	-	10	10	19.82	25.22
K	10	CMS	-	-	10	10	21.23	26.97
L	10	CMS	-	-	10	10	19.52	24.58

① AA recording error

② Repick 53040 K 7 surviving. I accidentally transferred CMS 2/3/22

1 of 2

Aquatec Environmental, Inc.
Reviewed by: 46 Date: 2/24/22SDG: 16245
Project: 21055

100.4

Amphipod, *H. azteca*, 42-D Survival, Growth, and Reproduction TSpecies: *Hyalella azteca*

Reference: EPA/600/R-99/064

SOP: SED-A-003

Client ID: Woods Hole Group/Lavallee

SEDIMENT TEST DATA:

REP	NUMBER SURVIVING	INITIALS	QA RE-PICK	INITIALS	TOTAL SURVIVING	NUMBER WEIGHED	INITIAL WEIGHT (mg)	FINAL WEIGHT (mg)
NOTES: Test end @ 12:00							Date/Init (Initial Weights): 1/29/22 AA	
							IN (Date/Time/Temp/Init): KP 2/3/22 1340 70°	
							OUT (Date/Time/Temp/Init): 2/4/22 09:25 70°C AA	

100.4

Amphipod, *H. azteca*, 42-D Survival, Growth, and Reproduction TSpecies: *Hyalella azteca*

Reference: EPA/600/R-99/064

SOP: SED-A-003

Client ID: Woods Hole Group/Lavallee

SEDIMENT TEST DATA:

Sample Number

Day 28 (2/3/22)

Day 35 (2/10/22)

Day 42 (2/17/22)

REP	Surv.	Initials	Surv.	Young	Initials	Surv.	Young	Initials	M	F	Number Weighed	Initial Weight	Final Weight
53040 CTRL													
A	9	KP	7	13	CMS	6	13	KP	2	4	6	21.89	25.85
B	10	KP	10	14	CMS	10	7	KP	3	7	10	20.95	26.08
C	10	KP	10	7	CMS	10	1	KP	8	2	10	16.86	21.74
D	0	KP/CMS	—	—	—	—	—	—	—	—	—	—	—
E	10	KP	10	3	CMS	10	30	CMS	42	98	10	18.97	23.36
F	10	KP	8	13	CMS	8	15	CMS	3	5	8	22.59	26.43
G	8	KP	8	4	KP	7	3	CMS	6	1	7	21.36	25.83
H	9	CMS	8	0	KP	8	0	CMS	5	3	8	16.51	20.78

* Lubricious present in quantity uncharacteristic to Ctrl.

53041 TOX - 4

① multiple copepods present													
A	10	KP	10	0	CMS	9	0	① KP	9	0	9	17.34	19.20
B	10	KP	9	4	CMS	8	0	KP	6	2	8	16.40	20.89
C	10	KP	10	3	CMS	8	0	KP	5	3	8	21.22	24.84
D	9	KP	9	7	CMS	7	3	KP	2	5	7	20.25	23.22
E	7	CMS/KP	7	5	KP	7	2	CMS	5	2	7	18.74	22.57
F	9	KP	9	0	KP	6	0	CMS	5	1	6	15.22	17.92
G	10	CMS	7	0	KP	2	0	CMS	2	0	2	18.87	19.33
H	10	CMS	10	7	KP	9	5	CMS	5	4	9	22.75	27.58

53042 TOX - 1

A	7	KP/CMS	7	0	CMS	6	4	KP	4	2	6	21.71	25.70
B	8	KP	8	13	CMS	8	8	KP	2	6	8	21.01	25.88
C	9	KP	8	0	CMS	5	0	KP	5	0	5	20.09	21.53
D	7	KP/CMS	4	0	CMS	1	0	KP	1	0	1	21.07	21.81
E	8	KP	8	9	KP	8	14	CMS	4	4	8	19.84	24.74
F	9	CMS	9	0	KP	9	4	CMS	5	4	9	19.07	23.66
G	9	CMS	9	0	KP	9	0	CMS	0	9	9	20.07	24.94
H	6	CMS/KP	6	0	KP	3	0	CMS	3	0	3	19.40	20.59

53043 TOX - 2

A	10	KP	10	11	CMS	10	10	KP	2	2	10	19.88	25.91
B	10	KP	10	0	CMS	9	6	KP	6	3	9	16.15	21.48
C	9	KP	9	5	CMS	9	0	KP	7	2	9	19.50	24.68
D	10	KP	10	12	CMS	10	21	KP	4	6	10	19.74	25.54
E	10	KP	10	0	KP	10	14	CMS	3	7	10	19.02	24.32
F	7	CMS/KP	7	2	KP	7	7	CMS	4	3	7	20.94	25.50
G	10	CMS	10	2	KP	10	7	CMS	6	4	10	19.57	25.05
H	9	CMS	6	6	KP	6	22	CMS	3	3	6	19.19	22.68

1 of 2

Aquatec Environmental, Inc.
Reviewed by: CMS Date: 2/18/22

338

SDG: 16245
Project 21055

100.4

Amphipod, *H. azteca*, 42-D Survival, Growth, and Reproduction TSpecies: *Hyalella azteca*

Reference: EPA/600/R-99/064

SOP: SED-A-003

Client ID: Woods Hole Group/Lavallee

SEDIMENT TEST DATA:

Sample Number

Day 28 (2/3/22)			Day 35 (2/10/22)			Day 42 (2/17/22)					Number	Initial	Final
REP	Surv.	Initials	Surv.	Young	Initials	Surv.	Young	Initials	M	F	Weighed	Weight	Weight
53044 TOX - 3													
A	9	KP	9	8	CMS	8	1	KP	5	3	8	21.18	26.26
B	10	KP	10	4	CMS	16	23	KP	5	5	10	19.61	24.23
C	10	KP	9	0	CMS	7	4	KP	6	1	7	20.10	24.40
D	9	KP	9	9	CMS	8	1	KP	6	2	8	22.01	25.62
E	10	KP	9	0	KP	9	14	CMS	6	3	9	21.03	23.46
F	10	KP	8	14	KP	8	12	CMS	4	4	8	17.00	21.49
G	9	CMS	9	8	KP	9	5	CMS	6	3	9	20.57	25.38
H	10	CMS	9	11	KP	9	12	CMS	4	5	9	22.29	27.07
53045 TOX - 5													
A	10	KP	8	0	CMS	7	0	KP	6	1	7	20.13	24.75
B	9	KP	9	13	CMS	9	33	KP	3	6	9	20.41	25.29
C	10	KP	10	17	CMS	10	8	KP	7	3	10	20.65	27.20
D	10	KP	9	18	CMS	9	7	KP	4	5	9	20.46	27.19
E	10	KP	10	23	KP	10	15	CMS	4	6	10	20.90	26.55
F	9	KP	8	4	KP	8	17	CMS	2	2	8	19.88	25.14
G	8	CMS	8	3	KP	8	10	CMS	5	3	8	19.95	24.03
H	10	CMS	8	0	KP	5	10	CMS	5	0	5	19.66	21.36
53046 TOX - 6													
A	9	KP	9	15	CMS	9	45	KP	3	6	9	20.44	26.50
B	10	KP	10	4	CMS	10	20	KP	6	4	10	19.40	26.20
C	9	KP	9	16	CMS	7	13	KP	5	2	7	19.45	24.43
D	9	KP	8	0	CMS	8	14	KP	5	3	8	20.34	25.82
E	10	KP	10	8	KP	9	18	CMS	6	3	9	20.25	26.37
F	10	CMS	10	9	KP	8	15	CMS	5	3	8	20.13	25.13
G	9	CMS	9	16	KP	9	8	CMS	5	4	9	20.01	25.13
H	10	CMS	10	2	KP	9	32	CMS	4	5	9	19.54	25.06

NOTES: ISKL done @ 12:00 A-H counted + transferred to water only @ 12:00 CMS+KP. (2) No females on Day 42 but scored as "1" because neonates were previously produced.

① Recording error EB 2/17/22 CMS 2/28/22

Date/Init (Initial Weights):
02/10/22 AA

IN (Date/Time/Temp/Init):
2/17/22 13:35 88° EB

OUT (Date/Time/Temp/Init):
2/18/22 16:25 90° CMS

placed in desiccator
CMS 2/18/22
weighed 2/28/22
CMS

Note: The delay in measuring final weights resulted from a failure of the 0.001mg Mettler balance. A new Ohaus balance was purchased to complete the Day 42 Final Weights.



Aquatic Research Organisms

DATA SHEET

I. Organism History

Species Hyalella azteca
Source: Lab reared ☒ Hatchery reared _____ Field collected _____
Hatch date 12/29/21 Receipt date _____
Lot number 12 29 21 HA Strain A20
Brood origination US FWS MO

Organisms Received:

Date: 1/5/22
Time: 12:30
Initials: JW
Temperature: 17.3 °C
Condition: Normal
Conductivity: 420 µS
Salinity: N/A ‰
DO: 7.5 mg/L
pH: 7.2
Action: Add Recon.
Fed YCT

II. Water Quality

Temperature 24 °C Salinity — ppt D.O. 8.5 ppm
pH 7.4 su Hardness ~120 ppm Alkalinity ~140 ppm

III. Culture Conditions

Freshwater ☒ Saltwater _____ Other _____
Recirculating _____ Flow through _____ Static renewal ☒
DIET: Flake food ☒ Phytoplankton _____ Trout chow ☒
Artemia _____ Rotifers _____ YCT _____ Other _____

Prophylactic treatments: _____

Comments: _____

IV. Shipping Information

Client: Aquatic VT # of Organisms 900+
Carrier: Seel Date shipped 1/4/22
Biologist: [Signature]



Aquatec Environmental, Inc.

273 Commerce Street
Williston, VT 05495
Tel: (802) 860 - 2960

Woods Hole Group
107 Waterhouse Road

Tel: (802) 495-6224
E-Mail: klavallee@woodsholegroup.com

Bourne, MA 02532

Client ID: Woods Hole Group/Lavallee

ORGANISM HOLDING AND ACCLIMATION

Species: Hyaella azteca
Supplier: Agustic Research Organisms
Condition: Normal

Date Received: 01/05/22
Age of Organism: 7 days Hatch 12/29/21
Culture ID: 122921 HA

Acclimation / Holding Procedures: Transfer to holding culture boxes, add laboratory water. Acclimate to water to be used for testing (sediment overlying water formulation). Aerate lightly. Water change at least once (50 %) every two days.

Daily Feeding: YCT (Lot #: 120921), 6-10mL. Do not allow excess food to accumulate.

Date	Fed	Temp.	pH	D.O.	Cond.	Condition	Water Change	Initials
<u>01/05/22</u>	<u>YCT</u>	<u>21.2/21.2</u>	<u>7.2</u>	<u>7.5</u>	<u>420 µS</u>	<u>Normal</u>	<u>Addel Recon</u>	<u>EB</u>
<u> / / </u>								
<u> / / </u>								
<u> / / </u>								
<u> / / </u>								

N = Normal, appear healthy. Record # dead if any observed.

Hyaella azteca Initial Dry Weight

Replicate	No. of Org. weighed	Initial Pan weight (mg)	Final Pan weight (mg)	Initial Average wt. (mg)
1	10	<u>22.61</u>	<u>22.20</u>	<u>0.019</u>
2	10	<u>19.72</u>	<u>19.95</u>	<u>0.023</u>
3	10	<u>20.49</u>	<u>20.65</u>	<u>0.016</u>
4	10	<u>20.04</u>	<u>20.25</u>	<u>0.021</u>
5	10	<u>19.93</u>	<u>20.13</u>	<u>0.020</u>
6	10	<u>17.71</u>	<u>17.89</u>	<u>0.018</u>
7	10	<u>18.68</u>	<u>18.89</u>	<u>0.021</u>
8	10	<u>18.53</u>	<u>18.68</u>	<u>0.015</u>
Initials		<u>EB</u>	<u>EB</u>	<u>CM</u>
Date		<u>1/6/22</u>	<u>1/7/22</u>	<u>2/17/22</u>

IN/OUT of Oven:

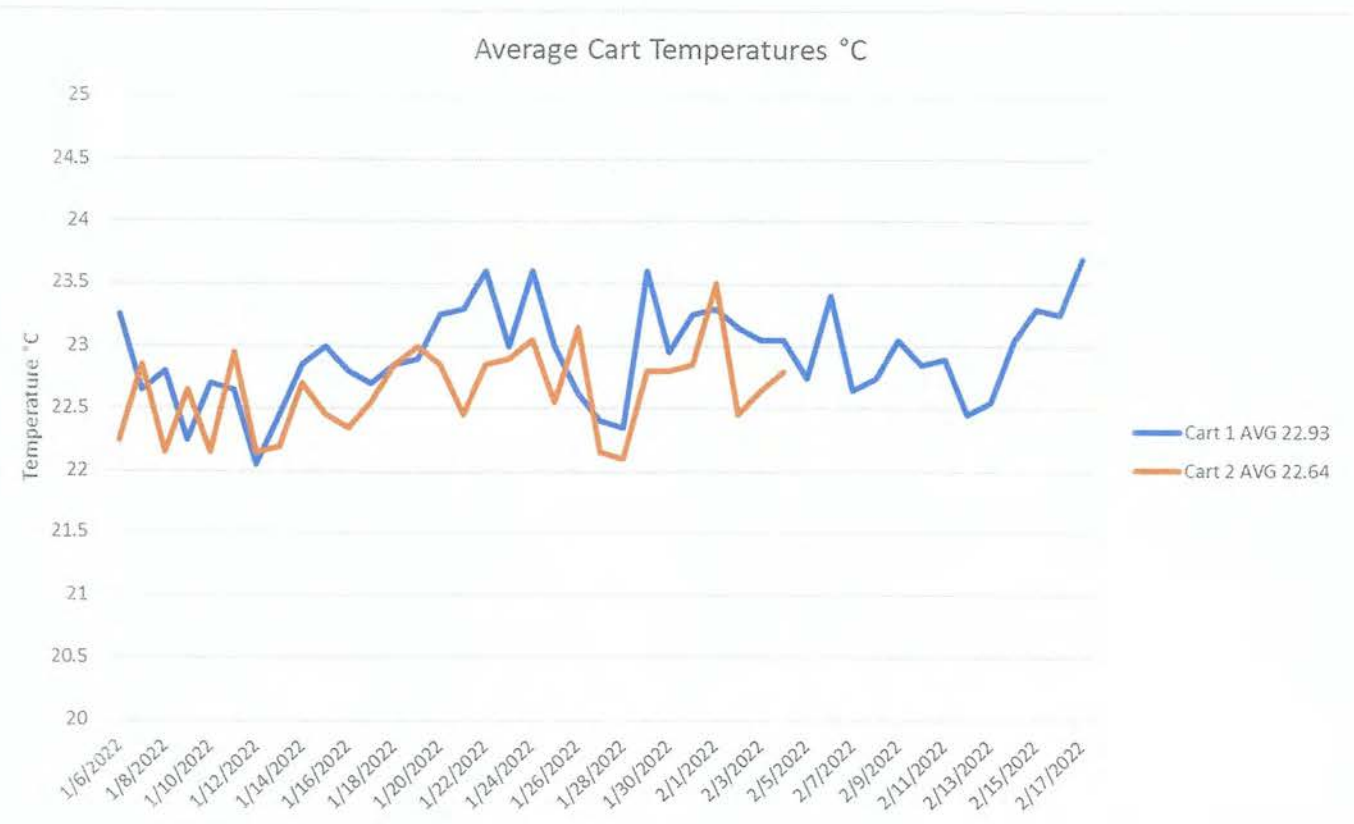
IN: Date/Time/Initials/Temp.
01/06/22/15:47/EB/85°C

OUT: Date/Time/Initials/Temp.
01/07/22/1000/EB/86°C

Aquatec Environmental, Inc.

Reviewed by: CM Date: 2/17/22

SDG: 16245
Project: 21055



Client ID: Woods Hole Group/Lavallee

CHEMISTRY MONITORING:

Page: 1 of 1

Sample	Analysis	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
53040 CTRL	pH	6.9	7.7			7.2		7.2		7.1			7.1		7.2		7.4
	DO (mg/L)	6.1	6.1			6.5		6.2		5.7			6.1		6.3		7.0
	Cond. (µS)	309	-			305							277		298		
53041 TOX - 4	pH	6.9	7.6			7.1		7.2		7.1			7.1		7.2		7.4
	DO (mg/L)	7.1	7.2			6.9		6.3		5.4			5.9		6.5		7.1
	Cond. (µS)	376	-			331							278				
53042 TOX - 1	pH	6.9	7.6			7.2		7.3		7.0			7.1		7.2		7.4
	DO (mg/L)	6.6	6.7			7.0		6.4		5.2			5.3		6.5		7.0
	Cond. (µS)	434	-			357							286				
53043 TOX - 2	pH	7.0	7.6			7.2		7.2		7.1			7.2		7.3		7.4
	DO (mg/L)	7.0	7.1			6.9		6.5		5.9			5.6		6.8		7.0
	Cond. (µS)	398	-			320							279				
53044 TOX - 3	pH	7.0	7.6			7.2		7.2		7.1			7.2		7.2		7.3
	DO (mg/L)	7.0	6.8			7.1		6.9		5.8			5.7		6.6		6.9
	Cond. (µS)	371	-			306							265				
53045 TOX - 5	pH	6.9	7.6			7.2		7.2		7.0			7.1		7.3		7.4
	DO (mg/L)	6.4	6.5			7.3		6.7		5.0			5.1		6.5		7.0
	Cond. (µS)	425	-			342							285				
53046 TOX - 6	pH	7.0	7.6			7.2		7.2		7.1			7.1		7.2		7.5
	DO (mg/L)	6.4	6.4			7.1		6.4		4.8			5.2		6.0		6.7
	Cond. (µS)	395	-			346							270				
2022	Date	1/16	1/17/22			1/18		1/19		1/20			1/21		1/22		1/23
	Initials	RP	EB			CM		CM		RP			CM		CM		CM

① Data correction EB 1/17/22

Client ID: Woods Hole Group/Lavallee

CHEMISTRY MONITORING:

Page: 1 of 1

Sample	Analysis	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
53040 CTRL	pH			7.7		7.8		7.7			7.5		7.5		7.7		
	DO (mg/L)			6.5		6.6		6.2			6.0		5.9		6.6		
	Cond. (µS)			344							353		340				
53041 TOX - 4	pH			7.8		7.9		7.6			7.5		7.5		7.8		
	DO (mg/L)			6.8		6.8		6.3			6.0		6.6		6.7		
	Cond. (µS)			348							352		342				
53042 TOX - 1	pH			7.7		7.7		7.6			7.6		7.6		7.9		
	DO (mg/L)			6.9		6.9		6.2			5.9		6.3		6.6		
	Cond. (µS)			334							356		341				
53043 TOX - 2	pH			7.7		7.8		7.5			7.6		7.6		7.9		
	DO (mg/L)			6.9		6.9		6.4			5.8		6.0		6.6		
	Cond. (µS)			351							353		338				
53044 TOX - 3	pH			7.2		7.9		7.5			7.6		7.6		7.7		
	DO (mg/L)			6.8		6.8		6.8			5.7		6.1		6.7		
	Cond. (µS)			338							348		345				
53045 TOX - 5	pH			7.7		7.8		7.6			7.5		7.5		7.8		
	DO (mg/L)			6.6		6.7		6.7			5.6		6.0		6.8		
	Cond. (µS)			340							352		342				
53046 TOX - 6	pH			7.7		7.8		7.6			7.5		7.6		7.8		
	DO (mg/L)			6.7		6.7		6.8			5.5		6.0		6.7		
	Cond. (µS)			339							353		348				
2022	Date			1/24		1/26		1/28			1/31		2/2		2/4		
	Initials			CMS		CMS		CMS			CMS		CMS		CMS		

Chemical analysis Date/Initials are noted on last page of Days 16 - 31 chemistry data sheets

Aquatec Environmental, Inc.
 Reviewed by: CMS Date: 2/17/22.

SDG: 16245
 Project 21055

Client ID: Woods Hole Group/Lavallee

CHEMISTRY MONITORING:

Page: 1 of 1

Sample	Analysis	32	33	34	35	36	37	38	39	40	41	42
53040 CTRL	pH	7.8		7.7		7.5			7.7		7.6	
	DO (mg/L)	7.9		7.8		7.1			7.2		6.9	
	Cond. (µS)	354		311							299	
53041 TOX - 4	pH	7.8		7.8		7.4			7.8		7.5	
	DO (mg/L)	7.8		7.7		7.0			7.1		6.8	
	Cond. (µS)	346		316							298	
53042 TOX - 1	pH	7.8		7.7		7.5			7.7		7.5	
	DO (mg/L)	7.9		7.8		7.1			7.1		6.9	
	Cond. (µS)	346		318							298	
53043 TOX - 2	pH	7.8		7.7		7.4			7.7		7.5	
	DO (mg/L)	7.8		7.8		7.0			7.1		6.8	
	Cond. (µS)	348		321							300	
53044 TOX - 3	pH	7.7		7.8		7.4			7.7		7.5	
	DO (mg/L)	7.9		7.8		6.3			7.0		6.6	
	Cond. (µS)	350		319							300	
53045 TOX - 5	pH	7.8		7.7		7.4			7.7		7.5	
	DO (mg/L)	7.8		7.7		6.3			7.2		6.5	
	Cond. (µS)	351		321							303	
53046 TOX - 6	pH	7.8		7.7		7.4			7.8		7.5	
	DO (mg/L)	7.9		7.8		6.5			7.3		6.4	
	Cond. (µS)	360		321							299	
2022	Date	2/7		2/9		2/11			2/14		2/16	
	Initials	CMS		CMS		LR			CMS		CMS	

Chemical analysis Date/Initials are noted on last page of Days 32 - 42 chemistry data sheets

Aquatec Environmental, Inc.

Reviewed by: CMS Date: 2/17/22

100.4

Amphipod, H. azteca, 42-D Survival, Growth, and ReproductionSpecies: *Hyalella azteca*

Reference: EPA/600/R-99/064

SOP: SED-A-003

Client ID: Woods Hole Group/Lavallee

WEEK OF: 1/2/22

DAILY SEDIMENT MONITORING - CHECKLIST:

ACTIVITY / DAY

AM**SUNDAY****MONDAY****TUESDAY****WEDNESDAY****THURSDAY****FRIDAY****SATURDAY**

Temperature(s):					23.3 22.5	22.6 22.9	23.0 22.0
Delivery system in place					✓	✓	✓
Check water Supply					✓ 22	✓ 22	✓ 22
Empty Waste					✓	✓	✓
Floater/Aeration* Check					N/A	✓	✓
Chems Collected / ok?					✓	✓	—

NOON

Renewal flowing?					✓	✓	✓
Drainage to Waste?					✓	✓	✓
Feeding (Time/Init.) Lot #: 120921					1305 RP	12:30 CMZ	1250 RP

PM

Temperature(s):					23.2 22.0	22.7 22.8	22.6 22.3
Delivery system in place					ON/A	✓	✓
Check water Supply					✓ 22	✓ 22	✓ 22
Empty Waste					✓	✓	✓
Floater/Aeration* Check					✓	✓	✓

Date:				1/5/22	1/6/22	1/7/22	1/8/22
Initials:				OL	OL RP	RP	RP

SUNDAY**MONDAY****TUESDAY****WEDNESDAY****THURSDAY****FRIDAY****SATURDAY**

Corrective Actions / Comments (Initial/Time) * Aeration required if DO is below/reaching minimum DO				Sediments loaded into test beakers, OLLW Added. Set up in water bath.	TEST START 1525 RP ONO PM RENEWAL		

Aquatec Environmental, Inc.

Reviewed by: CMZ Date: 2/17/22

SDG: 16245

Project: 21055

100.4

Amphipod, H. azteca, 42-D Survival, Growth, and ReproductionSpecies: *Hyalella azteca*

Reference: EPA/600/R-99/064

SOP: SED-A-003

Client ID: Woods Hole Group/Lavallee

WEEK OF: 1/9/22

DAILY SEDIMENT MONITORING - CHECKLIST:

ACTIVITY / DAY

AM	SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
Temperature(s):	22.2 22.7	22.2 22.0	22.6 22.9	22.0 22.1	22.5 22.1	22.5 22.1	22.9 22.3
Delivery system in place	✓	✓	✓	✓	✓	✓	✓
Check water Supply	✓22	✓22	✓22	✓22	✓22	✓22	✓22
Empty Waste	✓	✓	✓	✓	✓	✓	✓
Floater/Aeration* Check	✓	✓	✓	✓	✓	✓	✓
Chems Collected / ok?	—	✓	—	✓	—	✓	—

NOON 1:1 Renewals

Renewal flowing?	✓	✓	✓	✓	✓	✓	✓
Drainage to Waste?	✓	✓	✓	✓	✓	✓	✓
Feeding (Time/Init.) Lot #: 120921	13:00	13:00 CMS	13:00 CMS	12:30 CMS	15:15 B	1325 RP	1550 RP

PM

Temperature(s):	22.3 22.6	23.2 22.3	22.7 23.0	22.1 22.2	22.4 22.3	23.2 23.3	23.1 22.6
Delivery system in place	✓	✓	✓	✓	✓	✓	✓
Check water Supply	✓22	✓22	22✓	✓22	22✓	22✓	22✓
Empty Waste	✓	✓	✓	✓	✓	✓	✓
Floater/Aeration* Check	✓	✓	✓	✓	✓	✓	✓

Date:	1/9/22	1/10/22	1/11/22	1/12/22	1/13/22	1/14/22	1/15/22
Initials:	CMS	CMS	RP/CMS	CMS	CMS	RP	RP

SUNDAY MONDAY TUESDAY WEDNESDAY THURSDAY FRIDAY SATURDAY

Corrective Actions / Comments (Initial/Time) * Aeration required if DO is below/reaching minimum DO	1:1 Rec/LR Renewal started. CMS						

Aquatec Environmental, Inc.

Reviewed by: CMS Date: 2/17/22

SDG: 16245

Project 21055

100.4

Amphipod, H. azteca, 42-D Survival, Growth, and ReproductionSpecies: *Hyalella azteca*

Reference: EPA/600/R-99/064

SOP: SED-A-003

Client ID: Woods Hole Group/Lavallee

WEEK OF: 1/16/22

DAILY SEDIMENT MONITORING - CHECKLIST:

ACTIVITY / DAY

AM	SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
Temperature(s):	23.3°C 22.6°C	23.0 22.9	22.9 23.0	22.4 23.2	23.2 22.8	22.9 22.6	23.9 23.2
Delivery system in place	✓	✓	✓	✓	✓	✓	✓
Check water Supply	✓	✓ 22	22 ✓	22 ✓	22 ✓	22 ✓	22 ✓
Empty Waste	✓	✓	✓	✓	✓	✓	✓
Floater/Aeration* Check	✓	✓	✓	✓	✓	✓	✓
Chems Collected / ok?	—	✓	—	✓	—	✓	—

NOON

Renewal flowing?	✓	✓	✓	✓	✓	✓	✓
Drainage to Waste?	✓	✓	✓	✓	✓	✓	✓
Feeding (Time/Init.) Lot #: 120921	17:35 JP	12:55 AA	13:15 CMJ	16:45 JW	12:00 CMJ	1305 KP	1450 KP

PM

Temperature(s):	22.3 22.1	22.4 22.2	22.8 22.7	23.4 22.8	23.3 22.9	23.7 22.3	23.3 22.5
Delivery system in place	✓	✓	✓	✓	✓	✓	✓
Check water Supply	✓ 22	✓ 22	✓	✓ 22	✓ 22	✓ 22	✓ 22
Empty Waste	✓	✓	✓	✓	✓	✓	✓
Floater/Aeration* Check	✓	✓	✓	✓	✓	✓	✓

Date:	1/16/22	1/17/22	1/18/22	1/19/22	1/20/22	1/21/22	1/22/22
Initials:	JG/JW	CMJ	CMJ	JW	CMJ	KP	KP

SUNDAY MONDAY TUESDAY WEDNESDAY THURSDAY FRIDAY SATURDAY

Corrective Actions / Comments (Initial/Time) * Aeration required if DO is below/reaching minimum DO							

Aquatec Environmental, Inc.

Reviewed by: CMJ Date: 2/17/22

SDG: 16245

Project 21055

100.4

Amphipod, *H. azteca*, 42-D Survival, Growth, and ReproductionSpecies: *Hyalella azteca*

Reference: EPA/600/R-99/064

SOP: SED-A-003

Client ID: Woods Hole Group/Lavallee

WEEK OF: 1/23/22

DAILY SEDIMENT MONITORING - CHECKLIST:

ACTIVITY / DAY

AM	SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
Temperature(s):	23.7 22.9	23.7 23.1	22.8 22.4	22.7 23.2	22.5 22.0	22.3 22.1	23.6 22.3
Delivery system in place	✓	✓	✓	✓	✓	✓	✓
Check water Supply	✓ 22	22 ✓	22 ✓	22	✓ 22	✓ 22	✓ 22
Empty Waste	✓	✓	✓	✓	✓	✓	✓
Floater/Aeration* Check	✓	✓	✓	✓	✓	✓	✓
Chems Collected / ok?	—	✓	—	✓	—	✓	—

NOON

Renewal flowing?	✓	✓	✓	✓	✓	✓	✓
Drainage to Waste?	✓	✓	✓	✓	✓	✓	✓
Feeding (Time/Init.)	12:30 AA	14:00 CMA	13:45 CMA	13:00 CMA	15:15 KP	15:25	14:30 KP
Lot #: 011322							

PM

Temperature(s):	22.3 22.9	23.5 23.0	23.2 22.7	22.5 23.1	22.3 22.3	22.4 22.1	23.6 23.3
Delivery system in place	✓	✓	✓	✓	✓	✓	✓
Check water Supply	✓ 22	22 ✓	22 ✓	22 ✓	22 ✓	22 ✓	✓ 22
Empty Waste	✓	✓	✓	✓	✓	✓	✓
Floater/Aeration* Check	✓	✓	✓	✓	✓	✓	✓

Date:	1/23/22	1/24/22	1/25/22	1/26/22	1/27/22	1/28/22	1/29/22
Initials:	AA	CMA	CMA	CMA	KP	CMA	KP

SUNDAY MONDAY TUESDAY WEDNESDAY THURSDAY FRIDAY SATURDAY

Corrective Actions / Comments (Initial/Time)							
* Aeration required if DO is below/reaching minimum DO							

100.4

Amphipod, H. azteca, 42-D Survival, Growth, and ReproductionSpecies: *Hyalella azteca*

Reference: EPA/600/R-99/064

SOP: SED-A-003

Client ID: Woods Hole Group/Lavallee

WEEK OF: 1/30/22

DAILY SEDIMENT MONITORING - CHECKLIST:

ACTIVITY / DAY

AM	SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
Temperature(s):	22.3°C 22.3°C	23.3 22.9	23.3 23.4	23.2 21.9	23.1 22.7	23.0 22.8	22.8
Delivery system in place	✓	✓	✓	✓	✓	✓	✓
Check water Supply	✓	✓ 22	22 ✓	22 ✓	✓ 22	✓ 22	✓
Empty Waste	✓	✓ 2	✓	✓	✓	✓	✓
Floater/Aeration* Check	✓	✓	✓	✓	✓	✓	✓
Chems Collected / ok?	—	✓	—	✓	—	✓	—

NOON

Manual @ 13:00

Renewal flowing?	✓	✓	✓	✓	✓	✓	✓
Drainage to Waste?	✓	✓	✓	✓	✓	✓	✓
Feeding (Time/Init.) Lot #: 011322	13:20 JG	12:15	13:20	13:30 CMA	13:15 CMA	14:20	13:20 KP

PM

Temperature(s):	23.6°C 23.3°C	23.2 22.8	23.3 23.6	23.1 23.0	23.0 22.6	23.1 ~~22.9°C~~ one cart	22.7
Delivery system in place	✓	✓	✓	✓	✓	✓	✓
Check water Supply	✓	✓ 20	✓ 22	✓	✓ 22	✓	✓ 22
Empty Waste	✓	✓	✓	✓	✓	✓	✓
Floater/Aeration* Check	✓	✓	✓	✓	✓	✓	✓

Date:	1/30/22	1/31/22	2/1/22	2/2/22	2/3/22	2/4/22	2/5/22
Initials:	JG	CMA	CMA/KP	CMA	KP/CMA	CMA	KP

SUNDAY MONDAY TUESDAY WEDNESDAY THURSDAY FRIDAY SATURDAY

Corrective Actions / Comments (Initial/Time) * Aeration required if DO is below/reaching minimum DO					Day 28 A-H removed sed for water only 42d Reproduction 1-L Test End 1200 KP/ CMA	Cart #2 turned off, all reps. onto one cart. CMA	

100.4

Amphipod, H. azteca, 42-D Survival, Growth, and ReproductionSpecies: *Hyalella azteca*

Reference: EPA/600/R-99/064

SOP: SED-A-003

Client ID: Woods Hole Group/Lavallee

WEEK OF: 2/6/22

DAILY SEDIMENT MONITORING - CHECKLIST:

ACTIVITY / DAY

AM	SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
Temperature(s):	23.8 2	22.7	22.8	22.7	22.7	23.0	22.1
Delivery system in place	✓	✓	✓	✓	✓	✓	✓
Check water Supply	✓ 22	✓ 22	✓ 22	✓ 20↑	✓ 22	✓ 22	✓ 22
Empty Waste	✓	✓	✓	✓	✓	✓	✓
Floater/Aeration* Check	✓	✓	✓	✓	✓	✓	✓
Chems Collected / ok?	—	✓	—	✓	—	✓	—

NOON

Renewal flowing?	✓	✓	✓	✓	✓	✓	✓
Drainage to Waste?	✓	✓	✓	✓	✓	✓	✓
Feeding (Time/Init.)	✓	✓	✓	✓	✓	✓	✓
Lot #: 011322	12:30 AA/00	14:00 CMA	14:00 CMA	13:00	13:00	13:30 KP	15:10 KP

PM

Temperature(s):	23.0	22.6	22.7	23.4	23.0	22.8	22.8
Delivery system in place	✓	✓	✓	✓	✓	✓	✓
Check water Supply	✓	22✓	✓ 22	✓ 22	✓ 22	✓ 22	✓ 22
Empty Waste	✓	✓	✓	✓	✓	✓	✓
Floater/Aeration* Check	✓	✓	✓	✓	✓	✓	✓

Date:	2/6/22	2/7/22	2/8/22	2/9/22	2/10/22	2/11/22	2/12/22
Initials:	CMA	CMA	VCM	EB	KP/CMA	KP	KP

SUNDAY MONDAY TUESDAY WEDNESDAY THURSDAY FRIDAY SATURDAY

Corrective Actions / Comments (Initial/Time)				New lot of River water, warmed before renewal. CMA	Day 35 Necate Counts 1050 KP/CMA		
* Aeration required if DO is below/reaching minimum DO							

100.4

Amphipod, H. azteca, 42-D Survival, Growth, and ReproductionSpecies: *Hyaletta azteca*

Reference: EPA/600/R-99/064

SOP: SED-A-003

Client ID: Woods Hole Group/Lavallee

WEEK OF: 2/13/22

DAILY SEDIMENT MONITORING - CHECKLIST:

ACTIVITY / DAY

AM

SUNDAY

MONDAY

TUESDAY

WEDNESDAY

THURSDAY

FRIDAY

SATURDAY

Temperature(s):	22.7	22.8	23.4	23.2	23.7		
Delivery system in place	✓	✓	✓	✓			
Check water Supply	✓	✓ 22	✓ 22	✓ 22			
Empty Waste	✓	✓	✓	✓			
Floater/Aeration* Check	✓	✓	✓	✓			
Chems Collected / ok?	—	✓	—	✓			

NOON

Renewal flowing?	✓	✓	✓	✓			
Drainage to Waste?	✓	✓	✓	✓			
Feeding (Time/Init.) Lot #: 011322	12:50 JG	12:15 CMA	13:30	13:00			

PM

Temperature(s):	22.4	23.3	23.2	23.3			
Delivery system in place	✓	✓	✓	✓			
Check water Supply	✓	✓ 22	✓ 22	✓ 22			
Empty Waste	✓	✓	✓	✓			
Floater/Aeration* Check	✓	✓	✓	✓			

Date:	2/13/22	2/14/22	2/15/22	2/16/22	2/17/22		
Initials:	JG	CMA	CMA	CMA	CMA		

*Transcribed

checked JG

SUNDAY

MONDAY

TUESDAY

WEDNESDAY

THURSDAY

FRIDAY

SATURDAY

Corrective Actions / Comments (Initial/Time) * Aeration required if DO is below/reaching minimum DO					Test End 2/12:00 Neonate Count + M/F determinations CMA KP		

Aquatec Environmental, Inc.

Reviewed by: CMA Date: 3/8/22

352

SDG: 16245

Project 21055

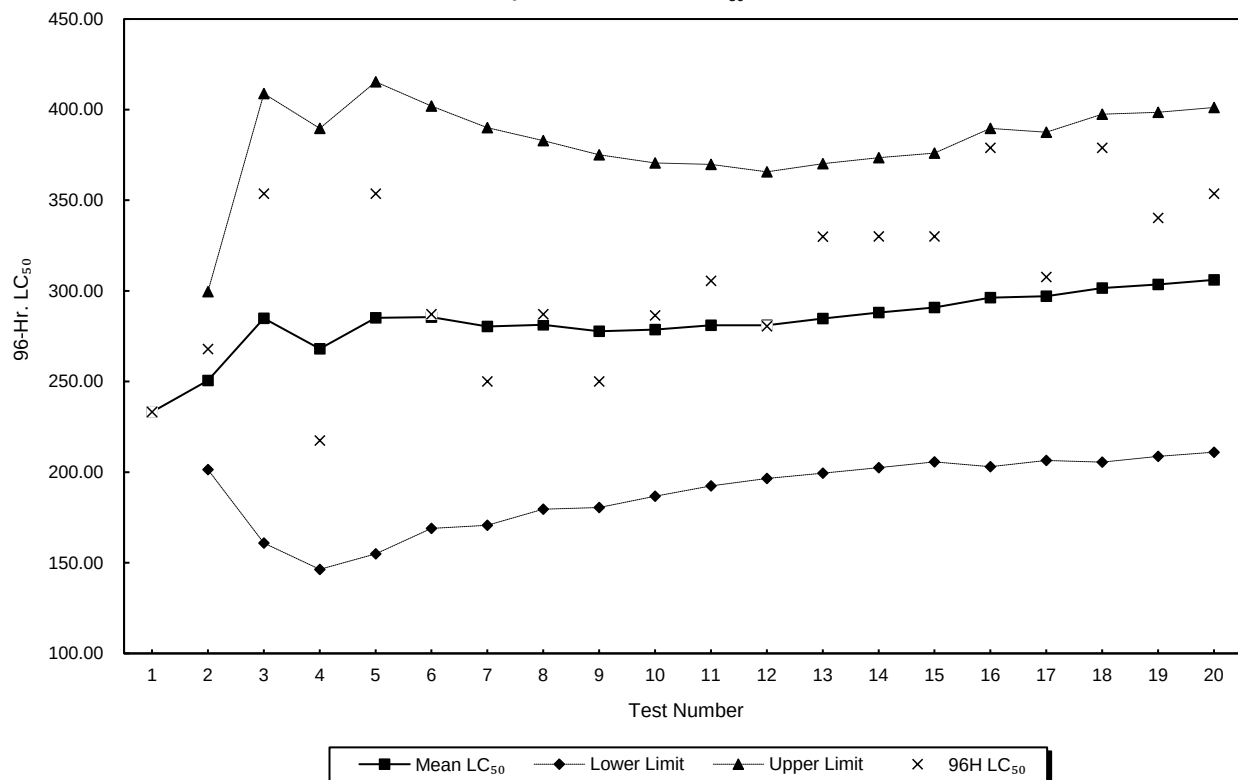
STANDARD REFERENCE TOXICANT CONTROL CHART

Reference Toxicant Control Chart
Hyaella azteca
in Potassium chloride (mg/L)

Test Number	Test Date	Organism Age (Days)	96H LC ₅₀	Mean LC ₅₀	Lower Limit	Upper Limit	Organism Source
1	6/1/18-6/5/18	7	233.200	233.20			Aquatic Research Organisms
2	6/6/18-6/10/18	7	267.900	250.55	201.48	299.62	Aquatic Research Organisms
3	8/1/18-8/5/18	8	353.600	284.90	160.95	408.85	Aquatic Research Organisms
4	3/20/19-3/24/19	8	217.400	268.03	146.38	389.67	Aquatic Research Organisms
5	4/3/19-4/7/19	8	353.600	285.14	154.92	415.36	Aquatic Research Organisms
6	7/31/19-8/4/19	8	287.200	285.48	169.00	401.97	Aquatic Research Organisms
7	12/20/19-12/24/19	8	250.000	280.41	170.75	390.08	Aquatic Research Organisms
8	3/13/20-3/17/20	13	287.200	281.26	179.62	382.91	Aquatic Research Organisms
9	3/19/20-3/23/20	8	250.000	277.79	180.45	375.13	Aquatic Research Organisms
10	4/22/20-4/26/20	8	286.500	278.66	186.72	370.60	Aquatic Research Organisms
11	5/6/20-5/10/20	8	305.500	281.10	192.39	369.81	Aquatic Research Organisms
12	8/26/20-8/30/20	8	280.500	281.05	196.47	365.63	Aquatic Research Organisms
13	9/29/20-10/3/20	7	329.900	284.81	199.42	370.20	Aquatic Research Organisms
14	4/28/21-5/2/21	13	330.000	288.04	202.51	373.56	Aquatic Research Organisms
15	4/29/21-5/3/21	8	330.000	290.83	205.62	376.05	Aquatic Research Organisms
16	10/7/21-10/11/21	8	378.900	296.34	202.98	389.70	Aquatic Research Organisms
17	10/22/21-10/26/21	11	307.700	297.01	206.44	387.57	Aquatic Research Organisms
18	11/19/21-11/23/21	8	378.900	301.56	205.59	397.52	Aquatic Research Organisms
19	12/1/21-12/5/21	8	340.200	303.59	208.65	398.52	Aquatic Research Organisms
20	12/22/21-12/26/21	8	353.600	306.09	211.02	401.16	Aquatic Research Organisms

Reference Control Chart

Hyaella azteca 96H LC₅₀





Appendix E



ANALYTICAL REPORT

Lab Number:	L2140340
Client:	Woods Hole Group 107 Waterhouse Road Bourne, MA 02532
ATTN:	Ted Wickwire
Phone:	(508) 495-6242
Project Name:	BELMONT LANDFILL
Project Number:	2018-0157
Report Date:	08/30/21

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Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0574), IL (200077), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #P330-17-00196).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com



Project Name: BELMONT LANDFILL

Project Number: 2018-0157

Lab Number: L2140340

Report Date: 08/30/21

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2140340-01	SOIL-3	SOIL	BELMONT, MA	07/27/21 09:20	07/27/21
L2140340-02	SED-1	SEDIMENT	BELMONT, MA	07/27/21 09:40	07/27/21
L2140340-03	SED-2	SEDIMENT	BELMONT, MA	07/27/21 10:35	07/27/21
L2140340-04	SOIL-5	SOIL	BELMONT, MA	07/27/21 10:42	07/27/21
L2140340-05	SOIL-6	SOIL	BELMONT, MA	07/27/21 13:10	07/27/21
L2140340-06	SED-7	SEDIMENT	BELMONT, MA	07/27/21 13:35	07/27/21
L2140340-07	SW-1	SURFACE WATER	BELMONT, MA	07/27/21 12:05	07/27/21
L2140340-08	SW-7	SURFACE WATER	BELMONT, MA	07/27/21 13:29	07/27/21
L2140340-09	SOIL-4	SOIL	BELMONT, MA	07/27/21 12:15	07/27/21
L2140340-10	SOIL-7-REP	SOIL	BELMONT, MA	07/27/21 14:02	07/27/21
L2140340-11	SOIL-7	SOIL	BELMONT, MA	07/27/21 13:55	07/27/21
L2140340-12	SOIL-8	SOIL	BELMONT, MA	07/27/21 14:40	07/27/21

Project Name: BELMONT LANDFILL

Lab Number: L2140340

Project Number: 2018-0157

Report Date: 08/30/21

MADEP MCP Response Action Analytical Report Certification

This form provides certifications for all samples performed by MCP methods. Please refer to the Sample Results and Container Information sections of this report for specification of MCP methods used for each analysis. The following questions pertain only to MCP Analytical Methods.

An affirmative response to questions A through F is required for "Presumptive Certainty" status		
A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?	YES
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	YES
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	YES
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data?"	YES
E a.	VPH, EPH, and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications).	N/A
E b.	APH and TO-15 Methods only: Was the complete analyte list reported for each method?	N/A
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	YES
A response to questions G, H and I is required for "Presumptive Certainty" status		
G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	YES
H	Were all QC performance standards specified in the CAM protocol(s) achieved?	NO
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	YES
For any questions answered "No", please refer to the case narrative section on the following page(s).		

Please note that sample matrix information is located in the Sample Results section of this report.



Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140340
Report Date: 08/30/21

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

HOLD POLICY - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140340
Report Date: 08/30/21

Case Narrative (continued)

Report Submission

All non-detect (ND) or estimated concentrations (J-qualified) have been quantitated to the limit noted in the MDL column.

MCP Related Narratives

PAHs by SIM

L2140340: Samples were frozen upon receipt in order to arrest the holding time.

L2140340-01D, -02D, -03D, -04D, -05D, -09D, -10D, -11D, and -12D: The sample has elevated detection limits due to the dilution required by the sample matrix.

WG1536097-4D and WG1536097-5D: The sample has elevated detection limits due to the dilution required by the sample matrix.

Total Metals

In reference to question H:

The WG1529020-3 LCSD recovery, associated with L2140340-01, -02, -03, -04, -05, -06, -09, -10, -11, and -12, is outside the acceptance criteria for barium (127%), cadmium (130%). Re-analysis of the LCSD yielded an unacceptable recovery for barium (132%), cadmium (134%). The LCS recovery is acceptable; therefore, no further action was taken. In addition, the WG1529020-2/-3 LCS/LCSD RPD(s), are above the acceptance criteria for beryllium (32%) and cadmium (31%).

The WG1529020-4/-5 MS/MSD recoveries, performed on L2140340-09, are outside the acceptance criteria for lead (159%/232%), silver (179%/180%) and zinc (144%/169%). Re-analysis of the MS yielded unacceptable recoveries for lead, silver, and zinc >125%. The LCS recoveries are acceptable; therefore, no further action was taken.

Total Mercury

In reference to question H:

The WG1529021-4 MS recovery, performed on L2140340-09, is outside the acceptance criteria for mercury

Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140340
Report Date: 08/30/21

Case Narrative (continued)

(133%). Re-analysis of the MS yielded an unacceptable recovery for mercury >125%. The LCS recovery is acceptable; therefore, no further action was taken.

Non-MCP Related Narratives

Total Organic Carbon

L2140340: Samples were frozen upon receipt in order to arrest the holding time.

L2140340-10 and -11: The Sample Replicate RPD is outside the acceptance criteria of 30%. A double-burn re-analysis was performed with a confirming result. The results of the original analysis are reported. The elevated RPD has been attributed to the non-homogeneous nature of the sample.

The WG1537983-4/-5 MS/MSD recoveries (Rep1 - 161%/340%) / (Rep2 - 216%/130%) performed on L2140340-09, are outside the 75-125% acceptance criteria, possibly due to sample matrix. The associated SRM recoveries are within criteria, indicating the sample batch was in control, and all sample results were accepted.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:

 Elizabeth Porta

Title: Technical Director/Representative

Date: 08/30/21

QC OUTLIER SUMMARY REPORT

Project Name: BELMONT LANDFILL

Project Number: 2018-0157

Lab Number: L2140340

Report Date: 08/30/21

Method	Client ID (Native ID)	Lab ID	Parameter	QC Type	Recovery/RPD (%)	QC Limits (%)	Associated Samples	Data Quality Assessment
MCP Total Metals - Mansfield Lab								
6020B	Batch QC	WG1529020-3	Barium, Total	LCSD	127	75-125	01-06,09-12	potential high bias
6020B	Batch QC	WG1529020-3	Beryllium, Total	LCSD	32	30	01-06,09-12	non-directional bias
6020B	Batch QC	WG1529020-3	Cadmium, Total	LCSD	31	30	01-06,09-12	non-directional bias
6020B	Batch QC	WG1529020-3	Cadmium, Total	LCSD	130	75-125	01-06,09-12	potential high bias
6020B	Batch QC (L2140340-09)	WG1529020-4	Lead, Total	MS	159	75-125	01-06,09-12	potential high bias
6020B	Batch QC (L2140340-09)	WG1529020-4	Silver, Total	MS	179	75-125	01-06,09-12	potential high bias
6020B	Batch QC (L2140340-09)	WG1529020-4	Zinc, Total	MS	144	75-125	01-06,09-12	potential high bias
6020B	Batch QC (L2140340-09)	WG1529020-5	Lead, Total	MSD	232	75-125	01-06,09-12	potential high bias
6020B	Batch QC (L2140340-09)	WG1529020-5	Silver, Total	MSD	180	75-125	01-06,09-12	potential high bias
6020B	Batch QC (L2140340-09)	WG1529020-5	Zinc, Total	MSD	169	75-125	01-06,09-12	potential high bias
7471B	Batch QC (L2140340-09)	WG1529021-4	Mercury, Total	MS	133	75-125	01-06,09-12	potential high bias
Total Organic Carbon - Mansfield Lab								
9060A	Batch QC (L2140340-09)	WG1537983-4	Total Organic Carbon (Rep1)	MS	161	75-125	01-06,09-12	potential high bias
9060A	Batch QC (L2140340-09)	WG1537983-4	Total Organic Carbon (Rep2)	MS	216	75-125	01-06,09-12	potential high bias
9060A	Batch QC (L2140340-09)	WG1537983-5	Total Organic Carbon (Rep1)	MSD	340	75-125	01-06,09-12	potential high bias
9060A	Batch QC (L2140340-09)	WG1537983-5	Total Organic Carbon (Rep2)	MSD	130	75-125	01-06,09-12	potential high bias

ORGANICS

SEMIVOLATILES

Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140340
Report Date: 08/30/21

SAMPLE RESULTS

Lab ID: L2140340-01 D
Client ID: SOIL-3
Sample Location: BELMONT, MA

Date Collected: 07/27/21 09:20
Date Received: 07/27/21
Field Prep: Not Specified

Sample Depth:

Matrix: Soil
Analytical Method: 1,8270D-SIM
Analytical Date: 08/27/21 16:15
Analyst: GP
Percent Solids: 59%

Extraction Method: EPA 3570
Extraction Date: 08/17/21 22:44
Cleanup Method: EPA 3630
Cleanup Date: 08/24/21

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PAHs by GC/MS-SIM - Mansfield Lab						
Naphthalene	30.2	J	ug/kg	32.6	12.8	5
Acenaphthylene	141.		ug/kg	32.6	12.8	5
Acenaphthene	19.8	J	ug/kg	32.6	12.7	5
Fluorene	33.8		ug/kg	32.6	19.3	5
Phenanthrene	454.		ug/kg	32.6	21.0	5
Anthracene	128.		ug/kg	32.6	22.3	5
Fluoranthene	1620		ug/kg	32.6	15.0	5
Pyrene	1420		ug/kg	32.6	18.0	5
Benz(a)anthracene	702.		ug/kg	32.6	16.0	5
Chrysene	1040		ug/kg	32.6	11.8	5
Benzo(b)fluoranthene	1200		ug/kg	32.6	15.6	5
Benzo(k)fluoranthene	914.		ug/kg	32.6	9.36	5
Benzo(a)pyrene	1000		ug/kg	32.6	9.46	5
Indeno(1,2,3-cd)pyrene	982.		ug/kg	32.6	9.30	5
Dibenz(a,h)anthracene	269.		ug/kg	32.6	19.4	5
Benzo(g,h,i)perylene	936.		ug/kg	32.6	21.0	5
2-Methylnaphthalene	19.9	J	ug/kg	32.6	14.2	5
1-Methylnaphthalene	17.6	J	ug/kg	32.6	14.8	5
2-Chloronaphthalene	ND		ug/kg	32.6	11.9	5

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	70		30-130
Pyrene-d10	75		30-130
Benzo(b)fluoranthene-d12	74		30-130

Project Name: BELMONT LANDFILL**Lab Number:** L2140340**Project Number:** 2018-0157**Report Date:** 08/30/21**SAMPLE RESULTS**

Lab ID: L2140340-02 D

Date Collected: 07/27/21 09:40

Client ID: SED-1

Date Received: 07/27/21

Sample Location: BELMONT, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Sediment

Extraction Method: EPA 3570

Analytical Method: 1,8270D-SIM

Extraction Date: 08/17/21 22:44

Analytical Date: 08/27/21 16:50

Cleanup Method: EPA 3630

Analyst: GP

Cleanup Date: 08/24/21

Percent Solids: 23%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PAHs by GC/MS-SIM - Mansfield Lab						
Naphthalene	75.5	J	ug/kg	83.2	32.6	5
Acenaphthylene	351.		ug/kg	83.2	32.6	5
Acenaphthene	145.		ug/kg	83.2	32.4	5
Fluorene	343.		ug/kg	83.2	49.2	5
Phenanthrene	2740		ug/kg	83.2	53.6	5
Anthracene	639.		ug/kg	83.2	56.9	5
Fluoranthene	9310		ug/kg	83.2	38.4	5
Pyrene	7300		ug/kg	83.2	46.0	5
Benz(a)anthracene	3380		ug/kg	83.2	41.0	5
Chrysene	4700		ug/kg	83.2	30.2	5
Benzo(b)fluoranthene	5420		ug/kg	83.2	39.9	5
Benzo(k)fluoranthene	2880		ug/kg	83.2	23.9	5
Benzo(a)pyrene	3970		ug/kg	83.2	24.1	5
Indeno(1,2,3-cd)pyrene	3430		ug/kg	83.2	23.7	5
Dibenz(a,h)anthracene	1020		ug/kg	83.2	49.4	5
Benzo(g,h,i)perylene	3180		ug/kg	83.2	53.6	5
2-Methylnaphthalene	43.6	J	ug/kg	83.2	36.2	5
1-Methylnaphthalene	43.6	J	ug/kg	83.2	37.6	5
2-Chloronaphthalene	ND		ug/kg	83.2	30.4	5

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	63		30-130
Pyrene-d10	65		30-130
Benzo(b)fluoranthene-d12	65		30-130

Project Name: BELMONT LANDFILL**Lab Number:** L2140340**Project Number:** 2018-0157**Report Date:** 08/30/21**SAMPLE RESULTS**

Lab ID: L2140340-03 D

Date Collected: 07/27/21 10:35

Client ID: SED-2

Date Received: 07/27/21

Sample Location: BELMONT, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Sediment

Extraction Method: EPA 3570

Analytical Method: 1,8270D-SIM

Extraction Date: 08/17/21 22:44

Analytical Date: 08/27/21 17:24

Cleanup Method: EPA 3630

Analyst: GP

Cleanup Date: 08/24/21

Percent Solids: 19%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PAHs by GC/MS-SIM - Mansfield Lab						
Naphthalene	55.2	J	ug/kg	101	39.7	5
Acenaphthylene	279.		ug/kg	101	39.7	5
Acenaphthene	90.0	J	ug/kg	101	39.4	5
Fluorene	189.		ug/kg	101	59.9	5
Phenanthrene	2540		ug/kg	101	65.3	5
Anthracene	469.		ug/kg	101	69.4	5
Fluoranthene	7820		ug/kg	101	46.7	5
Pyrene	5920		ug/kg	101	56.0	5
Benz(a)anthracene	2770		ug/kg	101	49.9	5
Chrysene	4260		ug/kg	101	36.8	5
Benzo(b)fluoranthene	5100		ug/kg	101	48.6	5
Benzo(k)fluoranthene	2850		ug/kg	101	29.1	5
Benzo(a)pyrene	3570		ug/kg	101	29.4	5
Indeno(1,2,3-cd)pyrene	3170		ug/kg	101	28.9	5
Dibenz(a,h)anthracene	990.		ug/kg	101	60.1	5
Benzo(g,h,i)perylene	3300		ug/kg	101	65.3	5
2-Methylnaphthalene	ND		ug/kg	101	44.1	5
1-Methylnaphthalene	ND		ug/kg	101	45.8	5
2-Chloronaphthalene	ND		ug/kg	101	37.0	5

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	73		30-130
Pyrene-d10	73		30-130
Benzo(b)fluoranthene-d12	80		30-130

Project Name: BELMONT LANDFILL**Lab Number:** L2140340**Project Number:** 2018-0157**Report Date:** 08/30/21**SAMPLE RESULTS**

Lab ID: L2140340-04 D

Date Collected: 07/27/21 10:42

Client ID: SOIL-5

Date Received: 07/27/21

Sample Location: BELMONT, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Soil

Extraction Method: EPA 3570

Analytical Method: 1,8270D-SIM

Extraction Date: 08/17/21 22:44

Analytical Date: 08/27/21 17:59

Cleanup Method: EPA 3630

Analyst: GP

Cleanup Date: 08/24/21

Percent Solids: 74%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PAHs by GC/MS-SIM - Mansfield Lab						
Naphthalene	47.1		ug/kg	25.8	10.1	5
Acenaphthylene	76.6		ug/kg	25.8	10.1	5
Acenaphthene	35.6		ug/kg	25.8	10.0	5
Fluorene	49.1		ug/kg	25.8	15.3	5
Phenanthrene	475.		ug/kg	25.8	16.6	5
Anthracene	139.		ug/kg	25.8	17.7	5
Fluoranthene	986.		ug/kg	25.8	11.9	5
Pyrene	878.		ug/kg	25.8	14.3	5
Benz(a)anthracene	533.		ug/kg	25.8	12.7	5
Chrysene	583.		ug/kg	25.8	9.38	5
Benzo(b)fluoranthene	674.		ug/kg	25.8	12.4	5
Benzo(k)fluoranthene	423.		ug/kg	25.8	7.42	5
Benzo(a)pyrene	598.		ug/kg	25.8	7.49	5
Indeno(1,2,3-cd)pyrene	459.		ug/kg	25.8	7.36	5
Dibenz(a,h)anthracene	152.		ug/kg	25.8	15.3	5
Benzo(g,h,i)perylene	456.		ug/kg	25.8	16.6	5
2-Methylnaphthalene	50.5		ug/kg	25.8	11.2	5
1-Methylnaphthalene	54.3		ug/kg	25.8	11.7	5
2-Chloronaphthalene	ND		ug/kg	25.8	9.43	5

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	77		30-130
Pyrene-d10	76		30-130
Benzo(b)fluoranthene-d12	75		30-130

Project Name: BELMONT LANDFILL**Lab Number:** L2140340**Project Number:** 2018-0157**Report Date:** 08/30/21**SAMPLE RESULTS**

Lab ID: L2140340-05 D

Date Collected: 07/27/21 13:10

Client ID: SOIL-6

Date Received: 07/27/21

Sample Location: BELMONT, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Soil

Extraction Method: EPA 3570

Analytical Method: 1,8270D-SIM

Extraction Date: 08/17/21 22:44

Analytical Date: 08/30/21 10:11

Cleanup Method: EPA 3630

Analyst: GP

Cleanup Date: 08/24/21

Percent Solids: 62%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PAHs by GC/MS-SIM - Mansfield Lab						
Naphthalene	320.		ug/kg	127	49.9	20
Acenaphthylene	2610		ug/kg	127	49.9	20
Acenaphthene	184.		ug/kg	127	49.6	20
Fluorene	535.		ug/kg	127	75.3	20
Phenanthrene	4690		ug/kg	127	82.1	20
Anthracene	1350		ug/kg	127	87.2	20
Fluoranthene	5840		ug/kg	127	58.7	20
Pyrene	8700		ug/kg	127	70.3	20
Benz(a)anthracene	5100		ug/kg	127	62.7	20
Chrysene	4700		ug/kg	127	46.2	20
Benzo(b)fluoranthene	4050		ug/kg	127	61.0	20
Benzo(k)fluoranthene	2560		ug/kg	127	36.6	20
Benzo(a)pyrene	4770		ug/kg	127	37.0	20
Indeno(1,2,3-cd)pyrene	3220		ug/kg	127	36.3	20
Dibenz(a,h)anthracene	995.		ug/kg	127	75.6	20
Benzo(g,h,i)perylene	3720		ug/kg	127	82.1	20
2-Methylnaphthalene	367.		ug/kg	127	55.4	20
1-Methylnaphthalene	432.		ug/kg	127	57.6	20
2-Chloronaphthalene	ND		ug/kg	127	46.5	20

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	70		30-130
Pyrene-d10	81		30-130
Benzo(b)fluoranthene-d12	82		30-130

Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140340
Report Date: 08/30/21

SAMPLE RESULTS

Lab ID: L2140340-06
Client ID: SED-7
Sample Location: BELMONT, MA

Date Collected: 07/27/21 13:35
Date Received: 07/27/21
Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
Analytical Method: 1,8270D-SIM
Analytical Date: 08/27/21 15:41
Analyst: GP
Percent Solids: 36%

Extraction Method: EPA 3570
Extraction Date: 08/17/21 22:44
Cleanup Method: EPA 3630
Cleanup Date: 08/24/21

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PAHs by GC/MS-SIM - Mansfield Lab						
Naphthalene	39.2		ug/kg	10.4	4.07	1
Acenaphthylene	62.3		ug/kg	10.4	4.07	1
Acenaphthene	59.4		ug/kg	10.4	4.04	1
Fluorene	42.3		ug/kg	10.4	6.14	1
Phenanthrene	367.		ug/kg	10.4	6.69	1
Anthracene	104.		ug/kg	10.4	7.10	1
Fluoranthene	756.		ug/kg	10.4	4.79	1
Pyrene	621.		ug/kg	10.4	5.73	1
Benz(a)anthracene	412.		ug/kg	10.4	5.11	1
Chrysene	446.		ug/kg	10.4	3.77	1
Benzo(b)fluoranthene	441.		ug/kg	10.4	4.97	1
Benzo(k)fluoranthene	348.		ug/kg	10.4	2.98	1
Benzo(a)pyrene	406.		ug/kg	10.4	3.01	1
Indeno(1,2,3-cd)pyrene	334.		ug/kg	10.4	2.96	1
Dibenz(a,h)anthracene	120.		ug/kg	10.4	6.16	1
Benzo(g,h,i)perylene	336.		ug/kg	10.4	6.69	1
2-Methylnaphthalene	49.2		ug/kg	10.4	4.52	1
1-Methylnaphthalene	28.4		ug/kg	10.4	4.69	1
2-Chloronaphthalene	ND		ug/kg	10.4	3.79	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	63		30-130
Pyrene-d10	78		30-130
Benzo(b)fluoranthene-d12	95		30-130

Project Name: BELMONT LANDFILL**Lab Number:** L2140340**Project Number:** 2018-0157**Report Date:** 08/30/21**SAMPLE RESULTS**

Lab ID: L2140340-09 D

Date Collected: 07/27/21 12:15

Client ID: SOIL-4

Date Received: 07/27/21

Sample Location: BELMONT, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Soil

Extraction Method: EPA 3570

Analytical Method: 1,8270D-SIM

Extraction Date: 08/17/21 22:44

Analytical Date: 08/27/21 19:07

Cleanup Method: EPA 3630

Analyst: GP

Cleanup Date: 08/24/21

Percent Solids: 67%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PAHs by GC/MS-SIM - Mansfield Lab						
Naphthalene	45.5		ug/kg	27.5	10.8	5
Acenaphthylene	113.		ug/kg	27.5	10.8	5
Acenaphthene	38.5		ug/kg	27.5	10.7	5
Fluorene	51.2		ug/kg	27.5	16.3	5
Phenanthrene	486.		ug/kg	27.5	17.7	5
Anthracene	161.		ug/kg	27.5	18.8	5
Fluoranthene	979.		ug/kg	27.5	12.7	5
Pyrene	933.		ug/kg	27.5	15.2	5
Benz(a)anthracene	537.		ug/kg	27.5	13.6	5
Chrysene	611.		ug/kg	27.5	10.0	5
Benzo(b)fluoranthene	680.		ug/kg	27.5	13.2	5
Benzo(k)fluoranthene	464.		ug/kg	27.5	7.90	5
Benzo(a)pyrene	592.		ug/kg	27.5	7.99	5
Indeno(1,2,3-cd)pyrene	463.		ug/kg	27.5	7.85	5
Dibenz(a,h)anthracene	155.		ug/kg	27.5	16.3	5
Benzo(g,h,i)perylene	473.		ug/kg	27.5	17.7	5
2-Methylnaphthalene	31.4		ug/kg	27.5	12.0	5
1-Methylnaphthalene	26.2	J	ug/kg	27.5	12.4	5
2-Chloronaphthalene	ND		ug/kg	27.5	10.0	5

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	84		30-130
Pyrene-d10	76		30-130
Benzo(b)fluoranthene-d12	75		30-130

Project Name: BELMONT LANDFILL**Lab Number:** L2140340**Project Number:** 2018-0157**Report Date:** 08/30/21**SAMPLE RESULTS**

Lab ID: L2140340-10 D

Date Collected: 07/27/21 14:02

Client ID: SOIL-7-REP

Date Received: 07/27/21

Sample Location: BELMONT, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Soil

Extraction Method: EPA 3570

Analytical Method: 1,8270D-SIM

Extraction Date: 08/17/21 22:44

Analytical Date: 08/27/21 20:49

Cleanup Method: EPA 3630

Analyst: GP

Cleanup Date: 08/24/21

Percent Solids: 72%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PAHs by GC/MS-SIM - Mansfield Lab						
Naphthalene	25.7	J	ug/kg	27.2	10.6	5
Acenaphthylene	112.		ug/kg	27.2	10.6	5
Acenaphthene	12.8	J	ug/kg	27.2	10.6	5
Fluorene	23.0	J	ug/kg	27.2	16.0	5
Phenanthrene	240.		ug/kg	27.2	17.5	5
Anthracene	105.		ug/kg	27.2	18.6	5
Fluoranthene	962.		ug/kg	27.2	12.5	5
Pyrene	918.		ug/kg	27.2	15.0	5
Benz(a)anthracene	602.		ug/kg	27.2	13.4	5
Chrysene	613.		ug/kg	27.2	9.86	5
Benzo(b)fluoranthene	702.		ug/kg	27.2	13.0	5
Benzo(k)fluoranthene	535.		ug/kg	27.2	7.79	5
Benzo(a)pyrene	684.		ug/kg	27.2	7.88	5
Indeno(1,2,3-cd)pyrene	560.		ug/kg	27.2	7.74	5
Dibenz(a,h)anthracene	169.		ug/kg	27.2	16.1	5
Benzo(g,h,i)perylene	548.		ug/kg	27.2	17.5	5
2-Methylnaphthalene	21.5	J	ug/kg	27.2	11.8	5
1-Methylnaphthalene	18.9	J	ug/kg	27.2	12.3	5
2-Chloronaphthalene	ND		ug/kg	27.2	9.91	5

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	79		30-130
Pyrene-d10	86		30-130
Benzo(b)fluoranthene-d12	85		30-130

Project Name: BELMONT LANDFILL**Lab Number:** L2140340**Project Number:** 2018-0157**Report Date:** 08/30/21**SAMPLE RESULTS**

Lab ID: L2140340-11 D

Date Collected: 07/27/21 13:55

Client ID: SOIL-7

Date Received: 07/27/21

Sample Location: BELMONT, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Soil

Extraction Method: EPA 3570

Analytical Method: 1,8270D-SIM

Extraction Date: 08/17/21 22:44

Analytical Date: 08/27/21 21:23

Cleanup Method: EPA 3630

Analyst: GP

Cleanup Date: 08/24/21

Percent Solids: 68%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PAHs by GC/MS-SIM - Mansfield Lab						
Naphthalene	25.6	J	ug/kg	27.2	10.7	5
Acenaphthylene	108.		ug/kg	27.2	10.7	5
Acenaphthene	ND		ug/kg	27.2	10.6	5
Fluorene	20.0	J	ug/kg	27.2	16.1	5
Phenanthrene	163.		ug/kg	27.2	17.6	5
Anthracene	74.1		ug/kg	27.2	18.6	5
Fluoranthene	498.		ug/kg	27.2	12.6	5
Pyrene	494.		ug/kg	27.2	15.0	5
Benz(a)anthracene	321.		ug/kg	27.2	13.4	5
Chrysene	382.		ug/kg	27.2	9.89	5
Benzo(b)fluoranthene	513.		ug/kg	27.2	13.0	5
Benzo(k)fluoranthene	282.		ug/kg	27.2	7.82	5
Benzo(a)pyrene	427.		ug/kg	27.2	7.90	5
Indeno(1,2,3-cd)pyrene	352.		ug/kg	27.2	7.77	5
Dibenz(a,h)anthracene	112.		ug/kg	27.2	16.2	5
Benzo(g,h,i)perylene	367.		ug/kg	27.2	17.6	5
2-Methylnaphthalene	23.1	J	ug/kg	27.2	11.8	5
1-Methylnaphthalene	24.2	J	ug/kg	27.2	12.3	5
2-Chloronaphthalene	ND		ug/kg	27.2	9.95	5

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	82		30-130
Pyrene-d10	78		30-130
Benzo(b)fluoranthene-d12	76		30-130

Project Name: BELMONT LANDFILL**Lab Number:** L2140340**Project Number:** 2018-0157**Report Date:** 08/30/21**SAMPLE RESULTS**

Lab ID: L2140340-12 D

Date Collected: 07/27/21 14:40

Client ID: SOIL-8

Date Received: 07/27/21

Sample Location: BELMONT, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Soil

Extraction Method: EPA 3570

Analytical Method: 1,8270D-SIM

Extraction Date: 08/17/21 22:44

Analytical Date: 08/27/21 21:57

Cleanup Method: EPA 3630

Analyst: GP

Cleanup Date: 08/24/21

Percent Solids: 19%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PAHs by GC/MS-SIM - Mansfield Lab						
Naphthalene	71.0	J	ug/kg	104	40.9	5
Acenaphthylene	331.		ug/kg	104	40.9	5
Acenaphthene	44.5	J	ug/kg	104	40.6	5
Fluorene	104.		ug/kg	104	61.7	5
Phenanthrene	1250		ug/kg	104	67.3	5
Anthracene	304.		ug/kg	104	71.4	5
Fluoranthene	4950		ug/kg	104	48.2	5
Pyrene	4150		ug/kg	104	57.6	5
Benz(a)anthracene	1800		ug/kg	104	51.4	5
Chrysene	3320		ug/kg	104	37.9	5
Benzo(b)fluoranthene	4930		ug/kg	104	50.0	5
Benzo(k)fluoranthene	2670		ug/kg	104	30.0	5
Benzo(a)pyrene	3140		ug/kg	104	30.3	5
Indeno(1,2,3-cd)pyrene	3430		ug/kg	104	29.8	5
Dibenz(a,h)anthracene	963.		ug/kg	104	61.9	5
Benzo(g,h,i)perylene	3620		ug/kg	104	67.3	5
2-Methylnaphthalene	ND		ug/kg	104	45.4	5
1-Methylnaphthalene	ND		ug/kg	104	47.2	5
2-Chloronaphthalene	ND		ug/kg	104	38.1	5

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	71		30-130
Pyrene-d10	70		30-130
Benzo(b)fluoranthene-d12	71		30-130

Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140340
Report Date: 08/30/21

Method Blank Analysis Batch Quality Control

Analytical Method: 1,8270D-SIM
Analytical Date: 08/27/21 09:25
Analyst: GP

Extraction Method: EPA 3570
Extraction Date: 08/17/21 22:44
Cleanup Method: EPA 3630
Cleanup Date: 08/24/21

Parameter	Result	Qualifier	Units	RL	MDL
PAHs by GC/MS-SIM - Mansfield Lab for sample(s): 01-06,09-12 Batch: WG1536097-1					
Naphthalene	ND		ug/kg	4.00	1.57
Acenaphthylene	ND		ug/kg	4.00	1.57
Acenaphthene	ND		ug/kg	4.00	1.56
Fluorene	ND		ug/kg	4.00	2.36
Phenanthrene	ND		ug/kg	4.00	2.58
Anthracene	ND		ug/kg	4.00	2.74
Fluoranthene	ND		ug/kg	4.00	1.84
Pyrene	ND		ug/kg	4.00	2.21
Benz(a)anthracene	ND		ug/kg	4.00	1.97
Chrysene	ND		ug/kg	4.00	1.45
Benzo(b)fluoranthene	ND		ug/kg	4.00	1.92
Benzo(k)fluoranthene	ND		ug/kg	4.00	1.15
Benzo(a)pyrene	ND		ug/kg	4.00	1.16
Indeno(1,2,3-cd)pyrene	ND		ug/kg	4.00	1.14
Dibenz(a,h)anthracene	ND		ug/kg	4.00	2.37
Benzo(g,h,i)perylene	ND		ug/kg	4.00	2.58
2-Methylnaphthalene	ND		ug/kg	4.00	1.74
1-Methylnaphthalene	ND		ug/kg	4.00	1.81
2-Chloronaphthalene	ND		ug/kg	4.00	1.46

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	78		30-130
Pyrene-d10	83		30-130
Benzo(b)fluoranthene-d12	90		30-130

Lab Control Sample Analysis

Batch Quality Control

Project Name: BELMONT LANDFILL

Project Number: 2018-0157

Lab Number: L2140340

Report Date: 08/30/21

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
PAHs by GC/MS-SIM - Mansfield Lab Associated sample(s): 01-06,09-12 Batch: WG1536097-2 WG1536097-3								
Naphthalene	59		77		40-140	26		30
Acenaphthylene	66		80		40-140	19		30
Acenaphthene	67		81		40-140	19		30
Fluorene	70		85		40-140	19		30
Phenanthrene	70		81		40-140	15		30
Anthracene	78		90		40-140	14		30
Fluoranthene	76		87		40-140	13		30
Pyrene	77		90		40-140	16		30
Benz(a)anthracene	82		91		40-140	10		30
Chrysene	81		89		40-140	9		30
Benzo(b)fluoranthene	91		97		40-140	6		30
Benzo(k)fluoranthene	93		103		40-140	10		30
Benzo(a)pyrene	87		99		40-140	13		30
Indeno(1,2,3-cd)pyrene	86		92		40-140	7		30
Dibenz(a,h)anthracene	93		101		40-140	8		30
Benzo(g,h,i)perylene	93		102		40-140	9		30
2-Methylnaphthalene	61		76		40-140	22		30
1-Methylnaphthalene	66		82		40-140	22		30
2-Chloronaphthalene	61		74		40-140	19		30

Lab Control Sample Analysis Batch Quality Control

Project Name: BELMONT LANDFILL

Lab Number: L2140340

Project Number: 2018-0157

Report Date: 08/30/21

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
PAHs by GC/MS-SIM - Mansfield Lab Associated sample(s): 01-06,09-12 Batch: WG1536097-2 WG1536097-3								

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2-Methylnaphthalene-d10	66		78		30-130
Pyrene-d10	81		92		30-130
Benzo(b)fluoranthene-d12	94		97		30-130

Matrix Spike Analysis

Batch Quality Control

Project Name: BELMONT LANDFILL

Project Number: 2018-0157

Lab Number: L2140340

Report Date: 08/30/21

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
PAHs by GC/MS-SIM - Mansfield Lab Associated sample(s): 01-06,09-12 QC Batch ID: WG1536097-4 WG1536097-5 QC Sample: L2140340-09 Client ID: SOIL-4												
Naphthalene	45.5	707	560	73		528	66		40-140	6		30
Acenaphthylene	113	707	633	74		631	70		40-140	0		30
Acenaphthene	38.5	707	546	72		555	70		40-140	2		30
Fluorene	51.2	707	558	72		572	71		40-140	2		30
Phenanthrene	486	707	973	69		967	65		40-140	1		30
Anthracene	161	707	677	73		751	80		40-140	10		30
Fluoranthene	979	707	1580	85		1720	101		40-140	8		30
Pyrene	933	707	1480	77		1620	93		40-140	9		30
Benz(a)anthracene	537	707	1110	81		1280	101		40-140	14		30
Chrysene	611	707	1140	75		1350	100		40-140	17		30
Benzo(b)fluoranthene	680	707	1280	85		1410	99		40-140	10		30
Benzo(k)fluoranthene	464	707	1030	80		1190	99		40-140	14		30
Benzo(a)pyrene	592	707	1190	85		1350	103		40-140	13		30
Indeno(1,2,3-cd)pyrene	463	707	1130	94		1290	112		40-140	13		30
Dibenz(a,h)anthracene	155	707	769	87		817	90		40-140	6		30
Benzo(g,h,i)perylene	473	707	1100	89		1220	101		40-140	10		30
2-Methylnaphthalene	31.4	707	573	77		511	65		40-140	11		30
1-Methylnaphthalene	26.2J	707	636	90		581	79		40-140	9		30
2-Chloronaphthalene	ND	707	473	67		502	68		40-140	6		30

Surrogate	MS % Recovery	MS Qualifier	MSD % Recovery	MSD Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	88		76		30-130

Matrix Spike Analysis**Batch Quality Control****Project Name:** BELMONT LANDFILL**Lab Number:** L2140340**Project Number:** 2018-0157**Report Date:** 08/30/21

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
PAHs by GC/MS-SIM - Mansfield Lab Associated sample(s): 01-06,09-12 QC Batch ID: WG1536097-4 WG1536097-5 QC Sample: L2140340-09 Client ID: SOIL-4												

Surrogate	MS		MSD		Acceptance Criteria
	% Recovery	Qualifier	% Recovery	Qualifier	
Benzo(b)fluoranthene-d12	75		74		30-130
Pyrene-d10	76		74		30-130

SEMIVOLATILES

High Resolution Mass Spectrometry

Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140340
Report Date: 08/30/21

SAMPLE RESULTS

Lab ID: L2140340-01
Client ID: SOIL-3
Sample Location: BELMONT, MA

Date Collected: 07/27/21 09:20
Date Received: 07/27/21
Field Prep: Not Specified

Sample Depth:

Matrix: Soil
Analytical Method: 132,1613B
Analytical Date: 08/06/21 02:02
Analyst: PB
Percent Solids: 59%

Extraction Method: EPA 8290A
Extraction Date: 07/28/21 14:00
Cleanup Method: EPA 1613B
Cleanup Date: 08/01/21

Parameter	Result	Qualifier	EMPC	Units	RL	MDL	Dilution Factor

Dioxins & Furans by Isotope Dilution HRMS - Mansfield Lab

2,3,7,8-TCDD	ND		0.799	pg/g	0.832	0.256	1

Surrogate/Cleanup Standard	% Recovery	Qualifier	Acceptance Criteria
13C12-2,3,7,8-TCDD	60		25-164
37CL4-2,3,7,8-TCDD	118		35-197

Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140340
Report Date: 08/30/21

SAMPLE RESULTS

Lab ID: L2140340-02
Client ID: SED-1
Sample Location: BELMONT, MA

Date Collected: 07/27/21 09:40
Date Received: 07/27/21
Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
Analytical Method: 132,1613B
Analytical Date: 08/06/21 17:17
Analyst: PB
Percent Solids: 23%

Extraction Method: EPA 8290A
Extraction Date: 07/28/21 14:00
Cleanup Method: EPA 1613B
Cleanup Date: 08/01/21

Parameter	Result	Qualifier	EMPC	Units	RL	MDL	Dilution Factor

Dioxins & Furans by Isotope Dilution HRMS - Mansfield Lab

2,3,7,8-TCDD	ND		1.20	pg/g	2.06	0.636	1

Surrogate/Cleanup Standard	% Recovery	Qualifier	Acceptance Criteria
13C12-2,3,7,8-TCDD	59		25-164
37CL4-2,3,7,8-TCDD	112		35-197

Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140340
Report Date: 08/30/21

SAMPLE RESULTS

Lab ID: L2140340-03
Client ID: SED-2
Sample Location: BELMONT, MA

Date Collected: 07/27/21 10:35
Date Received: 07/27/21
Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
Analytical Method: 132,1613B
Analytical Date: 08/06/21 18:21
Analyst: PB
Percent Solids: 19%

Extraction Method: EPA 8290A
Extraction Date: 07/28/21 14:00
Cleanup Method: EPA 1613B
Cleanup Date: 08/01/21

Parameter	Result	Qualifier	EMPC	Units	RL	MDL	Dilution Factor

Dioxins & Furans by Isotope Dilution HRMS - Mansfield Lab

2,3,7,8-TCDD	ND			pg/g	2.55	0.785	1

Surrogate/Cleanup Standard	% Recovery	Qualifier	Acceptance Criteria
13C12-2,3,7,8-TCDD	59		25-164
37CL4-2,3,7,8-TCDD	99		35-197

Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140340
Report Date: 08/30/21

SAMPLE RESULTS

Lab ID: L2140340-04
Client ID: SOIL-5
Sample Location: BELMONT, MA

Date Collected: 07/27/21 10:42
Date Received: 07/27/21
Field Prep: Not Specified

Sample Depth:

Matrix: Soil
Analytical Method: 132,1613B
Analytical Date: 08/06/21 19:25
Analyst: PB
Percent Solids: 74%

Extraction Method: EPA 8290A
Extraction Date: 07/28/21 14:00
Cleanup Method: EPA 1613B
Cleanup Date: 08/01/21

Parameter	Result	Qualifier	EMPC	Units	RL	MDL	Dilution Factor

Dioxins & Furans by Isotope Dilution HRMS - Mansfield Lab							

2,3,7,8-TCDD	0.967			pg/g	0.654	0.201	1

Surrogate/Cleanup Standard	% Recovery	Qualifier	Acceptance Criteria
13C12-2,3,7,8-TCDD	56		25-164
37CL4-2,3,7,8-TCDD	134		35-197

Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140340
Report Date: 08/30/21

SAMPLE RESULTS

Lab ID: L2140340-05
Client ID: SOIL-6
Sample Location: BELMONT, MA

Date Collected: 07/27/21 13:10
Date Received: 07/27/21
Field Prep: Not Specified

Sample Depth:

Matrix: Soil
Analytical Method: 132,1613B
Analytical Date: 08/06/21 20:29
Analyst: PB
Percent Solids: 62%

Extraction Method: EPA 8290A
Extraction Date: 07/28/21 14:00
Cleanup Method: EPA 1613B
Cleanup Date: 08/01/21

Parameter	Result	Qualifier	EMPC	Units	RL	MDL	Dilution Factor

Dioxins & Furans by Isotope Dilution HRMS - Mansfield Lab

2,3,7,8-TCDD	0.854			pg/g	0.776	0.239	1

Surrogate/Cleanup Standard	% Recovery	Qualifier	Acceptance Criteria
13C12-2,3,7,8-TCDD	69		25-164
37CL4-2,3,7,8-TCDD	126		35-197

Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140340
Report Date: 08/30/21

SAMPLE RESULTS

Lab ID: L2140340-06
Client ID: SED-7
Sample Location: BELMONT, MA

Date Collected: 07/27/21 13:35
Date Received: 07/27/21
Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
Analytical Method: 132,1613B
Analytical Date: 08/06/21 21:33
Analyst: PB
Percent Solids: 36%

Extraction Method: EPA 8290A
Extraction Date: 07/28/21 14:00
Cleanup Method: EPA 1613B
Cleanup Date: 08/01/21

Parameter	Result	Qualifier	EMPC	Units	RL	MDL	Dilution Factor

Dioxins & Furans by Isotope Dilution HRMS - Mansfield Lab

2,3,7,8-TCDD	ND		1.26	pg/g	1.34	0.411	1

Surrogate/Cleanup Standard	% Recovery	Qualifier	Acceptance Criteria
13C12-2,3,7,8-TCDD	62		25-164
37CL4-2,3,7,8-TCDD	97		35-197

Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140340
Report Date: 08/30/21

SAMPLE RESULTS

Lab ID: L2140340-09
Client ID: SOIL-4
Sample Location: BELMONT, MA

Date Collected: 07/27/21 12:15
Date Received: 07/27/21
Field Prep: Not Specified

Sample Depth:

Matrix: Soil
Analytical Method: 132,1613B
Analytical Date: 08/05/21 19:39
Analyst: PB
Percent Solids: 67%

Extraction Method: EPA 8290A
Extraction Date: 07/28/21 14:00
Cleanup Method: EPA 1613B
Cleanup Date: 08/01/21

Parameter	Result	Qualifier	EMPC	Units	RL	MDL	Dilution Factor

Dioxins & Furans by Isotope Dilution HRMS - Mansfield Lab

2,3,7,8-TCDD	ND		1.09	pg/g	0.730	0.225	1

Surrogate/Cleanup Standard	% Recovery	Qualifier	Acceptance Criteria
13C12-2,3,7,8-TCDD	57		25-164
37CL4-2,3,7,8-TCDD	132		35-197

Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140340
Report Date: 08/30/21

SAMPLE RESULTS

Lab ID: L2140340-10
Client ID: SOIL-7-REP
Sample Location: BELMONT, MA

Date Collected: 07/27/21 14:02
Date Received: 07/27/21
Field Prep: Not Specified

Sample Depth:

Matrix: Soil
Analytical Method: 132,1613B
Analytical Date: 08/05/21 22:50
Analyst: PB
Percent Solids: 72%

Extraction Method: EPA 8290A
Extraction Date: 07/28/21 14:00
Cleanup Method: EPA 1613B
Cleanup Date: 08/01/21

Parameter	Result	Qualifier	EMPC	Units	RL	MDL	Dilution Factor

Dioxins & Furans by Isotope Dilution HRMS - Mansfield Lab

2,3,7,8-TCDD	ND		0.634	pg/g	0.675	0.208	1

Surrogate/Cleanup Standard	% Recovery	Qualifier	Acceptance Criteria
13C12-2,3,7,8-TCDD	61		25-164
37CL4-2,3,7,8-TCDD	135		35-197

Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140340
Report Date: 08/30/21

SAMPLE RESULTS

Lab ID: L2140340-11
Client ID: SOIL-7
Sample Location: BELMONT, MA

Date Collected: 07/27/21 13:55
Date Received: 07/27/21
Field Prep: Not Specified

Sample Depth:

Matrix: Soil
Analytical Method: 132,1613B
Analytical Date: 08/05/21 23:54
Analyst: PB
Percent Solids: 68%

Extraction Method: EPA 8290A
Extraction Date: 07/28/21 14:00
Cleanup Method: EPA 1613B
Cleanup Date: 08/02/21

Parameter	Result	Qualifier	EMPC	Units	RL	MDL	Dilution Factor

Dioxins & Furans by Isotope Dilution HRMS - Mansfield Lab

2,3,7,8-TCDD	ND			pg/g	0.711	0.219	1

Surrogate/Cleanup Standard	% Recovery	Qualifier	Acceptance Criteria
13C12-2,3,7,8-TCDD	70		25-164
37CL4-2,3,7,8-TCDD	141		35-197

Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140340
Report Date: 08/30/21

SAMPLE RESULTS

Lab ID: L2140340-12
Client ID: SOIL-8
Sample Location: BELMONT, MA

Date Collected: 07/27/21 14:40
Date Received: 07/27/21
Field Prep: Not Specified

Sample Depth:

Matrix: Soil
Analytical Method: 132,1613B
Analytical Date: 08/06/21 00:58
Analyst: PB
Percent Solids: 19%

Extraction Method: EPA 8290A
Extraction Date: 07/28/21 14:00
Cleanup Method: EPA 1613B
Cleanup Date: 08/02/21

Parameter	Result	Qualifier	EMPC	Units	RL	MDL	Dilution Factor

Dioxins & Furans by Isotope Dilution HRMS - Mansfield Lab

2,3,7,8-TCDD	ND			pg/g	2.58	0.794	1

Surrogate/Cleanup Standard	% Recovery	Qualifier	Acceptance Criteria
13C12-2,3,7,8-TCDD	78		25-164
37CL4-2,3,7,8-TCDD	87		35-197

Project Name: BELMONT LANDFILL

Lab Number: L2140340

Project Number: 2018-0157

Report Date: 08/30/21

Method Blank Analysis Batch Quality Control

Analytical Method: 132,1613B
 Analytical Date: 08/05/21 17:31
 Analyst: PB

Extraction Method: EPA 8290A
 Extraction Date: 07/28/21 14:00
 Cleanup Method: EPA 1613B
 Cleanup Date: 08/01/21

Parameter	Result	Qualifier	EMPC	Units	RL	MDL
Dioxins & Furans by Isotope Dilution HRMS - Mansfield Lab for sample(s): 01-06,09-12 Batch: WG1528875-1						
2,3,7,8-TCDD	ND			pg/g	0.500	0.154
Surrogate/Cleanup Standard	%Recovery		Qualifier	Acceptance Criteria		
13C12-2,3,7,8-TCDD	59			25-164		
37CL4-2,3,7,8-TCDD	94			35-197		

Lab Control Sample Analysis**Batch Quality Control****Project Name:** BELMONT LANDFILL**Lab Number:** L2140340**Project Number:** 2018-0157**Report Date:** 08/30/21

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Dioxins & Furans by Isotope Dilution HRMS - Mansfield Lab Associated sample(s): 01-06,09-12 Batch: WG1528875-2								
2,3,7,8-TCDD	93		-		67-158	-		25

Surrogate/Cleanup Standard	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
13C12-2,3,7,8-TCDD	59				25-164
37CL4-2,3,7,8-TCDD	98				35-197

Matrix Spike Analysis**Batch Quality Control****Project Name:** BELMONT LANDFILL**Project Number:** 2018-0157**Lab Number:** L2140340**Report Date:** 08/30/21

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Dioxins & Furans by Isotope Dilution HRMS - Mansfield Lab Associated sample(s): 01-06,09-12 QC Batch ID: WG1528875-3 WG1528875-4 QC Sample: L2140340-09 Client ID: SOIL-4												
2,3,7,8-TCDD	ND	14.4	18.3	127		16.4	113		67-158	11		25

Surrogate/Cleanup Standard	MS % Recovery	Qualifier	MSD % Recovery	Qualifier	Acceptance Criteria
13C12-2,3,7,8-TCDD	67		62		25-164
37CL4-2,3,7,8-TCDD	146		155		35-197

METALS

Project Name: BELMONT LANDFILL**Lab Number:** L2140340**Project Number:** 2018-0157**Report Date:** 08/30/21**SAMPLE RESULTS**

Lab ID: L2140340-01

Date Collected: 07/27/21 09:20

Client ID: SOIL-3

Date Received: 07/27/21

Sample Location: BELMONT, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Soil

Percent Solids: 59%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	4.38		mg/kg	2.64	2.64	10	07/29/21 12:53	08/20/21 12:30	EPA 3050B	97,6020B	CD
Arsenic, Total	14.0		mg/kg	0.825	0.825	10	07/29/21 12:53	08/20/21 12:30	EPA 3050B	97,6020B	CD
Barium, Total	349		mg/kg	4.95	4.95	10	07/29/21 12:53	08/20/21 12:30	EPA 3050B	97,6020B	CD
Beryllium, Total	ND		mg/kg	0.4949	0.4949	10	07/29/21 12:53	08/20/21 12:30	EPA 3050B	97,6020B	CD
Cadmium, Total	5.261		mg/kg	0.3300	0.3300	10	07/29/21 12:53	08/20/21 12:30	EPA 3050B	97,6020B	CD
Chromium, Total	33.1		mg/kg	3.30	3.30	10	07/29/21 12:53	08/20/21 12:30	EPA 3050B	97,6020B	CD
Copper, Total	186		mg/kg	3.30	3.30	10	07/29/21 12:53	08/20/21 12:30	EPA 3050B	97,6020B	CD
Lead, Total	1030		mg/kg	0.990	0.990	10	07/29/21 12:53	08/20/21 12:30	EPA 3050B	97,6020B	CD
Mercury, Total	0.409		mg/kg	0.107	0.107	1	07/29/21 17:11	08/04/21 13:09	EPA 7471B	97,7471B	OU
Nickel, Total	29.0		mg/kg	1.65	1.65	10	07/29/21 12:53	08/20/21 12:30	EPA 3050B	97,6020B	CD
Selenium, Total	ND		mg/kg	3.30	3.30	10	07/29/21 12:53	08/20/21 12:30	EPA 3050B	97,6020B	CD
Silver, Total	2.11		mg/kg	0.825	0.825	10	07/29/21 12:53	08/20/21 12:30	EPA 3050B	97,6020B	CD
Zinc, Total	833		mg/kg	16.5	16.5	10	07/29/21 12:53	08/20/21 12:30	EPA 3050B	97,6020B	CD



Project Name: BELMONT LANDFILL**Lab Number:** L2140340**Project Number:** 2018-0157**Report Date:** 08/30/21**SAMPLE RESULTS**

Lab ID: L2140340-02

Date Collected: 07/27/21 09:40

Client ID: SED-1

Date Received: 07/27/21

Sample Location: BELMONT, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Sediment

Percent Solids: 23%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/kg	6.81	6.81	10	07/29/21 12:53	08/20/21 12:35	EPA 3050B	97,6020B	CD
Arsenic, Total	11.2		mg/kg	2.13	2.13	10	07/29/21 12:53	08/20/21 12:35	EPA 3050B	97,6020B	CD
Barium, Total	70.7		mg/kg	12.8	12.8	10	07/29/21 12:53	08/20/21 12:35	EPA 3050B	97,6020B	CD
Beryllium, Total	ND		mg/kg	1.277	1.277	10	07/29/21 12:53	08/20/21 12:35	EPA 3050B	97,6020B	CD
Cadmium, Total	1.660		mg/kg	0.8516	0.8516	10	07/29/21 12:53	08/20/21 12:35	EPA 3050B	97,6020B	CD
Chromium, Total	27.7		mg/kg	8.52	8.52	10	07/29/21 12:53	08/20/21 12:35	EPA 3050B	97,6020B	CD
Copper, Total	61.9		mg/kg	8.52	8.52	10	07/29/21 12:53	08/20/21 12:35	EPA 3050B	97,6020B	CD
Lead, Total	130		mg/kg	2.55	2.55	10	07/29/21 12:53	08/20/21 12:35	EPA 3050B	97,6020B	CD
Mercury, Total	ND		mg/kg	0.276	0.276	1	07/29/21 17:11	08/04/21 13:12	EPA 7471B	97,7471B	OU
Nickel, Total	19.2		mg/kg	4.26	4.26	10	07/29/21 12:53	08/20/21 12:35	EPA 3050B	97,6020B	CD
Selenium, Total	ND		mg/kg	8.52	8.52	10	07/29/21 12:53	08/20/21 12:35	EPA 3050B	97,6020B	CD
Silver, Total	ND		mg/kg	2.13	2.13	10	07/29/21 12:53	08/20/21 12:35	EPA 3050B	97,6020B	CD
Zinc, Total	265		mg/kg	42.6	42.6	10	07/29/21 12:53	08/20/21 12:35	EPA 3050B	97,6020B	CD



Project Name: BELMONT LANDFILL**Lab Number:** L2140340**Project Number:** 2018-0157**Report Date:** 08/30/21**SAMPLE RESULTS**

Lab ID: L2140340-03

Date Collected: 07/27/21 10:35

Client ID: SED-2

Date Received: 07/27/21

Sample Location: BELMONT, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Sediment

Percent Solids: 19%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/kg	7.87	7.87	10	07/29/21 12:53	08/20/21 13:34	EPA 3050B	97,6020B	CD
Arsenic, Total	13.5		mg/kg	2.46	2.46	10	07/29/21 12:53	08/20/21 13:34	EPA 3050B	97,6020B	CD
Barium, Total	86.6		mg/kg	14.8	14.8	10	07/29/21 12:53	08/20/21 13:34	EPA 3050B	97,6020B	CD
Beryllium, Total	ND		mg/kg	1.475	1.475	10	07/29/21 12:53	08/20/21 13:34	EPA 3050B	97,6020B	CD
Cadmium, Total	1.548		mg/kg	0.9836	0.9836	10	07/29/21 12:53	08/20/21 13:34	EPA 3050B	97,6020B	CD
Chromium, Total	34.9		mg/kg	9.84	9.84	10	07/29/21 12:53	08/20/21 13:34	EPA 3050B	97,6020B	CD
Copper, Total	57.4		mg/kg	9.84	9.84	10	07/29/21 12:53	08/20/21 13:34	EPA 3050B	97,6020B	CD
Lead, Total	82.0		mg/kg	2.95	2.95	10	07/29/21 12:53	08/20/21 13:34	EPA 3050B	97,6020B	CD
Mercury, Total	ND		mg/kg	0.335	0.335	1	07/29/21 17:11	08/04/21 13:16	EPA 7471B	97,7471B	OU
Nickel, Total	15.3		mg/kg	4.92	4.92	10	07/29/21 12:53	08/20/21 13:34	EPA 3050B	97,6020B	CD
Selenium, Total	ND		mg/kg	9.84	9.84	10	07/29/21 12:53	08/20/21 13:34	EPA 3050B	97,6020B	CD
Silver, Total	ND		mg/kg	2.46	2.46	10	07/29/21 12:53	08/20/21 13:34	EPA 3050B	97,6020B	CD
Zinc, Total	257		mg/kg	49.2	49.2	10	07/29/21 12:53	08/20/21 13:34	EPA 3050B	97,6020B	CD



Project Name: BELMONT LANDFILL**Lab Number:** L2140340**Project Number:** 2018-0157**Report Date:** 08/30/21**SAMPLE RESULTS**

Lab ID: L2140340-04

Date Collected: 07/27/21 10:42

Client ID: SOIL-5

Date Received: 07/27/21

Sample Location: BELMONT, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Soil

Percent Solids: 74%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	2.47		mg/kg	2.09	2.09	10	07/29/21 12:53	08/20/21 14:06	EPA 3050B	97,6020B	CD
Arsenic, Total	8.29		mg/kg	0.654	0.654	10	07/29/21 12:53	08/20/21 14:06	EPA 3050B	97,6020B	CD
Barium, Total	128		mg/kg	3.93	3.93	10	07/29/21 12:53	08/20/21 14:06	EPA 3050B	97,6020B	CD
Beryllium, Total	ND		mg/kg	0.3927	0.3927	10	07/29/21 12:53	08/20/21 14:06	EPA 3050B	97,6020B	CD
Cadmium, Total	0.9869		mg/kg	0.2618	0.2618	10	07/29/21 12:53	08/20/21 14:06	EPA 3050B	97,6020B	CD
Chromium, Total	25.8		mg/kg	2.62	2.62	10	07/29/21 12:53	08/20/21 14:06	EPA 3050B	97,6020B	CD
Copper, Total	58.8		mg/kg	2.62	2.62	10	07/29/21 12:53	08/20/21 14:06	EPA 3050B	97,6020B	CD
Lead, Total	290		mg/kg	0.785	0.785	10	07/29/21 12:53	08/20/21 14:06	EPA 3050B	97,6020B	CD
Mercury, Total	0.318		mg/kg	0.104	0.104	1	07/29/21 17:11	08/04/21 13:19	EPA 7471B	97,7471B	OU
Nickel, Total	17.3		mg/kg	1.31	1.31	10	07/29/21 12:53	08/20/21 14:06	EPA 3050B	97,6020B	CD
Selenium, Total	ND		mg/kg	2.62	2.62	10	07/29/21 12:53	08/20/21 14:06	EPA 3050B	97,6020B	CD
Silver, Total	0.716		mg/kg	0.654	0.654	10	07/29/21 12:53	08/20/21 14:06	EPA 3050B	97,6020B	CD
Zinc, Total	251		mg/kg	13.1	13.1	10	07/29/21 12:53	08/20/21 14:06	EPA 3050B	97,6020B	CD



Project Name: BELMONT LANDFILL**Lab Number:** L2140340**Project Number:** 2018-0157**Report Date:** 08/30/21**SAMPLE RESULTS**

Lab ID: L2140340-05

Date Collected: 07/27/21 13:10

Client ID: SOIL-6

Date Received: 07/27/21

Sample Location: BELMONT, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Soil

Percent Solids: 62%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/kg	2.49	2.49	10	07/29/21 12:53	08/20/21 14:11	EPA 3050B	97,6020B	CD
Arsenic, Total	5.26		mg/kg	0.778	0.778	10	07/29/21 12:53	08/20/21 14:11	EPA 3050B	97,6020B	CD
Barium, Total	94.8		mg/kg	4.67	4.67	10	07/29/21 12:53	08/20/21 14:11	EPA 3050B	97,6020B	CD
Beryllium, Total	ND		mg/kg	0.4670	0.4670	10	07/29/21 12:53	08/20/21 14:11	EPA 3050B	97,6020B	CD
Cadmium, Total	0.8546		mg/kg	0.3114	0.3114	10	07/29/21 12:53	08/20/21 14:11	EPA 3050B	97,6020B	CD
Chromium, Total	16.7		mg/kg	3.11	3.11	10	07/29/21 12:53	08/20/21 14:11	EPA 3050B	97,6020B	CD
Copper, Total	44.0		mg/kg	3.11	3.11	10	07/29/21 12:53	08/20/21 14:11	EPA 3050B	97,6020B	CD
Lead, Total	223		mg/kg	0.934	0.934	10	07/29/21 12:53	08/20/21 14:11	EPA 3050B	97,6020B	CD
Mercury, Total	0.223		mg/kg	0.116	0.116	1	07/29/21 17:11	08/04/21 13:22	EPA 7471B	97,7471B	OU
Nickel, Total	16.0		mg/kg	1.56	1.56	10	07/29/21 12:53	08/20/21 14:11	EPA 3050B	97,6020B	CD
Selenium, Total	ND		mg/kg	3.11	3.11	10	07/29/21 12:53	08/20/21 14:11	EPA 3050B	97,6020B	CD
Silver, Total	ND		mg/kg	0.778	0.778	10	07/29/21 12:53	08/20/21 14:11	EPA 3050B	97,6020B	CD
Zinc, Total	184		mg/kg	15.6	15.6	10	07/29/21 12:53	08/20/21 14:11	EPA 3050B	97,6020B	CD



Project Name: BELMONT LANDFILL**Lab Number:** L2140340**Project Number:** 2018-0157**Report Date:** 08/30/21**SAMPLE RESULTS**

Lab ID: L2140340-06

Date Collected: 07/27/21 13:35

Client ID: SED-7

Date Received: 07/27/21

Sample Location: BELMONT, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Sediment

Percent Solids: 36%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	5.58		mg/kg	4.25	4.25	10	07/29/21 12:53	08/20/21 14:15	EPA 3050B	97,6020B	CD
Arsenic, Total	7.73		mg/kg	1.33	1.33	10	07/29/21 12:53	08/20/21 14:15	EPA 3050B	97,6020B	CD
Barium, Total	191		mg/kg	7.98	7.98	10	07/29/21 12:53	08/20/21 14:15	EPA 3050B	97,6020B	CD
Beryllium, Total	ND		mg/kg	0.7976	0.7976	10	07/29/21 12:53	08/20/21 14:15	EPA 3050B	97,6020B	CD
Cadmium, Total	7.772		mg/kg	0.5317	0.5317	10	07/29/21 12:53	08/20/21 14:15	EPA 3050B	97,6020B	CD
Chromium, Total	14.6		mg/kg	5.32	5.32	10	07/29/21 12:53	08/20/21 14:15	EPA 3050B	97,6020B	CD
Copper, Total	57.6		mg/kg	5.32	5.32	10	07/29/21 12:53	08/20/21 14:15	EPA 3050B	97,6020B	CD
Lead, Total	447		mg/kg	1.60	1.60	10	07/29/21 12:53	08/20/21 14:15	EPA 3050B	97,6020B	CD
Mercury, Total	0.217		mg/kg	0.212	0.212	1	07/29/21 17:11	08/04/21 13:26	EPA 7471B	97,7471B	OU
Nickel, Total	17.6		mg/kg	2.66	2.66	10	07/29/21 12:53	08/20/21 14:15	EPA 3050B	97,6020B	CD
Selenium, Total	ND		mg/kg	5.32	5.32	10	07/29/21 12:53	08/20/21 14:15	EPA 3050B	97,6020B	CD
Silver, Total	ND		mg/kg	1.33	1.33	10	07/29/21 12:53	08/20/21 14:15	EPA 3050B	97,6020B	CD
Zinc, Total	586		mg/kg	26.6	26.6	10	07/29/21 12:53	08/20/21 14:15	EPA 3050B	97,6020B	CD



Project Name: BELMONT LANDFILL**Lab Number:** L2140340**Project Number:** 2018-0157**Report Date:** 08/30/21**SAMPLE RESULTS**

Lab ID: L2140340-07

Date Collected: 07/27/21 12:05

Client ID: SW-1

Date Received: 07/27/21

Sample Location: BELMONT, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Surface Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Hardness by SM 2340B - Mansfield Lab											
Hardness	103		mg/l	0.460	0.460	1	08/03/21 11:13	08/14/21 22:06	EPA 3005A	97,6020B	WP
MCP Total Metals - Mansfield Lab											
Barium, Total	0.0611		mg/l	0.0005	0.0005	1	08/03/21 11:13	08/14/21 22:06	EPA 3005A	97,6020B	WP
Iron, Total	1.02		mg/l	0.050	0.050	1	08/03/21 11:13	08/14/21 22:06	EPA 3005A	97,6020B	WP
Lead, Total	ND		mg/l	0.001	0.001	1	08/03/21 11:13	08/14/21 22:06	EPA 3005A	97,6020B	WP
Manganese, Total	0.0769		mg/l	0.0010	0.0010	1	08/03/21 11:13	08/14/21 22:06	EPA 3005A	97,6020B	WP
Zinc, Total	ND		mg/l	0.010	0.010	1	08/03/21 11:13	08/14/21 22:06	EPA 3005A	97,6020B	WP
MCP Dissolved Metals - Mansfield Lab											
Barium, Dissolved	0.0555		mg/l	0.0005	0.0005	1	08/02/21 16:48	08/13/21 18:41	EPA 3005A	97,6020B	CD
Iron, Dissolved	0.464		mg/l	0.050	0.050	1	08/02/21 16:48	08/13/21 18:41	EPA 3005A	97,6020B	CD
Lead, Dissolved	ND		mg/l	0.001	0.001	1	08/02/21 16:48	08/13/21 18:41	EPA 3005A	97,6020B	CD
Manganese, Dissolved	ND		mg/l	0.0010	0.0010	1	08/02/21 16:48	08/13/21 18:41	EPA 3005A	97,6020B	CD
Zinc, Dissolved	ND		mg/l	0.010	0.010	1	08/02/21 16:48	08/13/21 18:41	EPA 3005A	97,6020B	CD



Project Name: BELMONT LANDFILL**Lab Number:** L2140340**Project Number:** 2018-0157**Report Date:** 08/30/21**SAMPLE RESULTS**

Lab ID: L2140340-08

Date Collected: 07/27/21 13:29

Client ID: SW-7

Date Received: 07/27/21

Sample Location: BELMONT, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Surface Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Hardness by SM 2340B - Mansfield Lab											
Hardness	94.5		mg/l	0.460	0.460	1	08/03/21 11:13	08/14/21 23:02	EPA 3005A	97,6020B	WP
MCP Total Metals - Mansfield Lab											
Barium, Total	0.0627		mg/l	0.0005	0.0005	1	08/03/21 11:13	08/14/21 23:02	EPA 3005A	97,6020B	WP
Iron, Total	10.6		mg/l	0.050	0.050	1	08/03/21 11:13	08/14/21 23:02	EPA 3005A	97,6020B	WP
Lead, Total	0.001		mg/l	0.001	0.001	1	08/03/21 11:13	08/14/21 23:02	EPA 3005A	97,6020B	WP
Manganese, Total	1.144		mg/l	0.0010	0.0010	1	08/03/21 11:13	08/14/21 23:02	EPA 3005A	97,6020B	WP
Zinc, Total	ND		mg/l	0.010	0.010	1	08/03/21 11:13	08/14/21 23:02	EPA 3005A	97,6020B	WP
MCP Dissolved Metals - Mansfield Lab											
Barium, Dissolved	0.0416		mg/l	0.0005	0.0005	1	08/02/21 16:48	08/13/21 19:52	EPA 3005A	97,6020B	CD
Iron, Dissolved	3.83		mg/l	0.050	0.050	1	08/02/21 16:48	08/13/21 19:52	EPA 3005A	97,6020B	CD
Lead, Dissolved	ND		mg/l	0.001	0.001	1	08/02/21 16:48	08/13/21 19:52	EPA 3005A	97,6020B	CD
Manganese, Dissolved	0.2774		mg/l	0.0010	0.0010	1	08/02/21 16:48	08/13/21 19:52	EPA 3005A	97,6020B	CD
Zinc, Dissolved	ND		mg/l	0.010	0.010	1	08/02/21 16:48	08/13/21 19:52	EPA 3005A	97,6020B	CD



Project Name: BELMONT LANDFILL**Lab Number:** L2140340**Project Number:** 2018-0157**Report Date:** 08/30/21**SAMPLE RESULTS**

Lab ID: L2140340-09

Date Collected: 07/27/21 12:15

Client ID: SOIL-4

Date Received: 07/27/21

Sample Location: BELMONT, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Soil

Percent Solids: 67%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/kg	2.33	2.33	10	07/29/21 12:53	08/20/21 13:29	EPA 3050B	97,6020B	CD
Arsenic, Total	5.09		mg/kg	0.728	0.728	10	07/29/21 12:53	08/20/21 13:29	EPA 3050B	97,6020B	CD
Barium, Total	89.9		mg/kg	4.36	4.36	10	07/29/21 12:53	08/20/21 13:29	EPA 3050B	97,6020B	CD
Beryllium, Total	ND		mg/kg	0.4365	0.4365	10	07/29/21 12:53	08/20/21 13:29	EPA 3050B	97,6020B	CD
Cadmium, Total	1.217		mg/kg	0.2910	0.2910	10	07/29/21 12:53	08/20/21 13:29	EPA 3050B	97,6020B	CD
Chromium, Total	17.5		mg/kg	2.91	2.91	10	07/29/21 12:53	08/20/21 13:29	EPA 3050B	97,6020B	CD
Copper, Total	46.8		mg/kg	2.91	2.91	10	07/29/21 12:53	08/20/21 13:29	EPA 3050B	97,6020B	CD
Lead, Total	284		mg/kg	0.873	0.873	10	07/29/21 12:53	08/20/21 13:29	EPA 3050B	97,6020B	CD
Mercury, Total	0.258		mg/kg	0.098	0.098	1	07/29/21 17:11	08/04/21 12:46	EPA 7471B	97,7471B	OU
Nickel, Total	12.5		mg/kg	1.46	1.46	10	07/29/21 12:53	08/20/21 13:29	EPA 3050B	97,6020B	CD
Selenium, Total	ND		mg/kg	2.91	2.91	10	07/29/21 12:53	08/20/21 13:29	EPA 3050B	97,6020B	CD
Silver, Total	ND		mg/kg	0.728	0.728	10	07/29/21 12:53	08/20/21 13:29	EPA 3050B	97,6020B	CD
Zinc, Total	216		mg/kg	14.6	14.6	10	07/29/21 12:53	08/20/21 13:29	EPA 3050B	97,6020B	CD



Project Name: BELMONT LANDFILL**Lab Number:** L2140340**Project Number:** 2018-0157**Report Date:** 08/30/21**SAMPLE RESULTS**

Lab ID: L2140340-10

Date Collected: 07/27/21 14:02

Client ID: SOIL-7-REP

Date Received: 07/27/21

Sample Location: BELMONT, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Soil

Percent Solids: 72%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	2.42		mg/kg	2.12	2.12	10	07/29/21 12:53	08/20/21 14:20	EPA 3050B	97,6020B	CD
Arsenic, Total	6.49		mg/kg	0.664	0.664	10	07/29/21 12:53	08/20/21 14:20	EPA 3050B	97,6020B	CD
Barium, Total	79.1		mg/kg	3.98	3.98	10	07/29/21 12:53	08/20/21 14:20	EPA 3050B	97,6020B	CD
Beryllium, Total	ND		mg/kg	0.3985	0.3985	10	07/29/21 12:53	08/20/21 14:20	EPA 3050B	97,6020B	CD
Cadmium, Total	1.177		mg/kg	0.2657	0.2657	10	07/29/21 12:53	08/20/21 14:20	EPA 3050B	97,6020B	CD
Chromium, Total	16.3		mg/kg	2.66	2.66	10	07/29/21 12:53	08/20/21 14:20	EPA 3050B	97,6020B	CD
Copper, Total	77.3		mg/kg	2.66	2.66	10	07/29/21 12:53	08/20/21 14:20	EPA 3050B	97,6020B	CD
Lead, Total	523		mg/kg	0.797	0.797	10	07/29/21 12:53	08/20/21 14:20	EPA 3050B	97,6020B	CD
Mercury, Total	0.206		mg/kg	0.089	0.089	1	07/29/21 17:11	08/04/21 13:29	EPA 7471B	97,7471B	OU
Nickel, Total	22.7		mg/kg	1.33	1.33	10	07/29/21 12:53	08/20/21 14:20	EPA 3050B	97,6020B	CD
Selenium, Total	ND		mg/kg	2.66	2.66	10	07/29/21 12:53	08/20/21 14:20	EPA 3050B	97,6020B	CD
Silver, Total	ND		mg/kg	0.664	0.664	10	07/29/21 12:53	08/20/21 14:20	EPA 3050B	97,6020B	CD
Zinc, Total	272		mg/kg	13.3	13.3	10	07/29/21 12:53	08/20/21 14:20	EPA 3050B	97,6020B	CD



Project Name: BELMONT LANDFILL**Lab Number:** L2140340**Project Number:** 2018-0157**Report Date:** 08/30/21**SAMPLE RESULTS**

Lab ID: L2140340-11

Date Collected: 07/27/21 13:55

Client ID: SOIL-7

Date Received: 07/27/21

Sample Location: BELMONT, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Soil

Percent Solids: 68%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/kg	2.32	2.32	10	07/29/21 12:53	08/20/21 14:25	EPA 3050B	97,6020B	CD
Arsenic, Total	7.32		mg/kg	0.724	0.724	10	07/29/21 12:53	08/20/21 14:25	EPA 3050B	97,6020B	CD
Barium, Total	92.6		mg/kg	4.35	4.35	10	07/29/21 12:53	08/20/21 14:25	EPA 3050B	97,6020B	CD
Beryllium, Total	ND		mg/kg	0.4347	0.4347	10	07/29/21 12:53	08/20/21 14:25	EPA 3050B	97,6020B	CD
Cadmium, Total	1.134		mg/kg	0.2898	0.2898	10	07/29/21 12:53	08/20/21 14:25	EPA 3050B	97,6020B	CD
Chromium, Total	19.2		mg/kg	2.90	2.90	10	07/29/21 12:53	08/20/21 14:25	EPA 3050B	97,6020B	CD
Copper, Total	80.0		mg/kg	2.90	2.90	10	07/29/21 12:53	08/20/21 14:25	EPA 3050B	97,6020B	CD
Lead, Total	544		mg/kg	0.869	0.869	10	07/29/21 12:53	08/20/21 14:25	EPA 3050B	97,6020B	CD
Mercury, Total	0.240		mg/kg	0.108	0.108	1	07/29/21 17:11	08/04/21 13:32	EPA 7471B	97,7471B	OU
Nickel, Total	18.9		mg/kg	1.45	1.45	10	07/29/21 12:53	08/20/21 14:25	EPA 3050B	97,6020B	CD
Selenium, Total	ND		mg/kg	2.90	2.90	10	07/29/21 12:53	08/20/21 14:25	EPA 3050B	97,6020B	CD
Silver, Total	ND		mg/kg	0.724	0.724	10	07/29/21 12:53	08/20/21 14:25	EPA 3050B	97,6020B	CD
Zinc, Total	352		mg/kg	14.5	14.5	10	07/29/21 12:53	08/20/21 14:25	EPA 3050B	97,6020B	CD



Project Name: BELMONT LANDFILL**Lab Number:** L2140340**Project Number:** 2018-0157**Report Date:** 08/30/21**SAMPLE RESULTS**

Lab ID: L2140340-12

Date Collected: 07/27/21 14:40

Client ID: SOIL-8

Date Received: 07/27/21

Sample Location: BELMONT, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Soil

Percent Solids: 19%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/kg	8.28	8.28	10	07/29/21 12:53	08/20/21 14:30	EPA 3050B	97,6020B	CD
Arsenic, Total	32.2		mg/kg	2.59	2.59	10	07/29/21 12:53	08/20/21 14:30	EPA 3050B	97,6020B	CD
Barium, Total	234		mg/kg	15.5	15.5	10	07/29/21 12:53	08/20/21 14:30	EPA 3050B	97,6020B	CD
Beryllium, Total	ND		mg/kg	1.553	1.553	10	07/29/21 12:53	08/20/21 14:30	EPA 3050B	97,6020B	CD
Cadmium, Total	2.183		mg/kg	1.036	1.036	10	07/29/21 12:53	08/20/21 14:30	EPA 3050B	97,6020B	CD
Chromium, Total	62.4		mg/kg	10.4	10.4	10	07/29/21 12:53	08/20/21 14:30	EPA 3050B	97,6020B	CD
Copper, Total	107		mg/kg	10.4	10.4	10	07/29/21 12:53	08/20/21 14:30	EPA 3050B	97,6020B	CD
Lead, Total	273		mg/kg	3.11	3.11	10	07/29/21 12:53	08/20/21 14:30	EPA 3050B	97,6020B	CD
Mercury, Total	ND		mg/kg	0.384	0.384	1	07/29/21 17:11	08/04/21 13:36	EPA 7471B	97,7471B	OU
Nickel, Total	33.4		mg/kg	5.18	5.18	10	07/29/21 12:53	08/20/21 14:30	EPA 3050B	97,6020B	CD
Selenium, Total	ND		mg/kg	10.4	10.4	10	07/29/21 12:53	08/20/21 14:30	EPA 3050B	97,6020B	CD
Silver, Total	ND		mg/kg	2.59	2.59	10	07/29/21 12:53	08/20/21 14:30	EPA 3050B	97,6020B	CD
Zinc, Total	526		mg/kg	51.8	51.8	10	07/29/21 12:53	08/20/21 14:30	EPA 3050B	97,6020B	CD



Project Name: BELMONT LANDFILL

Lab Number: L2140340

Project Number: 2018-0157

Report Date: 08/30/21

Method Blank Analysis Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab for sample(s): 01-06,09-12 Batch: WG1529020-1										
Antimony, Total	ND		mg/kg	1.60	1.60	10	07/29/21 12:53	08/20/21 12:51	97,6020B	CD
Arsenic, Total	ND		mg/kg	0.500	0.500	10	07/29/21 12:53	08/20/21 12:51	97,6020B	CD
Barium, Total	ND		mg/kg	3.00	3.00	10	07/29/21 12:53	08/20/21 12:51	97,6020B	CD
Beryllium, Total	ND		mg/kg	0.3000	0.3000	10	07/29/21 12:53	08/20/21 12:51	97,6020B	CD
Cadmium, Total	ND		mg/kg	0.2000	0.2000	10	07/29/21 12:53	08/20/21 12:51	97,6020B	CD
Chromium, Total	ND		mg/kg	2.00	2.00	10	07/29/21 12:53	08/20/21 12:51	97,6020B	CD
Copper, Total	ND		mg/kg	2.00	2.00	10	07/29/21 12:53	08/20/21 12:51	97,6020B	CD
Lead, Total	ND		mg/kg	0.600	0.600	10	07/29/21 12:53	08/20/21 12:51	97,6020B	CD
Nickel, Total	ND		mg/kg	1.00	1.00	10	07/29/21 12:53	08/20/21 12:51	97,6020B	CD
Selenium, Total	ND		mg/kg	2.00	2.00	10	07/29/21 12:53	08/20/21 12:51	97,6020B	CD
Silver, Total	ND		mg/kg	0.500	0.500	10	07/29/21 12:53	08/20/21 12:51	97,6020B	CD
Zinc, Total	ND		mg/kg	10.0	10.0	10	07/29/21 12:53	08/20/21 12:51	97,6020B	CD

Prep Information

Digestion Method: EPA 3050B

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab for sample(s): 01-06,09-12 Batch: WG1529021-1										
Mercury, Total	ND		mg/kg	0.083	0.083	1	07/29/21 17:11	08/04/21 12:36	97,7471B	OU

Prep Information

Digestion Method: EPA 7471B

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Hardness by SM 2340B - Mansfield Lab for sample(s): 07-08 Batch: WG1530643-1										
Hardness	ND		mg/l	0.460	0.460	1	08/03/21 11:13	08/14/21 22:27	97,6020B	WP



Project Name: BELMONT LANDFILL

Lab Number: L2140340

Project Number: 2018-0157

Report Date: 08/30/21

Method Blank Analysis Batch Quality Control

Prep Information

Digestion Method: EPA 3005A

Parameter	Result Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab for sample(s): 07-08 Batch: WG1530643-1									
Barium, Total	ND	mg/l	0.0005	0.0005	1	08/03/21 11:13	08/14/21 22:27	97,6020B	WP
Iron, Total	ND	mg/l	0.050	0.050	1	08/03/21 11:13	08/14/21 22:27	97,6020B	WP
Lead, Total	ND	mg/l	0.001	0.001	1	08/03/21 11:13	08/14/21 22:27	97,6020B	WP
Manganese, Total	ND	mg/l	0.0010	0.0010	1	08/03/21 11:13	08/14/21 22:27	97,6020B	WP
Zinc, Total	ND	mg/l	0.010	0.010	1	08/03/21 11:13	08/14/21 22:27	97,6020B	WP

Prep Information

Digestion Method: EPA 3005A

Parameter	Result Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Dissolved Metals - Mansfield Lab for sample(s): 07-08 Batch: WG1530671-1									
Barium, Dissolved	ND	mg/l	0.0005	0.0005	1	08/02/21 16:48	08/13/21 19:09	97,6020B	CD
Iron, Dissolved	ND	mg/l	0.050	0.050	1	08/02/21 16:48	08/13/21 19:09	97,6020B	CD
Lead, Dissolved	ND	mg/l	0.001	0.001	1	08/02/21 16:48	08/13/21 19:09	97,6020B	CD
Manganese, Dissolved	ND	mg/l	0.0010	0.0010	1	08/02/21 16:48	08/13/21 19:09	97,6020B	CD
Zinc, Dissolved	ND	mg/l	0.010	0.010	1	08/02/21 16:48	08/13/21 19:09	97,6020B	CD

Prep Information

Digestion Method: EPA 3005A



Lab Control Sample Analysis

Batch Quality Control

Project Name: BELMONT LANDFILL

Project Number: 2018-0157

Lab Number: L2140340

Report Date: 08/30/21

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Total Metals - Mansfield Lab Associated sample(s): 01-06,09-12 Batch: WG1529020-2 WG1529020-3 SRM Lot Number: D109-540								
Antimony, Total	108		138		19-250	24		30
Arsenic, Total	95		127		70-130	29		30
Barium, Total	94		127	Q	75-125	30		30
Beryllium, Total	85		117		75-125	32	Q	30
Cadmium, Total	95		130	Q	75-125	31	Q	30
Chromium, Total	95		128		70-130	30		30
Copper, Total	93		121		75-125	26		30
Lead, Total	94		125		72-128	28		30
Nickel, Total	95		128		70-130	30		30
Selenium, Total	97		131		68-132	30		30
Silver, Total	97		131		68-131	30		30
Zinc, Total	96		125		70-130	26		30
MCP Total Metals - Mansfield Lab Associated sample(s): 01-06,09-12 Batch: WG1529021-2 WG1529021-3 SRM Lot Number: D109-540								
Mercury, Total	92		93		60-140	1		30

Lab Control Sample Analysis **Batch Quality Control**

Project Name: BELMONT LANDFILL

Project Number: 2018-0157

Lab Number: L2140340

Report Date: 08/30/21

Parameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
MCP Total Metals - Mansfield Lab Associated sample(s): 07-08 Batch: WG1530643-2 WG1530643-3					
Barium, Total	96	99	80-120	3	20
Iron, Total	95	97	80-120	2	20
Lead, Total	96	98	80-120	2	20
Manganese, Total	92	95	80-120	3	20
Zinc, Total	99	101	80-120	2	20
MCP Dissolved Metals - Mansfield Lab Associated sample(s): 07-08 Batch: WG1530671-2 WG1530671-3					
Barium, Dissolved	91	87	80-120	4	20
Iron, Dissolved	95	88	80-120	8	20
Lead, Dissolved	102	97	80-120	5	20
Manganese, Dissolved	95	91	80-120	4	20
Zinc, Dissolved	102	100	80-120	2	20

Matrix Spike Analysis

Batch Quality Control

Project Name: BELMONT LANDFILL

Project Number: 2018-0157

Lab Number: L2140340

Report Date: 08/30/21

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
MCP Total Metals - Mansfield Lab Associated sample(s): 01-06,09-12 QC Batch ID: WG1529020-4 WG1529020-5 QC Sample: L2140340-09 Client ID: SOIL-4												
Antimony, Total	ND	28.4	22.7	80		22.1	78		75-125	3		35
Arsenic, Total	5.09	6.81	12.0	101		12.3	106		75-125	2		35
Barium, Total	89.9	114	205	101		208	104		75-125	1		35
Beryllium, Total	ND	2.84	2.782	98		2.784	98		75-125	0		35
Cadmium, Total	1.217	3.01	4.163	98		4.143	97		75-125	0		35
Chromium, Total	17.5	11.4	29.3	104		31.5	123		75-125	7		35
Copper, Total	46.8	14.2	58.4	82		63.3	116		75-125	8		35
Lead, Total	284	30.1	332	159	Q	354	232	Q	75-125	6		35
Nickel, Total	12.5	28.4	39.6	95		40.0	97		75-125	1		35
Selenium, Total	ND	6.81	7.55	111		7.28	107		75-125	4		35
Silver, Total	ND	17	30.5	179	Q	30.7	180	Q	75-125	1		35
Zinc, Total	216	28.4	257	144	Q	264	169	Q	75-125	3		35

MCP Total Metals - Mansfield Lab Associated sample(s): 01-06,09-12 QC Batch ID: WG1529021-4 WG1529021-5 QC Sample: L2140340-09 Client ID: SOIL-4

Mercury, Total	0.258	0.218	0.549	133	Q	0.440	96		75-125	22		35

Project Name: BELMONT LANDFILL**Project Number:** 2018-0157**Lab Serial Dilution
Analysis
Batch Quality Control****Lab Number:** L2140340**Report Date:** 08/30/21

Parameter	Native Sample	Serial Dilution	Units	% D	Qual	RPD Limits
MCP Total Metals - Mansfield Lab Associated sample(s): 01-06,09-12 QC Batch ID: WG1529020-6 QC Sample: L2140340-09 Client ID: SOIL-4						
Lead, Total	284	268	mg/kg	6		20

INORGANICS & MISCELLANEOUS

Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140340
Report Date: 08/30/21

SAMPLE RESULTS

Lab ID: L2140340-01
Client ID: SOIL-3
Sample Location: BELMONT, MA

Date Collected: 07/27/21 09:20
Date Received: 07/27/21
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	7.87		%	0.010	0.010	1	-	08/21/21 06:44	1,9060A	SP
Total Organic Carbon (Rep2)	7.57		%	0.010	0.010	1	-	08/21/21 06:44	1,9060A	SP
Total Organic Carbon (Average)	7.72		%	0.010	0.010	1	-	08/21/21 06:44	1,9060A	SP
Grain Size Analysis - Mansfield Lab										
% Total Gravel	14.6		%	0.100	NA	1	-	08/21/21 17:21	12,D6913/D7928	DR
% Coarse Sand	8.80		%	0.100	NA	1	-	08/21/21 17:21	12,D6913/D7928	DR
% Medium Sand	33.7		%	0.100	NA	1	-	08/21/21 17:21	12,D6913/D7928	DR
% Fine Sand	23.5		%	0.100	NA	1	-	08/21/21 17:21	12,D6913/D7928	DR
% Total Fines	19.4		%	0.100	NA	1	-	08/21/21 17:21	12,D6913/D7928	DR
General Chemistry - Westborough Lab										
Cyanide, Free	ND		mg/kg	1.7	0.40	1	08/09/21 21:45	08/10/21 22:49	109,9016	AT
General Chemistry - Mansfield Lab										
Solids, Total	59.1		%	0.100	0.100	1	-	08/02/21 16:24	121,2540G	ES



Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140340
Report Date: 08/30/21

SAMPLE RESULTS

Lab ID: L2140340-02
Client ID: SED-1
Sample Location: BELMONT, MA

Date Collected: 07/27/21 09:40
Date Received: 07/27/21
Field Prep: Not Specified

Sample Depth:
Matrix: Sediment

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	8.40		%	0.010	0.010	1	-	08/21/21 06:44	1,9060A	SP
Total Organic Carbon (Rep2)	6.29		%	0.010	0.010	1	-	08/21/21 06:44	1,9060A	SP
Total Organic Carbon (Average)	7.34		%	0.010	0.010	1	-	08/21/21 06:44	1,9060A	SP
Grain Size Analysis - Mansfield Lab										
% Total Gravel	3.40		%	0.100	NA	1	-	08/21/21 17:21	12,D6913/D7928	DR
% Coarse Sand	3.50		%	0.100	NA	1	-	08/21/21 17:21	12,D6913/D7928	DR
% Medium Sand	14.3		%	0.100	NA	1	-	08/21/21 17:21	12,D6913/D7928	DR
% Fine Sand	39.1		%	0.100	NA	1	-	08/21/21 17:21	12,D6913/D7928	DR
% Total Fines	39.7		%	0.100	NA	1	-	08/21/21 17:21	12,D6913/D7928	DR
General Chemistry - Westborough Lab										
Cyanide, Free	ND		mg/kg	4.3	1.0	1	08/09/21 21:45	08/10/21 22:49	109,9016	AT
General Chemistry - Mansfield Lab										
Solids, Total	23.3		%	0.100	0.100	1	-	08/02/21 16:24	121,2540G	ES



Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140340
Report Date: 08/30/21

SAMPLE RESULTS

Lab ID: L2140340-03
Client ID: SED-2
Sample Location: BELMONT, MA

Date Collected: 07/27/21 10:35
Date Received: 07/27/21
Field Prep: Not Specified

Sample Depth:
Matrix: Sediment

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	11.8		%	0.010	0.010	1	-	08/21/21 06:44	1,9060A	SP
Total Organic Carbon (Rep2)	14.6		%	0.010	0.010	1	-	08/21/21 06:44	1,9060A	SP
Total Organic Carbon (Average)	13.2		%	0.010	0.010	1	-	08/21/21 06:44	1,9060A	SP
Grain Size Analysis - Mansfield Lab										
% Total Gravel	0.400		%	0.100	NA	1	-	08/21/21 17:21	12,D6913/D7928	DR
% Coarse Sand	5.10		%	0.100	NA	1	-	08/21/21 17:21	12,D6913/D7928	DR
% Medium Sand	23.4		%	0.100	NA	1	-	08/21/21 17:21	12,D6913/D7928	DR
% Fine Sand	26.7		%	0.100	NA	1	-	08/21/21 17:21	12,D6913/D7928	DR
% Total Fines	44.4		%	0.100	NA	1	-	08/21/21 17:21	12,D6913/D7928	DR
General Chemistry - Westborough Lab										
Cyanide, Free	ND		mg/kg	5.2	1.2	1	08/09/21 21:45	08/10/21 22:50	109,9016	AT
General Chemistry - Mansfield Lab										
Solids, Total	19.3		%	0.100	0.100	1	-	08/02/21 16:24	121,2540G	ES



Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140340
Report Date: 08/30/21

SAMPLE RESULTS

Lab ID: L2140340-04
Client ID: SOIL-5
Sample Location: BELMONT, MA

Date Collected: 07/27/21 10:42
Date Received: 07/27/21
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	7.31		%	0.010	0.010	1	-	08/21/21 06:44	1,9060A	SP
Total Organic Carbon (Rep2)	6.47		%	0.010	0.010	1	-	08/21/21 06:44	1,9060A	SP
Total Organic Carbon (Average)	6.89		%	0.010	0.010	1	-	08/21/21 06:44	1,9060A	SP
Grain Size Analysis - Mansfield Lab										
% Total Gravel	3.20		%	0.100	NA	1	-	08/21/21 17:21	12,D6913/D7928	DR
% Coarse Sand	3.30		%	0.100	NA	1	-	08/21/21 17:21	12,D6913/D7928	DR
% Medium Sand	19.1		%	0.100	NA	1	-	08/21/21 17:21	12,D6913/D7928	DR
% Fine Sand	36.0		%	0.100	NA	1	-	08/21/21 17:21	12,D6913/D7928	DR
% Total Fines	38.4		%	0.100	NA	1	-	08/21/21 17:21	12,D6913/D7928	DR
General Chemistry - Westborough Lab										
Cyanide, Free	ND		mg/kg	1.3	0.32	1	08/09/21 21:45	08/10/21 22:50	109,9016	AT
General Chemistry - Mansfield Lab										
Solids, Total	74.2		%	0.100	0.100	1	-	08/02/21 16:24	121,2540G	ES



Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140340
Report Date: 08/30/21

SAMPLE RESULTS

Lab ID: L2140340-05
Client ID: SOIL-6
Sample Location: BELMONT, MA

Date Collected: 07/27/21 13:10
Date Received: 07/27/21
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	10.8		%	0.010	0.010	1	-	08/21/21 06:44	1,9060A	SP
Total Organic Carbon (Rep2)	11.6		%	0.010	0.010	1	-	08/21/21 06:44	1,9060A	SP
Total Organic Carbon (Average)	11.2		%	0.010	0.010	1	-	08/21/21 06:44	1,9060A	SP
Grain Size Analysis - Mansfield Lab										
% Total Gravel	11.9		%	0.100	NA	1	-	08/21/21 17:21	12,D6913/D7928	DR
% Coarse Sand	4.90		%	0.100	NA	1	-	08/21/21 17:21	12,D6913/D7928	DR
% Medium Sand	25.7		%	0.100	NA	1	-	08/21/21 17:21	12,D6913/D7928	DR
% Fine Sand	32.4		%	0.100	NA	1	-	08/21/21 17:21	12,D6913/D7928	DR
% Total Fines	25.1		%	0.100	NA	1	-	08/21/21 17:21	12,D6913/D7928	DR
General Chemistry - Westborough Lab										
Cyanide, Free	ND		mg/kg	1.6	0.38	1	08/09/21 21:45	08/10/21 22:51	109,9016	AT
General Chemistry - Mansfield Lab										
Solids, Total	62.1		%	0.100	0.100	1	-	08/02/21 16:24	121,2540G	ES



Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140340
Report Date: 08/30/21

SAMPLE RESULTS

Lab ID: L2140340-06
Client ID: SED-7
Sample Location: BELMONT, MA

Date Collected: 07/27/21 13:35
Date Received: 07/27/21
Field Prep: Not Specified

Sample Depth:
Matrix: Sediment

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	7.03		%	0.010	0.010	1	-	08/21/21 06:44	1,9060A	SP
Total Organic Carbon (Rep2)	5.53		%	0.010	0.010	1	-	08/21/21 06:44	1,9060A	SP
Total Organic Carbon (Average)	6.28		%	0.010	0.010	1	-	08/21/21 06:44	1,9060A	SP
Grain Size Analysis - Mansfield Lab										
% Total Gravel	0.800		%	0.100	NA	1	-	08/21/21 17:21	12,D6913/D7928	DR
% Coarse Sand	2.10		%	0.100	NA	1	-	08/21/21 17:21	12,D6913/D7928	DR
% Medium Sand	11.5		%	0.100	NA	1	-	08/21/21 17:21	12,D6913/D7928	DR
% Fine Sand	46.1		%	0.100	NA	1	-	08/21/21 17:21	12,D6913/D7928	DR
% Total Fines	39.5		%	0.100	NA	1	-	08/21/21 17:21	12,D6913/D7928	DR
General Chemistry - Westborough Lab										
Cyanide, Free	ND		mg/kg	2.8	0.66	1	08/09/21 21:45	08/10/21 22:51	109,9016	AT
General Chemistry - Mansfield Lab										
Solids, Total	36.0		%	0.100	0.100	1	-	08/02/21 16:24	121,2540G	ES



Project Name: BELMONT LANDFILL

Project Number: 2018-0157

Lab Number: L2140340

Report Date: 08/30/21

SAMPLE RESULTS

Lab ID: L2140340-07

Client ID: SW-1

Sample Location: BELMONT, MA

Date Collected: 07/27/21 12:05

Date Received: 07/27/21

Field Prep: Not Specified

Sample Depth:

Matrix: Surface Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Cyanide, Free	ND		ug/l	2.00	0.544	1	08/10/21 15:40	08/10/21 22:38	109,9016	AT



Project Name: BELMONT LANDFILL**Project Number:** 2018-0157**Lab Number:** L2140340**Report Date:** 08/30/21**SAMPLE RESULTS****Lab ID:** L2140340-08**Client ID:** SW-7**Sample Location:** BELMONT, MA**Date Collected:** 07/27/21 13:29**Date Received:** 07/27/21**Field Prep:** Not Specified**Sample Depth:****Matrix:** Surface Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Cyanide, Free	ND		ug/l	2.00	0.544	1	08/10/21 15:40	08/10/21 22:38	109,9016	AT



Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140340
Report Date: 08/30/21

SAMPLE RESULTS

Lab ID: L2140340-09
Client ID: SOIL-4
Sample Location: BELMONT, MA

Date Collected: 07/27/21 12:15
Date Received: 07/27/21
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	7.54		%	0.010	0.010	1	-	08/21/21 06:44	1,9060A	SP
Total Organic Carbon (Rep2)	8.77		%	0.010	0.010	1	-	08/21/21 06:44	1,9060A	SP
Total Organic Carbon (Average)	8.15		%	0.010	0.010	1	-	08/21/21 06:44	1,9060A	SP
Grain Size Analysis - Mansfield Lab										
% Total Gravel	26.6		%	0.100	NA	1	-	08/21/21 17:21	12,D6913/D7928	DR
% Coarse Sand	7.70		%	0.100	NA	1	-	08/21/21 17:21	12,D6913/D7928	DR
% Medium Sand	22.5		%	0.100	NA	1	-	08/21/21 17:21	12,D6913/D7928	DR
% Fine Sand	21.1		%	0.100	NA	1	-	08/21/21 17:21	12,D6913/D7928	DR
% Total Fines	22.1		%	0.100	NA	1	-	08/21/21 17:21	12,D6913/D7928	DR
General Chemistry - Westborough Lab										
Cyanide, Free	ND		mg/kg	1.5	0.36	1	08/09/21 21:45	08/10/21 22:52	109,9016	AT
General Chemistry - Mansfield Lab										
Solids, Total	66.8		%	0.100	0.100	1	-	08/02/21 16:24	121,2540G	ES



Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140340
Report Date: 08/30/21

SAMPLE RESULTS

Lab ID: L2140340-10
Client ID: SOIL-7-REP
Sample Location: BELMONT, MA

Date Collected: 07/27/21 14:02
Date Received: 07/27/21
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	6.29		%	0.010	0.010	1	-	08/21/21 06:44	1,9060A	SP
Total Organic Carbon (Rep2)	4.75		%	0.010	0.010	1	-	08/21/21 06:44	1,9060A	SP
Total Organic Carbon (Average)	5.52		%	0.010	0.010	1	-	08/21/21 06:44	1,9060A	SP
Grain Size Analysis - Mansfield Lab										
% Total Gravel	7.30		%	0.100	NA	1	-	08/21/21 17:21	12,D6913/D7928	DR
% Coarse Sand	8.40		%	0.100	NA	1	-	08/21/21 17:21	12,D6913/D7928	DR
% Medium Sand	36.3		%	0.100	NA	1	-	08/21/21 17:21	12,D6913/D7928	DR
% Fine Sand	33.6		%	0.100	NA	1	-	08/21/21 17:21	12,D6913/D7928	DR
% Total Fines	14.4		%	0.100	NA	1	-	08/21/21 17:21	12,D6913/D7928	DR
General Chemistry - Westborough Lab										
Cyanide, Free	ND		mg/kg	1.4	0.33	1	08/09/21 21:45	08/10/21 22:53	109,9016	AT
General Chemistry - Mansfield Lab										
Solids, Total	71.5		%	0.100	0.100	1	-	08/02/21 16:24	121,2540G	ES



Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140340
Report Date: 08/30/21

SAMPLE RESULTS

Lab ID: L2140340-11
Client ID: SOIL-7
Sample Location: BELMONT, MA

Date Collected: 07/27/21 13:55
Date Received: 07/27/21
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	11.3		%	0.010	0.010	1	-	08/21/21 06:44	1,9060A	SP
Total Organic Carbon (Rep2)	22.3		%	0.010	0.010	1	-	08/21/21 06:44	1,9060A	SP
Total Organic Carbon (Average)	16.8		%	0.010	0.010	1	-	08/21/21 06:44	1,9060A	SP
Grain Size Analysis - Mansfield Lab										
% Total Gravel	11.5		%	0.100	NA	1	-	08/21/21 17:21	12,D6913/D7928	DR
% Coarse Sand	6.70		%	0.100	NA	1	-	08/21/21 17:21	12,D6913/D7928	DR
% Medium Sand	33.9		%	0.100	NA	1	-	08/21/21 17:21	12,D6913/D7928	DR
% Fine Sand	33.3		%	0.100	NA	1	-	08/21/21 17:21	12,D6913/D7928	DR
% Total Fines	14.6		%	0.100	NA	1	-	08/21/21 17:21	12,D6913/D7928	DR
General Chemistry - Westborough Lab										
Cyanide, Free	ND		mg/kg	1.5	0.35	1	08/09/21 21:45	08/10/21 22:54	109,9016	AT
General Chemistry - Mansfield Lab										
Solids, Total	67.5		%	0.100	0.100	1	-	08/02/21 16:24	121,2540G	ES



Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140340
Report Date: 08/30/21

SAMPLE RESULTS

Lab ID: L2140340-12
Client ID: SOIL-8
Sample Location: BELMONT, MA

Date Collected: 07/27/21 14:40
Date Received: 07/27/21
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	20.9		%	0.010	0.010	1	-	08/21/21 06:44	1,9060A	SP
Total Organic Carbon (Rep2)	23.1		%	0.010	0.010	1	-	08/21/21 06:44	1,9060A	SP
Total Organic Carbon (Average)	22.0		%	0.010	0.010	1	-	08/21/21 06:44	1,9060A	SP
Grain Size Analysis - Mansfield Lab										
% Total Gravel	2.70		%	0.100	NA	1	-	08/21/21 17:21	12,D6913/D7928	DR
% Coarse Sand	13.4		%	0.100	NA	1	-	08/21/21 17:21	12,D6913/D7928	DR
% Medium Sand	20.1		%	0.100	NA	1	-	08/21/21 17:21	12,D6913/D7928	DR
% Fine Sand	13.4		%	0.100	NA	1	-	08/21/21 17:21	12,D6913/D7928	DR
% Total Fines	50.4		%	0.100	NA	1	-	08/21/21 17:21	12,D6913/D7928	DR
General Chemistry - Westborough Lab										
Cyanide, Free	ND		mg/kg	5.4	1.3	1	08/09/21 21:45	08/10/21 22:55	109,9016	AT
General Chemistry - Mansfield Lab										
Solids, Total	18.5		%	0.100	0.100	1	-	08/02/21 16:24	121,2540G	ES



Project Name: BELMONT LANDFILL

Lab Number: L2140340

Project Number: 2018-0157

Report Date: 08/30/21

Method Blank Analysis Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab for sample(s): 01-06,09-12 Batch: WG1533180-1										
Cyanide, Free	ND		mg/kg	1.0	0.24	1	08/09/21 21:45	08/10/21 22:46	109,9016	AT
General Chemistry - Westborough Lab for sample(s): 07-08 Batch: WG1533507-1										
Cyanide, Free	ND		ug/l	2.00	0.544	1	08/10/21 15:40	08/10/21 22:35	109,9016	AT
Total Organic Carbon - Mansfield Lab for sample(s): 01-06,09-12 Batch: WG1537983-1										
Total Organic Carbon (Rep1)	ND		%	0.010	0.010	1	-	08/21/21 06:44	1,9060A	SP
Total Organic Carbon (Rep2)	ND		%	0.010	0.010	1	-	08/21/21 06:44	1,9060A	SP
Total Organic Carbon (Average)	ND		%	0.010	0.010	1	-	08/21/21 06:44	1,9060A	SP

Lab Control Sample Analysis

Batch Quality Control

Project Name: BELMONT LANDFILL

Project Number: 2018-0157

Lab Number: L2140340

Report Date: 08/30/21

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-06,09-12 Batch: WG1533180-2								
Cyanide, Free	82		-			-		
General Chemistry - Westborough Lab Associated sample(s): 07-08 Batch: WG1533507-2								
Cyanide, Free	85		-		75-125	-		
Total Organic Carbon - Mansfield Lab Associated sample(s): 01-06,09-12 Batch: WG1537983-2								
Total Organic Carbon (Rep1)	97		-		75-125	-		25
Total Organic Carbon (Rep2)	85		-		75-125	-		25
Total Organic Carbon (Average)	91		-		75-125	-		25

Matrix Spike Analysis

Batch Quality Control

Project Name: BELMONT LANDFILL

Lab Number: L2140340

Project Number: 2018-0157

Report Date: 08/30/21

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-06,09-12 QC Batch ID: WG1533180-3 WG1533180-4 QC Sample: L2140340-09 Client ID: SOIL-4												
Cyanide, Free	ND	31.81	23	72		22	70			4		
Total Organic Carbon - Mansfield Lab Associated sample(s): 01-06,09-12 QC Batch ID: WG1537983-4 WG1537983-5 QC Sample: L2140340-09 Client ID: SOIL-4												
Total Organic Carbon (Rep1)	7.54	0.898	8.99	161	Q	10.9	340	Q	75-125	19		25
Total Organic Carbon (Rep2)	8.77	0.846	10.6	216	Q	9.84	130	Q	75-125	7		25

Lab Duplicate Analysis *Batch Quality Control*

Project Name: BELMONT LANDFILL

Project Number: 2018-0157

Lab Number: L2140340

Report Date: 08/30/21

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-06,09-12 QC Batch ID: WG1533180-5 QC Sample: L2140340-09 Client ID: SOIL-4						
Cyanide, Free	ND	ND	mg/kg	NC		
Grain Size Analysis - Mansfield Lab Associated sample(s): 01-06,09-12 QC Batch ID: WG1537739-1 QC Sample: L2140340-09 Client ID: SOIL-4						
% Total Gravel	26.6	24.6	%	8		20
% Coarse Sand	7.70	7.20	%	7		20
% Medium Sand	22.5	23.5	%	4		20
% Fine Sand	21.1	21.4	%	1		20
% Total Fines	22.1	23.3	%	5		20
Total Organic Carbon - Mansfield Lab Associated sample(s): 01-06,09-12 QC Batch ID: WG1537983-3 QC Sample: L2140340-01 Client ID: SOIL-3						
Total Organic Carbon (Rep1)	7.87	8.32	%	6		25
Total Organic Carbon (Rep2)	7.57	7.45	%	2		25
Total Organic Carbon (Average)	7.72	7.88	%	2		25

Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Serial_No: 08302116:30
Lab Number: L2140340
Report Date: 08/30/21

Sample Receipt and Container Information

Were project specific reporting limits specified?

YES

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2140340-01A	Glass 250ml/8oz unpreserved	A	NA		4.3	Y	Absent		A2-BA-MCP6020T-10(180),A2-CR-MCP6020T-10(180),A2-CD-MCP6020T-10(180),A2-ZN-MCP6020T-10(180),A2-AG-MCP6020T-10(180),A2-AS-MCP6020T-10(180),A2-SB-MCP6020T-10(180),A2-BE-MCP6020T-10(180),A2-PAH-8270SIM(14),A2-NI-MCP6020T-10(180),A2-CU-MCP6020T-10(180),A2-SE-MCP6020T-10(180),A2-HG-MCP7471T-10(28),A2-TOC-9060-2REPS(28),A2-PB-MCP6020T-10(180)
L2140340-01B	Glass 120ml/4oz unpreserved	A	NA		4.3	Y	Absent		A2-DIOXIN-1613(365)
L2140340-01C	Plastic 8oz unpreserved for Grain Size	A	NA		4.3	Y	Absent		A2-HYDRO-TFINE(),A2-HYDRO-FSAND(),A2-HYDRO-MSAND(),A2-TS(7),A2-HYDRO-TGRAVEL(),A2-HYDRO-CSAND()
L2140340-01D	Glass 120ml/4oz unpreserved	A	NA		4.3	Y	Absent		FCN-9016(14)
L2140340-02A	Glass 250ml/8oz unpreserved	A	NA		4.3	Y	Absent		A2-CR-MCP6020T-10(180),A2-BA-MCP6020T-10(180),A2-CD-MCP6020T-10(180),A2-ZN-MCP6020T-10(180),A2-AG-MCP6020T-10(180),A2-AS-MCP6020T-10(180),A2-PAH-8270SIM(14),A2-SB-MCP6020T-10(180),A2-BE-MCP6020T-10(180),A2-CU-MCP6020T-10(180),A2-SE-MCP6020T-10(180),A2-HG-MCP7471T-10(28),A2-NI-MCP6020T-10(180),A2-TOC-9060-2REPS(28),A2-PB-MCP6020T-10(180)
L2140340-02B	Glass 120ml/4oz unpreserved	A	NA		4.3	Y	Absent		A2-DIOXIN-1613(365)
L2140340-02C	Plastic 8oz unpreserved for Grain Size	A	NA		4.3	Y	Absent		A2-HYDRO-TFINE(),A2-HYDRO-FSAND(),A2-HYDRO-MSAND(),A2-HYDRO-TGRAVEL(),A2-TS(7),A2-HYDRO-CSAND()
L2140340-02D	Glass 120ml/4oz unpreserved	A	NA		4.3	Y	Absent		FCN-9016(14)

Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Serial_No: 08302116:30
Lab Number: L2140340
Report Date: 08/30/21

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2140340-03A	Glass 250ml/8oz unpreserved	A	NA		4.3	Y	Absent		A2-CR-MCP6020T-10(180),A2-BA-MCP6020T-10(180),A2-AG-MCP6020T-10(180),A2-AS-MCP6020T-10(180),A2-CD-MCP6020T-10(180),A2-ZN-MCP6020T-10(180),A2-PAH-8270SIM(14),A2-BE-MCP6020T-10(180),A2-SB-MCP6020T-10(180),A2-SE-MCP6020T-10(180),A2-HG-MCP7471T-10(28),A2-CU-MCP6020T-10(180),A2-NI-MCP6020T-10(180),A2-PB-MCP6020T-10(180),A2-TOC-9060-2REPS(28)
L2140340-03B	Glass 120ml/4oz unpreserved	A	NA		4.3	Y	Absent		A2-DIOXIN-1613(365)
L2140340-03C	Plastic 8oz unpreserved for Grain Size	A	NA		4.3	Y	Absent		A2-HYDRO-TFINE(),A2-HYDRO-FSAND(),A2-HYDRO-MSAND(),A2-HYDRO-TGRAVEL(),A2-TS(7),A2-HYDRO-CSAND()
L2140340-03D	Glass 120ml/4oz unpreserved	A	NA		4.3	Y	Absent		FCN-9016(14)
L2140340-04A	Glass 250ml/8oz unpreserved	A	NA		4.3	Y	Absent		A2-BA-MCP6020T-10(180),A2-CR-MCP6020T-10(180),A2-AG-MCP6020T-10(180),A2-ZN-MCP6020T-10(180),A2-AS-MCP6020T-10(180),A2-CD-MCP6020T-10(180),A2-PAH-8270SIM(14),A2-SB-MCP6020T-10(180),A2-BE-MCP6020T-10(180),A2-HG-MCP7471T-10(28),A2-NI-MCP6020T-10(180),A2-SE-MCP6020T-10(180),A2-CU-MCP6020T-10(180),A2-PB-MCP6020T-10(180),A2-TOC-9060-2REPS(28)
L2140340-04B	Glass 120ml/4oz unpreserved	A	NA		4.3	Y	Absent		A2-DIOXIN-1613(365)
L2140340-04C	Plastic 8oz unpreserved for Grain Size	A	NA		4.3	Y	Absent		A2-HYDRO-TFINE(),A2-HYDRO-FSAND(),A2-HYDRO-MSAND(),A2-HYDRO-TGRAVEL(),A2-TS(7),A2-HYDRO-CSAND()
L2140340-04D	Glass 120ml/4oz unpreserved	A	NA		4.3	Y	Absent		FCN-9016(14)
L2140340-05A	Glass 250ml/8oz unpreserved	A	NA		4.3	Y	Absent		A2-BA-MCP6020T-10(180),A2-CR-MCP6020T-10(180),A2-CD-MCP6020T-10(180),A2-AS-MCP6020T-10(180),A2-AG-MCP6020T-10(180),A2-ZN-MCP6020T-10(180),A2-PAH-8270SIM(14),A2-SB-MCP6020T-10(180),A2-BE-MCP6020T-10(180),A2-HG-MCP7471T-10(28),A2-SE-MCP6020T-10(180),A2-CU-MCP6020T-10(180),A2-NI-MCP6020T-10(180),A2-PB-MCP6020T-10(180),A2-TOC-9060-2REPS(28)
L2140340-05B	Glass 120ml/4oz unpreserved	A	NA		4.3	Y	Absent		A2-DIOXIN-1613(365)
L2140340-05C	Plastic 8oz unpreserved for Grain Size	A	NA		4.3	Y	Absent		A2-HYDRO-TFINE(),A2-HYDRO-FSAND(),A2-HYDRO-MSAND(),A2-TS(7),A2-HYDRO-TGRAVEL(),A2-HYDRO-CSAND()
L2140340-05D	Glass 120ml/4oz unpreserved	A	NA		4.3	Y	Absent		FCN-9016(14)

*Values in parentheses indicate holding time in days

Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Serial_No: 08302116:30
Lab Number: L2140340
Report Date: 08/30/21

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2140340-06A	Glass 250ml/8oz unpreserved	A	NA		4.3	Y	Absent		A2-CR-MCP6020T-10(180),A2-BA-MCP6020T-10(180),A2-AG-MCP6020T-10(180),A2-ZN-MCP6020T-10(180),A2-AS-MCP6020T-10(180),A2-CD-MCP6020T-10(180),A2-SB-MCP6020T-10(180),A2-BE-MCP6020T-10(180),A2-PAH-8270SIM(14),A2-CU-MCP6020T-10(180),A2-SE-MCP6020T-10(180),A2-HG-MCP7471T-10(28),A2-NI-MCP6020T-10(180),A2-PB-MCP6020T-10(180),A2-TOC-9060-2REPS(28)
L2140340-06B	Glass 120ml/4oz unpreserved	A	NA		4.3	Y	Absent		A2-DIOXIN-1613(365)
L2140340-06C	Plastic 8oz unpreserved for Grain Size	A	NA		4.3	Y	Absent		A2-HYDRO-TFINE(),A2-HYDRO-FSAND(),A2-HYDRO-MSAND(),A2-TS(7),A2-HYDRO-TGRAVEL(),A2-HYDRO-CSAND()
L2140340-06D	Glass 120ml/4oz unpreserved	A	NA		4.3	Y	Absent		FCN-9016(14)
L2140340-07A	Plastic 120ml HNO3 preserved	A	<2	<2	4.3	Y	Absent		A2-BA-MCP6020T-10(180),A2-ZN-MCP6020T-10(180),A2-MN-MCP6020T-10(180),A2-HARD-MCP6020T-10(180),A2-FE-MCP6020T-10(180),A2-PB-MCP6020T-10(180)
L2140340-07B	Plastic 120ml unpreserved	A	7	7	4.3	Y	Absent		A2-FILTERMET(1)
L2140340-07C	Plastic 120ml unpreserved	A	7	7	4.3	Y	Absent		FCN-9016(14)
L2140340-07X	Plastic 120ml HNO3 preserved	A	<2	<2	4.3	Y	Absent		A2-ZN-MCP6020S-10(180),A2-BA-MCP6020S-10(180),A2-PB-MCP6020S-10(180),A2-MN-MCP6020S-10(180),A2-FE-MCP6020S-10(180)
L2140340-07Y	Brown Plastic 120ml NaOH preserved	A	>12	>12	4.3	Y	Absent		FCN-9016(14)
L2140340-08A	Plastic 120ml HNO3 preserved	A	<2	<2	4.3	Y	Absent		A2-BA-MCP6020T-10(180),A2-ZN-MCP6020T-10(180),A2-MN-MCP6020T-10(180),A2-FE-MCP6020T-10(180),A2-HARD-MCP6020T-10(180),A2-PB-MCP6020T-10(180)
L2140340-08B	Plastic 120ml unpreserved	A	7	7	4.3	Y	Absent		A2-FILTERMET(1)
L2140340-08C	Plastic 120ml unpreserved	A	7	7	4.3	Y	Absent		FCN-9016(14)
L2140340-08X	Plastic 120ml HNO3 preserved	A	<2	<2	4.3	Y	Absent		A2-ZN-MCP6020S-10(180),A2-BA-MCP6020S-10(180),A2-PB-MCP6020S-10(180),A2-MN-MCP6020S-10(180),A2-FE-MCP6020S-10(180)
L2140340-08Y	Brown Plastic 120ml NaOH preserved	A	>12	>12	4.3	Y	Absent		FCN-9016(14)

Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Serial_No: 08302116:30
Lab Number: L2140340
Report Date: 08/30/21

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2140340-09A	Glass 250ml/8oz unpreserved	A	NA		4.3	Y	Absent		A2-CR-MCP6020T-10(180),A2-BA-MCP6020T-10(180),A2-AS-MCP6020T-10(180),A2-AG-MCP6020T-10(180),A2-ZN-MCP6020T-10(180),A2-CD-MCP6020T-10(180),A2-PAH-8270SIM(14),A2-SB-MCP6020T-10(180),A2-BE-MCP6020T-10(180),A2-NI-MCP6020T-10(180),A2-SE-MCP6020T-10(180),A2-CU-MCP6020T-10(180),A2-HG-MCP7471T-10(28),A2-PB-MCP6020T-10(180)
L2140340-09A1	Glass 250ml/8oz unpreserved	A	NA		4.3	Y	Absent		A2-CR-MCP6020T-10(180),A2-BA-MCP6020T-10(180),A2-AS-MCP6020T-10(180),A2-AG-MCP6020T-10(180),A2-ZN-MCP6020T-10(180),A2-CD-MCP6020T-10(180),A2-PAH-8270SIM(14),A2-SB-MCP6020T-10(180),A2-BE-MCP6020T-10(180),A2-NI-MCP6020T-10(180),A2-SE-MCP6020T-10(180),A2-CU-MCP6020T-10(180),A2-HG-MCP7471T-10(28),A2-PB-MCP6020T-10(180)
L2140340-09B	Glass 120ml/4oz unpreserved	A	NA		4.3	Y	Absent		A2-DIOXIN-1613(365)
L2140340-09B1	Glass 120ml/4oz unpreserved	A	NA		4.3	Y	Absent		A2-DIOXIN-1613(365)
L2140340-09C	Plastic 8oz unpreserved for Grain Size	A	NA		4.3	Y	Absent		A2-HYDRO-TFINE(),A2-HYDRO-FSAND(),A2-HYDRO-MSAND(),A2-TS(7),A2-HYDRO-TGRAVEL(),A2-HYDRO-CSAND(),A2-TOC-9060-2REPS(28)
L2140340-09C1	Plastic 8oz unpreserved for Grain Size	A	NA		4.3	Y	Absent		A2-HYDRO-TFINE(),A2-HYDRO-FSAND(),A2-HYDRO-MSAND(),A2-TS(7),A2-HYDRO-TGRAVEL(),A2-HYDRO-CSAND(),A2-TOC-9060-2REPS(28)
L2140340-09D	Glass 120ml/4oz unpreserved	A	NA		4.3	Y	Absent		FCN-9016(14)
L2140340-09D1	Glass 120ml/4oz unpreserved	A	NA		4.3	Y	Absent		FCN-9016(14)
L2140340-10A	Glass 250ml/8oz unpreserved	A	NA		4.3	Y	Absent		A2-CR-MCP6020T-10(180),A2-BA-MCP6020T-10(180),A2-AG-MCP6020T-10(180),A2-AS-MCP6020T-10(180),A2-CD-MCP6020T-10(180),A2-ZN-MCP6020T-10(180),A2-PAH-8270SIM(14),A2-SB-MCP6020T-10(180),A2-BE-MCP6020T-10(180),A2-HG-MCP7471T-10(28),A2-SE-MCP6020T-10(180),A2-NI-MCP6020T-10(180),A2-CU-MCP6020T-10(180),A2-PB-MCP6020T-10(180),A2-TOC-9060-2REPS(28)
L2140340-10B	Glass 120ml/4oz unpreserved	A	NA		4.3	Y	Absent		A2-DIOXIN-1613(365)
L2140340-10C	Plastic 8oz unpreserved for Grain Size	A	NA		4.3	Y	Absent		A2-HYDRO-TFINE(),A2-HYDRO-FSAND(),A2-HYDRO-MSAND(),A2-HYDRO-TGRAVEL(),A2-TS(7),A2-HYDRO-CSAND()

Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Serial_No: 08302116:30
Lab Number: L2140340
Report Date: 08/30/21

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2140340-10D	Glass 120ml/4oz unpreserved	A	NA		4.3	Y	Absent		FCN-9016(14)
L2140340-11A	Glass 250ml/8oz unpreserved	A	NA		4.3	Y	Absent		A2-CR-MCP6020T-10(180),A2-BA-MCP6020T-10(180),A2-AG-MCP6020T-10(180),A2-AS-MCP6020T-10(180),A2-CD-MCP6020T-10(180),A2-ZN-MCP6020T-10(180),A2-SB-MCP6020T-10(180),A2-PAH-8270SIM(14),A2-BE-MCP6020T-10(180),A2-CU-MCP6020T-10(180),A2-NI-MCP6020T-10(180),A2-HG-MCP7471T-10(28),A2-SE-MCP6020T-10(180),A2-TOC-9060-2REPS(28),A2-PB-MCP6020T-10(180)
L2140340-11B	Glass 120ml/4oz unpreserved	A	NA		4.3	Y	Absent		A2-DIOXIN-1613(365)
L2140340-11C	Plastic 8oz unpreserved for Grain Size	A	NA		4.3	Y	Absent		A2-HYDRO-TFINE(),A2-HYDRO-FSAND(),A2-HYDRO-MSAND(),A2-TS(7),A2-HYDRO-TGRAVEL(),A2-HYDRO-CSAND()
L2140340-11D	Glass 120ml/4oz unpreserved	A	NA		4.3	Y	Absent		FCN-9016(14)
L2140340-12A	Glass 250ml/8oz unpreserved	A	NA		4.3	Y	Absent		A2-BA-MCP6020T-10(180),A2-CR-MCP6020T-10(180),A2-CD-MCP6020T-10(180),A2-ZN-MCP6020T-10(180),A2-AS-MCP6020T-10(180),A2-AG-MCP6020T-10(180),A2-PAH-8270SIM(14),A2-SB-MCP6020T-10(180),A2-BE-MCP6020T-10(180),A2-NI-MCP6020T-10(180),A2-CU-MCP6020T-10(180),A2-HG-MCP7471T-10(28),A2-SE-MCP6020T-10(180),A2-TOC-9060-2REPS(28),A2-PB-MCP6020T-10(180)
L2140340-12B	Glass 120ml/4oz unpreserved	A	NA		4.3	Y	Absent		A2-DIOXIN-1613(365)
L2140340-12C	Plastic 8oz unpreserved for Grain Size	A	NA		4.3	Y	Absent		A2-HYDRO-TFINE(),A2-HYDRO-FSAND(),A2-HYDRO-MSAND(),A2-HYDRO-TGRAVEL(),A2-TS(7),A2-HYDRO-CSAND()
L2140340-12D	Glass 120ml/4oz unpreserved	A	NA		4.3	Y	Absent		FCN-9016(14)

Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140340
Report Date: 08/30/21

GLOSSARY

Acronyms

DL	- Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EMPC	- Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LOD	- Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
LOQ	- Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.) Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
NR	- No Results: Term is utilized when 'No Target Compounds Requested' is reported for the analysis of Volatile or Semivolatile Organic TIC only requests.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TEF	- Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.
TEQ	- Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Report Format: DU Report with 'J' Qualifiers



Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140340
Report Date: 08/30/21

Footnotes

- 1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Difference: With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

PAH Total: With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. In addition, the 'PFAS, Total (6)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA, PFDA and PFOS. For MassDEP DW compliance analysis only, the 'PFAS, Total (6)' result is defined as the summation of results at or above the RL. Note: If a 'Total' result is requested, the results of its individual components will also be reported.

The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA, this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

- A** - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.
- B** - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).
- C** - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
- D** - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
- E** - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- F** - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.
- G** - The concentration may be biased high due to matrix interferences (i.e. co-elution) with non-target compound(s). The result should be considered estimated.
- H** - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
- I** - The lower value for the two columns has been reported due to obvious interference.
- J** - Estimated value. The Target analyte concentration is below the quantitation limit (RL), but above the Method Detection Limit (MDL) or Estimated Detection Limit (EDL) for SPME-related analyses. This represents an estimated concentration for Tentatively Identified Compounds (TICs).
- M** - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.
- ND** - Not detected at the method detection limit (MDL) for the sample, or estimated detection limit (EDL) for SPME-related analyses.

Report Format: DU Report with 'J' Qualifiers



Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140340
Report Date: 08/30/21

Data Qualifiers

- NJ** - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.
- P** - The RPD between the results for the two columns exceeds the method-specified criteria.
- Q** - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)
- R** - Analytical results are from sample re-analysis.
- RE** - Analytical results are from sample re-extraction.
- S** - Analytical results are from modified screening analysis.

Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140340
Report Date: 08/30/21

REFERENCES

- 1 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - VI, 2018.
- 12 Annual Book of ASTM Standards. (American Society for Testing and Materials) ASTM International.
- 97 EPA Test Methods (SW-846) with QC Requirements & Performance Standards for the Analysis of EPA SW-846 Methods under the Massachusetts Contingency Plan, WSC-CAM-IIA, IIB, IIIA, IIIB, IIIC, IIID, VA, VB, VC, VIA, VIB, VIIIA and VIIIB, July 2010.
- 109 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Revision 0, June 2010.
- 121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.
- 132 Method 1613 Revision B: Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution HRGC/HRMS. USEPA Office of Water, October 1994.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



Serial_No:08302116:30

ASTM D6913/D7928
GRAIN SIZE ANALYSIS

Serial No: 08302116.30

Grain Size (mm)	Percent Finer (%)
60.0	100
4.75	100
2.0	100
0.85	100
0.425	100
0.25	100
0.15	100
0.075	19

Project No.	Client:	Remarks:
Project:		
☐ Source of Sample: SOIL-3 Sample Number: L2140340-01		
Alpha Analytical Mansfield, MA		Figure

GRAIN SIZE DISTRIBUTION TEST DATA

8/24/2021

Location: SOIL-3

Sample Number: L2140340-01

Sieve Test Data

Post #200 Wash Test Weights (grams): Dry Sample and Tare = 108.51

Tare Wt. = 0.00

Minus #200 from wash = 0.0%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
108.51	0.00	3"	0.00	0.00	100.0
		2"	0.00	0.00	100.0
		1"	0.00	0.00	100.0
		3/4"	0.00	0.00	100.0
		1/2"	7.69	0.00	92.9
		3/8"	1.54	0.00	91.5
		#4	6.63	0.00	85.4
		#10	9.54	0.00	76.6
		#40	36.55	0.00	42.9
		#60	11.55	0.00	32.3
		#200	13.95	0.00	19.4

Serial_No:08302116:30

Fractional Components

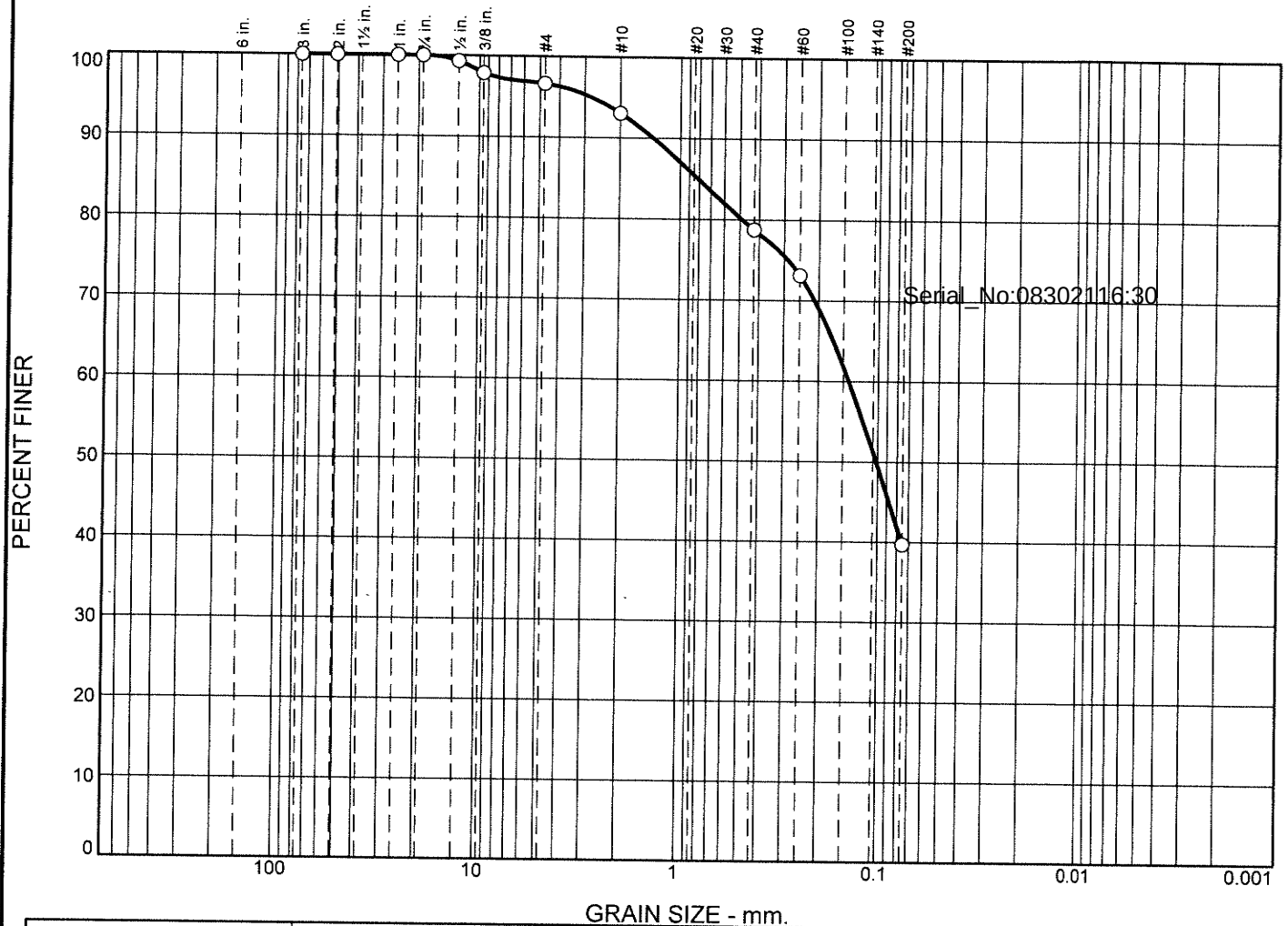
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	14.6	14.6	8.8	33.7	23.5	66.0			19.4

D ₅	D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₄₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
			0.0810	0.2164	0.3727	0.5744	0.8689	2.6562	4.5688	7.4730	14.3859

Fineness Modulus
2.65

Alpha Analytical

Particle Size Distribution Report



GRAIN SIZE - mm.										
% +3"		% Gravel		% Sand			% Fines			
		Coarse	Fine	Coarse	Medium	Fine	Silt		Clay	
○	0.0	0.0	3.4	3.5	14.3	39.1	39.7			
×	LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
○			0.8131	0.1408	0.1020					

Material Description							USCS	AASHTO
○								

Project No.	Client:	Remarks:
Project:		
○ Source of Sample: SED-1	Sample Number: L2140340-02	
Alpha Analytical		
Mansfield, MA		Figure

GRAIN SIZE DISTRIBUTION TEST DATA

8/24/2021

Location: SED-1

Sample Number: L2140340-02

Sieve Test Data

Post #200 Wash Test Weights (grams): Dry Sample and Tare = 52.27

Tare Wt. = 0.00

Minus #200 from wash = 0.0%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
52.27	0.00	3"	0.00	0.00	100.0
		2"	0.00	0.00	100.0
		1"	0.00	0.00	100.0
		3/4"	0.00	0.00	100.0
		1/2"	0.36	0.00	99.3
		3/8"	0.75	0.00	97.9
		#4	0.65	0.00	96.6
		#10	1.87	0.00	93.1
		#40	7.47	0.00	78.8
		#60	2.94	0.00	73.1
		#200	17.46	0.00	39.7

Serial_No:08302116:30

Fractional Components

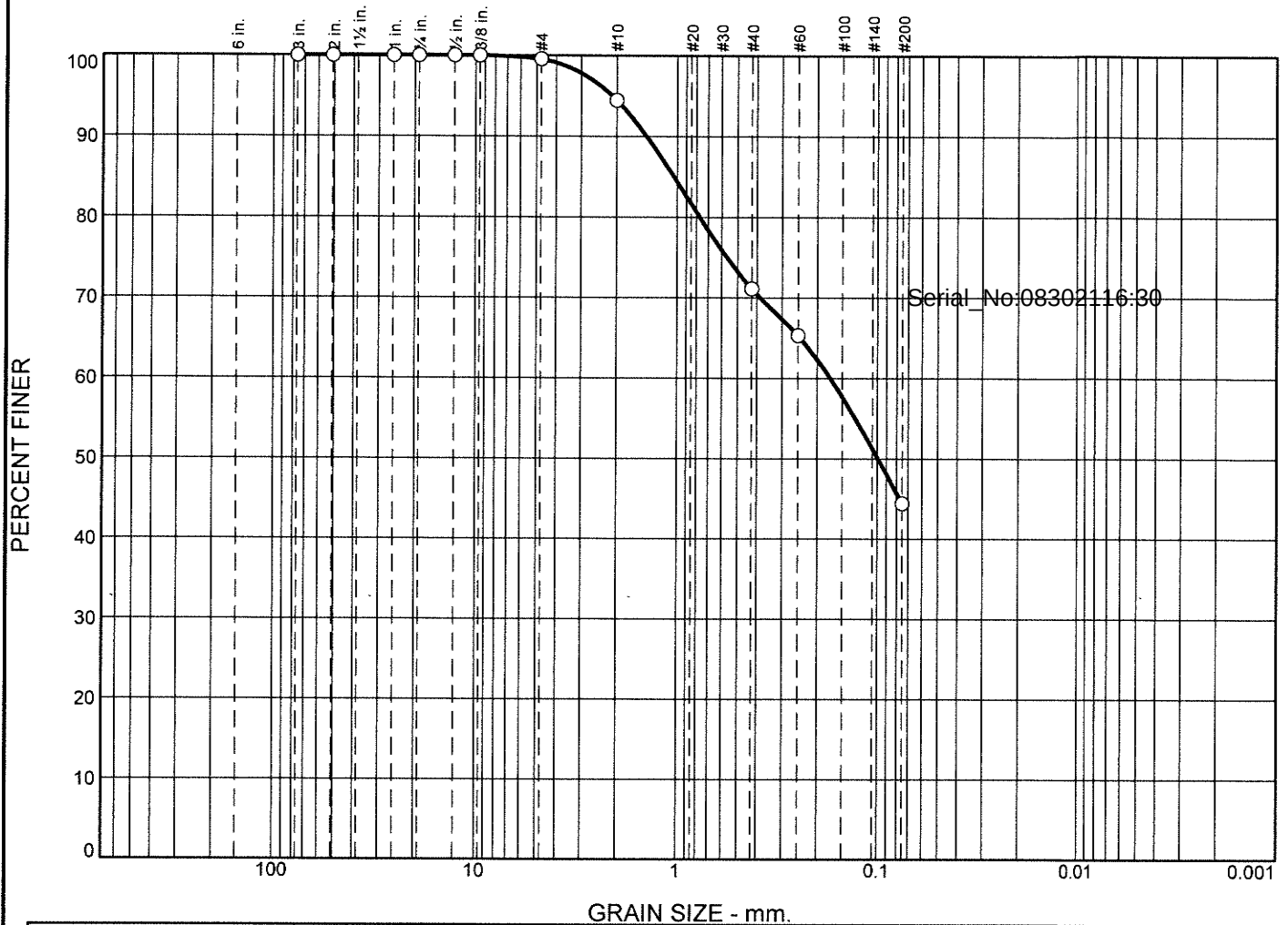
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	3.4	3.4	3.5	14.3	39.1	56.9			39.7

D ₅	D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₄₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
					0.0756	0.1020	0.1408	0.4878	0.8131	1.3656	2.7962

Fineness Modulus
1.03

Alpha Analytical

Particle Size Distribution Report



GRAIN SIZE - mm.										
% +3"		% Gravel		% Sand			% Fines			
		Coarse	Fine	Coarse	Medium	Fine	Silt		Clay	
○	0.0	0.0	0.4	5.1	23.4	26.7	44.4			
×	LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
○			1.0378	0.1723	0.0993					

Material Description								USCS	AASHTO
○									

Project No. Project: ○ Source of Sample: SED-2 Sample Number: L2140340-03	Remarks: Figure
Alpha Analytical Mansfield, MA	

GRAIN SIZE DISTRIBUTION TEST DATA

8/24/2021

Location: SED-2

Sample Number: L2140340-03

Sieve Test Data

Post #200 Wash Test Weights (grams): Dry Sample and Tare = 47.57
 Tare Wt. = 0.00
 Minus #200 from wash = 0.0%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
47.57	0.00	3"	0.00	0.00	100.0
		2"	0.00	0.00	100.0
		1"	0.00	0.00	100.0
		3/4"	0.00	0.00	100.0
		1/2"	0.00	0.00	100.0
		3/8"	0.00	0.00	100.0
		#4	0.21	0.00	99.6
		#10	2.42	0.00	94.5
		#40	11.11	0.00	71.1
		#60	2.76	0.00	65.3
		#200	9.93	0.00	44.4

Serial_No:08302116:30

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.4	0.4	5.1	23.4	26.7	55.2			44.4

D ₅	D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₄₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
						0.0993	0.1723	0.7708	1.0378	1.4211	2.1024

Fineness Modulus
1.16

Alpha Analytical

Serial No: 08302116:30

Grain Size (mm)	Grain Size (micrometers)	Percent Finer (%)
60	600	100
42.5	425	100
37.5	375	100
30	300	100
25	250	100
20	200	100
150	150	100
106	106	100
75	75	100
60	60	100
42.5	42.5	98
37.5	37.5	94
30	30	74
25	25	63
20	20	38

	Material Description	USCS	AASHTO
○			

Project No.	Client:	Remarks:
Project:		
○ Source of Sample: SOIL-5	Sample Number: L2140340-04	
Alpha Analytical		Figure
Mansfield, MA		

GRAIN SIZE DISTRIBUTION TEST DATA

8/24/2021

Location: SOIL-5

Sample Number: L2140340-04

Sieve Test Data

Post #200 Wash Test Weights (grams): Dry Sample and Tare = 130.91
Tare Wt. = 0.00
Minus #200 from wash = 0.0%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
130.91	0.00	3"	0.00	0.00	100.0
		2"	0.00	0.00	100.0
		1"	0.00	0.00	100.0
		3/4"	0.00	0.00	100.0
		1/2"	0.00	0.00	100.0
		3/8"	0.00	0.00	100.0
		#4	4.13	0.00	96.8
		#10	4.40	0.00	93.5
		#40	24.98	0.00	74.4
		#60	14.31	0.00	63.5
		#200	32.83	0.00	38.4

Serial_No:08302116:30

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	3.2	3.2	3.3	19.1	36.0	58.4			38.4

D ₅	D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₄₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
					0.0811	0.1315	0.2121	0.5823	0.8142	1.2567	2.8728

Fineness Modulus
1.19

Alpha Analytical

Serial No. 08302116:30

Grain Size (mm)	Percent Finer (%)
60.0	100
4.75	100
4.25	100
3.75	100
3.0	100
2.5	100
2.0	100
1.5	100
1.18	100
0.85	92
0.75	91
0.6	88
0.425	83
0.3	57
0.25	46
0.075	25

Project No.	Client:	Remarks:
Project:		
○ Source of Sample: SOIL-6 Sample Number: L2140340-05		
Alpha Analytical		Figure
Mansfield, MA		

GRAIN SIZE DISTRIBUTION TEST DATA

8/24/2021

Location: SOIL-6

Sample Number: L2140340-05

Sieve Test Data

Post #200 Wash Test Weights (grams): Dry Sample and Tare = 113.92

Tare Wt. = 0.00

Minus #200 from wash = 0.0%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
113.92	0.00	3"	0.00	0.00	100.0
		2"	0.00	0.00	100.0
		1"	0.00	0.00	100.0
		3/4"	0.00	0.00	100.0
		1/2"	9.44	0.00	91.7
		3/8"	0.82	0.00	91.0
		#4	3.35	0.00	88.1
		#10	5.51	0.00	83.2
		#40	29.34	0.00	57.5
		#60	13.39	0.00	45.7
		#200	23.45	0.00	25.1

Serial_No:08302116:30

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	11.9	11.9	4.9	25.7	32.4	63.0			25.1

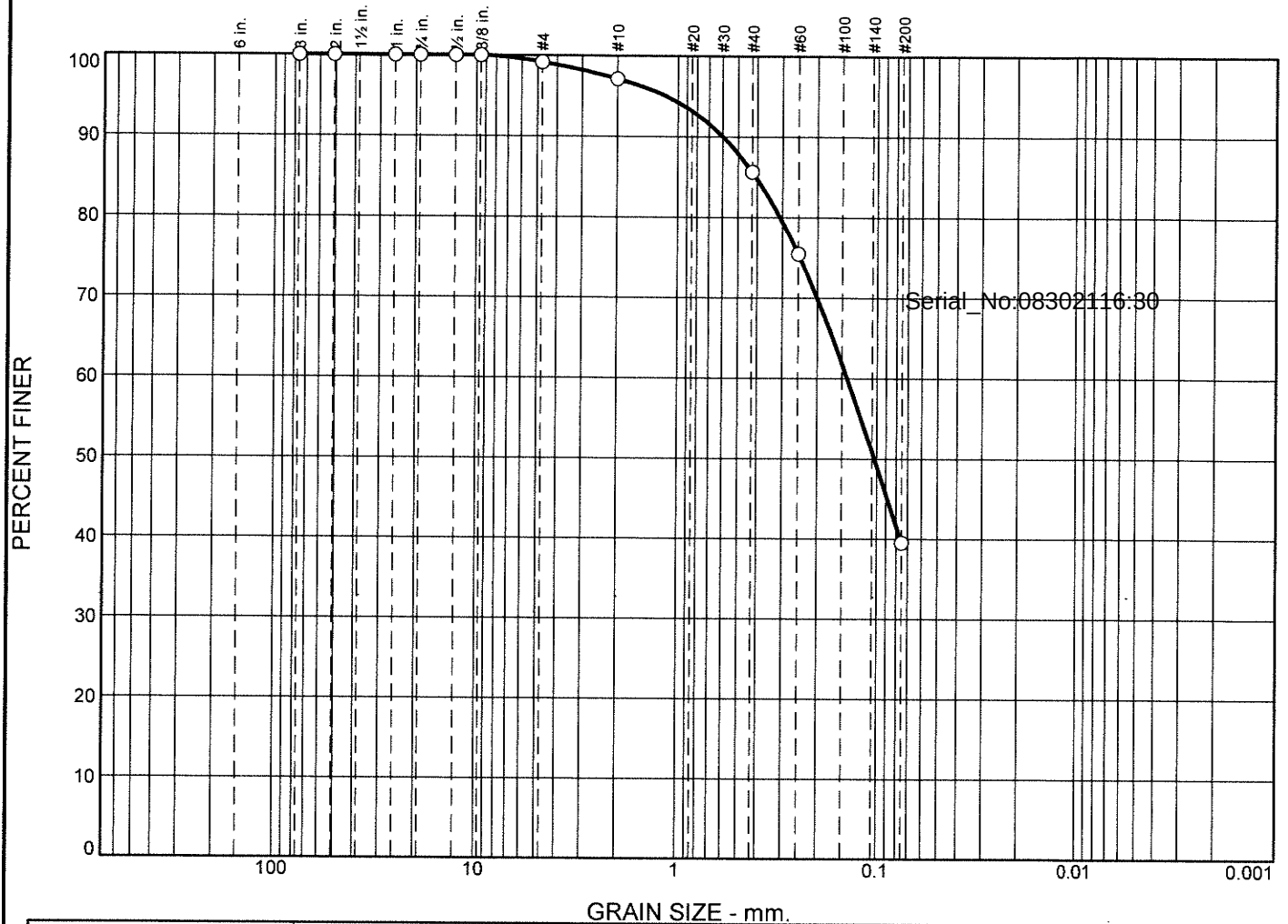
D ₅	D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₄₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
				0.1031	0.1868	0.3049	0.4770	1.4734	2.5736	7.3553	14.9726

Fineness Modulus

2.09

Alpha Analytical

Particle Size Distribution Report



GRAIN SIZE - mm.									
% +3"		% Gravel		% Sand			% Fines		
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay	
☐	0.0	0.0	0.8	2.1	11.5	46.1	39.5		
☐									
☒	LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c
☐			0.4082	0.1415	0.1031				
☐									

Material Description							USCS	AASHTO
☐								

Project No. Project: ☐ Source of Sample: SED-7 Sample Number: L2140340-06	Remarks:
Alpha Analytical Mansfield, MA	

Figure

GRAIN SIZE DISTRIBUTION TEST DATA

8/24/2021

Location: SED-7

Sample Number: L2140340-06

Sieve Test Data

Post #200 Wash Test Weights (grams): Dry Sample and Tare = 66.63

Tare Wt. = 0.00

Minus #200 from wash = 0.0%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
66.63	0.00	3"	0.00	0.00	100.0
		2"	0.00	0.00	100.0
		1"	0.00	0.00	100.0
		3/4"	0.00	0.00	100.0
		1/2"	0.00	0.00	100.0
		3/8"	0.00	0.00	100.0
		#4	0.55	0.00	99.2
		#10	1.36	0.00	97.1
		#40	7.67	0.00	85.6
		#60	6.76	0.00	75.5
		#200	23.95	0.00	39.5

Serial_No:08302116:30

Fractional Components

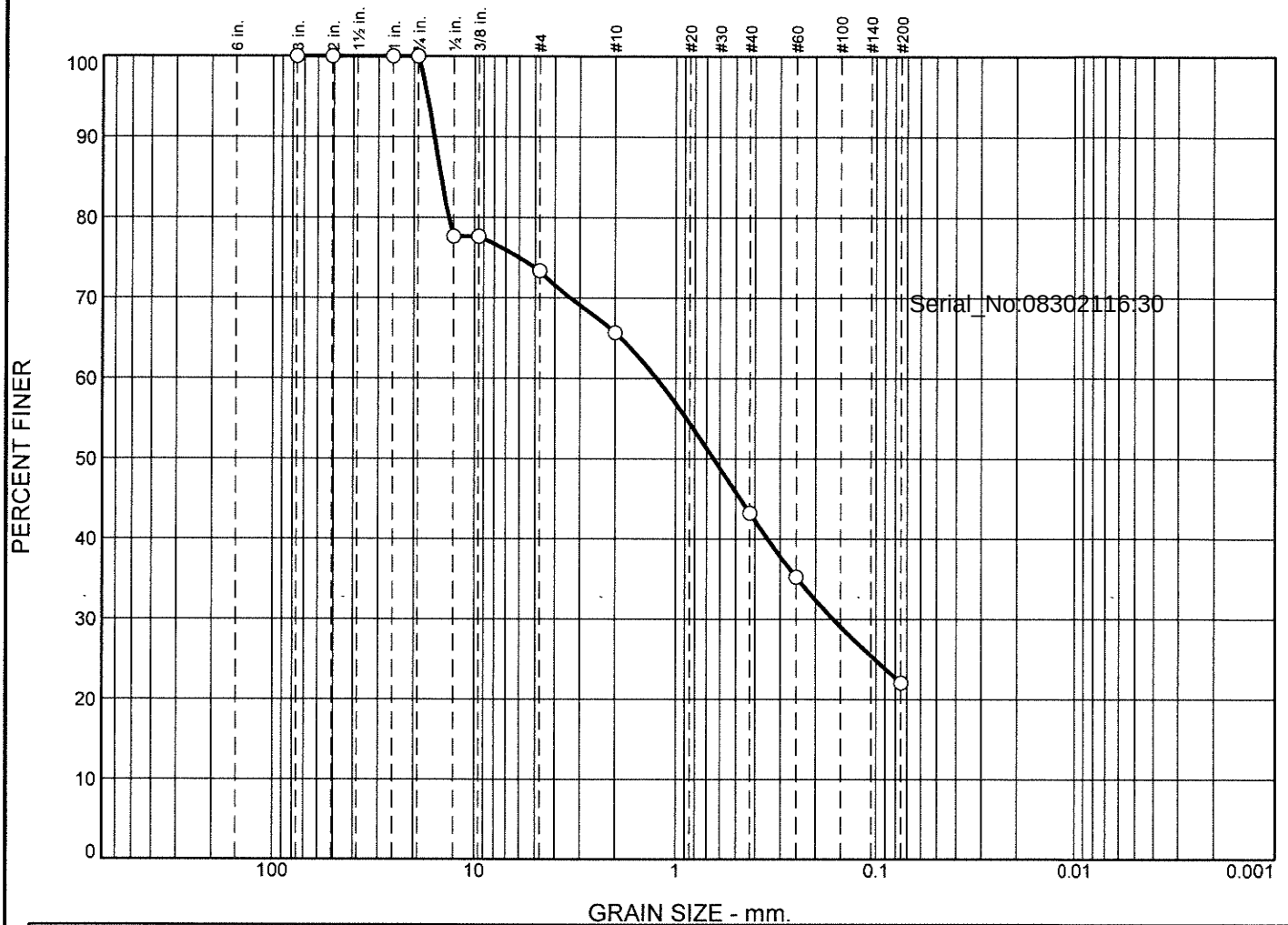
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.8	0.8	2.1	11.5	46.1	59.7			39.5

D ₅	D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₄₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
					0.0761	0.1031	0.1415	0.3083	0.4082	0.5966	1.1446

Fineness Modulus
0.77

Alpha Analytical

Particle Size Distribution Report



GRAIN SIZE - mm.									
% +3"		% Gravel		% Sand			% Fines		
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay	
☐	0.0	0.0	26.6	7.7	22.5	21.1	22.1		
☐									
☒	LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c
☐			14.6872	1.2408	0.6449	0.1634			
☐									
☐									

Material Description							USCS	AASHTO
☐								

Project No. Project: ☐ Source of Sample: SOIL-4 Sample Number: L2140340-09	Remarks:
Alpha Analytical Mansfield, MA	

Figure

GRAIN SIZE DISTRIBUTION TEST DATA

8/24/2021

Location: SOIL-4

Sample Number: L2140340-09

Sieve Test Data

Post #200 Wash Test Weights (grams): Dry Sample and Tare = 66.04

Tare Wt. = 0.00

Minus #200 from wash = 0.0%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
66.04	0.00	3"	0.00	0.00	100.0
		2"	0.00	0.00	100.0
		1"	0.00	0.00	100.0
		3/4"	0.00	0.00	100.0
		1/2"	14.76	0.00	77.6
		3/8"	0.00	0.00	77.6
		#4	2.82	0.00	73.4
		#10	5.08	0.00	65.7
		#40	14.83	0.00	43.2
		#60	5.26	0.00	35.3
		#200	8.71	0.00	22.1

Serial_No:08302116:30

Fractional Components

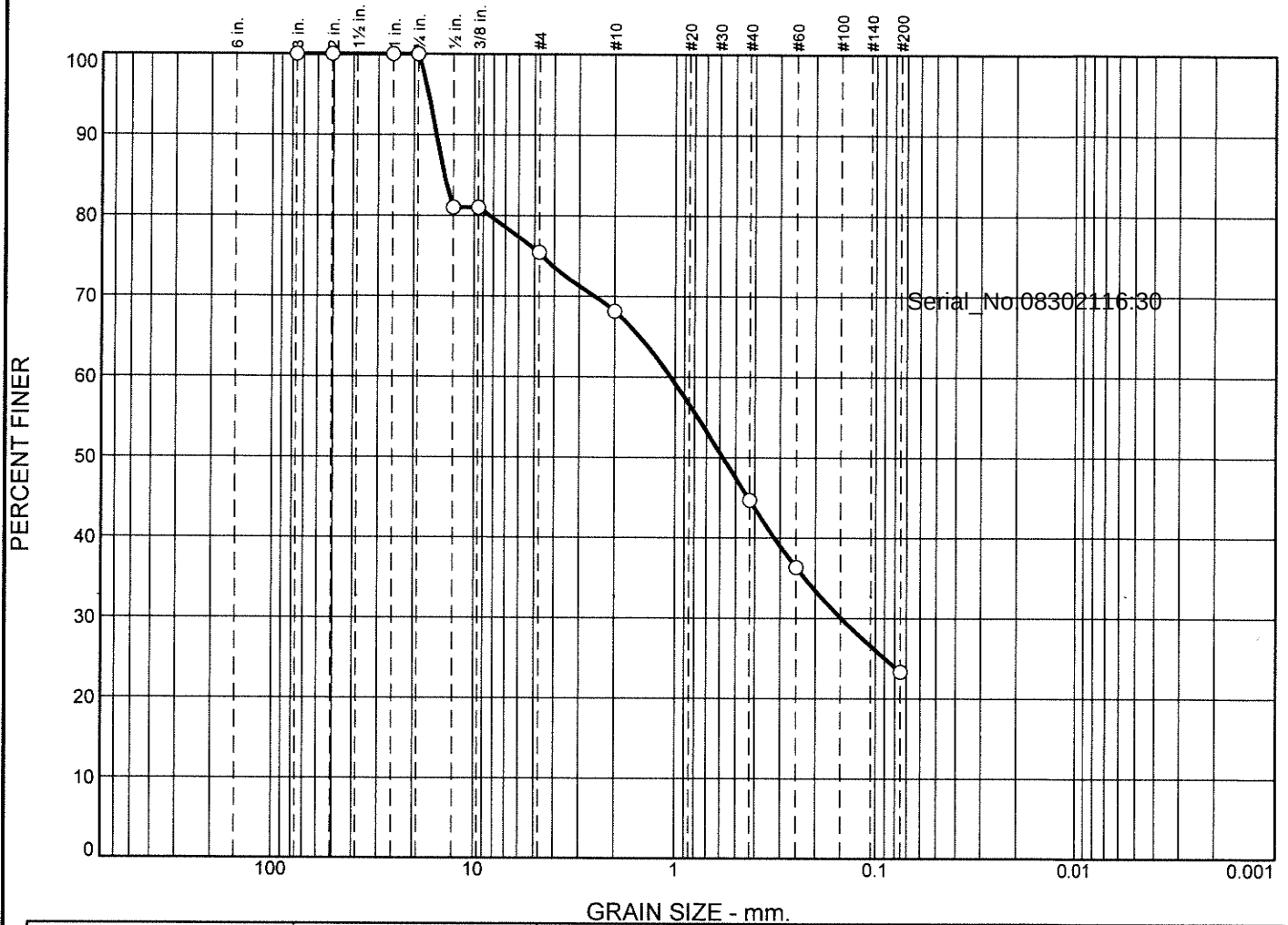
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	26.6	26.6	7.7	22.5	21.1	51.3			22.1

D ₅	D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₄₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
				0.1634	0.3460	0.6449	1.2408	13.4648	14.6872	15.8359	17.1237

Fineness Modulus
3.07

Alpha Analytical

Particle Size Distribution Report



GRAIN SIZE - mm.									
% +3"		% Gravel		% Sand			% Fines		
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay	
☐	0.0	0.0	24.6	7.2	23.5	21.4	23.3		
☐									
☒	LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c C _u
☐			14.0735	1.0527	0.5787	0.1487			
☐									

Material Description							USCS	AASHTO
☐								

Project No. Project: ☐ Source of Sample: SOIL-4 Sample Number: WG1537739-1	Client: Alpha Analytical Mansfield, MA	Remarks: Figure

GRAIN SIZE DISTRIBUTION TEST DATA

8/24/2021

Location: SOIL-4

Sample Number: WG1537739-1

Sieve Test Data

Post #200 Wash Test Weights (grams): Dry Sample and Tare = 66.11

Tare Wt. = 0.00

Minus #200 from wash = 0.0%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
66.11	0.00	3"	0.00	0.00	100.0
		2"	0.00	0.00	100.0
		1"	0.00	0.00	100.0
		3/4"	0.00	0.00	100.0
		1/2"	12.56	0.00	81.0
		3/8"	0.00	0.00	81.0
		#4	3.68	0.00	75.4
		#10	4.81	0.00	68.2
		#40	15.52	0.00	44.7
		#60	5.50	0.00	36.4
		#200	8.62	0.00	23.3

Serial_No:08302116:30

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	24.6	24.6	7.2	23.5	21.4	52.1			23.3

D ₅	D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₄₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
				0.1487	0.3192	0.5787	1.0527	8.3844	14.0735	15.4303	16.8790

Fineness Modulus
2.93

Alpha Analytical

GRAIN SIZE DISTRIBUTION TEST DATA

8/24/2021

Location: SOIL-7-REP

Sample Number: L2140340-10

Sieve Test Data

Post #200 Wash Test Weights (grams): Dry Sample and Tare = 123.54

Tare Wt. = 0.00

Minus #200 from wash = 0.0%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
123.54	0.00	3"	0.00	0.00	100.0
		2"	0.00	0.00	100.0
		1"	0.00	0.00	100.0
		3/4"	0.00	0.00	100.0
		1/2"	0.00	0.00	100.0
		3/8"	0.00	0.00	100.0
		#4	8.96	0.00	92.7
		#10	10.47	0.00	84.3
		#40	44.80	0.00	48.0
		#60	19.33	0.00	32.4
		#200	22.16	0.00	14.4

Serial_No:08302116:30

Fractional Components

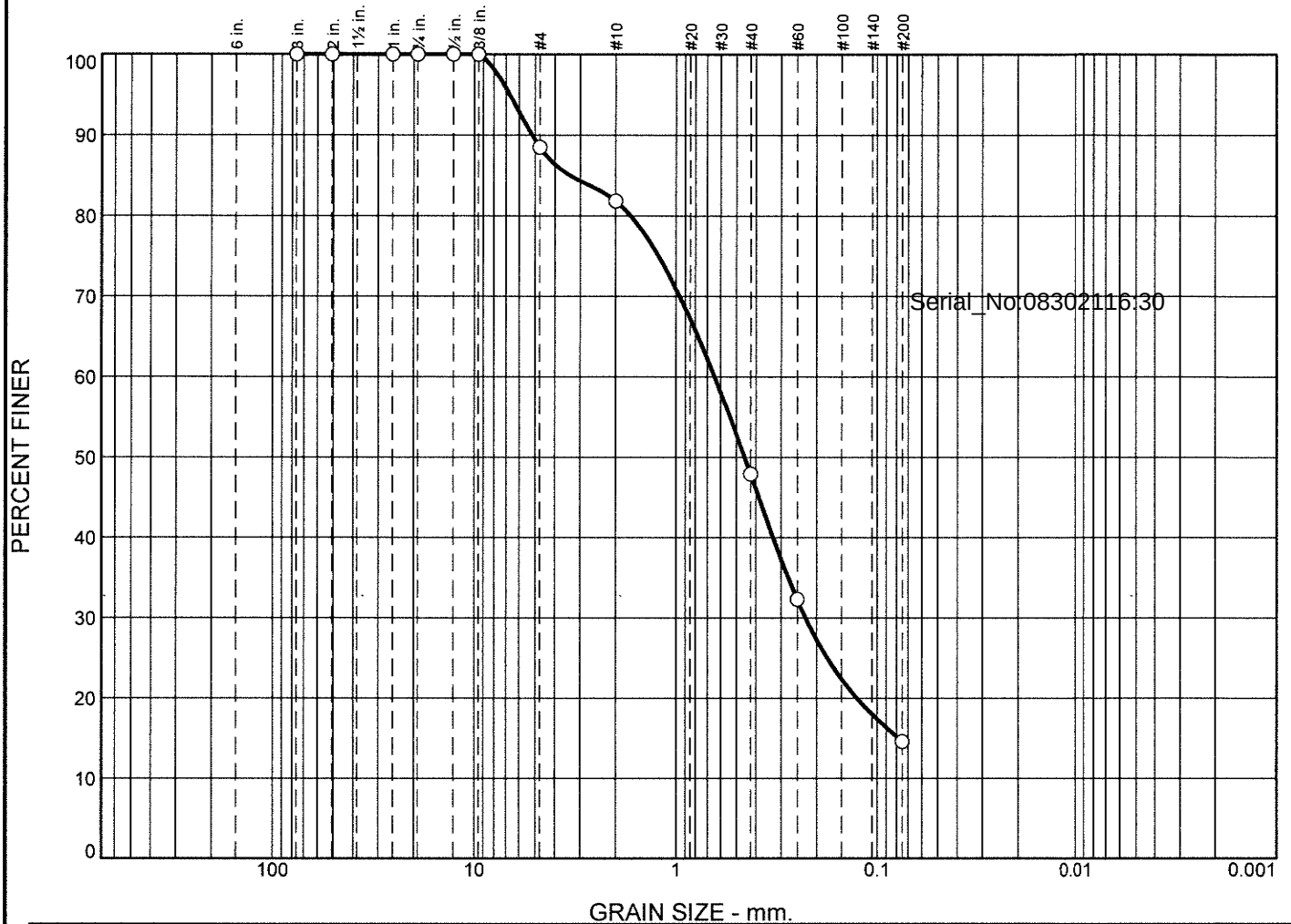
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	7.3	7.3	8.4	36.3	33.6	78.3			14.4

D ₅	D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₄₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
		0.0796	0.1266	0.2267	0.3279	0.4535	0.6382	1.5102	2.1218	3.5997	5.6984

Fineness Modulus
2.28

Alpha Analytical

Particle Size Distribution Report



GRAIN SIZE DISTRIBUTION TEST DATA

8/24/2021

Location: SOIL-7

Sample Number: L2140340-11

Sieve Test Data

Post #200 Wash Test Weights (grams): Dry Sample and Tare = 124.44

Tare Wt. = 0.00

Minus #200 from wash = 0.0%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
124.44	0.00	3"	0.00	0.00	100.0
		2"	0.00	0.00	100.0
		1"	0.00	0.00	100.0
		3/4"	0.00	0.00	100.0
		1/2"	0.00	0.00	100.0
		3/8"	0.00	0.00	100.0
		#4	14.30	0.00	88.5
		#10	8.31	0.00	81.8
		#40	42.21	0.00	47.9
		#60	19.41	0.00	32.3
		#200	22.04	0.00	14.6

Serial_No:08302116:30

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	11.5	11.5	6.7	33.9	33.3	73.9			14.6

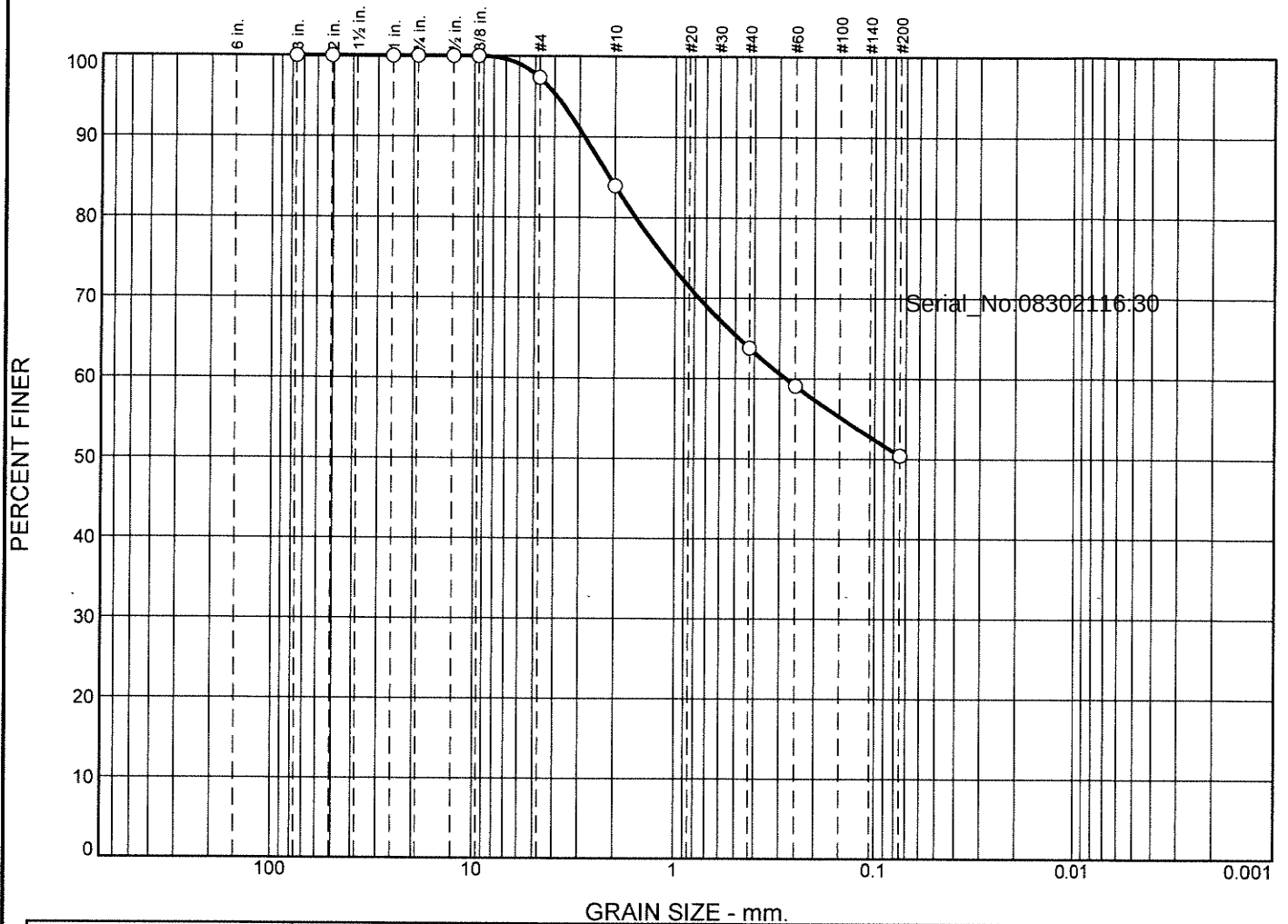
D ₅	D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₄₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
		0.0782	0.1259	0.2271	0.3287	0.4551	0.6430	1.6842	3.3765	5.1892	6.6904

Fineness
Modulus

2.36

Alpha Analytical

Particle Size Distribution Report



GRAIN SIZE - mm.											
% +3"		% Gravel		% Sand			% Fines				
		Coarse	Fine	Coarse	Medium	Fine	Silt		Clay		
☐	0.0		0.0	2.7	13.4	20.1	13.4	50.4			
☒	LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u	
☐			2.1280	0.2786							
Material Description								USCS	AASHTO		
☐											

Project No.	Client:	Remarks:
Project:		
☐ Source of Sample: SOIL-8	Sample Number: L2140340-12	
Alpha Analytical		
Mansfield, MA		Figure

GRAIN SIZE DISTRIBUTION TEST DATA

8/24/2021

Location: SOIL-8

Sample Number: L2140340-12

Sieve Test Data

Post #200 Wash Test Weights (grams): Dry Sample and Tare = 36.90

Tare Wt. = 0.00

Minus #200 from wash = 0.0%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
36.90	0.00	3"	0.00	0.00	100.0
		2"	0.00	0.00	100.0
		1"	0.00	0.00	100.0
		3/4"	0.00	0.00	100.0
		1/2"	0.00	0.00	100.0
		3/8"	0.00	0.00	100.0
		#4	0.98	0.00	97.3
		#10	4.95	0.00	83.9
		#40	7.43	0.00	63.8
		#60	1.73	0.00	59.1
		#200	3.21	0.00	50.4

Serial_No:08302116:30

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	2.7	2.7	13.4	20.1	13.4	46.9			50.4

D ₅	D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₄₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
							0.2786	1.5730	2.1280	2.8303	3.8915

Fineness Modulus
1.57

Alpha Analytical

Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility

EPA 624/624.1: m/p-xylene, o-xylene, Naphthalene

EPA 625/625.1: alpha-Terpineol

EPA 8260C/8260D: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.

EPA 8270D/8270E: NPW: Dimethylnaphthalene, 1,4-Diphenylhydrazine, alpha-Terpineol; SCM: Dimethylnaphthalene, 1,4-Diphenylhydrazine.

SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO₂, NO₃.

Mansfield Facility

SM 2540D: TSS

EPA 8082A: NPW: PCB: 1, 5, 31, 87, 101, 110, 141, 151, 153, 180, 183, 187.

EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene,

3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.

Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water

EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2:** Nitrate-N, Nitrite-N; **SM4500NO3-F:** Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE,**

EPA 180.1, SM2130B, SM4500CI-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B

EPA 332: Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.

Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT, SM9222D.**

Non-Potable Water

SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1:**

Ammonia-N, **LACHAT 10-107-06-1-B:** Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2:** Nitrate-N, **SM4500P-E, SM4500P-B, E, SM4500SO4-E,**

SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300: Chloride, Sulfate, Nitrate.

EPA 624.1: Volatile Halocarbons & Aromatics,

EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II,

Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs

EPA 625.1: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045:** PCB-Oil.

Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603, SM9222D.**

Mansfield Facility:

Drinking Water

EPA 200.7: Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1 Hg.**

EPA 522, EPA 537.1.

Non-Potable Water

EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.

EPA 200.8: Al, Sb, As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.

EPA 245.1 Hg.

SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.



8 Walkup Drive
Westboro, MA 01581
Tel: 508-696-0220

320 Forbes Blvd
Mansfield, MA 02048
Tel: 508-822-9300

CHAIN OF CUSTODY

PAGE 1 OF 2

Date Rec'd In Lab: 7/27/21

ALPHA Job #: L2140340

Project Information

Project Name: Belmont Land Fill

Project Location: Belmont, MA

Project #: 2018-0157

Project Manager: Ted Wickwire

ALPHA Quote #: Q7174-R5

Turn-Around Time

☒ Standard

☐ RUSH (only confirmed if pre-approved!)

Date Due:

Report Information - Data Deliverables

☒ ADEX ☒ EMAIL

Billing Information

☐ Same as Client info PO #:

Regulatory Requirements & Project Information Requirements

☐ Yes ☐ No MA MCP Analytical Methods ☐ Yes ☐ No CT RCP Analytical Methods
☐ Yes ☐ No Matrix Spike Required on this SDG? (Required for MCP Inorganics)
☐ Yes ☐ No GW1 Standards (Info Required for Metals & EPH with Targets)
☐ Yes ☐ No NPDES RGP
☐ Other State / Fed Program Criteria

Client Information

Client: Woods Hole Group

Address: 107 Waterhouse Rd
Bourne, MA

Phone: 207-234-7809

Email: Klavallee@woodsholegroup.com

Additional Project Information:

See quote for full analyte list
Lab filter water samples.

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection		Sample Matrix	Sampler Initials	VOC	SVOC	METAL	METAL	EPH: L	VPH: L	PCB	TPH: L	Grav	Free	TAL	TAL	Diox	TOC	Sample Comments	Sum		
		Date	Time																				
40340-01	Soil-3	7/27/21	0920	SED	KDL		1							1	1	1		1	1	See Quote	4		
02	Sed-1		0940	SED	KDL		1							1	1	1		1	1		4		
03	Sed-2		1035	SED	DGS		1							1	1	1		1	1		4		
04	Soil-5		1042	SED	DGS		1							1	1	1		1	1		4		
05	Soil-6		1310	SED	KDL		1							1	1	1		1	1		4		
06	SED-7		1335	SED	KDL		1							1	1	1		1	1		4		
07	SW-1		1205	SW	KDL										1	1	1			Preservative	3		
08	SW-7		1329	SW	KDL										1	1	1			Preservative	3		
09	Soil-4		1215	SED	DGS		1							1	1	1		1	1		4		
09	Soil-4-MS/MSD		1215	SED	DGS		1							1	1	1		1	1	MS/MSD	4		
Container Type		Preservative		Container Type		Preservative		Container Type		Preservative		Container Type		Preservative		Container Type		Preservative		Container Type		Preservative	
P= Plastic A= Amber glass V= Vial		A= None B= HCl C= HNO ₃		A		A		P		P		P		P		A		A		A		A	

Container Type

P= Plastic
A= Amber glass
V= Vial
G= Glass
B= Bacteria cup
C= Cube
O= Other
E= Encore
D= BOD Bottle

Preservative

A= None
B= HCl
C= HNO₃
D= H₂SO₄
E= NaOH
F= MeOH
G= NaHSO₄
H= Na₂S₂O₈
I= Ascorbic Acid
J= NH₄Cl
K= Zn Acetate
O= Other

Container Type

Preservative

Relinquished By:

Date/Time

Received By:

Date/Time

Klavallee
Benjamin Swick
7/27/21 2:07

7/27 15:00
7/27 17:40
7/27/21 2:07

Benjamin Swick
7/27/21 2:07

7/27 15:00
7/27/21 1740
7/27/21 2:07

All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

FORM NO: 01-01 (rev. 12-Mar-2012)

See quote for full analyte list
Lab filter water samples.

Criteria

All samples submitted are subject to Alpha's Terms and Conditions.
See reverse side.



ANALYTICAL REPORT

Lab Number:	L2140959
Client:	Woods Hole Group 107 Waterhouse Road Bourne, MA 02532
ATTN:	Ted Wickwire
Phone:	(508) 495-6242
Project Name:	BELMONT LANDFILL
Project Number:	2018-0157
Report Date:	08/30/21

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0574), IL (200077), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #P330-17-00196).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com



Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140959
Report Date: 08/30/21

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2140959-01	SED-9	SEDIMENT	BELMONT, MA	07/29/21 08:40	07/30/21
L2140959-02	SOIL-9	SOIL	BELMONT, MA	07/29/21 08:15	07/30/21
L2140959-03	SOIL-10	SOIL	BELMONT, MA	07/29/21 07:55	07/30/21
L2140959-04	SOIL-1	SOIL	BELMONT, MA	07/29/21 10:05	07/30/21
L2140959-05	SOIL-2	SOIL	BELMONT, MA	07/29/21 10:24	07/30/21

Project Name: BELMONT LANDFILL

Lab Number: L2140959

Project Number: 2018-0157

Report Date: 08/30/21

MADEP MCP Response Action Analytical Report Certification

This form provides certifications for all samples performed by MCP methods. Please refer to the Sample Results and Container Information sections of this report for specification of MCP methods used for each analysis. The following questions pertain only to MCP Analytical Methods.

An affirmative response to questions A through F is required for "Presumptive Certainty" status		
A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?	YES
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	YES
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	YES
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data?"	YES
E a.	VPH, EPH, and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications).	N/A
E b.	APH and TO-15 Methods only: Was the complete analyte list reported for each method?	N/A
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	YES
A response to questions G, H and I is required for "Presumptive Certainty" status		
G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	YES
H	Were all QC performance standards specified in the CAM protocol(s) achieved?	YES
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	YES
For any questions answered "No", please refer to the case narrative section on the following page(s).		

Please note that sample matrix information is located in the Sample Results section of this report.



Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140959
Report Date: 08/30/21

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

HOLD POLICY - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140959
Report Date: 08/30/21

Case Narrative (continued)

Report Submission

All non-detect (ND) or estimated concentrations (J-qualified) have been quantitated to the limit noted in the MDL column.

MCP Related Narratives

PAHs by SIM

L2140959: Samples were frozen upon receipt in order to arrest the holding time.

Non-MCP Related Narratives

Total Organic Carbon

WG1539215-1: The required batch QC was prepared; however, the native sample required a different reporting method; therefore, the associated QC results could not be reported.

Grain Size Analysis

The WG1537946-1 Laboratory Duplicate RPD for % gravel (86%), performed on L2140959-01, is outside the acceptance criteria. The elevated RPD has been attributed to the non-homogeneous nature of the native sample.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:



Elizabeth Porta

Title: Technical Director/Representative

Date: 08/30/21

QC OUTLIER SUMMARY REPORT

Project Name: BELMONT LANDFILL

Lab Number: L2140959

Project Number: 2018-0157

Report Date: 08/30/21

Method	Client ID (Native ID)	Lab ID	Parameter	QC Type	Recovery/RPD (%)	QC Limits (%)	Associated Samples	Data Quality Assessment
Grain Size Analysis - Mansfield Lab								
D6913/D7928	Batch QC (L2140959-01)	WG1537946-1	% Total Gravel	Duplicate	86	20	01-05	non-directional bias

ORGANICS

SEMIVOLATILES

Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140959
Report Date: 08/30/21

SAMPLE RESULTS

Lab ID: L2140959-01
Client ID: SED-9
Sample Location: BELMONT, MA

Date Collected: 07/29/21 08:40
Date Received: 07/30/21
Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
Analytical Method: 1,8270D-SIM
Analytical Date: 08/27/21 12:49
Analyst: GP
Percent Solids: 33%

Extraction Method: EPA 3570
Extraction Date: 08/17/21 22:47
Cleanup Method: EPA 3630
Cleanup Date: 08/24/21

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PAHs by GC/MS-SIM - Mansfield Lab						
Naphthalene	82.3		ug/kg	11.8	4.63	1
Acenaphthylene	116.		ug/kg	11.8	4.63	1
Acenaphthene	48.3		ug/kg	11.8	4.60	1
Fluorene	113.		ug/kg	11.8	6.99	1
Phenanthrene	822.		ug/kg	11.8	7.61	1
Anthracene	197.		ug/kg	11.8	8.09	1
Fluoranthene	1470		ug/kg	11.8	5.45	1
Pyrene	1300		ug/kg	11.8	6.53	1
Benz(a)anthracene	636.		ug/kg	11.8	5.82	1
Chrysene	791.		ug/kg	11.8	4.29	1
Benzo(b)fluoranthene	829.		ug/kg	11.8	5.66	1
Benzo(k)fluoranthene	564.		ug/kg	11.8	3.39	1
Benzo(a)pyrene	705.		ug/kg	11.8	3.43	1
Indeno(1,2,3-cd)pyrene	593.		ug/kg	11.8	3.37	1
Dibenz(a,h)anthracene	167.		ug/kg	11.8	7.01	1
Benzo(g,h,i)perylene	603.		ug/kg	11.8	7.61	1
2-Methylnaphthalene	62.1		ug/kg	11.8	5.14	1
1-Methylnaphthalene	39.6		ug/kg	11.8	5.34	1
2-Chloronaphthalene	ND		ug/kg	11.8	4.32	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	75		30-130
Pyrene-d10	82		30-130
Benzo(b)fluoranthene-d12	87		30-130

Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140959
Report Date: 08/30/21

SAMPLE RESULTS

Lab ID: L2140959-02
Client ID: SOIL-9
Sample Location: BELMONT, MA

Date Collected: 07/29/21 08:15
Date Received: 07/30/21
Field Prep: Not Specified

Sample Depth:

Matrix: Soil
Analytical Method: 1,8270D-SIM
Analytical Date: 08/27/21 13:23
Analyst: GP
Percent Solids: 8%

Extraction Method: EPA 3570
Extraction Date: 08/17/21 22:47
Cleanup Method: EPA 3630
Cleanup Date: 08/24/21

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PAHs by GC/MS-SIM - Mansfield Lab						
Naphthalene	55.3		ug/kg	47.2	18.5	1
Acenaphthylene	216.		ug/kg	47.2	18.5	1
Acenaphthene	28.9	J	ug/kg	47.2	18.4	1
Fluorene	36.7	J	ug/kg	47.2	27.9	1
Phenanthrene	551.		ug/kg	47.2	30.4	1
Anthracene	172.		ug/kg	47.2	32.3	1
Fluoranthene	1920		ug/kg	47.2	21.8	1
Pyrene	1710		ug/kg	47.2	26.1	1
Benz(a)anthracene	832.		ug/kg	47.2	23.2	1
Chrysene	1310		ug/kg	47.2	17.1	1
Benzo(b)fluoranthene	1850		ug/kg	47.2	22.6	1
Benzo(k)fluoranthene	930.		ug/kg	47.2	13.6	1
Benzo(a)pyrene	1270		ug/kg	47.2	13.7	1
Indeno(1,2,3-cd)pyrene	1250		ug/kg	47.2	13.4	1
Dibenz(a,h)anthracene	366.		ug/kg	47.2	28.0	1
Benzo(g,h,i)perylene	1280		ug/kg	47.2	30.4	1
2-Methylnaphthalene	37.5	J	ug/kg	47.2	20.5	1
1-Methylnaphthalene	26.1	J	ug/kg	47.2	21.3	1
2-Chloronaphthalene	ND		ug/kg	47.2	17.2	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	70		30-130
Pyrene-d10	78		30-130
Benzo(b)fluoranthene-d12	84		30-130

Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140959
Report Date: 08/30/21

SAMPLE RESULTS

Lab ID: L2140959-03
Client ID: SOIL-10
Sample Location: BELMONT, MA

Date Collected: 07/29/21 07:55
Date Received: 07/30/21
Field Prep: Not Specified

Sample Depth:

Matrix: Soil
Analytical Method: 1,8270D-SIM
Analytical Date: 08/27/21 13:57
Analyst: GP
Percent Solids: 14%

Extraction Method: EPA 3570
Extraction Date: 08/17/21 22:47
Cleanup Method: EPA 3630
Cleanup Date: 08/24/21

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PAHs by GC/MS-SIM - Mansfield Lab						
Naphthalene	51.5		ug/kg	25.9	10.2	1
Acenaphthylene	141.		ug/kg	25.9	10.2	1
Acenaphthene	18.9	J	ug/kg	25.9	10.1	1
Fluorene	22.7	J	ug/kg	25.9	15.3	1
Phenanthrene	420.		ug/kg	25.9	16.7	1
Anthracene	118.		ug/kg	25.9	17.7	1
Fluoranthene	1730		ug/kg	25.9	12.0	1
Pyrene	1480		ug/kg	25.9	14.3	1
Benz(a)anthracene	650.		ug/kg	25.9	12.8	1
Chrysene	1300		ug/kg	25.9	9.41	1
Benzo(b)fluoranthene	1870		ug/kg	25.9	12.4	1
Benzo(k)fluoranthene	1210		ug/kg	25.9	7.44	1
Benzo(a)pyrene	1150		ug/kg	25.9	7.52	1
Indeno(1,2,3-cd)pyrene	1410		ug/kg	25.9	7.39	1
Dibenz(a,h)anthracene	371.		ug/kg	25.9	15.4	1
Benzo(g,h,i)perylene	1420		ug/kg	25.9	16.7	1
2-Methylnaphthalene	20.6	J	ug/kg	25.9	11.3	1
1-Methylnaphthalene	15.6	J	ug/kg	25.9	11.7	1
2-Chloronaphthalene	ND		ug/kg	25.9	9.47	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	65		30-130
Pyrene-d10	78		30-130
Benzo(b)fluoranthene-d12	87		30-130

Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140959
Report Date: 08/30/21

SAMPLE RESULTS

Lab ID: L2140959-04
Client ID: SOIL-1
Sample Location: BELMONT, MA

Date Collected: 07/29/21 10:05
Date Received: 07/30/21
Field Prep: Not Specified

Sample Depth:

Matrix: Soil
Analytical Method: 1,8270D-SIM
Analytical Date: 08/27/21 14:32
Analyst: GP
Percent Solids: 14%

Extraction Method: EPA 3570
Extraction Date: 08/17/21 22:47
Cleanup Method: EPA 3630
Cleanup Date: 08/24/21

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PAHs by GC/MS-SIM - Mansfield Lab						
Naphthalene	22.7	J	ug/kg	26.5	10.4	1
Acenaphthylene	33.7		ug/kg	26.5	10.4	1
Acenaphthene	ND		ug/kg	26.5	10.3	1
Fluorene	ND		ug/kg	26.5	15.6	1
Phenanthrene	183.		ug/kg	26.5	17.0	1
Anthracene	30.9		ug/kg	26.5	18.1	1
Fluoranthene	368.		ug/kg	26.5	12.2	1
Pyrene	340.		ug/kg	26.5	14.6	1
Benz(a)anthracene	134.		ug/kg	26.5	13.0	1
Chrysene	213.		ug/kg	26.5	9.61	1
Benzo(b)fluoranthene	230.		ug/kg	26.5	12.7	1
Benzo(k)fluoranthene	134.		ug/kg	26.5	7.60	1
Benzo(a)pyrene	171.		ug/kg	26.5	7.68	1
Indeno(1,2,3-cd)pyrene	146.		ug/kg	26.5	7.54	1
Dibenz(a,h)anthracene	45.1		ug/kg	26.5	15.7	1
Benzo(g,h,i)perylene	168.		ug/kg	26.5	17.0	1
2-Methylnaphthalene	13.9	J	ug/kg	26.5	11.5	1
1-Methylnaphthalene	13.3	J	ug/kg	26.5	12.0	1
2-Chloronaphthalene	ND		ug/kg	26.5	9.66	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	66		30-130
Pyrene-d10	68		30-130
Benzo(b)fluoranthene-d12	70		30-130

Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140959
Report Date: 08/30/21

SAMPLE RESULTS

Lab ID: L2140959-05
Client ID: SOIL-2
Sample Location: BELMONT, MA

Date Collected: 07/29/21 10:24
Date Received: 07/30/21
Field Prep: Not Specified

Sample Depth:

Matrix: Soil
Analytical Method: 1,8270D-SIM
Analytical Date: 08/27/21 15:06
Analyst: GP
Percent Solids: 22%

Extraction Method: EPA 3570
Extraction Date: 08/17/21 22:47
Cleanup Method: EPA 3630
Cleanup Date: 08/24/21

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PAHs by GC/MS-SIM - Mansfield Lab						
Naphthalene	52.4		ug/kg	17.1	6.70	1
Acenaphthylene	24.7		ug/kg	17.1	6.70	1
Acenaphthene	14.3	J	ug/kg	17.1	6.65	1
Fluorene	24.2		ug/kg	17.1	10.1	1
Phenanthrene	197.		ug/kg	17.1	11.0	1
Anthracene	37.4		ug/kg	17.1	11.7	1
Fluoranthene	267.		ug/kg	17.1	7.88	1
Pyrene	238.		ug/kg	17.1	9.43	1
Benz(a)anthracene	126.		ug/kg	17.1	8.41	1
Chrysene	202.		ug/kg	17.1	6.20	1
Benzo(b)fluoranthene	188.		ug/kg	17.1	8.19	1
Benzo(k)fluoranthene	118.		ug/kg	17.1	4.90	1
Benzo(a)pyrene	144.		ug/kg	17.1	4.96	1
Indeno(1,2,3-cd)pyrene	116.		ug/kg	17.1	4.87	1
Dibenz(a,h)anthracene	40.7		ug/kg	17.1	10.1	1
Benzo(g,h,i)perylene	135.		ug/kg	17.1	11.0	1
2-Methylnaphthalene	89.7		ug/kg	17.1	7.43	1
1-Methylnaphthalene	72.6		ug/kg	17.1	7.72	1
2-Chloronaphthalene	ND		ug/kg	17.1	6.24	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	64		30-130
Pyrene-d10	66		30-130
Benzo(b)fluoranthene-d12	71		30-130

Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140959
Report Date: 08/30/21

Method Blank Analysis Batch Quality Control

Analytical Method: 1,8270D-SIM
Analytical Date: 08/27/21 09:25
Analyst: GP

Extraction Method: EPA 3570
Extraction Date: 08/17/21 22:44
Cleanup Method: EPA 3630
Cleanup Date: 08/24/21

Parameter	Result	Qualifier	Units	RL	MDL
PAHs by GC/MS-SIM - Mansfield Lab for sample(s): 01-05 Batch: WG1536097-1					
Naphthalene	ND		ug/kg	4.00	1.57
Acenaphthylene	ND		ug/kg	4.00	1.57
Acenaphthene	ND		ug/kg	4.00	1.56
Fluorene	ND		ug/kg	4.00	2.36
Phenanthrene	ND		ug/kg	4.00	2.58
Anthracene	ND		ug/kg	4.00	2.74
Fluoranthene	ND		ug/kg	4.00	1.84
Pyrene	ND		ug/kg	4.00	2.21
Benz(a)anthracene	ND		ug/kg	4.00	1.97
Chrysene	ND		ug/kg	4.00	1.45
Benzo(b)fluoranthene	ND		ug/kg	4.00	1.92
Benzo(k)fluoranthene	ND		ug/kg	4.00	1.15
Benzo(a)pyrene	ND		ug/kg	4.00	1.16
Indeno(1,2,3-cd)pyrene	ND		ug/kg	4.00	1.14
Dibenz(a,h)anthracene	ND		ug/kg	4.00	2.37
Benzo(g,h,i)perylene	ND		ug/kg	4.00	2.58
2-Methylnaphthalene	ND		ug/kg	4.00	1.74
1-Methylnaphthalene	ND		ug/kg	4.00	1.81
2-Chloronaphthalene	ND		ug/kg	4.00	1.46

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	78		30-130
Pyrene-d10	83		30-130
Benzo(b)fluoranthene-d12	90		30-130



Lab Control Sample Analysis

Batch Quality Control

Project Name: BELMONT LANDFILL

Project Number: 2018-0157

Lab Number: L2140959

Report Date: 08/30/21

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
PAHs by GC/MS-SIM - Mansfield Lab Associated sample(s): 01-05 Batch: WG1536097-2 WG1536097-3								
Naphthalene	59		77		40-140	26		30
Acenaphthylene	66		80		40-140	19		30
Acenaphthene	67		81		40-140	19		30
Fluorene	70		85		40-140	19		30
Phenanthrene	70		81		40-140	15		30
Anthracene	78		90		40-140	14		30
Fluoranthene	76		87		40-140	13		30
Pyrene	77		90		40-140	16		30
Benz(a)anthracene	82		91		40-140	10		30
Chrysene	81		89		40-140	9		30
Benzo(b)fluoranthene	91		97		40-140	6		30
Benzo(k)fluoranthene	93		103		40-140	10		30
Benzo(a)pyrene	87		99		40-140	13		30
Indeno(1,2,3-cd)pyrene	86		92		40-140	7		30
Dibenz(a,h)anthracene	93		101		40-140	8		30
Benzo(g,h,i)perylene	93		102		40-140	9		30
2-Methylnaphthalene	61		76		40-140	22		30
1-Methylnaphthalene	66		82		40-140	22		30
2-Chloronaphthalene	61		74		40-140	19		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: BELMONT LANDFILL

Project Number: 2018-0157

Lab Number: L2140959

Report Date: 08/30/21

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits

PAHs by GC/MS-SIM - Mansfield Lab Associated sample(s): 01-05 Batch: WG1536097-2 WG1536097-3

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2-Methylnaphthalene-d10	66		78		30-130
Pyrene-d10	81		92		30-130
Benzo(b)fluoranthene-d12	94		97		30-130

SEMIVOLATILES

High Resolution Mass Spectrometry

Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140959
Report Date: 08/30/21

SAMPLE RESULTS

Lab ID: L2140959-01
Client ID: SED-9
Sample Location: BELMONT, MA

Date Collected: 07/29/21 08:40
Date Received: 07/30/21
Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
Analytical Method: 132,1613B
Analytical Date: 08/11/21 14:22
Analyst: PB
Percent Solids: 33%

Extraction Method: EPA 8290A
Extraction Date: 08/02/21 16:36
Cleanup Method: EPA 1613B
Cleanup Date: 08/05/21

Parameter	Result	Qualifier	EMPC	Units	RL	MDL	Dilution Factor

Dioxins & Furans by Isotope Dilution HRMS - Mansfield Lab

2,3,7,8-TCDD	ND			pg/g	1.48	0.457	1

Surrogate/Cleanup Standard	% Recovery	Qualifier	Acceptance Criteria
13C12-2,3,7,8-TCDD	65		25-164
37CL4-2,3,7,8-TCDD	94		35-197

Project Name: BELMONT LANDFILL**Lab Number:** L2140959**Project Number:** 2018-0157**Report Date:** 08/30/21**SAMPLE RESULTS**

Lab ID: L2140959-02
 Client ID: SOIL-9
 Sample Location: BELMONT, MA

Date Collected: 07/29/21 08:15
 Date Received: 07/30/21
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil
 Analytical Method: 132,1613B
 Analytical Date: 08/11/21 15:26
 Analyst: PB
 Percent Solids: 8%

Extraction Method: EPA 8290A
 Extraction Date: 08/02/21 16:36
 Cleanup Method: EPA 1613B
 Cleanup Date: 08/05/21

Parameter	Result	Qualifier	EMPC	Units	RL	MDL	Dilution Factor

Dioxins & Furans by Isotope Dilution HRMS - Mansfield Lab

2,3,7,8-TCDD	ND			pg/g	5.96	1.84	1

Surrogate/Cleanup Standard	% Recovery	Qualifier	Acceptance Criteria
13C12-2,3,7,8-TCDD	73		25-164
37CL4-2,3,7,8-TCDD	111		35-197

Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140959
Report Date: 08/30/21

SAMPLE RESULTS

Lab ID: L2140959-03
Client ID: SOIL-10
Sample Location: BELMONT, MA

Date Collected: 07/29/21 07:55
Date Received: 07/30/21
Field Prep: Not Specified

Sample Depth:

Matrix: Soil
Analytical Method: 132,1613B
Analytical Date: 08/11/21 16:36
Analyst: PB
Percent Solids: 14%

Extraction Method: EPA 8290A
Extraction Date: 08/02/21 16:36
Cleanup Method: EPA 1613B
Cleanup Date: 08/05/21

Parameter	Result	Qualifier	EMPC	Units	RL	MDL	Dilution Factor
Dioxins & Furans by Isotope Dilution HRMS - Mansfield Lab							
2,3,7,8-TCDD	ND			pg/g	3.29	1.01	1

Surrogate/Cleanup Standard	% Recovery	Qualifier	Acceptance Criteria
13C12-2,3,7,8-TCDD	55		25-164
37CL4-2,3,7,8-TCDD	85		35-197

Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140959
Report Date: 08/30/21

SAMPLE RESULTS

Lab ID: L2140959-04
Client ID: SOIL-1
Sample Location: BELMONT, MA

Date Collected: 07/29/21 10:05
Date Received: 07/30/21
Field Prep: Not Specified

Sample Depth:

Matrix: Soil
Analytical Method: 132,1613B
Analytical Date: 08/11/21 17:41
Analyst: PB
Percent Solids: 14%

Extraction Method: EPA 8290A
Extraction Date: 08/02/21 16:36
Cleanup Method: EPA 1613B
Cleanup Date: 08/05/21

Parameter	Result	Qualifier	EMPC	Units	RL	MDL	Dilution Factor

Dioxins & Furans by Isotope Dilution HRMS - Mansfield Lab							

2,3,7,8-TCDD	ND			pg/g	3.53	1.09	1

Surrogate/Cleanup Standard	% Recovery	Qualifier	Acceptance Criteria
13C12-2,3,7,8-TCDD	63		25-164
37CL4-2,3,7,8-TCDD	99		35-197

Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140959
Report Date: 08/30/21

SAMPLE RESULTS

Lab ID: L2140959-05
Client ID: SOIL-2
Sample Location: BELMONT, MA

Date Collected: 07/29/21 10:24
Date Received: 07/30/21
Field Prep: Not Specified

Sample Depth:

Matrix: Soil
Analytical Method: 132,1613B
Analytical Date: 08/11/21 18:44
Analyst: PB
Percent Solids: 22%

Extraction Method: EPA 8290A
Extraction Date: 08/02/21 16:36
Cleanup Method: EPA 1613B
Cleanup Date: 08/05/21

Parameter	Result	Qualifier	EMPC	Units	RL	MDL	Dilution Factor

Dioxins & Furans by Isotope Dilution HRMS - Mansfield Lab							

2,3,7,8-TCDD	ND			pg/g	2.24	0.688	1

Surrogate/Cleanup Standard	% Recovery	Qualifier	Acceptance Criteria
13C12-2,3,7,8-TCDD	65		25-164
37CL4-2,3,7,8-TCDD	93		35-197

Project Name: BELMONT LANDFILL

Lab Number: L2140959

Project Number: 2018-0157

Report Date: 08/30/21

Method Blank Analysis Batch Quality Control

Analytical Method: 132,1613B
 Analytical Date: 08/10/21 18:07
 Analyst: PB

Extraction Method: EPA 8290A
 Extraction Date: 08/02/21 16:36
 Cleanup Method: EPA 1613B
 Cleanup Date: 08/04/21

Parameter	Result	Qualifier	EMPC	Units	RL	MDL
Dioxins & Furans by Isotope Dilution HRMS - Mansfield Lab for sample(s): 01-05 Batch: WG1529753-1						
2,3,7,8-TCDD	ND			pg/g	0.500	0.154
Surrogate/Cleanup Standard	%Recovery		Qualifier	Acceptance Criteria		
13C12-2,3,7,8-TCDD	72			25-164		
37CL4-2,3,7,8-TCDD	93			35-197		

Lab Control Sample Analysis**Batch Quality Control****Project Name:** BELMONT LANDFILL**Lab Number:** L2140959**Project Number:** 2018-0157**Report Date:** 08/30/21

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Dioxins & Furans by Isotope Dilution HRMS - Mansfield Lab Associated sample(s): 01-05 Batch: WG1529753-2								
2,3,7,8-TCDD	106		-		67-158	-		25

Surrogate/Cleanup Standard	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
13C12-2,3,7,8-TCDD	76				25-164
37CL4-2,3,7,8-TCDD	91				35-197

METALS

Project Name: BELMONT LANDFILL**Lab Number:** L2140959**Project Number:** 2018-0157**Report Date:** 08/30/21**SAMPLE RESULTS**

Lab ID: L2140959-01

Date Collected: 07/29/21 08:40

Client ID: SED-9

Date Received: 07/30/21

Sample Location: BELMONT, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Sediment

Percent Solids: 33%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/kg	4.75	4.75	10	08/02/21 12:32	08/25/21 18:06	EPA 3050B	97,6020B	CD
Arsenic, Total	10.7		mg/kg	1.48	1.48	10	08/02/21 12:32	08/25/21 18:06	EPA 3050B	97,6020B	CD
Barium, Total	116		mg/kg	8.91	8.91	10	08/02/21 12:32	08/25/21 18:06	EPA 3050B	97,6020B	CD
Beryllium, Total	ND		mg/kg	0.8910	0.8910	10	08/02/21 12:32	08/25/21 18:06	EPA 3050B	97,6020B	CD
Cadmium, Total	0.8960		mg/kg	0.5940	0.5940	10	08/02/21 12:32	08/25/21 18:06	EPA 3050B	97,6020B	CD
Chromium, Total	9.89		mg/kg	5.94	5.94	10	08/02/21 12:32	08/25/21 18:06	EPA 3050B	97,6020B	CD
Copper, Total	26.0		mg/kg	5.94	5.94	10	08/02/21 12:32	08/25/21 18:06	EPA 3050B	97,6020B	CD
Lead, Total	112		mg/kg	1.78	1.78	10	08/02/21 12:32	08/25/21 18:06	EPA 3050B	97,6020B	CD
Mercury, Total	ND		mg/kg	0.224	0.224	1	08/02/21 12:41	08/04/21 11:26	EPA 7471B	97,7471B	OU
Nickel, Total	8.02		mg/kg	2.97	2.97	10	08/02/21 12:32	08/25/21 18:06	EPA 3050B	97,6020B	CD
Selenium, Total	ND		mg/kg	5.94	5.94	10	08/02/21 12:32	08/25/21 18:06	EPA 3050B	97,6020B	CD
Silver, Total	ND		mg/kg	1.48	1.48	10	08/02/21 12:32	08/25/21 18:06	EPA 3050B	97,6020B	CD
Zinc, Total	132		mg/kg	29.7	29.7	10	08/02/21 12:32	08/25/21 18:06	EPA 3050B	97,6020B	CD



Project Name: BELMONT LANDFILL**Lab Number:** L2140959**Project Number:** 2018-0157**Report Date:** 08/30/21**SAMPLE RESULTS**

Lab ID: L2140959-02

Date Collected: 07/29/21 08:15

Client ID: SOIL-9

Date Received: 07/30/21

Sample Location: BELMONT, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Soil

Percent Solids: 8%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/kg	18.6	18.6	10	08/02/21 12:32	08/25/21 16:51	EPA 3050B	97,6020B	CD
Arsenic, Total	22.6		mg/kg	5.81	5.81	10	08/02/21 12:32	08/25/21 16:51	EPA 3050B	97,6020B	CD
Barium, Total	137		mg/kg	34.9	34.9	10	08/02/21 12:32	08/25/21 16:51	EPA 3050B	97,6020B	CD
Beryllium, Total	ND		mg/kg	3.487	3.487	10	08/02/21 12:32	08/25/21 16:51	EPA 3050B	97,6020B	CD
Cadmium, Total	ND		mg/kg	2.325	2.325	10	08/02/21 12:32	08/25/21 16:51	EPA 3050B	97,6020B	CD
Chromium, Total	ND		mg/kg	23.2	23.2	10	08/02/21 12:32	08/25/21 16:51	EPA 3050B	97,6020B	CD
Copper, Total	59.1		mg/kg	23.2	23.2	10	08/02/21 12:32	08/25/21 16:51	EPA 3050B	97,6020B	CD
Lead, Total	310		mg/kg	6.97	6.97	10	08/02/21 12:32	08/25/21 16:51	EPA 3050B	97,6020B	CD
Mercury, Total	ND		mg/kg	0.922	0.922	1	08/02/21 12:41	08/04/21 11:29	EPA 7471B	97,7471B	OU
Nickel, Total	16.5		mg/kg	11.6	11.6	10	08/02/21 12:32	08/25/21 16:51	EPA 3050B	97,6020B	CD
Selenium, Total	ND		mg/kg	23.2	23.2	10	08/02/21 12:32	08/25/21 16:51	EPA 3050B	97,6020B	CD
Silver, Total	ND		mg/kg	5.81	5.81	10	08/02/21 12:32	08/25/21 16:51	EPA 3050B	97,6020B	CD
Zinc, Total	241		mg/kg	116	116.	10	08/02/21 12:32	08/25/21 16:51	EPA 3050B	97,6020B	CD



Project Name: BELMONT LANDFILL**Lab Number:** L2140959**Project Number:** 2018-0157**Report Date:** 08/30/21**SAMPLE RESULTS**

Lab ID: L2140959-03

Date Collected: 07/29/21 07:55

Client ID: SOIL-10

Date Received: 07/30/21

Sample Location: BELMONT, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Soil

Percent Solids: 14%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/kg	10.5	10.5	10	08/02/21 12:32	08/25/21 16:56	EPA 3050B	97,6020B	CD
Arsenic, Total	14.9		mg/kg	3.28	3.28	10	08/02/21 12:32	08/25/21 16:56	EPA 3050B	97,6020B	CD
Barium, Total	119		mg/kg	19.7	19.7	10	08/02/21 12:32	08/25/21 16:56	EPA 3050B	97,6020B	CD
Beryllium, Total	ND		mg/kg	1.970	1.970	10	08/02/21 12:32	08/25/21 16:56	EPA 3050B	97,6020B	CD
Cadmium, Total	ND		mg/kg	1.313	1.313	10	08/02/21 12:32	08/25/21 16:56	EPA 3050B	97,6020B	CD
Chromium, Total	28.8		mg/kg	13.1	13.1	10	08/02/21 12:32	08/25/21 16:56	EPA 3050B	97,6020B	CD
Copper, Total	68.0		mg/kg	13.1	13.1	10	08/02/21 12:32	08/25/21 16:56	EPA 3050B	97,6020B	CD
Lead, Total	158		mg/kg	3.94	3.94	10	08/02/21 12:32	08/25/21 16:56	EPA 3050B	97,6020B	CD
Mercury, Total	ND		mg/kg	0.456	0.456	1	08/02/21 12:41	08/04/21 11:39	EPA 7471B	97,7471B	OU
Nickel, Total	19.3		mg/kg	6.57	6.57	10	08/02/21 12:32	08/25/21 16:56	EPA 3050B	97,6020B	CD
Selenium, Total	ND		mg/kg	13.1	13.1	10	08/02/21 12:32	08/25/21 16:56	EPA 3050B	97,6020B	CD
Silver, Total	ND		mg/kg	3.28	3.28	10	08/02/21 12:32	08/25/21 16:56	EPA 3050B	97,6020B	CD
Zinc, Total	241		mg/kg	65.7	65.7	10	08/02/21 12:32	08/25/21 16:56	EPA 3050B	97,6020B	CD



Project Name: BELMONT LANDFILL**Lab Number:** L2140959**Project Number:** 2018-0157**Report Date:** 08/30/21**SAMPLE RESULTS**

Lab ID: L2140959-04

Date Collected: 07/29/21 10:05

Client ID: SOIL-1

Date Received: 07/30/21

Sample Location: BELMONT, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Soil

Percent Solids: 14%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/kg	11.0	11.0	10	08/02/21 12:32	08/25/21 17:56	EPA 3050B	97,6020B	CD
Arsenic, Total	4.84		mg/kg	3.45	3.45	10	08/02/21 12:32	08/25/21 17:56	EPA 3050B	97,6020B	CD
Barium, Total	109		mg/kg	20.7	20.7	10	08/02/21 12:32	08/25/21 17:56	EPA 3050B	97,6020B	CD
Beryllium, Total	ND		mg/kg	2.072	2.072	10	08/02/21 12:32	08/25/21 17:56	EPA 3050B	97,6020B	CD
Cadmium, Total	1.556		mg/kg	1.381	1.381	10	08/02/21 12:32	08/25/21 17:56	EPA 3050B	97,6020B	CD
Chromium, Total	ND		mg/kg	13.8	13.8	10	08/02/21 12:32	08/25/21 17:56	EPA 3050B	97,6020B	CD
Copper, Total	46.6		mg/kg	13.8	13.8	10	08/02/21 12:32	08/25/21 17:56	EPA 3050B	97,6020B	CD
Lead, Total	73.8		mg/kg	4.14	4.14	10	08/02/21 12:32	08/25/21 17:56	EPA 3050B	97,6020B	CD
Mercury, Total	ND		mg/kg	0.515	0.515	1	08/02/21 12:41	08/04/21 11:43	EPA 7471B	97,7471B	OU
Nickel, Total	9.82		mg/kg	6.91	6.91	10	08/02/21 12:32	08/25/21 17:56	EPA 3050B	97,6020B	CD
Selenium, Total	ND		mg/kg	13.8	13.8	10	08/02/21 12:32	08/25/21 17:56	EPA 3050B	97,6020B	CD
Silver, Total	ND		mg/kg	3.45	3.45	10	08/02/21 12:32	08/25/21 17:56	EPA 3050B	97,6020B	CD
Zinc, Total	101		mg/kg	69.1	69.1	10	08/02/21 12:32	08/25/21 17:56	EPA 3050B	97,6020B	CD



Project Name: BELMONT LANDFILL**Lab Number:** L2140959**Project Number:** 2018-0157**Report Date:** 08/30/21**SAMPLE RESULTS**

Lab ID: L2140959-05

Date Collected: 07/29/21 10:24

Client ID: SOIL-2

Date Received: 07/30/21

Sample Location: BELMONT, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Soil

Percent Solids: 22%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/kg	6.98	6.98	10	08/02/21 12:32	08/25/21 18:01	EPA 3050B	97,6020B	CD
Arsenic, Total	9.30		mg/kg	2.18	2.18	10	08/02/21 12:32	08/25/21 18:01	EPA 3050B	97,6020B	CD
Barium, Total	95.6		mg/kg	13.1	13.1	10	08/02/21 12:32	08/25/21 18:01	EPA 3050B	97,6020B	CD
Beryllium, Total	ND		mg/kg	1.309	1.309	10	08/02/21 12:32	08/25/21 18:01	EPA 3050B	97,6020B	CD
Cadmium, Total	0.9332		mg/kg	0.8728	0.8728	10	08/02/21 12:32	08/25/21 18:01	EPA 3050B	97,6020B	CD
Chromium, Total	13.9		mg/kg	8.73	8.73	10	08/02/21 12:32	08/25/21 18:01	EPA 3050B	97,6020B	CD
Copper, Total	41.3		mg/kg	8.73	8.73	10	08/02/21 12:32	08/25/21 18:01	EPA 3050B	97,6020B	CD
Lead, Total	108		mg/kg	2.62	2.62	10	08/02/21 12:32	08/25/21 18:01	EPA 3050B	97,6020B	CD
Mercury, Total	ND		mg/kg	0.311	0.311	1	08/02/21 12:41	08/04/21 11:46	EPA 7471B	97,7471B	OU
Nickel, Total	11.8		mg/kg	4.36	4.36	10	08/02/21 12:32	08/25/21 18:01	EPA 3050B	97,6020B	CD
Selenium, Total	ND		mg/kg	8.73	8.73	10	08/02/21 12:32	08/25/21 18:01	EPA 3050B	97,6020B	CD
Silver, Total	ND		mg/kg	2.18	2.18	10	08/02/21 12:32	08/25/21 18:01	EPA 3050B	97,6020B	CD
Zinc, Total	96.7		mg/kg	43.6	43.6	10	08/02/21 12:32	08/25/21 18:01	EPA 3050B	97,6020B	CD



Project Name: BELMONT LANDFILL

Lab Number: L2140959

Project Number: 2018-0157

Report Date: 08/30/21

Method Blank Analysis Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab for sample(s): 01-05 Batch: WG1530471-1										
Antimony, Total	ND		mg/kg	1.60	1.60	10	08/02/21 12:32	08/25/21 16:22	97,6020B	CD
Arsenic, Total	ND		mg/kg	0.500	0.500	10	08/02/21 12:32	08/25/21 16:22	97,6020B	CD
Barium, Total	ND		mg/kg	3.00	3.00	10	08/02/21 12:32	08/25/21 16:22	97,6020B	CD
Beryllium, Total	ND		mg/kg	0.3000	0.3000	10	08/02/21 12:32	08/25/21 16:22	97,6020B	CD
Cadmium, Total	ND		mg/kg	0.2000	0.2000	10	08/02/21 12:32	08/25/21 16:22	97,6020B	CD
Chromium, Total	ND		mg/kg	2.00	2.00	10	08/02/21 12:32	08/25/21 16:22	97,6020B	CD
Copper, Total	ND		mg/kg	2.00	2.00	10	08/02/21 12:32	08/25/21 16:22	97,6020B	CD
Lead, Total	ND		mg/kg	0.600	0.600	10	08/02/21 12:32	08/25/21 16:22	97,6020B	CD
Nickel, Total	ND		mg/kg	1.00	1.00	10	08/02/21 12:32	08/25/21 16:22	97,6020B	CD
Selenium, Total	ND		mg/kg	2.00	2.00	10	08/02/21 12:32	08/25/21 16:22	97,6020B	CD
Silver, Total	ND		mg/kg	0.500	0.500	10	08/02/21 12:32	08/25/21 16:22	97,6020B	CD
Zinc, Total	ND		mg/kg	10.0	10.0	10	08/02/21 12:32	08/25/21 16:22	97,6020B	CD

Prep Information

Digestion Method: EPA 3050B

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab for sample(s): 01-05 Batch: WG1530472-1										
Mercury, Total	ND		mg/kg	0.083	0.083	1	08/02/21 12:41	08/04/21 11:16	97,7471B	OU

Prep Information

Digestion Method: EPA 7471B



Lab Control Sample Analysis

Batch Quality Control

Project Name: BELMONT LANDFILL

Project Number: 2018-0157

Lab Number: L2140959

Report Date: 08/30/21

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Total Metals - Mansfield Lab Associated sample(s): 01-05 Batch: WG1530471-2 WG1530471-3 SRM Lot Number: D109-540								
Antimony, Total	104		101		19-250	3		30
Arsenic, Total	102		95		70-130	7		30
Barium, Total	101		95		75-125	6		30
Beryllium, Total	97		92		75-125	5		30
Cadmium, Total	103		96		75-125	7		30
Chromium, Total	97		91		70-130	6		30
Copper, Total	99		94		75-125	5		30
Lead, Total	105		101		72-128	4		30
Nickel, Total	96		91		70-130	5		30
Selenium, Total	102		95		68-132	7		30
Silver, Total	110		102		68-131	8		30
Zinc, Total	100		94		70-130	6		30
MCP Total Metals - Mansfield Lab Associated sample(s): 01-05 Batch: WG1530472-2 WG1530472-3 SRM Lot Number: D109-540								
Mercury, Total	98		96		60-140	2		30

INORGANICS & MISCELLANEOUS

Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140959
Report Date: 08/30/21

SAMPLE RESULTS

Lab ID: L2140959-01
Client ID: SED-9
Sample Location: BELMONT, MA

Date Collected: 07/29/21 08:40
Date Received: 07/30/21
Field Prep: Not Specified

Sample Depth:
Matrix: Sediment

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	17.6		%	0.010	0.010	1	-	08/26/21 08:00	1,9060A	CM
Total Organic Carbon (Rep2)	15.5		%	0.010	0.010	1	-	08/26/21 08:00	1,9060A	CM
Total Organic Carbon (Average)	16.5		%	0.010	0.010	1	-	08/26/21 08:00	1,9060A	CM
Grain Size Analysis - Mansfield Lab										
% Total Gravel	0.500		%	0.100	NA	1	-	08/23/21 08:09	12,D6913/D7928	SJ
% Coarse Sand	3.80		%	0.100	NA	1	-	08/23/21 08:09	12,D6913/D7928	SJ
% Medium Sand	20.9		%	0.100	NA	1	-	08/23/21 08:09	12,D6913/D7928	SJ
% Fine Sand	60.4		%	0.100	NA	1	-	08/23/21 08:09	12,D6913/D7928	SJ
% Total Fines	14.4		%	0.100	NA	1	-	08/23/21 08:09	12,D6913/D7928	SJ
General Chemistry - Westborough Lab										
Cyanide, Free	ND		mg/kg	3.1	0.74	1	08/10/21 21:15	08/11/21 23:04	109,9016	AT
General Chemistry - Mansfield Lab										
Solids, Total	32.5		%	0.100	0.100	1	-	08/04/21 12:01	121,2540G	ES



Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140959
Report Date: 08/30/21

SAMPLE RESULTS

Lab ID: L2140959-02
Client ID: SOIL-9
Sample Location: BELMONT, MA

Date Collected: 07/29/21 08:15
Date Received: 07/30/21
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	29.6		%	0.010	0.010	1	-	08/26/21 08:00	1,9060A	CM
Total Organic Carbon (Rep2)	30.2		%	0.010	0.010	1	-	08/26/21 08:00	1,9060A	CM
Total Organic Carbon (Average)	29.9		%	0.010	0.010	1	-	08/26/21 08:00	1,9060A	CM
Grain Size Analysis - Mansfield Lab										
% Total Gravel	1.20		%	0.100	NA	1	-	08/23/21 08:09	12,D6913/D7928	SJ
% Coarse Sand	19.6		%	0.100	NA	1	-	08/23/21 08:09	12,D6913/D7928	SJ
% Medium Sand	40.2		%	0.100	NA	1	-	08/23/21 08:09	12,D6913/D7928	SJ
% Fine Sand	20.8		%	0.100	NA	1	-	08/23/21 08:09	12,D6913/D7928	SJ
% Total Fines	18.2		%	0.100	NA	1	-	08/23/21 08:09	12,D6913/D7928	SJ
General Chemistry - Westborough Lab										
Cyanide, Free	ND		mg/kg	12	2.9	1	08/10/21 21:15	08/11/21 23:04	109,9016	AT
General Chemistry - Mansfield Lab										
Solids, Total	8.24		%	0.100	0.100	1	-	08/04/21 12:01	121,2540G	ES



Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140959
Report Date: 08/30/21

SAMPLE RESULTS

Lab ID: L2140959-03
Client ID: SOIL-10
Sample Location: BELMONT, MA

Date Collected: 07/29/21 07:55
Date Received: 07/30/21
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	27.7		%	0.010	0.010	1	-	08/25/21 08:25	1,9060A	SP
Total Organic Carbon (Rep2)	27.8		%	0.010	0.010	1	-	08/25/21 08:25	1,9060A	SP
Total Organic Carbon (Average)	27.8		%	0.010	0.010	1	-	08/25/21 08:25	1,9060A	SP
Grain Size Analysis - Mansfield Lab										
% Total Gravel	0.600		%	0.100	NA	1	-	08/23/21 08:09	12,D6913/D7928	SJ
% Coarse Sand	6.00		%	0.100	NA	1	-	08/23/21 08:09	12,D6913/D7928	SJ
% Medium Sand	40.3		%	0.100	NA	1	-	08/23/21 08:09	12,D6913/D7928	SJ
% Fine Sand	31.5		%	0.100	NA	1	-	08/23/21 08:09	12,D6913/D7928	SJ
% Total Fines	21.6		%	0.100	NA	1	-	08/23/21 08:09	12,D6913/D7928	SJ
General Chemistry - Westborough Lab										
Cyanide, Free	ND		mg/kg	6.9	1.6	1	08/10/21 21:15	08/11/21 23:05	109,9016	AT
General Chemistry - Mansfield Lab										
Solids, Total	14.4		%	0.100	0.100	1	-	08/04/21 12:01	121,2540G	ES



Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140959
Report Date: 08/30/21

SAMPLE RESULTS

Lab ID: L2140959-04
Client ID: SOIL-1
Sample Location: BELMONT, MA

Date Collected: 07/29/21 10:05
Date Received: 07/30/21
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	34.7		%	0.010	0.010	1	-	08/25/21 08:25	1,9060A	SP
Total Organic Carbon (Rep2)	35.0		%	0.010	0.010	1	-	08/25/21 08:25	1,9060A	SP
Total Organic Carbon (Average)	34.8		%	0.010	0.010	1	-	08/25/21 08:25	1,9060A	SP
Grain Size Analysis - Mansfield Lab										
% Total Gravel	1.10		%	0.100	NA	1	-	08/23/21 08:09	12,D6913/D7928	SJ
% Coarse Sand	11.0		%	0.100	NA	1	-	08/23/21 08:09	12,D6913/D7928	SJ
% Medium Sand	44.3		%	0.100	NA	1	-	08/23/21 08:09	12,D6913/D7928	SJ
% Fine Sand	25.0		%	0.100	NA	1	-	08/23/21 08:09	12,D6913/D7928	SJ
% Total Fines	18.6		%	0.100	NA	1	-	08/23/21 08:09	12,D6913/D7928	SJ
General Chemistry - Westborough Lab										
Cyanide, Free	ND		mg/kg	7.2	1.7	1	08/10/21 21:15	08/11/21 23:05	109,9016	AT
General Chemistry - Mansfield Lab										
Solids, Total	13.9		%	0.100	0.100	1	-	08/04/21 12:01	121,2540G	ES



Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140959
Report Date: 08/30/21

SAMPLE RESULTS

Lab ID: L2140959-05
Client ID: SOIL-2
Sample Location: BELMONT, MA

Date Collected: 07/29/21 10:24
Date Received: 07/30/21
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	14.3		%	0.010	0.010	1	-	08/25/21 08:25	1,9060A	SP
Total Organic Carbon (Rep2)	14.6		%	0.010	0.010	1	-	08/25/21 08:25	1,9060A	SP
Total Organic Carbon (Average)	14.5		%	0.010	0.010	1	-	08/25/21 08:25	1,9060A	SP
Grain Size Analysis - Mansfield Lab										
% Total Gravel	ND		%	0.100	NA	1	-	08/23/21 08:09	12,D6913/D7928	SJ
% Coarse Sand	2.50		%	0.100	NA	1	-	08/23/21 08:09	12,D6913/D7928	SJ
% Medium Sand	19.2		%	0.100	NA	1	-	08/23/21 08:09	12,D6913/D7928	SJ
% Fine Sand	40.6		%	0.100	NA	1	-	08/23/21 08:09	12,D6913/D7928	SJ
% Total Fines	37.7		%	0.100	NA	1	-	08/23/21 08:09	12,D6913/D7928	SJ
General Chemistry - Westborough Lab										
Cyanide, Free	ND		mg/kg	4.5	1.1	1	08/10/21 21:15	08/11/21 23:06	109,9016	AT
General Chemistry - Mansfield Lab										
Solids, Total	22.1		%	0.100	0.100	1	-	08/04/21 12:01	121,2540G	ES



Project Name: BELMONT LANDFILL

Lab Number: L2140959

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Method Blank Analysis Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab for sample(s): 01-05 Batch: WG1533648-1										
Cyanide, Free	ND		mg/kg	1.0	0.24	1	08/10/21 21:15	08/11/21 22:53	109,9016	AT
Total Organic Carbon - Mansfield Lab for sample(s): 01-02 Batch: WG1535994-1										
Total Organic Carbon (Rep1)	ND		%	0.010	0.010	1	-	08/26/21 08:00	1,9060A	CM
Total Organic Carbon (Rep2)	ND		%	0.010	0.010	1	-	08/26/21 08:00	1,9060A	CM
Total Organic Carbon (Average)	ND		%	0.010	0.010	1	-	08/26/21 08:00	1,9060A	CM
Total Organic Carbon - Mansfield Lab for sample(s): 03-05 Batch: WG1539215-1										
Total Organic Carbon (Rep1)	ND		%	0.010	0.010	1	-	08/25/21 08:25	1,9060A	SP
Total Organic Carbon (Rep2)	ND		%	0.010	0.010	1	-	08/25/21 08:25	1,9060A	SP
Total Organic Carbon (Average)	ND		%	0.010	0.010	1	-	08/25/21 08:25	1,9060A	SP

Lab Control Sample Analysis

Batch Quality Control

Project Name: BELMONT LANDFILL

Project Number: 2018-0157

Lab Number: L2140959

Report Date: 08/30/21

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-05 Batch: WG1533648-2								
Cyanide, Free	86		-			-		
Total Organic Carbon - Mansfield Lab Associated sample(s): 01-02 Batch: WG1535994-2								
Total Organic Carbon (Rep1)	104		-		75-125	-		25
Total Organic Carbon (Rep2)	100		-		75-125	-		25
Total Organic Carbon (Average)	102		-		75-125	-		25
Total Organic Carbon - Mansfield Lab Associated sample(s): 03-05 Batch: WG1539215-2								
Total Organic Carbon (Rep1)	104		-		75-125	-		25
Total Organic Carbon (Rep2)	114		-		75-125	-		25
Total Organic Carbon (Average)	109		-		75-125	-		25

Project Name: BELMONT LANDFILL
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Lab Duplicate Analysis
Batch Quality Control

Lab Number: L2140959
Report Date: 08/30/21

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Grain Size Analysis - Mansfield Lab Associated sample(s): 01-05 QC Batch ID: WG1537946-1 QC Sample: L2140959-01 Client ID: SED-9						
% Total Gravel	0.500	0.200	%	86	Q	20
% Coarse Sand	3.80	3.50	%	8		20
% Medium Sand	20.9	20.1	%	4		20
% Fine Sand	60.4	64.0	%	6		20
% Total Fines	14.4	12.2	%	17		20

Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Serial_No:08302116:56
Lab Number: L2140959
Report Date: 08/30/21

Sample Receipt and Container Information

Were project specific reporting limits specified?

YES

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2140959-01A	Glass 120ml/4oz unpreserved	A	NA		3.7	Y	Absent		A2-BA-MCP6020T-10(180),A2-CR-MCP6020T-10(180),A2-CD-MCP6020T-10(180),A2-AS-MCP6020T-10(180),A2-AG-MCP6020T-10(180),A2-ZN-MCP6020T-10(180),A2-SB-MCP6020T-10(180),A2-BE-MCP6020T-10(180),A2-PAH-8270SIM(14),A2-HG-MCP7471T-10(28),A2-CU-MCP6020T-10(180),A2-NI-MCP6020T-10(180),A2-SE-MCP6020T-10(180),A2-PB-MCP6020T-10(180),A2-TOC-9060-2REPS(28)
L2140959-01B	Glass 120ml/4oz unpreserved	A	NA		3.7	Y	Absent		FCN-9016(14)
L2140959-01C	Glass 250ml/8oz unpreserved	A	NA		3.7	Y	Absent		A2-DIOXIN-1613(365),A2-TS(7)
L2140959-01D	Plastic 8oz unpreserved for Grain Size	A	NA		3.7	Y	Absent		A2-HYDRO-TFINE(),A2-HYDRO-FSAND(),A2-HYDRO-MSAND(),A2-HYDRO-TGRAVEL(),A2-HYDRO-CSAND()
L2140959-02A	Glass 120ml/4oz unpreserved	A	NA		3.7	Y	Absent		A2-BA-MCP6020T-10(180),A2-CR-MCP6020T-10(180),A2-CD-MCP6020T-10(180),A2-ZN-MCP6020T-10(180),A2-AG-MCP6020T-10(180),A2-AS-MCP6020T-10(180),A2-PAH-8270SIM(14),A2-BE-MCP6020T-10(180),A2-SB-MCP6020T-10(180),A2-SE-MCP6020T-10(180),A2-HG-MCP7471T-10(28),A2-NI-MCP6020T-10(180),A2-CU-MCP6020T-10(180),A2-PB-MCP6020T-10(180),A2-TOC-9060-2REPS(28)
L2140959-02B	Glass 120ml/4oz unpreserved	A	NA		3.7	Y	Absent		FCN-9016(14)
L2140959-02C	Glass 250ml/8oz unpreserved	A	NA		3.7	Y	Absent		A2-DIOXIN-1613(365),A2-TS(7)
L2140959-02D	Plastic 8oz unpreserved for Grain Size	A	NA		3.7	Y	Absent		A2-HYDRO-TFINE(),A2-HYDRO-FSAND(),A2-HYDRO-MSAND(),A2-HYDRO-TGRAVEL(),A2-HYDRO-CSAND()

Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Serial_No: 08302116:56
Lab Number: L2140959
Report Date: 08/30/21

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2140959-03A	Glass 120ml/4oz unpreserved	A	NA		3.7	Y	Absent		A2-BA-MCP6020T-10(180),A2-CR-MCP6020T-10(180),A2-CD-MCP6020T-10(180),A2-AG-MCP6020T-10(180),A2-ZN-MCP6020T-10(180),A2-AS-MCP6020T-10(180),A2-PAH-8270SIM(14),A2-BE-MCP6020T-10(180),A2-SB-MCP6020T-10(180),A2-SE-MCP6020T-10(180),A2-CU-MCP6020T-10(180),A2-HG-MCP7471T-10(28),A2-NI-MCP6020T-10(180),A2-TOC-9060-2REPS(28),A2-PB-MCP6020T-10(180)
L2140959-03B	Glass 120ml/4oz unpreserved	A	NA		3.7	Y	Absent		FCN-9016(14)
L2140959-03C	Glass 250ml/8oz unpreserved	A	NA		3.7	Y	Absent		A2-DIOXIN-1613(365),A2-TS(7)
L2140959-03D	Plastic 8oz unpreserved for Grain Size	A	NA		3.7	Y	Absent		A2-HYDRO-TFINE(),A2-HYDRO-FSAND(),A2-HYDRO-MSAND(),A2-HYDRO-TGRAVEL(),A2-HYDRO-CSAND()
L2140959-04A	Glass 120ml/4oz unpreserved	A	NA		3.7	Y	Absent		A2-BA-MCP6020T-10(180),A2-CR-MCP6020T-10(180),A2-ZN-MCP6020T-10(180),A2-CD-MCP6020T-10(180),A2-AG-MCP6020T-10(180),A2-AS-MCP6020T-10(180),A2-SB-MCP6020T-10(180),A2-BE-MCP6020T-10(180),A2-PAH-8270SIM(14),A2-SE-MCP6020T-10(180),A2-HG-MCP7471T-10(28),A2-CU-MCP6020T-10(180),A2-NI-MCP6020T-10(180),A2-TOC-9060-2REPS(28),A2-PB-MCP6020T-10(180)
L2140959-04B	Glass 120ml/4oz unpreserved	A	NA		3.7	Y	Absent		FCN-9016(14)
L2140959-04C	Glass 250ml/8oz unpreserved	A	NA		3.7	Y	Absent		A2-DIOXIN-1613(365),A2-TS(7)
L2140959-04D	Plastic 8oz unpreserved for Grain Size	A	NA		3.7	Y	Absent		A2-HYDRO-TFINE(),A2-HYDRO-FSAND(),A2-HYDRO-MSAND(),A2-HYDRO-TGRAVEL(),A2-HYDRO-CSAND()
L2140959-05A	Glass 120ml/4oz unpreserved	A	NA		3.7	Y	Absent		A2-BA-MCP6020T-10(180),A2-CR-MCP6020T-10(180),A2-AS-MCP6020T-10(180),A2-AG-MCP6020T-10(180),A2-CD-MCP6020T-10(180),A2-ZN-MCP6020T-10(180),A2-BE-MCP6020T-10(180),A2-PAH-8270SIM(14),A2-SB-MCP6020T-10(180),A2-CU-MCP6020T-10(180),A2-HG-MCP7471T-10(28),A2-NI-MCP6020T-10(180),A2-SE-MCP6020T-10(180),A2-PB-MCP6020T-10(180),A2-TOC-9060-2REPS(28)
L2140959-05B	Glass 120ml/4oz unpreserved	A	NA		3.7	Y	Absent		FCN-9016(14)
L2140959-05C	Glass 250ml/8oz unpreserved	A	NA		3.7	Y	Absent		A2-DIOXIN-1613(365),A2-TS(7)
L2140959-05D	Plastic 8oz unpreserved for Grain Size	A	NA		3.7	Y	Absent		A2-HYDRO-TFINE(),A2-HYDRO-FSAND(),A2-HYDRO-MSAND(),A2-HYDRO-TGRAVEL(),A2-HYDRO-CSAND()

Project Name: BELMONT LANDFILL
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Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)

Project Name: BELMONT LANDFILL
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GLOSSARY

Acronyms

DL	- Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EMPC	- Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LOD	- Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
LOQ	- Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
	Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
NR	- No Results: Term is utilized when 'No Target Compounds Requested' is reported for the analysis of Volatile or Semivolatile Organic TIC only requests.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TEF	- Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.
TEQ	- Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Report Format: DU Report with 'J' Qualifiers



Project Name: BELMONT LANDFILL
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Footnotes

- 1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Difference: With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

PAH Total: With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. In addition, the 'PFAS, Total (6)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA, PFDA and PFOS. For MassDEP DW compliance analysis only, the 'PFAS, Total (6)' result is defined as the summation of results at or above the RL. Note: If a 'Total' result is requested, the results of its individual components will also be reported.

The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA, this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

- A** - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.
- B** - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).
- C** - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
- D** - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
- E** - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- F** - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.
- G** - The concentration may be biased high due to matrix interferences (i.e. co-elution) with non-target compound(s). The result should be considered estimated.
- H** - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
- I** - The lower value for the two columns has been reported due to obvious interference.
- J** - Estimated value. The Target analyte concentration is below the quantitation limit (RL), but above the Method Detection Limit (MDL) or Estimated Detection Limit (EDL) for SPME-related analyses. This represents an estimated concentration for Tentatively Identified Compounds (TICs).
- M** - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.
- ND** - Not detected at the method detection limit (MDL) for the sample, or estimated detection limit (EDL) for SPME-related analyses.

Report Format: DU Report with 'J' Qualifiers



Project Name: BELMONT LANDFILL
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Data Qualifiers

- NJ** - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.
- P** - The RPD between the results for the two columns exceeds the method-specified criteria.
- Q** - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)
- R** - Analytical results are from sample re-analysis.
- RE** - Analytical results are from sample re-extraction.
- S** - Analytical results are from modified screening analysis.

Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140959
Report Date: 08/30/21

REFERENCES

- 1 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - VI, 2018.
- 12 Annual Book of ASTM Standards. (American Society for Testing and Materials) ASTM International.
- 97 EPA Test Methods (SW-846) with QC Requirements & Performance Standards for the Analysis of EPA SW-846 Methods under the Massachusetts Contingency Plan, WSC-CAM-IIA, IIB, IIIA, IIIB, IIIC, IIID, VA, VB, VC, VIA, VIB, VIIIA and VIIIB, July 2010.
- 109 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Revision 0, June 2010.
- 121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.
- 132 Method 1613 Revision B: Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution HRGC/HRMS. USEPA Office of Water, October 1994.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

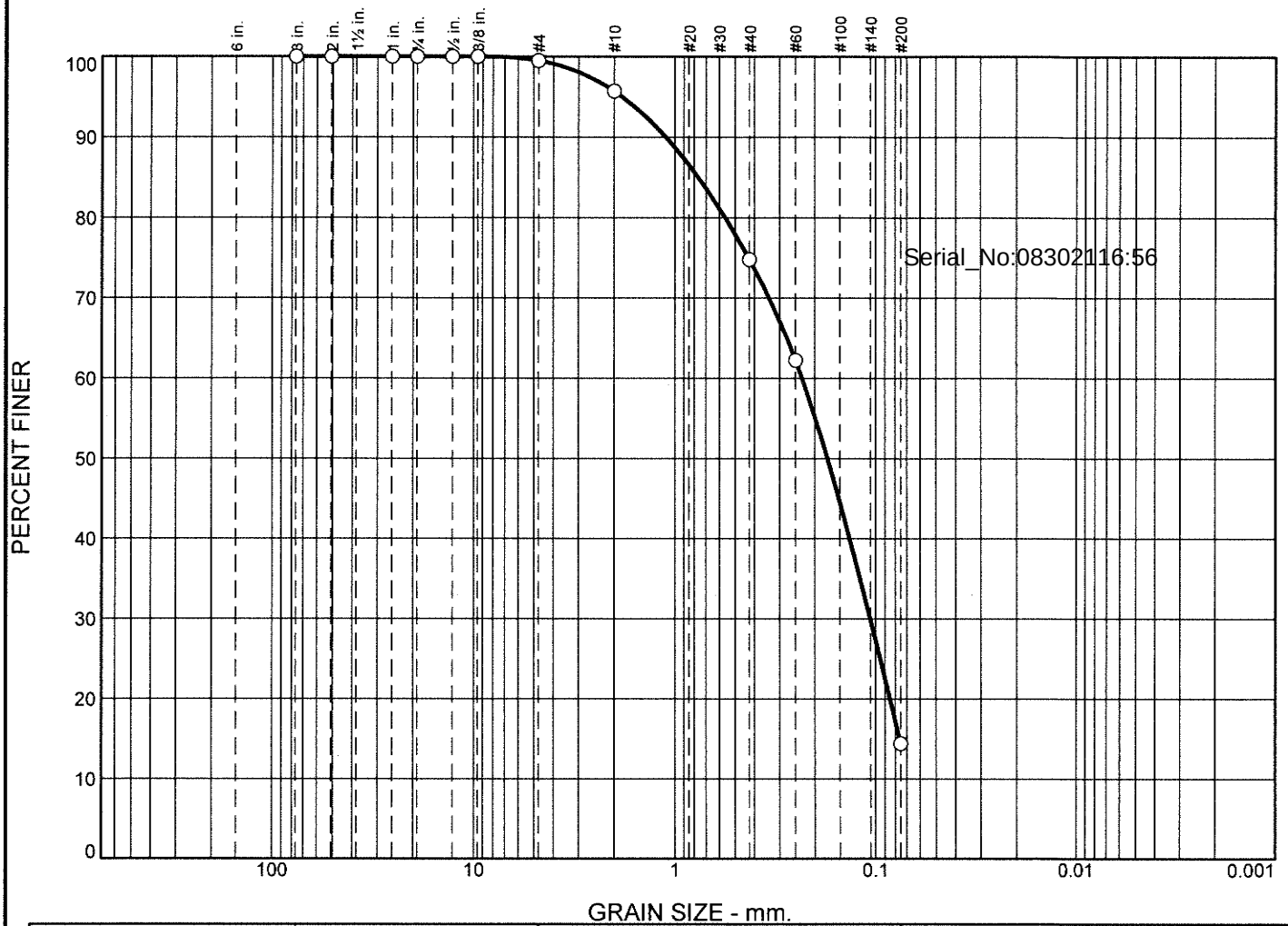
We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



Serial_No:08302116:56

ASTM D6913/D7928
GRAIN SIZE ANALYSIS

Particle Size Distribution Report



GRAIN SIZE - mm.									
% +3"		% Gravel		% Sand			% Fines		
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay	
○	0.0	0.0	0.5	3.8	20.9	60.4	14.4		
×	LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c
○			0.7644	0.2320	0.1733	0.1064	0.0760		

Material Description							USCS	AASHTO
○								

Project No. Project: ○ Source of Sample: SED-9 Sample Number: L2140959-01	Remarks:
Alpha Analytical Mansfield, MA	

Figure

GRAIN SIZE DISTRIBUTION TEST DATA

8/27/2021

Location: SED-9

Sample Number: L2140959-01

Sieve Test Data

Post #200 Wash Test Weights (grams): Dry Sample and Tare = 29.59

Tare Wt. = 0.00

Minus #200 from wash = 0.0%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
29.59	0.00	3"	0.00	0.00	100.0
		2"	0.00	0.00	100.0
		1"	0.00	0.00	100.0
		3/4"	0.00	0.00	100.0
		1/2"	0.00	0.00	100.0
		3/8"	0.00	0.00	100.0
		#4	0.15	0.00	99.5
		#10	1.12	0.00	95.7
		#40	6.19	0.00	74.8
		#60	3.71	0.00	62.3
		#200	14.16	0.00	14.4

Serial_No:08302116:56

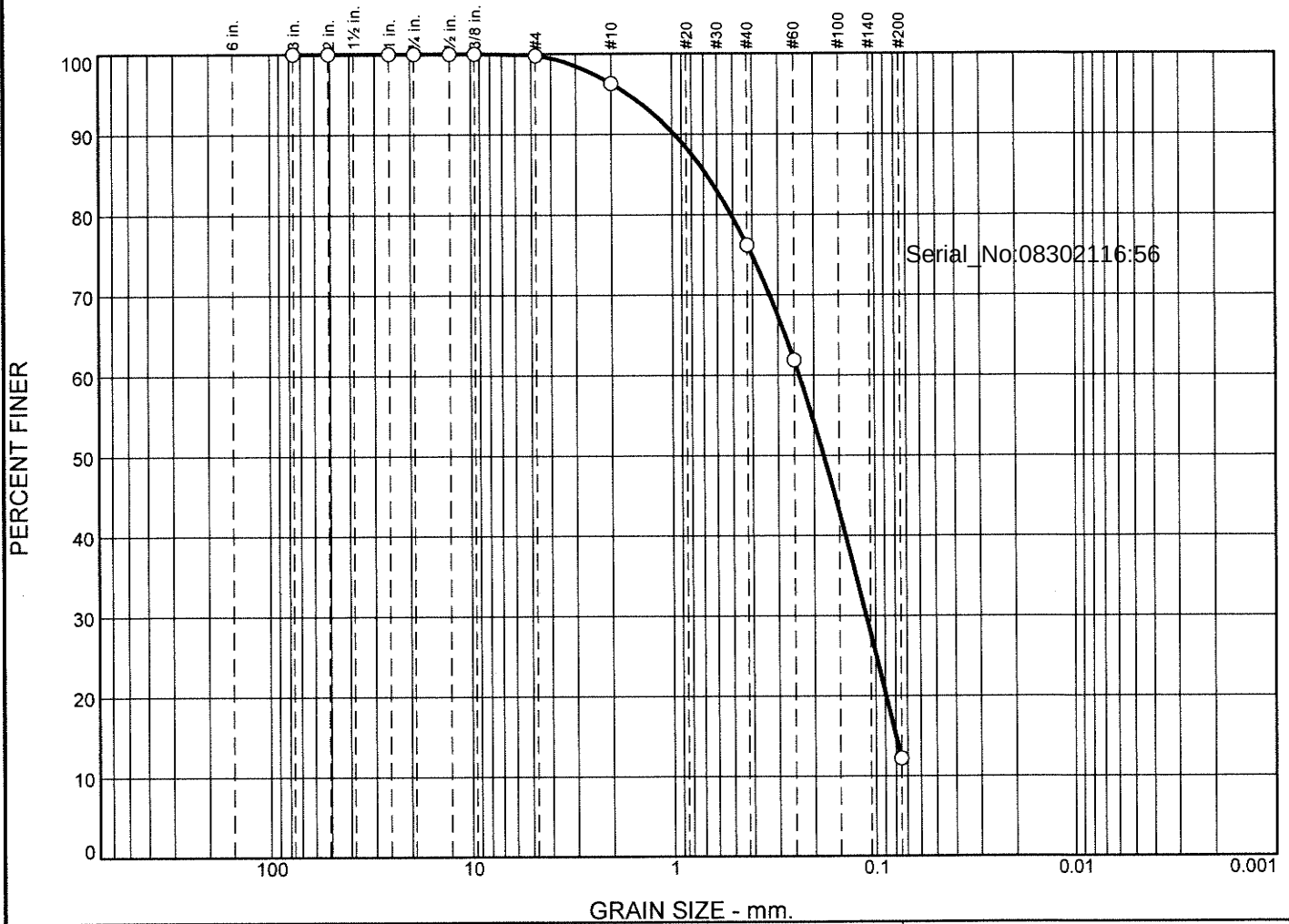
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.5	0.5	3.8	20.9	60.4	85.1			14.4

D ₅	D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₄₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
		0.0760	0.0849	0.1064	0.1345	0.1733	0.2320	0.5620	0.7644	1.1072	1.8238

Fineness Modulus
1.20

Particle Size Distribution Report



GRAIN SIZE - mm.									
% +3"	% Gravel		% Sand			% Fines			
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay		
0.0	0.0	0.2	3.5	20.1	64.0	12.2			
LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
		0.6765	0.2361	0.1792	0.1112	0.0798			

Material Description							USCS	AASHTO

Project No. Project: Source of Sample: SED-9 Sample Number: WG1537946-1	Client: Alpha Analytical Mansfield, MA	Remarks: Figure

GRAIN SIZE DISTRIBUTION TEST DATA

8/27/2021

Location: SED-9

Sample Number: WG1537946-1

Sieve Test Data

Post #200 Wash Test Weights (grams): Dry Sample and Tare = 30.22
 Tare Wt. = 0.00
 Minus #200 from wash = 0.0%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
30.22	0.00	3"	0.00	0.00	100.0
		2"	0.00	0.00	100.0
		1"	0.00	0.00	100.0
		3/4"	0.00	0.00	100.0
		1/2"	0.00	0.00	100.0
		3/8"	0.00	0.00	100.0
		#4	0.06	0.00	99.8
		#10	1.06	0.00	96.3
		#40	6.07	0.00	76.2
		#60	4.33	0.00	61.9
		#200	15.02	0.00	12.2

Serial_No:08302116:56

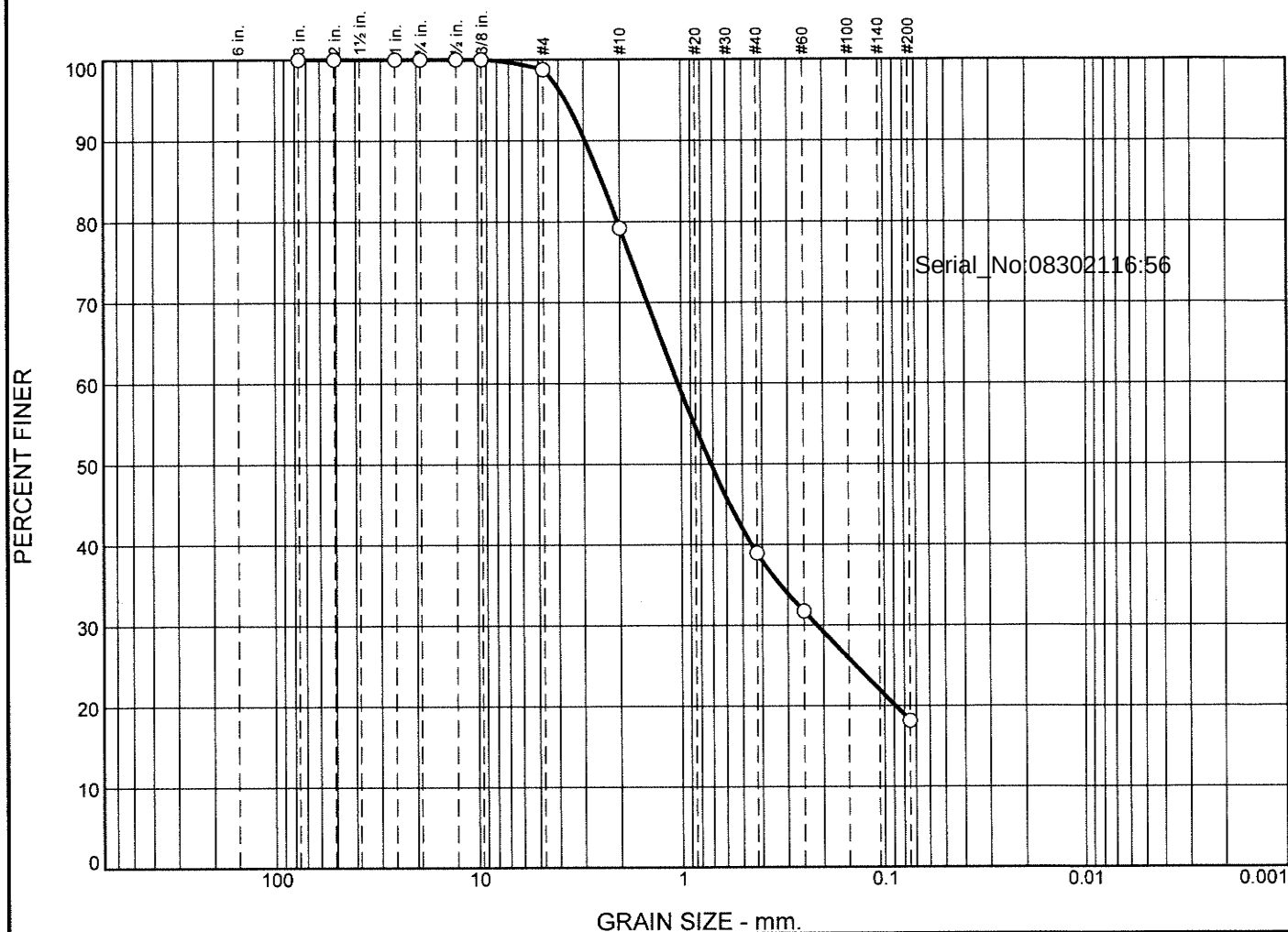
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.2	0.2	3.5	20.1	64.0	87.6			12.2

D ₅	D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₄₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
		0.0798	0.0890	0.1112	0.1400	0.1792	0.2361	0.5095	0.6765	0.9750	1.6576

Fineness Modulus
1.18

Particle Size Distribution Report



% +3"		% Gravel		% Sand			% Fines			
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay		
☐	0.0	0.0	1.2	19.6	40.2	20.8	18.2			
☒	LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
☐			2.4465	1.0388	0.7143	0.2156				
Material Description								USCS	AASHTO	
☐										

Project No.	Client:	Remarks:
Project:		
☐ Source of Sample: SOIL-9	Sample Number: L2140959-02	
Alpha Analytical		Figure
Mansfield, MA		

GRAIN SIZE DISTRIBUTION TEST DATA

8/27/2021

Location: SOIL-9

Sample Number: L2140959-02

Sieve Test Data

Post #200 Wash Test Weights (grams): Dry Sample and Tare = 26.00
Tare Wt. = 0.00
Minus #200 from wash = 0.0%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
26.00	0.00	3"	0.00	0.00	100.0
		2"	0.00	0.00	100.0
		1"	0.00	0.00	100.0
		3/4"	0.00	0.00	100.0
		1/2"	0.00	0.00	100.0
		3/8"	0.00	0.00	100.0
		#4	0.32	0.00	98.8
		#10	5.09	0.00	79.2
		#40	10.46	0.00	39.0
		#60	1.88	0.00	31.7
		#200	3.53	0.00	18.2

Serial_No:08302116:56

Fractional Components

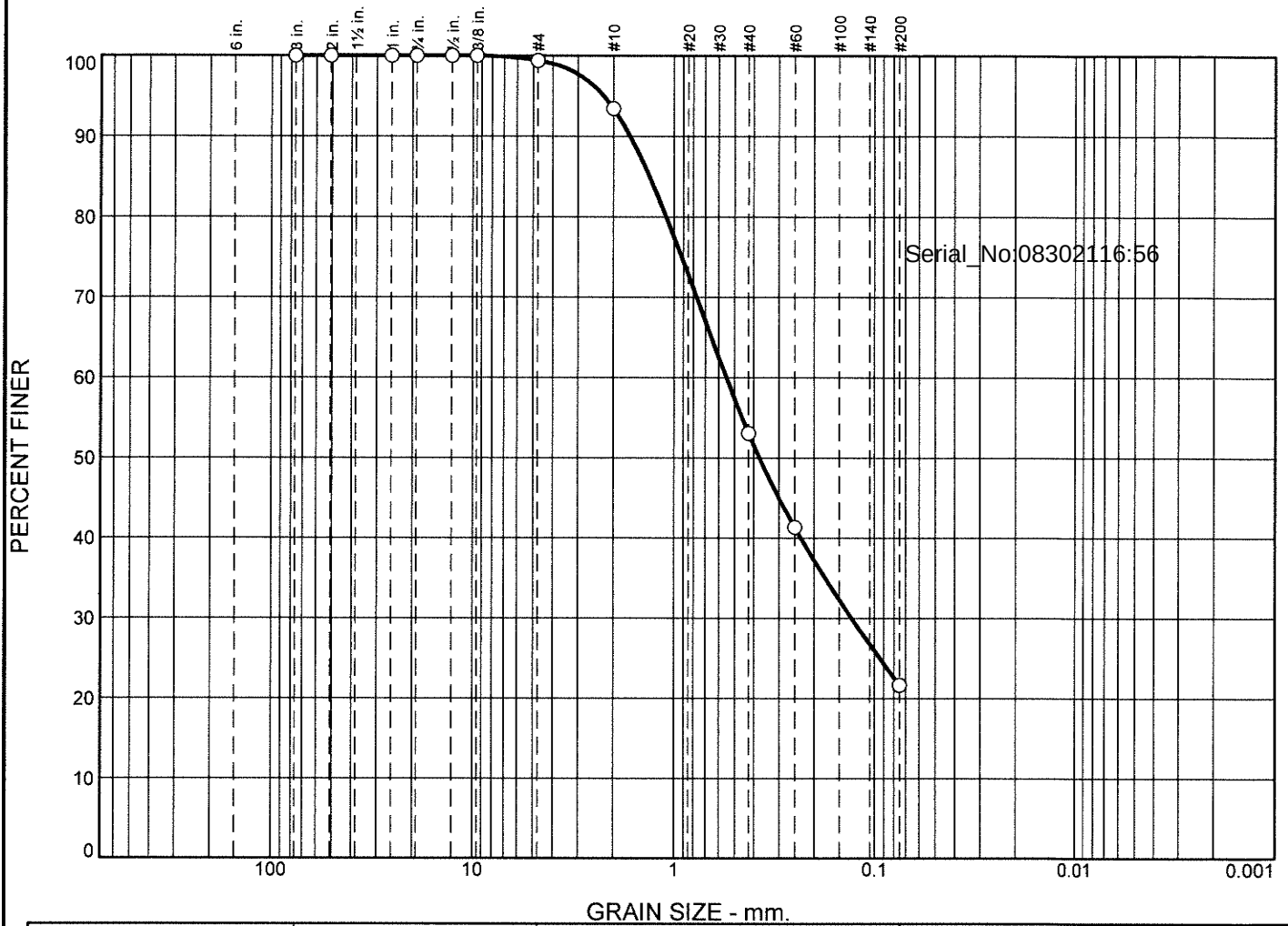
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	1.2	1.2	19.6	40.2	20.8	80.6			18.2

D ₅	D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₄₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
			0.0887	0.2156	0.4509	0.7143	1.0388	2.0558	2.4465	2.9531	3.6955

Fineness Modulus
2.48

Alpha Analytical

Particle Size Distribution Report



GRAIN SIZE - mm.									
% +3"	% Gravel		% Sand			% Fines			
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay		
0.0	0.0	0.6	6.0	40.3	31.5	21.6			
LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
		1.3243	0.5488	0.3750	0.1300				

Material Description	USCS	AASHTO

Project No. _____ Client: _____ Project: _____ Source of Sample: SOIL-10 Sample Number: L2140959-03	Remarks:
Alpha Analytical Mansfield, MA	

GRAIN SIZE DISTRIBUTION TEST DATA

8/27/2021

Location: SOIL-10

Sample Number: L2140959-03

Sieve Test Data

Post #200 Wash Test Weights (grams): Dry Sample and Tare = 24.25

Tare Wt. = 0.00

Minus #200 from wash = 0.0%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
24.25	0.00	3"	0.00	0.00	100.0
		2"	0.00	0.00	100.0
		1"	0.00	0.00	100.0
		3/4"	0.00	0.00	100.0
		1/2"	0.00	0.00	100.0
		3/8"	0.00	0.00	100.0
		#4	0.15	0.00	99.4
		#10	1.44	0.00	93.4
		#40	9.79	0.00	53.1
		#60	2.84	0.00	41.4
		#200	4.78	0.00	21.6

Serial_No:08302116:56

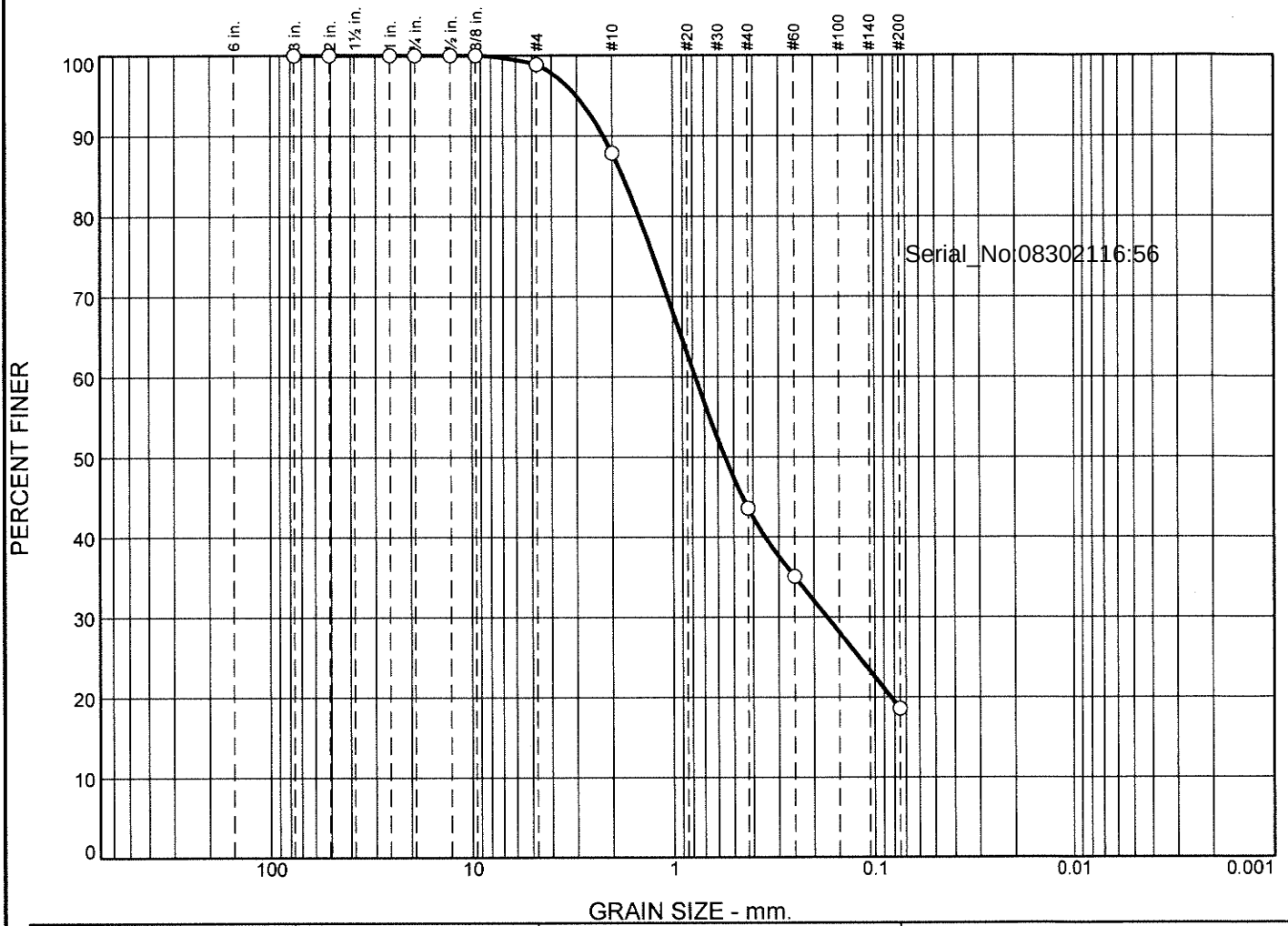
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.6	0.6	6.0	40.3	31.5	77.8			21.6

D ₅	D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₄₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
				0.1300	0.2328	0.3750	0.5488	1.0936	1.3243	1.6517	2.2360

Fineness Modulus
1.83

Particle Size Distribution Report



GRAIN SIZE - mm.									
% +3"	% Gravel		% Sand			% Fines			
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay		
0.0	0.0	1.1	11.0	44.3	25.0	18.6			
LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
		1.7728	0.7761	0.5534	0.1725				

Material Description							USCS	AASHTO

Project No. Project: ○ Source of Sample: SOIL-1 Sample Number: L2140959-04	Remarks:
Alpha Analytical Mansfield, MA	

GRAIN SIZE DISTRIBUTION TEST DATA

8/27/2021

Location: SOIL-1

Sample Number: L2140959-04

Sieve Test Data

Post #200 Wash Test Weights (grams): Dry Sample and Tare = 24.15

Tare Wt. = 0.00

Minus #200 from wash = 0.0%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
24.15	0.00	3"	0.00	0.00	100.0
		2"	0.00	0.00	100.0
		1"	0.00	0.00	100.0
		3/4"	0.00	0.00	100.0
		1/2"	0.00	0.00	100.0
		3/8"	0.00	0.00	100.0
		#4	0.27	0.00	98.9
		#10	2.66	0.00	87.9
		#40	10.69	0.00	43.6
		#60	2.06	0.00	35.1
		#200	3.98	0.00	18.6

Serial_No:08302116:56

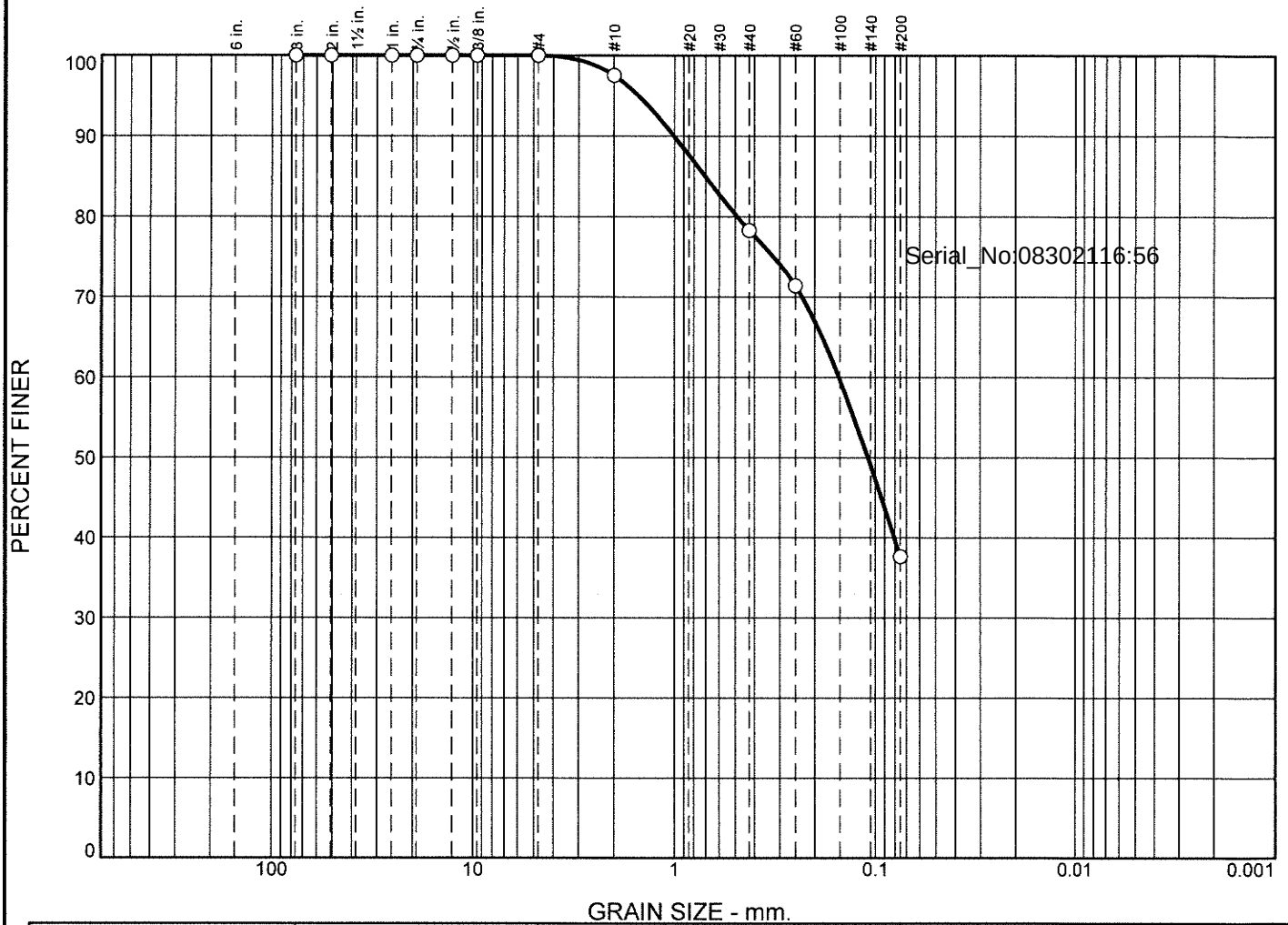
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	1.1	1.1	11.0	44.3	25.0	80.3			18.6

D ₅	D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₄₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
			0.0831	0.1725	0.3502	0.5534	0.7761	1.4732	1.7728	2.2138	3.0195

Fineness Modulus
2.19

Particle Size Distribution Report



GRAIN SIZE - mm.									
% +3"		% Gravel		% Sand			% Fines		
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay	
0.0		0.0	0.0	2.5	19.2	40.6	37.7		
LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
		0.7035	0.1518	0.1090					

Material Description							USCS	AASHTO

Project No. Client: Project: ○ Source of Sample: SOIL-2 Sample Number: L2140959-05	Remarks:
Alpha Analytical Mansfield, MA	

Figure

GRAIN SIZE DISTRIBUTION TEST DATA

8/27/2021

Location: SOIL-2

Sample Number: L2140959-05

Sieve Test Data

Post #200 Wash Test Weights (grams): Dry Sample and Tare = 52.62
Tare Wt. = 0.00
Minus #200 from wash = 0.0%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
52.62	0.00	3"	0.00	0.00	100.0
		2"	0.00	0.00	100.0
		1"	0.00	0.00	100.0
		3/4"	0.00	0.00	100.0
		1/2"	0.00	0.00	100.0
		3/8"	0.00	0.00	100.0
		#4	0.00	0.00	100.0
		#10	1.30	0.00	97.5
		#40	10.13	0.00	78.3
		#60	3.60	0.00	71.4
		#200	17.77	0.00	37.7

Serial_No:08302116:56

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	2.5	19.2	40.6	62.3			37.7

D ₅	D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₄₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
					0.0804	0.1090	0.1518	0.4882	0.7035	1.0051	1.5100

Fineness Modulus
0.93

Alpha Analytical

Alpha Analytical, Inc.Facility: **Company-wide**Department: **Quality Assurance**Title: **Certificate/Approval Program Summary**ID No.: **17873**

Revision 19

Published Date: 4/2/2021 1:14:23 PM

Page 1 of 1

Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility**EPA 624/624.1:** m/p-xylene, o-xylene, Naphthalene**EPA 625/625.1:** alpha-Terpineol**EPA 8260C/8260D:** NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.**EPA 8270D/8270E:** NPW: Dimethylnaphthalene, 1,4-Diphenylhydrazine, alpha-Terpineol; SCM: Dimethylnaphthalene, 1,4-Diphenylhydrazine.**SM4500:** NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO₂, NO₃.**Mansfield Facility****SM 2540D:** TSS**EPA 8082A:** NPW: PCB: 1, 5, 31, 87, 101, 110, 141, 151, 153, 180, 183, 187.**EPA TO-15:** Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene,

3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.

Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:**Drinking Water****EPA 300.0:** Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2:** Nitrate-N, Nitrite-N; **SM4500NO3-F:** Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE,****EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B****EPA 332:** Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.**Microbiology:** **SM9215B; SM9223-P/A, SM9223B-Colilert-QT, SM9222D.****Non-Potable Water****SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH:** Ammonia-N and Kjeldahl-N, **EPA 350.1:**Ammonia-N, **LACHAT 10-107-06-1-B:** Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2:** Nitrate-N, **SM4500P-E, SM4500P-B, E, SM4500SO4-E,****SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300:** Chloride, Sulfate, Nitrate.**EPA 624.1:** Volatile Halocarbons & Aromatics,**EPA 608.3:** Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II,

Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs

EPA 625.1: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045:** PCB-Oil.**Microbiology:** **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603, SM9222D.****Mansfield Facility:****Drinking Water****EPA 200.7:** Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1 Hg.****EPA 522, EPA 537.1.****Non-Potable Water****EPA 200.7:** Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.**EPA 200.8:** Al, Sb, As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.**EPA 245.1 Hg.****SM2340B**

For a complete listing of analytes and methods, please contact your Alpha Project Manager.



ANALYTICAL REPORT

Lab Number:	L2140910
Client:	Woods Hole Group 107 Waterhouse Road Bourne, MA 02532
ATTN:	Ted Wickwire
Phone:	(508) 495-6242
Project Name:	BELMONT LANDFILL
Project Number:	2018-0157
Report Date:	09/03/21

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Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0574), IL (200077), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #P330-17-00196).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com



Project Name: BELMONT LANDFILL

Project Number: 2018-0157

Lab Number: L2140910

Report Date: 09/03/21

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2140910-01	SW-4	SURFACE WATER	BELMONT, MA	07/28/21 08:24	07/29/21
L2140910-02	SW-5	SURFACE WATER	BELMONT, MA	07/28/21 09:10	07/29/21
L2140910-03	SW-6	SURFACE WATER	BELMONT, MA	07/28/21 08:56	07/29/21
L2140910-04	SED-11	SEDIMENT	BELMONT, MA	07/28/21 09:55	07/29/21
L2140910-05	SED-12	SEDIMENT	BELMONT, MA	07/28/21 08:40	07/29/21
L2140910-06	SOIL-14	SOIL	BELMONT, MA	07/28/21 10:55	07/29/21
L2140910-07	SED-10	SEDIMENT	BELMONT, MA	07/28/21 10:43	07/29/21
L2140910-08	SED-3	SEDIMENT	BELMONT, MA	07/28/21 11:55	07/29/21
L2140910-09	SOIL-12	SOIL	BELMONT, MA	07/28/21 12:46	07/29/21
L2140910-10	SOIL-13	SOIL	BELMONT, MA	07/28/21 12:21	07/29/21
L2140910-11	SED-8	SEDIMENT	BELMONT, MA	07/28/21 13:06	07/29/21
L2140910-12	SW-3	SURFACE WATER	BELMONT, MA	07/28/21 14:00	07/29/21
L2140910-13	SOIL-11	SOIL	BELMONT, MA	07/28/21 13:44	07/29/21
L2140910-14	SED-5	SEDIMENT	BELMONT, MA	07/28/21 15:35	07/29/21
L2140910-15	SED-6	SEDIMENT	BELMONT, MA	07/28/21 15:20	07/29/21
L2140910-16	SED-4	SEDIMENT	BELMONT, MA	07/28/21 15:55	07/29/21
L2140910-19	SW-2	SURFACE WATER	BELMONT, MA	07/28/21 11:57	07/29/21

Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140910
Report Date: 09/03/21

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

HOLD POLICY - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140910
Report Date: 09/03/21

Case Narrative (continued)

Report Submission

All non-detect (ND) or estimated concentrations (J-qualified) have been quantitated to the limit noted in the MDL column.

Sample Receipt

L2140910-01, -02, -03, -12, and -19: The sample was received below the appropriate pH for the Free Cyanide by Microdiffusion -EPA 9016 analysis. The laboratory added additional NaOH to a pH >12.

L2140910-19: A sample identified as "SW-2" was received, but not listed on the Chain of Custody. At the client's request, this sample was analyzed.

PAHs by SIM

L2140910-05, -06, -07, -08, -09, -10, -11, -11D, -13, -14, -15, and -16 was frozen upon receipt in order to arrest the holding time.

Total Mercury

The WG1529844-5 MS recoveries, performed on L2140910-07, are outside the acceptance criteria for mercury (131%/133%). Re-analysis of the MS yielded unacceptable recoveries for mercury in the range of >125%. The LCS recoveries are acceptable; therefore, no further action was taken.

Total Organic Carbon

The WG1532037-5 MS recovery (Rep2 - 60%) performed on L2140910-07, are outside the 75-125% acceptance criteria, possibly due to sample matrix. The associated SRM recoveries are within criteria, indicating the sample batch was in control, and all sample results were accepted.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:

 Elizabeth Porta

Title: Technical Director/Representative

Date: 09/03/21

ORGANICS

SEMIVOLATILES

Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140910
Report Date: 09/03/21

SAMPLE RESULTS

Lab ID: L2140910-04
Client ID: SED-11
Sample Location: BELMONT, MA

Date Collected: 07/28/21 09:55
Date Received: 07/29/21
Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
Analytical Method: 1,8270D-SIM
Analytical Date: 09/01/21 15:57
Analyst: GP
Percent Solids: 12%

Extraction Method: EPA 3570
Extraction Date: 08/26/21 21:27
Cleanup Method: EPA 3630
Cleanup Date: 08/31/21

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PAHs by GC/MS-SIM - Mansfield Lab						
Naphthalene	92.5		ug/kg	31.5	12.4	1
Acenaphthylene	332.		ug/kg	31.5	12.4	1
Acenaphthene	43.3		ug/kg	31.5	12.3	1
Fluorene	56.2		ug/kg	31.5	18.6	1
Phenanthrene	677.		ug/kg	31.5	20.3	1
Anthracene	229.		ug/kg	31.5	21.6	1
Fluoranthene	2120		ug/kg	31.5	14.5	1
Pyrene	1760		ug/kg	31.5	17.4	1
Benz(a)anthracene	1090		ug/kg	31.5	15.5	1
Chrysene	1300		ug/kg	31.5	11.4	1
Benzo(b)fluoranthene	1910		ug/kg	31.5	15.1	1
Benzo(k)fluoranthene	1190		ug/kg	31.5	9.05	1
Benzo(a)pyrene	1500		ug/kg	31.5	9.15	1
Indeno(1,2,3-cd)pyrene	1410		ug/kg	31.5	8.99	1
Dibenz(a,h)anthracene	419.		ug/kg	31.5	18.7	1
Benzo(g,h,i)perylene	1380		ug/kg	31.5	20.3	1
2-Methylnaphthalene	62.6		ug/kg	31.5	13.7	1
1-Methylnaphthalene	37.3		ug/kg	31.5	14.2	1
2-Chloronaphthalene	ND		ug/kg	31.5	11.5	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	68		30-130
Pyrene-d10	73		30-130
Benzo(b)fluoranthene-d12	74		30-130

Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140910
Report Date: 09/03/21

SAMPLE RESULTS

Lab ID: L2140910-05
Client ID: SED-12
Sample Location: BELMONT, MA

Date Collected: 07/28/21 08:40
Date Received: 07/29/21
Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
Analytical Method: 1,8270D-SIM
Analytical Date: 09/01/21 17:05
Analyst: GP
Percent Solids: 5%

Extraction Method: EPA 3570
Extraction Date: 08/26/21 21:27
Cleanup Method: EPA 3630
Cleanup Date: 08/31/21

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PAHs by GC/MS-SIM - Mansfield Lab						
Naphthalene	110.		ug/kg	69.9	27.4	1
Acenaphthylene	659.		ug/kg	69.9	27.4	1
Acenaphthene	47.2	J	ug/kg	69.9	27.2	1
Fluorene	56.9	J	ug/kg	69.9	41.3	1
Phenanthrene	899.		ug/kg	69.9	45.0	1
Anthracene	361.		ug/kg	69.9	47.8	1
Fluoranthene	3370		ug/kg	69.9	32.2	1
Pyrene	2870		ug/kg	69.9	38.6	1
Benz(a)anthracene	1940		ug/kg	69.9	34.4	1
Chrysene	2300		ug/kg	69.9	25.4	1
Benzo(b)fluoranthene	3580		ug/kg	69.9	33.5	1
Benzo(k)fluoranthene	1990		ug/kg	69.9	20.0	1
Benzo(a)pyrene	2440		ug/kg	69.9	20.3	1
Indeno(1,2,3-cd)pyrene	2450		ug/kg	69.9	19.9	1
Dibenz(a,h)anthracene	692.		ug/kg	69.9	41.4	1
Benzo(g,h,i)perylene	2330		ug/kg	69.9	45.0	1
2-Methylnaphthalene	67.4	J	ug/kg	69.9	30.4	1
1-Methylnaphthalene	45.3	J	ug/kg	69.9	31.6	1
2-Chloronaphthalene	ND		ug/kg	69.9	25.5	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	70		30-130
Pyrene-d10	86		30-130
Benzo(b)fluoranthene-d12	86		30-130

Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140910
Report Date: 09/03/21

SAMPLE RESULTS

Lab ID: L2140910-06
Client ID: SOIL-14
Sample Location: BELMONT, MA

Date Collected: 07/28/21 10:55
Date Received: 07/29/21
Field Prep: Not Specified

Sample Depth:

Matrix: Soil
Analytical Method: 1,8270D-SIM
Analytical Date: 09/01/21 17:38
Analyst: GP
Percent Solids: 13%

Extraction Method: EPA 3570
Extraction Date: 08/26/21 21:27
Cleanup Method: EPA 3630
Cleanup Date: 08/31/21

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PAHs by GC/MS-SIM - Mansfield Lab						
Naphthalene	79.4		ug/kg	29.4	11.5	1
Acenaphthylene	284.		ug/kg	29.4	11.5	1
Acenaphthene	36.4		ug/kg	29.4	11.4	1
Fluorene	37.0		ug/kg	29.4	17.4	1
Phenanthrene	658.		ug/kg	29.4	18.9	1
Anthracene	188.		ug/kg	29.4	20.1	1
Fluoranthene	2050		ug/kg	29.4	13.6	1
Pyrene	1850		ug/kg	29.4	16.2	1
Benz(a)anthracene	1100		ug/kg	29.4	14.5	1
Chrysene	1300		ug/kg	29.4	10.7	1
Benzo(b)fluoranthene	1890		ug/kg	29.4	14.1	1
Benzo(k)fluoranthene	1100		ug/kg	29.4	8.44	1
Benzo(a)pyrene	1340		ug/kg	29.4	8.53	1
Indeno(1,2,3-cd)pyrene	1280		ug/kg	29.4	8.38	1
Dibenz(a,h)anthracene	368.		ug/kg	29.4	17.4	1
Benzo(g,h,i)perylene	1290		ug/kg	29.4	18.9	1
2-Methylnaphthalene	71.2		ug/kg	29.4	12.8	1
1-Methylnaphthalene	38.3		ug/kg	29.4	13.3	1
2-Chloronaphthalene	ND		ug/kg	29.4	10.7	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	73		30-130
Pyrene-d10	84		30-130
Benzo(b)fluoranthene-d12	82		30-130

Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140910
Report Date: 09/03/21

SAMPLE RESULTS

Lab ID: L2140910-07
Client ID: SED-10
Sample Location: BELMONT, MA

Date Collected: 07/28/21 10:43
Date Received: 07/29/21
Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
Analytical Method: 1,8270D-SIM
Analytical Date: 09/01/21 18:12
Analyst: GP
Percent Solids: 11%

Extraction Method: EPA 3570
Extraction Date: 08/26/21 21:27
Cleanup Method: EPA 3630
Cleanup Date: 08/31/21

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PAHs by GC/MS-SIM - Mansfield Lab						
Naphthalene	80.4		ug/kg	34.4	13.5	1
Acenaphthylene	256.		ug/kg	34.4	13.5	1
Acenaphthene	28.5	J	ug/kg	34.4	13.4	1
Fluorene	47.3		ug/kg	34.4	20.3	1
Phenanthrene	528.		ug/kg	34.4	22.2	1
Anthracene	164.		ug/kg	34.4	23.5	1
Fluoranthene	1670		ug/kg	34.4	15.9	1
Pyrene	1540		ug/kg	34.4	19.0	1
Benz(a)anthracene	880.		ug/kg	34.4	16.9	1
Chrysene	1030		ug/kg	34.4	12.5	1
Benzo(b)fluoranthene	1360		ug/kg	34.4	16.5	1
Benzo(k)fluoranthene	928.		ug/kg	34.4	9.88	1
Benzo(a)pyrene	1100		ug/kg	34.4	9.98	1
Indeno(1,2,3-cd)pyrene	1040		ug/kg	34.4	9.81	1
Dibenz(a,h)anthracene	309.		ug/kg	34.4	20.4	1
Benzo(g,h,i)perylene	1040		ug/kg	34.4	22.2	1
2-Methylnaphthalene	76.4		ug/kg	34.4	15.0	1
1-Methylnaphthalene	33.8	J	ug/kg	34.4	15.6	1
2-Chloronaphthalene	ND		ug/kg	34.4	12.6	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	71		30-130
Pyrene-d10	80		30-130
Benzo(b)fluoranthene-d12	78		30-130

Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140910
Report Date: 09/03/21

SAMPLE RESULTS

Lab ID: L2140910-08
Client ID: SED-3
Sample Location: BELMONT, MA

Date Collected: 07/28/21 11:55
Date Received: 07/29/21
Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
Analytical Method: 1,8270D-SIM
Analytical Date: 09/01/21 19:51
Analyst: GP
Percent Solids: 11%

Extraction Method: EPA 3570
Extraction Date: 08/26/21 21:27
Cleanup Method: EPA 3630
Cleanup Date: 08/31/21

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PAHs by GC/MS-SIM - Mansfield Lab						
Naphthalene	76.2		ug/kg	36.7	14.4	1
Acenaphthylene	488.		ug/kg	36.7	14.4	1
Acenaphthene	57.5		ug/kg	36.7	14.3	1
Fluorene	94.9		ug/kg	36.7	21.7	1
Phenanthrene	1580		ug/kg	36.7	23.6	1
Anthracene	627.		ug/kg	36.7	25.1	1
Fluoranthene	6130		ug/kg	36.7	16.9	1
Pyrene	4570		ug/kg	36.7	20.3	1
Benz(a)anthracene	2500		ug/kg	36.7	18.1	1
Chrysene	4560		ug/kg	36.7	13.3	1
Benzo(b)fluoranthene	6480		ug/kg	36.7	17.6	1
Benzo(k)fluoranthene	4390		ug/kg	36.7	10.5	1
Benzo(a)pyrene	4000		ug/kg	36.7	10.6	1
Indeno(1,2,3-cd)pyrene	4170		ug/kg	36.7	10.5	1
Dibenz(a,h)anthracene	1190		ug/kg	36.7	21.8	1
Benzo(g,h,i)perylene	3900		ug/kg	36.7	23.6	1
2-Methylnaphthalene	52.5		ug/kg	36.7	16.0	1
1-Methylnaphthalene	31.2	J	ug/kg	36.7	16.6	1
2-Chloronaphthalene	ND		ug/kg	36.7	13.4	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	79		30-130
Pyrene-d10	87		30-130
Benzo(b)fluoranthene-d12	88		30-130

Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140910
Report Date: 09/03/21

SAMPLE RESULTS

Lab ID: L2140910-09
Client ID: SOIL-12
Sample Location: BELMONT, MA

Date Collected: 07/28/21 12:46
Date Received: 07/29/21
Field Prep: Not Specified

Sample Depth:

Matrix: Soil
Analytical Method: 1,8270D-SIM
Analytical Date: 09/01/21 20:25
Analyst: GP
Percent Solids: 78%

Extraction Method: EPA 3570
Extraction Date: 08/26/21 21:27
Cleanup Method: EPA 3630
Cleanup Date: 08/31/21

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PAHs by GC/MS-SIM - Mansfield Lab						
Naphthalene	19.1		ug/kg	5.04	1.97	1
Acenaphthylene	37.0		ug/kg	5.04	1.97	1
Acenaphthene	4.87	J	ug/kg	5.04	1.96	1
Fluorene	5.42		ug/kg	5.04	2.98	1
Phenanthrene	129.		ug/kg	5.04	3.24	1
Anthracene	35.5		ug/kg	5.04	3.44	1
Fluoranthene	334.		ug/kg	5.04	2.32	1
Pyrene	305.		ug/kg	5.04	2.78	1
Benz(a)anthracene	184.		ug/kg	5.04	2.48	1
Chrysene	204.		ug/kg	5.04	1.83	1
Benzo(b)fluoranthene	223.		ug/kg	5.04	2.41	1
Benzo(k)fluoranthene	178.		ug/kg	5.04	1.44	1
Benzo(a)pyrene	203.		ug/kg	5.04	1.46	1
Indeno(1,2,3-cd)pyrene	161.		ug/kg	5.04	1.44	1
Dibenz(a,h)anthracene	55.8		ug/kg	5.04	2.99	1
Benzo(g,h,i)perylene	150.		ug/kg	5.04	3.24	1
2-Methylnaphthalene	24.2		ug/kg	5.04	2.19	1
1-Methylnaphthalene	18.5		ug/kg	5.04	2.28	1
2-Chloronaphthalene	4.10	J	ug/kg	5.04	1.84	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	78		30-130
Pyrene-d10	91		30-130
Benzo(b)fluoranthene-d12	91		30-130

Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140910
Report Date: 09/03/21

SAMPLE RESULTS

Lab ID: L2140910-10
Client ID: SOIL-13
Sample Location: BELMONT, MA

Date Collected: 07/28/21 12:21
Date Received: 07/29/21
Field Prep: Not Specified

Sample Depth:

Matrix: Soil
Analytical Method: 1,8270D-SIM
Analytical Date: 09/01/21 20:58
Analyst: GP
Percent Solids: 10%

Extraction Method: EPA 3570
Extraction Date: 08/26/21 21:27
Cleanup Method: EPA 3630
Cleanup Date: 08/31/21

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PAHs by GC/MS-SIM - Mansfield Lab						
Naphthalene	132.		ug/kg	39.8	15.6	1
Acenaphthylene	848.		ug/kg	39.8	15.6	1
Acenaphthene	76.8		ug/kg	39.8	15.5	1
Fluorene	87.1		ug/kg	39.8	23.5	1
Phenanthrene	1400		ug/kg	39.8	25.6	1
Anthracene	555.		ug/kg	39.8	27.2	1
Fluoranthene	4680		ug/kg	39.8	18.3	1
Pyrene	3930		ug/kg	39.8	22.0	1
Benz(a)anthracene	2500		ug/kg	39.8	19.6	1
Chrysene	2910		ug/kg	39.8	14.4	1
Benzo(b)fluoranthene	4210		ug/kg	39.8	19.0	1
Benzo(k)fluoranthene	2110		ug/kg	39.8	11.4	1
Benzo(a)pyrene	3120		ug/kg	39.8	11.5	1
Indeno(1,2,3-cd)pyrene	2800		ug/kg	39.8	11.3	1
Dibenz(a,h)anthracene	871.		ug/kg	39.8	23.6	1
Benzo(g,h,i)perylene	2820		ug/kg	39.8	25.6	1
2-Methylnaphthalene	88.3		ug/kg	39.8	17.3	1
1-Methylnaphthalene	62.6		ug/kg	39.8	18.0	1
2-Chloronaphthalene	ND		ug/kg	39.8	14.5	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	77		30-130
Pyrene-d10	89		30-130
Benzo(b)fluoranthene-d12	91		30-130

Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140910
Report Date: 09/03/21

SAMPLE RESULTS

Lab ID: L2140910-11
Client ID: SED-8
Sample Location: BELMONT, MA

Date Collected: 07/28/21 13:06
Date Received: 07/29/21
Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
Analytical Method: 1,8270D-SIM
Analytical Date: 09/01/21 21:31
Analyst: GP
Percent Solids: 18%

Extraction Method: EPA 3570
Extraction Date: 08/26/21 21:27
Cleanup Method: EPA 3630
Cleanup Date: 08/31/21

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PAHs by GC/MS-SIM - Mansfield Lab						
Naphthalene	134.		ug/kg	21.4	8.40	1
Acenaphthylene	395.		ug/kg	21.4	8.40	1
Acenaphthene	143.		ug/kg	21.4	8.34	1
Fluorene	141.		ug/kg	21.4	12.7	1
Phenanthrene	2000		ug/kg	21.4	13.8	1
Anthracene	412.		ug/kg	21.4	14.7	1
Fluoranthene	5560	E	ug/kg	21.4	9.88	1
Pyrene	4350	E	ug/kg	21.4	11.8	1
Benz(a)anthracene	2650		ug/kg	21.4	10.5	1
Chrysene	2680		ug/kg	21.4	7.78	1
Benzo(b)fluoranthene	4500	E	ug/kg	21.4	10.3	1
Benzo(k)fluoranthene	1720		ug/kg	21.4	6.15	1
Benzo(a)pyrene	2620		ug/kg	21.4	6.22	1
Indeno(1,2,3-cd)pyrene	2780		ug/kg	21.4	6.11	1
Dibenz(a,h)anthracene	776.		ug/kg	21.4	12.7	1
Benzo(g,h,i)perylene	2620		ug/kg	21.4	13.8	1
2-Methylnaphthalene	99.6		ug/kg	21.4	9.33	1
1-Methylnaphthalene	70.5		ug/kg	21.4	9.69	1
2-Chloronaphthalene	16.5	J	ug/kg	21.4	7.83	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	80		30-130
Pyrene-d10	85		30-130
Benzo(b)fluoranthene-d12	88		30-130

Project Name: BELMONT LANDFILL**Project Number:** 2018-0157**Lab Number:** L2140910**Report Date:** 09/03/21**SAMPLE RESULTS**

Lab ID: L2140910-11 D

Client ID: SED-8

Sample Location: BELMONT, MA

Date Collected: 07/28/21 13:06

Date Received: 07/29/21

Field Prep: Not Specified

Sample Depth:

Matrix: Sediment

Analytical Method: 1,8270D-SIM

Analytical Date: 09/02/21 16:16

Analyst: GP

Percent Solids: 18%

Extraction Method: EPA 3570

Extraction Date: 08/26/21 21:27

Cleanup Method: EPA 3630

Cleanup Date: 08/31/21

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PAHs by GC/MS-SIM - Mansfield Lab						
Fluoranthene	5030		ug/kg	42.9	19.8	2
Pyrene	4140		ug/kg	42.9	23.7	2
Benzo(b)fluoranthene	4340		ug/kg	42.9	20.5	2

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	79		30-130
Pyrene-d10	82		30-130
Benzo(b)fluoranthene-d12	82		30-130

Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140910
Report Date: 09/03/21

SAMPLE RESULTS

Lab ID: L2140910-13
Client ID: SOIL-11
Sample Location: BELMONT, MA

Date Collected: 07/28/21 13:44
Date Received: 07/29/21
Field Prep: Not Specified

Sample Depth:

Matrix: Soil
Analytical Method: 1,8270D-SIM
Analytical Date: 09/01/21 22:05
Analyst: GP
Percent Solids: 20%

Extraction Method: EPA 3570
Extraction Date: 08/26/21 21:27
Cleanup Method: EPA 3630
Cleanup Date: 08/31/21

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PAHs by GC/MS-SIM - Mansfield Lab						
Naphthalene	86.5		ug/kg	18.4	7.20	1
Acenaphthylene	427.		ug/kg	18.4	7.20	1
Acenaphthene	55.0		ug/kg	18.4	7.14	1
Fluorene	53.5		ug/kg	18.4	10.8	1
Phenanthrene	965.		ug/kg	18.4	11.8	1
Anthracene	311.		ug/kg	18.4	12.6	1
Fluoranthene	3090		ug/kg	18.4	8.46	1
Pyrene	2670		ug/kg	18.4	10.1	1
Benz(a)anthracene	1650		ug/kg	18.4	9.03	1
Chrysene	1710		ug/kg	18.4	6.66	1
Benzo(b)fluoranthene	2470		ug/kg	18.4	8.79	1
Benzo(k)fluoranthene	1420		ug/kg	18.4	5.27	1
Benzo(a)pyrene	1850		ug/kg	18.4	5.32	1
Indeno(1,2,3-cd)pyrene	1720		ug/kg	18.4	5.23	1
Dibenz(a,h)anthracene	508.		ug/kg	18.4	10.9	1
Benzo(g,h,i)perylene	1790		ug/kg	18.4	11.8	1
2-Methylnaphthalene	77.0		ug/kg	18.4	7.99	1
1-Methylnaphthalene	52.1		ug/kg	18.4	8.30	1
2-Chloronaphthalene	ND		ug/kg	18.4	6.70	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	82		30-130
Pyrene-d10	92		30-130
Benzo(b)fluoranthene-d12	96		30-130

Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140910
Report Date: 09/03/21

SAMPLE RESULTS

Lab ID: L2140910-14
Client ID: SED-5
Sample Location: BELMONT, MA

Date Collected: 07/28/21 15:35
Date Received: 07/29/21
Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
Analytical Method: 1,8270D-SIM
Analytical Date: 09/01/21 22:38
Analyst: GP
Percent Solids: 15%

Extraction Method: EPA 3570
Extraction Date: 08/26/21 21:28
Cleanup Method: EPA 3630
Cleanup Date: 08/31/21

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PAHs by GC/MS-SIM - Mansfield Lab						
Naphthalene	106.		ug/kg	25.2	9.86	1
Acenaphthylene	160.		ug/kg	25.2	9.86	1
Acenaphthene	44.0		ug/kg	25.2	9.79	1
Fluorene	80.6		ug/kg	25.2	14.9	1
Phenanthrene	916.		ug/kg	25.2	16.2	1
Anthracene	278.		ug/kg	25.2	17.2	1
Fluoranthene	2860		ug/kg	25.2	11.6	1
Pyrene	2320		ug/kg	25.2	13.9	1
Benz(a)anthracene	1560		ug/kg	25.2	12.4	1
Chrysene	1510		ug/kg	25.2	9.13	1
Benzo(b)fluoranthene	1720		ug/kg	25.2	12.0	1
Benzo(k)fluoranthene	1200		ug/kg	25.2	7.22	1
Benzo(a)pyrene	1470		ug/kg	25.2	7.30	1
Indeno(1,2,3-cd)pyrene	1040		ug/kg	25.2	7.17	1
Dibenz(a,h)anthracene	370.		ug/kg	25.2	14.9	1
Benzo(g,h,i)perylene	1040		ug/kg	25.2	16.2	1
2-Methylnaphthalene	108.		ug/kg	25.2	10.9	1
1-Methylnaphthalene	61.6		ug/kg	25.2	11.4	1
2-Chloronaphthalene	ND		ug/kg	25.2	9.18	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	80		30-130
Pyrene-d10	81		30-130
Benzo(b)fluoranthene-d12	87		30-130

Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140910
Report Date: 09/03/21

SAMPLE RESULTS

Lab ID: L2140910-15
Client ID: SED-6
Sample Location: BELMONT, MA

Date Collected: 07/28/21 15:20
Date Received: 07/29/21
Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
Analytical Method: 1,8270D-SIM
Analytical Date: 09/01/21 23:11
Analyst: GP
Percent Solids: 16%

Extraction Method: EPA 3570
Extraction Date: 08/26/21 21:28
Cleanup Method: EPA 3630
Cleanup Date: 08/31/21

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PAHs by GC/MS-SIM - Mansfield Lab						
Naphthalene	181.		ug/kg	24.8	9.71	1
Acenaphthylene	366.		ug/kg	24.8	9.71	1
Acenaphthene	163.		ug/kg	24.8	9.64	1
Fluorene	273.		ug/kg	24.8	14.6	1
Phenanthrene	2060		ug/kg	24.8	16.0	1
Anthracene	491.		ug/kg	24.8	16.9	1
Fluoranthene	4330		ug/kg	24.8	11.4	1
Pyrene	3640		ug/kg	24.8	13.7	1
Benz(a)anthracene	2090		ug/kg	24.8	12.2	1
Chrysene	1940		ug/kg	24.8	8.99	1
Benzo(b)fluoranthene	2410		ug/kg	24.8	11.9	1
Benzo(k)fluoranthene	1610		ug/kg	24.8	7.11	1
Benzo(a)pyrene	1850		ug/kg	24.8	7.18	1
Indeno(1,2,3-cd)pyrene	1560		ug/kg	24.8	7.06	1
Dibenz(a,h)anthracene	512.		ug/kg	24.8	14.7	1
Benzo(g,h,i)perylene	1720		ug/kg	24.8	16.0	1
2-Methylnaphthalene	233.		ug/kg	24.8	10.8	1
1-Methylnaphthalene	131.		ug/kg	24.8	11.2	1
2-Chloronaphthalene	ND		ug/kg	24.8	9.04	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	83		30-130
Pyrene-d10	94		30-130
Benzo(b)fluoranthene-d12	102		30-130

Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140910
Report Date: 09/03/21

SAMPLE RESULTS

Lab ID: L2140910-16
Client ID: SED-4
Sample Location: BELMONT, MA

Date Collected: 07/28/21 15:55
Date Received: 07/29/21
Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
Analytical Method: 1,8270D-SIM
Analytical Date: 09/01/21 23:45
Analyst: GP
Percent Solids: 6%

Extraction Method: EPA 3570
Extraction Date: 08/26/21 21:28
Cleanup Method: EPA 3630
Cleanup Date: 08/31/21

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PAHs by GC/MS-SIM - Mansfield Lab						
Naphthalene	67.4		ug/kg	63.5	24.9	1
Acenaphthylene	242.		ug/kg	63.5	24.9	1
Acenaphthene	34.2	J	ug/kg	63.5	24.7	1
Fluorene	43.7	J	ug/kg	63.5	37.5	1
Phenanthrene	691.		ug/kg	63.5	40.9	1
Anthracene	189.		ug/kg	63.5	43.4	1
Fluoranthene	2530		ug/kg	63.5	29.3	1
Pyrene	2190		ug/kg	63.5	35.1	1
Benz(a)anthracene	1040		ug/kg	63.5	31.2	1
Chrysene	1710		ug/kg	63.5	23.1	1
Benzo(b)fluoranthene	2500		ug/kg	63.5	30.4	1
Benzo(k)fluoranthene	1370		ug/kg	63.5	18.2	1
Benzo(a)pyrene	1590		ug/kg	63.5	18.4	1
Indeno(1,2,3-cd)pyrene	1800		ug/kg	63.5	18.1	1
Dibenz(a,h)anthracene	496.		ug/kg	63.5	37.7	1
Benzo(g,h,i)perylene	1830		ug/kg	63.5	40.9	1
2-Methylnaphthalene	44.0	J	ug/kg	63.5	27.6	1
1-Methylnaphthalene	31.1	J	ug/kg	63.5	28.7	1
2-Chloronaphthalene	ND		ug/kg	63.5	23.2	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	84		30-130
Pyrene-d10	92		30-130
Benzo(b)fluoranthene-d12	97		30-130

Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140910
Report Date: 09/03/21

Method Blank Analysis Batch Quality Control

Analytical Method: 1,8270D-SIM
Analytical Date: 09/01/21 11:58
Analyst: GP

Extraction Method: EPA 3570
Extraction Date: 08/26/21 21:27
Cleanup Method: EPA 3630
Cleanup Date: 08/31/21

Parameter	Result	Qualifier	Units	RL	MDL
PAHs by GC/MS-SIM - Mansfield Lab for sample(s): 04-11,13-16 Batch: WG1539604-1					
Naphthalene	ND		ug/kg	4.00	1.57
Acenaphthylene	ND		ug/kg	4.00	1.57
Acenaphthene	ND		ug/kg	4.00	1.56
Fluorene	ND		ug/kg	4.00	2.36
Phenanthrene	ND		ug/kg	4.00	2.58
Anthracene	ND		ug/kg	4.00	2.74
Fluoranthene	ND		ug/kg	4.00	1.84
Pyrene	ND		ug/kg	4.00	2.21
Benz(a)anthracene	ND		ug/kg	4.00	1.97
Chrysene	ND		ug/kg	4.00	1.45
Benzo(b)fluoranthene	ND		ug/kg	4.00	1.92
Benzo(k)fluoranthene	ND		ug/kg	4.00	1.15
Benzo(a)pyrene	ND		ug/kg	4.00	1.16
Indeno(1,2,3-cd)pyrene	ND		ug/kg	4.00	1.14
Dibenz(a,h)anthracene	ND		ug/kg	4.00	2.37
Benzo(g,h,i)perylene	ND		ug/kg	4.00	2.58
2-Methylnaphthalene	ND		ug/kg	4.00	1.74
1-Methylnaphthalene	ND		ug/kg	4.00	1.81
2-Chloronaphthalene	ND		ug/kg	4.00	1.46

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	83		30-130
Pyrene-d10	98		30-130
Benzo(b)fluoranthene-d12	106		30-130

Lab Control Sample Analysis **Batch Quality Control**

Project Name: BELMONT LANDFILL

Project Number: 2018-0157

Lab Number: L2140910

Report Date: 09/03/21

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
PAHs by GC/MS-SIM - Mansfield Lab Associated sample(s): 04-11,13-16 Batch: WG1539604-2 WG1539604-3								
Naphthalene	84		82		40-140	2		30
Acenaphthylene	88		86		40-140	2		30
Acenaphthene	87		84		40-140	4		30
Fluorene	86		85		40-140	1		30
Phenanthrene	83		82		40-140	1		30
Anthracene	91		90		40-140	1		30
Fluoranthene	88		88		40-140	0		30
Pyrene	89		90		40-140	1		30
Benz(a)anthracene	94		92		40-140	2		30
Chrysene	84		87		40-140	4		30
Benzo(b)fluoranthene	111		108		40-140	3		30
Benzo(k)fluoranthene	88		91		40-140	3		30
Benzo(a)pyrene	96		96		40-140	0		30
Indeno(1,2,3-cd)pyrene	99		98		40-140	1		30
Dibenz(a,h)anthracene	100		98		40-140	2		30
Benzo(g,h,i)perylene	102		102		40-140	0		30
2-Methylnaphthalene	80		78		40-140	3		30
1-Methylnaphthalene	84		80		40-140	5		30
2-Chloronaphthalene	83		81		40-140	2		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: BELMONT LANDFILL

Project Number: 2018-0157

Lab Number: L2140910

Report Date: 09/03/21

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
PAHs by GC/MS-SIM - Mansfield Lab Associated sample(s): 04-11,13-16 Batch: WG1539604-2 WG1539604-3								

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2-Methylnaphthalene-d10	84		80		30-130
Pyrene-d10	93		91		30-130
Benzo(b)fluoranthene-d12	101		97		30-130

Matrix Spike Analysis **Batch Quality Control**

Project Name: BELMONT LANDFILL

Project Number: 2018-0157

Lab Number: L2140910

Report Date: 09/03/21

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
PAHs by GC/MS-SIM - Mansfield Lab Associated sample(s): 04-11,13-16 QC Batch ID: WG1539604-5 WG1539604-6 QC Sample: L2140910-07 Client ID: SED-10												
Naphthalene	80.4	4350	3090	69		3390	73		40-140	9		30
Acenaphthylene	256	4350	3770	81		4020	83		40-140	6		30
Acenaphthene	28.5J	4350	3480	80		3600	79		40-140	3		30
Fluorene	47.3	4350	3600	82		3710	81		40-140	3		30
Phenanthrene	528	4350	4320	87		4430	86		40-140	3		30
Anthracene	164	4350	3390	74		3580	75		40-140	5		30
Fluoranthene	1670	4350	5590	90		5520	85		40-140	1		30
Pyrene	1540	4350	5050	81		4830	72		40-140	4		30
Benz(a)anthracene	880	4350	4710	88		4790	86		40-140	2		30
Chrysene	1030	4350	4600	82		4520	77		40-140	2		30
Benzo(b)fluoranthene	1360	4350	5980	106		5700	96		40-140	5		30
Benzo(k)fluoranthene	928	4350	4130	74		4410	77		40-140	7		30
Benzo(a)pyrene	1100	4350	5000	90		4840	82		40-140	3		30
Indeno(1,2,3-cd)pyrene	1040	4350	5070	93		5160	91		40-140	2		30
Dibenz(a,h)anthracene	309	4350	4340	93		4240	87		40-140	2		30
Benzo(g,h,i)perylene	1040	4350	5140	94		4950	86		40-140	4		30
2-Methylnaphthalene	76.4	4350	3180	71		3350	72		40-140	5		30
1-Methylnaphthalene	33.8J	4350	3230	74		3500	77		40-140	8		30
2-Chloronaphthalene	ND	4350	3250	75		3420	75		40-140	5		30

Surrogate	MS % Recovery	MSD % Recovery	Acceptance Criteria
2-Methylnaphthalene-d10	77	75	30-130

Matrix Spike Analysis**Batch Quality Control****Project Name:** BELMONT LANDFILL**Lab Number:** L2140910**Project Number:** 2018-0157**Report Date:** 09/03/21

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
PAHs by GC/MS-SIM - Mansfield Lab Associated sample(s): 04-11,13-16 QC Batch ID: WG1539604-5 WG1539604-6 QC Sample: L2140910-07 Client ID: SED-10												

Surrogate	MS % Recovery	Qualifier	MSD % Recovery	Qualifier	Acceptance Criteria
Benzo(b)fluoranthene-d12	90		80		30-130
Pyrene-d10	88		81		30-130

Lab Duplicate Analysis Batch Quality Control

Project Name: BELMONT LANDFILL

Project Number: 2018-0157

Lab Number: L2140910

Report Date: 09/03/21

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
PAHs by GC/MS-SIM - Mansfield Lab Associated sample(s): 04-11,13-16 QC Batch ID: WG1539604-4 QC Sample: L2140910-04 Client ID: SED-11						
Naphthalene	92.5	106	ug/kg	14		30
Acenaphthylene	332	398	ug/kg	18		30
Acenaphthene	43.3	46.4	ug/kg	7		30
Fluorene	56.2	70.0	ug/kg	22		30
Phenanthrene	677	763	ug/kg	12		30
Anthracene	229	267	ug/kg	15		30
Fluoranthene	2120	2270	ug/kg	7		30
Pyrene	1760	1970	ug/kg	11		30
Benz(a)anthracene	1090	1260	ug/kg	14		30
Chrysene	1300	1500	ug/kg	14		30
Benzo(b)fluoranthene	1910	2130	ug/kg	11		30
Benzo(k)fluoranthene	1190	1380	ug/kg	15		30
Benzo(a)pyrene	1500	1670	ug/kg	11		30
Indeno(1,2,3-cd)pyrene	1410	1630	ug/kg	14		30
Dibenz(a,h)anthracene	419	528	ug/kg	23		30
Benzo(g,h,i)perylene	1380	1570	ug/kg	13		30
2-Methylnaphthalene	62.6	66.9	ug/kg	7		30
1-Methylnaphthalene	37.3	39.3	ug/kg	5		30
2-Chloronaphthalene	ND	ND	ug/kg	NC		30

Surrogate	%Recovery	Qualifier	%Recovery	Qualifier	Acceptance Criteria

Project Name: BELMONT LANDFILL

Project Number: 2018-0157

Lab Duplicate Analysis

Batch Quality Control

Lab Number: L2140910

Report Date: 09/03/21

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
PAHs by GC/MS-SIM - Mansfield Lab Associated sample(s): 04-11,13-16 QC Batch ID: WG1539604-4 QC Sample: L2140910-04 Client ID: SED-11						

Surrogate	%Recovery	Qualifier	%Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	68		67		30-130
Pyrene-d10	73		78		30-130
Benzo(b)fluoranthene-d12	74		81		30-130

SEMIVOLATILES

High Resolution Mass Spectrometry

Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140910
Report Date: 09/03/21

SAMPLE RESULTS

Lab ID: L2140910-04
Client ID: SED-11
Sample Location: BELMONT, MA

Date Collected: 07/28/21 09:55
Date Received: 07/29/21
Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
Analytical Method: 132,1613B
Analytical Date: 08/10/21 20:15
Analyst: PB
Percent Solids: 12%

Extraction Method: EPA 8290A
Extraction Date: 08/02/21 16:36
Cleanup Method: EPA 1613B
Cleanup Date: 08/04/21

Parameter	Result	Qualifier	EMPC	Units	RL	MDL	Dilution Factor

Dioxins & Furans by Isotope Dilution HRMS - Mansfield Lab

2,3,7,8-TCDD	ND			pg/g	4.07	1.25	1

Surrogate/Cleanup Standard	% Recovery	Qualifier	Acceptance Criteria
13C12-2,3,7,8-TCDD	74		25-164
37CL4-2,3,7,8-TCDD	98		35-197

Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140910
Report Date: 09/03/21

SAMPLE RESULTS

Lab ID: L2140910-05
Client ID: SED-12
Sample Location: BELMONT, MA

Date Collected: 07/28/21 08:40
Date Received: 07/29/21
Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
Analytical Method: 132,1613B
Analytical Date: 08/10/21 22:23
Analyst: PB
Percent Solids: 5%

Extraction Method: EPA 8290A
Extraction Date: 08/02/21 16:36
Cleanup Method: EPA 1613B
Cleanup Date: 08/04/21

Parameter	Result	Qualifier	EMPC	Units	RL	MDL	Dilution Factor

Dioxins & Furans by Isotope Dilution HRMS - Mansfield Lab							

2,3,7,8-TCDD	ND			pg/g	9.05	2.79	1

Surrogate/Cleanup Standard	% Recovery	Qualifier	Acceptance Criteria
13C12-2,3,7,8-TCDD	78		25-164
37CL4-2,3,7,8-TCDD	91		35-197

Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140910
Report Date: 09/03/21

SAMPLE RESULTS

Lab ID: L2140910-06
Client ID: SOIL-14
Sample Location: BELMONT, MA

Date Collected: 07/28/21 10:55
Date Received: 07/29/21
Field Prep: Not Specified

Sample Depth:

Matrix: Soil
Analytical Method: 132,1613B
Analytical Date: 08/10/21 23:27
Analyst: PB
Percent Solids: 13%

Extraction Method: EPA 8290A
Extraction Date: 08/02/21 16:36
Cleanup Method: EPA 1613B
Cleanup Date: 08/04/21

Parameter	Result	Qualifier	EMPC	Units	RL	MDL	Dilution Factor

Dioxins & Furans by Isotope Dilution HRMS - Mansfield Lab

2,3,7,8-TCDD	ND			pg/g	3.66	1.13	1

Surrogate/Cleanup Standard	% Recovery	Qualifier	Acceptance Criteria
13C12-2,3,7,8-TCDD	79		25-164
37CL4-2,3,7,8-TCDD	99		35-197

Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140910
Report Date: 09/03/21

SAMPLE RESULTS

Lab ID: L2140910-07
Client ID: SED-10
Sample Location: BELMONT, MA

Date Collected: 07/28/21 10:43
Date Received: 07/29/21
Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
Analytical Method: 132,1613B
Analytical Date: 08/11/21 00:31
Analyst: PB
Percent Solids: 11%

Extraction Method: EPA 8290A
Extraction Date: 08/02/21 16:36
Cleanup Method: EPA 1613B
Cleanup Date: 08/04/21

Parameter	Result	Qualifier	EMPC	Units	RL	MDL	Dilution Factor

Dioxins & Furans by Isotope Dilution HRMS - Mansfield Lab

2,3,7,8-TCDD	ND			pg/g	4.54	1.40	1

Surrogate/Cleanup Standard	% Recovery	Qualifier	Acceptance Criteria
13C12-2,3,7,8-TCDD	71		25-164
37CL4-2,3,7,8-TCDD	92		35-197

Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140910
Report Date: 09/03/21

SAMPLE RESULTS

Lab ID: L2140910-08
 Client ID: SED-3
 Sample Location: BELMONT, MA

Date Collected: 07/28/21 11:55
 Date Received: 07/29/21
 Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
 Analytical Method: 132,1613B
 Analytical Date: 08/11/21 03:42
 Analyst: PB
 Percent Solids: 11%

Extraction Method: EPA 8290A
 Extraction Date: 08/02/21 16:36
 Cleanup Method: EPA 1613B
 Cleanup Date: 08/04/21

Parameter	Result	Qualifier	EMPC	Units	RL	MDL	Dilution Factor

Dioxins & Furans by Isotope Dilution HRMS - Mansfield Lab							

2,3,7,8-TCDD	ND			pg/g	4.62	1.42	1

Surrogate/Cleanup Standard	% Recovery	Qualifier	Acceptance Criteria
13C12-2,3,7,8-TCDD	74		25-164
37CL4-2,3,7,8-TCDD	97		35-197

Project Name: BELMONT LANDFILL**Lab Number:** L2140910**Project Number:** 2018-0157**Report Date:** 09/03/21**SAMPLE RESULTS**

Lab ID: L2140910-09
 Client ID: SOIL-12
 Sample Location: BELMONT, MA

Date Collected: 07/28/21 12:46
 Date Received: 07/29/21
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil
 Analytical Method: 132,1613B
 Analytical Date: 08/11/21 04:46
 Analyst: PB
 Percent Solids: 78%

Extraction Method: EPA 8290A
 Extraction Date: 08/02/21 16:36
 Cleanup Method: EPA 1613B
 Cleanup Date: 08/04/21

Parameter	Result	Qualifier	EMPC	Units	RL	MDL	Dilution Factor
Dioxins & Furans by Isotope Dilution HRMS - Mansfield Lab							
2,3,7,8-TCDD	0.420	J		pg/g	0.636	0.196	1

Surrogate/Cleanup Standard	% Recovery	Qualifier	Acceptance Criteria
13C12-2,3,7,8-TCDD	63		25-164
37CL4-2,3,7,8-TCDD	85		35-197

Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140910
Report Date: 09/03/21

SAMPLE RESULTS

Lab ID: L2140910-10
Client ID: SOIL-13
Sample Location: BELMONT, MA

Date Collected: 07/28/21 12:21
Date Received: 07/29/21
Field Prep: Not Specified

Sample Depth:

Matrix: Soil
Analytical Method: 132,1613B
Analytical Date: 08/11/21 07:58
Analyst: PB
Percent Solids: 10%

Extraction Method: EPA 8290A
Extraction Date: 08/02/21 16:36
Cleanup Method: EPA 1613B
Cleanup Date: 08/04/21

Parameter	Result	Qualifier	EMPC	Units	RL	MDL	Dilution Factor

Dioxins & Furans by Isotope Dilution HRMS - Mansfield Lab

2,3,7,8-TCDD	ND			pg/g	4.92	1.52	1

Surrogate/Cleanup Standard	% Recovery	Qualifier	Acceptance Criteria
13C12-2,3,7,8-TCDD	66		25-164
37CL4-2,3,7,8-TCDD	93		35-197

Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140910
Report Date: 09/03/21

SAMPLE RESULTS

Lab ID: L2140910-11
Client ID: SED-8
Sample Location: BELMONT, MA

Date Collected: 07/28/21 13:06
Date Received: 07/29/21
Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
Analytical Method: 132,1613B
Analytical Date: 08/11/21 09:02
Analyst: PB
Percent Solids: 18%

Extraction Method: EPA 8290A
Extraction Date: 08/02/21 16:36
Cleanup Method: EPA 1613B
Cleanup Date: 08/05/21

Parameter	Result	Qualifier	EMPC	Units	RL	MDL	Dilution Factor

Dioxins & Furans by Isotope Dilution HRMS - Mansfield Lab

2,3,7,8-TCDD	ND			pg/g	2.73	0.842	1

Surrogate/Cleanup Standard	% Recovery	Qualifier	Acceptance Criteria
13C12-2,3,7,8-TCDD	64		25-164
37CL4-2,3,7,8-TCDD	101		35-197

Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140910
Report Date: 09/03/21

SAMPLE RESULTS

Lab ID: L2140910-13
Client ID: SOIL-11
Sample Location: BELMONT, MA

Date Collected: 07/28/21 13:44
Date Received: 07/29/21
Field Prep: Not Specified

Sample Depth:

Matrix: Soil
Analytical Method: 132,1613B
Analytical Date: 08/11/21 10:06
Analyst: PB
Percent Solids: 20%

Extraction Method: EPA 8290A
Extraction Date: 08/02/21 16:36
Cleanup Method: EPA 1613B
Cleanup Date: 08/05/21

Parameter	Result	Qualifier	EMPC	Units	RL	MDL	Dilution Factor
Dioxins & Furans by Isotope Dilution HRMS - Mansfield Lab							
2,3,7,8-TCDD	ND			pg/g	2.39	0.736	1
Surrogate/Cleanup Standard	% Recovery			Qualifier	Acceptance Criteria		
13C12-2,3,7,8-TCDD	72				25-164		
37CL4-2,3,7,8-TCDD	97				35-197		

Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140910
Report Date: 09/03/21

SAMPLE RESULTS

Lab ID: L2140910-14
Client ID: SED-5
Sample Location: BELMONT, MA

Date Collected: 07/28/21 15:35
Date Received: 07/29/21
Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
Analytical Method: 132,1613B
Analytical Date: 08/11/21 11:10
Analyst: PB
Percent Solids: 15%

Extraction Method: EPA 8290A
Extraction Date: 08/02/21 16:36
Cleanup Method: EPA 1613B
Cleanup Date: 08/05/21

Parameter	Result	Qualifier	EMPC	Units	RL	MDL	Dilution Factor

Dioxins & Furans by Isotope Dilution HRMS - Mansfield Lab

2,3,7,8-TCDD	ND			pg/g	3.13	0.964	1

Surrogate/Cleanup Standard	% Recovery	Qualifier	Acceptance Criteria
13C12-2,3,7,8-TCDD	58		25-164
37CL4-2,3,7,8-TCDD	92		35-197

Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140910
Report Date: 09/03/21

SAMPLE RESULTS

Lab ID: L2140910-15
Client ID: SED-6
Sample Location: BELMONT, MA

Date Collected: 07/28/21 15:20
Date Received: 07/29/21
Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
Analytical Method: 132,1613B
Analytical Date: 08/11/21 12:14
Analyst: PB
Percent Solids: 16%

Extraction Method: EPA 8290A
Extraction Date: 08/02/21 16:36
Cleanup Method: EPA 1613B
Cleanup Date: 08/05/21

Parameter	Result	Qualifier	EMPC	Units	RL	MDL	Dilution Factor

Dioxins & Furans by Isotope Dilution HRMS - Mansfield Lab							

2,3,7,8-TCDD	ND			pg/g	3.03	0.934	1

Surrogate/Cleanup Standard	% Recovery	Qualifier	Acceptance Criteria
13C12-2,3,7,8-TCDD	62		25-164
37CL4-2,3,7,8-TCDD	85		35-197

Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140910
Report Date: 09/03/21

SAMPLE RESULTS

Lab ID: L2140910-16
 Client ID: SED-4
 Sample Location: BELMONT, MA

Date Collected: 07/28/21 15:55
 Date Received: 07/29/21
 Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
 Analytical Method: 132,1613B
 Analytical Date: 08/11/21 13:18
 Analyst: PB
 Percent Solids: 6%

Extraction Method: EPA 8290A
 Extraction Date: 08/02/21 16:36
 Cleanup Method: EPA 1613B
 Cleanup Date: 08/05/21

Parameter	Result	Qualifier	EMPC	Units	RL	MDL	Dilution Factor
Dioxins & Furans by Isotope Dilution HRMS - Mansfield Lab							
2,3,7,8-TCDD	ND			pg/g	8.08	2.49	1
Surrogate/Cleanup Standard	% Recovery			Qualifier	Acceptance Criteria		
13C12-2,3,7,8-TCDD	55				25-164		
37CL4-2,3,7,8-TCDD	76				35-197		

Project Name: BELMONT LANDFILL

Lab Number: L2140910

Project Number: 2018-0157

Report Date: 09/03/21

Method Blank Analysis Batch Quality Control

Analytical Method: 132,1613B
 Analytical Date: 08/10/21 18:07
 Analyst: PB

Extraction Method: EPA 8290A
 Extraction Date: 08/02/21 16:36
 Cleanup Method: EPA 1613B
 Cleanup Date: 08/04/21

Parameter	Result	Qualifier	EMPC	Units	RL	MDL
Dioxins & Furans by Isotope Dilution HRMS - Mansfield Lab for sample(s): 04-11,13-16 Batch: WG1529753-1						
2,3,7,8-TCDD	ND			pg/g	0.500	0.154
Surrogate/Cleanup Standard	%Recovery		Qualifier	Acceptance Criteria		
13C12-2,3,7,8-TCDD	72			25-164		
37CL4-2,3,7,8-TCDD	93			35-197		

Lab Control Sample Analysis**Batch Quality Control****Project Name:** BELMONT LANDFILL**Lab Number:** L2140910**Project Number:** 2018-0157**Report Date:** 09/03/21

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Dioxins & Furans by Isotope Dilution HRMS - Mansfield Lab Associated sample(s): 04-11,13-16 Batch: WG1529753-2								
2,3,7,8-TCDD	106		-		67-158	-		25

Surrogate/Cleanup Standard	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
13C12-2,3,7,8-TCDD	76				25-164
37CL4-2,3,7,8-TCDD	91				35-197

Matrix Spike Analysis

Batch Quality Control

Project Name: BELMONT LANDFILL

Lab Number: L2140910

Project Number: 2018-0157

Report Date: 09/03/21

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Dioxins & Furans by Isotope Dilution HRMS - Mansfield Lab Associated sample(s): 04-11,13-16 QC Batch ID: WG1529753-3 WG1529753-4 QC Sample: L2140910-07 Client ID: SED-10												
2,3,7,8-TCDD	ND	87.9	97.5	111		100	110		67-158	3		25

Surrogate/Cleanup Standard	MS		MSD		Acceptance Criteria
	% Recovery	Qualifier	% Recovery	Qualifier	
13C12-2,3,7,8-TCDD	69		70		25-164
37CL4-2,3,7,8-TCDD	101		89		35-197

Lab Duplicate Analysis Batch Quality Control

Project Name: BELMONT LANDFILL

Project Number: 2018-0157

Lab Number: L2140910

Report Date: 09/03/21

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Dioxins & Furans by Isotope Dilution HRMS - Mansfield Lab Associated sample(s): 04-11,13-16 QC Batch ID: WG1529753-5 QC Sample: L2140910-04 Client ID: SED-11						
2,3,7,8-TCDD	ND	ND	pg/g	NC		25

Surrogate/Cleanup Standard	%Recovery	Qualifier	%Recovery	Qualifier	Acceptance Criteria
13C12-2,3,7,8-TCDD	74		71		25-164
37CL4-2,3,7,8-TCDD	98		98		35-197

METALS

Project Name: BELMONT LANDFILL**Lab Number:** L2140910**Project Number:** 2018-0157**Report Date:** 09/03/21**SAMPLE RESULTS**

Lab ID: L2140910-01

Date Collected: 07/28/21 08:24

Client ID: SW-4

Date Received: 07/29/21

Sample Location: BELMONT, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Surface Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst

Total Hardness by SM 2340B - Mansfield Lab

Hardness	52.2		mg/l	0.460	0.460	1	08/03/21 11:13	08/14/21 22:57	EPA 3005A	97,6020B	WP

MCP Total Metals - Mansfield Lab

Barium, Total	0.0343		mg/l	0.0005	0.0005	1	08/03/21 11:13	08/14/21 22:57	EPA 3005A	97,6020B	WP
Iron, Total	4.30		mg/l	0.050	0.050	1	08/03/21 11:13	08/14/21 22:57	EPA 3005A	97,6020B	WP
Lead, Total	0.002		mg/l	0.001	0.001	1	08/03/21 11:13	08/14/21 22:57	EPA 3005A	97,6020B	WP
Manganese, Total	0.2510		mg/l	0.0010	0.0010	1	08/03/21 11:13	08/14/21 22:57	EPA 3005A	97,6020B	WP
Zinc, Total	ND		mg/l	0.010	0.010	1	08/03/21 11:13	08/14/21 22:57	EPA 3005A	97,6020B	WP

MCP Dissolved Metals - Mansfield Lab

Barium, Dissolved	0.0275		mg/l	0.0005	0.0005	1	08/02/21 16:48	08/17/21 19:34	EPA 3005A	97,6020B	CD
Iron, Dissolved	1.46		mg/l	0.050	0.050	1	08/02/21 16:48	08/17/21 19:34	EPA 3005A	97,6020B	CD
Lead, Dissolved	0.009		mg/l	0.001	0.001	1	08/02/21 16:48	08/17/21 19:34	EPA 3005A	97,6020B	CD
Manganese, Dissolved	0.0121		mg/l	0.0010	0.0010	1	08/02/21 16:48	08/17/21 19:34	EPA 3005A	97,6020B	CD
Zinc, Dissolved	ND		mg/l	0.010	0.010	1	08/02/21 16:48	08/17/21 19:34	EPA 3005A	97,6020B	CD



Project Name: BELMONT LANDFILL**Lab Number:** L2140910**Project Number:** 2018-0157**Report Date:** 09/03/21**SAMPLE RESULTS**

Lab ID: L2140910-02

Date Collected: 07/28/21 09:10

Client ID: SW-5

Date Received: 07/29/21

Sample Location: BELMONT, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Surface Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst

Total Hardness by SM 2340B - Mansfield Lab

Hardness	49.3		mg/l	0.460	0.460	1	08/03/21 11:13	08/16/21 13:47	EPA 3005A	97,6020B	CD

MCP Total Metals - Mansfield Lab

Barium, Total	0.0475		mg/l	0.0005	0.0005	1	08/03/21 11:13	08/16/21 13:47	EPA 3005A	97,6020B	CD
Iron, Total	4.90		mg/l	0.050	0.050	1	08/03/21 11:13	08/16/21 13:47	EPA 3005A	97,6020B	CD
Lead, Total	0.003		mg/l	0.001	0.001	1	08/03/21 11:13	08/16/21 13:47	EPA 3005A	97,6020B	CD
Manganese, Total	0.2429		mg/l	0.0010	0.0010	1	08/03/21 11:13	08/16/21 13:47	EPA 3005A	97,6020B	CD
Zinc, Total	0.015		mg/l	0.010	0.010	1	08/03/21 11:13	08/16/21 13:47	EPA 3005A	97,6020B	CD

MCP Dissolved Metals - Mansfield Lab

Barium, Dissolved	0.0372		mg/l	0.0005	0.0005	1	08/02/21 16:48	08/13/21 20:13	EPA 3005A	97,6020B	CD
Iron, Dissolved	1.70		mg/l	0.050	0.050	1	08/02/21 16:48	08/13/21 20:13	EPA 3005A	97,6020B	CD
Lead, Dissolved	ND		mg/l	0.001	0.001	1	08/02/21 16:48	08/13/21 20:13	EPA 3005A	97,6020B	CD
Manganese, Dissolved	0.0018		mg/l	0.0010	0.0010	1	08/02/21 16:48	08/13/21 20:13	EPA 3005A	97,6020B	CD
Zinc, Dissolved	ND		mg/l	0.010	0.010	1	08/02/21 16:48	08/13/21 20:13	EPA 3005A	97,6020B	CD



Project Name: BELMONT LANDFILL

Lab Number: L2140910

Project Number: 2018-0157

Report Date: 09/03/21

SAMPLE RESULTS

Lab ID: L2140910-03

Date Collected: 07/28/21 08:56

Client ID: SW-6

Date Received: 07/29/21

Sample Location: BELMONT, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Surface Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst

Total Hardness by SM 2340B - Mansfield Lab

Hardness	54.8		mg/l	0.460	0.460	1	08/03/21 11:13	08/16/21 12:52	EPA 3005A	97,6020B	CD

MCP Total Metals - Mansfield Lab

Barium, Total	0.0495		mg/l	0.0005	0.0005	1	08/03/21 11:13	08/16/21 12:52	EPA 3005A	97,6020B	CD
Iron, Total	4.25		mg/l	0.050	0.050	1	08/03/21 11:13	08/16/21 12:52	EPA 3005A	97,6020B	CD
Lead, Total	0.005		mg/l	0.001	0.001	1	08/03/21 11:13	08/16/21 12:52	EPA 3005A	97,6020B	CD
Manganese, Total	0.3276		mg/l	0.0010	0.0010	1	08/03/21 11:13	08/16/21 12:52	EPA 3005A	97,6020B	CD
Zinc, Total	0.012		mg/l	0.010	0.010	1	08/03/21 11:13	08/16/21 12:52	EPA 3005A	97,6020B	CD

MCP Dissolved Metals - Mansfield Lab

Barium, Dissolved	0.0393		mg/l	0.0005	0.0005	1	08/02/21 16:48	08/13/21 20:18	EPA 3005A	97,6020B	CD
Iron, Dissolved	1.72		mg/l	0.050	0.050	1	08/02/21 16:48	08/13/21 20:18	EPA 3005A	97,6020B	CD
Lead, Dissolved	ND		mg/l	0.001	0.001	1	08/02/21 16:48	08/13/21 20:18	EPA 3005A	97,6020B	CD
Manganese, Dissolved	0.0053		mg/l	0.0010	0.0010	1	08/02/21 16:48	08/13/21 20:18	EPA 3005A	97,6020B	CD
Zinc, Dissolved	ND		mg/l	0.010	0.010	1	08/02/21 16:48	08/13/21 20:18	EPA 3005A	97,6020B	CD



Project Name: BELMONT LANDFILL**Lab Number:** L2140910**Project Number:** 2018-0157**Report Date:** 09/03/21**SAMPLE RESULTS**

Lab ID: L2140910-04

Date Collected: 07/28/21 09:55

Client ID: SED-11

Date Received: 07/29/21

Sample Location: BELMONT, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Sediment

Percent Solids: 12%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/kg	13.2	13.2	10	07/30/21 20:32	08/24/21 20:35	EPA 3050B	97,6020B	CD
Arsenic, Total	18.9		mg/kg	4.13	4.13	10	07/30/21 20:32	08/24/21 20:35	EPA 3050B	97,6020B	CD
Barium, Total	1320		mg/kg	24.8	24.8	10	07/30/21 20:32	08/24/21 20:35	EPA 3050B	97,6020B	CD
Beryllium, Total	ND		mg/kg	2.477	2.477	10	07/30/21 20:32	08/24/21 20:35	EPA 3050B	97,6020B	CD
Cadmium, Total	5.756		mg/kg	1.652	1.652	10	07/30/21 20:32	08/24/21 20:35	EPA 3050B	97,6020B	CD
Chromium, Total	34.1		mg/kg	16.5	16.5	10	07/30/21 20:32	08/24/21 20:35	EPA 3050B	97,6020B	CD
Copper, Total	243		mg/kg	16.5	16.5	10	07/30/21 20:32	08/24/21 20:35	EPA 3050B	97,6020B	CD
Lead, Total	540		mg/kg	4.95	4.95	10	07/30/21 20:32	08/24/21 20:35	EPA 3050B	97,6020B	CD
Mercury, Total	ND		mg/kg	0.566	0.566	1	07/30/21 21:33	07/31/21 13:19	EPA 7471B	97,7471B	NB
Nickel, Total	65.5		mg/kg	8.26	8.26	10	07/30/21 20:32	08/24/21 20:35	EPA 3050B	97,6020B	CD
Selenium, Total	ND		mg/kg	16.5	16.5	10	07/30/21 20:32	08/24/21 20:35	EPA 3050B	97,6020B	CD
Silver, Total	ND		mg/kg	4.13	4.13	10	07/30/21 20:32	08/24/21 20:35	EPA 3050B	97,6020B	CD
Zinc, Total	2260		mg/kg	82.6	82.6	10	07/30/21 20:32	08/24/21 20:35	EPA 3050B	97,6020B	CD



Project Name: BELMONT LANDFILL**Lab Number:** L2140910**Project Number:** 2018-0157**Report Date:** 09/03/21**SAMPLE RESULTS**

Lab ID: L2140910-05

Date Collected: 07/28/21 08:40

Client ID: SED-12

Date Received: 07/29/21

Sample Location: BELMONT, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Sediment

Percent Solids: 5%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/kg	28.2	28.2	10	07/30/21 20:32	08/24/21 20:49	EPA 3050B	97,6020B	CD
Arsenic, Total	29.3		mg/kg	8.83	8.83	10	07/30/21 20:32	08/24/21 20:49	EPA 3050B	97,6020B	CD
Barium, Total	387		mg/kg	53.0	53.0	10	07/30/21 20:32	08/24/21 20:49	EPA 3050B	97,6020B	CD
Beryllium, Total	ND		mg/kg	5.296	5.296	10	07/30/21 20:32	08/24/21 20:49	EPA 3050B	97,6020B	CD
Cadmium, Total	6.850		mg/kg	3.531	3.531	10	07/30/21 20:32	08/24/21 20:49	EPA 3050B	97,6020B	CD
Chromium, Total	39.8		mg/kg	35.3	35.3	10	07/30/21 20:32	08/24/21 20:49	EPA 3050B	97,6020B	CD
Copper, Total	156		mg/kg	35.3	35.3	10	07/30/21 20:32	08/24/21 20:49	EPA 3050B	97,6020B	CD
Lead, Total	248		mg/kg	10.6	10.6	10	07/30/21 20:32	08/24/21 20:49	EPA 3050B	97,6020B	CD
Mercury, Total	ND		mg/kg	1.24	1.24	1	07/30/21 21:33	07/31/21 14:01	EPA 7471B	97,7471B	NB
Nickel, Total	44.4		mg/kg	17.6	17.6	10	07/30/21 20:32	08/24/21 20:49	EPA 3050B	97,6020B	CD
Selenium, Total	ND		mg/kg	35.3	35.3	10	07/30/21 20:32	08/24/21 20:49	EPA 3050B	97,6020B	CD
Silver, Total	ND		mg/kg	8.83	8.83	10	07/30/21 20:32	08/24/21 20:49	EPA 3050B	97,6020B	CD
Zinc, Total	1060		mg/kg	176	176.	10	07/30/21 20:32	08/24/21 20:49	EPA 3050B	97,6020B	CD



Project Name: BELMONT LANDFILL**Lab Number:** L2140910**Project Number:** 2018-0157**Report Date:** 09/03/21**SAMPLE RESULTS**

Lab ID: L2140910-06

Date Collected: 07/28/21 10:55

Client ID: SOIL-14

Date Received: 07/29/21

Sample Location: BELMONT, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Soil

Percent Solids: 13%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/kg	11.7	11.7	10	07/30/21 20:32	08/24/21 20:54	EPA 3050B	97,6020B	CD
Arsenic, Total	22.3		mg/kg	3.66	3.66	10	07/30/21 20:32	08/24/21 20:54	EPA 3050B	97,6020B	CD
Barium, Total	247		mg/kg	22.0	22.0	10	07/30/21 20:32	08/24/21 20:54	EPA 3050B	97,6020B	CD
Beryllium, Total	2.704		mg/kg	2.195	2.195	10	07/30/21 20:32	08/24/21 20:54	EPA 3050B	97,6020B	CD
Cadmium, Total	3.538		mg/kg	1.464	1.464	10	07/30/21 20:32	08/24/21 20:54	EPA 3050B	97,6020B	CD
Chromium, Total	30.3		mg/kg	14.6	14.6	10	07/30/21 20:32	08/24/21 20:54	EPA 3050B	97,6020B	CD
Copper, Total	113		mg/kg	14.6	14.6	10	07/30/21 20:32	08/24/21 20:54	EPA 3050B	97,6020B	CD
Lead, Total	237		mg/kg	4.39	4.39	10	07/30/21 20:32	08/24/21 20:54	EPA 3050B	97,6020B	CD
Mercury, Total	ND		mg/kg	0.515	0.515	1	07/30/21 21:33	07/31/21 14:04	EPA 7471B	97,7471B	NB
Nickel, Total	65.4		mg/kg	7.32	7.32	10	07/30/21 20:32	08/24/21 20:54	EPA 3050B	97,6020B	CD
Selenium, Total	ND		mg/kg	14.6	14.6	10	07/30/21 20:32	08/24/21 20:54	EPA 3050B	97,6020B	CD
Silver, Total	ND		mg/kg	3.66	3.66	10	07/30/21 20:32	08/24/21 20:54	EPA 3050B	97,6020B	CD
Zinc, Total	249		mg/kg	73.2	73.2	10	07/30/21 20:32	08/24/21 20:54	EPA 3050B	97,6020B	CD



Project Name: BELMONT LANDFILL**Lab Number:** L2140910**Project Number:** 2018-0157**Report Date:** 09/03/21**SAMPLE RESULTS**

Lab ID: L2140910-07

Date Collected: 07/28/21 10:43

Client ID: SED-10

Date Received: 07/29/21

Sample Location: BELMONT, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Sediment

Percent Solids: 11%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/kg	14.8	14.8	10	07/30/21 20:32	08/24/21 20:45	EPA 3050B	97,6020B	CD
Arsenic, Total	13.2		mg/kg	4.61	4.61	10	07/30/21 20:32	08/24/21 20:45	EPA 3050B	97,6020B	CD
Barium, Total	559		mg/kg	27.7	27.7	10	07/30/21 20:32	08/24/21 20:45	EPA 3050B	97,6020B	CD
Beryllium, Total	ND		mg/kg	2.769	2.769	10	07/30/21 20:32	08/24/21 20:45	EPA 3050B	97,6020B	CD
Cadmium, Total	3.044		mg/kg	1.846	1.846	10	07/30/21 20:32	08/24/21 20:45	EPA 3050B	97,6020B	CD
Chromium, Total	33.5		mg/kg	18.4	18.4	10	07/30/21 20:32	08/24/21 20:45	EPA 3050B	97,6020B	CD
Copper, Total	184		mg/kg	18.4	18.4	10	07/30/21 20:32	08/24/21 20:45	EPA 3050B	97,6020B	CD
Lead, Total	375		mg/kg	5.54	5.54	10	07/30/21 20:32	08/24/21 20:45	EPA 3050B	97,6020B	CD
Mercury, Total	ND		mg/kg	0.613	0.613	1	07/30/21 21:33	07/31/21 13:26	EPA 7471B	97,7471B	NB
Nickel, Total	43.0		mg/kg	9.23	9.23	10	07/30/21 20:32	08/24/21 20:45	EPA 3050B	97,6020B	CD
Selenium, Total	ND		mg/kg	18.4	18.4	10	07/30/21 20:32	08/24/21 20:45	EPA 3050B	97,6020B	CD
Silver, Total	ND		mg/kg	4.61	4.61	10	07/30/21 20:32	08/24/21 20:45	EPA 3050B	97,6020B	CD
Zinc, Total	830		mg/kg	92.3	92.3	10	07/30/21 20:32	08/24/21 20:45	EPA 3050B	97,6020B	CD



Project Name: BELMONT LANDFILL**Lab Number:** L2140910**Project Number:** 2018-0157**Report Date:** 09/03/21**SAMPLE RESULTS**

Lab ID: L2140910-08

Date Collected: 07/28/21 11:55

Client ID: SED-3

Date Received: 07/29/21

Sample Location: BELMONT, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Sediment

Percent Solids: 11%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/kg	14.5	14.5	10	07/30/21 20:32	08/24/21 20:59	EPA 3050B	97,6020B	CD
Arsenic, Total	41.8		mg/kg	4.54	4.54	10	07/30/21 20:32	08/24/21 20:59	EPA 3050B	97,6020B	CD
Barium, Total	312		mg/kg	27.2	27.2	10	07/30/21 20:32	08/24/21 20:59	EPA 3050B	97,6020B	CD
Beryllium, Total	ND		mg/kg	2.721	2.721	10	07/30/21 20:32	08/24/21 20:59	EPA 3050B	97,6020B	CD
Cadmium, Total	5.064		mg/kg	1.814	1.814	10	07/30/21 20:32	08/24/21 20:59	EPA 3050B	97,6020B	CD
Chromium, Total	82.9		mg/kg	18.1	18.1	10	07/30/21 20:32	08/24/21 20:59	EPA 3050B	97,6020B	CD
Copper, Total	198		mg/kg	18.1	18.1	10	07/30/21 20:32	08/24/21 20:59	EPA 3050B	97,6020B	CD
Lead, Total	451		mg/kg	5.44	5.44	10	07/30/21 20:32	08/24/21 20:59	EPA 3050B	97,6020B	CD
Mercury, Total	ND		mg/kg	0.635	0.635	1	07/30/21 21:33	07/31/21 14:07	EPA 7471B	97,7471B	NB
Nickel, Total	41.3		mg/kg	9.07	9.07	10	07/30/21 20:32	08/24/21 20:59	EPA 3050B	97,6020B	CD
Selenium, Total	ND		mg/kg	18.1	18.1	10	07/30/21 20:32	08/24/21 20:59	EPA 3050B	97,6020B	CD
Silver, Total	ND		mg/kg	4.54	4.54	10	07/30/21 20:32	08/24/21 20:59	EPA 3050B	97,6020B	CD
Zinc, Total	587		mg/kg	90.7	90.7	10	07/30/21 20:32	08/24/21 20:59	EPA 3050B	97,6020B	CD



Project Name: BELMONT LANDFILL**Lab Number:** L2140910**Project Number:** 2018-0157**Report Date:** 09/03/21**SAMPLE RESULTS**

Lab ID: L2140910-09

Date Collected: 07/28/21 12:46

Client ID: SOIL-12

Date Received: 07/29/21

Sample Location: BELMONT, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Soil

Percent Solids: 78%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/kg	2.04	2.04	10	07/30/21 20:32	08/24/21 21:04	EPA 3050B	97,6020B	CD
Arsenic, Total	5.62		mg/kg	0.638	0.638	10	07/30/21 20:32	08/24/21 21:04	EPA 3050B	97,6020B	CD
Barium, Total	66.7		mg/kg	3.83	3.83	10	07/30/21 20:32	08/24/21 21:04	EPA 3050B	97,6020B	CD
Beryllium, Total	0.5582		mg/kg	0.3828	0.3828	10	07/30/21 20:32	08/24/21 21:04	EPA 3050B	97,6020B	CD
Cadmium, Total	0.4966		mg/kg	0.2552	0.2552	10	07/30/21 20:32	08/24/21 21:04	EPA 3050B	97,6020B	CD
Chromium, Total	18.8		mg/kg	2.55	2.55	10	07/30/21 20:32	08/24/21 21:04	EPA 3050B	97,6020B	CD
Copper, Total	29.5		mg/kg	2.55	2.55	10	07/30/21 20:32	08/24/21 21:04	EPA 3050B	97,6020B	CD
Lead, Total	85.0		mg/kg	0.766	0.766	10	07/30/21 20:32	08/24/21 21:04	EPA 3050B	97,6020B	CD
Mercury, Total	0.244		mg/kg	0.088	0.088	1	07/30/21 21:33	07/31/21 14:11	EPA 7471B	97,7471B	NB
Nickel, Total	13.0		mg/kg	1.28	1.28	10	07/30/21 20:32	08/24/21 21:04	EPA 3050B	97,6020B	CD
Selenium, Total	ND		mg/kg	2.55	2.55	10	07/30/21 20:32	08/24/21 21:04	EPA 3050B	97,6020B	CD
Silver, Total	ND		mg/kg	0.638	0.638	10	07/30/21 20:32	08/24/21 21:04	EPA 3050B	97,6020B	CD
Zinc, Total	141		mg/kg	12.8	12.8	10	07/30/21 20:32	08/24/21 21:04	EPA 3050B	97,6020B	CD



Project Name: BELMONT LANDFILL**Lab Number:** L2140910**Project Number:** 2018-0157**Report Date:** 09/03/21**SAMPLE RESULTS**

Lab ID: L2140910-10

Date Collected: 07/28/21 12:21

Client ID: SOIL-13

Date Received: 07/29/21

Sample Location: BELMONT, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Soil

Percent Solids: 10%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/kg	15.9	15.9	10	07/30/21 20:32	08/24/21 21:09	EPA 3050B	97,6020B	CD
Arsenic, Total	35.8		mg/kg	4.96	4.96	10	07/30/21 20:32	08/24/21 21:09	EPA 3050B	97,6020B	CD
Barium, Total	344		mg/kg	29.8	29.8	10	07/30/21 20:32	08/24/21 21:09	EPA 3050B	97,6020B	CD
Beryllium, Total	ND		mg/kg	2.975	2.975	10	07/30/21 20:32	08/24/21 21:09	EPA 3050B	97,6020B	CD
Cadmium, Total	2.406		mg/kg	1.984	1.984	10	07/30/21 20:32	08/24/21 21:09	EPA 3050B	97,6020B	CD
Chromium, Total	36.9		mg/kg	19.8	19.8	10	07/30/21 20:32	08/24/21 21:09	EPA 3050B	97,6020B	CD
Copper, Total	86.4		mg/kg	19.8	19.8	10	07/30/21 20:32	08/24/21 21:09	EPA 3050B	97,6020B	CD
Lead, Total	191		mg/kg	5.95	5.95	10	07/30/21 20:32	08/24/21 21:09	EPA 3050B	97,6020B	CD
Mercury, Total	ND		mg/kg	0.695	0.695	1	07/30/21 21:33	07/31/21 14:14	EPA 7471B	97,7471B	NB
Nickel, Total	24.2		mg/kg	9.92	9.92	10	07/30/21 20:32	08/24/21 21:09	EPA 3050B	97,6020B	CD
Selenium, Total	ND		mg/kg	19.8	19.8	10	07/30/21 20:32	08/24/21 21:09	EPA 3050B	97,6020B	CD
Silver, Total	ND		mg/kg	4.96	4.96	10	07/30/21 20:32	08/24/21 21:09	EPA 3050B	97,6020B	CD
Zinc, Total	359		mg/kg	99.2	99.2	10	07/30/21 20:32	08/24/21 21:09	EPA 3050B	97,6020B	CD



Project Name: BELMONT LANDFILL**Lab Number:** L2140910**Project Number:** 2018-0157**Report Date:** 09/03/21**SAMPLE RESULTS**

Lab ID: L2140910-11

Date Collected: 07/28/21 13:06

Client ID: SED-8

Date Received: 07/29/21

Sample Location: BELMONT, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Sediment

Percent Solids: 18%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/kg	8.63	8.63	10	07/30/21 20:32	08/24/21 21:13	EPA 3050B	97,6020B	CD
Arsenic, Total	19.9		mg/kg	2.70	2.70	10	07/30/21 20:32	08/24/21 21:13	EPA 3050B	97,6020B	CD
Barium, Total	226		mg/kg	16.2	16.2	10	07/30/21 20:32	08/24/21 21:13	EPA 3050B	97,6020B	CD
Beryllium, Total	ND		mg/kg	1.618	1.618	10	07/30/21 20:32	08/24/21 21:13	EPA 3050B	97,6020B	CD
Cadmium, Total	3.028		mg/kg	1.079	1.079	10	07/30/21 20:32	08/24/21 21:13	EPA 3050B	97,6020B	CD
Chromium, Total	47.7		mg/kg	10.8	10.8	10	07/30/21 20:32	08/24/21 21:13	EPA 3050B	97,6020B	CD
Copper, Total	111		mg/kg	10.8	10.8	10	07/30/21 20:32	08/24/21 21:13	EPA 3050B	97,6020B	CD
Lead, Total	246		mg/kg	3.24	3.24	10	07/30/21 20:32	08/24/21 21:13	EPA 3050B	97,6020B	CD
Mercury, Total	ND		mg/kg	0.360	0.360	1	07/30/21 21:33	07/31/21 14:17	EPA 7471B	97,7471B	NB
Nickel, Total	27.4		mg/kg	5.39	5.39	10	07/30/21 20:32	08/24/21 21:13	EPA 3050B	97,6020B	CD
Selenium, Total	ND		mg/kg	10.8	10.8	10	07/30/21 20:32	08/24/21 21:13	EPA 3050B	97,6020B	CD
Silver, Total	ND		mg/kg	2.70	2.70	10	07/30/21 20:32	08/24/21 21:13	EPA 3050B	97,6020B	CD
Zinc, Total	549		mg/kg	53.9	53.9	10	07/30/21 20:32	08/24/21 21:13	EPA 3050B	97,6020B	CD



Project Name: BELMONT LANDFILL**Lab Number:** L2140910**Project Number:** 2018-0157**Report Date:** 09/03/21**SAMPLE RESULTS**

Lab ID: L2140910-12

Date Collected: 07/28/21 14:00

Client ID: SW-3

Date Received: 07/29/21

Sample Location: BELMONT, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Surface Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Hardness by SM 2340B - Mansfield Lab											
Hardness	51.1		mg/l	0.460	0.460	1	08/03/21 11:13	08/16/21 13:52	EPA 3005A	97,6020B	CD
MCP Total Metals - Mansfield Lab											
Barium, Total	0.0354		mg/l	0.0005	0.0005	1	08/03/21 11:13	08/16/21 13:52	EPA 3005A	97,6020B	CD
Iron, Total	4.04		mg/l	0.050	0.050	1	08/03/21 11:13	08/16/21 13:52	EPA 3005A	97,6020B	CD
Lead, Total	0.001		mg/l	0.001	0.001	1	08/03/21 11:13	08/16/21 13:52	EPA 3005A	97,6020B	CD
Manganese, Total	0.1645		mg/l	0.0010	0.0010	1	08/03/21 11:13	08/16/21 13:52	EPA 3005A	97,6020B	CD
Zinc, Total	ND		mg/l	0.010	0.010	1	08/03/21 11:13	08/16/21 13:52	EPA 3005A	97,6020B	CD
MCP Dissolved Metals - Mansfield Lab											
Barium, Dissolved	0.0292		mg/l	0.0005	0.0005	1	08/02/21 16:48	08/13/21 20:22	EPA 3005A	97,6020B	CD
Iron, Dissolved	1.75		mg/l	0.050	0.050	1	08/02/21 16:48	08/13/21 20:22	EPA 3005A	97,6020B	CD
Lead, Dissolved	ND		mg/l	0.001	0.001	1	08/02/21 16:48	08/13/21 20:22	EPA 3005A	97,6020B	CD
Manganese, Dissolved	0.0093		mg/l	0.0010	0.0010	1	08/02/21 16:48	08/13/21 20:22	EPA 3005A	97,6020B	CD
Zinc, Dissolved	ND		mg/l	0.010	0.010	1	08/02/21 16:48	08/13/21 20:22	EPA 3005A	97,6020B	CD



Project Name: BELMONT LANDFILL**Lab Number:** L2140910**Project Number:** 2018-0157**Report Date:** 09/03/21**SAMPLE RESULTS**

Lab ID: L2140910-13

Date Collected: 07/28/21 13:44

Client ID: SOIL-11

Date Received: 07/29/21

Sample Location: BELMONT, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Soil

Percent Solids: 20%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/kg	7.46	7.46	10	07/30/21 20:32	08/24/21 21:28	EPA 3050B	97,6020B	CD
Arsenic, Total	25.1		mg/kg	2.33	2.33	10	07/30/21 20:32	08/24/21 21:28	EPA 3050B	97,6020B	CD
Barium, Total	207		mg/kg	14.0	14.0	10	07/30/21 20:32	08/24/21 21:28	EPA 3050B	97,6020B	CD
Beryllium, Total	ND		mg/kg	1.398	1.398	10	07/30/21 20:32	08/24/21 21:28	EPA 3050B	97,6020B	CD
Cadmium, Total	2.672		mg/kg	0.9319	0.9319	10	07/30/21 20:32	08/24/21 21:28	EPA 3050B	97,6020B	CD
Chromium, Total	32.6		mg/kg	9.32	9.32	10	07/30/21 20:32	08/24/21 21:28	EPA 3050B	97,6020B	CD
Copper, Total	75.0		mg/kg	9.32	9.32	10	07/30/21 20:32	08/24/21 21:28	EPA 3050B	97,6020B	CD
Lead, Total	366		mg/kg	2.80	2.80	10	07/30/21 20:32	08/24/21 21:28	EPA 3050B	97,6020B	CD
Mercury, Total	0.385		mg/kg	0.323	0.323	1	07/30/21 21:33	07/31/21 14:27	EPA 7471B	97,7471B	NB
Nickel, Total	26.1		mg/kg	4.66	4.66	10	07/30/21 20:32	08/24/21 21:28	EPA 3050B	97,6020B	CD
Selenium, Total	ND		mg/kg	9.32	9.32	10	07/30/21 20:32	08/24/21 21:28	EPA 3050B	97,6020B	CD
Silver, Total	ND		mg/kg	2.33	2.33	10	07/30/21 20:32	08/24/21 21:28	EPA 3050B	97,6020B	CD
Zinc, Total	402		mg/kg	46.6	46.6	10	07/30/21 20:32	08/24/21 21:28	EPA 3050B	97,6020B	CD



Project Name: BELMONT LANDFILL**Lab Number:** L2140910**Project Number:** 2018-0157**Report Date:** 09/03/21**SAMPLE RESULTS**

Lab ID: L2140910-14

Date Collected: 07/28/21 15:35

Client ID: SED-5

Date Received: 07/29/21

Sample Location: BELMONT, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Sediment

Percent Solids: 15%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/kg	10.4	10.4	10	07/30/21 20:32	08/24/21 21:33	EPA 3050B	97,6020B	CD
Arsenic, Total	17.8		mg/kg	3.26	3.26	10	07/30/21 20:32	08/24/21 21:33	EPA 3050B	97,6020B	CD
Barium, Total	153		mg/kg	19.6	19.6	10	07/30/21 20:32	08/24/21 21:33	EPA 3050B	97,6020B	CD
Beryllium, Total	ND		mg/kg	1.956	1.956	10	07/30/21 20:32	08/24/21 21:33	EPA 3050B	97,6020B	CD
Cadmium, Total	3.057		mg/kg	1.304	1.304	10	07/30/21 20:32	08/24/21 21:33	EPA 3050B	97,6020B	CD
Chromium, Total	15.1		mg/kg	13.0	13.0	10	07/30/21 20:32	08/24/21 21:33	EPA 3050B	97,6020B	CD
Copper, Total	49.7		mg/kg	13.0	13.0	10	07/30/21 20:32	08/24/21 21:33	EPA 3050B	97,6020B	CD
Lead, Total	186		mg/kg	3.91	3.91	10	07/30/21 20:32	08/24/21 21:33	EPA 3050B	97,6020B	CD
Mercury, Total	ND		mg/kg	0.422	0.422	1	07/30/21 21:33	07/31/21 14:30	EPA 7471B	97,7471B	NB
Nickel, Total	15.6		mg/kg	6.52	6.52	10	07/30/21 20:32	08/24/21 21:33	EPA 3050B	97,6020B	CD
Selenium, Total	ND		mg/kg	13.0	13.0	10	07/30/21 20:32	08/24/21 21:33	EPA 3050B	97,6020B	CD
Silver, Total	ND		mg/kg	3.26	3.26	10	07/30/21 20:32	08/24/21 21:33	EPA 3050B	97,6020B	CD
Zinc, Total	287		mg/kg	65.2	65.2	10	07/30/21 20:32	08/24/21 21:33	EPA 3050B	97,6020B	CD



Project Name: BELMONT LANDFILL**Lab Number:** L2140910**Project Number:** 2018-0157**Report Date:** 09/03/21**SAMPLE RESULTS**

Lab ID: L2140910-15

Date Collected: 07/28/21 15:20

Client ID: SED-6

Date Received: 07/29/21

Sample Location: BELMONT, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Sediment

Percent Solids: 16%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/kg	9.87	9.87	10	07/30/21 20:32	08/24/21 21:38	EPA 3050B	97,6020B	CD
Arsenic, Total	21.4		mg/kg	3.08	3.08	10	07/30/21 20:32	08/24/21 21:38	EPA 3050B	97,6020B	CD
Barium, Total	207		mg/kg	18.5	18.5	10	07/30/21 20:32	08/24/21 21:38	EPA 3050B	97,6020B	CD
Beryllium, Total	ND		mg/kg	1.851	1.851	10	07/30/21 20:32	08/24/21 21:38	EPA 3050B	97,6020B	CD
Cadmium, Total	4.217		mg/kg	1.234	1.234	10	07/30/21 20:32	08/24/21 21:38	EPA 3050B	97,6020B	CD
Chromium, Total	20.5		mg/kg	12.3	12.3	10	07/30/21 20:32	08/24/21 21:38	EPA 3050B	97,6020B	CD
Copper, Total	62.4		mg/kg	12.3	12.3	10	07/30/21 20:32	08/24/21 21:38	EPA 3050B	97,6020B	CD
Lead, Total	335		mg/kg	3.70	3.70	10	07/30/21 20:32	08/24/21 21:38	EPA 3050B	97,6020B	CD
Mercury, Total	ND		mg/kg	0.405	0.405	1	07/30/21 21:33	07/31/21 14:34	EPA 7471B	97,7471B	NB
Nickel, Total	19.7		mg/kg	6.17	6.17	10	07/30/21 20:32	08/24/21 21:38	EPA 3050B	97,6020B	CD
Selenium, Total	ND		mg/kg	12.3	12.3	10	07/30/21 20:32	08/24/21 21:38	EPA 3050B	97,6020B	CD
Silver, Total	ND		mg/kg	3.08	3.08	10	07/30/21 20:32	08/24/21 21:38	EPA 3050B	97,6020B	CD
Zinc, Total	399		mg/kg	61.7	61.7	10	07/30/21 20:32	08/24/21 21:38	EPA 3050B	97,6020B	CD



Project Name: BELMONT LANDFILL**Lab Number:** L2140910**Project Number:** 2018-0157**Report Date:** 09/03/21**SAMPLE RESULTS**

Lab ID: L2140910-16

Date Collected: 07/28/21 15:55

Client ID: SED-4

Date Received: 07/29/21

Sample Location: BELMONT, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Sediment

Percent Solids: 6%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/kg	25.7	25.7	10	07/30/21 20:32	08/24/21 21:42	EPA 3050B	97,6020B	CD
Arsenic, Total	29.8		mg/kg	8.04	8.04	10	07/30/21 20:32	08/24/21 21:42	EPA 3050B	97,6020B	CD
Barium, Total	232		mg/kg	48.3	48.3	10	07/30/21 20:32	08/24/21 21:42	EPA 3050B	97,6020B	CD
Beryllium, Total	ND		mg/kg	4.827	4.827	10	07/30/21 20:32	08/24/21 21:42	EPA 3050B	97,6020B	CD
Cadmium, Total	ND		mg/kg	3.218	3.218	10	07/30/21 20:32	08/24/21 21:42	EPA 3050B	97,6020B	CD
Chromium, Total	38.8		mg/kg	32.2	32.2	10	07/30/21 20:32	08/24/21 21:42	EPA 3050B	97,6020B	CD
Copper, Total	101		mg/kg	32.2	32.2	10	07/30/21 20:32	08/24/21 21:42	EPA 3050B	97,6020B	CD
Lead, Total	321		mg/kg	9.65	9.65	10	07/30/21 20:32	08/24/21 21:42	EPA 3050B	97,6020B	CD
Mercury, Total	ND		mg/kg	1.13	1.13	1	07/30/21 21:33	07/31/21 14:37	EPA 7471B	97,7471B	NB
Nickel, Total	26.2		mg/kg	16.1	16.1	10	07/30/21 20:32	08/24/21 21:42	EPA 3050B	97,6020B	CD
Selenium, Total	ND		mg/kg	32.2	32.2	10	07/30/21 20:32	08/24/21 21:42	EPA 3050B	97,6020B	CD
Silver, Total	ND		mg/kg	8.04	8.04	10	07/30/21 20:32	08/24/21 21:42	EPA 3050B	97,6020B	CD
Zinc, Total	381		mg/kg	161	161.	10	07/30/21 20:32	08/24/21 21:42	EPA 3050B	97,6020B	CD



Project Name: BELMONT LANDFILL**Lab Number:** L2140910**Project Number:** 2018-0157**Report Date:** 09/03/21**SAMPLE RESULTS**

Lab ID: L2140910-19

Date Collected: 07/28/21 11:57

Client ID: SW-2

Date Received: 07/29/21

Sample Location: BELMONT, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Surface Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Hardness by SM 2340B - Mansfield Lab											
Hardness	70.8		mg/l	0.460	0.460	1	08/03/21 11:13	08/16/21 13:57	EPA 3005A	97,6020B	CD
MCP Total Metals - Mansfield Lab											
Barium, Total	0.0472		mg/l	0.0005	0.0005	1	08/03/21 11:13	08/16/21 13:57	EPA 3005A	97,6020B	CD
Iron, Total	6.59		mg/l	0.050	0.050	1	08/03/21 11:13	08/16/21 13:57	EPA 3005A	97,6020B	CD
Lead, Total	0.009		mg/l	0.001	0.001	1	08/03/21 11:13	08/16/21 13:57	EPA 3005A	97,6020B	CD
Manganese, Total	0.2330		mg/l	0.0010	0.0010	1	08/03/21 11:13	08/16/21 13:57	EPA 3005A	97,6020B	CD
Zinc, Total	0.031		mg/l	0.010	0.010	1	08/03/21 11:13	08/16/21 13:57	EPA 3005A	97,6020B	CD
MCP Dissolved Metals - Mansfield Lab											
Barium, Dissolved	0.0349		mg/l	0.0005	0.0005	1	08/02/21 16:48	08/13/21 20:27	EPA 3005A	97,6020B	CD
Iron, Dissolved	0.896		mg/l	0.050	0.050	1	08/02/21 16:48	08/13/21 20:27	EPA 3005A	97,6020B	CD
Lead, Dissolved	ND		mg/l	0.001	0.001	1	08/02/21 16:48	08/13/21 20:27	EPA 3005A	97,6020B	CD
Manganese, Dissolved	0.0012		mg/l	0.0010	0.0010	1	08/02/21 16:48	08/13/21 20:27	EPA 3005A	97,6020B	CD
Zinc, Dissolved	ND		mg/l	0.010	0.010	1	08/02/21 16:48	08/13/21 20:27	EPA 3005A	97,6020B	CD



Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140910
Report Date: 09/03/21

Method Blank Analysis Batch Quality Control

Parameter	Result Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab for sample(s): 04-11,13-16 Batch: WG1529843-1									
Antimony, Total	ND	mg/kg	1.60	1.60	10	07/30/21 20:32	08/24/21 19:32	97,6020B	CD
Arsenic, Total	ND	mg/kg	0.500	0.500	10	07/30/21 20:32	08/24/21 19:32	97,6020B	CD
Barium, Total	ND	mg/kg	3.00	3.00	10	07/30/21 20:32	08/24/21 19:32	97,6020B	CD
Beryllium, Total	ND	mg/kg	0.3000	0.3000	10	07/30/21 20:32	08/24/21 19:32	97,6020B	CD
Cadmium, Total	ND	mg/kg	0.2000	0.2000	10	07/30/21 20:32	08/24/21 19:32	97,6020B	CD
Chromium, Total	ND	mg/kg	2.00	2.00	10	07/30/21 20:32	08/24/21 19:32	97,6020B	CD
Copper, Total	ND	mg/kg	2.00	2.00	10	07/30/21 20:32	08/24/21 19:32	97,6020B	CD
Lead, Total	ND	mg/kg	0.600	0.600	10	07/30/21 20:32	08/24/21 19:32	97,6020B	CD
Nickel, Total	ND	mg/kg	1.00	1.00	10	07/30/21 20:32	08/24/21 19:32	97,6020B	CD
Selenium, Total	ND	mg/kg	2.00	2.00	10	07/30/21 20:32	08/24/21 19:32	97,6020B	CD
Silver, Total	ND	mg/kg	0.500	0.500	10	07/30/21 20:32	08/24/21 19:32	97,6020B	CD
Zinc, Total	ND	mg/kg	10.0	10.0	10	07/30/21 20:32	08/24/21 19:32	97,6020B	CD

Prep Information

Digestion Method: EPA 3050B

Parameter	Result Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab for sample(s): 04-11,13-16 Batch: WG1529844-1									
Mercury, Total	ND	mg/kg	0.083	0.083	1	07/30/21 21:33	07/31/21 13:09	97,7471B	NB

Prep Information

Digestion Method: EPA 7471B

Parameter	Result Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Hardness by SM 2340B - Mansfield Lab for sample(s): 01-03,12,19 Batch: WG1530643-1									
Hardness	ND	mg/l	0.460	0.460	1	08/03/21 11:13	08/14/21 22:27	97,6020B	WP



Project Name: BELMONT LANDFILL

Lab Number: L2140910

Project Number: 2018-0157

Report Date: 09/03/21

Method Blank Analysis Batch Quality Control

Prep Information

Digestion Method: EPA 3005A

Parameter	Result Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab for sample(s): 01-03,12,19 Batch: WG1530643-1									
Barium, Total	ND	mg/l	0.0005	0.0005	1	08/03/21 11:13	08/14/21 22:27	97,6020B	WP
Iron, Total	ND	mg/l	0.050	0.050	1	08/03/21 11:13	08/14/21 22:27	97,6020B	WP
Lead, Total	ND	mg/l	0.001	0.001	1	08/03/21 11:13	08/14/21 22:27	97,6020B	WP
Manganese, Total	ND	mg/l	0.0010	0.0010	1	08/03/21 11:13	08/14/21 22:27	97,6020B	WP
Zinc, Total	ND	mg/l	0.010	0.010	1	08/03/21 11:13	08/14/21 22:27	97,6020B	WP

Prep Information

Digestion Method: EPA 3005A

Parameter	Result Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Dissolved Metals - Mansfield Lab for sample(s): 01-03,12,19 Batch: WG1530671-1									
Barium, Dissolved	ND	mg/l	0.0005	0.0005	1	08/02/21 16:48	08/13/21 19:09	97,6020B	CD
Iron, Dissolved	ND	mg/l	0.050	0.050	1	08/02/21 16:48	08/13/21 19:09	97,6020B	CD
Lead, Dissolved	ND	mg/l	0.001	0.001	1	08/02/21 16:48	08/13/21 19:09	97,6020B	CD
Manganese, Dissolved	ND	mg/l	0.0010	0.0010	1	08/02/21 16:48	08/13/21 19:09	97,6020B	CD
Zinc, Dissolved	ND	mg/l	0.010	0.010	1	08/02/21 16:48	08/13/21 19:09	97,6020B	CD

Prep Information

Digestion Method: EPA 3005A



Lab Control Sample Analysis Batch Quality Control

Project Name: BELMONT LANDFILL

Project Number: 2018-0157

Lab Number: L2140910

Report Date: 09/03/21

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Total Metals - Mansfield Lab Associated sample(s): 04-11,13-16 Batch: WG1529843-2 WG1529843-3 SRM Lot Number: D109-540								
Antimony, Total	90		89		19-250	1		30
Arsenic, Total	101		108		70-130	7		30
Barium, Total	98		104		75-125	6		30
Beryllium, Total	98		104		75-125	6		30
Cadmium, Total	100		106		75-125	6		30
Chromium, Total	93		98		70-130	5		30
Copper, Total	94		102		75-125	8		30
Lead, Total	100		105		72-128	5		30
Nickel, Total	92		97		70-130	5		30
Selenium, Total	108		114		68-132	5		30
Silver, Total	103		112		68-131	8		30
Zinc, Total	101		108		70-130	7		30
MCP Total Metals - Mansfield Lab Associated sample(s): 04-11,13-16 Batch: WG1529844-2 WG1529844-3 SRM Lot Number: D109-540								
Mercury, Total	96		98		60-140	2		30

Lab Control Sample Analysis **Batch Quality Control**

Project Name: BELMONT LANDFILL

Project Number: 2018-0157

Lab Number: L2140910

Report Date: 09/03/21

Parameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
MCP Total Metals - Mansfield Lab Associated sample(s): 01-03,12,19 Batch: WG1530643-2 WG1530643-3					
Barium, Total	96	99	80-120	3	20
Iron, Total	95	97	80-120	2	20
Lead, Total	96	98	80-120	2	20
Manganese, Total	92	95	80-120	3	20
Zinc, Total	99	101	80-120	2	20
MCP Dissolved Metals - Mansfield Lab Associated sample(s): 01-03,12,19 Batch: WG1530671-2 WG1530671-3					
Barium, Dissolved	91	87	80-120	4	20
Iron, Dissolved	95	88	80-120	8	20
Lead, Dissolved	102	97	80-120	5	20
Manganese, Dissolved	95	91	80-120	4	20
Zinc, Dissolved	102	100	80-120	2	20

Matrix Spike Analysis **Batch Quality Control**

Project Name: BELMONT LANDFILL

Lab Number: L2140910

Project Number: 2018-0157

Report Date: 09/03/21

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
MCP Total Metals - Mansfield Lab Associated sample(s): 04-11,13-16 QC Batch ID: WG1529843-5 WG1529843-6 QC Sample: L2140910-07 Client ID: SED-10												
Antimony, Total	ND	350	300	86		305	86		75-125	2		35
Arsenic, Total	13.2	84	104	108		104	107		75-125	0		35
Barium, Total	559	1400	2060	107		2060	106		75-125	0		35
Beryllium, Total	ND	35	36.67	105		37.21	106		75-125	1		35
Cadmium, Total	3.044	37.1	41.40	103		40.90	101		75-125	1		35
Chromium, Total	33.5	140	167	95		175	100		75-125	5		35
Copper, Total	184	175	367	104		364	102		75-125	1		35
Lead, Total	375	371	763	105		778	108		75-125	2		35
Nickel, Total	43.0	350	361	91		374	94		75-125	4		35
Selenium, Total	ND	84	93.8	112		92.5	109		75-125	1		35
Silver, Total	ND	210	229	109		227	107		75-125	1		35
Zinc, Total	830	350	1130	86		1200	105		75-125	6		35

MCP Total Metals - Mansfield Lab Associated sample(s): 04-11,13-16 QC Batch ID: WG1529844-5 WG1529844-6 QC Sample: L2140910-07 Client ID: SED-10

Mercury, Total	ND	1.25	1.64	131	Q	1.70	133	Q	75-125	4		35

Total Hardness by SM 2340B - Mansfield Lab Associated sample(s): 01-03,12,19 QC Batch ID: WG1530643-4 WG1530643-5 QC Sample: L2140910-01 Client ID: SW-4

Hardness	52.2	66.2	118	99		116	96		75-125	2		20

Matrix Spike Analysis **Batch Quality Control**

Project Name: BELMONT LANDFILL

Project Number: 2018-0157

Lab Number: L2140910

Report Date: 09/03/21

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	MSD Found	MSD %Recovery	Recovery Limits	RPD	RPD Limits
MCP Total Metals - Mansfield Lab Associated sample(s): 01-03,12,19 QC Batch ID: WG1530643-4 WG1530643-5 QC Sample: L2140910-01 Client ID: SW-4									
Barium, Total	0.0343	2	1.989	98	2.059	101	75-125	3	20
Iron, Total	4.30	1	5.10	80	5.23	93	75-125	3	20
Lead, Total	0.002	0.53	0.521	98	0.528	99	75-125	1	20
Manganese, Total	0.2510	0.5	0.7283	95	0.7558	101	75-125	4	20
Zinc, Total	ND	0.5	0.533	107	0.541	108	75-125	1	20

MCP Dissolved Metals - Mansfield Lab Associated sample(s): 01-03,12,19 QC Batch ID: WG1530671-4 WG1530671-5 QC Sample: L2140910-01 Client ID: SW-4

Barium, Dissolved	0.0275	2	2.045	101	1.986	98	75-125	3	20
Iron, Dissolved	1.46	1	2.36	90	2.26	80	75-125	4	20
Lead, Dissolved	0.009	0.53	0.521	96	0.507	94	75-125	3	20
Manganese, Dissolved	0.0121	0.5	0.4830	94	0.4702	92	75-125	3	20
Zinc, Dissolved	ND	0.5	0.522	104	0.513	103	75-125	2	20

Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Duplicate Analysis
Batch Quality Control

Lab Number: L2140910
Report Date: 09/03/21

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
MCP Total Metals - Mansfield Lab Associated sample(s): 04-11,13-16 QC Batch ID: WG1529843-4 QC Sample: L2140910-04 Client ID: SED-11						
Antimony, Total	ND	ND	mg/kg	NC		35
Arsenic, Total	18.9	18.4	mg/kg	3		35
Barium, Total	1320	1250	mg/kg	5		35
Beryllium, Total	ND	ND	mg/kg	NC		35
Cadmium, Total	5.756	6.346	mg/kg	10		35
Chromium, Total	34.1	33.0	mg/kg	3		35
Copper, Total	243	239	mg/kg	2		35
Lead, Total	540	546	mg/kg	1		35
Nickel, Total	65.5	60.4	mg/kg	8		35
Selenium, Total	ND	ND	mg/kg	NC		35
Silver, Total	ND	ND	mg/kg	NC		35
Zinc, Total	2260	2230	mg/kg	1		35
MCP Total Metals - Mansfield Lab Associated sample(s): 04-11,13-16 QC Batch ID: WG1529844-4 QC Sample: L2140910-04 Client ID: SED-11						
Mercury, Total	ND	ND	mg/kg	NC		35
Total Hardness by SM 2340B - Mansfield Lab Associated sample(s): 01-03,12,19 QC Batch ID: WG1530643-7 QC Sample: L2140910-03 Client ID: SW-6						
Hardness	54.8	54.6	mg/l	0		20

Lab Duplicate Analysis *Batch Quality Control*

Project Name: BELMONT LANDFILL

Project Number: 2018-0157

Lab Number: L2140910

Report Date: 09/03/21

Parameter	Native Sample	Duplicate Sample	Units	RPD	RPD Limits
MCP Total Metals - Mansfield Lab Associated sample(s): 01-03,12,19 QC Batch ID: WG1530643-7 QC Sample: L2140910-03 Client ID: SW-6					
Barium, Total	0.0495	0.0498	mg/l	0	20
Iron, Total	4.25	4.20	mg/l	1	20
Lead, Total	0.005	0.005	mg/l	0	20
Manganese, Total	0.3276	0.3270	mg/l	0	20
Zinc, Total	0.012	0.012	mg/l	3	20
MCP Dissolved Metals - Mansfield Lab Associated sample(s): 01-03,12,19 QC Batch ID: WG1530671-6 QC Sample: L2140910-03 Client ID: SW-6					
Barium, Dissolved	0.0393	0.0387	mg/l	1	20
Iron, Dissolved	1.72	1.71	mg/l	1	20
Lead, Dissolved	ND	ND	mg/l	NC	20
Manganese, Dissolved	0.0053	0.0052	mg/l	1	20
Zinc, Dissolved	ND	ND	mg/l	NC	20

Project Name: BELMONT LANDFILL
Project Number: 2018-0157

**Lab Serial Dilution
Analysis
Batch Quality Control**

Lab Number: L2140910
Report Date: 09/03/21

Parameter	Native Sample	Serial Dilution	Units	% D	Qual	RPD Limits
MCP Total Metals - Mansfield Lab Associated sample(s): 04-11,13-16 QC Batch ID: WG1529843-7 QC Sample: L2140910-07 Client ID: SED-10						
Lead, Total	375	369	mg/kg	2		20
Total Hardness by SM 2340B - Mansfield Lab Associated sample(s): 01-03,12,19 QC Batch ID: WG1530643-6 QC Sample: L2140910-01 Client ID: SW-4						
Hardness	52.2	51.3	mg/l	2		20
MCP Total Metals - Mansfield Lab Associated sample(s): 01-03,12,19 QC Batch ID: WG1530643-6 QC Sample: L2140910-01 Client ID: SW-4						
Barium, Total	0.0343	0.0334	mg/l	3		20
Iron, Total	4.30	4.46	mg/l	4		20
Manganese, Total	0.2510	0.2536	mg/l	1		20
MCP Dissolved Metals - Mansfield Lab Associated sample(s): 01-03,12,19 QC Batch ID: WG1530671-7 QC Sample: L2140910-01 Client ID: SW-4						
Barium, Dissolved	0.0275	0.0284	mg/l	3		20
Iron, Dissolved	1.46	1.40	mg/l	4		20

INORGANICS & MISCELLANEOUS

Project Name: BELMONT LANDFILL

Project Number: 2018-0157

Lab Number: L2140910

Report Date: 09/03/21

SAMPLE RESULTS

Lab ID: L2140910-01

Client ID: SW-4

Sample Location: BELMONT, MA

Date Collected: 07/28/21 08:24

Date Received: 07/29/21

Field Prep: Not Specified

Sample Depth:

Matrix: Surface Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Cyanide, Free	ND		ug/l	2.00	0.544	1	08/10/21 15:40	08/10/21 22:39	109,9016	AT



Project Name: BELMONT LANDFILL

Project Number: 2018-0157

Lab Number: L2140910

Report Date: 09/03/21

SAMPLE RESULTS

Lab ID: L2140910-02

Client ID: SW-5

Sample Location: BELMONT, MA

Date Collected: 07/28/21 09:10

Date Received: 07/29/21

Field Prep: Not Specified

Sample Depth:

Matrix: Surface Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Cyanide, Free	ND		ug/l	2.00	0.544	1	08/10/21 15:40	08/10/21 22:40	109,9016	AT



Project Name: BELMONT LANDFILL

Project Number: 2018-0157

Lab Number: L2140910

Report Date: 09/03/21

SAMPLE RESULTS

Lab ID: L2140910-03

Client ID: SW-6

Sample Location: BELMONT, MA

Date Collected: 07/28/21 08:56

Date Received: 07/29/21

Field Prep: Not Specified

Sample Depth:

Matrix: Surface Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Cyanide, Free	ND		ug/l	2.00	0.544	1	08/10/21 15:40	08/10/21 22:41	109,9016	AT



Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140910
Report Date: 09/03/21

SAMPLE RESULTS

Lab ID: L2140910-04
Client ID: SED-11
Sample Location: BELMONT, MA

Date Collected: 07/28/21 09:55
Date Received: 07/29/21
Field Prep: Not Specified

Sample Depth:
Matrix: Sediment

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	17.2		%	0.010	0.010	1	-	08/20/21 09:36	1,9060A	SP
Total Organic Carbon (Rep2)	17.9		%	0.010	0.010	1	-	08/20/21 09:36	1,9060A	SP
Total Organic Carbon (Average)	17.6		%	0.010	0.010	1	-	08/20/21 09:36	1,9060A	SP
Grain Size Analysis - Mansfield Lab										
% Total Gravel	ND		%	0.100	NA	1	-	08/19/21 12:54	12,D6913/D7928	DR
% Coarse Sand	6.60		%	0.100	NA	1	-	08/19/21 12:54	12,D6913/D7928	DR
% Medium Sand	22.9		%	0.100	NA	1	-	08/19/21 12:54	12,D6913/D7928	DR
% Fine Sand	13.0		%	0.100	NA	1	-	08/19/21 12:54	12,D6913/D7928	DR
% Total Fines	57.5		%	0.100	NA	1	-	08/19/21 12:54	12,D6913/D7928	DR
General Chemistry - Westborough Lab										
Cyanide, Free	ND		mg/kg	8.3	2.0	1	08/09/21 21:45	08/10/21 22:56	109,9016	AT
General Chemistry - Mansfield Lab										
Solids, Total	12.1		%	0.100	0.100	1	-	08/03/21 15:20	121,2540G	ES



Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140910
Report Date: 09/03/21

SAMPLE RESULTS

Lab ID: L2140910-05
Client ID: SED-12
Sample Location: BELMONT, MA

Date Collected: 07/28/21 08:40
Date Received: 07/29/21
Field Prep: Not Specified

Sample Depth:
Matrix: Sediment

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	24.6		%	0.010	0.010	1	-	08/20/21 09:36	1,9060A	SP
Total Organic Carbon (Rep2)	24.8		%	0.010	0.010	1	-	08/20/21 09:36	1,9060A	SP
Total Organic Carbon (Average)	24.7		%	0.010	0.010	1	-	08/20/21 09:36	1,9060A	SP
Grain Size Analysis - Mansfield Lab										
% Total Gravel	0.300		%	0.100	NA	1	-	08/19/21 12:54	12,D6913/D7928	DR
% Coarse Sand	48.9		%	0.100	NA	1	-	08/19/21 12:54	12,D6913/D7928	DR
% Medium Sand	24.2		%	0.100	NA	1	-	08/19/21 12:54	12,D6913/D7928	DR
% Fine Sand	14.5		%	0.100	NA	1	-	08/19/21 12:54	12,D6913/D7928	DR
% Total Fines	12.1		%	0.100	NA	1	-	08/19/21 12:54	12,D6913/D7928	DR
General Chemistry - Westborough Lab										
Cyanide, Free	ND		mg/kg	18	4.4	1	08/09/21 21:45	08/10/21 22:56	109,9016	AT
General Chemistry - Mansfield Lab										
Solids, Total	5.43		%	0.100	0.100	1	-	08/03/21 15:20	121,2540G	ES



Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140910
Report Date: 09/03/21

SAMPLE RESULTS

Lab ID: L2140910-06
Client ID: SOIL-14
Sample Location: BELMONT, MA

Date Collected: 07/28/21 10:55
Date Received: 07/29/21
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	23.9		%	0.010	0.010	1	-	08/20/21 09:36	1,9060A	SP
Total Organic Carbon (Rep2)	23.3		%	0.010	0.010	1	-	08/20/21 09:36	1,9060A	SP
Total Organic Carbon (Average)	23.6		%	0.010	0.010	1	-	08/20/21 09:36	1,9060A	SP
Grain Size Analysis - Mansfield Lab										
% Total Gravel	0.300		%	0.100	NA	1	-	08/19/21 12:54	12,D6913/D7928	DR
% Coarse Sand	5.10		%	0.100	NA	1	-	08/19/21 12:54	12,D6913/D7928	DR
% Medium Sand	20.8		%	0.100	NA	1	-	08/19/21 12:54	12,D6913/D7928	DR
% Fine Sand	10.8		%	0.100	NA	1	-	08/19/21 12:54	12,D6913/D7928	DR
% Total Fines	63.0		%	0.100	NA	1	-	08/19/21 12:54	12,D6913/D7928	DR
General Chemistry - Westborough Lab										
Cyanide, Free	ND		mg/kg	7.6	1.8	1	08/09/21 21:45	08/10/21 22:57	109,9016	AT
General Chemistry - Mansfield Lab										
Solids, Total	13.2		%	0.100	0.100	1	-	08/03/21 15:20	121,2540G	ES



Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140910
Report Date: 09/03/21

SAMPLE RESULTS

Lab ID: L2140910-07
Client ID: SED-10
Sample Location: BELMONT, MA

Date Collected: 07/28/21 10:43
Date Received: 07/29/21
Field Prep: Not Specified

Sample Depth:
Matrix: Sediment

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	17.6		%	0.010	0.010	1	-	08/20/21 09:36	1,9060A	SP
Total Organic Carbon (Rep2)	17.3		%	0.010	0.010	1	-	08/20/21 09:36	1,9060A	SP
Total Organic Carbon (Average)	17.4		%	0.010	0.010	1	-	08/20/21 09:36	1,9060A	SP
Grain Size Analysis - Mansfield Lab										
% Total Gravel	ND		%	0.100	NA	1	-	08/19/21 12:54	12,D6913/D7928	DR
% Coarse Sand	4.00		%	0.100	NA	1	-	08/19/21 12:54	12,D6913/D7928	DR
% Medium Sand	23.0		%	0.100	NA	1	-	08/19/21 12:54	12,D6913/D7928	DR
% Fine Sand	17.1		%	0.100	NA	1	-	08/19/21 12:54	12,D6913/D7928	DR
% Total Fines	55.9		%	0.100	NA	1	-	08/19/21 12:54	12,D6913/D7928	DR
General Chemistry - Westborough Lab										
Cyanide, Free	ND		mg/kg	9.2	2.2	1	08/10/21 21:15	08/11/21 22:57	109,9016	AT
General Chemistry - Mansfield Lab										
Solids, Total	10.8		%	0.100	0.100	1	-	08/03/21 15:20	121,2540G	ES



Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140910
Report Date: 09/03/21

SAMPLE RESULTS

Lab ID: L2140910-08
Client ID: SED-3
Sample Location: BELMONT, MA

Date Collected: 07/28/21 11:55
Date Received: 07/29/21
Field Prep: Not Specified

Sample Depth:
Matrix: Sediment

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	18.3		%	0.010	0.010	1	-	08/20/21 09:36	1,9060A	SP
Total Organic Carbon (Rep2)	18.3		%	0.010	0.010	1	-	08/20/21 09:36	1,9060A	SP
Total Organic Carbon (Average)	18.3		%	0.010	0.010	1	-	08/20/21 09:36	1,9060A	SP
Grain Size Analysis - Mansfield Lab										
% Total Gravel	2.10		%	0.100	NA	1	-	08/19/21 12:54	12,D6913/D7928	DR
% Coarse Sand	10.3		%	0.100	NA	1	-	08/19/21 12:54	12,D6913/D7928	DR
% Medium Sand	20.5		%	0.100	NA	1	-	08/19/21 12:54	12,D6913/D7928	DR
% Fine Sand	12.6		%	0.100	NA	1	-	08/19/21 12:54	12,D6913/D7928	DR
% Total Fines	54.5		%	0.100	NA	1	-	08/19/21 12:54	12,D6913/D7928	DR
General Chemistry - Westborough Lab										
Cyanide, Free	ND		mg/kg	9.4	2.2	1	08/10/21 21:15	08/11/21 22:59	109,9016	AT
General Chemistry - Mansfield Lab										
Solids, Total	10.6		%	0.100	0.100	1	-	08/03/21 15:20	121,2540G	ES



Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140910
Report Date: 09/03/21

SAMPLE RESULTS

Lab ID: L2140910-09
Client ID: SOIL-12
Sample Location: BELMONT, MA

Date Collected: 07/28/21 12:46
Date Received: 07/29/21
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	3.65		%	0.010	0.010	1	-	08/20/21 09:36	1,9060A	SP
Total Organic Carbon (Rep2)	4.06		%	0.010	0.010	1	-	08/20/21 09:36	1,9060A	SP
Total Organic Carbon (Average)	3.86		%	0.010	0.010	1	-	08/20/21 09:36	1,9060A	SP
Grain Size Analysis - Mansfield Lab										
% Total Gravel	8.20		%	0.100	NA	1	-	08/19/21 12:54	12,D6913/D7928	DR
% Coarse Sand	6.20		%	0.100	NA	1	-	08/19/21 12:54	12,D6913/D7928	DR
% Medium Sand	23.3		%	0.100	NA	1	-	08/19/21 12:54	12,D6913/D7928	DR
% Fine Sand	28.1		%	0.100	NA	1	-	08/19/21 12:54	12,D6913/D7928	DR
% Total Fines	34.2		%	0.100	NA	1	-	08/19/21 12:54	12,D6913/D7928	DR
General Chemistry - Westborough Lab										
Cyanide, Free	ND		mg/kg	1.3	0.31	1	08/10/21 21:15	08/11/21 22:59	109,9016	AT
General Chemistry - Mansfield Lab										
Solids, Total	78.0		%	0.100	0.100	1	-	08/03/21 15:20	121,2540G	ES



Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140910
Report Date: 09/03/21

SAMPLE RESULTS

Lab ID: L2140910-10
Client ID: SOIL-13
Sample Location: BELMONT, MA

Date Collected: 07/28/21 12:21
Date Received: 07/29/21
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	18.4		%	0.010	0.010	1	-	08/20/21 09:36	1,9060A	SP
Total Organic Carbon (Rep2)	17.9		%	0.010	0.010	1	-	08/20/21 09:36	1,9060A	SP
Total Organic Carbon (Average)	18.1		%	0.010	0.010	1	-	08/20/21 09:36	1,9060A	SP
Grain Size Analysis - Mansfield Lab										
% Total Gravel	1.70		%	0.100	NA	1	-	08/19/21 12:54	12,D6913/D7928	DR
% Coarse Sand	13.6		%	0.100	NA	1	-	08/19/21 12:54	12,D6913/D7928	DR
% Medium Sand	27.6		%	0.100	NA	1	-	08/19/21 12:54	12,D6913/D7928	DR
% Fine Sand	11.7		%	0.100	NA	1	-	08/19/21 12:54	12,D6913/D7928	DR
% Total Fines	45.4		%	0.100	NA	1	-	08/19/21 12:54	12,D6913/D7928	DR
General Chemistry - Westborough Lab										
Cyanide, Free	ND		mg/kg	10	2.5	1	08/10/21 21:15	08/11/21 23:00	109,9016	AT
General Chemistry - Mansfield Lab										
Solids, Total	9.68		%	0.100	0.100	1	-	08/03/21 15:20	121,2540G	ES



Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140910
Report Date: 09/03/21

SAMPLE RESULTS

Lab ID: L2140910-11
Client ID: SED-8
Sample Location: BELMONT, MA

Date Collected: 07/28/21 13:06
Date Received: 07/29/21
Field Prep: Not Specified

Sample Depth:
Matrix: Sediment

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	13.8		%	0.010	0.010	1	-	08/20/21 09:36	1,9060A	SP
Total Organic Carbon (Rep2)	14.6		%	0.010	0.010	1	-	08/20/21 09:36	1,9060A	SP
Total Organic Carbon (Average)	14.2		%	0.010	0.010	1	-	08/20/21 09:36	1,9060A	SP
Grain Size Analysis - Mansfield Lab										
% Total Gravel	0.100		%	0.100	NA	1	-	08/19/21 12:54	12,D6913/D7928	DR
% Coarse Sand	1.50		%	0.100	NA	1	-	08/19/21 12:54	12,D6913/D7928	DR
% Medium Sand	12.7		%	0.100	NA	1	-	08/19/21 12:54	12,D6913/D7928	DR
% Fine Sand	19.4		%	0.100	NA	1	-	08/19/21 12:54	12,D6913/D7928	DR
% Total Fines	66.3		%	0.100	NA	1	-	08/19/21 12:54	12,D6913/D7928	DR
General Chemistry - Westborough Lab										
Cyanide, Free	ND		mg/kg	5.6	1.3	1	08/10/21 21:15	08/11/21 23:00	109,9016	AT
General Chemistry - Mansfield Lab										
Solids, Total	17.8		%	0.100	0.100	1	-	08/03/21 15:20	121,2540G	ES



Project Name: BELMONT LANDFILL

Project Number: 2018-0157

Lab Number: L2140910

Report Date: 09/03/21

SAMPLE RESULTS

Lab ID: L2140910-12

Client ID: SW-3

Sample Location: BELMONT, MA

Date Collected: 07/28/21 14:00

Date Received: 07/29/21

Field Prep: Not Specified

Sample Depth:

Matrix: Surface Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Cyanide, Free	ND		ug/l	2.00	0.544	1	08/10/21 15:40	08/10/21 22:42	109,9016	AT



Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140910
Report Date: 09/03/21

SAMPLE RESULTS

Lab ID: L2140910-13
Client ID: SOIL-11
Sample Location: BELMONT, MA

Date Collected: 07/28/21 13:44
Date Received: 07/29/21
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	15.6		%	0.010	0.010	1	-	08/20/21 09:36	1,9060A	SP
Total Organic Carbon (Rep2)	15.9		%	0.010	0.010	1	-	08/20/21 09:36	1,9060A	SP
Total Organic Carbon (Average)	15.8		%	0.010	0.010	1	-	08/20/21 09:36	1,9060A	SP
Grain Size Analysis - Mansfield Lab										
% Total Gravel	ND		%	0.100	NA	1	-	08/19/21 12:54	12,D6913/D7928	DR
% Coarse Sand	8.50		%	0.100	NA	1	-	08/19/21 12:54	12,D6913/D7928	DR
% Medium Sand	27.2		%	0.100	NA	1	-	08/19/21 12:54	12,D6913/D7928	DR
% Fine Sand	17.0		%	0.100	NA	1	-	08/19/21 12:54	12,D6913/D7928	DR
% Total Fines	47.3		%	0.100	NA	1	-	08/19/21 12:54	12,D6913/D7928	DR
General Chemistry - Westborough Lab										
Cyanide, Free	ND		mg/kg	4.9	1.2	1	08/10/21 21:15	08/11/21 23:01	109,9016	AT
General Chemistry - Mansfield Lab										
Solids, Total	20.4		%	0.100	0.100	1	-	08/03/21 15:20	121,2540G	ES



Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140910
Report Date: 09/03/21

SAMPLE RESULTS

Lab ID: L2140910-14
Client ID: SED-5
Sample Location: BELMONT, MA

Date Collected: 07/28/21 15:35
Date Received: 07/29/21
Field Prep: Not Specified

Sample Depth:
Matrix: Sediment

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	16.6		%	0.010	0.010	1	-	08/20/21 09:36	1,9060A	SP
Total Organic Carbon (Rep2)	12.9		%	0.010	0.010	1	-	08/20/21 09:36	1,9060A	SP
Total Organic Carbon (Average)	14.8		%	0.010	0.010	1	-	08/20/21 09:36	1,9060A	SP
Grain Size Analysis - Mansfield Lab										
% Total Gravel	0.300		%	0.100	NA	1	-	08/19/21 12:54	12,D6913/D7928	DR
% Coarse Sand	3.00		%	0.100	NA	1	-	08/19/21 12:54	12,D6913/D7928	DR
% Medium Sand	18.6		%	0.100	NA	1	-	08/19/21 12:54	12,D6913/D7928	DR
% Fine Sand	42.3		%	0.100	NA	1	-	08/19/21 12:54	12,D6913/D7928	DR
% Total Fines	35.8		%	0.100	NA	1	-	08/19/21 12:54	12,D6913/D7928	DR
General Chemistry - Westborough Lab										
Cyanide, Free	ND		mg/kg	6.6	1.6	1	08/10/21 21:15	08/11/21 23:01	109,9016	AT
General Chemistry - Mansfield Lab										
Solids, Total	15.2		%	0.100	0.100	1	-	08/03/21 15:20	121,2540G	ES



Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140910
Report Date: 09/03/21

SAMPLE RESULTS

Lab ID: L2140910-15
Client ID: SED-6
Sample Location: BELMONT, MA

Date Collected: 07/28/21 15:20
Date Received: 07/29/21
Field Prep: Not Specified

Sample Depth:
Matrix: Sediment

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	9.16		%	0.010	0.010	1	-	08/20/21 09:36	1,9060A	SP
Total Organic Carbon (Rep2)	8.88		%	0.010	0.010	1	-	08/20/21 09:36	1,9060A	SP
Total Organic Carbon (Average)	9.02		%	0.010	0.010	1	-	08/20/21 09:36	1,9060A	SP
Grain Size Analysis - Mansfield Lab										
% Total Gravel	0.200		%	0.100	NA	1	-	08/19/21 12:54	12,D6913/D7928	DR
% Coarse Sand	2.30		%	0.100	NA	1	-	08/19/21 12:54	12,D6913/D7928	DR
% Medium Sand	15.4		%	0.100	NA	1	-	08/19/21 12:54	12,D6913/D7928	DR
% Fine Sand	38.4		%	0.100	NA	1	-	08/19/21 12:54	12,D6913/D7928	DR
% Total Fines	43.7		%	0.100	NA	1	-	08/19/21 12:54	12,D6913/D7928	DR
General Chemistry - Westborough Lab										
Cyanide, Free	ND		mg/kg	6.3	1.5	1	08/10/21 21:15	08/11/21 23:02	109,9016	AT
General Chemistry - Mansfield Lab										
Solids, Total	15.8		%	0.100	0.100	1	-	08/04/21 12:01	121,2540G	ES



Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140910
Report Date: 09/03/21

SAMPLE RESULTS

Lab ID: L2140910-16
Client ID: SED-4
Sample Location: BELMONT, MA

Date Collected: 07/28/21 15:55
Date Received: 07/29/21
Field Prep: Not Specified

Sample Depth:
Matrix: Sediment

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	27.6		%	0.010	0.010	1	-	08/20/21 09:36	1,9060A	SP
Total Organic Carbon (Rep2)	27.5		%	0.010	0.010	1	-	08/20/21 09:36	1,9060A	SP
Total Organic Carbon (Average)	27.6		%	0.010	0.010	1	-	08/20/21 09:36	1,9060A	SP
Grain Size Analysis - Mansfield Lab										
% Total Gravel	ND		%	0.100	NA	1	-	08/19/21 12:54	12,D6913/D7928	DR
% Coarse Sand	4.70		%	0.100	NA	1	-	08/19/21 12:54	12,D6913/D7928	DR
% Medium Sand	26.3		%	0.100	NA	1	-	08/19/21 12:54	12,D6913/D7928	DR
% Fine Sand	19.5		%	0.100	NA	1	-	08/19/21 12:54	12,D6913/D7928	DR
% Total Fines	49.5		%	0.100	NA	1	-	08/19/21 12:54	12,D6913/D7928	DR
General Chemistry - Westborough Lab										
Cyanide, Free	ND		mg/kg	16	3.9	1	08/10/21 21:15	08/11/21 23:02	109,9016	AT
General Chemistry - Mansfield Lab										
Solids, Total	6.06		%	0.100	0.100	1	-	08/04/21 12:01	121,2540G	ES



Project Name: BELMONT LANDFILL**Project Number:** 2018-0157**Lab Number:** L2140910**Report Date:** 09/03/21**SAMPLE RESULTS****Lab ID:** L2140910-19**Client ID:** SW-2**Sample Location:** BELMONT, MA**Date Collected:** 07/28/21 11:57**Date Received:** 07/29/21**Field Prep:** Not Specified**Sample Depth:****Matrix:** Surface Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Cyanide, Free	ND		ug/l	2.00	0.544	1	08/10/21 15:40	08/10/21 22:42	109,9016	AT



Project Name: BELMONT LANDFILL

Lab Number: L2140910

Project Number: 2018-0157

Report Date: 09/03/21

Method Blank Analysis Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab for sample(s): 04-11,13-16 Batch: WG1532037-1										
Total Organic Carbon (Rep1)	ND		%	0.010	0.010	1	-	08/20/21 09:36	1,9060A	SP
Total Organic Carbon (Rep2)	ND		%	0.010	0.010	1	-	08/20/21 09:36	1,9060A	SP
Total Organic Carbon (Average)	ND		%	0.010	0.010	1	-	08/20/21 09:36	1,9060A	SP
General Chemistry - Westborough Lab for sample(s): 04-06 Batch: WG1533180-1										
Cyanide, Free	ND		mg/kg	1.0	0.24	1	08/09/21 21:45	08/10/21 22:46	109,9016	AT
General Chemistry - Westborough Lab for sample(s): 01-03,12,19 Batch: WG1533507-1										
Cyanide, Free	ND		ug/l	2.00	0.544	1	08/10/21 15:40	08/10/21 22:35	109,9016	AT
General Chemistry - Westborough Lab for sample(s): 07-11,13-16 Batch: WG1533648-1										
Cyanide, Free	ND		mg/kg	1.0	0.24	1	08/10/21 21:15	08/11/21 22:53	109,9016	AT

Lab Control Sample Analysis**Batch Quality Control****Project Name:** BELMONT LANDFILL**Project Number:** 2018-0157**Lab Number:** L2140910**Report Date:** 09/03/21

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Total Organic Carbon - Mansfield Lab Associated sample(s): 04-11,13-16 Batch: WG1532037-2								
Total Organic Carbon (Rep1)	112		-		75-125	-		25
Total Organic Carbon (Rep2)	111		-		75-125	-		25
Total Organic Carbon (Average)	112		-		75-125	-		25
General Chemistry - Westborough Lab Associated sample(s): 04-06 Batch: WG1533180-2								
Cyanide, Free	82		-			-		
General Chemistry - Westborough Lab Associated sample(s): 01-03,12,19 Batch: WG1533507-2								
Cyanide, Free	85		-		75-125	-		
General Chemistry - Westborough Lab Associated sample(s): 07-11,13-16 Batch: WG1533648-2								
Cyanide, Free	86		-			-		

Matrix Spike Analysis

Batch Quality Control

Project Name: BELMONT LANDFILL

Project Number: 2018-0157

Lab Number: L2140910

Report Date: 09/03/21

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Total Organic Carbon - Mansfield Lab Associated sample(s): 04-11,13-16 QC Batch ID: WG1532037-4 WG1532037-5 QC Sample: L2140910-07 Client ID: SED-10												
Total Organic Carbon (Rep1)	17.6	1.26	19.1	120		18.6	92		75-125	3		25
Total Organic Carbon (Rep2)	17.3	1.32	18.6	98		18.1	60	Q	75-125	3		25
General Chemistry - Westborough Lab Associated sample(s): 04-06 QC Batch ID: WG1533180-3 WG1533180-4 QC Sample: L2140340-09 Client ID: MS Sample												
Cyanide, Free	ND	31.81	23	72		22	70			4		
General Chemistry - Westborough Lab Associated sample(s): 01-03,12,19 QC Batch ID: WG1533507-3 WG1533507-4 QC Sample: L2140910-01 Client ID: SW-4												
Cyanide, Free	ND	50	37.7	75		37.0	74		70-130	2		20
General Chemistry - Westborough Lab Associated sample(s): 07-11,13-16 QC Batch ID: WG1533648-3 WG1533648-4 QC Sample: L2140910-07 Client ID: SED-10												
Cyanide, Free	ND	194	140	71		140	72			1		

Lab Duplicate Analysis *Batch Quality Control*

Project Name: BELMONT LANDFILL

Project Number: 2018-0157

Lab Number: L2140910

Report Date: 09/03/21

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Mansfield Lab Associated sample(s): 04-11,13-14 QC Batch ID: WG1531031-1 QC Sample: L2140615-02 Client ID: DUP Sample						
Solids, Total	34.5	34.6	%	0		10
General Chemistry - Mansfield Lab Associated sample(s): 15-16 QC Batch ID: WG1531464-1 QC Sample: L2140998-02 Client ID: DUP Sample						
Solids, Total	40.5	42.6	%	5		10
Total Organic Carbon - Mansfield Lab Associated sample(s): 04-11,13-16 QC Batch ID: WG1532037-3 QC Sample: L2140910-04 Client ID: SED-11						
Total Organic Carbon (Rep1)	17.2	18.2	%	6		25
Total Organic Carbon (Rep2)	17.9	17.7	%	1		25
Total Organic Carbon (Average)	17.6	17.9	%	2		25
General Chemistry - Westborough Lab Associated sample(s): 04-06 QC Batch ID: WG1533180-5 QC Sample: L2140340-09 Client ID: DUP Sample						
Cyanide, Free	ND	ND	mg/kg	NC		
General Chemistry - Westborough Lab Associated sample(s): 04-06 QC Batch ID: WG1533180-6 QC Sample: L2140910-04 Client ID: SED-11						
Cyanide, Free	ND	ND	mg/kg	NC		
General Chemistry - Westborough Lab Associated sample(s): 01-03,12,19 QC Batch ID: WG1533507-5 QC Sample: L2140910-03 Client ID: SW-6						
Cyanide, Free	ND	ND	ug/l	NC		20

Lab Duplicate Analysis

Batch Quality Control

Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140910
Report Date: 09/03/21

Parameter	Native Sample	Duplicate Sample	Units	RPD	RPD Limits
Grain Size Analysis - Mansfield Lab Associated sample(s): 04-11,13-16 QC Batch ID: WG1536977-1 QC Sample: L2140910-04 Client ID: SED-11					
% Total Gravel	ND	ND	%	NC	20
% Coarse Sand	6.60	6.00	%	10	20
% Medium Sand	22.9	23.8	%	4	20
% Fine Sand	13.0	14.4	%	10	20
% Total Fines	57.5	55.8	%	3	20

Project Name: BELMONT LANDFILL**Lab Number:** L2140910**Project Number:** 2018-0157**Report Date:** 09/03/21**Sample Receipt and Container Information**

Were project specific reporting limits specified?

YES

Cooler Information

Cooler	Custody Seal
A	Absent
B	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2140910-01A	Plastic 120ml HNO3 preserved	B	<2	<2	3.0	Y	Absent		A2-BA-MCP6020T-10(180),A2-MN-MCP6020T-10(180),A2-ZN-MCP6020T-10(180),A2-FE-MCP6020T-10(180),A2-HARD-MCP6020T-10(180),A2-PB-MCP6020T-10(180)
L2140910-01A1	Plastic 120ml HNO3 preserved	B	<2	<2	3.0	Y	Absent		A2-BA-MCP6020T-10(180),A2-MN-MCP6020T-10(180),A2-ZN-MCP6020T-10(180),A2-FE-MCP6020T-10(180),A2-HARD-MCP6020T-10(180),A2-PB-MCP6020T-10(180)
L2140910-01B	Plastic 120ml unpreserved	B	7	>12	3.0	N	Absent		A2-FILTERMET(1)
L2140910-01B1	Plastic 120ml unpreserved	B	7	7	3.0	Y	Absent		A2-FILTERMET(1)
L2140910-01C	Plastic 120ml NaOH preserved	B	7	>12	3.0	N	Absent		FCN-9016(14)
L2140910-01C1	Plastic 120ml NaOH preserved	B	>12	>12	3.0	Y	Absent		FCN-9016(14)
L2140910-01X	Plastic 120ml HNO3 preserved	B	<2	<2	3.0	Y	Absent		A2-ZN-MCP6020S-10(180),A2-BA-MCP6020S-10(180),A2-PB-MCP6020S-10(180),A2-MN-MCP6020S-10(180),A2-FE-MCP6020S-10(180)
L2140910-01X1	Plastic 120ml HNO3 preserved	B	<2	<2	3.0	Y	Absent		A2-ZN-MCP6020S-10(180),A2-BA-MCP6020S-10(180),A2-PB-MCP6020S-10(180),A2-MN-MCP6020S-10(180),A2-FE-MCP6020S-10(180)
L2140910-02A	Plastic 120ml HNO3 preserved	B	<2	<2	3.0	Y	Absent		A2-BA-MCP6020T-10(180),A2-MN-MCP6020T-10(180),A2-ZN-MCP6020T-10(180),A2-HARD-MCP6020T-10(180),A2-FE-MCP6020T-10(180),A2-PB-MCP6020T-10(180)
L2140910-02B	Plastic 120ml unpreserved	B	7	>12	3.0	N	Absent		A2-FILTERMET(1)
L2140910-02C	Plastic 120ml NaOH preserved	B	7	>12	3.0	N	Absent		FCN-9016(14)
L2140910-02X	Plastic 120ml HNO3 preserved	B	<2	<2	3.0	Y	Absent		A2-ZN-MCP6020S-10(180),A2-BA-MCP6020S-10(180),A2-PB-MCP6020S-10(180),A2-MN-MCP6020S-10(180),A2-FE-MCP6020S-10(180)

Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Serial_No: 09032112:30
Lab Number: L2140910
Report Date: 09/03/21

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2140910-03A	Plastic 120ml HNO3 preserved	B	<2	<2	3.0	Y	Absent		A2-BA-MCP6020T-10(180),A2-ZN-MCP6020T-10(180),A2-MN-MCP6020T-10(180),A2-FE-MCP6020T-10(180),A2-HARD-MCP6020T-10(180),A2-PB-MCP6020T-10(180)
L2140910-03A1	Plastic 120ml HNO3 preserved	B	<2	<2	3.0	Y	Absent		A2-BA-MCP6020T-10(180),A2-ZN-MCP6020T-10(180),A2-MN-MCP6020T-10(180),A2-FE-MCP6020T-10(180),A2-HARD-MCP6020T-10(180),A2-PB-MCP6020T-10(180)
L2140910-03B	Plastic 120ml unpreserved	B	7	>12	3.0	N	Absent		A2-FILTERMET(1)
L2140910-03B1	Plastic 120ml unpreserved	B	7	7	3.0	Y	Absent		A2-FILTERMET(1)
L2140910-03C	Plastic 120ml NaOH preserved	B	7	>12	3.0	N	Absent		FCN-9016(14)
L2140910-03C1	Plastic 120ml NaOH preserved	B	>12	>12	3.0	Y	Absent		FCN-9016(14)
L2140910-03X	Plastic 120ml HNO3 preserved	B	<2	<2	3.0	Y	Absent		A2-ZN-MCP6020S-10(180),A2-BA-MCP6020S-10(180),A2-PB-MCP6020S-10(180),A2-MN-MCP6020S-10(180),A2-FE-MCP6020S-10(180)
L2140910-03X1	Plastic 120ml HNO3 preserved	B	<2	<2	3.0	Y	Absent		A2-ZN-MCP6020S-10(180),A2-BA-MCP6020S-10(180),A2-PB-MCP6020S-10(180),A2-MN-MCP6020S-10(180),A2-FE-MCP6020S-10(180)
L2140910-04A	Glass 250ml/8oz unpreserved	B	NA		3.0	Y	Absent		A2-CR-MCP6020T-10(180),A2-BA-MCP6020T-10(180),A2-AS-MCP6020T-10(180),A2-CD-MCP6020T-10(180),A2-ZN-MCP6020T-10(180),A2-AG-MCP6020T-10(180),A2-PAH-8270SIM(14),A2-BE-MCP6020T-10(180),A2-SB-MCP6020T-10(180),A2-HG-MCP7471T-10(28),A2-CU-MCP6020T-10(180),A2-NI-MCP6020T-10(180),A2-SE-MCP6020T-10(180),A2-PB-MCP6020T-10(180),A2-TOC-9060-2REPS(28)
L2140910-04A1	Glass 250ml/8oz unpreserved	B	NA		3.0	Y	Absent		A2-CR-MCP6020T-10(180),A2-BA-MCP6020T-10(180),A2-AS-MCP6020T-10(180),A2-CD-MCP6020T-10(180),A2-ZN-MCP6020T-10(180),A2-AG-MCP6020T-10(180),A2-PAH-8270SIM(14),A2-BE-MCP6020T-10(180),A2-SB-MCP6020T-10(180),A2-HG-MCP7471T-10(28),A2-CU-MCP6020T-10(180),A2-NI-MCP6020T-10(180),A2-SE-MCP6020T-10(180),A2-PB-MCP6020T-10(180),A2-TOC-9060-2REPS(28)
L2140910-04B	Glass 120ml/4oz unpreserved	B	NA		3.0	Y	Absent		A2-DIOXIN-1613(365)
L2140910-04B1	Glass 120ml/4oz unpreserved	B	NA		3.0	Y	Absent		A2-DIOXIN-1613(365)
L2140910-04C	Plastic 8oz unpreserved for Grain Size	B	NA		3.0	Y	Absent		A2-HYDRO-TFINE(),A2-HYDRO-FSAND(),A2-HYDRO-MSAND(),A2-HYDRO-TGRAVEL(),A2-TS(7),A2-HYDRO-CSAND()

*Values in parentheses indicate holding time in days

Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Serial_No: 09032112:30
Lab Number: L2140910
Report Date: 09/03/21

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2140910-04C1	Plastic 8oz unpreserved for Grain Size	B	NA		3.0	Y	Absent		A2-HYDRO-TFINE(),A2-HYDRO-FSAND(),A2-HYDRO-MSAND(),A2-HYDRO-TGRAVEL(),A2-TS(7),A2-HYDRO-CSAND()
L2140910-04D	Glass 120ml/4oz unpreserved	B	NA		3.0	Y	Absent		FCN-9016(14)
L2140910-04D1	Glass 120ml/4oz unpreserved	B	NA		3.0	Y	Absent		FCN-9016(14)
L2140910-05A	Glass 250ml/8oz unpreserved	B	NA		3.0	Y	Absent		A2-CR-MCP6020T-10(180),A2-BA-MCP6020T-10(180),A2-AS-MCP6020T-10(180),A2-ZN-MCP6020T-10(180),A2-AG-MCP6020T-10(180),A2-CD-MCP6020T-10(180),A2-PAH-8270SIM(14),A2-BE-MCP6020T-10(180),A2-SB-MCP6020T-10(180),A2-CU-MCP6020T-10(180),A2-HG-MCP7471T-10(28),A2-NI-MCP6020T-10(180),A2-SE-MCP6020T-10(180),A2-PB-MCP6020T-10(180),A2-TOC-9060-2REPS(28)
L2140910-05B	Glass 120ml/4oz unpreserved	B	NA		3.0	Y	Absent		A2-DIOXIN-1613(365)
L2140910-05C	Plastic 8oz unpreserved for Grain Size	B	NA		3.0	Y	Absent		A2-HYDRO-TFINE(),A2-HYDRO-FSAND(),A2-HYDRO-MSAND(),A2-HYDRO-TGRAVEL(),A2-TS(7),A2-HYDRO-CSAND()
L2140910-05D	Glass 120ml/4oz unpreserved	B	NA		3.0	Y	Absent		FCN-9016(14)
L2140910-06A	Glass 250ml/8oz unpreserved	A	NA		3.4	Y	Absent		A2-BA-MCP6020T-10(180),A2-CR-MCP6020T-10(180),A2-AS-MCP6020T-10(180),A2-AG-MCP6020T-10(180),A2-ZN-MCP6020T-10(180),A2-CD-MCP6020T-10(180),A2-BE-MCP6020T-10(180),A2-PAH-8270SIM(14),A2-SB-MCP6020T-10(180),A2-NI-MCP6020T-10(180),A2-SE-MCP6020T-10(180),A2-CU-MCP6020T-10(180),A2-HG-MCP7471T-10(28),A2-TOC-9060-2REPS(28),A2-PB-MCP6020T-10(180)
L2140910-06B	Glass 120ml/4oz unpreserved	A	NA		3.4	Y	Absent		A2-DIOXIN-1613(365)
L2140910-06C	Plastic 8oz unpreserved for Grain Size	A	NA		3.4	Y	Absent		A2-HYDRO-TFINE(),A2-HYDRO-FSAND(),A2-HYDRO-MSAND(),A2-HYDRO-TGRAVEL(),A2-TS(7),A2-HYDRO-CSAND()
L2140910-06D	Glass 120ml/4oz unpreserved	A	NA		3.4	Y	Absent		FCN-9016(14)
L2140910-07A	Glass 250ml/8oz unpreserved	A	NA		3.4	Y	Absent		A2-BA-MCP6020T-10(180),A2-CR-MCP6020T-10(180),A2-AG-MCP6020T-10(180),A2-ZN-MCP6020T-10(180),A2-CD-MCP6020T-10(180),A2-AS-MCP6020T-10(180),A2-PAH-8270SIM(14),A2-BE-MCP6020T-10(180),A2-SB-MCP6020T-10(180),A2-CU-MCP6020T-10(180),A2-SE-MCP6020T-10(180),A2-NI-MCP6020T-10(180),A2-HG-MCP7471T-10(28),A2-PB-MCP6020T-10(180),A2-TOC-9060-2REPS(28)

Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Serial_No: 09032112:30
Lab Number: L2140910
Report Date: 09/03/21

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2140910-07A1	Glass 250ml/8oz unpreserved	A	NA		3.4	Y	Absent		A2-BA-MCP6020T-10(180),A2-CR-MCP6020T-10(180),A2-AG-MCP6020T-10(180),A2-ZN-MCP6020T-10(180),A2-CD-MCP6020T-10(180),A2-AS-MCP6020T-10(180),A2-PAH-8270SIM(14),A2-BE-MCP6020T-10(180),A2-SB-MCP6020T-10(180),A2-CU-MCP6020T-10(180),A2-SE-MCP6020T-10(180),A2-NI-MCP6020T-10(180),A2-HG-MCP7471T-10(28),A2-PB-MCP6020T-10(180),A2-TOC-9060-2REPS(28)
L2140910-07B	Glass 120ml/4oz unpreserved	A	NA		3.4	Y	Absent		A2-DIOXIN-1613(365)
L2140910-07B1	Glass 120ml/4oz unpreserved	A	NA		3.4	Y	Absent		A2-DIOXIN-1613(365)
L2140910-07C	Plastic 8oz unpreserved for Grain Size	A	NA		3.4	Y	Absent		A2-HYDRO-TFINE(),A2-HYDRO-FSAND(),A2-HYDRO-MSAND(),A2-HYDRO-TGRAVEL(),A2-TS(7),A2-HYDRO-CSAND()
L2140910-07C1	Plastic 8oz unpreserved for Grain Size	A	NA		3.4	Y	Absent		A2-HYDRO-TFINE(),A2-HYDRO-FSAND(),A2-HYDRO-MSAND(),A2-HYDRO-TGRAVEL(),A2-TS(7),A2-HYDRO-CSAND()
L2140910-07D	Glass 120ml/4oz unpreserved	A	NA		3.4	Y	Absent		FCN-9016(14)
L2140910-07D1	Glass 120ml/4oz unpreserved	A	NA		3.4	Y	Absent		FCN-9016(14)
L2140910-08A	Glass 250ml/8oz unpreserved	A	NA		3.4	Y	Absent		A2-CR-MCP6020T-10(180),A2-BA-MCP6020T-10(180),A2-ZN-MCP6020T-10(180),A2-AG-MCP6020T-10(180),A2-CD-MCP6020T-10(180),A2-AS-MCP6020T-10(180),A2-BE-MCP6020T-10(180),A2-PAH-8270SIM(14),A2-SB-MCP6020T-10(180),A2-HG-MCP7471T-10(28),A2-CU-MCP6020T-10(180),A2-SE-MCP6020T-10(180),A2-NI-MCP6020T-10(180),A2-PB-MCP6020T-10(180),A2-TOC-9060-2REPS(28)
L2140910-08B	Glass 120ml/4oz unpreserved	A	NA		3.4	Y	Absent		A2-DIOXIN-1613(365)
L2140910-08C	Plastic 8oz unpreserved for Grain Size	A	NA		3.4	Y	Absent		A2-HYDRO-TFINE(),A2-HYDRO-FSAND(),A2-HYDRO-MSAND(),A2-HYDRO-TGRAVEL(),A2-TS(7),A2-HYDRO-CSAND()
L2140910-08D	Glass 120ml/4oz unpreserved	A	NA		3.4	Y	Absent		FCN-9016(14)
L2140910-09A	Glass 250ml/8oz unpreserved	A	NA		3.4	Y	Absent		A2-BA-MCP6020T-10(180),A2-CR-MCP6020T-10(180),A2-ZN-MCP6020T-10(180),A2-AG-MCP6020T-10(180),A2-AS-MCP6020T-10(180),A2-CD-MCP6020T-10(180),A2-SB-MCP6020T-10(180),A2-PAH-8270SIM(14),A2-BE-MCP6020T-10(180),A2-CU-MCP6020T-10(180),A2-SE-MCP6020T-10(180),A2-HG-MCP7471T-10(28),A2-NI-MCP6020T-10(180),A2-PB-MCP6020T-10(180),A2-TOC-9060-2REPS(28)

Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Serial_No: 09032112:30
Lab Number: L2140910
Report Date: 09/03/21

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2140910-09B	Glass 120ml/4oz unpreserved	A	NA		3.4	Y	Absent		A2-DIOXIN-1613(365)
L2140910-09C	Plastic 8oz unpreserved for Grain Size	A	NA		3.4	Y	Absent		A2-HYDRO-TFINE(),A2-HYDRO-FSAND(),A2-HYDRO-MSAND(),A2-HYDRO-TGRAVEL(),A2-TS(7),A2-HYDRO-CSAND()
L2140910-09D	Glass 120ml/4oz unpreserved	A	NA		3.4	Y	Absent		FCN-9016(14)
L2140910-10A	Glass 250ml/8oz unpreserved	A	NA		3.4	Y	Absent		A2-BA-MCP6020T-10(180),A2-CR-MCP6020T-10(180),A2-CD-MCP6020T-10(180),A2-ZN-MCP6020T-10(180),A2-AG-MCP6020T-10(180),A2-AS-MCP6020T-10(180),A2-BE-MCP6020T-10(180),A2-SB-MCP6020T-10(180),A2-PAH-8270SIM(14),A2-HG-MCP7471T-10(28),A2-NI-MCP6020T-10(180),A2-CU-MCP6020T-10(180),A2-SE-MCP6020T-10(180),A2-TOC-9060-2REPS(28),A2-PB-MCP6020T-10(180)
L2140910-10B	Glass 120ml/4oz unpreserved	A	NA		3.4	Y	Absent		A2-DIOXIN-1613(365)
L2140910-10C	Plastic 8oz unpreserved for Grain Size	A	NA		3.4	Y	Absent		A2-HYDRO-TFINE(),A2-HYDRO-FSAND(),A2-HYDRO-MSAND(),A2-HYDRO-TGRAVEL(),A2-TS(7),A2-HYDRO-CSAND()
L2140910-10D	Glass 120ml/4oz unpreserved	A	NA		3.4	Y	Absent		FCN-9016(14)
L2140910-11A	Glass 250ml/8oz unpreserved	A	NA		3.4	Y	Absent		A2-CR-MCP6020T-10(180),A2-BA-MCP6020T-10(180),A2-CD-MCP6020T-10(180),A2-AS-MCP6020T-10(180),A2-AG-MCP6020T-10(180),A2-ZN-MCP6020T-10(180),A2-BE-MCP6020T-10(180),A2-PAH-8270SIM(14),A2-SB-MCP6020T-10(180),A2-CU-MCP6020T-10(180),A2-HG-MCP7471T-10(28),A2-NI-MCP6020T-10(180),A2-SE-MCP6020T-10(180),A2-PB-MCP6020T-10(180),A2-TOC-9060-2REPS(28)
L2140910-11B	Glass 120ml/4oz unpreserved	A	NA		3.4	Y	Absent		A2-DIOXIN-1613(365)
L2140910-11C	Plastic 8oz unpreserved for Grain Size	A	NA		3.4	Y	Absent		A2-HYDRO-TFINE(),A2-HYDRO-FSAND(),A2-HYDRO-MSAND(),A2-HYDRO-TGRAVEL(),A2-TS(7),A2-HYDRO-CSAND()
L2140910-11D	Glass 120ml/4oz unpreserved	A	NA		3.4	Y	Absent		FCN-9016(14)
L2140910-12A	Plastic 120ml HNO3 preserved	A	<2	<2	3.4	Y	Absent		A2-BA-MCP6020T-10(180),A2-MN-MCP6020T-10(180),A2-ZN-MCP6020T-10(180),A2-FE-MCP6020T-10(180),A2-HARD-MCP6020T-10(180),A2-PB-MCP6020T-10(180)
L2140910-12B	Plastic 120ml unpreserved	A	7	>12	3.4	N	Absent		A2-FILTERMET(1)
L2140910-12C	Plastic 120ml NaOH preserved	A	7	>12	3.4	N	Absent		FCN-9016(14)

Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Serial_No: 09032112:30
Lab Number: L2140910
Report Date: 09/03/21

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2140910-12X	Plastic 120ml HNO3 preserved	A	<2	<2	3.4	Y	Absent		A2-ZN-MCP6020S-10(180),A2-BA-MCP6020S-10(180),A2-PB-MCP6020S-10(180),A2-MN-MCP6020S-10(180),A2-FE-MCP6020S-10(180)
L2140910-13A	Glass 250ml/8oz unpreserved	A	NA		3.4	Y	Absent		A2-BA-MCP6020T-10(180),A2-CR-MCP6020T-10(180),A2-CD-MCP6020T-10(180),A2-AS-MCP6020T-10(180),A2-ZN-MCP6020T-10(180),A2-AG-MCP6020T-10(180),A2-PAH-8270SIM(14),A2-BE-MCP6020T-10(180),A2-SB-MCP6020T-10(180),A2-HG-MCP7471T-10(28),A2-NI-MCP6020T-10(180),A2-SE-MCP6020T-10(180),A2-CU-MCP6020T-10(180),A2-TOC-9060-2REPS(28),A2-PB-MCP6020T-10(180)
L2140910-13B	Glass 120ml/4oz unpreserved	A	NA		3.4	Y	Absent		A2-DIOXIN-1613(365)
L2140910-13C	Plastic 8oz unpreserved for Grain Size	A	NA		3.4	Y	Absent		A2-HYDRO-TFINE(),A2-HYDRO-FSAND(),A2-HYDRO-MSAND(),A2-TS(7),A2-HYDRO-TGRAVEL(),A2-HYDRO-CSAND()
L2140910-13D	Glass 120ml/4oz unpreserved	A	NA		3.4	Y	Absent		FCN-9016(14)
L2140910-14A	Glass 250ml/8oz unpreserved	A	NA		3.4	Y	Absent		A2-CR-MCP6020T-10(180),A2-BA-MCP6020T-10(180),A2-CD-MCP6020T-10(180),A2-AS-MCP6020T-10(180),A2-AG-MCP6020T-10(180),A2-ZN-MCP6020T-10(180),A2-BE-MCP6020T-10(180),A2-SB-MCP6020T-10(180),A2-PAH-8270SIM(14),A2-SE-MCP6020T-10(180),A2-NI-MCP6020T-10(180),A2-CU-MCP6020T-10(180),A2-HG-MCP7471T-10(28),A2-TOC-9060-2REPS(28),A2-PB-MCP6020T-10(180)
L2140910-14B	Glass 120ml/4oz unpreserved	A	NA		3.4	Y	Absent		A2-DIOXIN-1613(365)
L2140910-14C	Plastic 8oz unpreserved for Grain Size	A	NA		3.4	Y	Absent		A2-HYDRO-TFINE(),A2-HYDRO-FSAND(),A2-HYDRO-MSAND(),A2-TS(7),A2-HYDRO-TGRAVEL(),A2-HYDRO-CSAND()
L2140910-14D	Glass 120ml/4oz unpreserved	A	NA		3.4	Y	Absent		FCN-9016(14)
L2140910-15A	Glass 250ml/8oz unpreserved	A	NA		3.4	Y	Absent		A2-BA-MCP6020T-10(180),A2-CR-MCP6020T-10(180),A2-ZN-MCP6020T-10(180),A2-AS-MCP6020T-10(180),A2-CD-MCP6020T-10(180),A2-AG-MCP6020T-10(180),A2-BE-MCP6020T-10(180),A2-PAH-8270SIM(14),A2-SB-MCP6020T-10(180),A2-HG-MCP7471T-10(28),A2-SE-MCP6020T-10(180),A2-CU-MCP6020T-10(180),A2-NI-MCP6020T-10(180),A2-PB-MCP6020T-10(180),A2-TOC-9060-2REPS(28)
L2140910-15B	Glass 120ml/4oz unpreserved	A	NA		3.4	Y	Absent		A2-DIOXIN-1613(365)

*Values in parentheses indicate holding time in days

Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Serial_No: 09032112:30
Lab Number: L2140910
Report Date: 09/03/21

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2140910-15C	Plastic 8oz unpreserved for Grain Size	A	NA		3.4	Y	Absent		A2-HYDRO-TFINE(),A2-HYDRO-FSAND(),A2-HYDRO-MSAND(),A2-TS(7),A2-HYDRO-TGRAVEL(),A2-HYDRO-CSAND()
L2140910-15D	Glass 120ml/4oz unpreserved	A	NA		3.4	Y	Absent		FCN-9016(14)
L2140910-16A	Glass 250ml/8oz unpreserved	A	NA		3.4	Y	Absent		A2-CR-MCP6020T-10(180),A2-BA-MCP6020T-10(180),A2-AS-MCP6020T-10(180),A2-ZN-MCP6020T-10(180),A2-AG-MCP6020T-10(180),A2-CD-MCP6020T-10(180),A2-PAH-8270SIM(14),A2-BE-MCP6020T-10(180),A2-SB-MCP6020T-10(180),A2-CU-MCP6020T-10(180),A2-HG-MCP7471T-10(28),A2-NI-MCP6020T-10(180),A2-SE-MCP6020T-10(180),A2-PB-MCP6020T-10(180),A2-TOC-9060-2REPS(28)
L2140910-16B	Glass 120ml/4oz unpreserved	A	NA		3.4	Y	Absent		A2-DIOXIN-1613(365)
L2140910-16C	Plastic 8oz unpreserved for Grain Size	A	NA		3.4	Y	Absent		A2-HYDRO-TFINE(),A2-HYDRO-FSAND(),A2-HYDRO-MSAND(),A2-TS(7),A2-HYDRO-TGRAVEL(),A2-HYDRO-CSAND()
L2140910-16D	Glass 120ml/4oz unpreserved	A	NA		3.4	Y	Absent		FCN-9016(14)
L2140910-19A	Plastic 120ml HNO3 preserved	A	<2	<2	3.4	Y	Absent		A2-BA-MCP6020T-10(180),A2-MN-MCP6020T-10(180),A2-ZN-MCP6020T-10(180),A2-FE-MCP6020T-10(180),A2-HARD-MCP6020T-10(180),A2-PB-MCP6020T-10(180)
L2140910-19B	Plastic 120ml unpreserved	A	7	>12	3.4	N	Absent		-
L2140910-19C	Plastic 120ml unpreserved	A	7	>12	3.4	N	Absent		FCN-9016(14)
L2140910-19X	Plastic 250ml HNO3 preserved	A	NA		3.4	Y	Absent		A2-ZN-MCP6020S-10(180),A2-BA-MCP6020S-10(180),A2-PB-MCP6020S-10(180),A2-FILTERMET(1),A2-MN-MCP6020S-10(180),A2-FE-MCP6020S-10(180)

Project Name: BELMONT LANDFILL
Project Number: 2018-0157

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GLOSSARY

Acronyms

DL	- Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EMPC	- Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LOD	- Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
LOQ	- Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.) Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
NR	- No Results: Term is utilized when 'No Target Compounds Requested' is reported for the analysis of Volatile or Semivolatile Organic TIC only requests.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TEF	- Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.
TEQ	- Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Report Format: DU Report with 'J' Qualifiers



Project Name: BELMONT LANDFILL
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Footnotes

- 1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Difference: With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

PAH Total: With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. In addition, the 'PFAS, Total (6)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA, PFDA and PFOS. For MassDEP DW compliance analysis only, the 'PFAS, Total (6)' result is defined as the summation of results at or above the RL. Note: If a 'Total' result is requested, the results of its individual components will also be reported.

The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA, this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

- A** - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.
- B** - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).
- C** - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
- D** - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
- E** - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- F** - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.
- G** - The concentration may be biased high due to matrix interferences (i.e. co-elution) with non-target compound(s). The result should be considered estimated.
- H** - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
- I** - The lower value for the two columns has been reported due to obvious interference.
- J** - Estimated value. The Target analyte concentration is below the quantitation limit (RL), but above the Method Detection Limit (MDL) or Estimated Detection Limit (EDL) for SPME-related analyses. This represents an estimated concentration for Tentatively Identified Compounds (TICs).
- M** - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.
- ND** - Not detected at the method detection limit (MDL) for the sample, or estimated detection limit (EDL) for SPME-related analyses.

Report Format: DU Report with 'J' Qualifiers



Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140910
Report Date: 09/03/21

Data Qualifiers

- NJ** - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.
- P** - The RPD between the results for the two columns exceeds the method-specified criteria.
- Q** - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)
- R** - Analytical results are from sample re-analysis.
- RE** - Analytical results are from sample re-extraction.
- S** - Analytical results are from modified screening analysis.

Project Name: BELMONT LANDFILL
Project Number: 2018-0157

Lab Number: L2140910
Report Date: 09/03/21

REFERENCES

- 1 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - VI, 2018.
- 12 Annual Book of ASTM Standards. (American Society for Testing and Materials) ASTM International.
- 97 EPA Test Methods (SW-846) with QC Requirements & Performance Standards for the Analysis of EPA SW-846 Methods under the Massachusetts Contingency Plan, WSC-CAM-IIA, IIB, IIIA, IIIB, IIIC, IIID, VA, VB, VC, VIA, VIB, VIIIA and VIIB, July 2010.
- 109 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Revision 0, June 2010.
- 121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.
- 132 Method 1613 Revision B: Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution HRGC/HRMS. USEPA Office of Water, October 1994.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

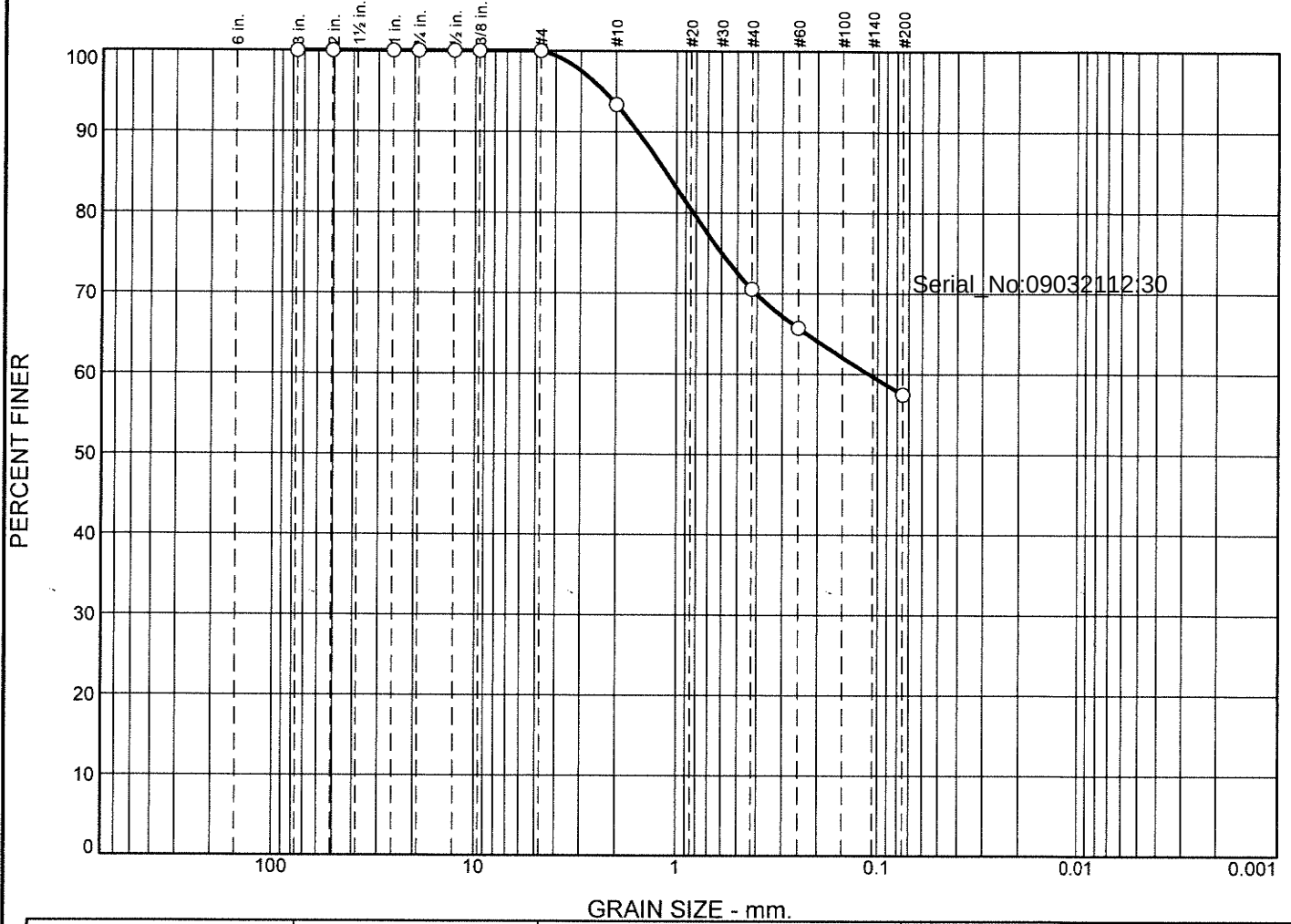
We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



Serial_No:09032112:30

ASTM D6913/D7928
GRAIN SIZE ANALYSIS

Particle Size Distribution Report

[illegible]

Material Description	USCS	AASHTO
○		

Project No.	Client:	Remarks:
Project:		
○ Source of Sample: SED-11	Sample Number: L2140910-04	
Alpha Analytical		Figure
Mansfield, MA		

GRAIN SIZE DISTRIBUTION TEST DATA

8/24/2021

Location: SED-11

Sample Number: L2140910-04

Sieve Test Data

Post #200 Wash Test Weights (grams): Dry Sample and Tare = 19.18
 Tare Wt. = 0.00
 Minus #200 from wash = 0.0%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
19.18	0.00	3"	0.00	0.00	100.0
		2"	0.00	0.00	100.0
		1"	0.00	0.00	100.0
		3/4"	0.00	0.00	100.0
		1/2"	0.00	0.00	100.0
		3/8"	0.00	0.00	100.0
		#4	0.00	0.00	100.0
		#10	1.27	0.00	93.4
		#40	4.38	0.00	70.5
		#60	0.92	0.00	65.7
		#200	1.59	0.00	57.5

Serial_No:09032112:30

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	6.6	22.9	13.0	42.5			57.5

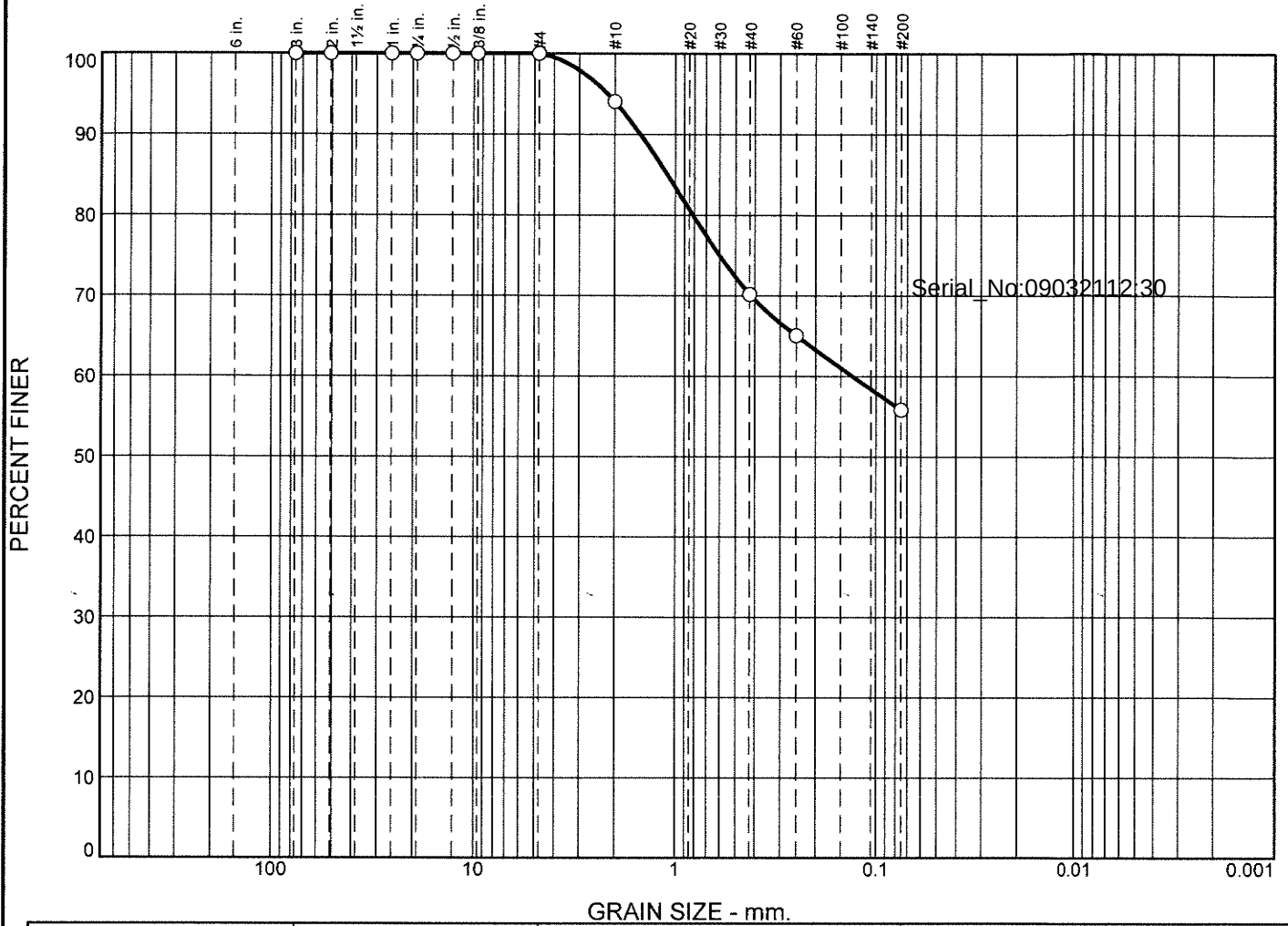
D ₅	D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₄₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
							0.1107	0.8280	1.1288	1.5604	2.2955

Fineness Modulus

1.15

Alpha Analytical

Particle Size Distribution Report

[illegible]

Material Description	USCS	AASHTO
○		

Project No.	Client:	Remarks:
Project:		
○ Source of Sample: SED-11 Sample Number: WG1536977-1		
Alpha Analytical		Figure
Mansfield, MA		

GRAIN SIZE DISTRIBUTION TEST DATA

8/24/2021

Location: SED-11

Sample Number: WG1536977-1

Sieve Test Data

Post #200 Wash Test Weights (grams): Dry Sample and Tare = 19.13
Tare Wt. = 0.00
Minus #200 from wash = 0.0%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
19.13	0.00	3"	0.00	0.00	100.0
		2"	0.00	0.00	100.0
		1"	0.00	0.00	100.0
		3/4"	0.00	0.00	100.0
		1/2"	0.00	0.00	100.0
		3/8"	0.00	0.00	100.0
		#4	0.00	0.00	100.0
		#10	1.14	0.00	94.0
		#40	4.56	0.00	70.2
		#60	0.98	0.00	65.1
		#200	1.77	0.00	55.8

Serial_No:09032112:30

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	6.0	23.8	14.4	44.2			55.8

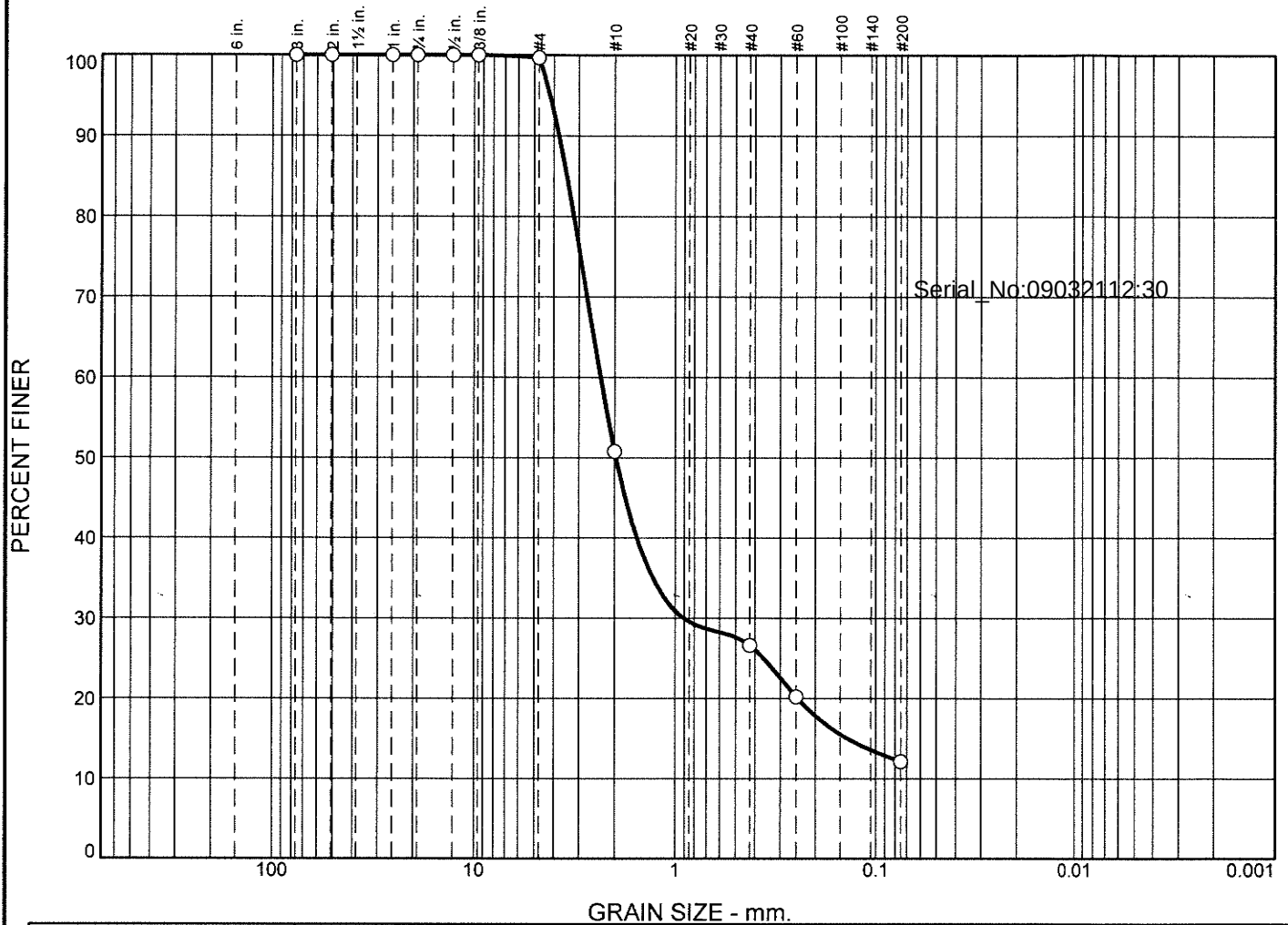
D ₅	D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₄₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
							0.1312	0.8142	1.0929	1.4906	2.1728

Fineness Modulus

1.15

Alpha Analytical

Particle Size Distribution Report



GRAIN SIZE - mm.									
% +3"		% Gravel		% Sand			% Fines		
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay	
○	0.0	0.0	0.3	48.9	24.2	14.5	12.1		
×	LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c
○			3.4528	2.3435	1.9695	0.9038	0.1382		C _u

Material Description							USCS	AASHTO
○								

Project No. Project: ○ Source of Sample: SED-12 Sample Number: L2140910-05	Client: Alpha Analytical Mansfield, MA	Remarks: Figure

GRAIN SIZE DISTRIBUTION TEST DATA

8/24/2021

Location: SED-12

Sample Number: L2140910-05

Sieve Test Data

Post #200 Wash Test Weights (grams): Dry Sample and Tare = 20.77
Tare Wt. = 0.00
Minus #200 from wash = 0.0%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
20.77	0.00	3"	0.00	0.00	100.0
		2"	0.00	0.00	100.0
		1"	0.00	0.00	100.0
		3/4"	0.00	0.00	100.0
		1/2"	0.00	0.00	100.0
		3/8"	0.00	0.00	100.0
		#4	0.07	0.00	99.7
		#10	10.15	0.00	50.8
		#40	5.02	0.00	26.6
		#60	1.33	0.00	20.2
		#200	1.68	0.00	12.1

Serial_No:09032112:30

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.3	0.3	48.9	24.2	14.5	87.6			12.1

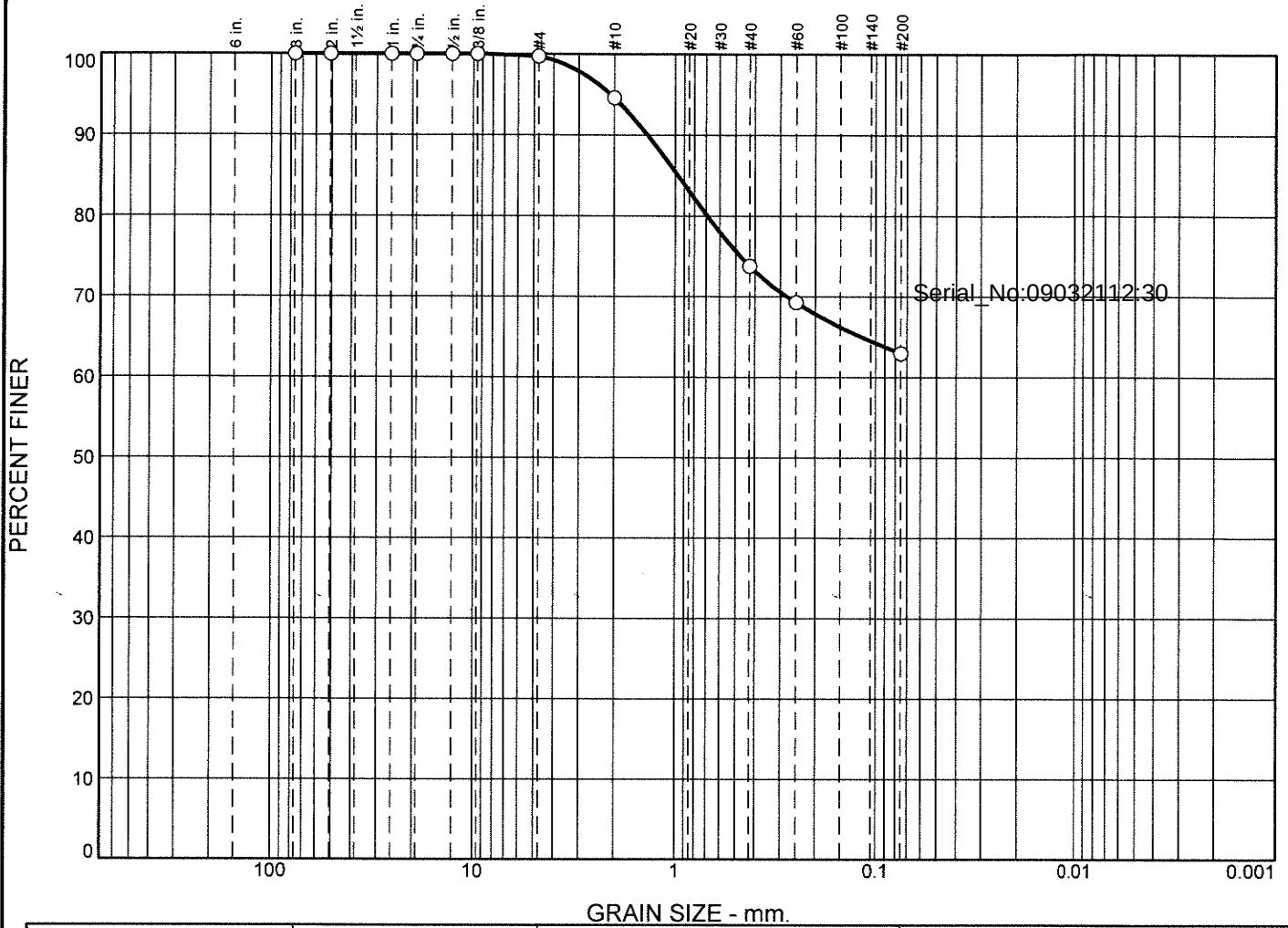
D ₅	D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₄₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
		0.1382	0.2454	0.9038	1.5494	1.9695	2.3435	3.1847	3.4528	3.7701	4.1753

Fineness Modulus

3.40

Alpha Analytical

Particle Size Distribution Report

[illegible]

Material Description	USCS	AASHTO
○		

Project No.	Client:	Remarks:
Project:		
○ Source of Sample: SOIL-14 Sample Number: L2140910-06		
Alpha Analytical		Figure
Mansfield, MA		

GRAIN SIZE DISTRIBUTION TEST DATA

8/24/2021

Location: SOIL-14

Sample Number: L2140910-06

Sieve Test Data

Post #200 Wash Test Weights (grams): Dry Sample and Tare = 33.29
 Tare Wt. = 0.00
 Minus #200 from wash = 0.0%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
33.29	0.00	3"	0.00	0.00	100.0
		2"	0.00	0.00	100.0
		1"	0.00	0.00	100.0
		3/4"	0.00	0.00	100.0
		1/2"	0.00	0.00	100.0
		3/8"	0.00	0.00	100.0
		#4	0.10	0.00	99.7
		#10	1.70	0.00	94.6
		#40	6.93	0.00	73.8
		#60	1.50	0.00	69.3
		#200	2.10	0.00	63.0

Serial_No:09032112:30

Fractional Components

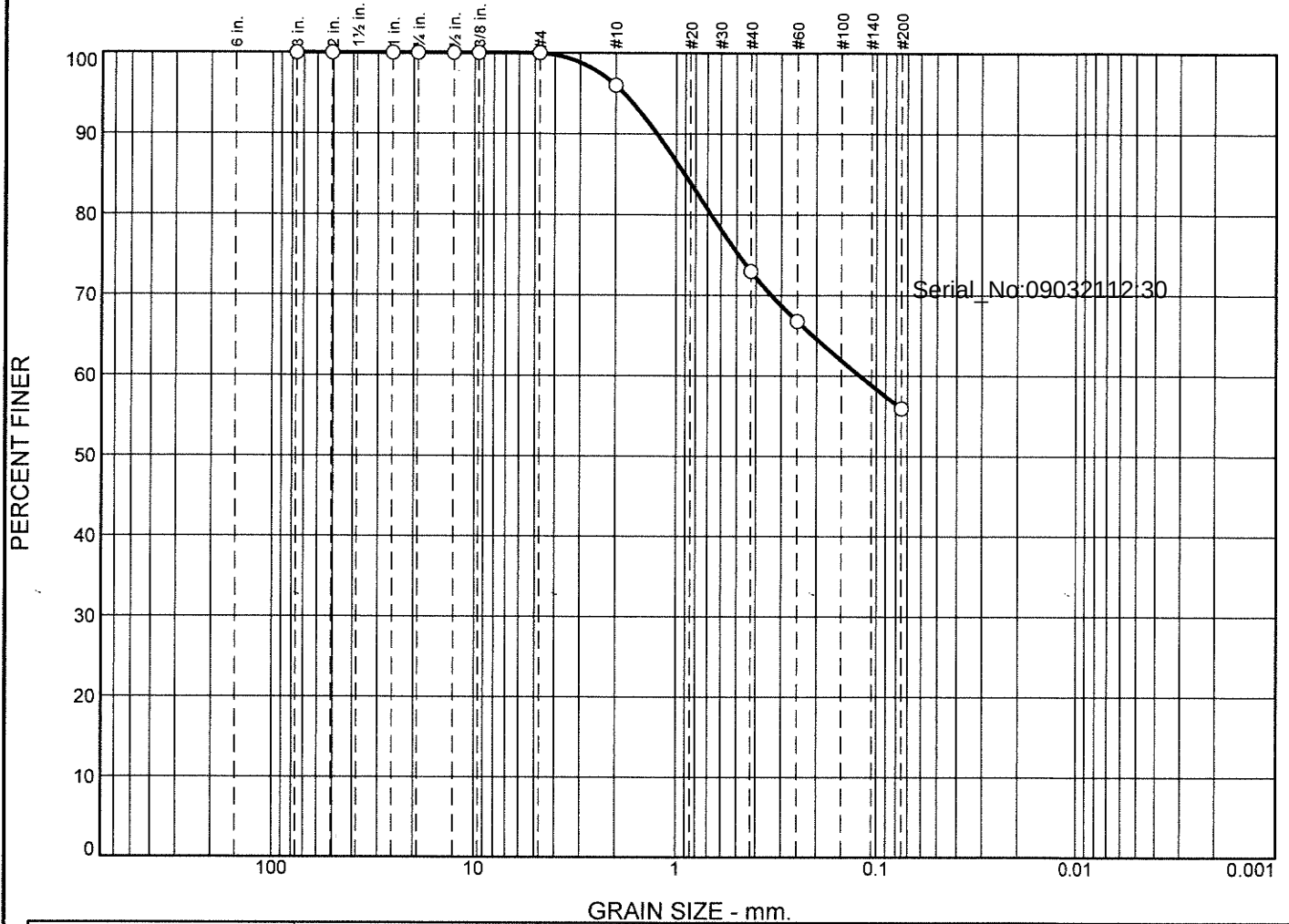
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.3	0.3	5.1	20.8	10.8	36.7			63.0

D ₅	D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₄₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
								0.6898	0.9682	1.3705	2.0823

Fineness Modulus
1.01

Alpha Analytical

Particle Size Distribution Report



GRAIN SIZE - mm.										
% +3"			% Gravel		% Sand			% Fines		
			Coarse	Fine	Coarse	Medium	Fine	Silt		Clay
○	0.0		0.0	0.0	4.0	23.0	17.1	55.9		
×	LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
○			0.9064	0.1212						

Material Description							USCS	AASHTO

Project No.	Client:	Remarks:
Project:		
Source of Sample: SED-10	Sample Number: L2140910-07	
Alpha Analytical		Figure
Mansfield, MA		

GRAIN SIZE DISTRIBUTION TEST DATA

8/24/2021

Location: SED-10

Sample Number: L2140910-07

Sieve Test Data

Post #200 Wash Test Weights (grams): Dry Sample and Tare = 30.29
Tare Wt. = 0.00
Minus #200 from wash = 0.0%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
30.29	0.00	3"	0.00	0.00	100.0
		2"	0.00	0.00	100.0
		1"	0.00	0.00	100.0
		3/4"	0.00	0.00	100.0
		1/2"	0.00	0.00	100.0
		3/8"	0.00	0.00	100.0
		#4	0.00	0.00	100.0
		#10	1.21	0.00	96.0
		#40	6.97	0.00	73.0
		#60	1.88	0.00	66.8
		#200	3.29	0.00	55.9

Serial_No:09032112:30

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	4.0	23.0	17.1	44.1			55.9

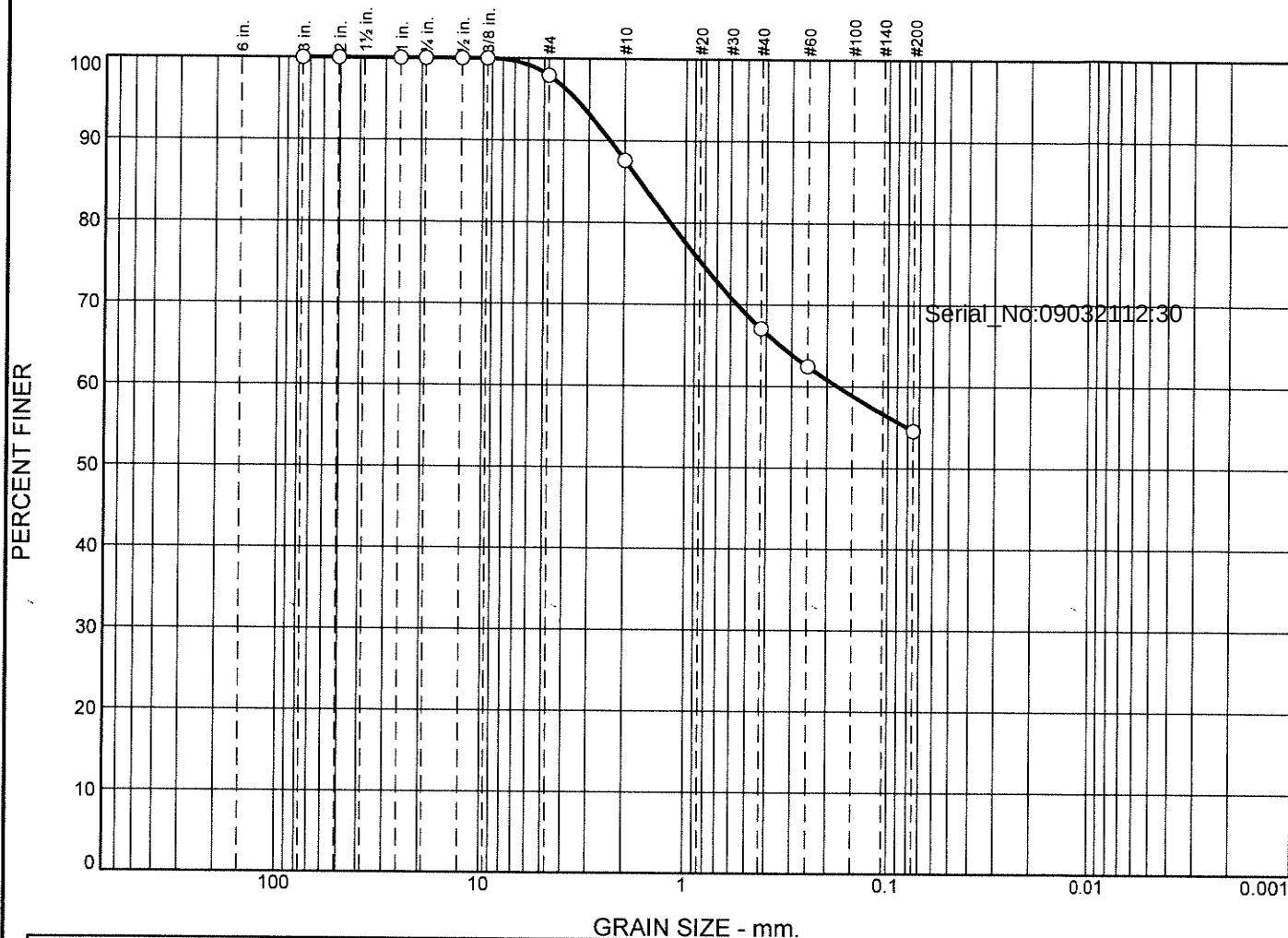
D ₅	D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₄₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
							0.1212	0.6707	0.9064	1.2424	1.8151

Fineness Modulus

1.05

Alpha Analytical

Particle Size Distribution Report



GRAIN SIZE - mm.												
% +3"			% Gravel		% Sand			% Fines				
			Coarse	Fine	Coarse	Medium	Fine	Silt		Clay		
○	0.0		0.0	2.1	10.3	20.5	12.6	54.5				
×	LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u		
○			1.6748	0.1778								
Material Description									USCS	AASHTO		
○												

Project No. Project: ○ Source of Sample: SED-3 Sample Number: L2140910-08	Remarks: Figure
Alpha Analytical Mansfield, MA	

GRAIN SIZE DISTRIBUTION TEST DATA

8/24/2021

Location: SED-3

Sample Number: L2140910-08

Sieve Test Data

Post #200 Wash Test Weights (grams): Dry Sample and Tare = 29.57
Tare Wt. = 0.00
Minus #200 from wash = 0.0%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
29.57	0.00	3"	0.00	0.00	100.0
		2"	0.00	0.00	100.0
		1"	0.00	0.00	100.0
		3/4"	0.00	0.00	100.0
		1/2"	0.00	0.00	100.0
		3/8"	0.00	0.00	100.0
		#4	0.61	0.00	97.9
		#10	3.06	0.00	87.6
		#40	6.07	0.00	67.1
		#60	1.36	0.00	62.5
		#200	2.34	0.00	54.5

Serial_No:09032112:30

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	2.1	2.1	10.3	20.5	12.6	43.4			54.5

D ₅	D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₄₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
							0.1778	1.1865	1.6748	2.3647	3.4754

Fineness Modulus

1.39

Alpha Analytical

Particle Size Distribution Report

Serial No: 09032112-30

GRAIN SIZE - mm.									
% +3"		% Gravel		% Sand			% Fines		
		Coarse	Fine	Coarse	Medium	Fine	Silt		Clay
0.0		0.0	8.2	6.2	23.3	28.1	34.2		
LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
		1.8485	0.3780	0.2236					
Material Description								USCS	AASHTO
Project No. Client:							Remarks:		
Project:									
Source of Sample: SOIL-12 Sample Number: L2140910-09									
Alpha Analytical							Figure		
Mansfield, MA									

GRAIN SIZE DISTRIBUTION TEST DATA

8/24/2021

Location: SOIL-12

Sample Number: L2140910-09

Sieve Test Data

Post #200 Wash Test Weights (grams): Dry Sample and Tare = 141.47

Tare Wt. = 0.00

Minus #200 from wash = 0.0%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
141.47	0.00	3"	0.00	0.00	100.0
		2"	0.00	0.00	100.0
		1"	0.00	0.00	100.0
		3/4"	0.00	0.00	100.0
		1/2"	0.00	0.00	100.0
		3/8"	0.00	0.00	100.0
		#4	11.65	0.00	91.8
		#10	8.67	0.00	85.6
		#40	32.97	0.00	62.3
		#60	14.64	0.00	52.0
		#200	25.09	0.00	34.2

Serial_No:09032112:30

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	8.2	8.2	6.2	23.3	28.1	57.6			34.2

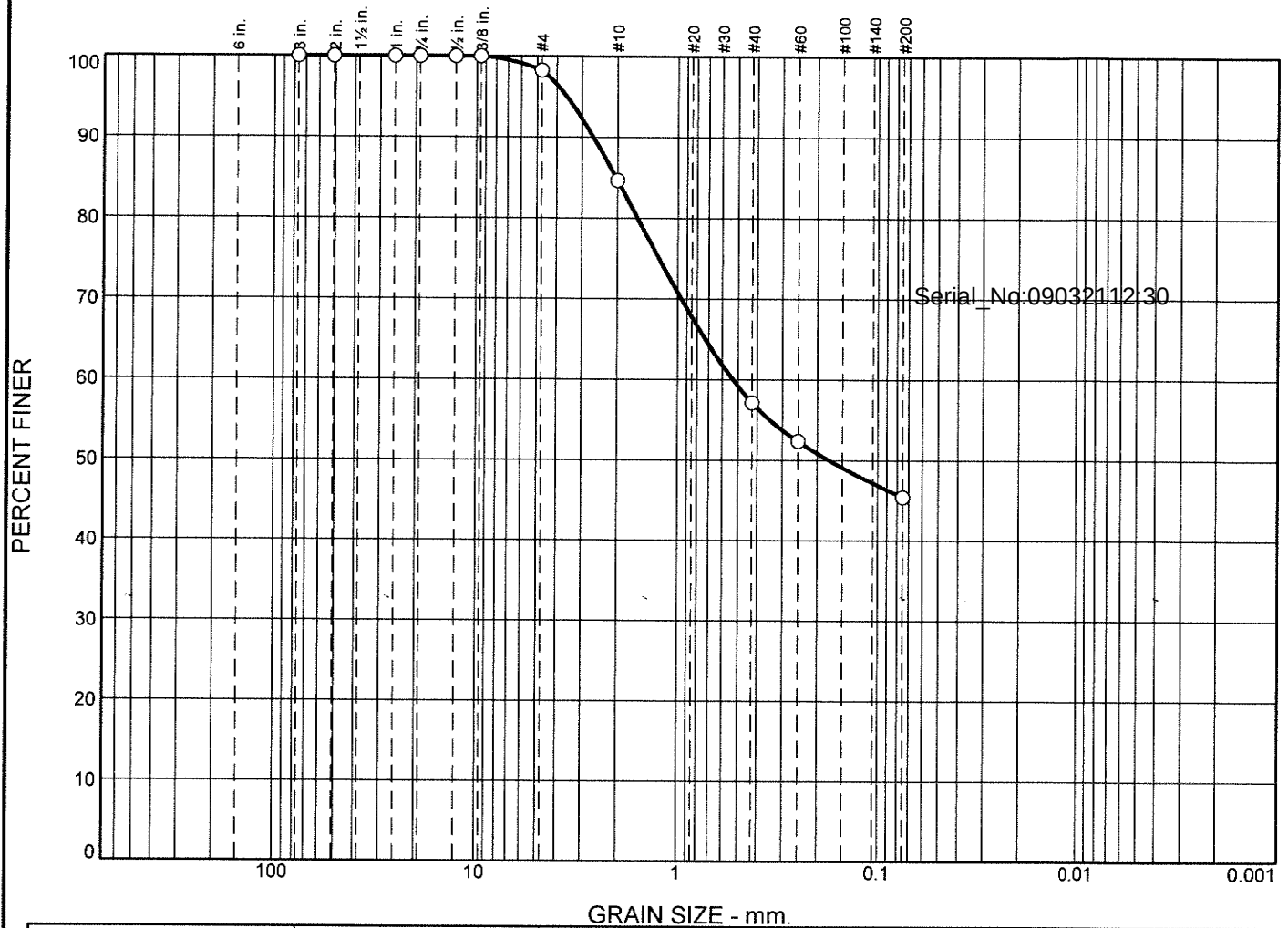
D ₅	D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₄₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
					0.1159	0.2236	0.3780	1.1821	1.8485	3.9815	6.0242

Fineness Modulus

1.73

Alpha Analytical

Particle Size Distribution Report



GRAIN SIZE - mm.										
% +3"			% Gravel		% Sand			% Fines		
			Coarse	Fine	Coarse	Medium	Fine	Silt	Clay	
○	0.0		0.0	1.7	13.6	27.6	11.7	45.4		
×	LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
○			2.0338	0.5297	0.1749					

Material Description								USCS	AASHTO

Project No. Project: ○ Source of Sample: SOIL-13 Sample Number: L2140910-10	Client: Alpha Analytical Mansfield, MA	Remarks: Figure

GRAIN SIZE DISTRIBUTION TEST DATA

8/24/2021

Location: SOIL-13

Sample Number: L2140910-10

Sieve Test Data

Post #200 Wash Test Weights (grams): Dry Sample and Tare = 27.65
Tare Wt. = 0.00
Minus #200 from wash = 0.0%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
27.65	0.00	3"	0.00	0.00	100.0
		2"	0.00	0.00	100.0
		1"	0.00	0.00	100.0
		3/4"	0.00	0.00	100.0
		1/2"	0.00	0.00	100.0
		3/8"	0.00	0.00	100.0
		#4	0.48	0.00	98.3
		#10	3.76	0.00	84.7
		#40	7.61	0.00	57.1
		#60	1.32	0.00	52.4
		#200	1.92	0.00	45.4

Serial_No:09032112:30

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	1.7	1.7	13.6	27.6	11.7	52.9			45.4

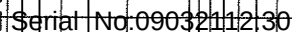
D ₅	D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₄₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
						0.1749	0.5297	1.5867	2.0338	2.6353	3.5670

Fineness Modulus

1.75

Alpha Analytical

PERCENT FINER



Project No.	Client:	Remarks:
Project:		
○ Source of Sample: SED-8	Sample Number: L2140910-11	
Alpha Analytical		Figure
Mansfield, MA		

GRAIN SIZE DISTRIBUTION TEST DATA

8/24/2021

Location: SED-8

Sample Number: L2140910-11

Sieve Test Data

Post #200 Wash Test Weights (grams): Dry Sample and Tare = 73.07
Tare Wt. = 0.00
Minus #200 from wash = 0.0%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
73.07	0.00	3"	0.00	0.00	100.0
		2"	0.00	0.00	100.0
		1"	0.00	0.00	100.0
		3/4"	0.00	0.00	100.0
		1/2"	0.00	0.00	100.0
		3/8"	0.00	0.00	100.0
		#4	0.07	0.00	99.9
		#10	1.10	0.00	98.4
		#40	9.25	0.00	85.7
		#60	4.23	0.00	80.0
		#200	9.94	0.00	66.3

Serial_No:09032112:30

Fractional Components

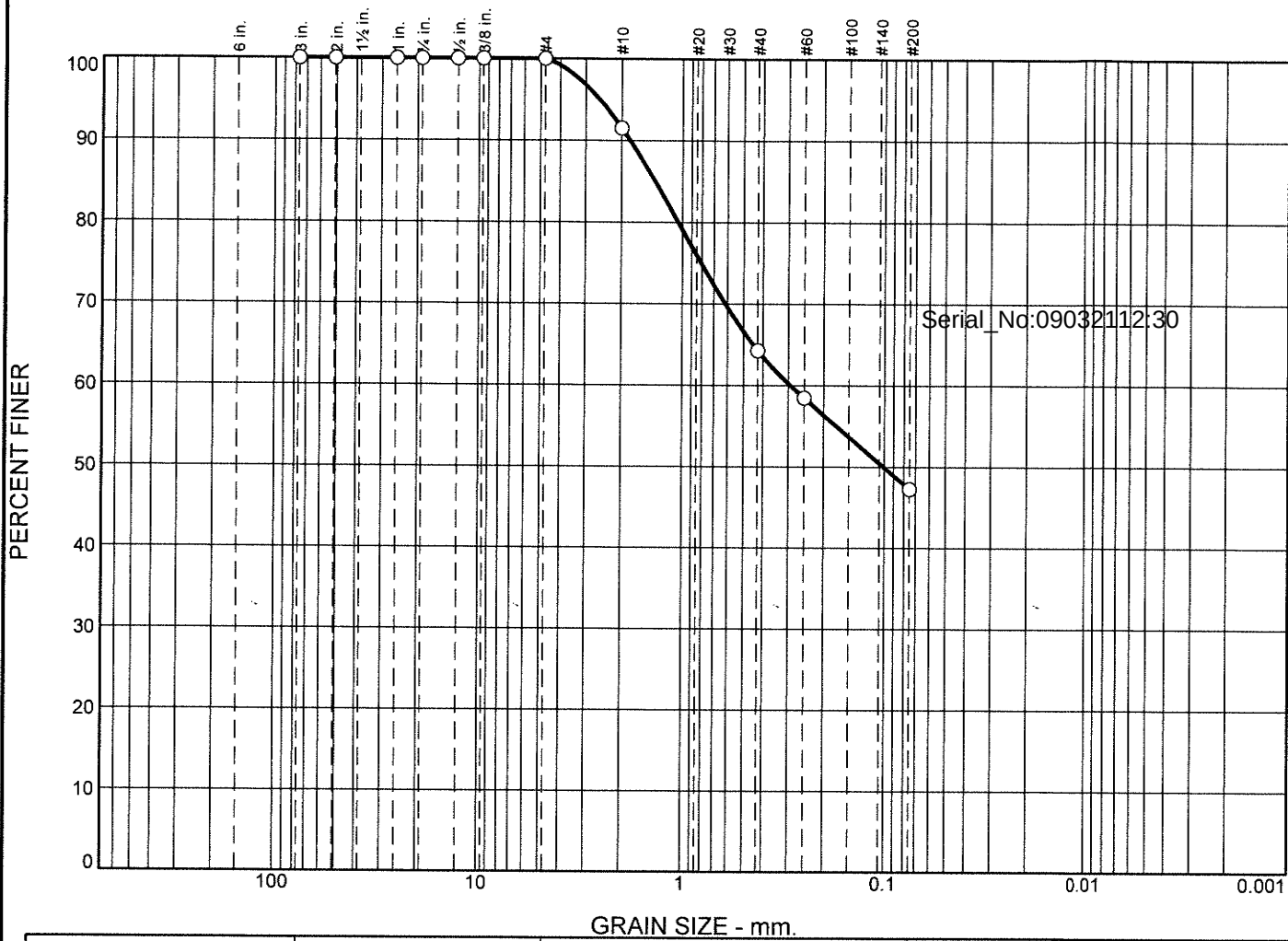
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.1	0.1	1.5	12.7	19.4	33.6			66.3

D ₅	D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₄₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
								0.2511	0.3966	0.6421	1.1291

Fineness Modulus
0.60

Alpha Analytical

Particle Size Distribution Report



GRAIN SIZE ANALYSIS												
% +3"			% Gravel		% Sand			% Fines				
			Coarse	Fine	Coarse	Medium	Fine	Silt		Clay		
○	0.0		0.0	0.0	8.5	27.2	17.0	47.3				
×	LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u		
○			1.3666	0.2919	0.1010							
Material Description									USCS	AASHTO		
○												

Project No.	Client:	Remarks:
Project:		
○ Source of Sample: SOIL-11 Sample Number: L2140910-13		
Alpha Analytical		Figure
Mansfield, MA		

GRAIN SIZE DISTRIBUTION TEST DATA

8/24/2021

Location: SOIL-11

Sample Number: L2140910-13

Sieve Test Data

Post #200 Wash Test Weights (grams): Dry Sample and Tare = 40.83
 Tare Wt. = 0.00
 Minus #200 from wash = 0.0%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
40.83	0.00	3"	0.00	0.00	100.0
		2"	0.00	0.00	100.0
		1"	0.00	0.00	100.0
		3/4"	0.00	0.00	100.0
		1/2"	0.00	0.00	100.0
		3/8"	0.00	0.00	100.0
		#4	0.00	0.00	100.0
		#10	3.46	0.00	91.5
		#40	11.12	0.00	64.3
		#60	2.37	0.00	58.5
		#200	4.58	0.00	47.3

Serial_No:09032112:30

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	8.5	27.2	17.0	52.7			47.3

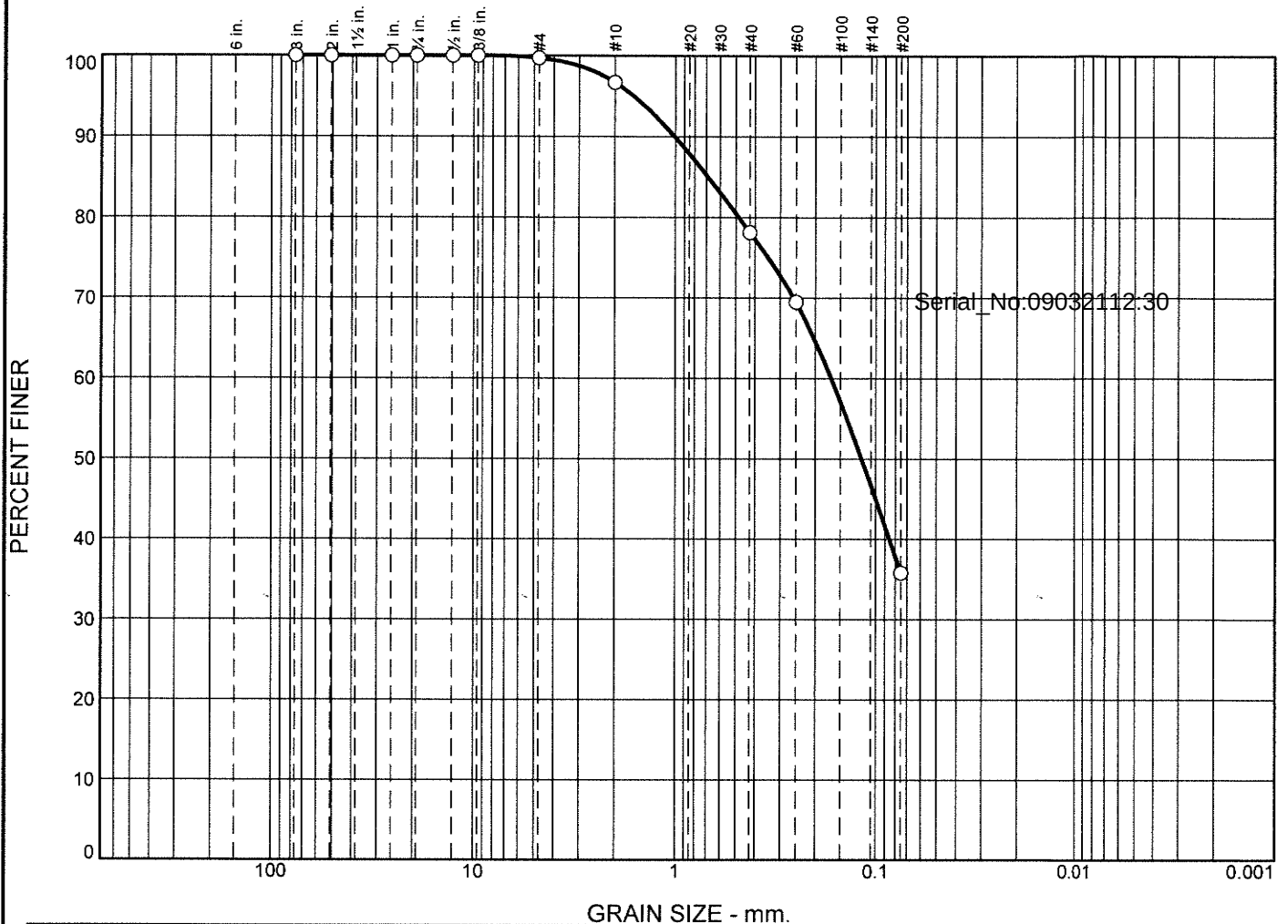
D ₅	D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₄₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
						0.1010	0.2919	1.0493	1.3666	1.8174	2.5633

Fineness Modulus

1.40

Alpha Analytical

Particle Size Distribution Report



GRAIN SIZE - mm.									
% +3"	% Gravel		% Sand			% Fines			
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay		
0.0	0.0	0.3	3.0	18.6	42.3	35.8			
LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
		0.6870	0.1668	0.1177					
Material Description							USCS	AASHTO	

Project No. Project: ○ Source of Sample: SED-5 Sample Number: L2140910-14	Client: Alpha Analytical Mansfield, MA	Remarks: Figure

GRAIN SIZE DISTRIBUTION TEST DATA

8/24/2021

Location: SED-5

Sample Number: L2140910-14

Sieve Test Data

Post #200 Wash Test Weights (grams): Dry Sample and Tare = 41.94
 Tare Wt. = 0.00
 Minus #200 from wash = 0.0%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
41.94	0.00	3"	0.00	0.00	100.0
		2"	0.00	0.00	100.0
		1"	0.00	0.00	100.0
		3/4"	0.00	0.00	100.0
		1/2"	0.00	0.00	100.0
		3/8"	0.00	0.00	100.0
		#4	0.12	0.00	99.7
		#10	1.26	0.00	96.7
		#40	7.79	0.00	78.1
		#60	3.62	0.00	69.5
		#200	14.13	0.00	35.8

Serial_No:09032112:30

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.3	0.3	3.0	18.6	42.3	63.9			35.8

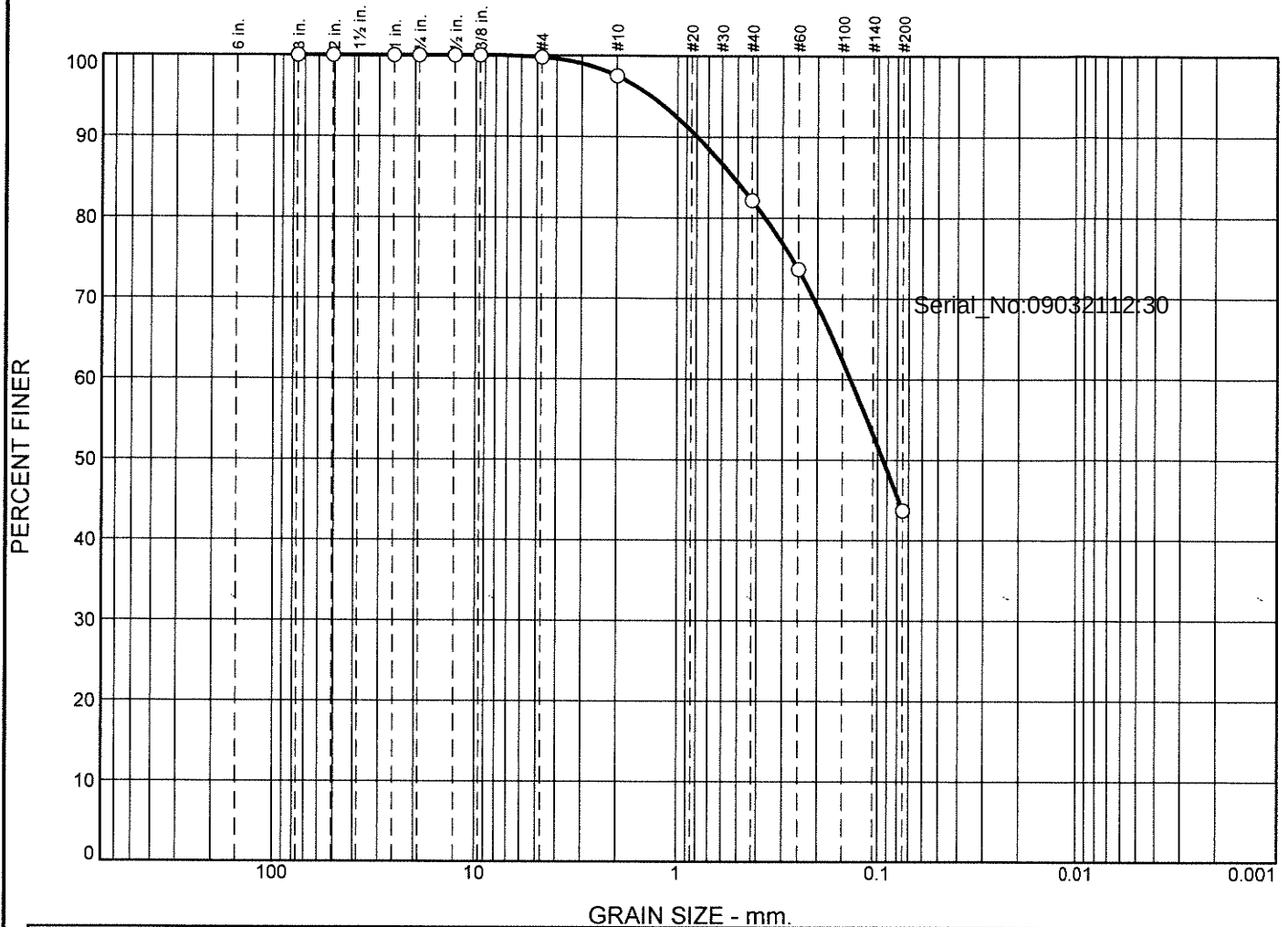
D ₅	D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₄₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
					0.0855	0.1177	0.1668	0.4833	0.6870	1.0065	1.6095

Fineness Modulus

0.98

Alpha Analytical

Particle Size Distribution Report



GRAIN SIZE - mm.									
% +3"		% Gravel		% Sand			% Fines		
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay	
○	0.0	0.0	0.2	2.3	15.4	38.4	43.7		
×	LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c
○			0.5249	0.1369	0.0941				

Material Description							USCS	AASHTO
○								

Project No. Project: ○ Source of Sample: SED-6 Sample Number: L2140910-15	Client: 	Remarks:
Alpha Analytical Mansfield, MA		

Figure

GRAIN SIZE DISTRIBUTION TEST DATA

8/24/2021

Location: SED-6

Sample Number: L2140910-15

Sieve Test Data

Post #200 Wash Test Weights (grams): Dry Sample and Tare = 42.46
Tare Wt. = 0.00
Minus #200 from wash = 0.0%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
42.46	0.00	3"	0.00	0.00	100.0
		2"	0.00	0.00	100.0
		1"	0.00	0.00	100.0
		3/4"	0.00	0.00	100.0
		1/2"	0.00	0.00	100.0
		3/8"	0.00	0.00	100.0
		#4	0.09	0.00	99.8
		#10	0.97	0.00	97.5
		#40	6.52	0.00	82.1
		#60	3.61	0.00	73.6
		#200	12.71	0.00	43.7

Serial_No:09032112:30

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.2	0.2	2.3	15.4	38.4	56.1			43.7

D ₅	D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₄₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
						0.0941	0.1369	0.3660	0.5249	0.7959	1.3558

Fineness Modulus

0.82

Alpha Analytical

Particle Size Distribution Report

Serial No: 09032112:30

GRAIN SIZE - mm.										
% +3"		% Gravel		% Sand			% Fines			
		Coarse	Fine	Coarse	Medium	Fine	Silt		Clay	
○	0.0	0.0	0.0	4.7	26.3	19.5	49.5			
×	LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
○			1.0203	0.2180	0.0795					
Material Description								USCS	AASHTO	
Project No. Client: Project:								Remarks:		
Source of Sample: SED-4 Sample Number: L2140910-16										
Alpha Analytical Mansfield, MA										

Figure

GRAIN SIZE DISTRIBUTION TEST DATA

8/24/2021

Location: SED-4

Sample Number: L2140910-16

Sieve Test Data

Post #200 Wash Test Weights (grams): Dry Sample and Tare = 21.57

Tare Wt. = 0.00

Minus #200 from wash = 0.0%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
21.57	0.00	3"	0.00	0.00	100.0
		2"	0.00	0.00	100.0
		1"	0.00	0.00	100.0
		3/4"	0.00	0.00	100.0
		1/2"	0.00	0.00	100.0
		3/8"	0.00	0.00	100.0
		#4	0.00	0.00	100.0
		#10	1.01	0.00	95.3
		#40	5.68	0.00	69.0
		#60	1.59	0.00	61.6
		#200	2.62	0.00	49.5

Serial_No:09032112:30

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	4.7	26.3	19.5	50.5			49.5

D ₅	D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₄₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
						0.0795	0.2180	0.7815	1.0203	1.3613	1.9446

Fineness Modulus

1.21

Alpha Analytical

Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility

EPA 624/624.1: m/p-xylene, o-xylene, Naphthalene

EPA 625/625.1: alpha-Terpineol

EPA 8260C/8260D: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.

EPA 8270D/8270E: NPW: Dimethylnaphthalene, 1,4-Diphenylhydrazine, alpha-Terpineol; SCM: Dimethylnaphthalene, 1,4-Diphenylhydrazine.

SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO₂, NO₃.

Mansfield Facility

SM 2540D: TSS

EPA 8082A: NPW: PCB: 1, 5, 31, 87, 101, 110, 141, 151, 153, 180, 183, 187.

EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene,

3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.

Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water

EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2:** Nitrate-N, Nitrite-N; **SM4500NO3-F:** Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE,**

EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B

EPA 332: Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.

Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT, SM9222D.**

Non-Potable Water

SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1:** Ammonia-N, **LACHAT 10-107-06-1-B:** Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2:** Nitrate-N, **SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300:** Chloride, Sulfate, Nitrate.

EPA 624.1: Volatile Halocarbons & Aromatics,

EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs

EPA 625.1: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045:** PCB-Oil.

Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603, SM9222D.**

Mansfield Facility:

Drinking Water

EPA 200.7: Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1 Hg.**

EPA 522, EPA 537.1.

Non-Potable Water

EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.

EPA 200.8: Al, Sb, As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.

EPA 245.1 Hg.

SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

PAGE 1 OF

320 Forbes Blvd
Mansfield, MA 02048
Tel: 508-822-9300

Project Information

Project Location: Belmont, MA

Project #: 2018-0157

Project Manager: Ted Wickwire

ALPHA Quote #: Q7174-R5

Address: 107 waterhouse Rd
Bourne, MA

Phone: 207-239-7809

Email: Klavallee@woodsholegroup.com

Turn-Around Time

☒ Standard ☐ RUSH (only confirmed if pre-approved!)

Date Due:

Additional Project Information:
See quote for full analyte list
Lab filter water samples

Date Rec'd in Lab:

Report Information - Data Deliverables

☒ ADEx ☒ EMAIL

ALPHA Job #: C2140910

Billing Information

☐ Same as Client info PO #:

Regulatory Requirements & Project Information Requirements

☐ Yes ☐ No MA MCP Analytical Methods ☐ Yes ☐ No CT RCP Analytical Methods
☐ Yes ☐ No Matrix Spike Required on this SDG? (Required for MCP Inorganics)
☐ Yes ☐ No GW1 Standards (Info Required for Metals & EPH with Targets)
☐ Yes ☐ No NPDES RGP
☐ Other State /Fed Program Criteria

ANALYSIS

ANALYSIS		SAMPLE INFO	
VOC: ☐ 8260 ☐ 624 ☐ 524.2		Filtration	
SVOC: ☐ ABN ☒ PAH		☐ Field	
METALS: ☐ MCP 13 ☐ MCP 14 ☐ RCP 15		☒ Lab to do	
EPH: ☐ RCRA5 ☐ RCRA8 ☐ PP13		Preservation	
VPH: ☐ Ranges & Targets ☐ Ranges Only		☐ Lab to do	
☐ PCB ☐ PEST			
TPH: ☐ Quant Only ☐ Fingerprint			
Grain size			
Free Cyanide SM 4500			
TAL Metals			
TAL Metals Dissolved			
Dioxins & Furans EPA 1613B			
TOC EPA 9060A			
Sample Comments			

SAMPLE INFO

Filtration
☐ Field
☒ Lab to do

Preservation
☐ Lab to do

Sample Comments

ALPHA Lab ID (Lab Use Only)		Sample ID	Collection		Sample Matrix	Sampler Initials	VOC:	SVOC:	METAL:	METAL:	EPH:	VPH:	PCB:	TPH:	Grav:	Free:	TAL:	TAL:	Diox:	TOC:	Sample Comments	TREES	
			Date	Time																			
40910-	01	SW-4	7/28/21	0824	SW	DGS										1	1	1			See Quote	3	
	01	SW-4-MS/MSD	}	0824	SW	DGS										1	1	1			MS/MSD	3	
	02	SW-5		0910	SW	DGS											1	1	1				3
	03	SW-6		0856	SW	DGS											1	1	1				3
	17	SW-6-Rep		0856	SW	DGS											1	1	1			Rep/Dup	3
	04	Sed-11		0955	SED	DGS		1									1	1	1		1		4
	18	Sed-11-Rep		0955	SED	DGS		1									1	1	1		1	Rep/Dup	4
	05	Sed-12		0840	SED	KDL		1									1	1	1		1		4
	06	Soil-14		1055	SED	DGS		1									1	1	1		1		4
	07	Sed-10		1043	SED	DGS		1									1	1	1		1		4

Container Type
P= Plastic
A= Amber glass
V= Vial
G= Glass
B= Bacteria cup
C= Cube
O= Other
E= Encore
D= BOD Bottle

Preservative
 A= None
 B= HCl
 C= HNO₃
 D= H₂SO₄
 E= NaOH
 F= MeOH
 G= NaHSO₄
 H = Na₂S₂O₃
 I= Ascorbic Acid
 J = NH₄Cl
 K= Zn Acetate
 O= Other

Container Type

Preservative

A

A

1

1

Received By:

Date/Time

7/29/21 1001-
7/29/21 1418

All samples submitted are subject to Alpha's Terms and Conditions.
See reverse side.

FORM NO: 01-01 (rev. 12-Mar-2012)

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FORM NO: 01-01 (rev. 12-Mar-2012)



ANALYTICAL REPORT

Lab Number:	L2170562
Client:	Woods Hole Group 107 Waterhouse Road Bourne, MA 02532
ATTN:	Ted Wickwire
Phone:	(508) 495-6242
Project Name:	BELMONT LANDFILL
Project Number:	18-0157
Report Date:	02/23/22

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0574), IL (200077), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #P330-17-00196).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com



Project Name: BELMONT LANDFILL

Project Number: 18-0157

Lab Number: L2170562

Report Date: 02/23/22

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2170562-01	TOX-1	SEDIMENT	BELMONT, MA	12/21/21 13:38	12/22/21
L2170562-02	TOX-2	SEDIMENT	BELMONT, MA	12/21/21 12:35	12/22/21
L2170562-03	TOX-3	SEDIMENT	BELMONT, MA	12/21/21 11:25	12/22/21
L2170562-04	TOX-3-DUP	SEDIMENT	BELMONT, MA	12/21/21 11:57	12/22/21
L2170562-05	TOX-4	SEDIMENT	BELMONT, MA	12/21/21 09:05	12/22/21
L2170562-06	TOX-5	SEDIMENT	BELMONT, MA	12/21/21 14:22	12/22/21
L2170562-07	TOX-6	SEDIMENT	BELMONT, MA	12/21/21 15:54	12/22/21
L2170562-08	WORM-1	SOIL	BELMONT, MA	12/21/21 13:26	12/22/21
L2170562-09	WORM-2	SOIL	BELMONT, MA	12/21/21 12:36	12/22/21
L2170562-10	WORM-3	SOIL	BELMONT, MA	12/21/21 11:01	12/22/21
L2170562-11	WORM-3-DUP	SOIL	BELMONT, MA	12/21/21 11:36	12/22/21
L2170562-12	WORM-4	SOIL	BELMONT, MA	12/21/21 09:22	12/22/21
L2170562-13	WORM-5	SOIL	BELMONT, MA	12/21/21 09:57	12/22/21
L2170562-14	WORM-6	SOIL	BELMONT, MA	12/21/21 15:10	12/22/21

Project Name: BELMONT LANDFILL

Lab Number: L2170562

Project Number: 18-0157

Report Date: 02/23/22

MADEP MCP Response Action Analytical Report Certification

This form provides certifications for all samples performed by MCP methods. Please refer to the Sample Results and Container Information sections of this report for specification of MCP methods used for each analysis. The following questions pertain only to MCP Analytical Methods.

An affirmative response to questions A through F is required for "Presumptive Certainty" status		
A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?	YES
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	YES
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	YES
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data?"	YES
E a.	VPH, EPH, and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications).	N/A
E b.	APH and TO-15 Methods only: Was the complete analyte list reported for each method?	N/A
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	YES
A response to questions G, H and I is required for "Presumptive Certainty" status		
G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	YES
H	Were all QC performance standards specified in the CAM protocol(s) achieved?	NO
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	YES
For any questions answered "No", please refer to the case narrative section on the following page(s).		

Please note that sample matrix information is located in the Sample Results section of this report.



Project Name: BELMONT LANDFILL
Project Number: 18-0157

Lab Number: L2170562
Report Date: 02/23/22

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

HOLD POLICY - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

Project Name: BELMONT LANDFILL
Project Number: 18-0157

Lab Number: L2170562
Report Date: 02/23/22

Case Narrative (continued)

Report Submission

All non-detect (ND) or estimated concentrations (J-qualified) have been quantitated to the limit noted in the MDL column.

MCP Related Narratives

PAHs

In reference to question H:

The WG1590525-5 MSD recovery, performed on L2170562-05, is outside the acceptance criteria for pyrene (38%). In addition, the WG1590525-4/-5 MS/MSD RPDs are outside of the acceptance criteria for several compounds. The LCS/LCSD recoveries are acceptable; therefore, no further action was taken.

Total Metals

In reference to question H:

The WG1592414-3/-4 MS/MSD recoveries, performed on L2170562-05, are outside the acceptance criteria for lead (163%/138%). Re-analysis of the MS yielded unacceptable recoveries for lead >125%. The LCS recoveries are acceptable; therefore, no further action was taken.

Total Mercury

In reference to question H:

The WG1595162-7 MS recoveries, performed on L2170562-12, are outside the acceptance criteria for mercury (72%). Re-analysis of the MS yielded unacceptable recoveries for Mercury in the range of 30-74%. The LCS recoveries are acceptable; therefore, no further action was taken.

Non-MCP Related Narratives

Total Organic Carbon

L2170562-06: The Sample Replicate RPD is outside the acceptance criteria of 30%. A double-burn re-analysis was performed with a confirming result. The results of the original analysis are reported. The elevated

Project Name: BELMONT LANDFILL
Project Number: 18-0157

Lab Number: L2170562
Report Date: 02/23/22

Case Narrative (continued)

RPD has been attributed to the non-homogeneous nature of the sample.

The WG1592954-3/-4 MS/MSD recoveries (Rep1 - 261%-MSD) / (Rep2 - 55%/181%) performed on L2170562-12, do not apply because the sample concentrations are greater than four times the spike amounts added.

The WG1592955-3/-4 MS/MSD recoveries (Rep1 - 50%/0%) / (Rep2 - 0%-MS) performed on L2170562-05, are outside the 75-125% acceptance criteria, possibly due to sample matrix. The associated SRM recoveries are within criteria, indicating the sample batch was in control, and all sample results were accepted. In addition, the WG1592955-3/-4 MS/MSD RPDs (Rep1 - 60%) / (Rep2 - 30%), are outside the acceptance criteria of 25%. The elevated RPD has been attributed to the non-homogeneous nature of the native sample.

Grain Size Analysis

The WG1602845-2 Laboratory Duplicate RPD for %gravel (67%), performed on L2170562-12, is outside the acceptance criteria. The elevated RPD has been attributed to the non-homogeneous nature of the native sample.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:  Elizabeth Porta

Title: Technical Director/Representative

Date: 02/23/22

QC OUTLIER SUMMARY REPORT

Project Name: BELMONT LANDFILL

Lab Number: L2170562

Project Number: 18-0157

Report Date: 02/23/22

Method	Client ID (Native ID)	Lab ID	Parameter	QC Type	Recovery/RPD (%)	QC Limits (%)	Associated Samples	Data Quality Assessment
PAHs by GC/MS-SIM - Mansfield Lab								
8270D-SIM	Batch QC (L2170562-05)	WG1590525-5	Acenaphthylene	MSD	34	30	01-14	non-directional bias
8270D-SIM	Batch QC (L2170562-05)	WG1590525-5	Phenanthrene	MSD	37	30	01-14	non-directional bias
8270D-SIM	Batch QC (L2170562-05)	WG1590525-5	Fluoranthene	MSD	50	30	01-14	non-directional bias
8270D-SIM	Batch QC (L2170562-05)	WG1590525-5	Pyrene	MSD	38	40-140	01-14	potential low bias
8270D-SIM	Batch QC (L2170562-05)	WG1590525-5	Pyrene	MSD	61	30	01-14	non-directional bias
8270D-SIM	Batch QC (L2170562-05)	WG1590525-5	Benz(a)anthracene	MSD	65	30	01-14	non-directional bias
8270D-SIM	Batch QC (L2170562-05)	WG1590525-5	Chrysene	MSD	53	30	01-14	non-directional bias
8270D-SIM	Batch QC (L2170562-05)	WG1590525-5	Benzo(b)fluoranthene	MSD	54	30	01-14	non-directional bias
8270D-SIM	Batch QC (L2170562-05)	WG1590525-5	Benzo(k)fluoranthene	MSD	34	30	01-14	non-directional bias
8270D-SIM	Batch QC (L2170562-05)	WG1590525-5	Benzo(a)pyrene	MSD	51	30	01-14	non-directional bias
8270D-SIM	Batch QC (L2170562-05)	WG1590525-5	Indeno(1,2,3-cd)pyrene	MSD	44	30	01-14	non-directional bias
8270D-SIM	Batch QC (L2170562-05)	WG1590525-5	Benzo(g,h,i)perylene	MSD	33	30	01-14	non-directional bias
MCP Total Metals - Mansfield Lab								
6020B	Batch QC (L2170562-05)	WG1592414-3	Lead, Total	MS	163	75-125	01-14	potential high bias
6020B	Batch QC (L2170562-05)	WG1592414-4	Lead, Total	MSD	138	75-125	01-14	potential high bias
7471B	Batch QC (L2170562-12)	WG1595162-7	Mercury, Total	MSD	72	75-125	01-14	potential low bias
Grain Size Analysis - Mansfield Lab								
D6913/D7928	Batch QC (L2170562-12)	WG1602845-2	% Total Gravel	Duplicate	67	20	01-14	non-directional bias
Total Organic Carbon - Mansfield Lab								
9060A	Batch QC (L2170562-12)	WG1592954-3	Total Organic Carbon (Rep2)	MS	55	75-125	07-12	potential low bias
9060A	Batch QC (L2170562-12)	WG1592954-4	Total Organic Carbon (Rep1)	MSD	261	75-125	07-12	potential high bias
9060A	Batch QC (L2170562-12)	WG1592954-4	Total Organic Carbon (Rep2)	MSD	181	75-125	07-12	potential high bias
9060A	Batch QC (L2170562-05)	WG1592955-3	Total Organic Carbon (Rep1)	MS	50	75-125	01-06,13-14	potential low bias
9060A	Batch QC (L2170562-05)	WG1592955-3	Total Organic Carbon (Rep2)	MS	0	75-125	01-06,13-14	potential low bias
9060A	Batch QC (L2170562-05)	WG1592955-4	Total Organic Carbon (Rep1)	MSD	0	75-125	01-06,13-14	potential low bias
9060A	Batch QC (L2170562-05)	WG1592955-4	Total Organic Carbon (Rep1)	MSD	60	25	01-06,13-14	non-directional bias

QC OUTLIER SUMMARY REPORT

Project Name: BELMONT LANDFILL**Lab Number:** L2170562**Project Number:** 18-0157**Report Date:** 02/23/22

Method	Client ID (Native ID)	Lab ID	Parameter	QC Type	Recovery/RPD (%)	QC Limits (%)	Associated Samples	Data Quality Assessment
9060A	Batch QC (L2170562-05)	WG1592955-4	Total Organic Carbon (Rep2)	MSD	30	25	01-06,13-14	non-directional bias

ORGANICS

SEMIVOLATILES

Project Name: BELMONT LANDFILL
Project Number: 18-0157

Lab Number: L2170562
Report Date: 02/23/22

SAMPLE RESULTS

Lab ID: L2170562-01 D2
 Client ID: TOX-1
 Sample Location: BELMONT, MA

Date Collected: 12/21/21 13:38
 Date Received: 12/22/21
 Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
 Analytical Method: 1,8270D-SIM
 Analytical Date: 02/07/22 21:24
 Analyst: PS
 Percent Solids: 35%

Extraction Method: EPA 3570
 Extraction Date: 01/04/22 21:14
 Cleanup Method: EPA 3630
 Cleanup Date: 01/08/22

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

PAHs by GC/MS-SIM - Mansfield Lab

Fluoranthene	6570		ug/kg	45.2	20.9	4

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	38		30-130
Pyrene-d10	42		30-130
Benzo(b)fluoranthene-d12	43		30-130

Project Name: BELMONT LANDFILL**Lab Number:** L2170562**Project Number:** 18-0157**Report Date:** 02/23/22**SAMPLE RESULTS**

Lab ID: L2170562-01 D

Date Collected: 12/21/21 13:38

Client ID: TOX-1

Date Received: 12/22/21

Sample Location: BELMONT, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Sediment

Extraction Method: EPA 3570

Analytical Method: 1,8270D-SIM

Extraction Date: 01/04/22 21:14

Analytical Date: 02/04/22 00:38

Cleanup Method: EPA 3630

Analyst: PS

Cleanup Date: 01/08/22

Percent Solids: 35%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PAHs by GC/MS-SIM - Mansfield Lab						
Naphthalene	49.3		ug/kg	22.6	8.87	2
Acenaphthylene	208.		ug/kg	22.6	8.87	2
Acenaphthene	74.4		ug/kg	22.6	8.80	2
Fluorene	133.		ug/kg	22.6	13.4	2
Phenanthrene	2070		ug/kg	22.6	14.6	2
Anthracene	367.		ug/kg	22.6	15.5	2
Fluoranthene	6980	E	ug/kg	22.6	10.4	2
Pyrene	4400		ug/kg	22.6	12.5	2
Benz(a)anthracene	2350		ug/kg	22.6	11.1	2
Chrysene	3240		ug/kg	22.6	8.21	2
Benzo(b)fluoranthene	3380		ug/kg	22.6	10.8	2
Benzo(k)fluoranthene	2250		ug/kg	22.6	6.49	2
Benzo(a)pyrene	2840		ug/kg	22.6	6.56	2
Indeno(1,2,3-cd)pyrene	2480		ug/kg	22.6	6.45	2
Dibenz(a,h)anthracene	488.		ug/kg	22.6	13.4	2
Benzo(g,h,i)perylene	2540		ug/kg	22.6	14.6	2
2-Methylnaphthalene	22.1	J	ug/kg	22.6	9.84	2
1-Methylnaphthalene	21.1	J	ug/kg	22.6	10.2	2
2-Chloronaphthalene	ND		ug/kg	22.6	8.26	2

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	39		30-130
Pyrene-d10	41		30-130
Benzo(b)fluoranthene-d12	44		30-130

Project Name: BELMONT LANDFILL
Project Number: 18-0157

Lab Number: L2170562
Report Date: 02/23/22

SAMPLE RESULTS

Lab ID: L2170562-02 D
Client ID: TOX-2
Sample Location: BELMONT, MA

Date Collected: 12/21/21 12:35
Date Received: 12/22/21
Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
Analytical Method: 1,8270D-SIM
Analytical Date: 02/04/22 01:12
Analyst: PS
Percent Solids: 25%

Extraction Method: EPA 3570
Extraction Date: 01/04/22 21:14
Cleanup Method: EPA 3630
Cleanup Date: 01/08/22

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PAHs by GC/MS-SIM - Mansfield Lab						
Naphthalene	62.4		ug/kg	30.5	11.9	2
Acenaphthylene	254.		ug/kg	30.5	11.9	2
Acenaphthene	39.7		ug/kg	30.5	11.8	2
Fluorene	75.6		ug/kg	30.5	18.0	2
Phenanthrene	1100		ug/kg	30.5	19.6	2
Anthracene	244.		ug/kg	30.5	20.8	2
Fluoranthene	4260		ug/kg	30.5	14.0	2
Pyrene	2690		ug/kg	30.5	16.8	2
Benz(a)anthracene	1510		ug/kg	30.5	15.0	2
Chrysene	2200		ug/kg	30.5	11.0	2
Benzo(b)fluoranthene	2830		ug/kg	30.5	14.6	2
Benzo(k)fluoranthene	1570		ug/kg	30.5	8.74	2
Benzo(a)pyrene	2070		ug/kg	30.5	8.83	2
Indeno(1,2,3-cd)pyrene	2010		ug/kg	30.5	8.68	2
Dibenz(a,h)anthracene	429.		ug/kg	30.5	18.1	2
Benzo(g,h,i)perylene	2060		ug/kg	30.5	19.6	2
2-Methylnaphthalene	31.0		ug/kg	30.5	13.2	2
1-Methylnaphthalene	23.1	J	ug/kg	30.5	13.8	2
2-Chloronaphthalene	ND		ug/kg	30.5	11.1	2

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	47		30-130
Pyrene-d10	43		30-130
Benzo(b)fluoranthene-d12	46		30-130

Project Name: BELMONT LANDFILL
Project Number: 18-0157

Lab Number: L2170562
Report Date: 02/23/22

SAMPLE RESULTS

Lab ID: L2170562-03
Client ID: TOX-3
Sample Location: BELMONT, MA

Date Collected: 12/21/21 11:25
Date Received: 12/22/21
Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
Analytical Method: 1,8270D-SIM
Analytical Date: 02/03/22 17:53
Analyst: PS
Percent Solids: 30%

Extraction Method: EPA 3570
Extraction Date: 01/04/22 21:14
Cleanup Method: EPA 3630
Cleanup Date: 01/08/22

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PAHs by GC/MS-SIM - Mansfield Lab						
Naphthalene	104.		ug/kg	12.9	5.05	1
Acenaphthylene	115.		ug/kg	12.9	5.05	1
Acenaphthene	34.6		ug/kg	12.9	5.02	1
Fluorene	68.1		ug/kg	12.9	7.62	1
Phenanthrene	569.		ug/kg	12.9	8.30	1
Anthracene	118.		ug/kg	12.9	8.82	1
Fluoranthene	991.		ug/kg	12.9	5.94	1
Pyrene	795.		ug/kg	12.9	7.12	1
Benz(a)anthracene	456.		ug/kg	12.9	6.34	1
Chrysene	570.		ug/kg	12.9	4.68	1
Benzo(b)fluoranthene	468.		ug/kg	12.9	6.18	1
Benzo(k)fluoranthene	385.		ug/kg	12.9	3.70	1
Benzo(a)pyrene	498.		ug/kg	12.9	3.74	1
Indeno(1,2,3-cd)pyrene	387.		ug/kg	12.9	3.68	1
Dibenz(a,h)anthracene	97.3		ug/kg	12.9	7.65	1
Benzo(g,h,i)perylene	394.		ug/kg	12.9	8.30	1
2-Methylnaphthalene	123.		ug/kg	12.9	5.61	1
1-Methylnaphthalene	78.0		ug/kg	12.9	5.83	1
2-Chloronaphthalene	ND		ug/kg	12.9	4.71	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	45		30-130
Pyrene-d10	43		30-130
Benzo(b)fluoranthene-d12	47		30-130

Project Name: BELMONT LANDFILL
Project Number: 18-0157

Lab Number: L2170562
Report Date: 02/23/22

SAMPLE RESULTS

Lab ID: L2170562-04
Client ID: TOX-3-DUP
Sample Location: BELMONT, MA

Date Collected: 12/21/21 11:57
Date Received: 12/22/21
Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
Analytical Method: 1,8270D-SIM
Analytical Date: 02/03/22 18:27
Analyst: PS
Percent Solids: 35%

Extraction Method: EPA 3570
Extraction Date: 01/04/22 21:14
Cleanup Method: EPA 3630
Cleanup Date: 01/08/22

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PAHs by GC/MS-SIM - Mansfield Lab						
Naphthalene	75.7		ug/kg	10.6	4.18	1
Acenaphthylene	94.3		ug/kg	10.6	4.18	1
Acenaphthene	20.8		ug/kg	10.6	4.14	1
Fluorene	47.3		ug/kg	10.6	6.29	1
Phenanthrene	394.		ug/kg	10.6	6.86	1
Anthracene	91.6		ug/kg	10.6	7.28	1
Fluoranthene	641.		ug/kg	10.6	4.91	1
Pyrene	557.		ug/kg	10.6	5.88	1
Benz(a)anthracene	329.		ug/kg	10.6	5.24	1
Chrysene	404.		ug/kg	10.6	3.87	1
Benzo(b)fluoranthene	310.		ug/kg	10.6	5.10	1
Benzo(k)fluoranthene	289.		ug/kg	10.6	3.06	1
Benzo(a)pyrene	354.		ug/kg	10.6	3.09	1
Indeno(1,2,3-cd)pyrene	267.		ug/kg	10.6	3.04	1
Dibenz(a,h)anthracene	68.3		ug/kg	10.6	6.32	1
Benzo(g,h,i)perylene	274.		ug/kg	10.6	6.86	1
2-Methylnaphthalene	95.1		ug/kg	10.6	4.63	1
1-Methylnaphthalene	59.0		ug/kg	10.6	4.81	1
2-Chloronaphthalene	ND		ug/kg	10.6	3.89	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	38		30-130
Pyrene-d10	36		30-130
Benzo(b)fluoranthene-d12	41		30-130

Project Name: BELMONT LANDFILL
Project Number: 18-0157

Lab Number: L2170562
Report Date: 02/23/22

SAMPLE RESULTS

Lab ID: L2170562-05
Client ID: TOX-4
Sample Location: BELMONT, MA

Date Collected: 12/21/21 09:05
Date Received: 12/22/21
Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
Analytical Method: 1,8270D-SIM
Analytical Date: 02/03/22 22:23
Analyst: PS
Percent Solids: 23%

Extraction Method: EPA 3570
Extraction Date: 01/04/22 21:14
Cleanup Method: EPA 3630
Cleanup Date: 01/08/22

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PAHs by GC/MS-SIM - Mansfield Lab						
Naphthalene	66.1		ug/kg	17.0	6.68	1
Acenaphthylene	131.		ug/kg	17.0	6.68	1
Acenaphthene	26.5		ug/kg	17.0	6.62	1
Fluorene	31.0		ug/kg	17.0	10.1	1
Phenanthrene	322.		ug/kg	17.0	11.0	1
Anthracene	116.		ug/kg	17.0	11.6	1
Fluoranthene	849.		ug/kg	17.0	7.85	1
Pyrene	825.		ug/kg	17.0	9.40	1
Benz(a)anthracene	645.		ug/kg	17.0	8.38	1
Chrysene	743.		ug/kg	17.0	6.18	1
Benzo(b)fluoranthene	807.		ug/kg	17.0	8.16	1
Benzo(k)fluoranthene	552.		ug/kg	17.0	4.89	1
Benzo(a)pyrene	710.		ug/kg	17.0	4.94	1
Indeno(1,2,3-cd)pyrene	663.		ug/kg	17.0	4.85	1
Dibenz(a,h)anthracene	146.		ug/kg	17.0	10.1	1
Benzo(g,h,i)perylene	713.		ug/kg	17.0	11.0	1
2-Methylnaphthalene	44.8		ug/kg	17.0	7.41	1
1-Methylnaphthalene	24.8		ug/kg	17.0	7.70	1
2-Chloronaphthalene	ND		ug/kg	17.0	6.22	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	50		30-130
Pyrene-d10	45		30-130
Benzo(b)fluoranthene-d12	51		30-130

Project Name: BELMONT LANDFILL
Project Number: 18-0157

Lab Number: L2170562
Report Date: 02/23/22

SAMPLE RESULTS

Lab ID: L2170562-06
Client ID: TOX-5
Sample Location: BELMONT, MA

Date Collected: 12/21/21 14:22
Date Received: 12/22/21
Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
Analytical Method: 1,8270D-SIM
Analytical Date: 02/04/22 00:04
Analyst: PS
Percent Solids: 62%

Extraction Method: EPA 3570
Extraction Date: 01/04/22 21:14
Cleanup Method: EPA 3630
Cleanup Date: 01/08/22

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PAHs by GC/MS-SIM - Mansfield Lab						
Naphthalene	32.4		ug/kg	6.32	2.48	1
Acenaphthylene	81.3		ug/kg	6.32	2.48	1
Acenaphthene	50.8		ug/kg	6.32	2.46	1
Fluorene	63.6		ug/kg	6.32	3.74	1
Phenanthrene	884.		ug/kg	6.32	4.07	1
Anthracene	273.		ug/kg	6.32	4.32	1
Fluoranthene	1470	E	ug/kg	6.32	2.91	1
Pyrene	1430	E	ug/kg	6.32	3.49	1
Benz(a)anthracene	850.		ug/kg	6.32	3.11	1
Chrysene	699.		ug/kg	6.32	2.29	1
Benzo(b)fluoranthene	613.		ug/kg	6.32	3.03	1
Benzo(k)fluoranthene	518.		ug/kg	6.32	1.81	1
Benzo(a)pyrene	741.		ug/kg	6.32	1.83	1
Indeno(1,2,3-cd)pyrene	500.		ug/kg	6.32	1.80	1
Dibenz(a,h)anthracene	107.		ug/kg	6.32	3.75	1
Benzo(g,h,i)perylene	507.		ug/kg	6.32	4.07	1
2-Methylnaphthalene	15.6		ug/kg	6.32	2.75	1
1-Methylnaphthalene	15.0		ug/kg	6.32	2.86	1
2-Chloronaphthalene	ND		ug/kg	6.32	2.31	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	57		30-130
Pyrene-d10	55		30-130
Benzo(b)fluoranthene-d12	56		30-130

Project Name: BELMONT LANDFILL**Project Number:** 18-0157**Lab Number:** L2170562**Report Date:** 02/23/22**SAMPLE RESULTS**

Lab ID: L2170562-06 D

Client ID: TOX-5

Sample Location: BELMONT, MA

Date Collected: 12/21/21 14:22

Date Received: 12/22/21

Field Prep: Not Specified

Sample Depth:

Matrix: Sediment

Analytical Method: 1,8270D-SIM

Analytical Date: 02/07/22 20:50

Analyst: PS

Percent Solids: 62%

Extraction Method: EPA 3570

Extraction Date: 01/04/22 21:14

Cleanup Method: EPA 3630

Cleanup Date: 01/08/22

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PAHs by GC/MS-SIM - Mansfield Lab						
Fluoranthene	1760		ug/kg	12.6	5.83	2
Pyrene	1380		ug/kg	12.6	6.98	2

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	55		30-130
Pyrene-d10	53		30-130
Benzo(b)fluoranthene-d12	54		30-130

Project Name: BELMONT LANDFILL
Project Number: 18-0157

Lab Number: L2170562
Report Date: 02/23/22

SAMPLE RESULTS

Lab ID: L2170562-07
Client ID: TOX-6
Sample Location: BELMONT, MA

Date Collected: 12/21/21 15:54
Date Received: 12/22/21
Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
Analytical Method: 1,8270D-SIM
Analytical Date: 02/03/22 17:19
Analyst: PS
Percent Solids: 21%

Extraction Method: EPA 3570
Extraction Date: 01/04/22 21:14
Cleanup Method: EPA 3630
Cleanup Date: 01/08/22

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PAHs by GC/MS-SIM - Mansfield Lab						
Naphthalene	44.0		ug/kg	18.9	7.40	1
Acenaphthylene	ND		ug/kg	18.9	7.40	1
Acenaphthene	ND		ug/kg	18.9	7.34	1
Fluorene	ND		ug/kg	18.9	11.2	1
Phenanthrene	74.1		ug/kg	18.9	12.2	1
Anthracene	13.0	J	ug/kg	18.9	12.9	1
Fluoranthene	147.		ug/kg	18.9	8.70	1
Pyrene	112.		ug/kg	18.9	10.4	1
Benz(a)anthracene	62.8		ug/kg	18.9	9.28	1
Chrysene	100.		ug/kg	18.9	6.85	1
Benzo(b)fluoranthene	108.		ug/kg	18.9	9.04	1
Benzo(k)fluoranthene	62.3		ug/kg	18.9	5.42	1
Benzo(a)pyrene	76.1		ug/kg	18.9	5.47	1
Indeno(1,2,3-cd)pyrene	71.0		ug/kg	18.9	5.38	1
Dibenz(a,h)anthracene	16.5	J	ug/kg	18.9	11.2	1
Benzo(g,h,i)perylene	78.3		ug/kg	18.9	12.2	1
2-Methylnaphthalene	35.5		ug/kg	18.9	8.21	1
1-Methylnaphthalene	24.3		ug/kg	18.9	8.53	1
2-Chloronaphthalene	ND		ug/kg	18.9	6.89	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	50		30-130
Pyrene-d10	51		30-130
Benzo(b)fluoranthene-d12	54		30-130

Project Name: BELMONT LANDFILL
Project Number: 18-0157

Lab Number: L2170562
Report Date: 02/23/22

SAMPLE RESULTS

Lab ID: L2170562-08
Client ID: WORM-1
Sample Location: BELMONT, MA

Date Collected: 12/21/21 13:26
Date Received: 12/22/21
Field Prep: Not Specified

Sample Depth:

Matrix: Soil
Analytical Method: 1,8270D-SIM
Analytical Date: 02/03/22 19:01
Analyst: PS
Percent Solids: 70%

Extraction Method: EPA 3570
Extraction Date: 01/04/22 21:14
Cleanup Method: EPA 3630
Cleanup Date: 01/08/22

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PAHs by GC/MS-SIM - Mansfield Lab						
Naphthalene	28.2		ug/kg	5.70	2.24	1
Acenaphthylene	87.5		ug/kg	5.70	2.24	1
Acenaphthene	7.36		ug/kg	5.70	2.22	1
Fluorene	11.5		ug/kg	5.70	3.37	1
Phenanthrene	219.		ug/kg	5.70	3.67	1
Anthracene	60.4		ug/kg	5.70	3.90	1
Fluoranthene	541.		ug/kg	5.70	2.63	1
Pyrene	452.		ug/kg	5.70	3.15	1
Benz(a)anthracene	268.		ug/kg	5.70	2.81	1
Chrysene	327.		ug/kg	5.70	2.07	1
Benzo(b)fluoranthene	326.		ug/kg	5.70	2.73	1
Benzo(k)fluoranthene	259.		ug/kg	5.70	1.64	1
Benzo(a)pyrene	351.		ug/kg	5.70	1.65	1
Indeno(1,2,3-cd)pyrene	286.		ug/kg	5.70	1.62	1
Dibenz(a,h)anthracene	64.4		ug/kg	5.70	3.38	1
Benzo(g,h,i)perylene	277.		ug/kg	5.70	3.67	1
2-Methylnaphthalene	13.0		ug/kg	5.70	2.48	1
1-Methylnaphthalene	11.2		ug/kg	5.70	2.58	1
2-Chloronaphthalene	ND		ug/kg	5.70	2.08	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	57		30-130
Pyrene-d10	60		30-130
Benzo(b)fluoranthene-d12	65		30-130

Project Name: BELMONT LANDFILL**Lab Number:** L2170562**Project Number:** 18-0157**Report Date:** 02/23/22**SAMPLE RESULTS**

Lab ID: L2170562-09 D

Date Collected: 12/21/21 12:36

Client ID: WORM-2

Date Received: 12/22/21

Sample Location: BELMONT, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Soil

Extraction Method: EPA 3570

Analytical Method: 1,8270D-SIM

Extraction Date: 01/04/22 21:15

Analytical Date: 02/07/22 21:58

Cleanup Method: EPA 3630

Analyst: PS

Cleanup Date: 01/08/22

Percent Solids: 25%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PAHs by GC/MS-SIM - Mansfield Lab						
Naphthalene	55.7		ug/kg	32.6	12.8	2
Acenaphthylene	154.		ug/kg	32.6	12.8	2
Acenaphthene	29.8	J	ug/kg	32.6	12.7	2
Fluorene	32.5	J	ug/kg	32.6	19.2	2
Phenanthrene	790.		ug/kg	32.6	21.0	2
Anthracene	146.		ug/kg	32.6	22.3	2
Fluoranthene	3270		ug/kg	32.6	15.0	2
Pyrene	2300		ug/kg	32.6	18.0	2
Benz(a)anthracene	1110		ug/kg	32.6	16.0	2
Chrysene	2030		ug/kg	32.6	11.8	2
Benzo(b)fluoranthene	2380		ug/kg	32.6	15.6	2
Benzo(k)fluoranthene	2020		ug/kg	32.6	9.35	2
Benzo(a)pyrene	1960		ug/kg	32.6	9.45	2
Indeno(1,2,3-cd)pyrene	2200		ug/kg	32.6	9.29	2
Dibenz(a,h)anthracene	431.		ug/kg	32.6	19.3	2
Benzo(g,h,i)perylene	2260		ug/kg	32.6	21.0	2
2-Methylnaphthalene	19.0	J	ug/kg	32.6	14.2	2
1-Methylnaphthalene	ND		ug/kg	32.6	14.7	2
2-Chloronaphthalene	ND		ug/kg	32.6	11.9	2

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	31		30-130
Pyrene-d10	30		30-130
Benzo(b)fluoranthene-d12	31		30-130

Project Name: BELMONT LANDFILL
Project Number: 18-0157

Lab Number: L2170562
Report Date: 02/23/22

SAMPLE RESULTS

Lab ID: L2170562-10
Client ID: WORM-3
Sample Location: BELMONT, MA

Date Collected: 12/21/21 11:01
Date Received: 12/22/21
Field Prep: Not Specified

Sample Depth:

Matrix: Soil
Analytical Method: 1,8270D-SIM
Analytical Date: 02/03/22 19:35
Analyst: PS
Percent Solids: 14%

Extraction Method: EPA 3570
Extraction Date: 01/04/22 21:15
Cleanup Method: EPA 3630
Cleanup Date: 01/08/22

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PAHs by GC/MS-SIM - Mansfield Lab						
Naphthalene	81.6		ug/kg	28.7	11.2	1
Acenaphthylene	103.		ug/kg	28.7	11.2	1
Acenaphthene	27.5	J	ug/kg	28.7	11.2	1
Fluorene	30.7		ug/kg	28.7	17.0	1
Phenanthrene	440.		ug/kg	28.7	18.5	1
Anthracene	113.		ug/kg	28.7	19.6	1
Fluoranthene	1260		ug/kg	28.7	13.2	1
Pyrene	965.		ug/kg	28.7	15.8	1
Benz(a)anthracene	526.		ug/kg	28.7	14.1	1
Chrysene	725.		ug/kg	28.7	10.4	1
Benzo(b)fluoranthene	773.		ug/kg	28.7	13.7	1
Benzo(k)fluoranthene	611.		ug/kg	28.7	8.24	1
Benzo(a)pyrene	732.		ug/kg	28.7	8.32	1
Indeno(1,2,3-cd)pyrene	698.		ug/kg	28.7	8.18	1
Dibenz(a,h)anthracene	139.		ug/kg	28.7	17.0	1
Benzo(g,h,i)perylene	687.		ug/kg	28.7	18.5	1
2-Methylnaphthalene	40.8		ug/kg	28.7	12.5	1
1-Methylnaphthalene	27.8	J	ug/kg	28.7	13.0	1
2-Chloronaphthalene	ND		ug/kg	28.7	10.5	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	51		30-130
Pyrene-d10	50		30-130
Benzo(b)fluoranthene-d12	52		30-130

Project Name: BELMONT LANDFILL
Project Number: 18-0157

Lab Number: L2170562
Report Date: 02/23/22

SAMPLE RESULTS

Lab ID: L2170562-11
Client ID: WORM-3-DUP
Sample Location: BELMONT, MA

Date Collected: 12/21/21 11:36
Date Received: 12/22/21
Field Prep: Not Specified

Sample Depth:

Matrix: Soil
Analytical Method: 1,8270D-SIM
Analytical Date: 02/03/22 20:09
Analyst: PS
Percent Solids: 12%

Extraction Method: EPA 3570
Extraction Date: 01/04/22 21:15
Cleanup Method: EPA 3630
Cleanup Date: 01/08/22

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PAHs by GC/MS-SIM - Mansfield Lab						
Naphthalene	76.3		ug/kg	31.0	12.2	1
Acenaphthylene	151.		ug/kg	31.0	12.2	1
Acenaphthene	36.4		ug/kg	31.0	12.1	1
Fluorene	36.0		ug/kg	31.0	18.3	1
Phenanthrene	600.		ug/kg	31.0	20.0	1
Anthracene	145.		ug/kg	31.0	21.2	1
Fluoranthene	1810		ug/kg	31.0	14.3	1
Pyrene	1290		ug/kg	31.0	17.1	1
Benz(a)anthracene	771.		ug/kg	31.0	15.3	1
Chrysene	994.		ug/kg	31.0	11.3	1
Benzo(b)fluoranthene	1100		ug/kg	31.0	14.9	1
Benzo(k)fluoranthene	962.		ug/kg	31.0	8.91	1
Benzo(a)pyrene	1080		ug/kg	31.0	9.00	1
Indeno(1,2,3-cd)pyrene	1010		ug/kg	31.0	8.85	1
Dibenz(a,h)anthracene	203.		ug/kg	31.0	18.4	1
Benzo(g,h,i)perylene	1030		ug/kg	31.0	20.0	1
2-Methylnaphthalene	49.8		ug/kg	31.0	13.5	1
1-Methylnaphthalene	35.5		ug/kg	31.0	14.0	1
2-Chloronaphthalene	ND		ug/kg	31.0	11.3	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	48		30-130
Pyrene-d10	44		30-130
Benzo(b)fluoranthene-d12	51		30-130

Project Name: BELMONT LANDFILL
Project Number: 18-0157

Lab Number: L2170562
Report Date: 02/23/22

SAMPLE RESULTS

Lab ID: L2170562-12
Client ID: WORM-4
Sample Location: BELMONT, MA

Date Collected: 12/21/21 09:22
Date Received: 12/22/21
Field Prep: Not Specified

Sample Depth:

Matrix: Soil
Analytical Method: 1,8270D-SIM
Analytical Date: 02/03/22 20:42
Analyst: PS
Percent Solids: 10%

Extraction Method: EPA 3570
Extraction Date: 01/04/22 21:15
Cleanup Method: EPA 3630
Cleanup Date: 01/08/22

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PAHs by GC/MS-SIM - Mansfield Lab						
Naphthalene	112.		ug/kg	36.9	14.5	1
Acenaphthylene	362.		ug/kg	36.9	14.5	1
Acenaphthene	44.6		ug/kg	36.9	14.4	1
Fluorene	50.9		ug/kg	36.9	21.8	1
Phenanthrene	703.		ug/kg	36.9	23.8	1
Anthracene	279.		ug/kg	36.9	25.2	1
Fluoranthene	2430		ug/kg	36.9	17.0	1
Pyrene	2430		ug/kg	36.9	20.4	1
Benz(a)anthracene	1560		ug/kg	36.9	18.2	1
Chrysene	1950		ug/kg	36.9	13.4	1
Benzo(b)fluoranthene	2030		ug/kg	36.9	17.7	1
Benzo(k)fluoranthene	1640		ug/kg	36.9	10.6	1
Benzo(a)pyrene	1980		ug/kg	36.9	10.7	1
Indeno(1,2,3-cd)pyrene	1850		ug/kg	36.9	10.5	1
Dibenz(a,h)anthracene	376.		ug/kg	36.9	21.9	1
Benzo(g,h,i)perylene	1900		ug/kg	36.9	23.8	1
2-Methylnaphthalene	58.4		ug/kg	36.9	16.0	1
1-Methylnaphthalene	42.9		ug/kg	36.9	16.7	1
2-Chloronaphthalene	ND		ug/kg	36.9	13.5	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	44		30-130
Pyrene-d10	42		30-130
Benzo(b)fluoranthene-d12	43		30-130

Project Name: BELMONT LANDFILL
Project Number: 18-0157

Lab Number: L2170562
Report Date: 02/23/22

SAMPLE RESULTS

Lab ID: L2170562-13
Client ID: WORM-5
Sample Location: BELMONT, MA

Date Collected: 12/21/21 09:57
Date Received: 12/22/21
Field Prep: Not Specified

Sample Depth:

Matrix: Soil
Analytical Method: 1,8270D-SIM
Analytical Date: 02/03/22 16:46
Analyst: PS
Percent Solids: 68%

Extraction Method: EPA 3570
Extraction Date: 01/04/22 21:15
Cleanup Method: EPA 3630
Cleanup Date: 01/08/22

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PAHs by GC/MS-SIM - Mansfield Lab						
Naphthalene	35.4		ug/kg	5.84	2.29	1
Acenaphthylene	33.3		ug/kg	5.84	2.29	1
Acenaphthene	12.9		ug/kg	5.84	2.27	1
Fluorene	14.4		ug/kg	5.84	3.45	1
Phenanthrene	246.		ug/kg	5.84	3.76	1
Anthracene	57.4		ug/kg	5.84	3.99	1
Fluoranthene	586.		ug/kg	5.84	2.69	1
Pyrene	470.		ug/kg	5.84	3.22	1
Benz(a)anthracene	310.		ug/kg	5.84	2.87	1
Chrysene	304.		ug/kg	5.84	2.12	1
Benzo(b)fluoranthene	289.		ug/kg	5.84	2.80	1
Benzo(k)fluoranthene	259.		ug/kg	5.84	1.67	1
Benzo(a)pyrene	324.		ug/kg	5.84	1.69	1
Indeno(1,2,3-cd)pyrene	227.		ug/kg	5.84	1.66	1
Dibenz(a,h)anthracene	53.9		ug/kg	5.84	3.46	1
Benzo(g,h,i)perylene	216.		ug/kg	5.84	3.76	1
2-Methylnaphthalene	27.9		ug/kg	5.84	2.54	1
1-Methylnaphthalene	20.8		ug/kg	5.84	2.64	1
2-Chloronaphthalene	ND		ug/kg	5.84	2.13	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	55		30-130
Pyrene-d10	55		30-130
Benzo(b)fluoranthene-d12	57		30-130

Project Name: BELMONT LANDFILL
Project Number: 18-0157

Lab Number: L2170562
Report Date: 02/23/22

SAMPLE RESULTS

Lab ID: L2170562-14
Client ID: WORM-6
Sample Location: BELMONT, MA

Date Collected: 12/21/21 15:10
Date Received: 12/22/21
Field Prep: Not Specified

Sample Depth:

Matrix: Soil
Analytical Method: 1,8270D-SIM
Analytical Date: 02/03/22 16:12
Analyst: PS
Percent Solids: 17%

Extraction Method: EPA 3570
Extraction Date: 01/04/22 21:15
Cleanup Method: EPA 3630
Cleanup Date: 01/08/22

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PAHs by GC/MS-SIM - Mansfield Lab						
Naphthalene	30.0		ug/kg	21.8	8.53	1
Acenaphthylene	21.8		ug/kg	21.8	8.53	1
Acenaphthene	ND		ug/kg	21.8	8.47	1
Fluorene	ND		ug/kg	21.8	12.9	1
Phenanthrene	122.		ug/kg	21.8	14.0	1
Anthracene	19.5	J	ug/kg	21.8	14.9	1
Fluoranthene	250.		ug/kg	21.8	10.0	1
Pyrene	263.		ug/kg	21.8	12.0	1
Benz(a)anthracene	82.7		ug/kg	21.8	10.7	1
Chrysene	140.		ug/kg	21.8	7.90	1
Benzo(b)fluoranthene	110.		ug/kg	21.8	10.4	1
Benzo(k)fluoranthene	89.0		ug/kg	21.8	6.25	1
Benzo(a)pyrene	106.		ug/kg	21.8	6.31	1
Indeno(1,2,3-cd)pyrene	83.5		ug/kg	21.8	6.20	1
Dibenz(a,h)anthracene	20.0	J	ug/kg	21.8	12.9	1
Benzo(g,h,i)perylene	136.		ug/kg	21.8	14.0	1
2-Methylnaphthalene	10.2	J	ug/kg	21.8	9.47	1
1-Methylnaphthalene	10.2	J	ug/kg	21.8	9.84	1
2-Chloronaphthalene	ND		ug/kg	21.8	7.94	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	41		30-130
Pyrene-d10	43		30-130
Benzo(b)fluoranthene-d12	44		30-130

Project Name: BELMONT LANDFILL
Project Number: 18-0157

Lab Number: L2170562
Report Date: 02/23/22

Method Blank Analysis Batch Quality Control

Analytical Method: 1,8270D-SIM
Analytical Date: 02/03/22 14:30
Analyst: PS

Extraction Method: EPA 3570
Extraction Date: 01/04/22 21:14
Cleanup Method: EPA 3630
Cleanup Date: 01/08/22

Parameter	Result	Qualifier	Units	RL	MDL
PAHs by GC/MS-SIM - Mansfield Lab for sample(s): 01-14 Batch: WG1590525-1					
Naphthalene	3.64	J	ug/kg	4.00	1.57
Acenaphthylene	ND		ug/kg	4.00	1.57
Acenaphthene	ND		ug/kg	4.00	1.56
Fluorene	ND		ug/kg	4.00	2.36
Phenanthrene	ND		ug/kg	4.00	2.58
Anthracene	ND		ug/kg	4.00	2.74
Fluoranthene	ND		ug/kg	4.00	1.84
Pyrene	ND		ug/kg	4.00	2.21
Benz(a)anthracene	ND		ug/kg	4.00	1.97
Chrysene	ND		ug/kg	4.00	1.45
Benzo(b)fluoranthene	ND		ug/kg	4.00	1.92
Benzo(k)fluoranthene	ND		ug/kg	4.00	1.15
Benzo(a)pyrene	ND		ug/kg	4.00	1.16
Indeno(1,2,3-cd)pyrene	ND		ug/kg	4.00	1.14
Dibenz(a,h)anthracene	ND		ug/kg	4.00	2.37
Benzo(g,h,i)perylene	ND		ug/kg	4.00	2.58
2-Methylnaphthalene	ND		ug/kg	4.00	1.74
1-Methylnaphthalene	ND		ug/kg	4.00	1.81
2-Chloronaphthalene	ND		ug/kg	4.00	1.46

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	52		30-130
Pyrene-d10	54		30-130
Benzo(b)fluoranthene-d12	59		30-130

Lab Control Sample Analysis

Batch Quality Control

Project Name: BELMONT LANDFILL

Project Number: 18-0157

Lab Number: L2170562

Report Date: 02/23/22

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
PAHs by GC/MS-SIM - Mansfield Lab Associated sample(s): 01-14 Batch: WG1590525-2 WG1590525-3								
Naphthalene	58		54		40-140	7		30
Acenaphthylene	51		47		40-140	8		30
Acenaphthene	52		49		40-140	6		30
Fluorene	57		52		40-140	9		30
Phenanthrene	54		48		40-140	12		30
Anthracene	61		56		40-140	9		30
Fluoranthene	64		56		40-140	13		30
Pyrene	58		50		40-140	15		30
Benz(a)anthracene	64		56		40-140	13		30
Chrysene	62		54		40-140	14		30
Benzo(b)fluoranthene	67		54		40-140	21		30
Benzo(k)fluoranthene	63		61		40-140	3		30
Benzo(a)pyrene	62		55		40-140	12		30
Indeno(1,2,3-cd)pyrene	68		61		40-140	11		30
Dibenz(a,h)anthracene	71		63		40-140	12		30
Benzo(g,h,i)perylene	73		66		40-140	10		30
2-Methylnaphthalene	55		50		40-140	10		30
1-Methylnaphthalene	59		53		40-140	11		30
2-Chloronaphthalene	52		48		40-140	8		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: BELMONT LANDFILL

Project Number: 18-0157

Lab Number: L2170562

Report Date: 02/23/22

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits

PAHs by GC/MS-SIM - Mansfield Lab Associated sample(s): 01-14 Batch: WG1590525-2 WG1590525-3

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2-Methylnaphthalene-d10	59		53		30-130
Pyrene-d10	62		53		30-130
Benzo(b)fluoranthene-d12	65		56		30-130

Matrix Spike Analysis

Batch Quality Control

Project Name: BELMONT LANDFILL

Project Number: 18-0157

Lab Number: L2170562

Report Date: 02/23/22

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
PAHs by GC/MS-SIM - Mansfield Lab Associated sample(s): 01-14 QC Batch ID: WG1590525-4 WG1590525-5 QC Sample: L2170562-05 Client ID: TOX-4												
Naphthalene	66.1	2120	1360	61		1130	50		40-140	18		30
Acenaphthylene	131	2120	1540	66		1090	45		40-140	34	Q	30
Acenaphthene	26.5	2120	1230	57		1020	47		40-140	19		30
Fluorene	31.0	2120	1180	54		1140	52		40-140	3		30
Phenanthrene	322	2120	2120	85		1460	54		40-140	37	Q	30
Anthracene	116	2120	1460	63		1140	48		40-140	25		30
Fluoranthene	849	2120	3380	119		2030	56		40-140	50	Q	30
Pyrene	825	2120	3070	106		1640	38	Q	40-140	61	Q	30
Benz(a)anthracene	645	2120	3240	122		1650	47		40-140	65	Q	30
Chrysene	743	2120	2760	95		1610	41		40-140	53	Q	30
Benzo(b)fluoranthene	807	2120	3180	112		1820	48		40-140	54	Q	30
Benzo(k)fluoranthene	552	2120	2170	76		1540	46		40-140	34	Q	30
Benzo(a)pyrene	710	2120	2800	98		1670	45		40-140	51	Q	30
Indeno(1,2,3-cd)pyrene	663	2120	2780	100		1780	53		40-140	44	Q	30
Dibenz(a,h)anthracene	146	2120	1780	77		1330	56		40-140	29		30
Benzo(g,h,i)perylene	713	2120	2640	91		1900	56		40-140	33	Q	30
2-Methylnaphthalene	44.8	2120	1320	60		1090	49		40-140	19		30
1-Methylnaphthalene	24.8	2120	1370	63		1120	52		40-140	20		30
2-Chloronaphthalene	ND	2120	1150	54		963	45		40-140	18		30

Surrogate	MS % Recovery	MSD % Recovery	Acceptance Criteria
2-Methylnaphthalene-d10	64	52	30-130
Benzo(b)fluoranthene-d12	61	54	30-130

Matrix Spike Analysis**Batch Quality Control****Project Name:** BELMONT LANDFILL**Lab Number:** L2170562**Project Number:** 18-0157**Report Date:** 02/23/22

<i>Parameter</i>	<i>Native Sample</i>	<i>MS Added</i>	<i>MS Found</i>	<i>MS %Recovery</i>	<i>Qual</i>	<i>MSD Found</i>	<i>MSD %Recovery</i>	<i>Qual</i>	<i>Recovery Limits</i>	<i>RPD</i>	<i>Qual</i>	<i>RPD Limits</i>

PAHs by GC/MS-SIM - Mansfield Lab Associated sample(s): 01-14 QC Batch ID: WG1590525-4 WG1590525-5 QC Sample: L2170562-05 Client ID: TOX-4

<i>Surrogate</i>	<i>MS % Recovery</i>	<i>Qualifier</i>	<i>MSD % Recovery</i>	<i>Qualifier</i>	<i>Acceptance Criteria</i>
Pyrene-d10	55		45		30-130

Matrix Spike Analysis

Batch Quality Control

Project Name: BELMONT LANDFILL

Project Number: 18-0157

Lab Number: L2170562

Report Date: 02/23/22

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
PAHs by GC/MS-SIM - Mansfield Lab Associated sample(s): 01-14 QC Batch ID: WG1590525-6 WG1590525-7 QC Sample: L2170562-12 Client ID: WORM-4												
Naphthalene	112	4790	2450	49		2720	55		40-140	10		30
Acenaphthylene	362	4790	2540	46		2830	52		40-140	11		30
Acenaphthene	44.6	4790	2220	45		2450	50		40-140	10		30
Fluorene	50.9	4790	2490	51		2720	56		40-140	9		30
Phenanthrene	703	4790	3110	50		3700	63		40-140	17		30
Anthracene	279	4790	2750	52		2930	56		40-140	6		30
Fluoranthene	2430	4790	5820	71		6700	90		40-140	14		30
Pyrene	2430	4790	4850	51		5370	62		40-140	10		30
Benz(a)anthracene	1560	4790	4100	53		4700	66		40-140	14		30
Chrysene	1950	4790	4320	50		4630	56		40-140	7		30
Benzo(b)fluoranthene	2030	4790	5070	64		5740	78		40-140	12		30
Benzo(k)fluoranthene	1640	4790	3640	42		3970	49		40-140	9		30
Benzo(a)pyrene	1980	4790	4390	50		4930	62		40-140	12		30
Indeno(1,2,3-cd)pyrene	1850	4790	4790	61		5110	68		40-140	6		30
Dibenz(a,h)anthracene	376	4790	3100	57		3320	62		40-140	7		30
Benzo(g,h,i)perylene	1900	4790	4790	60		5200	69		40-140	8		30
2-Methylnaphthalene	58.4	4790	2280	46		2570	53		40-140	12		30
1-Methylnaphthalene	42.9	4790	2440	50		2700	56		40-140	10		30
2-Chloronaphthalene	ND	4790	2110	44		2330	49		40-140	10		30

Surrogate	MS % Recovery	MS Qualifier	MSD % Recovery	MSD Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	48		53		30-130
Benzo(b)fluoranthene-d12	48		52		30-130

Matrix Spike Analysis

Batch Quality Control

Project Name: BELMONT LANDFILL

Lab Number: L2170562

Project Number: 18-0157

Report Date: 02/23/22

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
PAHs by GC/MS-SIM - Mansfield Lab Associated sample(s): 01-14 QC Batch ID: WG1590525-6 WG1590525-7 QC Sample: L2170562-12 Client ID: WORM-4												

Surrogate	MS % Recovery	Qualifier	MSD % Recovery	Qualifier	Acceptance Criteria
Pyrene-d10	47		51		30-130

SEMIVOLATILES

High Resolution Mass Spectrometry

Project Name: BELMONT LANDFILL
Project Number: 18-0157

Lab Number: L2170562
Report Date: 02/23/22

SAMPLE RESULTS

Lab ID: L2170562-01
Client ID: TOX-1
Sample Location: BELMONT, MA

Date Collected: 12/21/21 13:38
Date Received: 12/22/21
Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
Analytical Method: 132,1613B
Analytical Date: 02/12/22 14:10
Analyst: PB
Percent Solids: 35%

Extraction Method: EPA 8290A
Extraction Date: 02/08/22 16:24
Cleanup Method: EPA 1613B
Cleanup Date: 02/11/22

Parameter	Result	Qualifier	EMPC	Units	RL	MDL	Dilution Factor

Dioxins & Furans by Isotope Dilution HRMS - Mansfield Lab							

2,3,7,8-TCDD	ND			pg/g	1.38	0.426	1

Surrogate/Cleanup Standard	% Recovery	Qualifier	Acceptance Criteria
13C12-2,3,7,8-TCDD	66		25-164
37CL4-2,3,7,8-TCDD	97		35-197

Project Name: BELMONT LANDFILL
Project Number: 18-0157

Lab Number: L2170562
Report Date: 02/23/22

SAMPLE RESULTS

Lab ID: L2170562-02
Client ID: TOX-2
Sample Location: BELMONT, MA

Date Collected: 12/21/21 12:35
Date Received: 12/22/21
Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
Analytical Method: 132,1613B
Analytical Date: 02/16/22 18:43
Analyst: PB
Percent Solids: 25%

Extraction Method: EPA 8290A
Extraction Date: 02/08/22 16:24
Cleanup Method: EPA 1613B
Cleanup Date: 02/15/22

Parameter	Result	Qualifier	EMPC	Units	RL	MDL	Dilution Factor

Dioxins & Furans by Isotope Dilution HRMS - Mansfield Lab

2,3,7,8-TCDD	ND			pg/g	1.92	0.593	1

Surrogate/Cleanup Standard	% Recovery	Qualifier	Acceptance Criteria
13C12-2,3,7,8-TCDD	65		25-164
37CL4-2,3,7,8-TCDD	97		35-197

Project Name: BELMONT LANDFILL
Project Number: 18-0157

Lab Number: L2170562
Report Date: 02/23/22

SAMPLE RESULTS

Lab ID: L2170562-03
Client ID: TOX-3
Sample Location: BELMONT, MA

Date Collected: 12/21/21 11:25
Date Received: 12/22/21
Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
Analytical Method: 132,1613B
Analytical Date: 02/16/22 19:54
Analyst: PB
Percent Solids: 30%

Extraction Method: EPA 8290A
Extraction Date: 02/08/22 16:24
Cleanup Method: EPA 1613B
Cleanup Date: 02/15/22

Parameter	Result	Qualifier	EMPC	Units	RL	MDL	Dilution Factor

Dioxins & Furans by Isotope Dilution HRMS - Mansfield Lab							

2,3,7,8-TCDD	ND			pg/g	1.59	0.490	1

Surrogate/Cleanup Standard	% Recovery	Qualifier	Acceptance Criteria
13C12-2,3,7,8-TCDD	74		25-164
37CL4-2,3,7,8-TCDD	96		35-197

Project Name: BELMONT LANDFILL
Project Number: 18-0157

Lab Number: L2170562
Report Date: 02/23/22

SAMPLE RESULTS

Lab ID: L2170562-04
Client ID: TOX-3-DUP
Sample Location: BELMONT, MA

Date Collected: 12/21/21 11:57
Date Received: 12/22/21
Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
Analytical Method: 132,1613B
Analytical Date: 02/16/22 13:58
Analyst: PB
Percent Solids: 35%

Extraction Method: EPA 8290A
Extraction Date: 02/08/22 16:24
Cleanup Method: EPA 1613B
Cleanup Date: 02/15/22

Parameter	Result	Qualifier	EMPC	Units	RL	MDL	Dilution Factor

Dioxins & Furans by Isotope Dilution HRMS - Mansfield Lab

2,3,7,8-TCDD	ND			pg/g	1.40	0.431	1

Surrogate/Cleanup Standard	% Recovery	Qualifier	Acceptance Criteria
13C12-2,3,7,8-TCDD	68		25-164
37CL4-2,3,7,8-TCDD	87		35-197

Project Name: BELMONT LANDFILL
Project Number: 18-0157

Lab Number: L2170562
Report Date: 02/23/22

SAMPLE RESULTS

Lab ID: L2170562-05
Client ID: TOX-4
Sample Location: BELMONT, MA

Date Collected: 12/21/21 09:05
Date Received: 12/22/21
Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
Analytical Method: 132,1613B
Analytical Date: 02/16/22 15:09
Analyst: PB
Percent Solids: 23%

Extraction Method: EPA 8290A
Extraction Date: 02/08/22 16:24
Cleanup Method: EPA 1613B
Cleanup Date: 02/15/22

Parameter	Result	Qualifier	EMPC	Units	RL	MDL	Dilution Factor

Dioxins & Furans by Isotope Dilution HRMS - Mansfield Lab

2,3,7,8-TCDD	ND			pg/g	2.09	0.644	1

Surrogate/Cleanup Standard	% Recovery	Qualifier	Acceptance Criteria
13C12-2,3,7,8-TCDD	68		25-164
37CL4-2,3,7,8-TCDD	96		35-197

Project Name: BELMONT LANDFILL
Project Number: 18-0157

Lab Number: L2170562
Report Date: 02/23/22

SAMPLE RESULTS

Lab ID: L2170562-06
Client ID: TOX-5
Sample Location: BELMONT, MA

Date Collected: 12/21/21 14:22
Date Received: 12/22/21
Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
Analytical Method: 132,1613B
Analytical Date: 02/16/22 21:05
Analyst: PB
Percent Solids: 62%

Extraction Method: EPA 8290A
Extraction Date: 02/08/22 16:24
Cleanup Method: EPA 1613B
Cleanup Date: 02/15/22

Parameter	Result	Qualifier	EMPC	Units	RL	MDL	Dilution Factor

Dioxins & Furans by Isotope Dilution HRMS - Mansfield Lab

2,3,7,8-TCDD	ND			pg/g	0.764	0.235	1

Surrogate/Cleanup Standard	% Recovery	Qualifier	Acceptance Criteria
13C12-2,3,7,8-TCDD	69		25-164
37CL4-2,3,7,8-TCDD	101		35-197

Project Name: BELMONT LANDFILL
Project Number: 18-0157

Lab Number: L2170562
Report Date: 02/23/22

SAMPLE RESULTS

Lab ID: L2170562-07
Client ID: TOX-6
Sample Location: BELMONT, MA

Date Collected: 12/21/21 15:54
Date Received: 12/22/21
Field Prep: Not Specified

Sample Depth:

Matrix: Sediment
Analytical Method: 132,1613B
Analytical Date: 02/17/22 14:10
Analyst: PB
Percent Solids: 21%

Extraction Method: EPA 8290A
Extraction Date: 02/09/22 16:34
Cleanup Method: EPA 1613B
Cleanup Date: 02/16/22

Parameter	Result	Qualifier	EMPC	Units	RL	MDL	Dilution Factor

Dioxins & Furans by Isotope Dilution HRMS - Mansfield Lab

2,3,7,8-TCDD	ND			pg/g	2.36	0.726	1

Surrogate/Cleanup Standard	% Recovery	Qualifier	Acceptance Criteria
13C12-2,3,7,8-TCDD	68		25-164
37CL4-2,3,7,8-TCDD	92		35-197

Project Name: BELMONT LANDFILL
Project Number: 18-0157

Lab Number: L2170562
Report Date: 02/23/22

SAMPLE RESULTS

Lab ID: L2170562-08
Client ID: WORM-1
Sample Location: BELMONT, MA

Date Collected: 12/21/21 13:26
Date Received: 12/22/21
Field Prep: Not Specified

Sample Depth:

Matrix: Soil
Analytical Method: 132,1613B
Analytical Date: 02/17/22 15:21
Analyst: PB
Percent Solids: 70%

Extraction Method: EPA 8290A
Extraction Date: 02/09/22 16:34
Cleanup Method: EPA 1613B
Cleanup Date: 02/16/22

Parameter	Result	Qualifier	EMPC	Units	RL	MDL	Dilution Factor

Dioxins & Furans by Isotope Dilution HRMS - Mansfield Lab							

2,3,7,8-TCDD	ND			pg/g	0.684	0.211	1

Surrogate/Cleanup Standard	% Recovery	Qualifier	Acceptance Criteria
13C12-2,3,7,8-TCDD	67		25-164
37CL4-2,3,7,8-TCDD	92		35-197

Project Name: BELMONT LANDFILL
Project Number: 18-0157

Lab Number: L2170562
Report Date: 02/23/22

SAMPLE RESULTS

Lab ID: L2170562-09
Client ID: WORM-2
Sample Location: BELMONT, MA

Date Collected: 12/21/21 12:36
Date Received: 12/22/21
Field Prep: Not Specified

Sample Depth:

Matrix: Soil
Analytical Method: 132,1613B
Analytical Date: 02/17/22 16:32
Analyst: PB
Percent Solids: 25%

Extraction Method: EPA 8290A
Extraction Date: 02/09/22 16:34
Cleanup Method: EPA 1613B
Cleanup Date: 02/16/22

Parameter	Result	Qualifier	EMPC	Units	RL	MDL	Dilution Factor

Dioxins & Furans by Isotope Dilution HRMS - Mansfield Lab

2,3,7,8-TCDD	ND			pg/g	2.00	0.616	1

Surrogate/Cleanup Standard	% Recovery	Qualifier	Acceptance Criteria
13C12-2,3,7,8-TCDD	64		25-164
37CL4-2,3,7,8-TCDD	87		35-197

Project Name: BELMONT LANDFILL
Project Number: 18-0157

Lab Number: L2170562
Report Date: 02/23/22

SAMPLE RESULTS

Lab ID: L2170562-10
Client ID: WORM-3
Sample Location: BELMONT, MA

Date Collected: 12/21/21 11:01
Date Received: 12/22/21
Field Prep: Not Specified

Sample Depth:

Matrix: Soil
Analytical Method: 132,1613B
Analytical Date: 02/17/22 17:44
Analyst: PB
Percent Solids: 14%

Extraction Method: EPA 8290A
Extraction Date: 02/09/22 16:34
Cleanup Method: EPA 1613B
Cleanup Date: 02/16/22

Parameter	Result	Qualifier	EMPC	Units	RL	MDL	Dilution Factor

Dioxins & Furans by Isotope Dilution HRMS - Mansfield Lab							

2,3,7,8-TCDD	ND			pg/g	3.51	1.08	1

Surrogate/Cleanup Standard	% Recovery	Qualifier	Acceptance Criteria
13C12-2,3,7,8-TCDD	78		25-164
37CL4-2,3,7,8-TCDD	100		35-197

Project Name: BELMONT LANDFILL
Project Number: 18-0157

Lab Number: L2170562
Report Date: 02/23/22

SAMPLE RESULTS

Lab ID: L2170562-11
Client ID: WORM-3-DUP
Sample Location: BELMONT, MA

Date Collected: 12/21/21 11:36
Date Received: 12/22/21
Field Prep: Not Specified

Sample Depth:

Matrix: Soil
Analytical Method: 132,1613B
Analytical Date: 02/18/22 14:38
Analyst: PB
Percent Solids: 12%

Extraction Method: EPA 8290A
Extraction Date: 02/09/22 16:34
Cleanup Method: EPA 1613B
Cleanup Date: 02/16/22

Parameter	Result	Qualifier	EMPC	Units	RL	MDL	Dilution Factor

Dioxins & Furans by Isotope Dilution HRMS - Mansfield Lab							

2,3,7,8-TCDD	ND			pg/g	4.01	1.24	1

Surrogate/Cleanup Standard	% Recovery	Qualifier	Acceptance Criteria
13C12-2,3,7,8-TCDD	78		25-164
37CL4-2,3,7,8-TCDD	106		35-197

Project Name: BELMONT LANDFILL
Project Number: 18-0157

Lab Number: L2170562
Report Date: 02/23/22

SAMPLE RESULTS

Lab ID: L2170562-12
Client ID: WORM-4
Sample Location: BELMONT, MA

Date Collected: 12/21/21 09:22
Date Received: 12/22/21
Field Prep: Not Specified

Sample Depth:

Matrix: Soil
Analytical Method: 132,1613B
Analytical Date: 02/18/22 15:42
Analyst: PB
Percent Solids: 10%

Extraction Method: EPA 8290A
Extraction Date: 02/09/22 16:34
Cleanup Method: EPA 1613B
Cleanup Date: 02/16/22

Parameter	Result	Qualifier	EMPC	Units	RL	MDL	Dilution Factor

Dioxins & Furans by Isotope Dilution HRMS - Mansfield Lab							

2,3,7,8-TCDD	ND			pg/g	4.77	1.47	1

Surrogate/Cleanup Standard	% Recovery	Qualifier	Acceptance Criteria
13C12-2,3,7,8-TCDD	79		25-164
37CL4-2,3,7,8-TCDD	102		35-197

Project Name: BELMONT LANDFILL
Project Number: 18-0157

Lab Number: L2170562
Report Date: 02/23/22

SAMPLE RESULTS

Lab ID: L2170562-13
Client ID: WORM-5
Sample Location: BELMONT, MA

Date Collected: 12/21/21 09:57
Date Received: 12/22/21
Field Prep: Not Specified

Sample Depth:

Matrix: Soil
Analytical Method: 132,1613B
Analytical Date: 02/18/22 18:54
Analyst: PB
Percent Solids: 68%

Extraction Method: EPA 8290A
Extraction Date: 02/09/22 16:34
Cleanup Method: EPA 1613B
Cleanup Date: 02/16/22

Parameter	Result	Qualifier	EMPC	Units	RL	MDL	Dilution Factor

Dioxins & Furans by Isotope Dilution HRMS - Mansfield Lab							

2,3,7,8-TCDD	ND			pg/g	0.719	0.222	1

Surrogate/Cleanup Standard	% Recovery	Qualifier	Acceptance Criteria
13C12-2,3,7,8-TCDD	72		25-164
37CL4-2,3,7,8-TCDD	91		35-197

Project Name: BELMONT LANDFILL
Project Number: 18-0157

Lab Number: L2170562
Report Date: 02/23/22

SAMPLE RESULTS

Lab ID: L2170562-14
Client ID: WORM-6
Sample Location: BELMONT, MA

Date Collected: 12/21/21 15:10
Date Received: 12/22/21
Field Prep: Not Specified

Sample Depth:

Matrix: Soil
Analytical Method: 132,1613B
Analytical Date: 02/18/22 19:58
Analyst: PB
Percent Solids: 17%

Extraction Method: EPA 8290A
Extraction Date: 02/09/22 16:34
Cleanup Method: EPA 1613B
Cleanup Date: 02/16/22

Parameter	Result	Qualifier	EMPC	Units	RL	MDL	Dilution Factor

Dioxins & Furans by Isotope Dilution HRMS - Mansfield Lab

2,3,7,8-TCDD	ND			pg/g	2.78	0.857	1

Surrogate/Cleanup Standard	% Recovery	Qualifier	Acceptance Criteria
13C12-2,3,7,8-TCDD	73		25-164
37CL4-2,3,7,8-TCDD	89		35-197

Project Name: BELMONT LANDFILL

Lab Number: L2170562

Project Number: 18-0157

Report Date: 02/23/22

Method Blank Analysis Batch Quality Control

Analytical Method: 132,1613B
 Analytical Date: 02/11/22 19:26
 Analyst: PB

Extraction Method: EPA 8290A
 Extraction Date: 02/08/22 16:24
 Cleanup Method: EPA 1613B
 Cleanup Date: 02/10/22

Parameter	Result	Qualifier	EMPC	Units	RL	MDL
Dioxins & Furans by Isotope Dilution HRMS - Mansfield Lab for sample(s): 01-06 Batch: WG1602476-1						
2,3,7,8-TCDD	ND			pg/g	0.500	0.154

Surrogate/Cleanup Standard	%Recovery	Qualifier	Acceptance Criteria
13C12-2,3,7,8-TCDF	64		24-169
13C12-2,3,7,8-TCDD	66		25-164
13C12-1,2,3,7,8-PeCDF	66		24-185
13C12-2,3,4,7,8-PeCDF	66		21-178
13C12-1,2,3,7,8-PeCDD	68		25-181
13C12-1,2,3,4,7,8-HxCDF	82		26-152
13C12-1,2,3,6,7,8-HxCDF	77		26-123
13C12-2,3,4,6,7,8-HxCDF	72		28-136
13C12-1,2,3,7,8,9-HxCDF	74		29-147
13C12-1,2,3,4,7,8-HxCDD	74		32-141
13C12-1,2,3,6,7,8-HxCDD	83		28-130
13C12-1,2,3,4,6,7,8-HpCDF	68		28-143
13C12-1,2,3,4,7,8,9-HpCDF	65		26-138
13C12-1,2,3,4,6,7,8-HpCDD	78		23-140
13C12-OCDD	72		17-157
37CL4-2,3,7,8-TCDD	95		35-197

Project Name: BELMONT LANDFILL

Lab Number: L2170562

Project Number: 18-0157

Report Date: 02/23/22

Method Blank Analysis Batch Quality Control

Analytical Method: 132,1613B
 Analytical Date: 02/17/22 11:47
 Analyst: PB

Extraction Method: EPA 8290A
 Extraction Date: 02/09/22 16:34
 Cleanup Method: EPA 1613B
 Cleanup Date: 02/16/22

Parameter	Result	Qualifier	EMPC	Units	RL	MDL
Dioxins & Furans by Isotope Dilution HRMS - Mansfield Lab for sample(s): 07-14 Batch: WG1603168-1						
2,3,7,8-TCDD	ND			pg/g	0.500	0.154
Surrogate/Cleanup Standard	%Recovery		Qualifier	Acceptance Criteria		
13C12-2,3,7,8-TCDD	75			25-164		
37CL4-2,3,7,8-TCDD	96			35-197		

Lab Control Sample Analysis

Batch Quality Control

Project Name: BELMONT LANDFILL

Lab Number: L2170562

Project Number: 18-0157

Report Date: 02/23/22

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Dioxins & Furans by Isotope Dilution HRMS - Mansfield Lab Associated sample(s): 01-06 Batch: WG1602476-2								
2,3,7,8-TCDD	106		-		67-158	-		25

Surrogate/Cleanup Standard	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
13C12-2,3,7,8-TCDF	70				24-169
13C12-2,3,7,8-TCDD	69				25-164
13C12-1,2,3,7,8-PeCDF	72				24-185
13C12-2,3,4,7,8-PeCDF	70				21-178
13C12-1,2,3,7,8-PeCDD	69				25-181
13C12-1,2,3,4,7,8-HxCDF	84				26-152
13C12-1,2,3,6,7,8-HxCDF	77				26-123
13C12-2,3,4,6,7,8-HxCDF	75				28-136
13C12-1,2,3,7,8,9-HxCDF	77				29-147
13C12-1,2,3,4,7,8-HxCDD	78				32-141
13C12-1,2,3,6,7,8-HxCDD	86				28-130
13C12-1,2,3,4,6,7,8-HpCDF	70				28-143
13C12-1,2,3,4,7,8,9-HpCDF	66				26-138
13C12-1,2,3,4,6,7,8-HpCDD	81				23-140
13C12-OCDD	75				17-157
37CL4-2,3,7,8-TCDD	91				35-197

Lab Control Sample Analysis**Batch Quality Control****Project Name:** BELMONT LANDFILL**Lab Number:** L2170562**Project Number:** 18-0157**Report Date:** 02/23/22

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Dioxins & Furans by Isotope Dilution HRMS - Mansfield Lab Associated sample(s): 07-14 Batch: WG1603168-2								
2,3,7,8-TCDD	108		-		67-158	-		25

Surrogate/Cleanup Standard	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
13C12-2,3,7,8-TCDD	78				25-164
37CL4-2,3,7,8-TCDD	95				35-197

Matrix Spike Analysis **Batch Quality Control**

Project Name: BELMONT LANDFILL

Lab Number: L2170562

Project Number: 18-0157

Report Date: 02/23/22

<i>Parameter</i>	<i>Native Sample</i>	<i>MS Added</i>	<i>MS Found</i>	<i>MS %Recovery</i>	<i>Qual</i>	<i>MSD Found</i>	<i>MSD %Recovery</i>	<i>Qual</i>	<i>Recovery Limits</i>	<i>RPD</i>	<i>Qual</i>	<i>RPD Limits</i>
Dioxins & Furans by Isotope Dilution HRMS - Mansfield Lab Associated sample(s): 01-06 QC Batch ID: WG1602476-3 WG1602476-4 QC Sample: L2170562-05 Client ID: TOX-4												
2,3,7,8-TCDD	ND	42.9	47.7	111		48.3	113		67-158	1		25

<i>Surrogate/Cleanup Standard</i>	<i>MS % Recovery</i>	<i>Qualifier</i>	<i>MSD % Recovery</i>	<i>Qualifier</i>	<i>Acceptance Criteria</i>
13C12-2,3,7,8-TCDD	68		62		25-164
37CL4-2,3,7,8-TCDD	94		94		35-197

Matrix Spike Analysis

Batch Quality Control

Project Name: BELMONT LANDFILL

Project Number: 18-0157

Lab Number: L2170562

Report Date: 02/23/22

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Dioxins & Furans by Isotope Dilution HRMS - Mansfield Lab Associated sample(s): 07-14 QC Batch ID: WG1603168-3 WG1603168-4 QC Sample: L2170562-12 Client ID: WORM-4												
2,3,7,8-TCDD	ND	93.7	102	109		96.7	103		67-158	5		25

Surrogate/Cleanup Standard	MS		MSD		Acceptance Criteria
	% Recovery	Qualifier	% Recovery	Qualifier	
13C12-2,3,7,8-TCDD	64		78		25-164
37CL4-2,3,7,8-TCDD	88		92		35-197

METALS

Project Name: BELMONT LANDFILL**Lab Number:** L2170562**Project Number:** 18-0157**Report Date:** 02/23/22**SAMPLE RESULTS**

Lab ID: L2170562-01

Date Collected: 12/21/21 13:38

Client ID: TOX-1

Date Received: 12/22/21

Sample Location: BELMONT, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Sediment

Percent Solids: 35%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/kg	4.33	4.33	10	01/12/22 11:17	01/19/22 12:08	EPA 3050B	97,6020B	CD
Arsenic, Total	11.8		mg/kg	1.35	1.35	10	01/12/22 11:17	01/19/22 12:08	EPA 3050B	97,6020B	CD
Barium, Total	98.8		mg/kg	8.12	8.12	10	01/12/22 11:17	01/19/22 12:08	EPA 3050B	97,6020B	CD
Beryllium, Total	ND		mg/kg	0.8122	0.8122	10	01/12/22 11:17	01/19/22 12:08	EPA 3050B	97,6020B	CD
Cadmium, Total	1.787		mg/kg	0.5414	0.5414	10	01/12/22 11:17	01/19/22 12:08	EPA 3050B	97,6020B	CD
Chromium, Total	36.2		mg/kg	5.41	5.41	10	01/12/22 11:17	01/19/22 12:08	EPA 3050B	97,6020B	CD
Copper, Total	63.4		mg/kg	5.41	5.41	10	01/12/22 11:17	01/19/22 12:08	EPA 3050B	97,6020B	CD
Lead, Total	95.2		mg/kg	1.62	1.62	10	01/12/22 11:17	01/19/22 12:08	EPA 3050B	97,6020B	CD
Mercury, Total	ND		mg/kg	0.188	0.188	1	01/18/22 11:21	01/18/22 14:59	EPA 7471B	97,7471B	AC
Nickel, Total	18.8		mg/kg	2.71	2.71	10	01/12/22 11:17	01/19/22 12:08	EPA 3050B	97,6020B	CD
Selenium, Total	ND		mg/kg	5.41	5.41	10	01/12/22 11:17	01/19/22 12:08	EPA 3050B	97,6020B	CD
Silver, Total	ND		mg/kg	1.35	1.35	10	01/12/22 11:17	01/19/22 12:08	EPA 3050B	97,6020B	CD
Zinc, Total	325		mg/kg	27.1	27.1	10	01/12/22 11:17	01/19/22 12:08	EPA 3050B	97,6020B	CD



Project Name: BELMONT LANDFILL**Lab Number:** L2170562**Project Number:** 18-0157**Report Date:** 02/23/22**SAMPLE RESULTS**

Lab ID: L2170562-02

Date Collected: 12/21/21 12:35

Client ID: TOX-2

Date Received: 12/22/21

Sample Location: BELMONT, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Sediment

Percent Solids: 25%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/kg	6.05	6.05	10	01/12/22 11:17	01/19/22 12:13	EPA 3050B	97,6020B	CD
Arsenic, Total	26.8		mg/kg	1.89	1.89	10	01/12/22 11:17	01/19/22 12:13	EPA 3050B	97,6020B	CD
Barium, Total	185		mg/kg	11.3	11.3	10	01/12/22 11:17	01/19/22 12:13	EPA 3050B	97,6020B	CD
Beryllium, Total	ND		mg/kg	1.134	1.134	10	01/12/22 11:17	01/19/22 12:13	EPA 3050B	97,6020B	CD
Cadmium, Total	3.202		mg/kg	0.7560	0.7560	10	01/12/22 11:17	01/19/22 12:13	EPA 3050B	97,6020B	CD
Chromium, Total	57.5		mg/kg	7.56	7.56	10	01/12/22 11:17	01/19/22 12:13	EPA 3050B	97,6020B	CD
Copper, Total	123		mg/kg	7.56	7.56	10	01/12/22 11:17	01/19/22 12:13	EPA 3050B	97,6020B	CD
Lead, Total	397		mg/kg	2.27	2.27	10	01/12/22 11:17	01/19/22 12:13	EPA 3050B	97,6020B	CD
Mercury, Total	0.371		mg/kg	0.253	0.253	1	01/18/22 11:21	01/18/22 15:03	EPA 7471B	97,7471B	AC
Nickel, Total	34.0		mg/kg	3.78	3.78	10	01/12/22 11:17	01/19/22 12:13	EPA 3050B	97,6020B	CD
Selenium, Total	ND		mg/kg	7.56	7.56	10	01/12/22 11:17	01/19/22 12:13	EPA 3050B	97,6020B	CD
Silver, Total	ND		mg/kg	1.89	1.89	10	01/12/22 11:17	01/19/22 12:13	EPA 3050B	97,6020B	CD
Zinc, Total	468		mg/kg	37.8	37.8	10	01/12/22 11:17	01/19/22 12:13	EPA 3050B	97,6020B	CD



Project Name: BELMONT LANDFILL**Lab Number:** L2170562**Project Number:** 18-0157**Report Date:** 02/23/22**SAMPLE RESULTS**

Lab ID: L2170562-03

Date Collected: 12/21/21 11:25

Client ID: TOX-3

Date Received: 12/22/21

Sample Location: BELMONT, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Sediment

Percent Solids: 30%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/kg	5.05	5.05	10	01/12/22 11:17	01/19/22 12:19	EPA 3050B	97,6020B	CD
Arsenic, Total	9.90		mg/kg	1.58	1.58	10	01/12/22 11:17	01/19/22 12:19	EPA 3050B	97,6020B	CD
Barium, Total	98.6		mg/kg	9.46	9.46	10	01/12/22 11:17	01/19/22 12:19	EPA 3050B	97,6020B	CD
Beryllium, Total	ND		mg/kg	0.9462	0.9462	10	01/12/22 11:17	01/19/22 12:19	EPA 3050B	97,6020B	CD
Cadmium, Total	1.196		mg/kg	0.6308	0.6308	10	01/12/22 11:17	01/19/22 12:19	EPA 3050B	97,6020B	CD
Chromium, Total	12.2		mg/kg	6.31	6.31	10	01/12/22 11:17	01/19/22 12:19	EPA 3050B	97,6020B	CD
Copper, Total	41.4		mg/kg	6.31	6.31	10	01/12/22 11:17	01/19/22 12:19	EPA 3050B	97,6020B	CD
Lead, Total	124		mg/kg	1.89	1.89	10	01/12/22 11:17	01/19/22 12:19	EPA 3050B	97,6020B	CD
Mercury, Total	0.265		mg/kg	0.229	0.229	1	01/18/22 11:21	01/18/22 15:06	EPA 7471B	97,7471B	AC
Nickel, Total	13.5		mg/kg	3.15	3.15	10	01/12/22 11:17	01/19/22 12:19	EPA 3050B	97,6020B	CD
Selenium, Total	ND		mg/kg	6.31	6.31	10	01/12/22 11:17	01/19/22 12:19	EPA 3050B	97,6020B	CD
Silver, Total	ND		mg/kg	1.58	1.58	10	01/12/22 11:17	01/19/22 12:19	EPA 3050B	97,6020B	CD
Zinc, Total	139		mg/kg	31.5	31.5	10	01/12/22 11:17	01/19/22 12:19	EPA 3050B	97,6020B	CD



Project Name: BELMONT LANDFILL**Lab Number:** L2170562**Project Number:** 18-0157**Report Date:** 02/23/22**SAMPLE RESULTS**

Lab ID: L2170562-04

Date Collected: 12/21/21 11:57

Client ID: TOX-3-DUP

Date Received: 12/22/21

Sample Location: BELMONT, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Sediment

Percent Solids: 35%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/kg	4.33	4.33	10	01/12/22 11:17	01/19/22 12:24	EPA 3050B	97,6020B	CD
Arsenic, Total	12.3		mg/kg	1.35	1.35	10	01/12/22 11:17	01/19/22 12:24	EPA 3050B	97,6020B	CD
Barium, Total	126		mg/kg	8.12	8.12	10	01/12/22 11:17	01/19/22 12:24	EPA 3050B	97,6020B	CD
Beryllium, Total	ND		mg/kg	0.8123	0.8123	10	01/12/22 11:17	01/19/22 12:24	EPA 3050B	97,6020B	CD
Cadmium, Total	1.302		mg/kg	0.5415	0.5415	10	01/12/22 11:17	01/19/22 12:24	EPA 3050B	97,6020B	CD
Chromium, Total	14.9		mg/kg	5.42	5.42	10	01/12/22 11:17	01/19/22 12:24	EPA 3050B	97,6020B	CD
Copper, Total	49.9		mg/kg	5.42	5.42	10	01/12/22 11:17	01/19/22 12:24	EPA 3050B	97,6020B	CD
Lead, Total	167		mg/kg	1.62	1.62	10	01/12/22 11:17	01/19/22 12:24	EPA 3050B	97,6020B	CD
Mercury, Total	0.249		mg/kg	0.197	0.197	1	01/18/22 11:21	01/18/22 15:09	EPA 7471B	97,7471B	AC
Nickel, Total	16.4		mg/kg	2.71	2.71	10	01/12/22 11:17	01/19/22 12:24	EPA 3050B	97,6020B	CD
Selenium, Total	ND		mg/kg	5.42	5.42	10	01/12/22 11:17	01/19/22 12:24	EPA 3050B	97,6020B	CD
Silver, Total	ND		mg/kg	1.35	1.35	10	01/12/22 11:17	01/19/22 12:24	EPA 3050B	97,6020B	CD
Zinc, Total	172		mg/kg	27.1	27.1	10	01/12/22 11:17	01/19/22 12:24	EPA 3050B	97,6020B	CD



Project Name: BELMONT LANDFILL**Lab Number:** L2170562**Project Number:** 18-0157**Report Date:** 02/23/22**SAMPLE RESULTS**

Lab ID: L2170562-05

Date Collected: 12/21/21 09:05

Client ID: TOX-4

Date Received: 12/22/21

Sample Location: BELMONT, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Sediment

Percent Solids: 23%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/kg	6.74	6.74	10	01/12/22 11:17	01/19/22 11:29	EPA 3050B	97,6020B	CD
Arsenic, Total	11.1		mg/kg	2.10	2.10	10	01/12/22 11:17	01/19/22 11:29	EPA 3050B	97,6020B	CD
Barium, Total	285		mg/kg	12.6	12.6	10	01/12/22 11:17	01/19/22 11:29	EPA 3050B	97,6020B	CD
Beryllium, Total	1.696		mg/kg	1.263	1.263	10	01/12/22 11:17	01/19/22 11:29	EPA 3050B	97,6020B	CD
Cadmium, Total	2.586		mg/kg	0.8422	0.8422	10	01/12/22 11:17	01/19/22 11:29	EPA 3050B	97,6020B	CD
Chromium, Total	35.4		mg/kg	8.42	8.42	10	01/12/22 11:17	01/19/22 11:29	EPA 3050B	97,6020B	CD
Copper, Total	162		mg/kg	8.42	8.42	10	01/12/22 11:17	01/19/22 11:29	EPA 3050B	97,6020B	CD
Lead, Total	487		mg/kg	2.53	2.53	10	01/12/22 11:17	01/19/22 11:29	EPA 3050B	97,6020B	CD
Mercury, Total	0.398		mg/kg	0.279	0.279	1	01/18/22 11:21	01/18/22 14:20	EPA 7471B	97,7471B	AC
Nickel, Total	48.7		mg/kg	4.21	4.21	10	01/12/22 11:17	01/19/22 11:29	EPA 3050B	97,6020B	CD
Selenium, Total	ND		mg/kg	8.42	8.42	10	01/12/22 11:17	01/19/22 11:29	EPA 3050B	97,6020B	CD
Silver, Total	ND		mg/kg	2.10	2.10	10	01/12/22 11:17	01/19/22 11:29	EPA 3050B	97,6020B	CD
Zinc, Total	426		mg/kg	42.1	42.1	10	01/12/22 11:17	01/19/22 11:29	EPA 3050B	97,6020B	CD



Project Name: BELMONT LANDFILL**Lab Number:** L2170562**Project Number:** 18-0157**Report Date:** 02/23/22**SAMPLE RESULTS**

Lab ID: L2170562-06

Date Collected: 12/21/21 14:22

Client ID: TOX-5

Date Received: 12/22/21

Sample Location: BELMONT, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Sediment

Percent Solids: 62%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/kg	2.43	2.43	10	01/12/22 11:17	01/19/22 12:29	EPA 3050B	97,6020B	CD
Arsenic, Total	3.33		mg/kg	0.759	0.759	10	01/12/22 11:17	01/19/22 12:29	EPA 3050B	97,6020B	CD
Barium, Total	47.9		mg/kg	4.55	4.55	10	01/12/22 11:17	01/19/22 12:29	EPA 3050B	97,6020B	CD
Beryllium, Total	ND		mg/kg	0.4553	0.4553	10	01/12/22 11:17	01/19/22 12:29	EPA 3050B	97,6020B	CD
Cadmium, Total	0.4514		mg/kg	0.3035	0.3035	10	01/12/22 11:17	01/19/22 12:29	EPA 3050B	97,6020B	CD
Chromium, Total	8.47		mg/kg	3.04	3.04	10	01/12/22 11:17	01/19/22 12:29	EPA 3050B	97,6020B	CD
Copper, Total	65.7		mg/kg	3.04	3.04	10	01/12/22 11:17	01/19/22 12:29	EPA 3050B	97,6020B	CD
Lead, Total	140		mg/kg	0.910	0.910	10	01/12/22 11:17	01/19/22 12:29	EPA 3050B	97,6020B	CD
Mercury, Total	ND		mg/kg	0.112	0.112	1	01/18/22 11:21	01/18/22 15:13	EPA 7471B	97,7471B	AC
Nickel, Total	10.6		mg/kg	1.52	1.52	10	01/12/22 11:17	01/19/22 12:29	EPA 3050B	97,6020B	CD
Selenium, Total	ND		mg/kg	3.04	3.04	10	01/12/22 11:17	01/19/22 12:29	EPA 3050B	97,6020B	CD
Silver, Total	ND		mg/kg	0.759	0.759	10	01/12/22 11:17	01/19/22 12:29	EPA 3050B	97,6020B	CD
Zinc, Total	129		mg/kg	15.2	15.2	10	01/12/22 11:17	01/19/22 12:29	EPA 3050B	97,6020B	CD



Project Name: BELMONT LANDFILL**Lab Number:** L2170562**Project Number:** 18-0157**Report Date:** 02/23/22**SAMPLE RESULTS**

Lab ID: L2170562-07

Date Collected: 12/21/21 15:54

Client ID: TOX-6

Date Received: 12/22/21

Sample Location: BELMONT, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Sediment

Percent Solids: 21%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/kg	7.47	7.47	10	01/12/22 11:17	01/19/22 12:34	EPA 3050B	97,6020B	CD
Arsenic, Total	9.68		mg/kg	2.33	2.33	10	01/12/22 11:17	01/19/22 12:34	EPA 3050B	97,6020B	CD
Barium, Total	193		mg/kg	14.0	14.0	10	01/12/22 11:17	01/19/22 12:34	EPA 3050B	97,6020B	CD
Beryllium, Total	ND		mg/kg	1.400	1.400	10	01/12/22 11:17	01/19/22 12:34	EPA 3050B	97,6020B	CD
Cadmium, Total	1.861		mg/kg	0.9335	0.9335	10	01/12/22 11:17	01/19/22 12:34	EPA 3050B	97,6020B	CD
Chromium, Total	15.8		mg/kg	9.34	9.34	10	01/12/22 11:17	01/19/22 12:34	EPA 3050B	97,6020B	CD
Copper, Total	58.3		mg/kg	9.34	9.34	10	01/12/22 11:17	01/19/22 12:34	EPA 3050B	97,6020B	CD
Lead, Total	89.3		mg/kg	2.80	2.80	10	01/12/22 11:17	01/19/22 12:34	EPA 3050B	97,6020B	CD
Mercury, Total	ND		mg/kg	0.312	0.312	1	01/18/22 11:21	01/18/22 15:16	EPA 7471B	97,7471B	AC
Nickel, Total	18.5		mg/kg	4.67	4.67	10	01/12/22 11:17	01/19/22 12:34	EPA 3050B	97,6020B	CD
Selenium, Total	ND		mg/kg	9.34	9.34	10	01/12/22 11:17	01/19/22 12:34	EPA 3050B	97,6020B	CD
Silver, Total	ND		mg/kg	2.33	2.33	10	01/12/22 11:17	01/19/22 12:34	EPA 3050B	97,6020B	CD
Zinc, Total	219		mg/kg	46.7	46.7	10	01/12/22 11:17	01/19/22 12:34	EPA 3050B	97,6020B	CD



Project Name: BELMONT LANDFILL**Lab Number:** L2170562**Project Number:** 18-0157**Report Date:** 02/23/22**SAMPLE RESULTS**

Lab ID: L2170562-08

Date Collected: 12/21/21 13:26

Client ID: WORM-1

Date Received: 12/22/21

Sample Location: BELMONT, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Soil

Percent Solids: 70%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/kg	2.19	2.19	10	01/12/22 11:17	01/19/22 12:40	EPA 3050B	97,6020B	CD
Arsenic, Total	7.00		mg/kg	0.684	0.684	10	01/12/22 11:17	01/19/22 12:40	EPA 3050B	97,6020B	CD
Barium, Total	66.6		mg/kg	4.10	4.10	10	01/12/22 11:17	01/19/22 12:40	EPA 3050B	97,6020B	CD
Beryllium, Total	0.4641		mg/kg	0.4104	0.4104	10	01/12/22 11:17	01/19/22 12:40	EPA 3050B	97,6020B	CD
Cadmium, Total	0.6157		mg/kg	0.2736	0.2736	10	01/12/22 11:17	01/19/22 12:40	EPA 3050B	97,6020B	CD
Chromium, Total	17.3		mg/kg	2.74	2.74	10	01/12/22 11:17	01/19/22 12:40	EPA 3050B	97,6020B	CD
Copper, Total	25.7		mg/kg	2.74	2.74	10	01/12/22 11:17	01/19/22 12:40	EPA 3050B	97,6020B	CD
Lead, Total	199		mg/kg	0.821	0.821	10	01/12/22 11:17	01/19/22 12:40	EPA 3050B	97,6020B	CD
Mercury, Total	0.426		mg/kg	0.094	0.094	1	01/18/22 11:21	01/18/22 15:19	EPA 7471B	97,7471B	AC
Nickel, Total	12.2		mg/kg	1.37	1.37	10	01/12/22 11:17	01/19/22 12:40	EPA 3050B	97,6020B	CD
Selenium, Total	ND		mg/kg	2.74	2.74	10	01/12/22 11:17	01/19/22 12:40	EPA 3050B	97,6020B	CD
Silver, Total	ND		mg/kg	0.684	0.684	10	01/12/22 11:17	01/19/22 12:40	EPA 3050B	97,6020B	CD
Zinc, Total	124		mg/kg	13.7	13.7	10	01/12/22 11:17	01/19/22 12:40	EPA 3050B	97,6020B	CD



Project Name: BELMONT LANDFILL**Lab Number:** L2170562**Project Number:** 18-0157**Report Date:** 02/23/22**SAMPLE RESULTS**

Lab ID: L2170562-09

Date Collected: 12/21/21 12:36

Client ID: WORM-2

Date Received: 12/22/21

Sample Location: BELMONT, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Soil

Percent Solids: 25%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/kg	6.28	6.28	10	01/12/22 11:17	01/19/22 12:45	EPA 3050B	97,6020B	CD
Arsenic, Total	29.3		mg/kg	1.96	1.96	10	01/12/22 11:17	01/19/22 12:45	EPA 3050B	97,6020B	CD
Barium, Total	236		mg/kg	11.8	11.8	10	01/12/22 11:17	01/19/22 12:45	EPA 3050B	97,6020B	CD
Beryllium, Total	ND		mg/kg	1.177	1.177	10	01/12/22 11:17	01/19/22 12:45	EPA 3050B	97,6020B	CD
Cadmium, Total	2.134		mg/kg	0.7849	0.7849	10	01/12/22 11:17	01/19/22 12:45	EPA 3050B	97,6020B	CD
Chromium, Total	67.9		mg/kg	7.85	7.85	10	01/12/22 11:17	01/19/22 12:45	EPA 3050B	97,6020B	CD
Copper, Total	116		mg/kg	7.85	7.85	10	01/12/22 11:17	01/19/22 12:45	EPA 3050B	97,6020B	CD
Lead, Total	245		mg/kg	2.35	2.35	10	01/12/22 11:17	01/19/22 12:45	EPA 3050B	97,6020B	CD
Mercury, Total	0.269		mg/kg	0.261	0.261	1	01/18/22 11:21	01/18/22 15:23	EPA 7471B	97,7471B	AC
Nickel, Total	35.1		mg/kg	3.92	3.92	10	01/12/22 11:17	01/19/22 12:45	EPA 3050B	97,6020B	CD
Selenium, Total	ND		mg/kg	7.85	7.85	10	01/12/22 11:17	01/19/22 12:45	EPA 3050B	97,6020B	CD
Silver, Total	ND		mg/kg	1.96	1.96	10	01/12/22 11:17	01/19/22 12:45	EPA 3050B	97,6020B	CD
Zinc, Total	547		mg/kg	39.2	39.2	10	01/12/22 11:17	01/19/22 12:45	EPA 3050B	97,6020B	CD



Project Name: BELMONT LANDFILL**Lab Number:** L2170562**Project Number:** 18-0157**Report Date:** 02/23/22**SAMPLE RESULTS**

Lab ID: L2170562-10

Date Collected: 12/21/21 11:01

Client ID: WORM-3

Date Received: 12/22/21

Sample Location: BELMONT, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Soil

Percent Solids: 14%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/kg	11.0	11.0	10	01/12/22 11:17	01/19/22 12:50	EPA 3050B	97,6020B	CD
Arsenic, Total	18.7		mg/kg	3.43	3.43	10	01/12/22 11:17	01/19/22 12:50	EPA 3050B	97,6020B	CD
Barium, Total	99.4		mg/kg	20.6	20.6	10	01/12/22 11:17	01/19/22 12:50	EPA 3050B	97,6020B	CD
Beryllium, Total	ND		mg/kg	2.059	2.059	10	01/12/22 11:17	01/19/22 12:50	EPA 3050B	97,6020B	CD
Cadmium, Total	2.210		mg/kg	1.372	1.372	10	01/12/22 11:17	01/19/22 12:50	EPA 3050B	97,6020B	CD
Chromium, Total	15.3		mg/kg	13.7	13.7	10	01/12/22 11:17	01/19/22 12:50	EPA 3050B	97,6020B	CD
Copper, Total	46.0		mg/kg	13.7	13.7	10	01/12/22 11:17	01/19/22 12:50	EPA 3050B	97,6020B	CD
Lead, Total	253		mg/kg	4.12	4.12	10	01/12/22 11:17	01/19/22 12:50	EPA 3050B	97,6020B	CD
Mercury, Total	ND		mg/kg	0.464	0.464	1	01/18/22 11:21	01/18/22 15:32	EPA 7471B	97,7471B	AC
Nickel, Total	20.6		mg/kg	6.86	6.86	10	01/12/22 11:17	01/19/22 12:50	EPA 3050B	97,6020B	CD
Selenium, Total	ND		mg/kg	13.7	13.7	10	01/12/22 11:17	01/19/22 12:50	EPA 3050B	97,6020B	CD
Silver, Total	ND		mg/kg	3.43	3.43	10	01/12/22 11:17	01/19/22 12:50	EPA 3050B	97,6020B	CD
Zinc, Total	246		mg/kg	68.6	68.6	10	01/12/22 11:17	01/19/22 12:50	EPA 3050B	97,6020B	CD



Project Name: BELMONT LANDFILL**Lab Number:** L2170562**Project Number:** 18-0157**Report Date:** 02/23/22**SAMPLE RESULTS**

Lab ID: L2170562-11

Date Collected: 12/21/21 11:36

Client ID: WORM-3-DUP

Date Received: 12/22/21

Sample Location: BELMONT, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Soil

Percent Solids: 12%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/kg	12.6	12.6	10	01/12/22 11:17	01/19/22 12:56	EPA 3050B	97,6020B	CD
Arsenic, Total	35.3		mg/kg	3.92	3.92	10	01/12/22 11:17	01/19/22 12:56	EPA 3050B	97,6020B	CD
Barium, Total	239		mg/kg	23.6	23.6	10	01/12/22 11:17	01/19/22 12:56	EPA 3050B	97,6020B	CD
Beryllium, Total	ND		mg/kg	2.355	2.355	10	01/12/22 11:17	01/19/22 12:56	EPA 3050B	97,6020B	CD
Cadmium, Total	3.833		mg/kg	1.570	1.570	10	01/12/22 11:17	01/19/22 12:56	EPA 3050B	97,6020B	CD
Chromium, Total	42.2		mg/kg	15.7	15.7	10	01/12/22 11:17	01/19/22 12:56	EPA 3050B	97,6020B	CD
Copper, Total	111		mg/kg	15.7	15.7	10	01/12/22 11:17	01/19/22 12:56	EPA 3050B	97,6020B	CD
Lead, Total	657		mg/kg	4.71	4.71	10	01/12/22 11:17	01/19/22 12:56	EPA 3050B	97,6020B	CD
Mercury, Total	ND		mg/kg	0.530	0.530	1	01/18/22 11:21	01/18/22 15:36	EPA 7471B	97,7471B	AC
Nickel, Total	44.6		mg/kg	7.85	7.85	10	01/12/22 11:17	01/19/22 12:56	EPA 3050B	97,6020B	CD
Selenium, Total	ND		mg/kg	15.7	15.7	10	01/12/22 11:17	01/19/22 12:56	EPA 3050B	97,6020B	CD
Silver, Total	ND		mg/kg	3.92	3.92	10	01/12/22 11:17	01/19/22 12:56	EPA 3050B	97,6020B	CD
Zinc, Total	512		mg/kg	78.5	78.5	10	01/12/22 11:17	01/19/22 12:56	EPA 3050B	97,6020B	CD



Project Name: BELMONT LANDFILL**Lab Number:** L2170562**Project Number:** 18-0157**Report Date:** 02/23/22**SAMPLE RESULTS**

Lab ID: L2170562-12

Date Collected: 12/21/21 09:22

Client ID: WORM-4

Date Received: 12/22/21

Sample Location: BELMONT, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Soil

Percent Solids: 10%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/kg	15.0	15.0	10	01/12/22 11:17	01/19/22 11:50	EPA 3050B	97,6020B	CD
Arsenic, Total	19.3		mg/kg	4.70	4.70	10	01/12/22 11:17	01/19/22 11:50	EPA 3050B	97,6020B	CD
Barium, Total	344		mg/kg	28.2	28.2	10	01/12/22 11:17	01/19/22 11:50	EPA 3050B	97,6020B	CD
Beryllium, Total	ND		mg/kg	2.819	2.819	10	01/12/22 11:17	01/19/22 11:50	EPA 3050B	97,6020B	CD
Cadmium, Total	2.788		mg/kg	1.880	1.880	10	01/12/22 11:17	01/19/22 11:50	EPA 3050B	97,6020B	CD
Chromium, Total	45.5		mg/kg	18.8	18.8	10	01/12/22 11:17	01/19/22 11:50	EPA 3050B	97,6020B	CD
Copper, Total	103		mg/kg	18.8	18.8	10	01/12/22 11:17	01/19/22 11:50	EPA 3050B	97,6020B	CD
Lead, Total	282		mg/kg	5.64	5.64	10	01/12/22 11:17	01/19/22 11:50	EPA 3050B	97,6020B	CD
Mercury, Total	0.683		mg/kg	0.619	0.619	1	01/18/22 11:21	01/18/22 14:36	EPA 7471B	97,7471B	AC
Nickel, Total	32.0		mg/kg	9.40	9.40	10	01/12/22 11:17	01/19/22 11:50	EPA 3050B	97,6020B	CD
Selenium, Total	ND		mg/kg	18.8	18.8	10	01/12/22 11:17	01/19/22 11:50	EPA 3050B	97,6020B	CD
Silver, Total	ND		mg/kg	4.70	4.70	10	01/12/22 11:17	01/19/22 11:50	EPA 3050B	97,6020B	CD
Zinc, Total	410		mg/kg	94.0	94.0	10	01/12/22 11:17	01/19/22 11:50	EPA 3050B	97,6020B	CD



Project Name: BELMONT LANDFILL**Lab Number:** L2170562**Project Number:** 18-0157**Report Date:** 02/23/22**SAMPLE RESULTS**

Lab ID: L2170562-13

Date Collected: 12/21/21 09:57

Client ID: WORM-5

Date Received: 12/22/21

Sample Location: BELMONT, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Soil

Percent Solids: 68%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/kg	2.22	2.22	10	01/12/22 11:17	01/19/22 14:03	EPA 3050B	97,6020B	CD
Arsenic, Total	9.46		mg/kg	0.694	0.694	10	01/12/22 11:17	01/19/22 14:03	EPA 3050B	97,6020B	CD
Barium, Total	87.2		mg/kg	4.16	4.16	10	01/12/22 11:17	01/19/22 14:03	EPA 3050B	97,6020B	CD
Beryllium, Total	0.4812		mg/kg	0.4162	0.4162	10	01/12/22 11:17	01/19/22 14:03	EPA 3050B	97,6020B	CD
Cadmium, Total	0.6449		mg/kg	0.2775	0.2775	10	01/12/22 11:17	01/19/22 14:03	EPA 3050B	97,6020B	CD
Chromium, Total	22.7		mg/kg	2.77	2.77	10	01/12/22 11:17	01/19/22 14:03	EPA 3050B	97,6020B	CD
Copper, Total	28.9		mg/kg	2.77	2.77	10	01/12/22 11:17	01/19/22 14:03	EPA 3050B	97,6020B	CD
Lead, Total	143		mg/kg	0.832	0.832	10	01/12/22 11:17	01/19/22 14:03	EPA 3050B	97,6020B	CD
Mercury, Total	0.158		mg/kg	0.095	0.095	1	01/18/22 11:21	01/18/22 15:39	EPA 7471B	97,7471B	AC
Nickel, Total	17.1		mg/kg	1.39	1.39	10	01/12/22 11:17	01/19/22 14:03	EPA 3050B	97,6020B	CD
Selenium, Total	ND		mg/kg	2.77	2.77	10	01/12/22 11:17	01/19/22 14:03	EPA 3050B	97,6020B	CD
Silver, Total	ND		mg/kg	0.694	0.694	10	01/12/22 11:17	01/19/22 14:03	EPA 3050B	97,6020B	CD
Zinc, Total	188		mg/kg	13.9	13.9	10	01/12/22 11:17	01/19/22 14:03	EPA 3050B	97,6020B	CD



Project Name: BELMONT LANDFILL**Lab Number:** L2170562**Project Number:** 18-0157**Report Date:** 02/23/22**SAMPLE RESULTS**

Lab ID: L2170562-14

Date Collected: 12/21/21 15:10

Client ID: WORM-6

Date Received: 12/22/21

Sample Location: BELMONT, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Soil

Percent Solids: 17%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/kg	8.93	8.93	10	01/12/22 11:17	01/19/22 14:08	EPA 3050B	97,6020B	CD
Arsenic, Total	12.2		mg/kg	2.79	2.79	10	01/12/22 11:17	01/19/22 14:08	EPA 3050B	97,6020B	CD
Barium, Total	302		mg/kg	16.7	16.7	10	01/12/22 11:17	01/19/22 14:08	EPA 3050B	97,6020B	CD
Beryllium, Total	ND		mg/kg	1.675	1.675	10	01/12/22 11:17	01/19/22 14:08	EPA 3050B	97,6020B	CD
Cadmium, Total	2.406		mg/kg	1.117	1.117	10	01/12/22 11:17	01/19/22 14:08	EPA 3050B	97,6020B	CD
Chromium, Total	14.7		mg/kg	11.2	11.2	10	01/12/22 11:17	01/19/22 14:08	EPA 3050B	97,6020B	CD
Copper, Total	77.7		mg/kg	11.2	11.2	10	01/12/22 11:17	01/19/22 14:08	EPA 3050B	97,6020B	CD
Lead, Total	111		mg/kg	3.35	3.35	10	01/12/22 11:17	01/19/22 14:08	EPA 3050B	97,6020B	CD
Mercury, Total	ND		mg/kg	0.417	0.417	1	01/18/22 11:21	01/18/22 15:42	EPA 7471B	97,7471B	AC
Nickel, Total	24.4		mg/kg	5.58	5.58	10	01/12/22 11:17	01/19/22 14:08	EPA 3050B	97,6020B	CD
Selenium, Total	ND		mg/kg	11.2	11.2	10	01/12/22 11:17	01/19/22 14:08	EPA 3050B	97,6020B	CD
Silver, Total	ND		mg/kg	2.79	2.79	10	01/12/22 11:17	01/19/22 14:08	EPA 3050B	97,6020B	CD
Zinc, Total	223		mg/kg	55.8	55.8	10	01/12/22 11:17	01/19/22 14:08	EPA 3050B	97,6020B	CD



Project Name: BELMONT LANDFILL

Lab Number: L2170562

Project Number: 18-0157

Report Date: 02/23/22

Method Blank Analysis Batch Quality Control

Parameter	Result Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab for sample(s): 01-14 Batch: WG1592414-1									
Antimony, Total	ND	mg/kg	1.60	1.60	10	01/12/22 11:17	01/19/22 11:03	97,6020B	CD
Arsenic, Total	ND	mg/kg	0.500	0.500	10	01/12/22 11:17	01/19/22 11:03	97,6020B	CD
Barium, Total	ND	mg/kg	3.00	3.00	10	01/12/22 11:17	01/19/22 11:03	97,6020B	CD
Beryllium, Total	ND	mg/kg	0.3000	0.3000	10	01/12/22 11:17	01/19/22 11:03	97,6020B	CD
Cadmium, Total	ND	mg/kg	0.2000	0.2000	10	01/12/22 11:17	01/19/22 11:03	97,6020B	CD
Chromium, Total	ND	mg/kg	2.00	2.00	10	01/12/22 11:17	01/19/22 11:03	97,6020B	CD
Copper, Total	ND	mg/kg	2.00	2.00	10	01/12/22 11:17	01/19/22 11:03	97,6020B	CD
Lead, Total	ND	mg/kg	0.600	0.600	10	01/12/22 11:17	01/19/22 11:03	97,6020B	CD
Nickel, Total	ND	mg/kg	1.00	1.00	10	01/12/22 11:17	01/19/22 11:03	97,6020B	CD
Selenium, Total	ND	mg/kg	2.00	2.00	10	01/12/22 11:17	01/19/22 11:03	97,6020B	CD
Silver, Total	ND	mg/kg	0.500	0.500	10	01/12/22 11:17	01/19/22 11:03	97,6020B	CD
Zinc, Total	ND	mg/kg	10.0	10.0	10	01/12/22 11:17	01/19/22 11:03	97,6020B	CD

Prep Information

Digestion Method: EPA 3050B

Parameter	Result Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab for sample(s): 01-14 Batch: WG1595162-1									
Mercury, Total	ND	mg/kg	0.083	0.083	1	01/18/22 11:21	01/18/22 14:03	97,7471B	AC

Prep Information

Digestion Method: EPA 7471B



Lab Control Sample Analysis

Batch Quality Control

Project Name: BELMONT LANDFILL

Project Number: 18-0157

Lab Number: L2170562

Report Date: 02/23/22

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Total Metals - Mansfield Lab Associated sample(s): 01-14 Batch: WG1592414-2 SRM Lot Number: D113-540								
Antimony, Total	173		-		20-250	-		30
Arsenic, Total	112		-		70-130	-		30
Barium, Total	105		-		75-125	-		30
Beryllium, Total	97		-		75-125	-		30
Cadmium, Total	106		-		75-125	-		30
Chromium, Total	109		-		70-130	-		30
Copper, Total	96		-		75-125	-		30
Lead, Total	110		-		72-128	-		30
Nickel, Total	108		-		70-130	-		30
Selenium, Total	113		-		66-134	-		30
Silver, Total	114		-		70-131	-		30
Zinc, Total	107		-		70-130	-		30
MCP Total Metals - Mansfield Lab Associated sample(s): 01-14 Batch: WG1595162-2 WG1595162-3 SRM Lot Number: D113-540								
Mercury, Total	84		87		60-140	4		30

Matrix Spike Analysis

Batch Quality Control

Project Name: BELMONT LANDFILL

Project Number: 18-0157

Lab Number: L2170562

Report Date: 02/23/22

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
MCP Total Metals - Mansfield Lab Associated sample(s): 01-14 QC Batch ID: WG1592414-3 WG1592414-4 QC Sample: L2170562-05 Client ID: TOX-4												
Antimony, Total	ND	168	156	93		158	95		75-125	1		35
Arsenic, Total	11.1	40.2	51.7	101		52.4	104		75-125	1		35
Barium, Total	285	671	966	102		982	105		75-125	2		35
Beryllium, Total	1.696	16.8	19.75	108		19.53	107		75-125	1		35
Cadmium, Total	2.586	17.8	20.86	103		22.47	113		75-125	7		35
Chromium, Total	35.4	67.1	104	102		104	103		75-125	0		35
Copper, Total	162	83.8	234	86		232	84		75-125	1		35
Lead, Total	487	178	777	163	Q	730	138	Q	75-125	6		35
Nickel, Total	48.7	168	205	93		211	98		75-125	3		35
Selenium, Total	ND	40.2	44.5	110		45.5	114		75-125	2		35
Silver, Total	ND	100	106	105		107	107		75-125	1		35
Zinc, Total	426	168	587	96		575	90		75-125	2		35

Matrix Spike Analysis **Batch Quality Control**

Project Name: BELMONT LANDFILL

Project Number: 18-0157

Lab Number: L2170562

Report Date: 02/23/22

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	MSD Found	MSD %Recovery	Recovery Limits	RPD	RPD Limits
MCP Total Metals - Mansfield Lab Associated sample(s): 01-14 QC Batch ID: WG1592414-6 WG1592414-7 QC Sample: L2170562-12 Client ID: WORM-4									
Antimony, Total	ND	374	368	98	372	99	75-125	1	35
Arsenic, Total	19.3	89.8	115	106	112	103	75-125	3	35
Barium, Total	344	1500	1950	107	1920	105	75-125	2	35
Beryllium, Total	ND	37.4	42.48	114	40.08	107	75-125	6	35
Cadmium, Total	2.788	39.7	46.61	110	46.85	111	75-125	1	35
Chromium, Total	45.5	150	202	104	194	99	75-125	4	35
Copper, Total	103	187	289	99	270	89	75-125	7	35
Lead, Total	282	397	771	123	746	117	75-125	3	35
Nickel, Total	32.0	374	419	103	406	100	75-125	3	35
Selenium, Total	ND	89.8	92.8	103	94.7	105	75-125	2	35
Silver, Total	ND	224	243	108	245	109	75-125	1	35
Zinc, Total	410	374	841	115	768	96	75-125	9	35
MCP Total Metals - Mansfield Lab Associated sample(s): 01-14 QC Batch ID: WG1595162-4 WG1595162-5 QC Sample: L2170562-05 Client ID: TOX-4									
Mercury, Total	0.398	0.567	1.00	106	1.11	114	75-125	7	35
MCP Total Metals - Mansfield Lab Associated sample(s): 01-14 QC Batch ID: WG1595162-6 WG1595162-7 QC Sample: L2170562-12 Client ID: WORM-4									
Mercury, Total	0.683	1.4	2.07	99	1.63	72	Q 75-125	24	35

Project Name: BELMONT LANDFILL
Project Number: 18-0157

**Lab Serial Dilution
Analysis**
Batch Quality Control

Lab Number: L2170562
Report Date: 02/23/22

Parameter	Native Sample	Serial Dilution	Units	% D	Qual	RPD Limits
MCP Total Metals - Mansfield Lab Associated sample(s): 01-14 QC Batch ID: WG1592414-5 QC Sample: L2170562-05 Client ID: TOX-4						
Lead, Total	487	436	mg/kg	10		20

INORGANICS & MISCELLANEOUS

Project Name: BELMONT LANDFILL
Project Number: 18-0157

Lab Number: L2170562
Report Date: 02/23/22

SAMPLE RESULTS

Lab ID: L2170562-01
Client ID: TOX-1
Sample Location: BELMONT, MA

Date Collected: 12/21/21 13:38
Date Received: 12/22/21
Field Prep: Not Specified

Sample Depth:
Matrix: Sediment

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	12.5		%	0.010	0.010	1	-	01/11/22 09:59	1,9060A	SP
Total Organic Carbon (Rep2)	10.9		%	0.010	0.010	1	-	01/11/22 09:59	1,9060A	SP
Total Organic Carbon (Average)	11.7		%	0.010	0.010	1	-	01/11/22 09:59	1,9060A	SP
Grain Size Analysis - Mansfield Lab										
% Total Gravel	2.50		%	0.100	NA	1	-	02/08/22 22:23	12,D6913/D7928	SK
% Coarse Sand	3.60		%	0.100	NA	1	-	02/08/22 22:23	12,D6913/D7928	SK
% Medium Sand	24.2		%	0.100	NA	1	-	02/08/22 22:23	12,D6913/D7928	SK
% Fine Sand	46.0		%	0.100	NA	1	-	02/08/22 22:23	12,D6913/D7928	SK
% Total Fines	23.7		%	0.100	NA	1	-	02/08/22 22:23	12,D6913/D7928	SK
General Chemistry - Westborough Lab										
Cyanide, Free	ND		mg/kg	0.29	2.9	1	-	01/02/22 08:45	121,4500CN-E(M)	MR
General Chemistry - Mansfield Lab										
Solids, Total	34.9		%	0.100	0.100	1	-	12/27/21 15:52	121,2540G	AV



Project Name: BELMONT LANDFILL
Project Number: 18-0157

Lab Number: L2170562
Report Date: 02/23/22

SAMPLE RESULTS

Lab ID: L2170562-02
Client ID: TOX-2
Sample Location: BELMONT, MA

Date Collected: 12/21/21 12:35
Date Received: 12/22/21
Field Prep: Not Specified

Sample Depth:
Matrix: Sediment

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	12.7		%	0.010	0.010	1	-	01/11/22 09:59	1,9060A	SP
Total Organic Carbon (Rep2)	13.7		%	0.010	0.010	1	-	01/11/22 09:59	1,9060A	SP
Total Organic Carbon (Average)	13.2		%	0.010	0.010	1	-	01/11/22 09:59	1,9060A	SP
Grain Size Analysis - Mansfield Lab										
% Total Gravel	1.50		%	0.100	NA	1	-	02/08/22 22:23	12,D6913/D7928	SK
% Coarse Sand	7.90		%	0.100	NA	1	-	02/08/22 22:23	12,D6913/D7928	SK
% Medium Sand	34.9		%	0.100	NA	1	-	02/08/22 22:23	12,D6913/D7928	SK
% Fine Sand	28.6		%	0.100	NA	1	-	02/08/22 22:23	12,D6913/D7928	SK
% Total Fines	27.1		%	0.100	NA	1	-	02/08/22 22:23	12,D6913/D7928	SK
General Chemistry - Westborough Lab										
Cyanide, Free	ND		mg/kg	0.40	4.0	1	-	01/02/22 08:45	121,4500CN-E(M)	MR
General Chemistry - Mansfield Lab										
Solids, Total	25.3		%	0.100	0.100	1	-	12/27/21 15:52	121,2540G	AV



Project Name: BELMONT LANDFILL
Project Number: 18-0157

Lab Number: L2170562
Report Date: 02/23/22

SAMPLE RESULTS

Lab ID: L2170562-03
Client ID: TOX-3
Sample Location: BELMONT, MA

Date Collected: 12/21/21 11:25
Date Received: 12/22/21
Field Prep: Not Specified

Sample Depth:
Matrix: Sediment

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	12.7		%	0.010	0.010	1	-	01/11/22 09:59	1,9060A	SP
Total Organic Carbon (Rep2)	11.8		%	0.010	0.010	1	-	01/11/22 09:59	1,9060A	SP
Total Organic Carbon (Average)	12.2		%	0.010	0.010	1	-	01/11/22 09:59	1,9060A	SP
Grain Size Analysis - Mansfield Lab										
% Total Gravel	0.900		%	0.100	NA	1	-	02/08/22 22:23	12,D6913/D7928	SK
% Coarse Sand	4.20		%	0.100	NA	1	-	02/08/22 22:23	12,D6913/D7928	SK
% Medium Sand	20.5		%	0.100	NA	1	-	02/08/22 22:23	12,D6913/D7928	SK
% Fine Sand	36.2		%	0.100	NA	1	-	02/08/22 22:23	12,D6913/D7928	SK
% Total Fines	38.2		%	0.100	NA	1	-	02/08/22 22:23	12,D6913/D7928	SK
General Chemistry - Westborough Lab										
Cyanide, Free	ND		mg/kg	0.33	3.3	1	-	01/02/22 08:45	121,4500CN-E(M)	MR
General Chemistry - Mansfield Lab										
Solids, Total	30.0		%	0.100	0.100	1	-	12/27/21 15:52	121,2540G	AV



Project Name: BELMONT LANDFILL
Project Number: 18-0157

Lab Number: L2170562
Report Date: 02/23/22

SAMPLE RESULTS

Lab ID: L2170562-04
Client ID: TOX-3-DUP
Sample Location: BELMONT, MA

Date Collected: 12/21/21 11:57
Date Received: 12/22/21
Field Prep: Not Specified

Sample Depth:
Matrix: Sediment

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	11.7		%	0.010	0.010	1	-	01/11/22 09:59	1,9060A	SP
Total Organic Carbon (Rep2)	13.1		%	0.010	0.010	1	-	01/11/22 09:59	1,9060A	SP
Total Organic Carbon (Average)	12.4		%	0.010	0.010	1	-	01/11/22 09:59	1,9060A	SP
Grain Size Analysis - Mansfield Lab										
% Total Gravel	1.00		%	0.100	NA	1	-	02/08/22 22:23	12,D6913/D7928	SK
% Coarse Sand	4.30		%	0.100	NA	1	-	02/08/22 22:23	12,D6913/D7928	SK
% Medium Sand	21.6		%	0.100	NA	1	-	02/08/22 22:23	12,D6913/D7928	SK
% Fine Sand	36.1		%	0.100	NA	1	-	02/08/22 22:23	12,D6913/D7928	SK
% Total Fines	37.0		%	0.100	NA	1	-	02/08/22 22:23	12,D6913/D7928	SK
General Chemistry - Westborough Lab										
Cyanide, Free	ND		mg/kg	0.28	2.8	1	-	01/02/22 08:45	121,4500CN-E(M)	MR
General Chemistry - Mansfield Lab										
Solids, Total	35.0		%	0.100	0.100	1	-	12/27/21 15:52	121,2540G	AV



Project Name: BELMONT LANDFILL
Project Number: 18-0157

Lab Number: L2170562
Report Date: 02/23/22

SAMPLE RESULTS

Lab ID: L2170562-05
Client ID: TOX-4
Sample Location: BELMONT, MA

Date Collected: 12/21/21 09:05
Date Received: 12/22/21
Field Prep: Not Specified

Sample Depth:
Matrix: Sediment

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	16.1		%	0.010	0.010	1	-	01/11/22 09:59	1,9060A	SP
Total Organic Carbon (Rep2)	16.4		%	0.010	0.010	1	-	01/11/22 09:59	1,9060A	SP
Total Organic Carbon (Average)	16.2		%	0.010	0.010	1	-	01/11/22 09:59	1,9060A	SP
Grain Size Analysis - Mansfield Lab										
% Total Gravel	4.20		%	0.100	NA	1	-	02/08/22 22:23	12,D6913/D7928	SK
% Coarse Sand	11.9		%	0.100	NA	1	-	02/08/22 22:23	12,D6913/D7928	SK
% Medium Sand	34.0		%	0.100	NA	1	-	02/08/22 22:23	12,D6913/D7928	SK
% Fine Sand	25.8		%	0.100	NA	1	-	02/08/22 22:23	12,D6913/D7928	SK
% Total Fines	24.1		%	0.100	NA	1	-	02/08/22 22:23	12,D6913/D7928	SK
General Chemistry - Westborough Lab										
Cyanide, Free	ND		mg/kg	0.44	4.4	1	-	01/02/22 08:45	121,4500CN-E(M)	MR
General Chemistry - Mansfield Lab										
Solids, Total	22.8		%	0.100	0.100	1	-	12/27/21 15:52	121,2540G	AV



Project Name: BELMONT LANDFILL
Project Number: 18-0157

Lab Number: L2170562
Report Date: 02/23/22

SAMPLE RESULTS

Lab ID: L2170562-06
Client ID: TOX-5
Sample Location: BELMONT, MA

Date Collected: 12/21/21 14:22
Date Received: 12/22/21
Field Prep: Not Specified

Sample Depth:
Matrix: Sediment

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	1.49		%	0.010	0.010	1	-	01/11/22 09:59	1,9060A	SP
Total Organic Carbon (Rep2)	1.07		%	0.010	0.010	1	-	01/11/22 09:59	1,9060A	SP
Total Organic Carbon (Average)	1.28		%	0.010	0.010	1	-	01/11/22 09:59	1,9060A	SP
Grain Size Analysis - Mansfield Lab										
% Total Gravel	5.40		%	0.100	NA	1	-	02/08/22 22:23	12,D6913/D7928	SK
% Coarse Sand	4.90		%	0.100	NA	1	-	02/08/22 22:23	12,D6913/D7928	SK
% Medium Sand	31.6		%	0.100	NA	1	-	02/08/22 22:23	12,D6913/D7928	SK
% Fine Sand	53.5		%	0.100	NA	1	-	02/08/22 22:23	12,D6913/D7928	SK
% Total Fines	4.60		%	0.100	NA	1	-	02/08/22 22:23	12,D6913/D7928	SK
General Chemistry - Westborough Lab										
Cyanide, Free	ND		mg/kg	0.16	1.6	1	-	01/02/22 08:45	121,4500CN-E(M)	MR
General Chemistry - Mansfield Lab										
Solids, Total	62.4		%	0.100	0.100	1	-	12/27/21 15:52	121,2540G	AV



Project Name: BELMONT LANDFILL
Project Number: 18-0157

Lab Number: L2170562
Report Date: 02/23/22

SAMPLE RESULTS

Lab ID: L2170562-07
Client ID: TOX-6
Sample Location: BELMONT, MA

Date Collected: 12/21/21 15:54
Date Received: 12/22/21
Field Prep: Not Specified

Sample Depth:
Matrix: Sediment

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	8.21		%	0.010	0.010	1	-	01/11/22 09:51	1,9060A	SP
Total Organic Carbon (Rep2)	6.97		%	0.010	0.010	1	-	01/11/22 09:51	1,9060A	SP
Total Organic Carbon (Average)	7.59		%	0.010	0.010	1	-	01/11/22 09:51	1,9060A	SP
Grain Size Analysis - Mansfield Lab										
% Total Gravel	4.30		%	0.100	NA	1	-	02/08/22 22:23	12,D6913/D7928	SK
% Coarse Sand	15.7		%	0.100	NA	1	-	02/08/22 22:23	12,D6913/D7928	SK
% Medium Sand	36.2		%	0.100	NA	1	-	02/08/22 22:23	12,D6913/D7928	SK
% Fine Sand	33.8		%	0.100	NA	1	-	02/08/22 22:23	12,D6913/D7928	SK
% Total Fines	10.0		%	0.100	NA	1	-	02/08/22 22:23	12,D6913/D7928	SK
General Chemistry - Westborough Lab										
Cyanide, Free	ND		mg/kg	0.48	4.8	1	-	01/02/22 08:45	121,4500CN-E(M)	MR
General Chemistry - Mansfield Lab										
Solids, Total	20.6		%	0.100	0.100	1	-	12/27/21 15:52	121,2540G	AV



Project Name: BELMONT LANDFILL
Project Number: 18-0157

Lab Number: L2170562
Report Date: 02/23/22

SAMPLE RESULTS

Lab ID: L2170562-08
Client ID: WORM-1
Sample Location: BELMONT, MA

Date Collected: 12/21/21 13:26
Date Received: 12/22/21
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	5.78		%	0.010	0.010	1	-	01/11/22 09:51	1,9060A	SP
Total Organic Carbon (Rep2)	4.86		%	0.010	0.010	1	-	01/11/22 09:51	1,9060A	SP
Total Organic Carbon (Average)	5.32		%	0.010	0.010	1	-	01/11/22 09:51	1,9060A	SP
Grain Size Analysis - Mansfield Lab										
% Total Gravel	19.7		%	0.100	NA	1	-	02/08/22 22:23	12,D6913/D7928	SK
% Coarse Sand	6.40		%	0.100	NA	1	-	02/08/22 22:23	12,D6913/D7928	SK
% Medium Sand	42.0		%	0.100	NA	1	-	02/08/22 22:23	12,D6913/D7928	SK
% Fine Sand	17.4		%	0.100	NA	1	-	02/08/22 22:23	12,D6913/D7928	SK
% Total Fines	14.5		%	0.100	NA	1	-	02/08/22 22:23	12,D6913/D7928	SK
General Chemistry - Westborough Lab										
Cyanide, Free	ND		mg/kg	0.14	1.4	1	-	01/02/22 08:45	121,4500CN-E(M)	MR
General Chemistry - Mansfield Lab										
Solids, Total	69.7		%	0.100	0.100	1	-	12/27/21 15:52	121,2540G	AV



Project Name: BELMONT LANDFILL
Project Number: 18-0157

Lab Number: L2170562
Report Date: 02/23/22

SAMPLE RESULTS

Lab ID: L2170562-09
Client ID: WORM-2
Sample Location: BELMONT, MA

Date Collected: 12/21/21 12:36
Date Received: 12/22/21
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	18.4		%	0.010	0.010	1	-	01/11/22 09:51	1,9060A	SP
Total Organic Carbon (Rep2)	18.5		%	0.010	0.010	1	-	01/11/22 09:51	1,9060A	SP
Total Organic Carbon (Average)	18.4		%	0.010	0.010	1	-	01/11/22 09:51	1,9060A	SP
Grain Size Analysis - Mansfield Lab										
% Total Gravel	3.50		%	0.100	NA	1	-	02/08/22 22:23	12,D6913/D7928	SK
% Coarse Sand	14.3		%	0.100	NA	1	-	02/08/22 22:23	12,D6913/D7928	SK
% Medium Sand	43.1		%	0.100	NA	1	-	02/08/22 22:23	12,D6913/D7928	SK
% Fine Sand	26.4		%	0.100	NA	1	-	02/08/22 22:23	12,D6913/D7928	SK
% Total Fines	12.7		%	0.100	NA	1	-	02/08/22 22:23	12,D6913/D7928	SK
General Chemistry - Westborough Lab										
Cyanide, Free	ND		mg/kg	0.41	4.1	1	-	01/02/22 08:45	121,4500CN-E(M)	MR
General Chemistry - Mansfield Lab										
Solids, Total	24.5		%	0.100	0.100	1	-	12/27/21 15:52	121,2540G	AV



Project Name: BELMONT LANDFILL
Project Number: 18-0157

Lab Number: L2170562
Report Date: 02/23/22

SAMPLE RESULTS

Lab ID: L2170562-10
Client ID: WORM-3
Sample Location: BELMONT, MA

Date Collected: 12/21/21 11:01
Date Received: 12/22/21
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	24.0		%	0.010	0.010	1	-	01/11/22 09:51	1,9060A	SP
Total Organic Carbon (Rep2)	24.3		%	0.010	0.010	1	-	01/11/22 09:51	1,9060A	SP
Total Organic Carbon (Average)	24.1		%	0.010	0.010	1	-	01/11/22 09:51	1,9060A	SP
Grain Size Analysis - Mansfield Lab										
% Total Gravel	1.60		%	0.100	NA	1	-	02/08/22 22:23	12,D6913/D7928	SK
% Coarse Sand	12.0		%	0.100	NA	1	-	02/08/22 22:23	12,D6913/D7928	SK
% Medium Sand	37.7		%	0.100	NA	1	-	02/08/22 22:23	12,D6913/D7928	SK
% Fine Sand	14.5		%	0.100	NA	1	-	02/08/22 22:23	12,D6913/D7928	SK
% Total Fines	34.2		%	0.100	NA	1	-	02/08/22 22:23	12,D6913/D7928	SK
General Chemistry - Westborough Lab										
Cyanide, Free	ND		mg/kg	0.72	7.2	1	-	01/02/22 08:45	121,4500CN-E(M)	MR
General Chemistry - Mansfield Lab										
Solids, Total	13.8		%	0.100	0.100	1	-	12/27/21 15:52	121,2540G	AV



Project Name: BELMONT LANDFILL
Project Number: 18-0157

Lab Number: L2170562
Report Date: 02/23/22

SAMPLE RESULTS

Lab ID: L2170562-11
Client ID: WORM-3-DUP
Sample Location: BELMONT, MA

Date Collected: 12/21/21 11:36
Date Received: 12/22/21
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	25.5		%	0.010	0.010	1	-	01/11/22 09:51	1,9060A	SP
Total Organic Carbon (Rep2)	25.7		%	0.010	0.010	1	-	01/11/22 09:51	1,9060A	SP
Total Organic Carbon (Average)	25.6		%	0.010	0.010	1	-	01/11/22 09:51	1,9060A	SP
Grain Size Analysis - Mansfield Lab										
% Total Gravel	5.50		%	0.100	NA	1	-	02/08/22 22:23	12,D6913/D7928	SK
% Coarse Sand	14.9		%	0.100	NA	1	-	02/08/22 22:23	12,D6913/D7928	SK
% Medium Sand	40.5		%	0.100	NA	1	-	02/08/22 22:23	12,D6913/D7928	SK
% Fine Sand	20.3		%	0.100	NA	1	-	02/08/22 22:23	12,D6913/D7928	SK
% Total Fines	18.8		%	0.100	NA	1	-	02/08/22 22:23	12,D6913/D7928	SK
General Chemistry - Westborough Lab										
Cyanide, Free	ND		mg/kg	0.82	8.2	1	-	01/02/22 08:45	121,4500CN-E(M)	MR
General Chemistry - Mansfield Lab										
Solids, Total	12.2		%	0.100	0.100	1	-	12/27/21 15:52	121,2540G	AV



Project Name: BELMONT LANDFILL
Project Number: 18-0157

Lab Number: L2170562
Report Date: 02/23/22

SAMPLE RESULTS

Lab ID: L2170562-12
Client ID: WORM-4
Sample Location: BELMONT, MA

Date Collected: 12/21/21 09:22
Date Received: 12/22/21
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	22.0		%	0.010	0.010	1	-	01/11/22 09:51	1,9060A	SP
Total Organic Carbon (Rep2)	21.9		%	0.010	0.010	1	-	01/11/22 09:51	1,9060A	SP
Total Organic Carbon (Average)	21.9		%	0.010	0.010	1	-	01/11/22 09:51	1,9060A	SP
Grain Size Analysis - Mansfield Lab										
% Total Gravel	2.80		%	0.100	NA	1	-	02/08/22 22:23	12,D6913/D7928	SK
% Coarse Sand	17.3		%	0.100	NA	1	-	02/08/22 22:23	12,D6913/D7928	SK
% Medium Sand	45.9		%	0.100	NA	1	-	02/08/22 22:23	12,D6913/D7928	SK
% Fine Sand	19.2		%	0.100	NA	1	-	02/08/22 22:23	12,D6913/D7928	SK
% Total Fines	14.8		%	0.100	NA	1	-	02/08/22 22:23	12,D6913/D7928	SK
General Chemistry - Westborough Lab										
Cyanide, Free	ND		mg/kg	0.98	9.8	1	-	01/02/22 08:45	121,4500CN-E(M)	MR
General Chemistry - Mansfield Lab										
Solids, Total	10.2		%	0.100	0.100	1	-	12/27/21 15:52	121,2540G	AV



Project Name: BELMONT LANDFILL
Project Number: 18-0157

Lab Number: L2170562
Report Date: 02/23/22

SAMPLE RESULTS

Lab ID: L2170562-13
Client ID: WORM-5
Sample Location: BELMONT, MA

Date Collected: 12/21/21 09:57
Date Received: 12/22/21
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	2.63		%	0.010	0.010	1	-	01/11/22 09:59	1,9060A	SP
Total Organic Carbon (Rep2)	2.91		%	0.010	0.010	1	-	01/11/22 09:59	1,9060A	SP
Total Organic Carbon (Average)	2.77		%	0.010	0.010	1	-	01/11/22 09:59	1,9060A	SP
Grain Size Analysis - Mansfield Lab										
% Total Gravel	1.10		%	0.100	NA	1	-	02/08/22 22:23	12,D6913/D7928	SK
% Coarse Sand	5.10		%	0.100	NA	1	-	02/08/22 22:23	12,D6913/D7928	SK
% Medium Sand	39.8		%	0.100	NA	1	-	02/08/22 22:23	12,D6913/D7928	SK
% Fine Sand	19.9		%	0.100	NA	1	-	02/08/22 22:23	12,D6913/D7928	SK
% Total Fines	34.1		%	0.100	NA	1	-	02/08/22 22:23	12,D6913/D7928	SK
General Chemistry - Westborough Lab										
Cyanide, Free	ND		mg/kg	0.15	1.5	1	-	01/02/22 08:45	121,4500CN-E(M)	MR
General Chemistry - Mansfield Lab										
Solids, Total	68.2		%	0.100	0.100	1	-	12/27/21 15:52	121,2540G	AV



Project Name: BELMONT LANDFILL
Project Number: 18-0157

Lab Number: L2170562
Report Date: 02/23/22

SAMPLE RESULTS

Lab ID: L2170562-14
Client ID: WORM-6
Sample Location: BELMONT, MA

Date Collected: 12/21/21 15:10
Date Received: 12/22/21
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	35.2		%	0.010	0.010	1	-	01/11/22 09:59	1,9060A	SP
Total Organic Carbon (Rep2)	43.0		%	0.010	0.010	1	-	01/11/22 09:59	1,9060A	SP
Total Organic Carbon (Average)	39.1		%	0.010	0.010	1	-	01/11/22 09:59	1,9060A	SP
Grain Size Analysis - Mansfield Lab										
% Total Gravel	3.10		%	0.100	NA	1	-	02/08/22 22:23	12,D6913/D7928	SK
% Coarse Sand	9.30		%	0.100	NA	1	-	02/08/22 22:23	12,D6913/D7928	SK
% Medium Sand	46.7		%	0.100	NA	1	-	02/08/22 22:23	12,D6913/D7928	SK
% Fine Sand	25.4		%	0.100	NA	1	-	02/08/22 22:23	12,D6913/D7928	SK
% Total Fines	15.5		%	0.100	NA	1	-	02/08/22 22:23	12,D6913/D7928	SK
General Chemistry - Westborough Lab										
Cyanide, Free	ND		mg/kg	0.59	5.9	1	-	01/02/22 08:45	121,4500CN-E(M)	MR
General Chemistry - Mansfield Lab										
Solids, Total	17.0		%	0.100	0.100	1	-	12/27/21 15:52	121,2540G	AV



Project Name: BELMONT LANDFILL

Lab Number: L2170562

Project Number: 18-0157

Report Date: 02/23/22

Method Blank Analysis Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab for sample(s): 01-14 Batch: WG1589593-1										
Cyanide, Free	ND		mg/kg	0.10	1.0	1	-	01/02/22 08:45	121,4500CN-E(M)	MR
Total Organic Carbon - Mansfield Lab for sample(s): 07-12 Batch: WG1592954-1										
Total Organic Carbon (Rep1)	ND		%	0.010	0.010	1	-	01/11/22 09:51	1,9060A	SP
Total Organic Carbon (Rep2)	ND		%	0.010	0.010	1	-	01/11/22 09:51	1,9060A	SP
Total Organic Carbon (Average)	ND		%	0.010	0.010	1	-	01/11/22 09:51	1,9060A	SP
Total Organic Carbon - Mansfield Lab for sample(s): 01-06,13-14 Batch: WG1592955-1										
Total Organic Carbon (Rep1)	ND		%	0.010	0.010	1	-	01/11/22 09:59	1,9060A	SP
Total Organic Carbon (Rep2)	ND		%	0.010	0.010	1	-	01/11/22 09:59	1,9060A	SP
Total Organic Carbon (Average)	ND		%	0.010	0.010	1	-	01/11/22 09:59	1,9060A	SP

Lab Control Sample Analysis

Batch Quality Control

Project Name: BELMONT LANDFILL

Project Number: 18-0157

Lab Number: L2170562

Report Date: 02/23/22

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-14 Batch: WG1589593-2								
Cyanide, Free	90		-			-		
Total Organic Carbon - Mansfield Lab Associated sample(s): 07-12 Batch: WG1592954-2								
Total Organic Carbon (Rep1)	94		-		75-125	-		25
Total Organic Carbon (Rep2)	105		-		75-125	-		25
Total Organic Carbon (Average)	100		-		75-125	-		25
Total Organic Carbon - Mansfield Lab Associated sample(s): 01-06,13-14 Batch: WG1592955-2								
Total Organic Carbon (Rep1)	104		-		75-125	-		25
Total Organic Carbon (Rep2)	100		-		75-125	-		25
Total Organic Carbon (Average)	102		-		75-125	-		25

Matrix Spike Analysis

Batch Quality Control

Project Name: BELMONT LANDFILL

Project Number: 18-0157

Lab Number: L2170562

Report Date: 02/23/22

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-14 QC Batch ID: WG1589593-4 QC Sample: L2170562-05 Client ID: TOX-4												
Cyanide, Free	ND	2.05	2	98		-	-		-			
General Chemistry - Westborough Lab Associated sample(s): 01-14 QC Batch ID: WG1589593-6 QC Sample: L2170562-12 Client ID: WORM-4												
Cyanide, Free	ND	2.18	1.95	89		-	-		-			
Total Organic Carbon - Mansfield Lab Associated sample(s): 07-12 QC Batch ID: WG1592954-3 WG1592954-4 QC Sample: L2170562-12 Client ID: WORM-4												
Total Organic Carbon (Rep1)	22.0	1.57	23.4	89		26.1	261	Q	75-125	11		25
Total Organic Carbon (Rep2)	21.9	1.64	22.8	55	Q	24.3	181	Q	75-125	6		25
Total Organic Carbon - Mansfield Lab Associated sample(s): 01-06,13-14 QC Batch ID: WG1592955-3 WG1592955-4 QC Sample: L2170562-05 Client ID: TOX-4												
Total Organic Carbon (Rep1)	16.1	1.41	16.8	50	Q	9.02	0	Q	75-125	60	Q	25
Total Organic Carbon (Rep2)	16.4	1.71	13.3	0	Q	18.0	111		75-125	30	Q	25

Lab Duplicate Analysis

Batch Quality Control

Project Name: BELMONT LANDFILL

Project Number: 18-0157

Lab Number: L2170562

Report Date: 02/23/22

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-14 QC Batch ID: WG1589593-3 QC Sample: L2170562-05 Client ID: TOX-4						
Cyanide, Free	ND	ND	mg/kg	NC		
General Chemistry - Westborough Lab Associated sample(s): 01-14 QC Batch ID: WG1589593-5 QC Sample: L2170562-12 Client ID: WORM-4						
Cyanide, Free	ND	ND	mg/kg	NC		
Grain Size Analysis - Mansfield Lab Associated sample(s): 01-14 QC Batch ID: WG1602845-1 QC Sample: L2170562-05 Client ID: TOX-4						
% Total Gravel	4.20	3.50	%	18		20
% Coarse Sand	11.9	11.7	%	2		20
% Medium Sand	34.0	40.5	%	17		20
% Fine Sand	25.8	23.8	%	8		20
% Total Fines	24.1	20.5	%	16		20
Grain Size Analysis - Mansfield Lab Associated sample(s): 01-14 QC Batch ID: WG1602845-2 QC Sample: L2170562-12 Client ID: WORM-4						
% Total Gravel	2.80	1.40	%	67	Q	20
% Coarse Sand	17.3	17.4	%	1		20
% Medium Sand	45.9	53.4	%	15		20
% Fine Sand	19.2	15.7	%	20		20
% Total Fines	14.8	12.1	%	20		20

Project Name: BELMONT LANDFILL
Project Number: 18-0157

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Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information

Cooler	Custody Seal
A	Absent
B	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2170562-01A	Glass 120ml/4oz unpreserved	A	NA		2.8	Y	Absent		A2-DIOXIN-1613(365)
L2170562-01B	Glass 250ml/8oz unpreserved	A	NA		2.8	Y	Absent		A2-CR-MCP6020T-10(180),A2-BA-MCP6020T-10(180),A2-AG-MCP6020T-10(180),A2-ZN-MCP6020T-10(180),A2-CD-MCP6020T-10(180),A2-TS(7),A2-AS-MCP6020T-10(180),A2-SB-MCP6020T-10(180),A2-BE-MCP6020T-10(180),A2-PAH-8270SIM(14),A2-CU-MCP6020T-10(180),A2-SE-MCP6020T-10(180),A2-NI-MCP6020T-10(180),A2-HG-MCP7471T-10(28),A2-HGPREP-AA(28),A2-PREP-3050:2T(180),A2-PB-MCP6020T-10(180),A2-TOC-9060-2REPS(28),A2-PREP-3050:1T(180)
L2170562-01C	Glass 250ml/8oz unpreserved	A	NA		2.8	Y	Absent		FCN(14)
L2170562-01D	Plastic 8oz unpreserved for Grain Size	A	NA		2.8	Y	Absent		A2-HYDRO-TFINE(),A2-HYDRO-FSAND(),A2-HYDRO-MSAND(),A2-HYDRO-TGRAVEL(),A2-HYDRO-CSAND()
L2170562-02A	Glass 120ml/4oz unpreserved	B	NA		3.5	Y	Absent		A2-DIOXIN-1613(365)
L2170562-02B	Glass 120ml/4oz unpreserved	B	NA		3.5	Y	Absent		A2-CR-MCP6020T-10(180),A2-BA-MCP6020T-10(180),A2-CD-MCP6020T-10(180),A2-TS(7),A2-AG-MCP6020T-10(180),A2-AS-MCP6020T-10(180),A2-ZN-MCP6020T-10(180),A2-BE-MCP6020T-10(180),A2-PAH-8270SIM(14),A2-SB-MCP6020T-10(180),A2-HG-MCP7471T-10(28),A2-NI-MCP6020T-10(180),A2-CU-MCP6020T-10(180),A2-SE-MCP6020T-10(180),A2-PREP-3050:2T(180),A2-PB-MCP6020T-10(180),A2-TOC-9060-2REPS(28),A2-HGPREP-AA(28),A2-PREP-3050:1T(180)
L2170562-02C	Glass 250ml/8oz unpreserved	B	NA		3.5	Y	Absent		FCN(14)
L2170562-02D	Plastic 8oz unpreserved for Grain Size	B	NA		3.5	Y	Absent		A2-HYDRO-TFINE(),A2-HYDRO-FSAND(),A2-HYDRO-MSAND(),A2-HYDRO-TGRAVEL(),A2-HYDRO-CSAND()
L2170562-03A	Glass 120ml/4oz unpreserved	B	NA		3.5	Y	Absent		A2-DIOXIN-1613(365)

*Values in parentheses indicate holding time in days

Project Name: BELMONT LANDFILL
Project Number: 18-0157

Serial_No: 02232217:04
Lab Number: L2170562
Report Date: 02/23/22

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2170562-03B	Glass 120ml/4oz unpreserved	B	NA		3.5	Y	Absent		A2-BA-MCP6020T-10(180),A2-CR-MCP6020T-10(180),A2-TS(7),A2-AG-MCP6020T-10(180),A2-AS-MCP6020T-10(180),A2-CD-MCP6020T-10(180),A2-ZN-MCP6020T-10(180),A2-BE-MCP6020T-10(180),A2-PAH-8270SIM(14),A2-SB-MCP6020T-10(180),A2-CU-MCP6020T-10(180),A2-HG-MCP7471T-10(28),A2-NI-MCP6020T-10(180),A2-SE-MCP6020T-10(180),A2-HGPREP-AA(28),A2-PREP-3050:2T(180),A2-TOC-9060-2REPS(28),A2-PB-MCP6020T-10(180),A2-PREP-3050:1T(180)
L2170562-03C	Glass 250ml/8oz unpreserved	B	NA		3.5	Y	Absent		FCN(14)
L2170562-03D	Plastic 8oz unpreserved for Grain Size	B	NA		3.5	Y	Absent		A2-HYDRO-TFINE(),A2-HYDRO-FSAND(),A2-HYDRO-MSAND(),A2-HYDRO-TGRAVEL(),A2-HYDRO-CSAND()
L2170562-04A	Glass 120ml/4oz unpreserved	B	NA		3.5	Y	Absent		A2-DIOXIN-1613(365)
L2170562-04B	Glass 120ml/4oz unpreserved	B	NA		3.5	Y	Absent		A2-BA-MCP6020T-10(180),A2-CR-MCP6020T-10(180),A2-AS-MCP6020T-10(180),A2-AG-MCP6020T-10(180),A2-ZN-MCP6020T-10(180),A2-CD-MCP6020T-10(180),A2-TS(7),A2-BE-MCP6020T-10(180),A2-SB-MCP6020T-10(180),A2-PAH-8270SIM(14),A2-NI-MCP6020T-10(180),A2-SE-MCP6020T-10(180),A2-CU-MCP6020T-10(180),A2-HG-MCP7471T-10(28),A2-HGPREP-AA(28),A2-PB-MCP6020T-10(180),A2-TOC-9060-2REPS(28),A2-PREP-3050:2T(180),A2-PREP-3050:1T(180)
L2170562-04C	Glass 250ml/8oz unpreserved	B	NA		3.5	Y	Absent		FCN(14)
L2170562-04D	Plastic 8oz unpreserved for Grain Size	B	NA		3.5	Y	Absent		A2-HYDRO-TFINE(),A2-HYDRO-FSAND(),A2-HYDRO-MSAND(),A2-HYDRO-TGRAVEL(),A2-HYDRO-CSAND()
L2170562-05A	Glass 120ml/4oz unpreserved	B	NA		3.5	Y	Absent		A2-DIOXIN-1613(365)
L2170562-05A1	Glass 120ml/4oz unpreserved	A	NA		2.8	Y	Absent		A2-DIOXIN-1613(365)

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Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2170562-05B	Glass 120ml/4oz unpreserved	B	NA		3.5	Y	Absent		A2-BA-MCP6020T-10(180),A2-CR-MCP6020T-10(180),A2-ZN-MCP6020T-10(180),A2-AS-MCP6020T-10(180),A2-AG-MCP6020T-10(180),A2-CD-MCP6020T-10(180),A2-TS(7),A2-SB-MCP6020T-10(180),A2-PAH-8270SIM(14),A2-BE-MCP6020T-10(180),A2-CU-MCP6020T-10(180),A2-SE-MCP6020T-10(180),A2-HG-MCP7471T-10(28),A2-NI-MCP6020T-10(180),A2-PREP-3050:2T(180),A2-HGPREP-AA(28),A2-PB-MCP6020T-10(180),A2-TOC-9060-2REPS(28),A2-PREP-3050:1T(180)
L2170562-05B1	Glass 250ml/8oz unpreserved	A	NA		2.8	Y	Absent		A2-TOC-9060-2REPS(28)
L2170562-05C	Glass 250ml/8oz unpreserved	B	NA		3.5	Y	Absent		FCN(14)
L2170562-05C1	Glass 250ml/8oz unpreserved	A	NA		2.8	Y	Absent		FCN(14)
L2170562-05D	Plastic 8oz unpreserved for Grain Size	B	NA		3.5	Y	Absent		A2-HYDRO-TFINE(),A2-HYDRO-FSAND(),A2-HYDRO-MSAND(),A2-HYDRO-TGRAVEL(),A2-HYDRO-CSAND()
L2170562-05D1	Plastic 8oz unpreserved for Grain Size	A	NA		2.8	Y	Absent		A2-HYDRO-TGRAVEL()
L2170562-06A	Glass 120ml/4oz unpreserved	A	NA		2.8	Y	Absent		A2-DIOXIN-1613(365)
L2170562-06B	Glass 120ml/4oz unpreserved	A	NA		2.8	Y	Absent		A2-CR-MCP6020T-10(180),A2-BA-MCP6020T-10(180),A2-CD-MCP6020T-10(180),A2-AG-MCP6020T-10(180),A2-AS-MCP6020T-10(180),A2-TS(7),A2-ZN-MCP6020T-10(180),A2-BE-MCP6020T-10(180),A2-PAH-8270SIM(14),A2-SB-MCP6020T-10(180),A2-NI-MCP6020T-10(180),A2-HG-MCP7471T-10(28),A2-CU-MCP6020T-10(180),A2-SE-MCP6020T-10(180),A2-PB-MCP6020T-10(180),A2-PREP-3050:2T(180),A2-TOC-9060-2REPS(28),A2-HGPREP-AA(28),A2-PREP-3050:1T(180)
L2170562-06C	Glass 250ml/8oz unpreserved	A	NA		2.8	Y	Absent		FCN(14)
L2170562-06D	Plastic 8oz unpreserved for Grain Size	A	NA		2.8	Y	Absent		A2-HYDRO-TFINE(),A2-HYDRO-FSAND(),A2-HYDRO-MSAND(),A2-HYDRO-TGRAVEL(),A2-HYDRO-CSAND()
L2170562-07A	Glass 120ml/4oz unpreserved	A	NA		2.8	Y	Absent		A2-DIOXIN-1613(365)

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Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2170562-07B	Glass 120ml/4oz unpreserved	A	NA		2.8	Y	Absent		A2-BA-MCP6020T-10(180),A2-CR-MCP6020T-10(180),A2-CD-MCP6020T-10(180),A2-ZN-MCP6020T-10(180),A2-AS-MCP6020T-10(180),A2-AG-MCP6020T-10(180),A2-TS(7),A2-SB-MCP6020T-10(180),A2-BE-MCP6020T-10(180),A2-PAH-8270SIM(14),A2-NI-MCP6020T-10(180),A2-CU-MCP6020T-10(180),A2-HG-MCP7471T-10(28),A2-SE-MCP6020T-10(180),A2-HGPREP-AA(28),A2-PREP-3050:2T(180),A2-PB-MCP6020T-10(180),A2-TOC-9060-2REPS(28),A2-PREP-3050:1T(180)
L2170562-07C	Glass 250ml/8oz unpreserved	A	NA		2.8	Y	Absent		FCN(14)
L2170562-07D	Plastic 8oz unpreserved for Grain Size	A	NA		2.8	Y	Absent		A2-HYDRO-TFINE(),A2-HYDRO-FSAND(),A2-HYDRO-MSAND(),A2-HYDRO-TGRAVEL(),A2-HYDRO-CSAND()
L2170562-08A	Glass 120ml/4oz unpreserved	A	NA		2.8	Y	Absent		A2-DIOXIN-1613(365)
L2170562-08B	Glass 120ml/4oz unpreserved	A	NA		2.8	Y	Absent		A2-CR-MCP6020T-10(180),A2-BA-MCP6020T-10(180),A2-AS-MCP6020T-10(180),A2-CD-MCP6020T-10(180),A2-TS(7),A2-ZN-MCP6020T-10(180),A2-AG-MCP6020T-10(180),A2-PAH-8270SIM(14),A2-SB-MCP6020T-10(180),A2-BE-MCP6020T-10(180),A2-CU-MCP6020T-10(180),A2-HG-MCP7471T-10(28),A2-NI-MCP6020T-10(180),A2-SE-MCP6020T-10(180),A2-PB-MCP6020T-10(180),A2-HGPREP-AA(28),A2-TOC-9060-2REPS(28),A2-PREP-3050:2T(180),A2-PREP-3050:1T(180)
L2170562-08C	Glass 250ml/8oz unpreserved	A	NA		2.8	Y	Absent		FCN(14)
L2170562-08D	Plastic 8oz unpreserved for Grain Size	A	NA		2.8	Y	Absent		A2-HYDRO-TFINE(),A2-HYDRO-FSAND(),A2-HYDRO-MSAND(),A2-HYDRO-TGRAVEL(),A2-HYDRO-CSAND()
L2170562-09A	Glass 120ml/4oz unpreserved	A	NA		2.8	Y	Absent		A2-DIOXIN-1613(365)
L2170562-09B	Glass 120ml/4oz unpreserved	A	NA		2.8	Y	Absent		A2-CR-MCP6020T-10(180),A2-BA-MCP6020T-10(180),A2-TS(7),A2-AG-MCP6020T-10(180),A2-ZN-MCP6020T-10(180),A2-AS-MCP6020T-10(180),A2-CD-MCP6020T-10(180),A2-SB-MCP6020T-10(180),A2-BE-MCP6020T-10(180),A2-PAH-8270SIM(14),A2-CU-MCP6020T-10(180),A2-NI-MCP6020T-10(180),A2-SE-MCP6020T-10(180),A2-HG-MCP7471T-10(28),A2-TOC-9060-2REPS(28),A2-PREP-3050:2T(180),A2-HGPREP-AA(28),A2-PB-MCP6020T-10(180),A2-PREP-3050:1T(180)
L2170562-09C	Glass 250ml/8oz unpreserved	A	NA		2.8	Y	Absent		FCN(14)

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Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2170562-09D	Plastic 8oz unpreserved for Grain Size	A	NA		2.8	Y	Absent		A2-HYDRO-TFINE(),A2-HYDRO-FSAND(),A2-HYDRO-MSAND(),A2-HYDRO-TGRAVEL(),A2-HYDRO-CSAND()
L2170562-10A	Glass 120ml/4oz unpreserved	B	NA		3.5	Y	Absent		A2-DIOXIN-1613(365)
L2170562-10B	Glass 120ml/4oz unpreserved	B	NA		3.5	Y	Absent		A2-CR-MCP6020T-10(180),A2-BA-MCP6020T-10(180),A2-ZN-MCP6020T-10(180),A2-AS-MCP6020T-10(180),A2-CD-MCP6020T-10(180),A2-AG-MCP6020T-10(180),A2-TS(7),A2-BE-MCP6020T-10(180),A2-PAH-8270SIM(14),A2-SB-MCP6020T-10(180),A2-HG-MCP7471T-10(28),A2-CU-MCP6020T-10(180),A2-NI-MCP6020T-10(180),A2-SE-MCP6020T-10(180),A2-HGPREP-AA(28),A2-PB-MCP6020T-10(180),A2-PREP-3050:2T(180),A2-TOC-9060-2REPS(28),A2-PREP-3050:1T(180)
L2170562-10C	Glass 250ml/8oz unpreserved	B	NA		3.5	Y	Absent		FCN(14)
L2170562-10D	Plastic 8oz unpreserved for Grain Size	B	NA		3.5	Y	Absent		A2-HYDRO-TFINE(),A2-HYDRO-FSAND(),A2-HYDRO-MSAND(),A2-HYDRO-TGRAVEL(),A2-HYDRO-CSAND()
L2170562-11A	Glass 120ml/4oz unpreserved	B	NA		3.5	Y	Absent		A2-DIOXIN-1613(365)
L2170562-11B	Glass 120ml/4oz unpreserved	B	NA		3.5	Y	Absent		A2-CR-MCP6020T-10(180),A2-BA-MCP6020T-10(180),A2-AS-MCP6020T-10(180),A2-ZN-MCP6020T-10(180),A2-CD-MCP6020T-10(180),A2-AG-MCP6020T-10(180),A2-TS(7),A2-PAH-8270SIM(14),A2-SB-MCP6020T-10(180),A2-BE-MCP6020T-10(180),A2-SE-MCP6020T-10(180),A2-HG-MCP7471T-10(28),A2-NI-MCP6020T-10(180),A2-CU-MCP6020T-10(180),A2-TOC-9060-2REPS(28),A2-HGPREP-AA(28),A2-PB-MCP6020T-10(180),A2-PREP-3050:2T(180),A2-PREP-3050:1T(180)
L2170562-11C	Glass 250ml/8oz unpreserved	B	NA		3.5	Y	Absent		FCN(14)
L2170562-11D	Plastic 8oz unpreserved for Grain Size	B	NA		3.5	Y	Absent		A2-HYDRO-TFINE(),A2-HYDRO-FSAND(),A2-HYDRO-MSAND(),A2-HYDRO-TGRAVEL(),A2-HYDRO-CSAND()
L2170562-12A	Glass 120ml/4oz unpreserved	B	NA		3.5	Y	Absent		A2-DIOXIN-1613(365)
L2170562-12A1	Glass 60mL/2oz unpreserved	B	NA		3.5	Y	Absent		A2-DIOXIN-1613(365)

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Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2170562-12B	Glass 120ml/4oz unpreserved	B	NA		3.5	Y	Absent		A2-CR-MCP6020T-10(180),A2-BA-MCP6020T-10(180),A2-CD-MCP6020T-10(180),A2-ZN-MCP6020T-10(180),A2-TS(7),A2-AS-MCP6020T-10(180),A2-AG-MCP6020T-10(180),A2-PAH-8270SIM(14),A2-SB-MCP6020T-10(180),A2-BE-MCP6020T-10(180),A2-NI-MCP6020T-10(180),A2-SE-MCP6020T-10(180),A2-HG-MCP7471T-10(28),A2-CU-MCP6020T-10(180),A2-PB-MCP6020T-10(180),A2-TOC-9060-2REPS(28),A2-HGPREP-AA(28),A2-PREP-3050:2T(180),A2-PREP-3050:1T(180)
L2170562-12B1	Glass 250ml/8oz unpreserved	B	NA		3.5	Y	Absent		A2-AG-MCP6020T-10(180)
L2170562-12C	Glass 250ml/8oz unpreserved	B	NA		3.5	Y	Absent		FCN(14)
L2170562-12C1	Glass 250ml/8oz unpreserved	B	NA		3.5	Y	Absent		FCN(14)
L2170562-12D	Plastic 8oz unpreserved for Grain Size	B	NA		3.5	Y	Absent		A2-HYDRO-TFINE(),A2-HYDRO-FSAND(),A2-HYDRO-MSAND(),A2-HYDRO-TGRAVEL(),A2-HYDRO-CSAND()
L2170562-12D1	Plastic 8oz unpreserved for Grain Size	B	NA		3.5	Y	Absent		A2-HYDRO-CSAND()
L2170562-13A	Glass 120ml/4oz unpreserved	B	NA		3.5	Y	Absent		A2-DIOXIN-1613(365)
L2170562-13B	Glass 120ml/4oz unpreserved	B	NA		3.5	Y	Absent		A2-BA-MCP6020T-10(180),A2-CR-MCP6020T-10(180),A2-AG-MCP6020T-10(180),A2-ZN-MCP6020T-10(180),A2-TS(7),A2-AS-MCP6020T-10(180),A2-CD-MCP6020T-10(180),A2-BE-MCP6020T-10(180),A2-SB-MCP6020T-10(180),A2-PAH-8270SIM(14),A2-HG-MCP7471T-10(28),A2-CU-MCP6020T-10(180),A2-NI-MCP6020T-10(180),A2-SE-MCP6020T-10(180),A2-PB-MCP6020T-10(180),A2-TOC-9060-2REPS(28),A2-PREP-3050:2T(180),A2-HGPREP-AA(28),A2-PREP-3050:1T(180)
L2170562-13C	Glass 250ml/8oz unpreserved	B	NA		3.5	Y	Absent		FCN(14)
L2170562-13D	Plastic 8oz unpreserved for Grain Size	B	NA		3.5	Y	Absent		A2-HYDRO-TFINE(),A2-HYDRO-FSAND(),A2-HYDRO-MSAND(),A2-HYDRO-TGRAVEL(),A2-HYDRO-CSAND()
L2170562-14A	Glass 120ml/4oz unpreserved	A	NA		2.8	Y	Absent		A2-DIOXIN-1613(365)

Project Name: BELMONT LANDFILL
Project Number: 18-0157

Serial_No: 02232217:04
Lab Number: L2170562
Report Date: 02/23/22

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2170562-14B	Glass 120ml/4oz unpreserved	A	NA		2.8	Y	Absent		A2-BA-MCP6020T-10(180),A2-CR-MCP6020T-10(180),A2-ZN-MCP6020T-10(180),A2-AG-MCP6020T-10(180),A2-AS-MCP6020T-10(180),A2-CD-MCP6020T-10(180),A2-TS(7),A2-PAH-8270SIM(14),A2-BE-MCP6020T-10(180),A2-SB-MCP6020T-10(180),A2-HG-MCP7471T-10(28),A2-SE-MCP6020T-10(180),A2-NI-MCP6020T-10(180),A2-CU-MCP6020T-10(180),A2-HGPREP-AA(28),A2-TOC-9060-2REPS(28),A2-PB-MCP6020T-10(180),A2-PREP-3050:2T(180),A2-PREP-3050:1T(180)
L2170562-14C	Glass 250ml/8oz unpreserved	A	NA		2.8	Y	Absent		FCN(14)
L2170562-14D	Plastic 8oz unpreserved for Grain Size	A	NA		2.8	Y	Absent		A2-HYDRO-TFINE(),A2-HYDRO-FSAND(),A2-HYDRO-MSAND(),A2-HYDRO-TGRAVEL(),A2-HYDRO-CSAND()

Project Name: BELMONT LANDFILL
Project Number: 18-0157

Lab Number: L2170562
Report Date: 02/23/22

GLOSSARY

Acronyms

DL	- Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EMPC	- Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LOD	- Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
LOQ	- Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.) Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
NR	- No Results: Term is utilized when 'No Target Compounds Requested' is reported for the analysis of Volatile or Semivolatile Organic TIC only requests.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TEF	- Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.
TEQ	- Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Report Format: DU Report with 'J' Qualifiers



Project Name: BELMONT LANDFILL
Project Number: 18-0157

Lab Number: L2170562
Report Date: 02/23/22

Footnotes

- 1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Difference: With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

PAH Total: With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. In addition, the 'PFAS, Total (6)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA, PFDA and PFOS. For MassDEP DW compliance analysis only, the 'PFAS, Total (6)' result is defined as the summation of results at or above the RL. Note: If a 'Total' result is requested, the results of its individual components will also be reported.

The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA, this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

- A** - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.
- B** - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).
- C** - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
- D** - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
- E** - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- F** - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.
- G** - The concentration may be biased high due to matrix interferences (i.e. co-elution) with non-target compound(s). The result should be considered estimated.
- H** - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
- I** - The lower value for the two columns has been reported due to obvious interference.
- J** - Estimated value. The Target analyte concentration is below the quantitation limit (RL), but above the Method Detection Limit (MDL) or Estimated Detection Limit (EDL) for SPME-related analyses. This represents an estimated concentration for Tentatively Identified Compounds (TICs).
- M** - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.
- ND** - Not detected at the method detection limit (MDL) for the sample, or estimated detection limit (EDL) for SPME-related analyses.

Report Format: DU Report with 'J' Qualifiers



Project Name: BELMONT LANDFILL
Project Number: 18-0157

Lab Number: L2170562
Report Date: 02/23/22

Data Qualifiers

- NJ** - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.
- P** - The RPD between the results for the two columns exceeds the method-specified criteria.
- Q** - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)
- R** - Analytical results are from sample re-analysis.
- RE** - Analytical results are from sample re-extraction.
- S** - Analytical results are from modified screening analysis.
- V** - The surrogate associated with this target analyte has a recovery outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)
- Z** - The batch matrix spike and/or duplicate associated with this target analyte has a recovery/RPD outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

Project Name: BELMONT LANDFILL
Project Number: 18-0157

Lab Number: L2170562
Report Date: 02/23/22

REFERENCES

- 1 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - VI, 2018.
- 12 Annual Book of ASTM Standards. (American Society for Testing and Materials) ASTM International.
- 97 EPA Test Methods (SW-846) with QC Requirements & Performance Standards for the Analysis of EPA SW-846 Methods under the Massachusetts Contingency Plan, WSC-CAM-IIA, IIB, IIIA, IIIB, IIIC, IIID, VA, VB, VC, VIA, VIB, VIIIA and VIIIB, July 2010.
- 121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.
- 132 Method 1613 Revision B: Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution HRGC/HRMS. USEPA Office of Water, October 1994.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



ASTM D6913/D7928

GRAIN SIZE ANALYSIS

Particle Size Distribution Report



		% +3"		% Gravel		% Sand			% Fines		
				Coarse	Fine	Coarse	Medium	Fine	Silt	Clay	
☐		0.0		0.2	2.3	3.6	24.2	46.0	23.7		
☐											
☒		LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	
☐				0.9424	0.2818	0.1916	0.0935				
☐											
Material Description									USCS	AASHTO	
☐											
Project No.		Client:									
Project:											
☐	Source of Sample: TOX-1		Sample Number: L2170562-01								
		Alpha Analytical									
		Mansfield, MA									
		Remarks:									
		Figure									

GRAIN SIZE DISTRIBUTION TEST DATA

2/14/2022

Location: TOX-1

Sample Number: L2170562-01

Sieve Test Data

Post #200 Wash Test Weights (grams): Dry Sample and Tare = 32.23

Tare Wt. = 0.00

Minus #200 from wash = 0.0%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
32.23	0.00	3"	0.00	0.00	100.0
		2"	0.00	0.00	100.0
		1"	0.00	0.00	100.0
		#4	0.79	0.00	97.5
		#10	1.18	0.00	93.9
		#40	7.78	0.00	69.7
		#200	14.84	0.00	23.7

Fractional Components

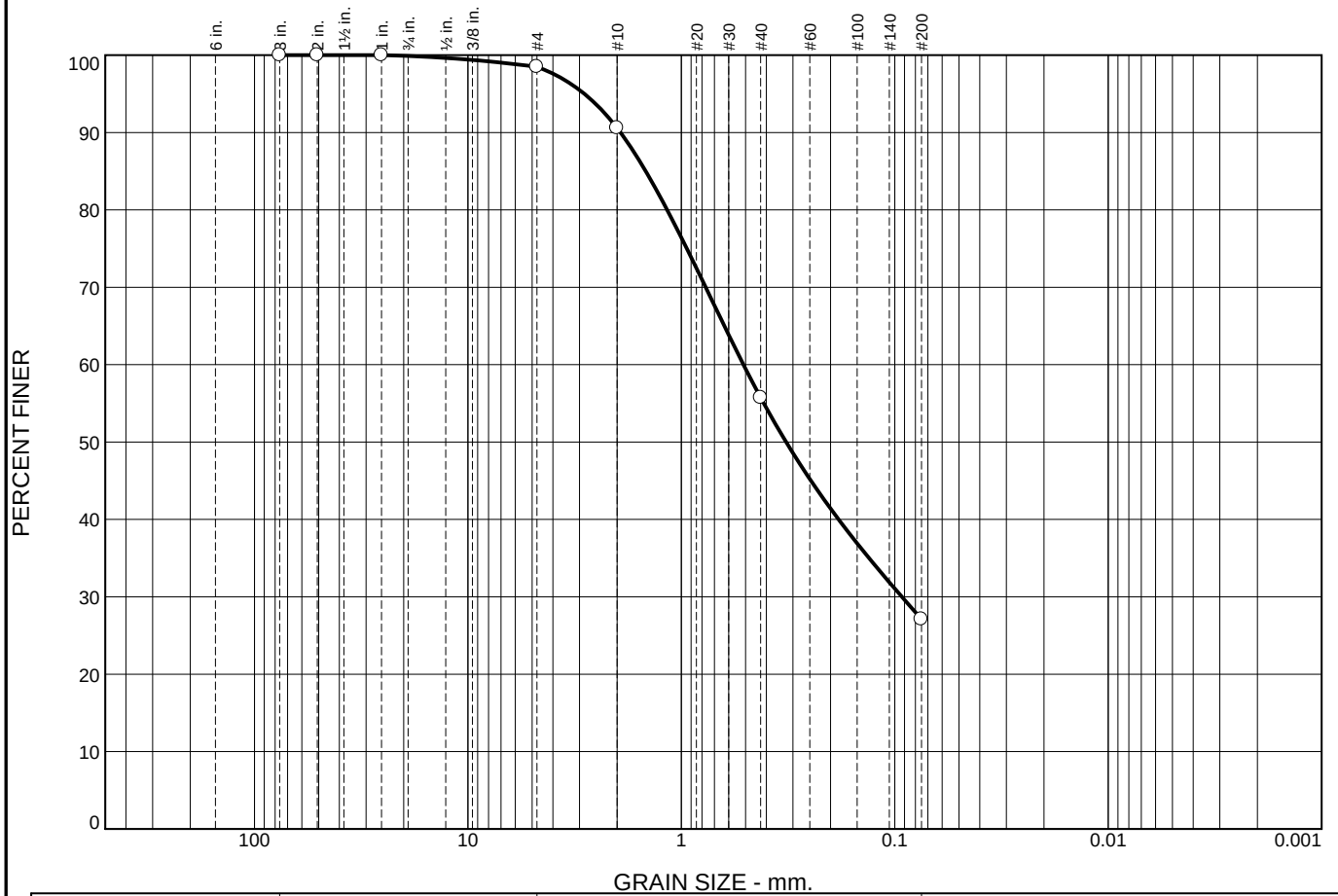
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.2	2.3	2.5	3.6	24.2	46.0	73.8			23.7

D ₅	D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₄₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
				0.0935	0.1331	0.1916	0.2818	0.7025	0.9424	1.3510	2.3554

Fineness Modulus
1.38

Alpha Analytical

Particle Size Distribution Report



% +3"		% Gravel		% Sand			% Fines		
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay	
☐	0.0	0.1	1.4	7.9	34.9	28.6	27.1		
☐									
☒	LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	
☐			1.4683	0.5115	0.3230	0.0926			
☐									
Material Description							USCS	AASHTO	
☐									
Project No. Client:							Remarks:		
Project:									
☐ Source of Sample: TOX-2 Sample Number: L2170562-02									
Alpha Analytical							Figure		
Mansfield, MA									

GRAIN SIZE DISTRIBUTION TEST DATA

2/14/2022

Location: TOX-2

Sample Number: L2170562-02

Sieve Test Data

Post #200 Wash Test Weights (grams): Dry Sample and Tare = 21.87

Tare Wt. = 0.00

Minus #200 from wash = 0.0%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
21.87	0.00	3"	0.00	0.00	100.0
		2"	0.00	0.00	100.0
		1"	0.00	0.00	100.0
		#4	0.33	0.00	98.5
		#10	1.73	0.00	90.6
		#40	7.62	0.00	55.7
		#200	6.26	0.00	27.1

Fractional Components

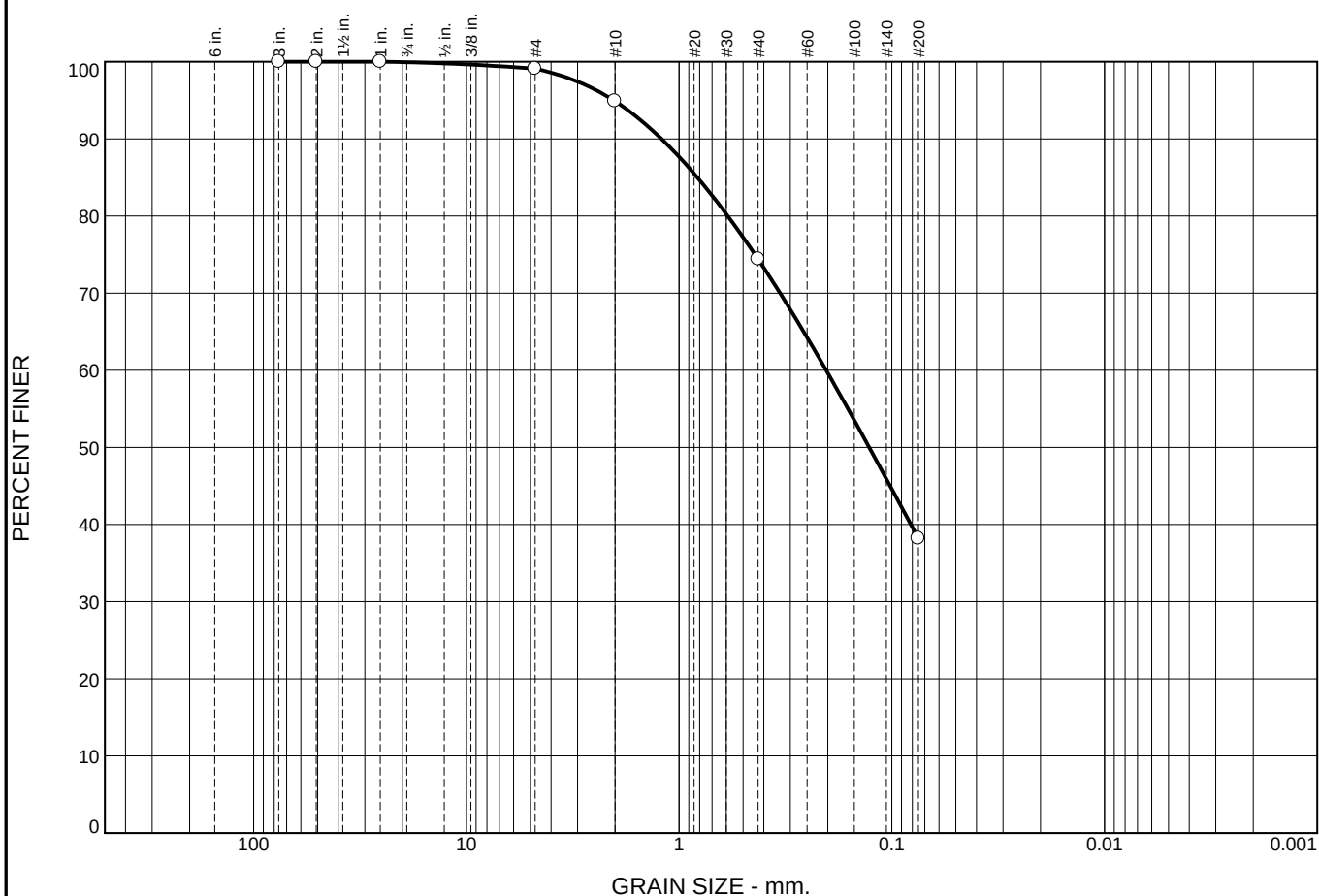
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.1	1.4	1.5	7.9	34.9	28.6	71.4			27.1

D ₅	D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₄₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
				0.0926	0.1834	0.3230	0.5115	1.1655	1.4683	1.9279	2.8482

Fineness Modulus
1.80

Alpha Analytical

Particle Size Distribution Report



GRAIN SIZE DISTRIBUTION TEST DATA

2/14/2022

Location: TOX-3

Sample Number: L2170562-03

Sieve Test Data

Post #200 Wash Test Weights (grams): Dry Sample and Tare = 38.70

Tare Wt. = 0.00

Minus #200 from wash = 0.0%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
38.70	0.00	3"	0.00	0.00	100.0
		2"	0.00	0.00	100.0
		1"	0.00	0.00	100.0
		#4	0.35	0.00	99.1
		#10	1.63	0.00	94.9
		#40	7.93	0.00	74.4
		#200	14.01	0.00	38.2

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.1	0.8	0.9	4.2	20.5	36.2	60.9			38.2

D ₅	D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₄₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
					0.0813	0.1277	0.2035	0.5904	0.8206	1.2093	2.0304

Fineness Modulus
1.14

Alpha Analytical

Particle Size Distribution Report



GRAIN SIZE DISTRIBUTION TEST DATA

2/14/2022

Location: TOX-3-DUP

Sample Number: L2170562-04

Sieve Test Data

Post #200 Wash Test Weights (grams): Dry Sample and Tare = 29.26

Tare Wt. = 0.00

Minus #200 from wash = 0.0%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
29.26	0.00	3"	0.00	0.00	100.0
		2"	0.00	0.00	100.0
		1"	0.00	0.00	100.0
		#4	0.30	0.00	99.0
		#10	1.26	0.00	94.7
		#40	6.31	0.00	73.1
		#200	10.55	0.00	37.0

Fractional Components

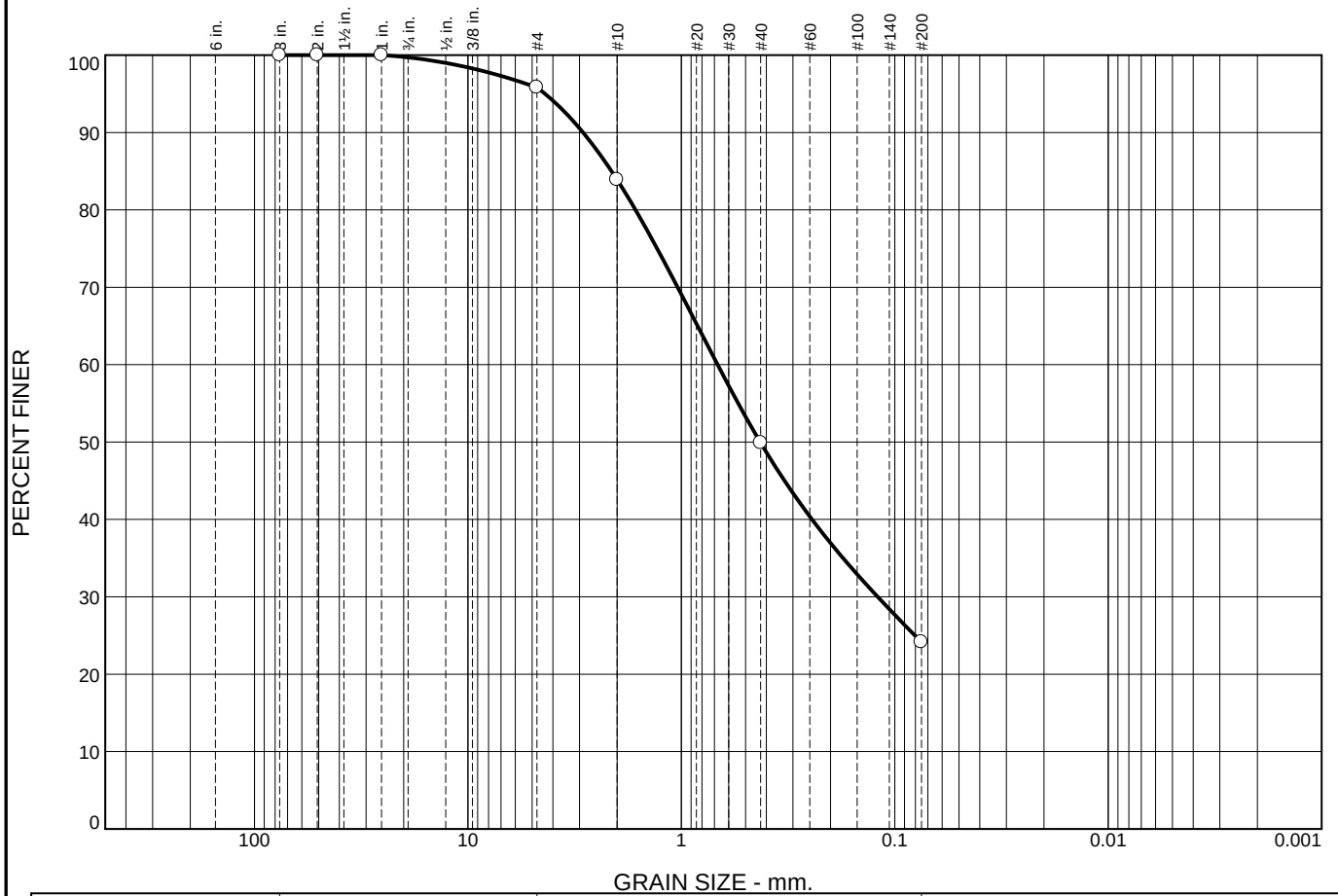
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.1	0.9	1.0	4.3	21.6	36.1	62.0			37.0

D ₅	D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₄₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
					0.0858	0.1357	0.2178	0.6302	0.8680	1.2620	2.0850

Fineness Modulus
1.19

Alpha Analytical

Particle Size Distribution Report



% +3"		% Gravel		% Sand			% Fines		
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay	
☐	0.0	0.3	3.9	11.9	34.0	25.8	24.1		
☐									
☒	LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	
☐			2.1232	0.6764	0.4273	0.1202			
☐									
Material Description							USCS	AASHTO	
☐									
Project No. Client:							Remarks:		
Project:									
☐ Source of Sample: TOX-4 Sample Number: L2170562-05									
Alpha Analytical							Figure		
Mansfield, MA									

GRAIN SIZE DISTRIBUTION TEST DATA

2/14/2022

Location: TOX-4

Sample Number: L2170562-05

Sieve Test Data

Post #200 Wash Test Weights (grams): Dry Sample and Tare = 9.32

Tare Wt. = 0.00

Minus #200 from wash = 0.0%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
9.32	0.00	3"	0.00	0.00	100.0
		2"	0.00	0.00	100.0
		1"	0.00	0.00	100.0
		#4	0.39	0.00	95.8
		#10	1.11	0.00	83.9
		#40	3.17	0.00	49.9
		#200	2.40	0.00	24.1

Fractional Components

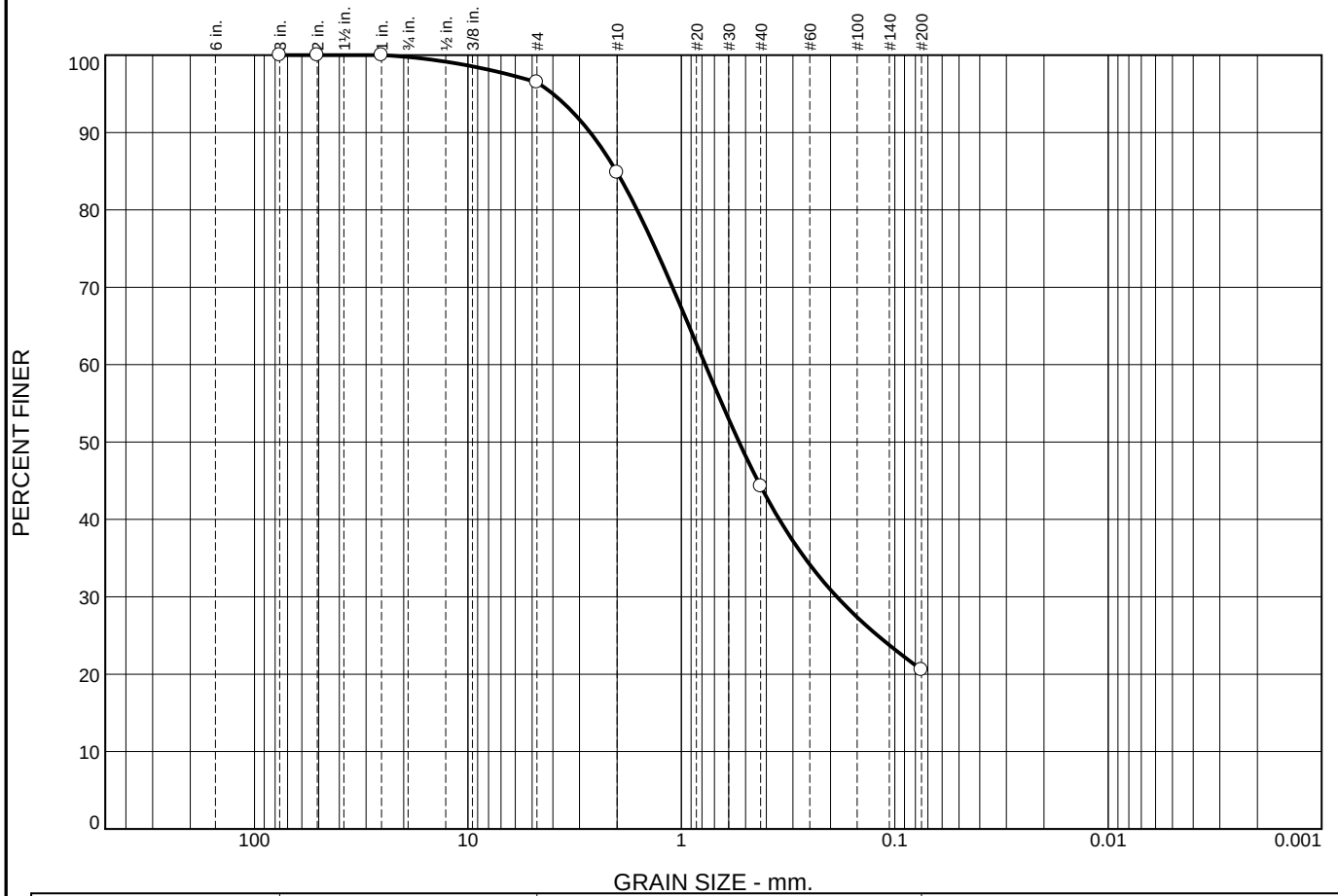
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.3	3.9	4.2	11.9	34.0	25.8	71.7			24.1

D ₅	D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₄₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
				0.1202	0.2442	0.4273	0.6764	1.6394	2.1232	2.8873	4.3513

Fineness Modulus
2.13

Alpha Analytical

Particle Size Distribution Report



% +3"		% Gravel		% Sand			% Fines		
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay	
☐	0.0	0.2	3.3	11.7	40.5	23.8	20.5		
☐									
☒	LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	
☐			2.0162	0.7727	0.5365	0.1868			
☐									
Material Description							USCS	AASHTO	
☐									
Project No. Client: Project:							Remarks:		
☐ Source of Sample: TOX-4 Sample Number: WG1602845-1							Figure		
Alpha Analytical Mansfield, MA									

GRAIN SIZE DISTRIBUTION TEST DATA

2/14/2022

Location: TOX-4

Sample Number: WG1602845-1

Sieve Test Data

Post #200 Wash Test Weights (grams): Dry Sample and Tare = 9.10

Tare Wt. = 0.00

Minus #200 from wash = 0.0%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
9.10	0.00	3"	0.00	0.00	100.0
		2"	0.00	0.00	100.0
		1"	0.00	0.00	100.0
		#4	0.32	0.00	96.5
		#10	1.06	0.00	84.8
		#40	3.69	0.00	44.3
		#200	2.16	0.00	20.5

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.2	3.3	3.5	11.7	40.5	23.8	76.0			20.5

D ₅	D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₄₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
				0.1868	0.3477	0.5365	0.7727	1.6109	2.0162	2.6708	4.0003

Fineness Modulus
2.28

Alpha Analytical

GRAIN SIZE DISTRIBUTION TEST DATA

2/14/2022

Location: TOX-5

Sample Number: L2170562-06

USCS Classification: SP

Sieve Test Data

Post #200 Wash Test Weights (grams): Dry Sample and Tare = 77.31

Tare Wt. = 0.00

Minus #200 from wash = 0.0%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
77.31	0.00	3"	0.00	0.00	100.0
		2"	0.00	0.00	100.0
		1"	0.00	0.00	100.0
		#4	4.17	0.00	94.6
		#10	3.76	0.00	89.7
		#40	24.45	0.00	58.1
		#200	41.34	0.00	4.6

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.5	4.9	5.4	4.9	31.6	53.5	90.0			4.6

D ₅	D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₄₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
0.0758	0.0885	0.1033	0.1206	0.1653	0.2283	0.3193	0.4552	1.0529	1.3945	2.0519	5.2776

Fineness Modulus	C _u	C _c
1.93	5.14	0.68

Alpha Analytical

Particle Size Distribution Report



% +3"		% Gravel		% Sand			% Fines			
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay		
☐	0.0	0.3	4.0	15.7	36.2	33.8	10.0			
☐										
☒	LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
☐			2.5271	0.8514	0.5577	0.2189	0.0989	0.0752	0.75	11.32
☐										
Material Description								USCS	AASHTO	
☐										
Project No. Client: Project:								Remarks:		
☐ Source of Sample: TOX-6 Sample Number: L2170562-07										
Alpha Analytical Mansfield, MA										
								Figure		

GRAIN SIZE DISTRIBUTION TEST DATA

2/14/2022

Location: TOX-6

Sample Number: L2170562-07

Sieve Test Data

Post #200 Wash Test Weights (grams): Dry Sample and Tare = 17.98

Tare Wt. = 0.00

Minus #200 from wash = 0.0%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
17.98	0.00	3"	0.00	0.00	100.0
		2"	0.00	0.00	100.0
		1"	0.00	0.00	100.0
		#4	0.78	0.00	95.7
		#10	2.82	0.00	80.0
		#40	6.50	0.00	43.8
		#200	6.09	0.00	10.0

Fractional Components

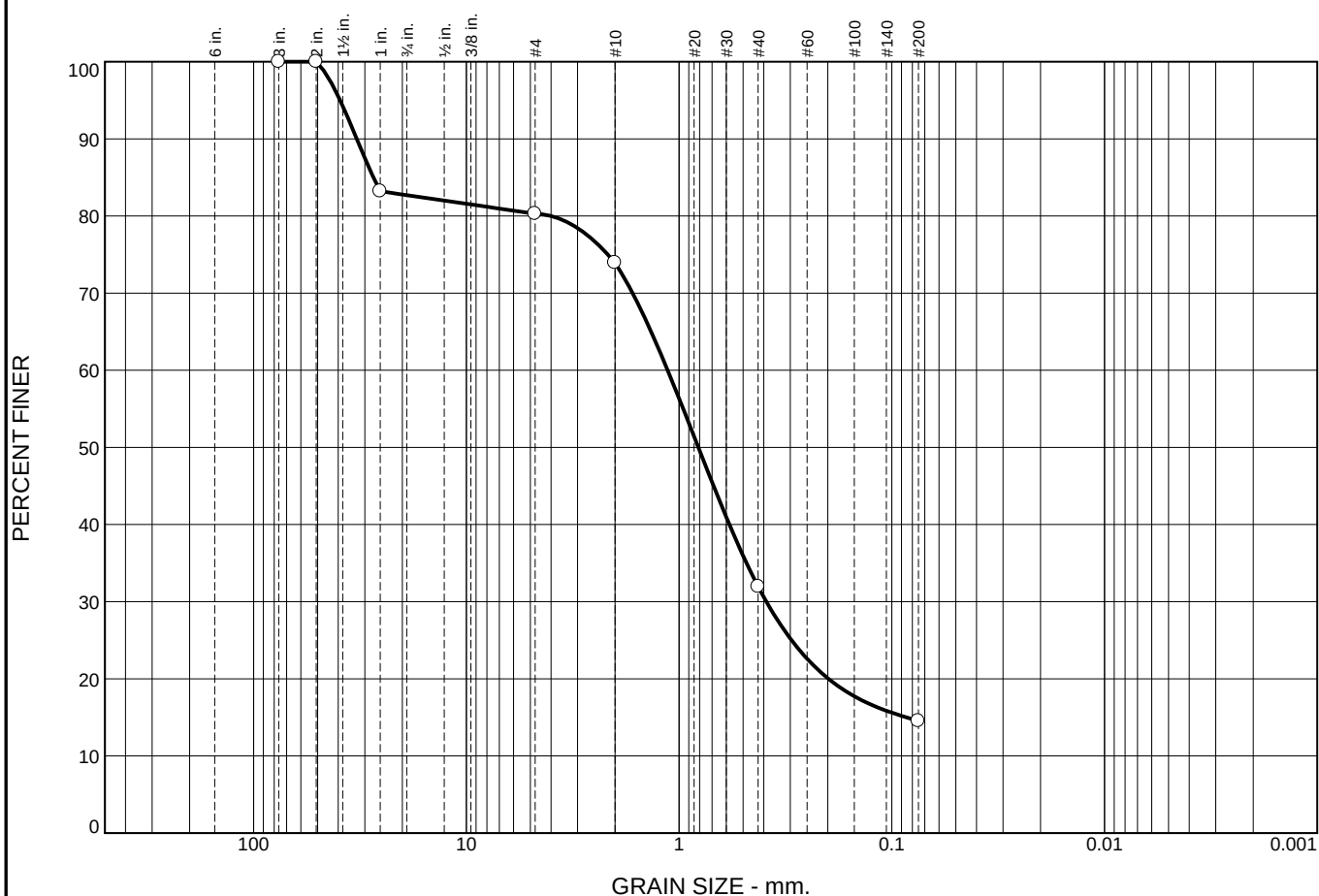
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.3	4.0	4.3	15.7	36.2	33.8	85.7			10.0

D ₅	D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₄₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
	0.0752	0.0989	0.1297	0.2189	0.3565	0.5577	0.8514	2.0020	2.5271	3.2716	4.5061

Fineness Modulus	C _u	C _c
2.44	11.32	0.75

Alpha Analytical

Particle Size Distribution Report



GRAIN SIZE - mm.									
% +3"		% Gravel		% Sand			% Fines		
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay	
0.0		17.3	2.4	6.4	42.0	17.4	14.5		
☒ LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
☐		27.3384	1.1318	0.8118	0.3890	0.0854			
Material Description							USCS	AASHTO	
Project No.		Client:				Remarks:			
Project:									
☐ Source of Sample: WORM-1 Sample Number: L2170562-08									
Alpha Analytical						Figure			
Mansfield, MA									

GRAIN SIZE DISTRIBUTION TEST DATA

2/14/2022

Location: WORM-1

Sample Number: L2170562-08

Sieve Test Data

Post #200 Wash Test Weights (grams): Dry Sample and Tare = 80.92

Tare Wt. = 0.00

Minus #200 from wash = 0.0%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
80.92	0.00	3"	0.00	0.00	100.0
		2"	0.00	0.00	100.0
		1"	13.59	0.00	83.2
		#4	2.36	0.00	80.3
		#10	5.15	0.00	73.9
		#40	33.97	0.00	31.9
		#200	14.09	0.00	14.5

Fractional Components

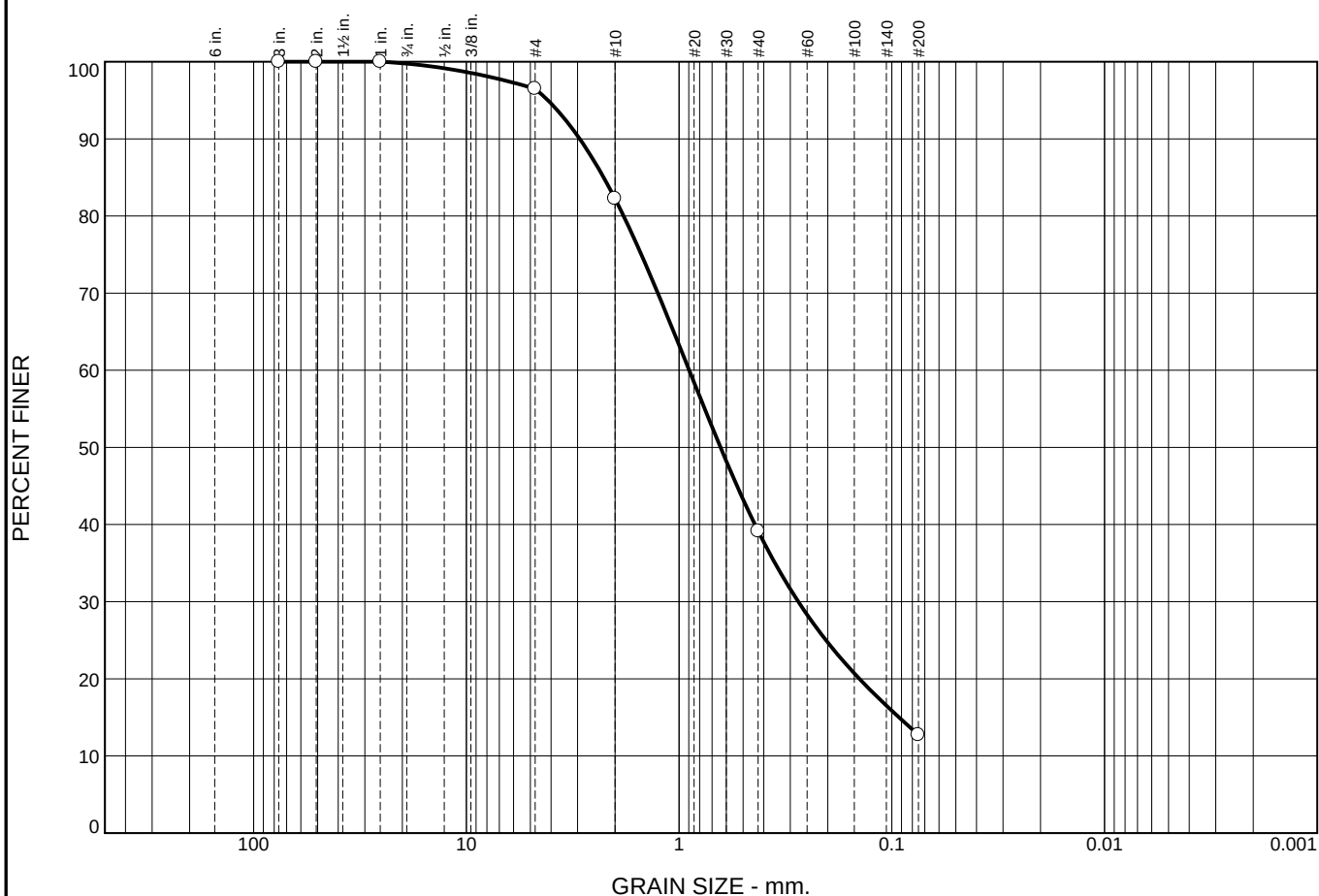
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	17.3	2.4	19.7	6.4	42.0	17.4	65.8			14.5

D ₅	D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₄₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
		0.0854	0.1986	0.3890	0.5800	0.8118	1.1318	4.0010	27.3384	32.7388	39.2172

Fineness Modulus
3.40

Alpha Analytical

Particle Size Distribution Report



% +3"		% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
☐	0.0	0.2	3.3	14.3	43.1	26.4	12.7	
☒	LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀
☐			2.2626	0.8965	0.6385	0.2752	0.0924	
Material Description							USCS	AASHTO
☐								
Project No.		Client:		Remarks:				
Project:								
☐ Source of Sample: WORM-2		Sample Number: L2170562-09						
Alpha Analytical				Figure				
Mansfield, MA								

GRAIN SIZE DISTRIBUTION TEST DATA

2/14/2022

Location: WORM-2

Sample Number: L2170562-09

Sieve Test Data

Post #200 Wash Test Weights (grams): Dry Sample and Tare = 15.71

Tare Wt. = 0.00

Minus #200 from wash = 0.0%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
15.71	0.00	3"	0.00	0.00	100.0
		2"	0.00	0.00	100.0
		1"	0.00	0.00	100.0
		#4	0.55	0.00	96.5
		#10	2.24	0.00	82.2
		#40	6.77	0.00	39.1
		#200	4.15	0.00	12.7

Fractional Components

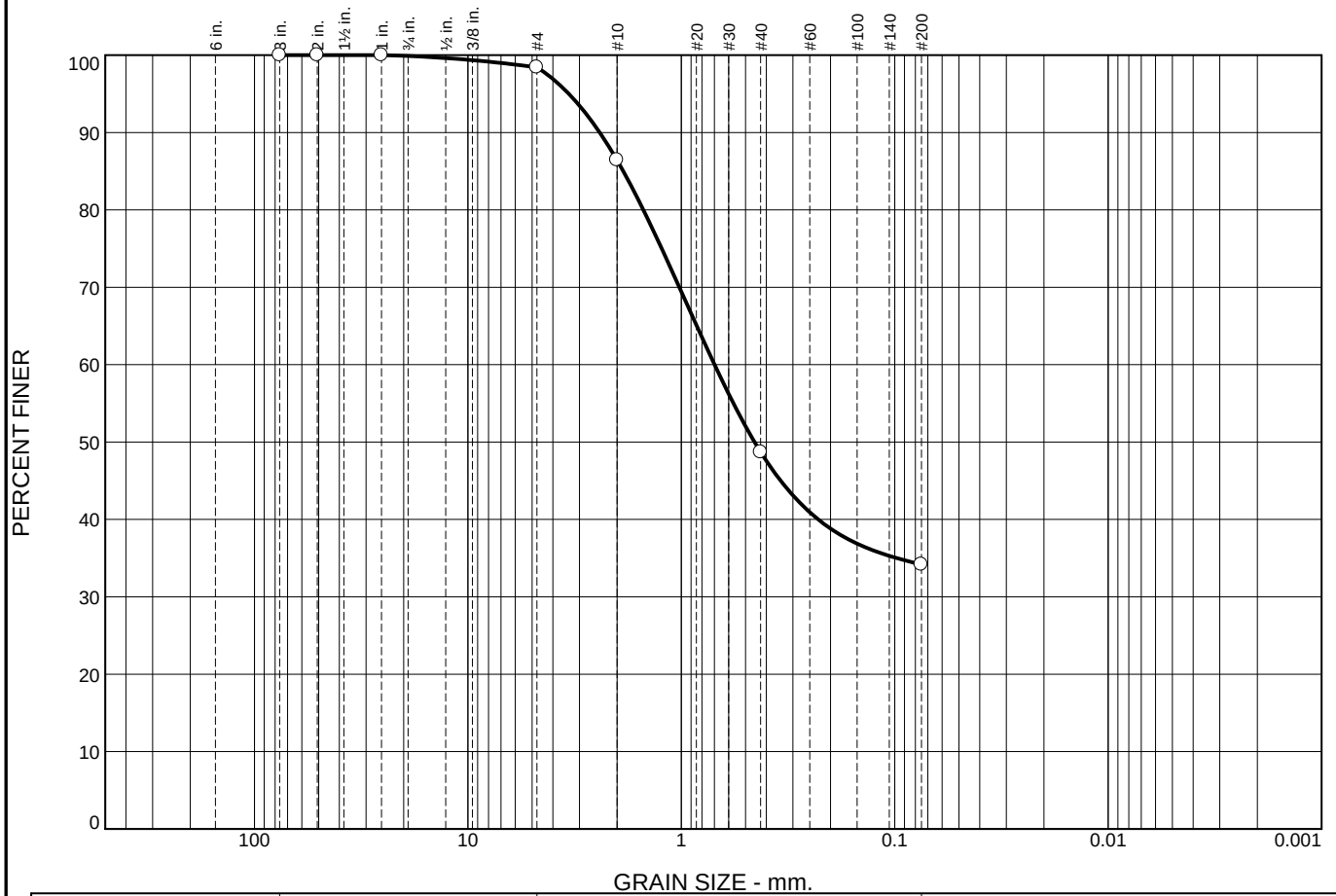
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.2	3.3	3.5	14.3	43.1	26.4	83.8			12.7

D ₅	D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₄₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
		0.0924	0.1420	0.2752	0.4401	0.6385	0.8965	1.8224	2.2626	2.9320	4.1353

Fineness Modulus
2.51

Alpha Analytical

Particle Size Distribution Report



% +3"		% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
☐	0.0	0.1	1.5	12.0	37.7	14.5	34.2	
☒	LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀
☐			1.8696	0.6985	0.4540			
Material Description							USCS	AASHTO
☐								
Project No.		Client:		Remarks:				
Project:								
☐ Source of Sample: WORM-3		Sample Number: L2170562-10		Figure				
Alpha Analytical		Mansfield, MA						

GRAIN SIZE DISTRIBUTION TEST DATA

2/14/2022

Location: WORM-3

Sample Number: L2170562-10

Sieve Test Data

Post #200 Wash Test Weights (grams): Dry Sample and Tare = 19.67

Tare Wt. = 0.00

Minus #200 from wash = 0.0%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
19.67	0.00	3"	0.00	0.00	100.0
		2"	0.00	0.00	100.0
		1"	0.00	0.00	100.0
		#4	0.31	0.00	98.4
		#10	2.36	0.00	86.4
		#40	7.42	0.00	48.7
		#200	2.86	0.00	34.2

Fractional Components

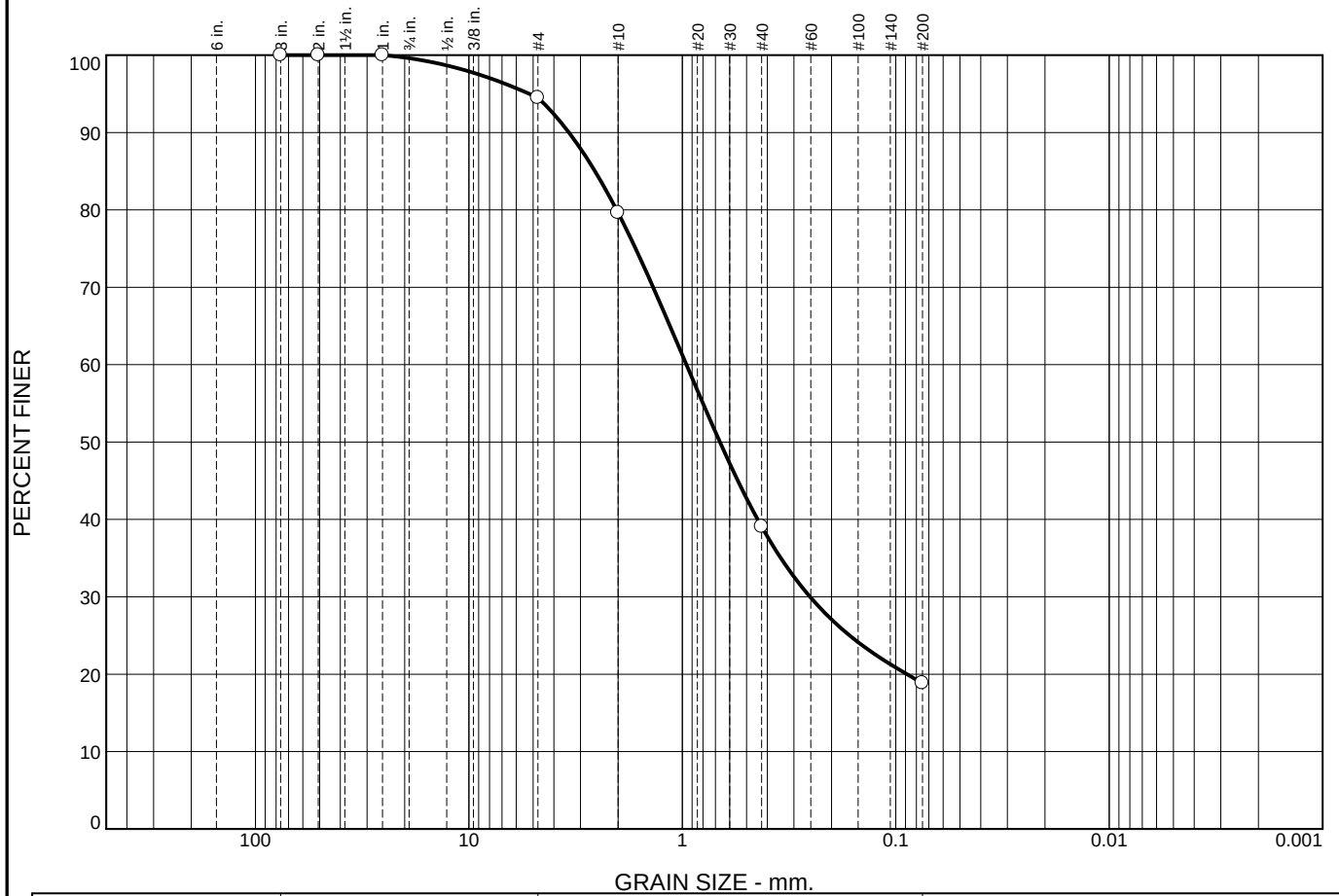
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.1	1.5	1.6	12.0	37.7	14.5	64.2			34.2

D ₅	D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₄₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
					0.2284	0.4540	0.6985	1.5059	1.8696	2.4120	3.3679

Fineness Modulus
2.03

Alpha Analytical

Particle Size Distribution Report



GRAIN SIZE - mm.										
% +3"		% Gravel		% Sand			% Fines			
		Coarse	Fine	Coarse	Medium	Fine	Silt		Clay	
0.0		0.4	5.1	14.9	40.5	20.3	18.8			
×	LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
○			2.5665	0.9569	0.6667	0.2522				
Material Description								USCS	AASHTO	
Project No. Client:						Remarks:				
Project:										
○ Source of Sample: WORM-3-DUP Sample Number: L2170562-11										
Alpha Analytical						Figure				
Mansfield, MA										

GRAIN SIZE DISTRIBUTION TEST DATA

2/14/2022

Location: WORM-3-DUP

Sample Number: L2170562-11

Sieve Test Data

Post #200 Wash Test Weights (grams): Dry Sample and Tare = 19.05

Tare Wt. = 0.00

Minus #200 from wash = 0.0%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
19.05	0.00	3"	0.00	0.00	100.0
		2"	0.00	0.00	100.0
		1"	0.00	0.00	100.0
		#4	1.05	0.00	94.5
		#10	2.83	0.00	79.6
		#40	7.73	0.00	39.1
		#200	3.85	0.00	18.8

Fractional Components

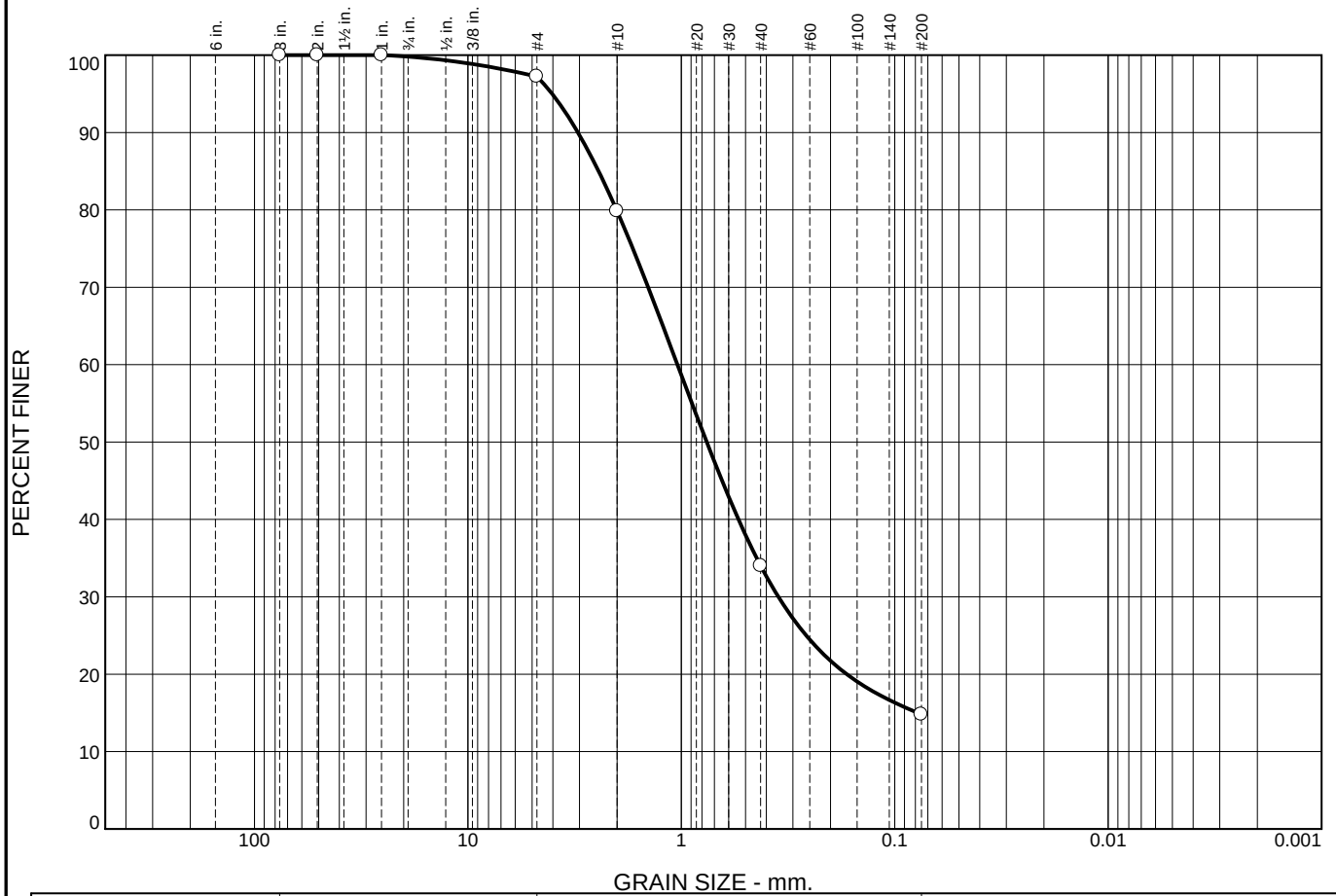
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.4	5.1	5.5	14.9	40.5	20.3	75.7			18.8

D ₅	D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₄₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
			0.0887	0.2522	0.4440	0.6667	0.9569	2.0320	2.5665	3.3996	5.2147

Fineness Modulus
2.55

Alpha Analytical

Particle Size Distribution Report



% +3"		% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0		0.2	2.6	17.3	45.9	19.2	14.8	
☒ LL	☐ PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c
		2.4410	1.0428	0.7602	0.3510	0.0781		C _u
Material Description							USCS	AASHTO
Project No. _____ Client: _____ Project: _____						Remarks:		
☐ Source of Sample: WORM-4 Sample Number: L2170562-12								
Alpha Analytical Mansfield, MA								
						Figure		

GRAIN SIZE DISTRIBUTION TEST DATA

2/14/2022

Location: WORM-4

Sample Number: L2170562-12

Sieve Test Data

Post #200 Wash Test Weights (grams): Dry Sample and Tare = 5.41

Tare Wt. = 0.00

Minus #200 from wash = 0.0%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
5.41	0.00	3"	0.00	0.00	100.0
		2"	0.00	0.00	100.0
		1"	0.00	0.00	100.0
		#4	0.15	0.00	97.2
		#10	0.94	0.00	79.9
		#40	2.48	0.00	34.0
		#200	1.04	0.00	14.8

Fractional Components

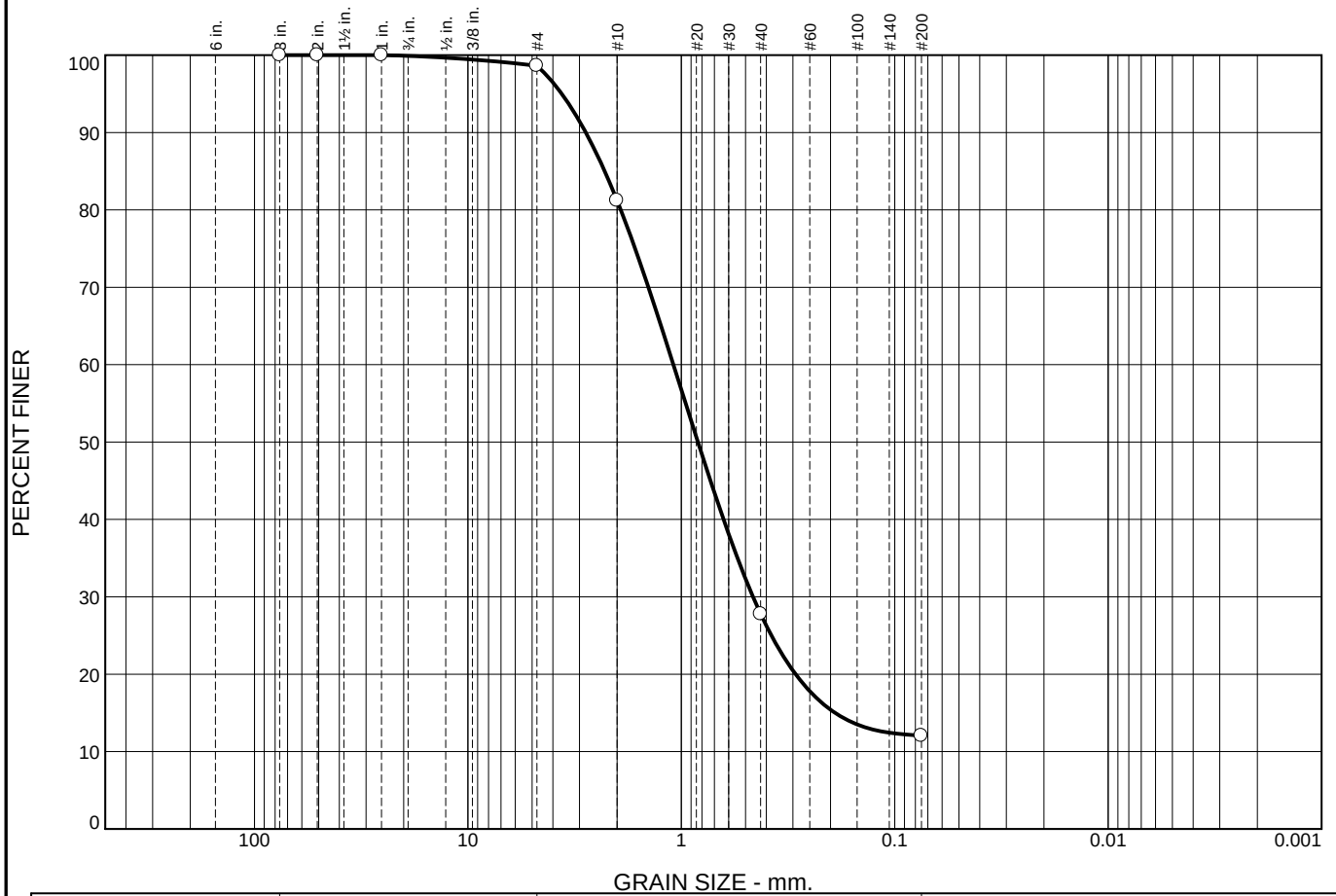
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.2	2.6	2.8	17.3	45.9	19.2	82.4			14.8

D ₅	D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₄₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
		0.0781	0.1679	0.3510	0.5397	0.7602	1.0428	2.0109	2.4410	3.0508	4.0320

Fineness Modulus
2.67

Alpha Analytical

Particle Size Distribution Report



% +3"		% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
☐	0.0	0.1	1.3	17.4	53.4	15.7	12.1	
☒	LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀
☐			2.2854	1.0888	0.8359	0.4616	0.1904	
Material Description							USCS	AASHTO
☐								
Project No. Client: Project:							Remarks:	
☐ Source of Sample: WORM-4 Sample Number: WG1602845-2								
Alpha Analytical								
Mansfield, MA							Figure	

GRAIN SIZE DISTRIBUTION TEST DATA

2/14/2022

Location: WORM-4

Sample Number: WG1602845-2

Sieve Test Data

Post #200 Wash Test Weights (grams): Dry Sample and Tare = 6.55

Tare Wt. = 0.00

Minus #200 from wash = 0.0%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
6.55	0.00	3"	0.00	0.00	100.0
		2"	0.00	0.00	100.0
		1"	0.00	0.00	100.0
		#4	0.09	0.00	98.6
		#10	1.14	0.00	81.2
		#40	3.50	0.00	27.8
		#200	1.03	0.00	12.1

Fractional Components

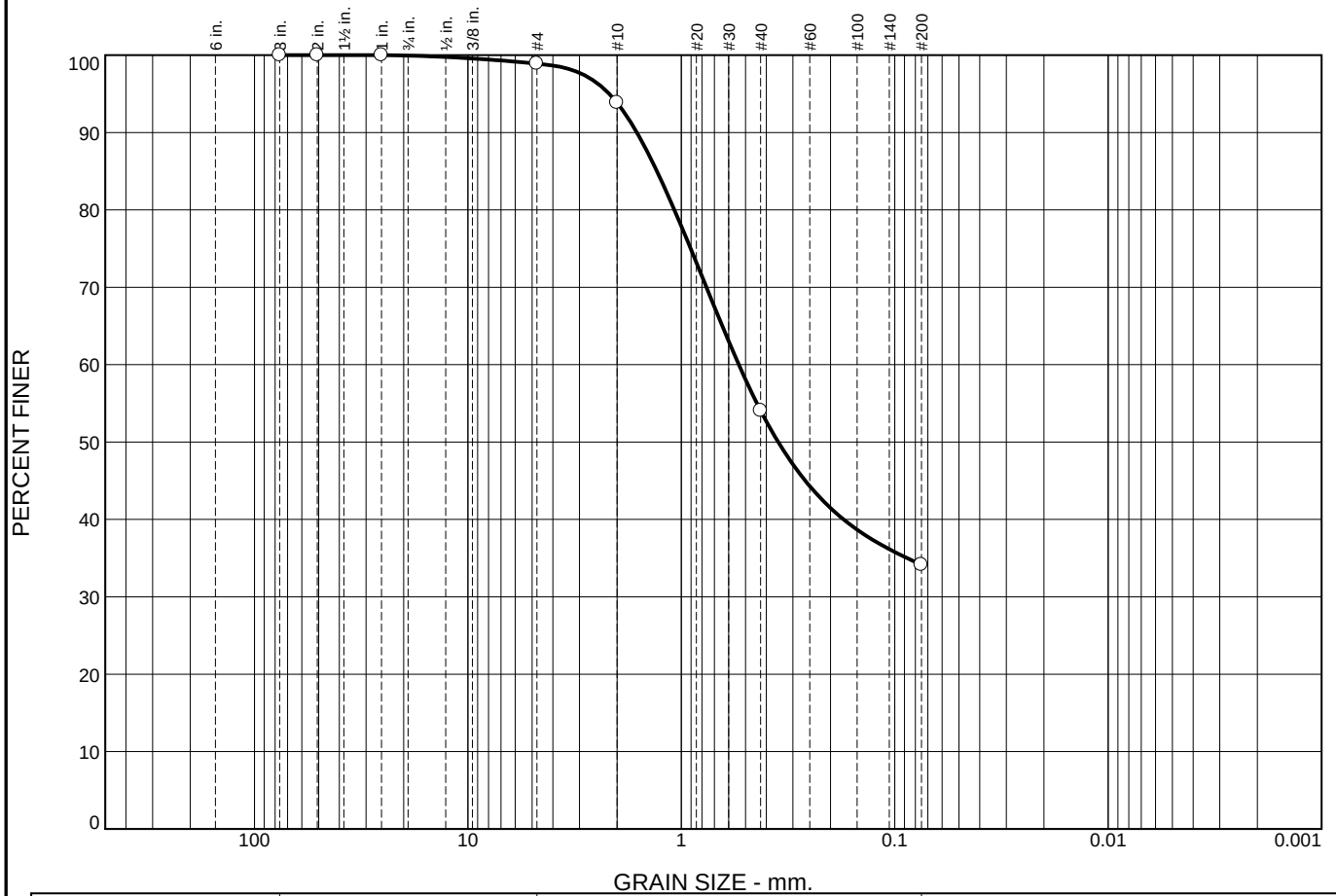
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.1	1.3	1.4	17.4	53.4	15.7	86.5			12.1

D ₅	D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₄₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
		0.1904	0.2916	0.4616	0.6340	0.8359	1.0888	1.9211	2.2854	2.8037	3.6342

Fineness Modulus
2.81

Alpha Analytical

Particle Size Distribution Report



% +3"		% Gravel		% Sand			% Fines		
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay	
☐	0.0	0.1	1.0	5.1	39.8	19.9	34.1		
☐									
☒	LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	
☐			1.3007	0.5377	0.3517				
☐									
☐									
Material Description							USCS	AASHTO	
☐									
Project No. Client: Project:							Remarks:		
☐ Source of Sample: WORM-5 Sample Number: L2170562-13									
Alpha Analytical Mansfield, MA									
							Figure		

GRAIN SIZE DISTRIBUTION TEST DATA

2/14/2022

Location: WORM-5

Sample Number: L2170562-13

Sieve Test Data

Post #200 Wash Test Weights (grams): Dry Sample and Tare = 76.99

Tare Wt. = 0.00

Minus #200 from wash = 0.0%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
76.99	0.00	3"	0.00	0.00	100.0
		2"	0.00	0.00	100.0
		1"	0.00	0.00	100.0
		#4	0.85	0.00	98.9
		#10	3.89	0.00	93.8
		#40	30.64	0.00	54.0
		#200	15.33	0.00	34.1

Fractional Components

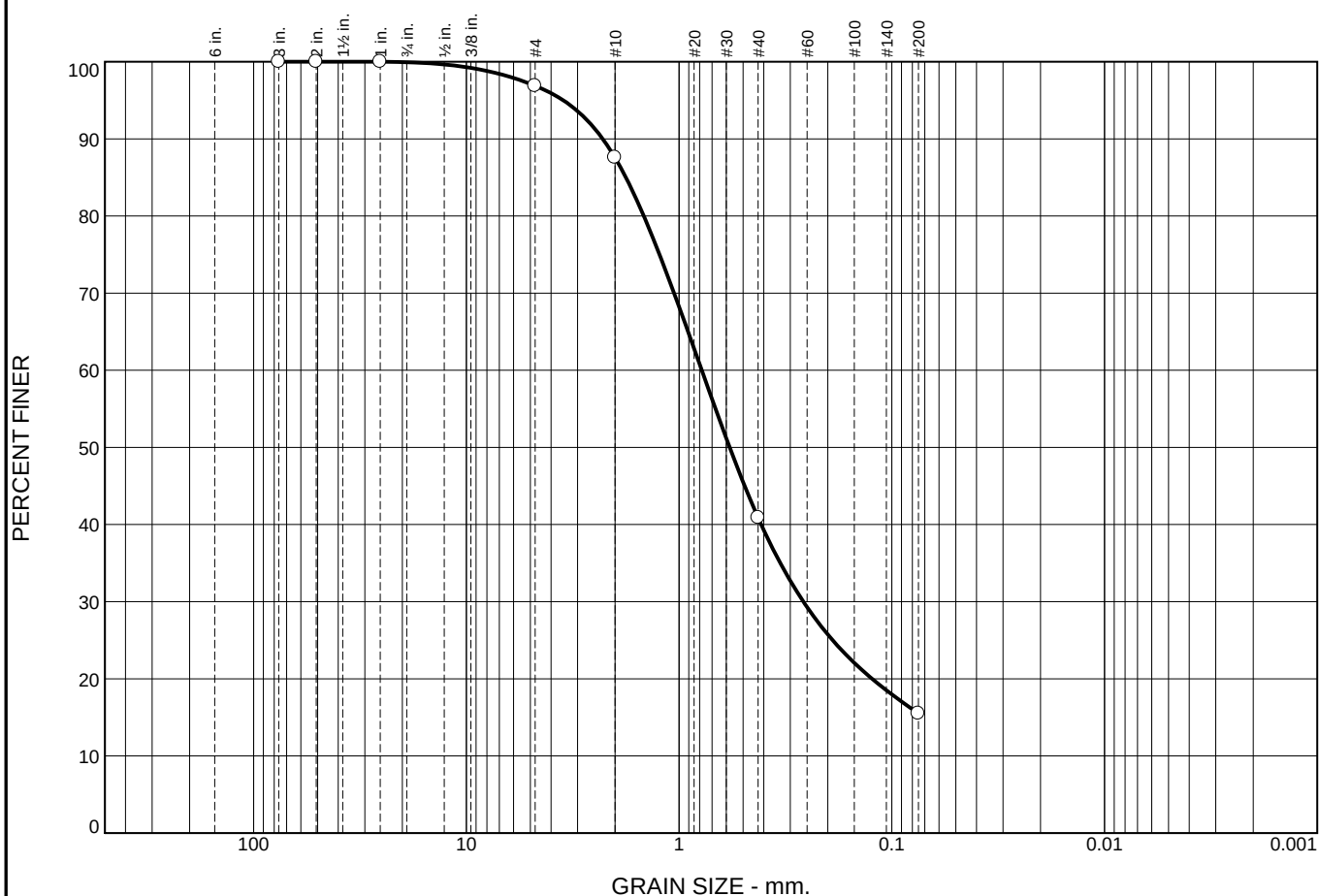
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.1	1.0	1.1	5.1	39.8	19.9	64.8			34.1

D ₅	D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₄₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
					0.1737	0.3517	0.5377	1.0777	1.3007	1.6148	2.1773

Fineness Modulus
1.74

Alpha Analytical

Particle Size Distribution Report



% +3"		% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
☐	0.0	0.1	3.0	9.3	46.7	25.4	15.5	
☒	LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀
☐			1.7780	0.7824	0.5782	0.2605		
Material Description							USCS	AASHTO
☐								
Project No.		Client:		Remarks:				
Project:								
☐ Source of Sample: WORM-6		Sample Number: L2170562-14						
Alpha Analytical		Mansfield, MA						

Figure

GRAIN SIZE DISTRIBUTION TEST DATA

2/14/2022

Location: WORM-6

Sample Number: L2170562-14

Sieve Test Data

Post #200 Wash Test Weights (grams): Dry Sample and Tare = 19.55

Tare Wt. = 0.00

Minus #200 from wash = 0.0%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
19.55	0.00	3"	0.00	0.00	100.0
		2"	0.00	0.00	100.0
		1"	0.00	0.00	100.0
		#4	0.61	0.00	96.9
		#10	1.82	0.00	87.6
		#40	9.13	0.00	40.9
		#200	4.96	0.00	15.5

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.1	3.0	3.1	9.3	46.7	25.4	81.4			15.5

D ₅	D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₄₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
			0.1237	0.2605	0.4113	0.5782	0.7824	1.4646	1.7780	2.2848	3.5027

Fineness Modulus
2.34

Alpha Analytical

Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility

EPA 624/624.1: m/p-xylene, o-xylene, Naphthalene

EPA 625/625.1: alpha-Terpineol

EPA 8260C/8260D: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.

EPA 8270D/8270E: NPW: Dimethylnaphthalene, 1,4-Diphenylhydrazine, alpha-Terpineol; SCM: Dimethylnaphthalene, 1,4-Diphenylhydrazine.

SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO₂, NO₃.

Mansfield Facility

SM 2540D: TSS

EPA 8082A: NPW: PCB: 1, 5, 31, 87, 101, 110, 141, 151, 153, 180, 183, 187.

EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene,

3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.

Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water

EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2:** Nitrate-N, Nitrite-N; **SM4500NO3-F:** Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE,**

EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B

EPA 332: Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.

Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT, SM9222D.**

Non-Potable Water

SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1:**

Ammonia-N, **LACHAT 10-107-06-1-B:** Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2:** Nitrate-N, **SM4500P-E, SM4500P-B, E, SM4500SO4-E,**

SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300: Chloride, Sulfate, Nitrate.

EPA 624.1: Volatile Halocarbons & Aromatics,

EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs

EPA 625.1: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045:** PCB-Oil.

Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603, SM9222D.**

Mansfield Facility:

Drinking Water

EPA 200.7: Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1 Hg.**

EPA 522, EPA 537.1.

Non-Potable Water

EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.

EPA 200.8: Al, Sb, As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.

EPA 245.1 Hg.

SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.



8 Walkup Drive
Westboro, MA 01581
Tel: 508-898-9220

320 Forbes Blvd
Mansfield, MA 02048
Tel: 508-822-9300

CHAIN OF CUSTODY

PAGE 1 OF 2

Date Rec'd in Lab: 12/22/21

ALPHA Job #: 12170562

Project Information

Project Name: Belmont Landfill

Project Location: Belmont, MA

Project #: 18-0157

Project Manager: Ted Wickwire

ALPHA Quote #: 16929-R2

Turn-Around Time

☒ Standard ☐ RUSH (only confirmed if pre-approved)

Date Due:

Report Information - Data Deliverables

☒ ADEx ☒ EMAIL

Billing Information

☒ Same as Client info PO #:

Regulatory Requirements & Project Information Requirements

☐ Yes ☐ No MA MCP Analytical Methods ☐ Yes ☐ No CT RCP Analytical Methods
☐ Yes ☐ No Matrix Spike Required on this SDG? (Required for MCP Inorganics)
☐ Yes ☐ No GW1 Standards (Info Required for Metals & EPH with Targets)
☐ Yes ☐ No NPDES RGP
☐ Other State /Fed Program _____ Criteria _____

Client Information

Client: Woods Hole Group

Address: 107 Waterhouse Rd
Bourne, MA 02532

Phone: 508-495-6224

Email: klavallee@whgrp.com

Additional Project Information:

Tissue samples will be sent at later date from Aquatex, Inc.

see quote for metals list.

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection		Sample Matrix	Sampler Initials	VOC:	SVOC:	METAL	METAL	EPH: ☐	VPH: ☐	☐ PCB	TPH: ☐	G-rail	TOC	Dioxin	Free	Meta	Sample Comments	T-T-S
		Date	Time																	
70562-01	TOX-1	12/21/21	13:38	SED	KDL		1							1	1	1	1	1		4
02	TOX-2	12/21/21	12:35	SED	KDL		1							1	1	1	1	1		4
03	TOX-3	12/21/21	11:25	SED	KDL		1							1	1	1	1	1		4
04	TOX-3- DUP	12/21/21	11:57	SED	KDL		1							1	1	1	1	1		4
05	TOX-4	12/21/21	09:05	SED	KDL		1							1	1	1	1	1		4
↓	TOX-4- MS-MSD	12/21/21	09:05	SED	KDL		1							1	1	1	1	1		4
06	TOX-5	12/21/21	14:22	SED	KDL		1							1	1	1	1	1		4
07	TOX-6	12/21/21	15:54	SED	KDL		1							1	1	1	1	1		4
08	WORM-1	12/21/21	13:26	SOIL	KDL		1							1	1	1	1	1		4
09	WORM-2	12/21/21	12:36	SOIL	KDL		1							1	1	1	1	1		4
Container Type		Preservative		Container Type		A								P	A	A	A	A		
P= Plastic A= Amber glass V= Vial		A= None B= HCl C= HNO3		Preservative		A								A	A	A	A	A		

Relinquished By:	Date/Time	Received By:	Date/Time	All samples submitted are subject to Alpha's Terms and Conditions. See reverse side. FORM NO: 01-01 (rev. 12-Mar-2012)
<u>Rob Wickwire</u>	<u>12/22/21 12:45</u>	<u>Rob Wickwire</u>	<u>12/22/21 12:45</u>	



8 Walkup Drive
Westboro, MA 01581
Tel: 508-898-9220

320 Forbes Blvd
Mansfield, MA 02048
Tel: 508-822-9300

CHAIN OF CUSTODY

PAGE 2 OF 2

Project Information

Project Name: Belmont Landfill

Project Location: Belmont, MA

Project #: 18-0157

Project Manager: Ted Wickwire

ALPHA Quote #: 16929-R2

Turn-Around Time

☒ Standard ☐ RUSH (only confirmed if pre-approved)

Date Due:

Date Rec'd in Lab: 12/22/21

ALPHA Job #: L2170562

Report Information - Data Deliverables

☒ ADEx ☒ EMAIL

Billing Information

☒ Same as Client info PO #:

Regulatory Requirements & Project Information Requirements

☐ Yes ☐ No MA MCP Analytical Methods ☐ Yes ☐ No CT RCP Analytical Methods
☐ Yes ☐ No Matrix Spike Required on this SDG? (Required for MCP Inorganics)
☐ Yes ☐ No GW1 Standards (Info Required for Metals & EPH with Targets)
☐ Yes ☐ No NPDES RGP
☐ Other State /Fed Program Criteria

Client Information

Client: Woods Hole Group

Address: 107 Waterhouse Rd
Bourne, MA 02532

Phone: 508-495-6224

Email: klavallee@whgrp.com

Additional Project Information:

See quote for metals list.

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection		Sample Matrix	Sampler Initials	VOC:	SVOC:	METAL	METAL	EPH: ☐	VPH: ☐	☐ PCB	TPH: ☐	Grav: ☐	TOC	Dioxin	Frag	Metal		Sample Comments	S
		Date	Time																		
70562-10	WORM-3	12/21/21	11 01	SOIL	KDL		1							1	1	1	1	1			4
-11	WORM-3-DUP	12/21/21	11 36	SOIL	KDL		1							1	1	1	1	1			4
-12	WORM-4	12/21/21	09 22	SOIL	KDL		1							1	1	1	1	1			4
↓	WORM-4-MS-MSD	12/21/21	09 30	SOIL	KDL		1							1	1	1	1	1			4
-13	WORM-5	12/21/21	09 57	SOIL	KDL		1							1	1	1	1	1			4
-14	WORM-6	12/21/21	15 10	SOIL	KDL		1							1	1	1	1	1			4

Container Type

P= Plastic
A= Amber glass
V= Vial
G= Glass
B= Bacteria cup
C= Cube
O= Other
E= Encore
D= BOD Bottle

Preservative

A= None
B= HCl
C= HNO₃
D= H₂SO₄
E= NaOH
F= MeOH
G= NaHSO₄
H= Na₂S₂O₃
I= Ascorbic Acid
J= NH₄Cl
K= Zn Acetate
O= Other

Container Type

A

P

A

A

A

A

A

Preservative

A

A

A

A

A

A

A

Relinquished By:

Date/Time

Karl Luecke

Rob Maerbo

12/22/21 12:48
12/22/21 17:40

Received By:

Date/Time

Rob Maerbo

AKL

12/21/21 12:48
12/22/21 17:40

All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

FORM NO: 01-01 (rev. 12-Mar-2012)



ANALYTICAL REPORT

Lab Number:	L2231953
Client:	Woods Hole Group 107 Waterhouse Road Bourne, MA 02532
ATTN:	Ted Wickwire
Phone:	(508) 495-6242
Project Name:	BELMONT LANDFILL-TISSUE
Project Number:	2018-0157
Report Date:	07/19/22

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA030), NH NELAP (2062), CT (PH-0141), DoD (L2474), FL (E87814), IL (200081), LA (85084), ME (MA00030), MD (350), NJ (MA015), NY (11627), NC (685), OH (CL106), PA (68-02089), RI (LAO00299), TX (T104704419), VT (VT-0015), VA (460194), WA (C954), US Army Corps of Engineers, USDA (Permit #P330-17-00150), USFWS (Permit #206964).

320 Forbes Boulevard, Mansfield, MA 02048-1806
508-822-9300 (Fax) 508-822-3288 800-624-9220 - www.alphalab.com



Project Name: BELMONT LANDFILL-TISSUE
Project Number: 2018-0157

Lab Number: L2231953
Report Date: 07/19/22

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2231953-01	WORM-1	TISSUE	BELMONT, MA	06/13/22 10:20	06/16/22
L2231953-02	WORM-2	TISSUE	BELMONT, MA	06/13/22 11:00	06/16/22
L2231953-03	WORM-5	TISSUE	BELMONT, MA	06/13/22 08:30	06/16/22

Project Name: BELMONT LANDFILL-TISSUE
Project Number: 2018-0157

Lab Number: L2231953
Report Date: 07/19/22

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

HOLD POLICY - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

Project Name: BELMONT LANDFILL-TISSUE
Project Number: 2018-0157

Lab Number: L2231953
Report Date: 07/19/22

Case Narrative (continued)

Report Submission

All non-detect (ND) or estimated concentrations (J-qualified) have been quantitated to the limit noted in the MDL column.

Total Metals

The WG1662907-3 batched QC SRM recoveries are outside the acceptance criteria for lead (110%), selenium (74%) and zinc (88%); however, the associated LCS recoveries are within overall method allowances. No further action was required.

Total Mercury

The WG1662908-3 batched QC SRM recovery is outside the acceptance criteria for mercury (57%); however, the associated LCS recovery is within overall method allowances. No further action was required.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:  Elizabeth Porta

Title: Technical Director/Representative

Date: 07/19/22

METALS

Project Name: BELMONT LANDFILL-TISSUE**Lab Number:** L2231953**Project Number:** 2018-0157**Report Date:** 07/19/22**SAMPLE RESULTS**

Lab ID: L2231953-01

Date Collected: 06/13/22 10:20

Client ID: WORM-1

Date Received: 06/16/22

Sample Location: BELMONT, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Tissue

Percent Solids: Results are reported on an 'AS RECEIVED' basis.

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/kg	0.485	0.030	2	07/18/22 13:41	07/18/22 23:38	EPA 3051A	1,6020B	WP
Arsenic, Total	0.636		mg/kg	0.121	0.042	2	07/18/22 13:41	07/18/22 23:38	EPA 3051A	1,6020B	WP
Barium, Total	3.02		mg/kg	0.121	0.038	2	07/18/22 13:41	07/18/22 23:38	EPA 3051A	1,6020B	WP
Beryllium, Total	ND		mg/kg	0.073	0.010	2	07/18/22 13:41	07/18/22 23:38	EPA 3051A	1,6020B	WP
Cadmium, Total	2.50		mg/kg	0.049	0.013	2	07/18/22 13:41	07/18/22 23:38	EPA 3051A	1,6020B	WP
Chromium, Total	0.874		mg/kg	0.485	0.044	2	07/18/22 13:41	07/18/22 23:38	EPA 3051A	1,6020B	WP
Copper, Total	3.05		mg/kg	0.121	0.041	2	07/18/22 13:41	07/18/22 23:38	EPA 3051A	1,6020B	WP
Lead, Total	16.2		mg/kg	0.049	0.007	2	07/18/22 13:41	07/18/22 23:38	EPA 3051A	1,6020B	WP
Mercury, Total	0.115		mg/kg	0.015	0.004	5	07/18/22 13:41	07/19/22 11:52	EPA 7474	1,7474	ML
Nickel, Total	0.527		mg/kg	0.121	0.045	2	07/18/22 13:41	07/18/22 23:38	EPA 3051A	1,6020B	WP
Selenium, Total	1.45		mg/kg	0.242	0.133	2	07/18/22 13:41	07/18/22 23:38	EPA 3051A	1,6020B	WP
Silver, Total	0.057	J	mg/kg	0.121	0.011	2	07/18/22 13:41	07/18/22 23:38	EPA 3051A	1,6020B	WP
Zinc, Total	193		mg/kg	1.21	0.181	2	07/18/22 13:41	07/18/22 23:38	EPA 3051A	1,6020B	WP



Project Name: BELMONT LANDFILL-TISSUE**Lab Number:** L2231953**Project Number:** 2018-0157**Report Date:** 07/19/22**SAMPLE RESULTS**

Lab ID: L2231953-02

Date Collected: 06/13/22 11:00

Client ID: WORM-2

Date Received: 06/16/22

Sample Location: BELMONT, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Tissue

Percent Solids: Results are reported on an 'AS RECEIVED' basis.

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/kg	0.489	0.030	2	07/18/22 13:41	07/18/22 23:53	EPA 3051A	1,6020B	WP
Arsenic, Total	0.751		mg/kg	0.122	0.042	2	07/18/22 13:41	07/18/22 23:53	EPA 3051A	1,6020B	WP
Barium, Total	6.26		mg/kg	0.122	0.039	2	07/18/22 13:41	07/18/22 23:53	EPA 3051A	1,6020B	WP
Beryllium, Total	ND		mg/kg	0.073	0.010	2	07/18/22 13:41	07/18/22 23:53	EPA 3051A	1,6020B	WP
Cadmium, Total	0.597		mg/kg	0.049	0.013	2	07/18/22 13:41	07/18/22 23:53	EPA 3051A	1,6020B	WP
Chromium, Total	0.448	J	mg/kg	0.489	0.044	2	07/18/22 13:41	07/18/22 23:53	EPA 3051A	1,6020B	WP
Copper, Total	2.97		mg/kg	0.122	0.041	2	07/18/22 13:41	07/18/22 23:53	EPA 3051A	1,6020B	WP
Lead, Total	10.2		mg/kg	0.049	0.007	2	07/18/22 13:41	07/18/22 23:53	EPA 3051A	1,6020B	WP
Mercury, Total	0.027		mg/kg	0.015	0.004	5	07/18/22 13:41	07/19/22 11:54	EPA 7474	1,7474	ML
Nickel, Total	0.372		mg/kg	0.122	0.046	2	07/18/22 13:41	07/18/22 23:53	EPA 3051A	1,6020B	WP
Selenium, Total	0.525		mg/kg	0.244	0.134	2	07/18/22 13:41	07/18/22 23:53	EPA 3051A	1,6020B	WP
Silver, Total	0.029	J	mg/kg	0.122	0.011	2	07/18/22 13:41	07/18/22 23:53	EPA 3051A	1,6020B	WP
Zinc, Total	71.8		mg/kg	1.22	0.182	2	07/18/22 13:41	07/18/22 23:53	EPA 3051A	1,6020B	WP



Project Name: BELMONT LANDFILL-TISSUE**Lab Number:** L2231953**Project Number:** 2018-0157**Report Date:** 07/19/22**SAMPLE RESULTS**

Lab ID: L2231953-03

Date Collected: 06/13/22 08:30

Client ID: WORM-5

Date Received: 06/16/22

Sample Location: BELMONT, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Tissue

Percent Solids: Results are reported on an 'AS RECEIVED' basis.

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/kg	0.453	0.028	2	07/18/22 13:41	07/18/22 23:58	EPA 3051A	1,6020B	WP
Arsenic, Total	0.969		mg/kg	0.113	0.039	2	07/18/22 13:41	07/18/22 23:58	EPA 3051A	1,6020B	WP
Barium, Total	48.0		mg/kg	0.113	0.036	2	07/18/22 13:41	07/18/22 23:58	EPA 3051A	1,6020B	WP
Beryllium, Total	0.022	J	mg/kg	0.068	0.009	2	07/18/22 13:41	07/18/22 23:58	EPA 3051A	1,6020B	WP
Cadmium, Total	2.51		mg/kg	0.045	0.012	2	07/18/22 13:41	07/18/22 23:58	EPA 3051A	1,6020B	WP
Chromium, Total	3.46		mg/kg	0.453	0.041	2	07/18/22 13:41	07/18/22 23:58	EPA 3051A	1,6020B	WP
Copper, Total	12.0		mg/kg	0.113	0.038	2	07/18/22 13:41	07/18/22 23:58	EPA 3051A	1,6020B	WP
Lead, Total	35.9		mg/kg	0.045	0.007	2	07/18/22 13:41	07/18/22 23:58	EPA 3051A	1,6020B	WP
Mercury, Total	0.043		mg/kg	0.014	0.004	5	07/18/22 13:41	07/19/22 11:57	EPA 7474	1,7474	ML
Nickel, Total	1.93		mg/kg	0.113	0.042	2	07/18/22 13:41	07/18/22 23:58	EPA 3051A	1,6020B	WP
Selenium, Total	0.358		mg/kg	0.226	0.124	2	07/18/22 13:41	07/18/22 23:58	EPA 3051A	1,6020B	WP
Silver, Total	0.108	J	mg/kg	0.113	0.010	2	07/18/22 13:41	07/18/22 23:58	EPA 3051A	1,6020B	WP
Zinc, Total	89.1		mg/kg	1.13	0.169	2	07/18/22 13:41	07/18/22 23:58	EPA 3051A	1,6020B	WP



Project Name: BELMONT LANDFILL-TISSUE

Lab Number: L2231953

Project Number: 2018-0157

Report Date: 07/19/22

Method Blank Analysis Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01-03 Batch: WG1662907-1										
Antimony, Total	ND		mg/kg	0.200	0.012	1	07/18/22 13:41	07/18/22 21:57	1,6020B	WP
Arsenic, Total	ND		mg/kg	0.050	0.017	1	07/18/22 13:41	07/18/22 21:57	1,6020B	WP
Barium, Total	ND		mg/kg	0.050	0.016	1	07/18/22 13:41	07/18/22 21:57	1,6020B	WP
Beryllium, Total	ND		mg/kg	0.030	0.004	1	07/18/22 13:41	07/18/22 21:57	1,6020B	WP
Cadmium, Total	ND		mg/kg	0.020	0.005	1	07/18/22 13:41	07/18/22 21:57	1,6020B	WP
Chromium, Total	0.031	J	mg/kg	0.200	0.018	1	07/18/22 13:41	07/18/22 21:57	1,6020B	WP
Copper, Total	ND		mg/kg	0.050	0.017	1	07/18/22 13:41	07/18/22 21:57	1,6020B	WP
Lead, Total	ND		mg/kg	0.020	0.003	1	07/18/22 13:41	07/18/22 21:57	1,6020B	WP
Nickel, Total	0.032	J	mg/kg	0.050	0.019	1	07/18/22 13:41	07/18/22 21:57	1,6020B	WP
Selenium, Total	ND		mg/kg	0.100	0.055	1	07/18/22 13:41	07/18/22 21:57	1,6020B	WP
Silver, Total	ND		mg/kg	0.050	0.005	1	07/18/22 13:41	07/18/22 21:57	1,6020B	WP
Zinc, Total	ND		mg/kg	0.500	0.075	1	07/18/22 13:41	07/18/22 21:57	1,6020B	WP

Prep Information

Digestion Method: EPA 3051A

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01-03 Batch: WG1662908-1										
Mercury, Total	ND		mg/kg	0.013	0.004	5	07/18/22 13:41	07/19/22 10:47	1,7474	ML

Prep Information

Digestion Method: EPA 7474



Lab Control Sample Analysis Batch Quality Control

Project Name: BELMONT LANDFILL-TISSUE

Project Number: 2018-0157

Lab Number: L2231953

Report Date: 07/19/22

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-03 Batch: WG1662907-2								
Antimony, Total	96		-		75-125	-		20
Arsenic, Total	93		-		75-125	-		20
Barium, Total	98		-		75-125	-		20
Beryllium, Total	97		-		75-125	-		20
Cadmium, Total	102		-		75-125	-		20
Chromium, Total	94		-		75-125	-		20
Copper, Total	93		-		75-125	-		20
Lead, Total	97		-		75-125	-		20
Nickel, Total	93		-		75-125	-		20
Selenium, Total	83		-		75-125	-		20
Silver, Total	100		-		75-125	-		20
Zinc, Total	90		-		75-125	-		20
Total Metals - Mansfield Lab Associated sample(s): 01-03 Batch: WG1662908-2 SRM Lot Number: HPHGAF								
Mercury, Total	88		-		80-120	-		20

Matrix Spike Analysis

Batch Quality Control

Project Name: BELMONT LANDFILL-TISSUE
Project Number: 2018-0157

Lab Number: L2231953
Report Date: 07/19/22

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-03 QC Batch ID: WG1662907-4 WG1662907-5 QC Sample: L2228542-21 Client ID: MS Sample												
Antimony, Total	ND	59.6	52.8	88		45.9	91		75-125	14		20
Arsenic, Total	2.53	14.3	15.2	88		13.2	88		75-125	14		20
Barium, Total	0.071J	238	220	92		182	91		75-125	19		20
Beryllium, Total	ND	5.96	5.48	92		4.46	89		75-125	21	Q	20
Cadmium, Total	0.097	6.32	6.11	95		5.06	93		75-125	19		20
Chromium, Total	0.262J	23.8	21.7	91		17.4	87		75-125	22	Q	20
Copper, Total	1.18	29.8	27.5	88		23.1	87		75-125	17		20
Lead, Total	0.165	63.2	57.3	90		49.4	92		75-125	15		20
Nickel, Total	0.381	59.6	56.0	93		44.3	87		75-125	23	Q	20
Selenium, Total	0.264	14.3	12.7	87		10.5	85		75-125	19		20
Silver, Total	0.020J	5.96	5.67	95		4.85	97		75-125	16		20
Zinc, Total	15.0	59.6	70.0	92		52.6	75		75-125	28	Q	20
Total Metals - Mansfield Lab Associated sample(s): 01-03 QC Batch ID: WG1662908-4 WG1662908-5 QC Sample: L2228542-21 Client ID: MS Sample												
Mercury, Total	ND	0.617	0.434	70	Q	0.423	67	Q	80-120	3		20

Lab Duplicate Analysis *Batch Quality Control*

Project Name: BELMONT LANDFILL-TISSUE

Project Number: 2018-0157

Lab Number: L2231953

Report Date: 07/19/22

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-03 QC Batch ID: WG1662907-6 QC Sample: L2228542-22 Client ID: DUP Sample						
Arsenic, Total	2.36	2.36	mg/kg	0		20
Cadmium, Total	0.073	0.072	mg/kg	2		20
Chromium, Total	0.129J	0.125J	mg/kg	NC		20
Copper, Total	1.02	0.971	mg/kg	5		20
Lead, Total	0.132	0.135	mg/kg	2		20
Nickel, Total	0.292	0.225	mg/kg	26	Q	20
Zinc, Total	16.1	16.6	mg/kg	3		20
Total Metals - Mansfield Lab Associated sample(s): 01-03 QC Batch ID: WG1662908-6 QC Sample: L2228542-22 Client ID: DUP Sample						
Mercury, Total	ND	ND	mg/kg	NC		20

Project Name: BELMONT LANDFILL-TISSUE
Project Number: 2018-0157

Lab Number: L2231953
Report Date: 07/19/22

S.R.M. Standard Quality Control

Standard Reference Material (SRM): WG1662907-3

Parameter	% Recovery	Qual	QC Criteria
Arsenic, Total	104		94-106
Cadmium, Total	97		96-104
Chromium, Total	95		88-112
Copper, Total	97		96-104
Lead, Total	110	Q	92-108
Nickel, Total	104		95-105
Selenium, Total	74	Q	91-109
Zinc, Total	88	Q	96-104

Project Name: BELMONT LANDFILL-TISSUE**Lab Number:** L2231953**Project Number:** 2018-0157**Report Date:** 07/19/22**S.R.M. Standard Quality Control**

Standard Reference Material (SRM): WG1662908-3

Parameter	% Recovery	Qual	QC Criteria
Mercury, Total	57	Q	92-108

INORGANICS & MISCELLANEOUS

Project Name: BELMONT LANDFILL-TISSUE**Lab Number:** L2231953**Project Number:** 2018-0157**Report Date:** 07/19/22**SAMPLE RESULTS****Lab ID:** L2231953-01**Date Collected:** 06/13/22 10:20**Client ID:** WORM-1**Date Received:** 06/16/22**Sample Location:** BELMONT, MA**Field Prep:** Not Specified**Sample Depth:****Matrix:** Tissue

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Moisture	82.8		%	0.100	0.100	1	-	07/15/22 17:17	121,2540G	JM
Percent Lipids	3.79		%	0.100	NA	1	-	07/18/22 00:00	111,-	CP



Project Name: BELMONT LANDFILL-TISSUE**Lab Number:** L2231953**Project Number:** 2018-0157**Report Date:** 07/19/22**Method Blank Analysis**
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab for sample(s): 01 Batch: WG1663361-1										
Percent Lipids	ND		%	0.100	NA	1	-	07/18/22 00:00	111,-	CP

Lab Duplicate Analysis *Batch Quality Control*

Project Name: BELMONT LANDFILL-TISSUE

Project Number: 2018-0157

Lab Number: L2231953

Report Date: 07/19/22

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1663361-2 QC Sample: L2231953-01 Client ID: WORM-1						
Percent Lipids	3.79	3.92	%	3		20
General Chemistry - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1663502-1 QC Sample: L2231953-01 Client ID: WORM-1						
Moisture	82.8	82.7	%	0		10

Project Name: BELMONT LANDFILL-TISSUE
Project Number: 2018-0157

Serial_No:07192217:38
Lab Number: L2231953
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Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information

Cooler **Custody Seal**
A Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2231953-01A	Glass 500ml/16oz unpreserved	A	NA		6.0	Y	Absent		A2-PB-6020T(180),A2-MOISTURE-2540(7),A2-SB-6020T(180),A2-ZN-6020T(180),A2-NI-6020T(180),A2-BA-6020T(180),A2-LIPIDS(7),A2-CR-6020T(180),A2-AS-6020T(180),A2-CD-6020T(180),A2-BE-6020T(180),A2-HG-7474T(365),A2-SE-6020T(180),A2-AG-6020T(180),A2-CU-6020T(180)
L2231953-02A	Glass 500ml/16oz unpreserved	A	NA		6.0	Y	Absent		A2-PB-6020T(180),A2-SB-6020T(180),A2-BA-6020T(180),A2-ZN-6020T(180),A2-NI-6020T(180),A2-CR-6020T(180),A2-AS-6020T(180),A2-BE-6020T(180),A2-CD-6020T(180),A2-HG-7474T(365),A2-SE-6020T(180),A2-CU-6020T(180),A2-AG-6020T(180)
L2231953-03A	Glass 500ml/16oz unpreserved	A	NA		6.0	Y	Absent		A2-PB-6020T(180),A2-ZN-6020T(180),A2-BA-6020T(180),A2-NI-6020T(180),A2-SB-6020T(180),A2-CR-6020T(180),A2-AS-6020T(180),A2-CD-6020T(180),A2-HG-7474T(365),A2-BE-6020T(180),A2-SE-6020T(180),A2-AG-6020T(180),A2-CU-6020T(180)

Project Name: BELMONT LANDFILL-TISSUE
Project Number: 2018-0157

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GLOSSARY

Acronyms

DL	- Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EMPC	- Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LOD	- Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
LOQ	- Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
	Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
NR	- No Results: Term is utilized when 'No Target Compounds Requested' is reported for the analysis of Volatile or Semivolatile Organic TIC only requests.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TEF	- Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.
TEQ	- Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Report Format: DU Report with 'J' Qualifiers



Project Name: BELMONT LANDFILL-TISSUE
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Footnotes

- 1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Chlordane: The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA, this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

Difference: With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Gasoline Range Organics (GRO): Gasoline Range Organics (GRO) results include all chromatographic peaks eluting from Methyl tert butyl ether through Naphthalene, with the exception of GRO analysis in support of State of Ohio programs, which includes all chromatographic peaks eluting from Hexane through Dodecane.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

PAH Total: With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. In addition, the 'PFAS, Total (6)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA, PFDA and PFOS. For MassDEP DW compliance analysis only, the 'PFAS, Total (6)' result is defined as the summation of results at or above the RL. Note: If a 'Total' result is requested, the results of its individual components will also be reported.

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

- A** - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.
- B** - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).
- C** - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
- D** - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
- E** - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- F** - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.
- G** - The concentration may be biased high due to matrix interferences (i.e. co-elution) with non-target compound(s). The result should be considered estimated.
- H** - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
- I** - The lower value for the two columns has been reported due to obvious interference.
- J** - Estimated value. The Target analyte concentration is below the quantitation limit (RL), but above the Method Detection Limit (MDL) or Estimated Detection Limit (EDL) for SPME-related analyses. This represents an estimated concentration for Tentatively

Report Format: DU Report with 'J' Qualifiers



Project Name: BELMONT LANDFILL-TISSUE
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Data Qualifiers

Identified Compounds (TICs).

- M** - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.
- ND** - Not detected at the method detection limit (MDL) for the sample, or estimated detection limit (EDL) for SPME-related analyses.
- NJ** - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.
- P** - The RPD between the results for the two columns exceeds the method-specified criteria.
- Q** - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)
- R** - Analytical results are from sample re-analysis.
- RE** - Analytical results are from sample re-extraction.
- S** - Analytical results are from modified screening analysis.
- V** - The surrogate associated with this target analyte has a recovery outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)
- Z** - The batch matrix spike and/or duplicate associated with this target analyte has a recovery/RPD outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

Report Format: DU Report with 'J' Qualifiers



Project Name: BELMONT LANDFILL-TISSUE
Project Number: 2018-0157

Lab Number: L2231953
Report Date: 07/19/22

REFERENCES

- 1 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - VI, 2018.
- 111 NOAA Technical Memorandum NOS ORCA 130: Sampling and Analytical Methods of the National Status and Trends Program Mussel Watch Project: 1993-196 Update. March 1998.
- 121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility

EPA 624/624.1: m/p-xylene, o-xylene, Naphthalene

EPA 625/625.1: alpha-Terpineol

EPA 8260C/8260D: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.

EPA 8270D/8270E: NPW: Dimethylnaphthalene, 1,4-Diphenylhydrazine, alpha-Terpineol; SCM: Dimethylnaphthalene, 1,4-Diphenylhydrazine.

SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO₂, NO₃.

Mansfield Facility

SM 2540D: TSS

EPA 8082A: NPW: PCB: 1, 5, 31, 87, 101, 110, 141, 151, 153, 180, 183, 187.

EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene,

3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.

Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water

EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2:** Nitrate-N, Nitrite-N; **SM4500NO3-F:** Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE,**

EPA 180.1, SM2130B, SM4500CI-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B

EPA 332: Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.

Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT, SM9222D.**

Non-Potable Water

SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1:**

Ammonia-N, **LACHAT 10-107-06-1-B:** Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2:** Nitrate-N, **SM4500P-E, SM4500P-B, E, SM4500SO4-E,**

SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300: Chloride, Sulfate, Nitrate.

EPA 624.1: Volatile Halocarbons & Aromatics,

EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs

EPA 625.1: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045:** PCB-Oil.

Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603, SM9222D.**

Mansfield Facility:

Drinking Water

EPA 200.7: Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1 Hg.**

EPA 522, EPA 537.1.

Non-Potable Water

EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.

EPA 200.8: Al, Sb, As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.

EPA 245.1 Hg.

SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.



CHAIN OF CUSTODY

PAGE 1 OF 1

8 Walkup Drive
Westboro, MA 01581
Tel: 508-898-9220

320 Forbes Blvd
Mansfield, MA 02048
Tel: 508-822-9300

Client Information

Client:	Woods Hole Group
Address:	107 Waterhouse Ave Bourne, MA 02530
Phone:	508-495-6224

Email: Klavallee@whgrp.com

Additional Project Information:

Tissue masses are small. If too small to analyze individually, please call. We may decide to composite.

Project Information

Project Name: Belmont Landfill-Tissue

Project Location: Belmont, MA

Project #: 2018-0157

Project Manager: Ted Wickwire

ALPHA Quote #: 16929

Turn-Around Time

☒ Standard ☐ RUSH (only confirmed if pre-approved!)

Date Due:

Date Rec'd in Lab:

Report Information - Data Deliverables

☒ ADEx ☒ EMAIL

ALPHA Job #: L2231953

Billing Information

☒ Same as Client info	PO #:

Regulatory Requirements & Project Information Requirements

☐ Yes ☐ No MA MCP Analytical Methods ☐ Yes ☐ No CT RCP Analytical Methods
☐ Yes ☐ No Matrix Spike Required on this SDG? (Required for MCP Inorganics)
☐ Yes ☐ No GW1 Standards (Info Required for Metals & EPH with Targets)
☐ Yes ☐ No NPDES RGP
☐ Other State /Fed Program Criteria

[illegible]**Container Type**

P= Plastic
A= Amber glass
V= Vial
G= Glass
B= Bacteria cup
C= Cube
O= Other
E= Encore
D= BOD Bottle

Preservative

A = None
B = HCl
C = HNO₃
D = H₂SO₄
E = NaOH
F = MeOH
G = NaHSO₄
H = Na₂S₂O₃
I = Ascorbic Acid
J = NH₄Cl
K = Zn Acetate
Q = Other

Container Type

Preservative

Belinquished By:

Date/Time

Received By:

Date/Time

All samples submitted are subject to Alpha's Terms and Conditions.
See reverse side.

FORM NO. 01-01 (rev. 12-Mar-2012)