Prepared for

The Boeing Company

Santa Susana Site 5800 Woolsey Canyon Road Canoga Park, California, 91304-1148

Santa Susana Field Laboratory

Site-Wide Stormwater Annual Report

2020/21 Reporting Year

Prepared by

The Surface Water Expert Panel

and



engineers | scientists | innovators

924 Anacapa Street, Suite 4A, Santa Barbara, CA, 93101

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Appendices

Appendix A: 2020/21 Reporting Year Sampling and Analysis Plan

Appendix B: 2020/21 BMP Program Laboratory Reports

Appendix C: Exceeding Constituent Source Analysis

Appendix D: 2020/21 BMP Performance Analysis

Abbreviations

CASQA	California Stormwater Quality Association
CM	Culvert Modification
COC	Constituent of Concern
DMR	Discharge Monitoring Report
DNQ	Detected not Quantified
DOE	Department of Energy
DTSC	Department of Toxic Substances Control
ELV	Expendable Launch Vehicle
GETS	Groundwater Extraction and Treatment System
ISRA	Interim Source Removal Action
LARWQCB	Los Angeles Regional Water Quality Control Board
LOE	Line of Evidence
LOX	Liquid Oxygen Plant
mg	milligram
μg/L	micrograms per liter
NASA	National Aeronautics and Space Administration
ND	Northern Drainage
NPDES	National Pollutant Discharge Elimination System
OF	Outfall
PL	Permit Effluent Limit
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Feasibility Investigation
RMHF	Radioactive Materials Handling Facility
RMMP	Restoration, Mitigation, and Monitoring Plan
SAP	Sampling and Analysis Plan
SSFL	Santa Susana Field Laboratory
SWPPP	Stormwater Pollution Prevention Plan
SWTS	Stormwater Conveyance and Treatment System
TCDD	Tetrachlorodibenzo-p-dioxin
TEQ	Toxic Equivalence
TSS	Total Suspended Solid

1 Introduction

The Santa Susana Field Laboratory (SSFL) occupies approximately 2,850 acres and is located at the top of Woolsey Canyon Road in the Simi Hills of Ventura County, California. During wet weather, the SSFL has the potential to discharge stormwater runoff impacted by constituents from the facility. As such, discharges from SSFL are currently regulated by the Los Angeles Regional Water Quality Control Board (LARWQCB) under *National Pollutant Discharge Elimination System (NPDES) Permit No. CA0001309 for the Boeing Company, SSFL, Canoga Park, CA, Order No. R4-2015-0033* ("2015 Permit") (LARWQCB, 2015). The 2015 Permit¹ became effective on April 1, 2015, and states the following:

"The Discharger has agreed to maintain the Surface Water Expert Panel. With input from the Surface Water Expert Panel, the Discharger shall submit annual reports that describe the previous year's monitoring results, evaluation of existing BMP performance, and submit a workplan that includes recommendations for modified and/or new storm water controls and monitoring that will address exceedances from any Outfall addressed by this Permit. The Discharger shall also support the Surface Water Expert Panel in organizing periodic public interaction events and encouraging public communication involvement. The first annual report shall be due within 6 months of the effective date of this Permit [October 1, 2015]."

The Site-Wide Stormwater Work Plan and 2014/15 Annual Report ("2015 Work Plan") (Santa Susana Surface Water Expert Panel and Geosyntec Consultants, 2015a) was intended to meet this requirement. This 2020/21 Annual Report is intended to meet the commitments outlined in the 2015 Work Plan. The existing Work Plan and Permit will govern until a new Permit is issued and effective. This report focuses on the results and findings of the 2020/21 reporting year, covering the June 1, 2020 to May 31, 2021 period.

1.1 Background

The SSFL (the "site") is jointly owned by the Boeing Company (Boeing) and the federal government. The National Aeronautics and Space Administration (NASA) administers the portion of the property owned by the federal government. As shown in Figure 1, the site is divided into four administrative areas (Areas I, II, III, and IV) with undeveloped land areas to both the north and south. Administrative Areas I and III are operated by Boeing, which owns the majority of Area I and all of Area III. A portion of Area I (40 acres) and all of Area II are owned by the federal government and are administered by NASA. Boeing and predecessor contractors performed work at the Department of Energy (DOE) ETEC (Energy Technology Engineering Center) site in Area IV at Santa Susana Field Laboratory prior to the 1998 Department of Energy remediation contract with Boeing. While the land in Area IV is owned by Boeing, the Department of Energy is responsible for the cleanup. Boeing no longer serves as the Department of Energy's contractor. DOE owns specific facilities located on approximately 90 acres of Area IV. Industrial operations at the SSFL have ceased; current activities at the site include environmental monitoring and sampling, demolition, and remediation planning. The site also provides exceptional wildlife habitat and undeveloped land (open space).

¹ Prior to April 1, 2015 this site was regulated since 2010 under the *National Pollutant Discharge Elimination System (NPDES) Permit No. CA0001309 for the Boeing Company, SSFL, Canoga Park, CA, Order No. R4-2010-0090* ("2010 Permit")

Stormwater discharges² from the SSFL are typically captured and treated upstream of, or at, the outfalls, up to a design storm size. An exception to this Outfall-based treatment approach is at Outfalls 001 and 002 in the southern undeveloped land, where stormwater runoff consists of runoff from undeveloped areas with no or minimal history of industrial activity or known surface soil contamination, as well as treated stormwater from Outfalls 011 and 018, respectively. Runoff to Outfalls 001 and 002, downstream of Outfalls 011 and 018, is discharged without additional treatment. Another exception to this is at Outfalls 008 and 009, where the stormwater quality management strategy instead combines distributed source controls with natural treatment systems due to the challenge of treating stormwater at these canyon outfalls (i.e., Outfall-based treatment would require construction of large dams with substantial environmental impact and potential risk to the public downstream). At Outfalls 008 and 009, Interim Source Removal Action (ISRA) and Best Management Practices (BMP) programs were implemented beginning in 2009 with oversight and participation of the LARWQCB to improve compliance with the 2010 Permit limits through the dual approach of remediation of surface soils that are above defined thresholds for NPDES constituents of concern, and through distributed control and/or treatment of stormwater runoff from prioritized subareas, respectively. The BMP Plan for the Outfall 008 and 009 Watersheds (MWH et al., 2010) ("2010 BMP Plan") was developed under the oversight of the Surface Water Expert Panel (referred to herein as the "SWEP" or "Expert Panel"). The 2015 Work Plan replaced the 2010 BMP Plan, provides an overall strategy for improving NPDES compliance for stormwater discharges site-wide and continues the important process of public outreach and engagement on stormwater issues.

The Surface Water Expert Panel -- consisting of Dr. Robert Pitt (University of Alabama), Dr. Robert Gearheart (Humboldt State University), Dr. Michael Stenstrom (University of California Los Angeles), Dr. Michael Josselyn (WRA Environmental Consultants), and Jonathan Jones (Wright Water Engineers) -- continues to oversee stormwater planning and design work at the SSFL, as well as provide input on monitoring, source removal activities and other NPDES Permit issues. The Surface Water Expert Panel also oversees scientific studies related to SSFL stormwater quality issues and BMP design, reviewed the stormwater Human Health Risk Assessment (HHRA), and interfaces with the public on SSFL stormwater activities and related considerations. Their original mission, to improve stormwater at NPDES Outfalls 008 and 009, was expanded through the 2015 Work Plan to include all NPDES Outfalls as required through the 2015 Permit. This year, as in recent previous years, the Surface Water Expert Panel also reviewed the Quarterly Discharge Monitoring Reports (DMRs) and federal government construction SWPPPs, providing comments and perspective on these plans.

1.2 Site Overview

The outfalls regulated under the 2015 NPDES Permit are listed in Table 1 and depicted in Figure 1. The NPDES Permit states that 60% of the annual stormwater discharge from SSFL exits the property via two southerly discharge points (Outfalls 001 and 002) to Bell Creek, a tributary to the Los Angeles River. Upstream Outfalls that contribute to the discharge at Outfalls 001 and 002 include Outfalls 011 and 018. Outfall 019 is Permitted for the injection of treated groundwater, but not planned for the discharge of surface water. Outfall 020, while included in the NPDES Permit, is also not planned for the discharge of surface water. The Surface Water Expert Panel's scope does not include groundwater, unless

² Treated groundwater discharges are also covered in the 2015 Permit, however, the 2015 Work Plan scope is limited to stormwater discharges.

groundwater is known to comingle with stormwater and potentially contribute constituents of concern to the NPDES Outfalls. A separate Groundwater Expert Panel is active at SSFL and oversees Boeing related groundwater tasks, including addressing treated groundwater discharge and naturally occurring seeps and springs.

Stormwater from the northern areas of the site is transferred to Silvernale Pond for treatment prior to discharge at Outfall 018. Higher flows, beyond the storage/transfer system capacity, discharge at Outfalls 003 through 007 and 010. At Outfalls 011 and 018, stormwater conveyance and treatment systems (SWTSs) have been in place since 2012 for advanced treatment using ActiFlo coagulation and filtration systems which are pretreated by sedimentation and flow equalization in ponds. However, the SWTS at Outfall 011 has had periods where operations lapsed during its lifetime. Because of the location, size, and terrain of the Outfall 008 and 009 watersheds, coupled with the inability to practically store large amounts of stormwater in these watersheds, flows from these areas are not captured and treated by the SWTSs³, and instead a distributed stormwater treatment and iterative (or adaptive management-based) approach is employed in both the Outfall 008 and 009 watersheds, as described in the 2010 BMP Plan. Thus, Outfall 009 naturally flows to Arroyo Simi, which subsequently flows to Calleguas Creek, and stormwater runoff from Happy Valley (Outfall 008) naturally flows via Dayton Canyon Creek to Chatsworth Creek. Chatsworth Creek flows south to Bell Creek southwest of the intersection of Shoup Avenue and Sherman Way. Bell Creek subsequently flows southeast to the Los Angeles River.

Outfall*	Status/Discharge Description
001	Downstream of Outfall 011; discharge to Bell Creek
002	Downstream of Outfall 018; discharge to Bell Creek
003	Runoff transferred to Silvernale for treatment prior to discharge at Outfall 018 ⁴
004	Runoff transferred to Silvernale for treatment prior to discharge at Outfall 018 ⁴
005	Runoff transferred to Silvernale for treatment prior to discharge at Outfall 018 ⁴
006	Runoff transferred to Silvernale for treatment prior to discharge at Outfall 018 ⁴
007	Runoff transferred to Silvernale for treatment prior to discharge at Outfall 018 ⁴
008	Stormwater from Happy Valley; discharge to Dayton Creek
009	Stormwater from Northern Drainage; discharge to Arroyo Simi
010	Runoff transferred to Silvernale for treatment prior to discharge at Outfall 018 ⁴
011	Stormwater and perimeter pond (treated at Stormwater Treatment System [SWTS]); discharge to Outfall 001
018	Stormwater and R-2 pond (treated at SWTS); discharge to Outfall 002
019	Injection of treated groundwater (GET System); no surface discharge
020	Not planned for use; injection of treated groundwater (GET System); no surface discharge

Table 1. NPDES Outfall Descriptions

*Outfalls 012 through 017 were excluded from the 2015 Permit

³ An exception to this is at the helipad, located in Area II in the Outfall 009 watershed, where some runoff is captured and piped to Silvernale Pond for treatment in the Outfall 018 SWTS.

⁴ If storage and transfer capacities to Silvernale are exceeded, stormwater runoff is treated in media filters at each individual Outfall before discharging to Calleguas Creek tributaries.



1.3 Existing Stormwater Treatment

BMPs have been implemented throughout the site to treat stormwater prior to discharge. The major structural treatment BMPs (i.e., excluding site-wide erosion and sediment controls, unpaved road control measures, and demolition of buildings and paved areas with subsequent soil scarification and revegetation) are summarized in the *ISRA Performance Monitoring and BMP Monitoring for the Outfalls 008 and 009 Watersheds, 2014/2015 Rainy Season* ("2015 Annual Report for Outfalls 008 and 009") (MWH *et al.*, 2015), the 2015 BMP Plan (Haley & Aldrich, 2015), and subsequent Annual Reports, and include the following (see Figure 2 for photos of each), by completion date:

- 2009: Outfall 009 Culvert Modifications (CMs)
- 2010: Outfall 008 ISRA Excavations
- 2011: Outfall 009 Helipad Berms and Pumps
- 2011: Outfall 011 Stormwater Conveyance and Treatment System (SWTS)
- 2011: Outfall 018 Stormwater Conveyance and Treatment System (SWTS)
- 2012: Outfall 009 B-1 Sedimentation Basin and Media Filter
- 2012: Outfall 009 Northern Drainage Restoration Measures
- 2012: Outfall 009 CM-9 Additional Improvements
- 2013: Outfall 009 Lower Parking Lot Sedimentation Basin and Biofilter
- 2013: Outfall 009 ISRA Excavations
- 2013: Outfall 009 ELV Treatment BMP⁵
- 2013: Outfall 009 LOX Sandbag Berms and Slope Drains
- 2015: Outfall 009 B1436 Detention Bioswales
- 2017: Outfall 009 Wattles added around Poles along Roads
- 2017: Outfall 009 Upper Parking Lot Media Filter
- 2017: Outfall 009 Roadway Diversion to CM-3
- 2017: Outfall 009 Administration Area Inlet Filters
- 2017: Outfall 009 Enhanced Erosion Controls in the Former Shooting Range Area
- 2017: Outfall 009 Roadway Diversion to CM-1
- 2018: Outfall 009 CM-1 Reconstruction
- 2019: Outfall 009 Mulch Sack Curb Extension in Lower Parking Lot
- 2019: Area II Utility Pole vegetation clearing and soil base stabilization
- 2020: Outfall 009 ELV and Biofilter Cistern Generators Added
- 2020: Outfall 009 CM-3 Check Dams Added and Media Filter Reconstruction
- 2020: Southern Buffer Zone Utility Pole BMPs
- 2021: Outfall 009 ELV Treatment BMP Media Filter Underdrain Layer Reconstruction

In addition, there has been extensive use of erosion and sediment control BMPs, revegetation, stabilization of repaved roads, and other activities to stabilize soil. Impervious surfaces, such as

⁵ ELV Treatment BMP was not operational in the 2018/19 reporting year due to the Woolsey Fire burning the power supply connection. A generator was purchased and was installed in September 2019, so it was operational for the 2019/20 reporting year.

buildings and parking lots, have also been removed across the site and "disconnected" from one another, restoring those sites to more natural conditions.

Stormwater from Outfall 011 is pumped to a storage pond for settling and evaporation and, when runoff volumes are anticipated to exceed the pond storage capacity, stored stormwater is treated using an advanced treatment system. The treated stormwater then flows to Outfall 001. However, in November of 2018 the conveyance pipelines burned in the Woolsey wildfire. The OF011 SWTS was not operational in the following 2018/19 season, with flows from Outfall 011 instead treated only by the flow-through media filter at the Outfall. The OF011 SWTS was repaired in late 2019 and was operational prior to the first storm event of the 2019/20 season. All stormwater (up to a certain size design storm event that varies by Outfall based on site-specific pumping and storage capacities) from Outfalls 003, 004, 005, 006, 007, 009⁶, and 010 is pumped to the Silvernale Pond for eventual treatment at the Outfall 018 SWTS and treated along with flows from the Outfall 018 watershed. The SWTS has been highly effective at reducing exceedances.

The various distributed BMPs in the Outfall 009 watershed (e.g., widespread revegetation, erosion and sediment controls, natural treatment BMPs) have also been effective at reducing the concentrations of the constituents of concern (COCs) in the watershed's stormwater. In general, the statistical evaluation of influent versus effluent BMP performance sample results included in this Annual Report indicate that significant COC load removals are occurring in these subareas, particularly for BMP influent samples that are above Permit Limits. Additionally, there was stabilization and ongoing inspections of the Northern Drainage, the primary stormwater conveyance in Outfall 009 watershed.

Limited runoff has occurred at Outfall 008 since the completion of ISRA activities (the identification, evaluation, remediation or stabilization, and restoration of areas of contaminated soil containing COCs that may have contributed to exceedances of NPDES Permit limits in stormwater) and installation of new erosion and sediment controls, revegetation, and unpaved road stabilization in 2012. During the 2013-2018 period, only a total of four discharges occurred, each sampled and analyzed for approximately 60-200 parameters, and only three results were at concentrations above the 2015 Permit Limits. This outcome reflects positive performance of the ISRA soil removal activities, revegetation/restoration, and erosion controls targeting sediment-bound COCs. While the 2018/19 year had nine samples collected and 11 results at concentrations above the 2015 Permit Limits, this increase in runoff and exceedances is likely due to a combination of the above average rainfall and post-Woolsey wildfire conditions that decreased vegetative cover and accelerated runoff. In the 2019/20 year, there were only five samples collected and none had concentrations above the 2015 Permit Limits. There were no discharges in 2020/21 due to the low rainfall year. These results further demonstrate the effectiveness of the iterative and distributed BMP approach that has been employed in these watersheds.

⁶ Stormwater runoff from a small area within the Outfall 009 watershed (helipad area) is pumped to the storage pond for treatment prior to being discharged from Outfall 018, while stormwater runoff from the remaining, vast majority of the watershed flows to Outfall 009.



2009: Culvert Modifications



2010: Outfall 008 Watershed ISRA Excavations



2011: Helipad Berms and Pumps



2011: Outfall 011 SWTS



2011: Outfall 018 SWTS



2012: B-1 Sedimentation Basin and Media Filter



2012: Northern Drainage Restoration Measures



2012: CM-9 Additional Improvements (Perforated Pipe, Extended Sedimentation Area and Rip Rap Berm)



2013: Lower Parking Lot Sedimentation Basin and Biofilter



2013: Outfall 009 Watershed ISRA Excavations



2013: ELV Treatment BMP



2013: LOX Sandbag Berms and Slope Drains





2015: B1436 Detention Bioswales

2017: Wattles around Poles along Roads



2017: Upper Parking Lot Media Filter



2017: Roadway Diversion to CM-3



2017: Administration Area Inlet Filters (Filter Basket)



2017: Administration Area Weighted Wattle and Riprap at Culvert Inlet



2017: Enhanced Erosion and Sediment Controls in Former Shooting Range Area



2017: Roadway Diversion to CM-1



2018: CM-1 Reconstruction Including Enlargement



2019: Mulch Sack Curb Extension in Lower Parking Lot



2019: Area II Utility Pole Vegetation Clearing and Soil Base Stabilization



2020: Outfall 009 CM-3 Check Dams Added and Filter Media Reconstruction



2020: Outfall 009 CM-3 Check Dams Added and Media Filter Reconstruction



2020: Southern Buffer Zone Utility Pole BMPs



2020: Outfall 009 ELV and Biofilter Cistern Generators Added



2021: Outfall 009 ELV Treatment BMP Media Filter Reconstruction

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Figure 2. Photos of Example Structural BMPs and Years of Construction
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1.4 Permit History

An overview of past SSFL stormwater Permits, Expert Panel involvement, and Permit limit and benchmark exceedances (compared to the 2015 Permit effluent limits/benchmarks) at the regulated Outfalls over the past 20 years is provided in Figure 4. The number of Permit limit and benchmark exceedances that occur each year are a function of Permit changes, annual rainfall, treatment BMPs and stormwater discharge avoidance strategies implemented, and natural variability of stormwater quality. Notable milestones shown in Figure 4 include:

- **1998 NPDES Permit:** NPDES Permit No. CA0001309 was issued to regulate wastewater and stormwater discharged from SSFL.
- **2004 NPDES Permit:** The 2004 Permit included new CTR-based effluent limits and added 11 new compliance monitoring locations. As a result for the increased regulation, the number of benchmark and Permit limit exceedances increased.

- **2005 Topanga wildfire**: Approximately 97% of SSFL was burned resulting in an increased number of Permit limit exceedances compared to reporting years with similar rainfall.
- **2006 NPDES Permit:** The 2004 Permit was revised to also include the waste load allocations (WLAs) from the applicable TMDLs for the downstream waterbodies.
- 2007 Cease and Desist Order (CDO): Through the CDO, the RWQCB required "the assembly of a panel to review site conditions, modeled flow, contaminants of concern, and evaluate the BMPs capable of providing treatment to meet the final effluent limits." The CDO also required BMP planning, performance evaluation, and reporting requirements.
- 2010 NPDES Permit: No major changes to Permit. The Expert Panel continued to make datainformed BMP recommendations in the Outfall 008 and 009 watersheds, which were implemented at SSFL (see Section 1.3).
- In 2011, following the construction of the Outfall 018 SWTS, stormwater from Outfalls 003 through 007 and 010 was retained in storage tanks and transferred to Silvernale Pond and the SWTS, reducing the number of discharges and opportunities for exceedances site-wide.
- 2015 NPDES Permit: Permit expanded the Expert Panel's charge to all regulated SSFL Outfalls. In response, the Panel reviews Permit limit and benchmark exceedances for all Outfalls and makes data-driven BMP recommendations on a site-wide basis. In the 2015-2018 drought period, the number of Permit limit and benchmark exceedances fell compared to years with similar rainfall.
- 2018 Woolsey wildfire: Approximately 80% of SSFL was burned and above-average rainfall was measured. Because of the hydrophobicity⁷ of the soil and the loss of vegetative cover due to the wildfire event, rain events after the fire produced significantly greater amounts of runoff compared to similar sized rains during non-fire years. There were an increased number of benchmark and Permit limit exceedances in the year immediately following the wildfire compared to reporting years with similar rainfall, however, water quality recovered to typical non-wildfire levels in the following year.

1.5 Report Organization

This report is organized as follows:

- Section 2: Monitoring Activities
- Section 3: BMP Activities
- Section 4: Key Findings
- Section 5: Recommendations
- Section 6: Milestones/Schedule
- Section 7: References

⁷ Soils that exhibit hydrophobicity cause water to collect on the soil surface rather than infiltrate into the ground. Wildfires generally cause soils to be hydrophobic temporarily, which increases water repellency, surface runoff and erosion at post-burn sites.



Figure 3. Summary of SSFL Permits, Surface Water Expert Panel Involvement, and Water Quality, 1998-2021

2 Monitoring Activities

This section describes the hydrologic characteristics of the past reporting year, as well as a summary of the results of stormwater samples collected at NPDES compliance Outfalls (in accordance with the 2015 NPDES Permit), BMP monitoring in the Outfall 009 watershed (in accordance with the 2018/19 Sampling and Analysis Plan [Stantec, 2018]), as well as a summary of monitoring activities conducted as part of the Northern Drainage assessment and the non-industrial sources special study (Santa Susana Surface Water Expert Panel and Geosyntec Consultants, 2015b).

2.1 2020/21 Rainfall

The long-term average annual rainfall at SSFL from 1959 to 2021 is 16.8 inches⁸, primarily occurring as winter storms from October through March. Highly variable periods of above average and below average annual rainfall amounts are common. Little rainfall typically occurs during the April through September dry season. 4.54 inches of rainfall were measured in the 2020/21 reporting year (the reporting year is defined as June 1 – May 31). This past season's rainfall was the lowest rain year in the 1959-2021 period of record and the only year in the 1998-2021 period of record without any stormwater discharge from the NPDES outfalls. Five rain events (where a "rain event" is defined in the Permit as greater than 0.1 inches of rainfall in a 24-hour period and preceded by at least 72 hours of dry weather) occurred in the 2020/21 reporting year, with none of these storms producing observable flow at any Outfalls. For historical context, Table 2 summarizes the rainfall over the past twelve reporting years since submittal of the Surface Water Expert Panel Work Plan in 2010. Five of these twelve years have had above average rainfall.

Reporting Year	Annual Rainfall	Percent of Average Annual Rainfall	Number of Rain Events
2020/21	4.54	27%	5
2019/20	20.5	122%	9
2018/19	26.3	157%	12
2017/18	9.8	58%	4
2016/17	23.4	139%	14
2015/16	12.0	71%	13
2014/15	11.2	67%	9
2013/14	6.1	36%	5
2012/13	8.1	48%	9
2011/12	11.3	67%	10
2010/11	25.4	139%	14
2009/10	19.5	116%	11

Table 2. Historical Rainfall at SSFL, since 2010 Surface Water Expert Panel Work Plan

Above average annual rainfall amounts are **bolded**.

⁸ Data from the Simi Hills – Rocketdyne Lab gauge (Ventura County Watershed Protection District site 249) was used to determine annual rainfall from 1958/59 through 2000/01. However, rainfall data are not available at this gauge from 1977/78 through 1984/85. Data from the Area 4 gauge (which was moved to Area 1 on January 1, 2013) were used to determine annual rainfall from 2001/02 through 2020/21. This results in a period of record of 55 years.

Table 3 summarizes the 2020/21 individual rainfall event characteristics, as well as the NPDES Outfalls sampled, and the number of watershed 009 BMP subarea monitoring samples. A total of 14 watershed BMP samples (collected at BMP performance, potential BMP subarea⁹, and background locations) were collected in the 2020/21 reporting year. Figure 5 illustrates the cumulative rainfall and NPDES Outfall discharge samples collected during the 2020/21 reporting year.



Figure 4. Annual Cumulative Rainfall, 2016-2021

The event with the highest total rainfall occurred December 27-29, 2020 (1.62-in), with a maximum rainfall intensity recurrence interval of less than 1-year across all durations (Figure 6). The next largest event occurred January 28-30, 2021 (1.32-in), which also had a maximum rainfall intensity recurrence interval of less than 1-year across all durations (Table 3 and Table 4).

Table 3. NOAA Point Precipitation Frequency Estimates for Event Intensity at SSFL

Average Recurrence Interval (years)	1	2	5	10	25	50
1- hr Precipitation Depth (in)	0.51	0.67	0.87	1.03	1.24	1.41
3- hr Precipitation Depth (in)	0.95	1.24	1.62	1.92	2.32	2.62
6- hr Precipitation Depth (in)	1.38	1.80	2.35	2.78	3.36	3.79
12- hr Precipitation Depth (in)	1.89	2.47	3.21	3.81	4.59	5.18
24- hr Precipitation Depth (in)	2.53	3.33	4.34	5.14	6.20	6.99

⁹ "Potential BMP subarea monitoring locations" are defined here as drainage areas for stormwater runoff sampling points, and that include ISRA, RCRA Facility Investigation (RFI), and/or developed areas (i.e., buildings, parking lots, roads, etc.) so that impacted runoff quality might be expected and/or treatment BMPs might be necessary, pending an evaluation of the monitoring results.

Rain Event	Total Rainfall ¹	Event Duration ¹	24-hr Recurrence Interval	Average Rainfall Intensity ¹	Maximum 1-Hour Rainfall Intensity ¹	Antecedent Dry Period ²	NPDES Outfalls with Sampleable Discharge	Number of Outfall 009 Watershed BMP Subarea Monitoring	
	(in)	(hrs)	(years)	(in/hr)	(in/hr)	(days)		Samples	
12/28-29/2020	1.62	26	<1	0.06	0.28	224	None	None	
1/23-25/2021	0.32	50	<1	0.0064	0.11	26	None	None	
1/28-30/2021	1.32	33	<1	0.04	0.27	3	None	3	
3/10-12/2021	0.94	51	<1	0.018	0.16	40	None	11	
3/15/2021	0.21	5	<1	0.042	0.08	3	None	None	
Non-Rain Event Total ³	0.17								
Total	4.54						0 samples	14 samples	

Table 4. 2020/21 Reporting Year and Monitoring Event Summary

¹ Total rainfall, average rainfall intensity, and maximum 1-hour rainfall intensity were calculated based on rainfall recorded at a maintained and calibrated weather station within Area I.

² Antecedent dry period counted as the number of days between the start of the rain event and the last 24 hr period with at least 0.1 inches rainfall

³ On the following seven days, rainfall was measured but was not considered a rain event per the NPDES Permit definition: October 21-22, 2020 (0.02"), November 7, 2020 (0.03"), December 14, 2020 (0.02"), March 3, 2021 (0.04"), April 25, 2021 (0.01"), and May 7, 2021 (0.01").



Figure 5. Observed Precipitation Intensities and Durations for 2020/21 Reporting Year, Area I Gauge, with NOAA Point Precipitation Frequency Estimates

Most site structural BMPs are designed to treat the 24-hr, 1-year recurrence interval storm (2.53 inches). Additionally, the rip rap placed in the Northern Drainage as grade control structures was sized to prevent movement during storms up to the 24-hr, 5-year event (4.34 inches). However, when back-to-back storms occur, even a storm smaller than the design storm can overwhelm the BMPs. This past season, however, the highest recorded 24-hour rainfall (1.61 inches on 12/28/2020) was below the design storm and no significant back-to-back events occurred; this helps to explain why no BMP overflow events were observed this season.

2.2 2020/21 Stormwater Sampling

During the 2020/21 rainy season, 14 BMP performance samples in the Outfall 009 watershed were collected. There was no discharge at the subarea locations in the Outfall 001 and 002 watersheds and no discharge at NPDES Outfalls. These sampling locations can be found in Appendix A and sampling results are discussed in the sections below.

2.2.1 NPDES Outfalls

SSFL Outfall discharges are monitored for water quality compliance with the 2015 NPDES Permit. This past reporting year experienced five rainfall events, all with relatively low rainfall intensities, resulting in no sampleable discharge (and thus no opportunities for Permit limit or benchmark exceedances) at any Outfalls in 2020/21. Additionally, no storms exceeded the Outfall 018 or 011 available pond capacities.

2.2.2 BMP Performance Monitoring

BMP performance monitoring is not required by the NPDES Permit. However, the Expert Panel has recommended that individual BMPs be monitored to assess their relative ability to remove stormwater COCs before they reach the Outfalls. BMP monitoring in the Outfall 009 watershed was conducted throughout the 2020/21 reporting year as outlined in the *2020/21 Rainy Season Sampling and Analysis Plan (SAP) Updates, Best Management Practice (BMP) Monitoring Program* ("2020/21 SAP") (Appendix A to this report) (HAI, 2020). This SAP is updated on an annual basis and will be updated again for the 2021/22 reporting year, as later discussed in Section 5.2.1.

This past reporting year, stormwater samples at BMP performance monitoring locations were collected in the Outfall 009 watershed. At the Panel's recommendation, sampling at the BMP performance locations was temporarily reduced to two samples per year until site activities increase as remediation is initiated. Sampling at the potential BMP subareas to identify additional distributed control locations was discontinued after the 2018/19 reporting year due to improved runoff quality at Outfall 009. No storms had a 24-hour rainfall depth that were above the design storm for the treatment controls in the Outfall 009 watershed, no bypass was observed in the Outfall 009 watershed structural BMPs. Table 7 summarizes the number of samples collected at each BMP monitoring location in the Outfall 009 watershed subareas, as well as the number of copper, lead, mercury, and dioxins results greater than the Outfall 009 Permit limits, for reference only as historical COCs, as the Permit limits and benchmarks only apply to the Outfall samples. A total of 14 samples were collected. Of these, seven were BMP influent samples, two were intermediate samples, and five were effluent samples. Of the influent samples, 29% (2 of 7), 29% (2 of 7), 0% (0 of 7), and 86% (6 of 7) of these samples had concentrations greater than the NPDES Outfall Permit limits for copper, lead, mercury, and dioxins, respectively. Focusing on the five fully treated (BMP effluent) samples, 0% (0 of 5), 0% (0 of 5), 0% (0 of 5), and 40% (2 of 5) of these samples had concentrations greater than the NPDES Permit limits for copper, lead, mercury, and dioxins, respectively.

A BMP Performance Analysis is conducted annually to evaluate the performance of existing treatment BMPs in the Outfall 009 watershed using statistical, temporal, and other data analysis approaches. The 2020/21 reporting year data have been incorporated into the BMP Performance Analysis dataset that was first established in December 2009. Out of many constituents analyzed at the performance monitoring sites, specific COCs were selected for the data analyses based on historical exceedances at Outfall 009, including total lead, total copper¹⁰, and dioxins (TCDD TEQ no DNQ).

This year, as in previous years, the Surface Water Expert Panel has overseen and reviewed the BMP performance analysis and evaluated the results for any new BMP or monitoring recommendations. Initial analysis results were presented to the Surface Water Expert Panel in a meeting held August 18-19,

¹⁰ Copper is not included as a pollutant of concern for the Outfall 009 watershed in the 2015 Expert Panel Work Plan. However, data for total copper are still presented in the paired line plots.

2021. The Surface Water Expert Panel received the draft BMP Performance Analysis report in September 2021 and the revised draft in October 2021. BMP and monitoring recommendations were developed based on their review of these results and incorporated into the recommendations found in Sections 5.1 and 5.2 of this report. The final report, *2020/21 BMP Performance Analysis, Santa Susana Field Laboratory* (Santa Susana Surface Water Expert Panel and Geosyntec Consultants, 2021b), is provided as Appendix D to this report. Key findings are discussed in Section 4 below.

In addition to the regular annual performance analysis, two peer-reviewed journal articles were published using the extensive BMP performance monitoring data collected at SSFL. The papers were both published in *Journal of Sustainable Water in the Built Environment* and are titled Laboratory Media Test Comparisons to Long-Term Performance of Biofilter and Media Filter Treatment-Train Stormwater Controls. Journal of Sustainable Water in the Built Environment (Pitt, et al., 2021) and Performance Changes during Long-Term Monitoring of Full-Scale Media Filter Stormwater Controls at an Industrial Site (Pitt, et al., 2022).

				Results Greater than OF009 Permit Limit (reference only, as limits apply to Permitted Outfall locations only)			
			Number	Copper	Lead	Mercury	TCDD TEQ (no DNQ)
Site	Туре	Site Description	Samples	(14 ug/L)	(5.2 ug/L)	(0.1 ug/L)	(2.8e-8 ug/L)
B1BMP0009	Influent	Upper lot media filter – road culvert influent	1	0	0	0	1
B1BMP0010	Influent	Upper lot media filter – parking lot influent	1	1	0	0	1
B1BMP0011	Effluent	Upper lot media filter – BMP effluent	1	0	0	0	1
ILBMP0004	Influent	Upstream 1 (B1436 Southern Detention Bioswale influent)	1	0	0	0	1
ILBMP0005	Effluent	Downstream (B1436 Southern Detention Bioswale effluent)	1	0	0	0	0
ILBMP0008	Influent	Upstream 2 (B1436 Southern Detention Bioswale influent)	1	1	1	0	1
ILBMP0009	Influent	Filter basket influent in the admin building area parking lot	1	0	1	0	1
ILBMP0010	Effluent	Filter basket effluent in the admin building area parking lot	1	0	0	0	1
LPBMP0002	Influent	Lower parking lot influent to cistern, before treatment	2	0	0	0	1
LPBMP0003	Intermediate	Lower parking lot sediment basin outlet, before treatment	2	0	0	0	1
LPBMP0004	Effluent	Lower parking lot biofilter outlet	2	1	0	0	0
	SUBT	OTALS BY SITE TYPE					
		BMP Influent	7	2	2	0	6
		BMP Intermediate	2	1	0	0	1
		BMP Effluent	5	0	0	0	2
		Background	0	0	0	0	0
	TOTA	L COUNT	14	3	2	0	9

 Table 5. Outfall 009 BMP Subarea Stormwater Monitoring Results, 2020/21 Reporting Year

2.2.3 Outfall 001 and Outfall 002 Subarea Monitoring

Beginning in the 2019/20 reporting year, to help investigate the cause of ongoing benchmark exceedances in the Outfall 001 and 002 watersheds, subarea samples were collected in these buffer zone watersheds to characterize runoff from both natural background and potentially impacted areas. However, due to the unusually dry year this past season, none of the six identified subarea sampling locations had sampleable flow in 2020/21. The Panel has recommended for the Southern Buffer Zone subarea sampling program to continue in the 2021/22 rainy season.

2.2.4 Demolition Subarea Monitoring

Subarea samples were collected in Outfall 003 watershed due to demolition of the Radioactive Materials Handling Facility (RMHF). Samples were collected before diverting to Silvernale to characterize runoff from the RMHF demolition area. Two samples were collected in accordance with the recommendation in the 2020 Annual Report and analyzed for metals, dioxins, radionuclides, and general water quality parameters. Results were compared against the NPDES Permit Limits for Outfall 003 and of the 67 parameters analyzed, copper, lead, zinc, and dioxins were detected above the Permit Limit in the first storm event and only zinc and was detected above the Permit Limit in the second storm event. The pH of both samples were below the defined Permit Limit range.

2.3 Northern Drainage Assessment

As identified in the *Northern Drainage Restoration, Mitigation, and Monitoring Plan* (RMMP) (Haley & Aldrich, 2011), recurring site investigations were performed annually along the Northern Drainage for a duration of five years (2011/12 to 2016/17).

Although the RMMP expired in 2017, a voluntary annual stream walk and inspection of in-channel erosion risk areas and sediment control conditions in the lower portion of the Outfall 009 drainage was conducted on June 10, 2021. No additional stabilization measures or maintenance activities are recommended at this time.

2.4 Outfall 009 Non-Industrial Sources Special Study

The 2015 Work Plan was developed in part to address periodic lead and dioxins exceedances (most recently in February 2017 and December 2018, respectively) at Outfall 009 despite the implementation of numerous BMPs in the upper watershed and to follow-up on previous findings that paved subareas had significantly higher stormwater concentrations of exceeding constituents than unpaved subareas (regardless of whether impacted soils were known to exist). The 2015 Work Plan posed the following questions as the basis for a non-industrial sources special study:

- 1. Where (spatially) within watershed 009 are dioxins and lead in stormwater predominantly coming from; and
- 2. What are the predominant sources of constituents in paved subareas -- e.g., pavement material itself (weathered or newly resurfaced), vehicles, treated wood poles, historic shooting range, and/or atmospheric deposition?

The Surface Water Expert Panel and Geosyntec developed the *Special Monitoring Studies for the 009 Watershed* ("Special Study Work Plan") (Santa Susana Surface Water Expert Panel and Geosyntec Consultants, 2015b), which proposed approaches to collect data to further investigate the causes and sources of dioxins and lead in stormwater at Outfall 009. The Expert Panel also recommended offsite sampling and lead isotope sampling in the Northern Drainage during the 2018/19 reporting year. The Non-Industrial Sources Special Study was expanded again through recommendations in the 2018/19 Annual Report to include additional parameters and potential sources affecting stormwater quality in the Southern Buffer Zone. The frequency and samples dates of these programs are provided in Table 9. A summary report will be made available in 2022, after all monitoring activities have been completed and the results analyzed.

	Event	Events	Events		
Activity	Frequency	Scoped	Completed	Completed	Event Dates
Atmospheric Deposition (2 sites)	Monthly	12	12	6/14/2016 7/14/2016 8/16/2016	12/13/2016 3/14/2017 4/27/2017
				9/16/2016 10/17/2016 11/15/2016	5/31/2017 6/28/2017 7/31/2017
Pavement Solids (6 sites)	Quarterly	5	5	6/14-15/2016 7/28-29/2016 10/25-26/2017	3/13-14/2017 8/23-24/2017
Soils Near Treated Wood Poles (18 sites)	Single sampling event	1	1	5/11-1	12/2016
Northern Drainage (ND) Stormwater	Storm- based	12	12	3/7/2016 (4 of 7 sites) 12/24/2016 (4 of 7) 1/9/2017 (4 of 7) 1/19/2017 (5 of 7) 2/4/2017 (6 of 7) 2/11/2017 (6 of 7)	2/17/2017 (7 of 7) 2/26/2017 (6 of 7) 3/22/2018 (5 of 6) 12/6/2018 (2 of 6) 2/18/2019 (6 of 6) 3/2/2019 (6 of 6)
Northern Drainage Sediments	Single sampling event	2	2	3/25-28/2 9/7/201	016 (7 sites) 7 (8 sites)
Offsite Pavement Solids from Public Roads (3 sites)	Single sampling event	1	1	11/7	7/2018
Offsite Stormwater Runoff from Public Roads (4 sites)	Single sampling event	3	3	3/2, 3/22 1/14	/2018 2/2018 4/2019
Lead Isotope Study	Single sampling event	1 for solid samples 10 stormwater events	1 solid 6 stormwater	Shooting Range Background S ND Sediment Atmospheric Dep Pavement So Lead Shot Stormwater: 2/18 3/8/2019, 3/21/3 3/16	e Soil: 8/27/2018 Soil: 8/28/2018 : 8/29-30/2018 position: 10/2/2018 lids: 10/2/2018 : 8/27/2018 3/2019, 2/28/2019, 2019, 12/24/2019, 5/2020
Core Sample of Treated Wood Poles (9 sites)	Single sampling event	1	1	10/6-	7/2020

2

Storm-

based

0

SSFL Site-Wide Stormwater Annual Report | BMP Activities Table 6. Non-Industrial Sources Special Study – Monitoring Events, Planned and Completed

Stormwater Runoff from

Treated Wood Poles

(3 pairs of upstream/

downstream sites)

No sampleable flow in the rainy season

of 2020/21. Contingency sampling events are still being discussed for

2021/22

	Event	Events	Events	
Activity	Frequency	Scoped	Completed	Completed Event Dates
Southern Buffer Zone	Single	1	1	11/24/2020
Soils Near Treated Wood	sampling			
Poles	event			
Southern Buffer Zone Soils Near Metal Stakes	Single sampling event	1	1	11/23/2020
Southern Buffer Zone Gravel Road Solids	Single sampling event	1	1	11/23/2020

3 BMP Activities

The following sections summarize the construction and demolition activities conducted at SSFL, the BMP activities within each watershed (e.g., new BMPs, inspections, maintenance, etc.), and public involvement within the past year.

3.1 Demolition

DOE demolition activities of buildings in the Radioactive Materials Handling Facility (RMHF) area began in July 2020 and was completed in December 2020. Stormwater from this area was sampled as described in section 2.2.4. Demolition activities are covered by a separate Construction SWPPP which has been reviewed by the Surface Water Expert Panel.

3.2 New Activities/Maintenance

Outfall/BMP activities and maintenance conducted at SSFL during the past year (e.g., erosion, sediment control, and drainage stabilization inspections, removal of sediment and debris from Outfalls following extreme storm events, BMP repairs, etc.) are incorporated by reference through the following quarterly NPDES Discharge Monitoring Reports (DMRs):

- The Boeing Company, 2020a. *Third Quarter 2020 NPDES Discharge Monitoring Report, Compliance File CI-6027 and NPDES No. CA0001309, Santa Susana Field Laboratory, Ventura County, California.* November 15.
- The Boeing Company, 2020b. Fourth Quarter 2020 NPDES Discharge Monitoring Report, Compliance File CI-6027 and NPDES No. CA0001309, Santa Susana Field Laboratory, Ventura County, California. February 15.
- The Boeing Company, 2021a. First Quarter 2021 NPDES Discharge Monitoring Report, Compliance File CI-6027 and NPDES No. CA0001309, Santa Susana Field Laboratory, Ventura County, California. May 15.
- The Boeing Company, 2021b. Second Quarter 2021 NPDES Discharge Monitoring Report, Compliance File CI-6027 and NPDES No. CA0001309, Santa Susana Field Laboratory, Ventura County, California. August 15.

As recommended in the 2019/20 SSFL Site-Wide Stormwater Annual Report (Surface Water Expert Panel and Geosyntec, 202019), the following BMP maintenance, improvement, and monitoring actions were taken this past season:

- **Outfall 009 CM-9 continued to be monitored for signs of clogging:** The CM continues to perform well and has not yet exhibited signs of clogging, despite its long duration of operation and elevated accumulation of sediment (but still below critical levels).
- **Outfall 009 ELV media filter reconstruction:** The ELV system as-built plans were not available for review to determine the current design of the system, so the BMP was physically inspected. It was determined that the gravel underdrain layer should be retrofitted to better contain the filter media and prevent washout. The ELV media bed reconstruction was completed in September 2021 and is shown in Figure 9.



Figure 6. Reconstructed ELV Media Bed Showing Flow Distributing Geotextile on Top of Media

• **Outfall 009 CM-4 check dam reconstruction:** Riprap check dams were rebuilt upstream of CM-4 to capture sediment and debris before the CM and the riprap in the ponding area was replaced as shown in Figure 10.



Figure 7. Check dam and ponding area upstream of CM-4 before (left) and after (right) reconstruction

• Maintained erosion control material stockpile as feasible: The late-season timing of the Woolsey fire highlighted the importance of being able to implement erosion controls quickly before a storm event. A stockpile of control measures, such as wattles, are maintained and cycled through at the site so there is always a sufficient quantity of materials available if needed.

3.3 Public Involvement

Numerous stakeholder groups and members of the public have expressed interest in the stormwater issues at the SSFL at past public involvement activities and Regional Board hearings. To keep these groups and others apprised of progress, and provide an opportunity for public input, periodic public forum meetings and site tours have been held with the Surface Water Expert Panel since 2011 and throughout the duration of the 2015 Work Plan. Additionally, project status reports and submittal

documents have been posted on the Boeing project website after major project milestones and prior to public outreach meetings. Table 10 summarizes public involvement activities that have occurred since the 2010 BMP Plan (MWH et al., 2010). The most recent public meeting was hosted remotely, via Zoom, on August 19, 2021. Prior to the meeting, a survey was developed and distributed to the public to gauge topics of interest, which allowed the Surface Water Expert Panel to tailor the presentation content. The Surface Water Expert Panel presented on the 2020/21 rainfall and site monitoring activities, BMP performance, results from internal subarea stormwater monitoring, and responded to questions submitted by the public. Although site tours are typically planned as part of the public meeting, a public tour was not possible this year due to coronavirus restrictions on gatherings.

er Expert i aner i abne involvement Activities, 2011-2021					
Date	Activity				
August 19, 2021	Public meeting (virtual)				
August 11, 2020	Public meeting (virtual)				
July 17 2019	Public meeting and SSFL tour				
May 9, 2019	Presentation to LARWQCB				
May 25, 2018	Public meeting and SSFL tour				
August 17, 2017	DIPCON LA Conference SSFL tour				
March 21, 2017	Public meeting and SSFL tour				
November 19, 2014	Community Action Group meeting				
March 20, 2013	Public meeting and SSFL tour				
October 6, 2013	Public meeting and SSFL tour				
August 25, 2011	Public meeting				
January 22, 2011	Public meeting and SSFL tour				

Table 7. Surface Water Expert Panel Public Involvement Activities, 2011-2021

4 Key Findings

Data supporting the following key findings are provided in the analyses referenced above. The following findings significantly shape the BMP and monitoring recommendations presented in Section 5.

a. 2020/21 was an exceptionally dry year that did not produce stormwater discharges at the Outfalls.

Less frequent and intense storm activity in the 2020/21 reporting year as compared to the 2019/20 reporting year, in combination with the on-site stormwater control measures, resulted in no stormwater discharges (or Permit limit exceedances) at the Outfalls. Only 4.54 inches of rainfall fell at the site, which is well below the long-term annual average of 16.8 inches. 2020/21 was the driest year in the 55 years of rainfall records available at the site.



Figure 8. SSFL Long-Term Rainfall Record

b. The stormwater controls and SWTSs generally continue to be very effective across the site.

Performance monitoring of the distributed treatment controls in the 009 watershed demonstrates continued water quality improvement, which supports NPDES compliance at Outfall 009. This past reporting year, all BMP-COC combinations had the same or fewer effluent concentration results above Permit Limits compared to the influent concentrations. Historically, most grouped BMP-COC combinations also showed lower average and maximum exceedance ratios (i.e., exceeding sample concentrations divided by the Permit Limit) for effluent results compared to the influent results.

As shown in Tables 12-16, lead and dioxins reductions are observed for almost all BMP types, based on the percent change from BMP influent to effluent concentrations. The percent of influent samples greater than the Outfall Permit limit is less than or equal the percent of effluent samples greater than the Permit limits for both lead and dioxins for all BMPs, indicating an improvement in water quality between influent and effluent. For almost all BMP types the maximum and average ratios of observed concentrations to Permit limit, for results exceeding Permit limits, generally exhibit a higher ratio in influent than effluent, for both lead and dioxins. Two exceptions are the B-1 Media Filter (lead) and the Boeing Admin Area Inlet Filters (dioxins) where the maximum and average ratio of observed concentrations to the Permit limit show a higher ratio for effluent than influent samples, suggesting an increase in concentration through the inlet filter for the available data pairs. Overall, constituent loads are being reduced, both because concentrations are being reduced, and because runoff volumes are being reduced by upstream pavement and building removal and stormwater storage in BMPs.

BMP	Parameter	% of Samples Greater than Permit Limits		Maximum Exceedance Ratio (Exceeding Result: Permit Limit)		Average Exceedance Ratio (Exceeding Result: Permit Limit)	
		Influent	Effluent	Influent	Effluent	Influent	Effluent
B-1	Lead	35%	8.7%	1.8	1.7	1.3	1.5
	TCDD TEQ no DNQ	85%	68%	12,868	10	773	3.9
CM-1	Lead	31%	17%	11	7.5	3.9	3.0
	TCDD TEQ no DNQ	60%	48%	3,149	155	159	15
CM-9	Lead	41%	24%	11	6.9	4.2	2.9
	TCDD TEQ no DNQ	49%	22%	56	5.2	8.5	3.2
Upper Lot	Lead	12%	0%	1.2	N/A ¹	1.1	N/A ¹
Media Filter	TCDD TEQ no DNQ	76%	50%	11	2.7	4.8	1.8
CM-3	Lead	40%	0%	1.7	N/A ¹	1.5	N/A ¹
	TCDD TEQ no DNQ	0%	0%	N/A ¹	N/A ¹	N/A ¹	N/A ¹

Table 8. B-1, CM-1, CM-9, Upper Lot Media Filter, CM-3 [post 2017/2018] Influent and Effluent Concentrations Compared to the Outfall 009 Permit Limits, 2009-2021

¹Not calculated because there were no exceedances of Permit limits

% of Samples Greater than Permit Limits		Maximum I Ratio (E) Result : Pe	Exceedance cceeding rmit Limit)	Average Exceedance Ratio (Exceeding Result : Permit Limit)		
Parameter	Influent	Effluent	Influent	Effluent	Influent	Effluent
Lead	10%	3.1%	3.8	1.1	2.1	1.1
TCDD TEQ no DNQ	87%	9.4%	17	5.2	4.0	3.3

Table 9. Lower Lot Biofilter Influent and Effluent Summary as Compared to the Outfall 009Permit Limits, 2013-2021

Table 10. ELV Treatment BMP Influent and Effluent Summary as compared to the Outf	all 009
Permit Limits, 2013-2020	

	% of Samples Greater than Permit Limits		Maximum Ratio (E Result : Pe	Exceedance xceeding rrmit Limit)	Average Exceedance Ratio (Exceeding Result : Permit Limit)	
Parameter	Influent	Effluent	Influent	Effluent	Influent	Effluent
Lead	17%	0%	9.7	N/A ¹	5.9	N/A ¹
TCDD TEQ no DNQ	33%	13%	13	6.9	4.8	4.2

¹Not calculated because there were no exceedances of Permit limits

Table 11. Detention Bioswales Influent and Effluent Summary as compared to the Outfall 009Permit Limits, 2015-2021

	% of Samples Greater than Permit Limits		Maximum I Ratio (E) Result : Pe	Exceedance «ceeding rmit Limit)	Average Exceedance Ratio (Exceeding Result : Permit Limit)	
Parameter	Influent	Effluent	Influent	Effluent	Influent	Effluent
Lead	38%	0%	4.5	N/A ¹	1.8	N/A ¹
TCDD TEQ no DNQ	75%	14%	737	6.7	54	3.4

¹Not calculated because there were no exceedances of Permit limits

Parameter	% of Samples Greater than Permit Limits		Maximum I Ratio (Excee : Permi	Exceedance eding Result t Limit)	Average Exceedance Ratio (Exceeding Result : Permit Limit)	
	Influent	Effluent	Influent	Effluent	Influent	Effluent
Lead	25%	0%	1.1	N/A ¹	1.1	N/A ¹
TCDD TEQ no DNQ	100%	100%	22	76	11	26

 Table 12. Boeing Admin Area Inlet Filters Influent and Effluent Summary as compared to the

 Outfall 009 Permit Limits, 2018-2021

¹Not calculated because there were no exceedances of Permit limits

Figure 9 and Figure 10 present summaries of influent and effluent monitoring results for dioxins and lead by BMP group.



Figure 9. BMP Performance – Influent/Effluent Box Plot for Dioxins



Figure 10. BMP Performance – Influent/Effluent Box Plot for Lead

Q1-1.5*IQR

Q1-1.5*IQR

c. Boeing and NASA continue to implement Surface Water Expert Panel recommendations.

As described in Sections 1.3 and 3.2, recommendations from the Surface Expert Panel continue to be implemented at the site in order to continue to improve stormwater quality. A summary of recommendations from the 2019/20 Annual Report and their status to-date are provided in Table 14.

Watershed	Recommendation	Status
Sitewide	Continue to have the Expert Panel receive and review all	Completed
	demolition (demo) and cleanup SWPPPs	
Sitewide	Continue to monitor the condition of existing erosion and	Completed
	sediment controls and vegetation across the site and	
	repairing or supplementing where needed	
Sitewide	Identify and evaluate the feasibility of removing	On-going
	unnecessary treated wood utility poles and other treated	
	wood, and adjacent soils where staining is observed	
Outfalls 001	Install non-flammable media wattles around the	On-going - Wattles
& 002	remaining bare treated wood utility poles in the Southern	should be spaced out
	Buffer Zone	from poles to better
		capture impacted soils
Outfalls 001	Evaluate removal of pipe support stakes (potential iron	Completed – Stakes
	source)	were removed
Outfalls 001	Evaluate subarea monitoring data in OF001 and OF002	On-going – No
& 002	watersheds to identify any critical subwatersheds	samples collected in
		2020/21
Outfall 009	Compare CM-3 performance before/after rebuilding	On-going - No samples
		collected in 2020/21
Outfall 009	Review as-built plans for ELV or physically inspect BMP to	Completed – Retrofit
	determine if a retrofit is recommended to contain filter	made
	media and prevent washout	
Outfall 009	Maintain check dams in Northern Drainage and remove	Complete – no
	sediment as needed	sediment removal
		required this year
Outfall 009	Evaluate admin area inlet filter performance	Completed –
		Recommended keeping
		inlet filters
Outfall 018	OF018/R-2A pond spillway media filter redesign/rebuild	In progress
	evaluation	
Outfall 018	Collect stormwater samples from DOE RMHF demo area	Completed
	during first two storm events of the 2020/21 rainy season	
	and analyze for the monitoring suite required at Outfall	
	003, the watershed where this area is located.	

Table 13. Summary of 2019/20 Surface Water Expert Panel BMP Recommendations
d. The Expert Panel continues to find that more data are needed to confirm our understanding of sources of recent stormwater exceedances.

Extensive sampling was conducted throughout Outfall 008 and 009 to identify areas with impacted stormwater beginning in 2009. Locations were ranked to prioritize targeting subareas for treatment. From 2008-present, distributed BMPs were designed and installed to treat stormwater from highest priority areas. Additionally, 2008 Interim Source Removal Action (ISRA) removed surface soils high in NPDES exceeding parameters. ISRA excavations were completed in 2010 in the Outfall 008 watershed and 2013 in the Outfall 009 watershed.

Based upon the success of subarea sampling guiding BMP prioritization and placement in the Outfall 008 and 009 watersheds, the Surface Water Expert Panel has initiated a similar process in the Outfall 001 and 002 watersheds. Six subarea monitoring locations were identified and monitored over the 2019/20 reporting year. Due to an unusually dry year, none of the six locations had sampleable flows this year. This subarea monitoring program will be continued in order to gather more results for a robust analysis.

Additional targeted solid and stormwater source sampling is ongoing as well. The Panel will continue to make these findings available in public meetings and annual reports (described in detail in previous Annual Reports Appendix C: Exceeding Constituent Source Investigation).

e. Based on preliminary data collection along Bell Creek, dry weather flows are believed to include flows from the adjacent urban areas (e.g., irrigation overspray) along with alreadydocumented seep/spring flows that originate near the property boundary, while septic effluent may have little or no contribution based on water quality analysis.

In response to concerns expressed by local stakeholders regarding dry weather observed flow along Bell Creek just downstream of SSFL, a dry weather sampling investigation was conducted. Boeing and the Ground Water Expert Panel (GWEP) already have a seep monitoring program, and any dry weather flows at SSFL property boundary originate entirely from seeps or springs. The purpose of the dry weather sampling was to determine if septic effluent or other anthropogenic sources were also contributing to flows along the reach, since significant algae was observed, and the adjacent neighborhood was at least partly unsewered.

On December 23, 2021, surface water was sampled downstream of the Bell Canyon neighborhood properties at the Buckskin Drive bridge during dry weather and analyzed for chemical indicators of septic effluent. Based on a single sample, chemical signatures indicated no significant septic effluent contribution, but field observations did note contributing dry weather urban flows from irrigation overspray.

5 Recommendations

5.1 BMP Recommendations

The following sections outline the proposed BMP recommendations for the Site.

5.1.1 Site-Wide Recommendations

The Expert Panel recommends:

- continuing to involve the Expert Panel on review of all demolition and cleanup SWPPPs site-wide to assess the robustness of the construction BMPs being used during these important projects;
- continuing to monitor the condition of existing erosion and sediment controls and vegetation across the site and repairing or supplementing where needed; and
- moving treated wood utility pole BMPs (wattles, biobags) further from poles to better contain pole-impacted soils.

5.1.2 Outfall 009 Watershed

There were no NPDES exceedances at Outfall 009 in the 2020/21 reporting year, so no new treatment BMPs are recommended in this watershed. Existing BMPs should continue to be observed and repaired as needed.

The Expert Panel recommends observing the newly reconstructed CM-3 to assess its performance over time.

Based on cumulative solids loading calculations, it is estimated that CM-9 has approximately one year until initial maintenance is needed. As such, the Expert Panel recommends that post-storm ponding at CM-9 be closely observed in the coming year to check for indications of clogging.

The Expert Panel recommends continuing to maintain check dams in the Northern Drainage and remove accumulated sediments as needed to preserve their function.

Although the administrative area inlet filters do not appear to be removing lead and dioxins as desired, the Expert Panel has recommended to leave them in place to help as a trash control. All stormwater entering these inlets is conveyed to the lower lot biofilter for additional treatment.

5.2 Monitoring Recommendations

The sections below outline recommendations made by the Expert Panel with respect to stormwater monitoring of potential and existing BMP subareas, continuation of as-needed inspections along the Northern Drainage, and potential additions to the non-industrial source special study.

5.2.1 Stormwater Monitoring

Informed by the data analyses performed above, the Expert Panel recommends the following changes for the 2020/21 stormwater monitoring program, as documented in the *2019/20 Sampling and Analysis Plan (SAP) Updates, Best Management Practice (BMP) Monitoring Program* (Haley & Aldrich, 2019):

• Continue to sample all Outfall 009 BMP performance sites during two events per year. This temporarily reduced sample frequency reflects the reduction in site activities within the Outfall 009 watershed anticipated for next year (e.g., limited ISRA, construction, demolition, etc.

planned). The Panel will revisit all voluntary (i.e., not required by the NPDES Permit) monitoring frequencies when SSFL site remediation activities increase.

- Continue to complete full BMP performance inspection checklists for all BMPs which includes visiting each during every storm event to observe whether there is stormwater discharging and again 72 hours after the end of the rain event to observe if any ponded water remains.
- Continue subarea monitoring in Outfall 001 and 002 watersheds during all runoff-producing storm events to evaluate sources of constituents found in stormwater at these Outfalls.
- Continue to hold off on monitoring at Northern Drainage subarea sampling locations. If a lead exceedance is measured at Outfall 009, reevaluate monitoring at these locations, or at one site downstream of the shooting range.
- Continue to also analyze for the filtered form of each metal when total metals are already being analyzed in Outfall samples as required by the Permit.
- Restart background subarea monitoring during all runoff-producing storm events to evaluate natural background contributions of constituents found in stormwater at these Outfalls.
- Start subarea monitoring in Outfall 011 watershed during all runoff-producing storm events to evaluate stormwater constituent contributions from Area 1 Burn Pit.

5.2.2 Northern Drainage

As specified in the RMMP, 2016/17 was the last year of required geomorphic monitoring. As such, nearterm monitoring and maintenance should focus on NPDES compliance needs only. A continued annual assessment of sediment delivery and erosion along this important reach of drainage is recommended.

5.2.3 Non-Industrial Source Special Study

Initial monitoring activities associated with the Non-Industrial Source Special Study are now completed, as specified in Section 2.4. Additional activities recommended in the 2019/20 Annual Report are either complete, in progress, or planned for the start of the 2021/22 rainy season (Table 9).

The following activities are planned for 2021/22 based on recommendations from the Expert Panel:

- Analysis of lead isotope sampling results to determine if the former shooting range is contributing lead to Outfall 009.
- Wet weather sheet flow sampling upgradient and downgradient of pentachlorophenol (PCP) treated utility poles with and without BMPs (permeable barriers). The objective is to assess the impact of poles on runoff and the effectiveness of BMPs in reducing metals and dioxins.
- Dry weather step-out sampling of soils and paved surfaces upgradient and downgradient of treated wood utility poles. The objective is to determine the area around PCP treated utility poles that is impacted by metals and dioxins, so that BMPs can be effectively implemented.
- Sampling near newly installed fiberglass utility poles in the Southern Buffer to determine if soils remain impacted after replacement.
- Sampling of gross alpha in undeveloped subwatersheds and dioxin in subwatersheds with treated wood poles to better assess background and non-industrial sources to stormwater.

6 Milestones/Schedule

Following BMPs/treatment control implementation, effectiveness of these measures will be evaluated primarily by the results of surface water samples collected at Outfalls, supplemented by any subarea data collected as part of the 2015 Work Plan. These sampling results will continue to be reviewed annually to determine whether additional upgrades or maintenance may be warranted. The following milestones are planned for the remainder of the NPDES Permit term.

<u>2021/22</u>

Future Expert Panel activities will be determined based on requirements of the pending renewed NPDES Permit and Boeing's requests for Expert Panel involvement.

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Appendix A: 2020/21 Reporting Year Sampling and Analysis Plan



HALEY & ALDRICH, INC. 5333 Mission Center Road Suite 300 San Diego, CA 92108 619.280.9210

30 November 2020 File No. 0129095-005

Mr. Peter Zorba National Aeronautics and Space Administration Santa Susana Field Laboratory 5800 Woolsey Canyon Road Canoga Park, California 91304

Mr. Jeffrey Wokurka The Boeing Company Santa Susana Field Laboratory 5800 Woolsey Canyon Road Canoga Park, California 91304

Subject: 2020/2021 Rainy Season Sampling and Analysis Plan (SAP) Updates, Best Management Practice (BMP) Monitoring Program Santa Susana Field Laboratory Canoga Park, California

Dear Mr. Zorba and Mr. Wokurka:

This letter presents the Sampling and Analysis Plan (SAP) updates to the Best Management Practice (BMP) subarea and BMP performance monitoring programs near or within the Outfalls 001, 002, 003 and 009 watersheds at the Santa Susana Field Laboratory (SSFL) for the 2020/2021 rainy season, and serves as an addendum to the 2015/2016 and 2016/2017 rainy season SAPs (MWH Americas, Inc. [MWH], 2015; 2016) and the 2017/2018, 2018/2019, and 2019/2020 SAPs (Haley & Aldrich, 2018a; 2018b; 2019). BMP subarea monitoring is conducted at locations receiving runoff from potential source areas and other infrastructure (e.g., roads, buildings, parking areas) to evaluate the potential for contribution of constituents of concern (COCs) from the potential source areas to stormwater runoff and to identify locations for new BMPs. BMP performance monitoring is conducted at selected structural BMPs (e.g., Lower Parking Lot BMP, B1436 detention bioswales) to assess the effectiveness of the BMPs at promoting sediment settling and improving surface water quality to comply with NPDES benchmarks and permit limits at Outfalls 001, 002, 003, 008, 009, and 018.

The updates to the BMP monitoring program SAP for the 2020/2021 rainy season account for field observations of monitoring locations during the 2019/2020 rainy season and an evaluation of surface water sampling data collected to date and are described below. In addition, attached to this letter are 2020/2021 rainy season versions of the SAP tables and figures as well as standardized BMP inspection forms. The changes described in this letter were developed with input from, and in accordance with, the recommendations from the SSFL Surface Water Expert Panel (Expert Panel) and Geosyntec Consultants (Geosyntec), and were initially presented in the 2019/2020 Site-wide Stormwater Annual Report (Surface Water Expert Panel and Geosyntec Consultants, 2020).

BMP Monitoring Updates

OUTFALL 003

A temporary monitoring location will be added within the Department of Energy (DOE) Radioactive Material Handling Facility (RMHF) demolition area, at the inlet pipe from the RMHF paved area to Tank 28, to monitor demolition activities that began in July 2020.

Sampling at this location will be conducted during the first two rain events of the 2020/2021 rainy season and samples will be analyzed for parameters required by the NPDES Permit at Outfall 003, including a set of annual and routine constituents. The following constituents will be analyzed during both sampling events: TSS, Iron, Manganese, Lead, Dioxins, and Gross Alpha.

BMP SAMPLING ACTIVITIES CONTINUING FROM THE 2019/2020 SAP UPDATES

Subarea monitoring within Outfall 001 and 002 watersheds to evaluate sources of constituents found in stormwater at these outfalls will continue at the following locations for every rain event with sampleable flow: EPSW001BG01, EPSW001IE01, EPSW001PV01, EPSW002BG01, EPSW002IE01, and EPSW002IE02. Sampling is required regardless of whether Outfall 001 or 002 discharge.

Monitoring active BMP performance sites within the Outfall 009 watershed will continue to be conducted twice a year.

- During 2020, it is not essential to sample BMPs unless Outfall 009 discharges. However, if no samples are collected by the end of Fourth Quarter 2020, then BMPs will be sampled during any two rain events in 2021 with sampleable flow.
- All BMPs do not need to be sampled during the same rain event, but influent and effluent samples from a single BMP must be collected during the same event.

If a lead exceedance is measured at Outfall 009, sampling Northern Drainage subarea monitoring locations or one location downstream of the shooting range will be reevaluated.

The lower lot totalizer reading will be recorded after each rain event, as feasible.

BMP INSPECTION FORMS

The BMP inspections will be conducted during every rain event exceeding 0.75 inches of rainfall, and once after the rainy season using the BMP Inspection Forms attached to this SAP. These forms include observations, maintenance needs, and corrective actions and were revised in Fall 2020 to reflect current field conditions. As specified on each form, a standardized framed photo should be taken at the same location, facing the same direction, during each site visit.



2020/2021 Rainy Season SAP Updates, BMP Monitoring Program 30 November 2020 Page 3

72 hours after the end of each rain event exceeding 0.75 inches of rainfall, field crews will also inspect and record maximum ponding levels at locations listed in the Boeing 72 Hours After Rain Event Ponding Inspection Form and NASA 72 Hours After Rain Event Ponding Inspection Form. Both forms are included as Attachments to this SAP. The ponding inspection may occur at a time slightly before or after the 72 hours.

Sincerely yours, HALEY & ALDRICH, INC.

Walkour Relille

Katherine Miller Project Manager

Nancy E. Dardi

Nancy E. Gardiner, CPESC, QSD, QISP Program Manager



2020/2021 Rainy Season SAP Updates, BMP Monitoring Program 30 November 2020 Page 4

Enclosures:

References

Table I – BMP Monitoring Inspection Locations and Analytical Plan, 2020/2021 Rainy Season

Figure 1 – Outfall 009, BMP Monitoring Locations

Figure 2 – Outfall 009, B-1 and Lower Parking Lot Areas – Boeing

Figure 3 – Outfall 009, IEL Area – Boeing

Figure 4 – Outfall 009, AILF Area – Boeing

Figure 5 – Outfall 009, CMs South of LOX Area – NASA

Figure 6 – Outfall 009, A2LF, CM-1, and Helipad Areas – NASA

Figure 7 – Outfall 009, ELV Area – NASA

Figure 8 – Outfall 001 and 002 BMP Monitoring Locations

Figure 9 – Outfall 001, Potential BMP Subarea

Figure 10– Outfall 001, Potential BMP Subarea

Figure 11 – Outfall 002, Potential BMP Subarea

Figure 12 – Outfall 002, Potential BMP Subarea

Figure 13 – Outfall 002, Potential BMP Subarea

Figure 14 – Outfall 003 and Phase 1 Demolition Boundary at RMHF

BMP Inspection Forms – Outfalls 008 and 009 – Boeing

BMP Inspection Forms – Outfall 009 – NASA

Boeing 72 Hours After Rain Event Ponding Inspection Form

NASA 72 Hours After Rain Event Ponding Inspection Form

Sample Collection Forms

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TABLES

TABLE IBMP MONITORING INSPECTION LOCATIONS AND ANALYTICAL PLAN2020/2021 RAINY SEASONSANTA SUSANA FIELD LABORATORYCANOGA PARK, CALIFORNIA

Object ID	Sampling Responsibility	Location	Areas Monitored	Purpose	Notes	Sample Frequency	Cd, Cu, Pb (Total Dissolved) (Method 200.7/200.8) Hg (Total Dissolved) (Method 245.1) Cd, Cu, Pb (Total Recoverable) Hg (Total Recoverable) Hg (Total Recoverable)	Dioxins (Method 1613)	Total Suspended Solids (Method 2540)	Particle Size Distribution (Method ASTM D422)	Turbidity (Method 180.1)	As, Cd, Cu, Fe, Pb, Mn, Se, Zn (Total Dissolved) (Method 200.7/200.8) Hg (Total Dissolved) (Method 245.1)	As, Cd, Cu, Fe, Pb, Mn, Se, Zn (Total Recoverable) (Method 200.7/200.8) Hg (Total Recoverable) (Method 245.1)	504 (Method 300)	Gross Alpha (Total Dissolved) (Method 900.0)	Gross Alpha (Total Recoverable) (Method 900.0)	Outfall 003 NPDES permit-required constituents ¹
A1BMP0002	Boeing	AILF	CM-9, AILF	US South, Treatment BMP Performance Monitoring	AILF tributary drainage	Twice a year	x x	х	х	х							
A1BMP0003	Boeing	AILF	CM-9, AILF, IEL, Area II Road	DS, Treatment BMP Performance Monitoring	CM-9 underdrain	Twice a year	x x	х	х	х							
A2BMP0006	NASA	CM-1	CM-1	US East, Treatment BMP Performance Monitoring	CM-1 eastern tributary drainage	Twice a year	x x	х	х	х							
A2BMP0007	NASA	CM-1	CM-1	DS, Treatment BMP Performance Monitoring	CM-1 culvert outlet	Twice a year	x x	х	х	х							
A2BMP0012	NASA	CM-1	CM-1, Area II Road	US, Treatment BMP Performance Monitoring	Outlet pipe south side of road	Twice a year	x x	х	х	х	х						
B1BMP0009	Boeing	B-1	B-1 Upper Parking Lot Media Filter	US North, Treatment BMP Performance Monitoring	Gunite swale conveying road runoff	Twice a year	x x	х	х	х							
B1BMP0010	Boeing	B-1	B-1 Upper Parking Lot Media Filter	US South, Treatment BMP Performance Monitoring	Culvert outlet from upper parking lot area	Twice a year	x x	х	х	х							
B1BMP0011	Boeing	B-1	B-1 Upper Parking Lot Media Filter	DS, Treatment BMP Performance Monitoring	Underdrains	Twice a year	x x	х	х	х							
EVBMP0001	NASA	ELV	ELV, Helipad	ELV Treatment BMP Overflow Monitoring	Culvert inlet; runoff will only be present when rain events exceed ELV BMP design storm	Twice a year	x x	х	х	х	х						
EVBMP0003	NASA	CM-1	CM-1, Area II Road	US West, Treatment BMP Performance Monitoring	Sheetflow along Area II Road upstream of sandbag berm	Twice a year	x x	х	х	х							
EVBMP0007	NASA	ELV	ELV Treatment BMP	US, Treatment BMP Performance Monitoring	Sample port in BMP influent pipe prior to "T" connection	Twice a year	x x	х	х	x							
EVBMP0008	NASA	ELV	ELV Treatment BMP	DS, Treatment BMP Performance Monitoring	Discharge from media filter tank pipe	Twice a year	x x	х	х	х	х						
EVBMP0009	NASA	ELV	ELV Treatment BMP	Mid-Point Treatment BMP Performance Monitoring	Composite of samples from eastern and western sample ports between settling tanks and media filter	Twice a year	x x	х	х	х	х						
ILBMP0002	Boeing	AILF	CM-9, IEL, Area II Road	US East, Treatment BMP Performance Monitoring	Culvert inlet off Area II Road	Twice a year	x x	х	х	х							
ILBMP0004	Boeing	IEL	B1436 Southern Detention Bioswale	US, Treatment BMP Performance Monitoring	Concrete swale (western) diverting sheetflow into rock crib	Twice a year	x x	х	х	х							
ILBMP0005	Boeing	IEL	B1436 Southern Detention Bioswale	DS, Treatment BMP Performance Monitoring	Bioswale underdrain (subsurface 12- inch drain connecting to existing culvert)	Twice a year	X* X*	Х*	х	х							
ILBMP0008	Boeing	IEL	B1436 Southern Detention Bioswale	US, Treatment BMP Performance Monitoring	Concrete swale (eastern) diverting sheetflow into rock crib	Twice a year	x x	х	х	х							
ILBMP0009	Boeing	Administration bldgs. area	Administration buildings area filter basket	Filter basket BMP Performance Monitoring	Influent (upstream) filter basket sample	Twice a year	x x	х	х	x							
ILBMP0010	Boeing	Administration bldgs. area	Administration buildings area filter basket	Filter basket BMP Performance Monitoring	Effluent (downstream) filter basket sample	Twice a year	x x	х	х	x							
LPBMP0002	Boeing	Lower Parking Lot	Lower Parking Lot BMP	US, Treatment BMP Performance Monitoring	Sample port in cistern discharge pipe	Twice a year	x x	х	х	х							
LPBMP0003	Boeing	Lower Parking Lot	Lower Parking Lot BMP	Mid-Point Treatment BMP Performance Monitoring	Sediment Basin outlet box	Twice a year	x x	х	x	x							
LPBMP0004	Boeing	Lower Parking Lot	Lower Parking Lot BMP	DS Treatment BMP Performance Monitoring	Discharge from Biofilter effluent pipe	Twice a year	x x	х	х	x							
LXBMP0010	Boeing	CM-3	Service Area Road BMP	US, Treatment BMP Performance Monitoring	Outlet pipe south side of road	Twice a year	x x	х	х	x							
LXBMP0011	Boeing	CM-3	Service Area Road BMP	US, Treatment BMP Performance Monitoring	Natural drainage upstream of CM-3	Twice a year	x x	х	х	x							
LXBMP0012	Boeing	CM-3	Service Area Road BMP	DS, Treatment BMP Performance Monitoring	Underdrains	Twice a year	x x	х	х	x							
EPSW001BG01	Boeing	OF001 Watershed	Background (natural unimpacted areas)	Potential BMP Location	Located at the low spot along Bell Canyon Road and north of the road leading to Outfall 001.	Every Storm		х	х			х	x	х	х	х	
EPSW001IE01	Boeing	OF001 Watershed	Impacted Soils Evaluation (A1BP, CTL-V)	Potential BMP Location	At the bottom of the hill to the north of the intersection of the Southern Buffer Zone Road and Outfall 001 Road.	Every Storm		х	х			х	x	х	х	х	
EPSW001PV01	Boeing	OF001 Watershed	Background (with paved areas)	Potential BMP Location	South side of the road heading towards Outfall 001 at the intersection of Outfall 001 road and Bell Canyon Road.	Every Storm		х	х			х	х	х	х	х	
EPSW002BG01	Boeing	OF002 Watershed	Natural Background	Potential BMP Location	Located past the second water guzzler just before the steep incline into Outfall 002. Road delineator to the west of culvert.	Every Storm		х	x			x	x	х	x	х	

TABLE I BMP MONITORING INSPECTION LOCATIONS AND ANALYTICAL PLAN 2020/2021 RAINY SEASON SANTA SUSANA FIELD LABORATORY CANOGA PARK, CALIFORNIA

Object ID	Sampling Responsibility	Location	Areas Monitored	Purpose	Notes	Sample Frequency	Cd, Cu, Pb (Total Dissolved) (Method 200.7/200.8) Hg (Total Dissolved) (Method 245.1)	Cd, Cu, Pb (Total Recoverable) (Method 200.7/200.8) Hg (Total Recoverable) (Method 245.1)	Dioxins (Method 1613)	Total Suspended Solids (Method 2540)	Particle Size Distribution (Method ASTM D422)	Turbidity (Method 180.1)	As, Cd, Cu, Fe, Pb, Mn, Se, Zn (Total Dissolved) (Method 200.7/200.8) Hg (Total Dissolved) (Method 245.1)	As, Cd, Cu, Fe, Pb, Mn, Se, Zn (Total Recoverable) (Method 200.7/200.8) Hg (Total Recoverable) (Method 245.1)	SO4 (Method 300)	Gross Alpha (Total Dissolved) (Method 900.0)	Gross Alpha (Total Recoverable) (Method 900.0)	Outfall 003 NPDES permit-required constituents ¹
EPSW002IE01	Boeing	OF002 Watershed	Impacted Soils Evaluation (STL-IV)	Potential BMP Location	At STLV-IV. Immediately past the gates to the south east; adjacent to the new telephone pole.	Every Storm			х	х			х	х	х	x	х	
EPSW002IE02	Boeing	OF002 Watershed	Impacted Soils Evaluation (Coca)	Potential BMP Location	Located along the Southern Buffer Zone Road at the culvert inlet on the north side of the road. Approximately 400 feet east of the turnout.	Every Storm			х	х			x	х	x	x	х	
RMHF0001	Boeing	OF003 Watershed	Phase 1 Demolition Boundary at RMHF	Demolition Monitoring	Sample port is located at the inlet pipe from the RMHF paved area that leads to Tank 28 in Area IV.	First 2 Storms			х	х			X ²	X ²		х	х	х

Notes: * Collect one equipment blank per sampling day from the equipment used to sample the B1436 Detention Bioswales downstream monitoring location (under drains) and place on hold for metals and dioxins analysis; the analyses will be performed if unusual results are reported for primary samples. The EB sample ID will be based on the ID of the primary sample collected immediately before collecting the equipment blank, and will either be ILQW0005_yyyymmdd or ILQW0007_yyyymmdd.

¹ Outfall 003 NPDES permit-required constituents will only be analyzed according to the frequency stated in Table E-2b of the permit during the first 2 storm events (between July 1, 2020 - June 30, 2021).

All other constituents marked for analysis at RMHF0001 will be analyzed during both sampling events regardless of the frequency stated in the permit.

² Only Iron, Lead, and Manganese.

Abbreviations:

CM - Culvert Modification

DS - Downstream

RMHF = Radioactive Materials Handling Facility

US - Upstream X = Collect and Analyze

FIGURES



		CULVERT MODIFICATION (CM)
		UPSTREAM BMP PERFORMANCE MONITORING LOCATION
	\bigotimes	DOWNSTREAM BMP PERFORMANCE MONITORING LOCATION
	\triangle	MIDPOINT BMP PERFORMANCE MONITORING LOCATION
	۲	PREVIOUS BMP PERFORMANCE MONITORING LOCATION
	\triangle	POTENTIAL BMP PERFORMANCE MONITORING LOCATION
	\bigcirc	ACTIVE NPDES OUTFALL
	\bigcirc	FORMER NPDES OUTFALL
	۲	PREVIOUS SPECIAL STUDIES AND OTHER SAMPLING LOCATIONS
		DRAINAGE
_		SURFACE WATER DIVIDE
		EROSION CONTROL FABRIC/LINER
		ISRA EXCAVATION BOUNDARY
		FORMER ISRA EXCAVATION BOUNDARY
		ADMINISTRATIVE AREA BOUNDARY
		STUDY AREA
-		SSFL PROPERTY BOUNDARY

- 1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
- 2. SAP = SAMPLING AND ANALYSIS PLAN
- 3. BMP = BEST MANAGEMENT PRACTICE
- 4. AERIAL IMAGERY SOURCE: CIRGIS





	CULVERT MODIFICATION (CM)
	UPSTREAM BMP PERFORMANCE MONITORING LOCATION
\bigotimes	DOWNSTREAM BMP PERFORMANCE MONITORING LOCATION
	MIDPOINT BMP PERFORMANCE MONITORING LOCATION
۲	PREVIOUS BMP PERFORMANCE MONITORING LOCATION
	PREVIOUS SPECIAL STUDIES AND OTHER SAMPLING LOCATIONS
\oplus	24" STORM DRAIN
	DRAINAGE
	SURFACE WATER DIVIDE
	CONVEYANCE PIPELINE
	ASPHALT CURB
	ROLLING AC BERM
	STORM DRAIN (ESTIMATED SUBSURFACE TRACE)
_	STORM DRAIN INFERRED
	ASPHALT/CONCRETE REMOVAL AREA
	DETENTION BIOSWALE
	ENGINEERED NATURAL TREATMENT SYSTEM
	ROCK CRIB SWALE
	SEDIMENTAION BASIN
	ISRA EXCAVATION BOUNDARY
	ADMINISTRATIVE AREA BOUNDARY
	STUDY AREA
	SSFL PROPERTY BOUNDARY

- 1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
- 2. SAP = SAMPLING AND ANALYSIS PLAN
- 3. BMP = BEST MANAGEMENT PRACTICE
- 4. AERIAL IMAGERY SOURCE: CIRGIS





	UPSTREAM BMP PERFORMANCE MONITORING LOCATION
\diamond	DOWNSTREAM BMP PERFORMANCE MONITORING LOCATION
۲	PREVIOUS BMP PERFORMANCE MONITORING LOCATION
\oplus	24" STORM DRAIN
	SURFACE WATER DIVIDE
	ROLLING AC BERM
	ASPHALT/CONCRETE REMOVAL AREA
	DETENTION BIOSWALE
	ROCK CRIB SWALE
	ISRA EXCAVATION BOUNDARY
	STUDY AREA

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- 3. BMP = BEST MANAGEMENT PRACTICE
- 4. AERIAL IMAGERY SOURCE: CIRGIS





LEGEND CULVERT MODIFICATION (CM) UPSTREAM BMP PERFORMANCE MONITORING LOCATION ٢ DOWNSTREAM BMP PERFORMANCE MONITORING LOCATION \bigcirc PREVIOUS BMP PERFORMANCE MONITORING LOCATION ----- DRAINAGE - - - SURFACE WATER DIVIDE CONVEYANCE PIPELINE ASPHALT/CONCRETE REMOVAL AREA ROCK CRIB SWALE ISRA EXCAVATION BOUNDARY FORMER ISRA EXCAVATION BOUNDARY T STUDY AREA SSFL PROPERTY BOUNDARY

- 1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
- 2. SAP = SAMPLING AND ANALYSIS PLAN
- 3. BMP = BEST MANAGEMENT PRACTICE
- 4. AERIAL IMAGERY SOURCE: CIRGIS





	CULVERT MODIFICATION (CM)
	UPSTREAM BMP PERFORMANCE MONITORING LOCATION
\diamond	DOWNSTREAM BMP PERFORMANCE MONITORING LOCATION
	PREVIOUS BMP PERFORMANCE MONITORING LOCATION
	PREVIOUS SPECIAL STUDIES AND OTHER SAMPLING LOCATIONS
	DRAINAGE
	ROCK CRIB SWALE
	ISRA EXCAVATION BOUNDARY
	FORMER ISRA EXCAVATION BOUNDARY
	STUDY AREA
	ADMINISTRATIVE AREA BOUNDARY

- 1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
- 2. SAP = SAMPLING AND ANALYSIS PLAN
- 3. BMP = BEST MANAGEMENT PRACTICE
- 4. AERIAL IMAGERY SOURCE: CIRGIS





	CULVERT MODIFICATION (CM)
	UPSTREAM BMP PERFORMANCE MONITORING LOCATION
\diamond	DOWNSTREAM BMP PERFORMANCE MONITORING LOCATION
۲	PREVIOUS BMP PERFORMANCE MONITORING LOCATION
\triangle	POTENTIAL BMP PERFORMANCE MONITORING LOCATION
\bigcirc	ACTIVE NPDES OUTFALL
	PREVIOUS SPECIAL STUDIES AND OTHER SAMPLING LOCATIONS
	DRAINAGE
	CONVEYANCE PIPELINE
	ROCK CRIB SWALE
	EROSION CONTROL FABRIC/LINER
	ISRA EXCAVATION BOUNDARY
	FORMER ISRA EXCAVATION BOUNDARY
	STUDY AREA
	ADMINISTRATIVE AREA BOUNDARY
	SSFL PROPERTY BOUNDARY

- 1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
- 2. SAP = SAMPLING AND ANALYSIS PLAN
- 3. BMP = BEST MANAGEMENT PRACTICE
- 4. AERIAL IMAGERY SOURCE: CIRGIS





	UPSTREAM BMP PERFORMANCE MONITORING LOCATION
\bigotimes	DOWNSTREAM BMP PERFORMANCE MONITORING LOCATION
\triangle	MIDPOINT BMP PERFORMANCE MONITORING LOCATION
۲	PREVIOUS BMP PERFORMANCE MONITORING LOCATION
\triangle	POTENTIAL BMP PERFORMANCE MONITORING LOCATION
	DRAINAGE
	CONVEYANCE PIPELINE
	ROCK CRIB SWALE
	SEDIMENTAION BASIN

ISRA EXCAVATION BOUNDARY

STUDY AREA

- 1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
- 2. SAP = SAMPLING AND ANALYSIS PLAN
- 3. BMP = BEST MANAGEMENT PRACTICE
- 4. AERIAL IMAGERY SOURCE: CIRGIS







- ACTIVE NPDES OUTFALL
- FORMER NPDES OUTFALL
- ----- DRAINAGE
- - SURFACE WATER DIVIDE
 - STUDY AREA
 - ADMINISTRATIVE AREA BOUNDARY
 - SSFL PROPERTY BOUNDARY

- 1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
- 2. SAP = SAMPLING AND ANALYSIS PLAN
- 3. BMP = BEST MANAGEMENT PRACTICE
- 4. AERIAL IMAGERY SOURCE: CIRGIS







A POTENTIAL BMP PERFORMANCE MONITORING LOCATION

----- DRAINAGE

- 1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
- 2. SAP = SAMPLING AND ANALYSIS PLAN
- 3. BMP = BEST MANAGEMENT PRACTICE
- 4. AERIAL IMAGERY SOURCE: CIRGIS





- A POTENTIAL BMP PERFORMANCE MONITORING LOCATION
- ----- DRAINAGE



ADMINISTRATIVE AREA BOUNDARY

- 1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
- 2. SAP = SAMPLING AND ANALYSIS PLAN
- 3. BMP = BEST MANAGEMENT PRACTICE
- 4. AERIAL IMAGERY SOURCE: CIRGIS







A POTENTIAL BMP PERFORMANCE MONITORING LOCATION

----- DRAINAGE

- 1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
- 2. SAP = SAMPLING AND ANALYSIS PLAN
- 3. BMP = BEST MANAGEMENT PRACTICE
- 4. AERIAL IMAGERY SOURCE: CIRGIS







----- DRAINAGE



ADMINISTRATIVE AREA BOUNDARY

- 1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
- 2. SAP = SAMPLING AND ANALYSIS PLAN
- 3. BMP = BEST MANAGEMENT PRACTICE
- 4. AERIAL IMAGERY SOURCE: CIRGIS





- A POTENTIAL BMP PERFORMANCE MONITORING LOCATION
- ----- DRAINAGE



- 1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
- 2. SAP = SAMPLING AND ANALYSIS PLAN
- 3. BMP = BEST MANAGEMENT PRACTICE
- 4. AERIAL IMAGERY SOURCE: CIRGIS





	SAMPLE BOX
AS	AUTO SAMPLER
MB	MEDIA BED
F	FLOW METER TOTALIZER
(SP)	SUBMERSIBLE PUMP
	DRAIN
	UPSTREAM BMP PERFORMANCE MONITORING LOCATION
\bigcirc	ACTIVE NPDES OUTFALL
\asymp	FLUME
	P-DRNS
	CHECK DAM
	DEMOLITION BOUNDARY
	PIPELINE
×	FENCE
	SURFACE WATER DIVIDE
	NATURAL DRAINAGE
	SURFACE WATER FLOW DIRECTION
	SWALE
૾ૢૼ૾૱ૼ૱	GRAVEL
0000	RIP RAP
	MEDIA FILTER
	EXISTING BUILDING/STRUCTURE
	AWNING
<u> </u>	ADMINISTRATIVE AREA BOUNDARY
IOTES	
. ALL LO	CATIONS AND DIMENSIONS ARE APPROXIMATE.

- 2. ALL THE BMPs SHOWN ON THE FIGURE ARE EXISTING.
- 3. AERIAL IMAGERY SOURCE: CIRGIS



ALDRICH 2020/2021 RAINY SEASON MAP BMP MONITORING PROGRAM THE BOEING COMPANY

> OUTFALL 003 AND PHASE 1 DEMOLITION BOUNDARY AT RADIOACTIVE MATERIALS HANDLING FACILITY (RMHF)

SCALE IN FEET

NOVEMBER 2020

FIGURE 14

160

Happy Valley - Road Leading Down to Lower BMP Area BMP Performance Inspection Checklist

Client	The Boeing Company	Inspection Date
Project Name	Santa Susana	Inspector Name
County	Ventura County	Inspector Company
State	California	Project Manager
Inspection Type(s)	Stormwater Inspection	Precip. Present

Happy Valley - Road Leading Down to Lower BMP Area

Inspection Status: Conducted/Not Conducted

Inspection Checklist Questions:	Inspection Answers:
During Rain Event Inspection	
Any odors, suspended materials, floating material, etc. observed?	No/Yes/NA with comment
Are erosion/sediment controls in good condition?	No/Yes/NA with comment
Is the road leading down to BMP area free of erosion?	No/Yes/NA with comment
Are rip rap berms free of sediment/debris?	No/Yes/NA with comment
Are upstream areas free of erosion or sediment?	No/Yes/NA with comment
72 Hours After the End of the Rain Event Inspection	
Any odors, suspended materials, floating material, etc. observed?	No/Yes/NA with comment
Are erosion/sediment controls in good condition?	No/Yes/NA with comment
Is the road leading down to BMP area free of erosion?	No/Yes/NA with comment
Are rip rap berms free of sediment/debris?	No/Yes/NA with comment

Are upstream areas free of erosion or sediment?

Corrective action identified during this inspection event: No/Yes/NA with comment

No/Yes/NA with comment

Happy Valley - Road Leading Down to Lower BMP Area BMP Performance Inspection Checklist

Client Project Name County State Inspection Type(s) The Boeing Company Santa Susana Ventura County California Stormwater Inspection Inspection Date Inspector Name Inspector Company Project Manager Precip. Present

Insert photo here

Insert photo here

Photo LBMP-1: Overview of HVS Lower BMP Area (from top of road east)

Photo LBMP-2: Overview of HVS Lower BMP Area (from top of road west)

General Comments:

Signature

Client Project Name County State Inspection Type(s) The Boeing Company Santa Susana Ventura County California Stormwater Inspection Inspection Date Inspector Name Inspector Company Project Manager Precip. Present

OF008

Inspection Status: Conducted/Not Conducted

Inspection Checklist Questions:	Inspection Answers:
During Rain Event Inspection	
Any odors, suspended materials, floating material, etc. observed?	No/Yes/NA with comment
Are erosion/sediment controls in good condition?	No/Yes/NA with comment
Are upstream areas free of erosion or sediment?	No/Yes/NA with comment
72 Hours After the End of the Rain Event Inspection	
Any odors, suspended materials, floating material, etc. observed?	No/Yes/NA with comment

Are erosion/sediment controls in good condition?No/Yes/NA with commentAre upstream areas free of erosion or sediment?No/Yes/NA with comment

Corrective action identified during this inspection event: No/Yes/NA with comments

General Comments:

Client Project Name County State Inspection Type(s) The Boeing Company Santa Susana Ventura County California Stormwater Inspection OF008 BMP Performance Inspection Checklist

Inspection Date Inspector Name Inspector Company Project Manager Precip. Present

Insert photo here

Insert photo here

Photo OF008-1: HVS Drainage and Tributary Drainage Overview (looking north) Photo OF008-2: Outfall 008 Overview

Insert photo here

Photo OF008-3: Tributary Drainage Check Dams

General Comments:

Signature

OF009 ADMINISTRATION BUILDING AREA

BMP Performance Inspection Checklist

Client	The Boeing Company	Inspection Date
Project Name	Santa Susana	Inspector Name
County	Ventura County	Inspector Company
State	California	Project Manager
Inspection Type(s)	Stormwater Inspection	Precip. Present

OF009 Administration Building Area	Inspection Status:	Conducted/Not Conducted		
Inspection Checklist Questions:		Inspection Answers:		
During Rain Event Inspection				
Any odors, suspended materials, floating material, etc. observed?		No/Yes/NA with comment		
Is any short-circuiting present around the lip of the filter basket?		No/Yes/NA with comment		
72 Hours After the End of the Rain Event Inspection				
Any odors, suspended materials, floating material, etc. observed?		No/Yes/NA with comment		
Is ponded water observed in filter basket?		No/Yes/NA with comment		

Corrective action identified during this inspection event: No/Yes/NA with comment

OF009 ADMINISTRATION BUILDING AREA BMP Performance Inspection Checklist

Client	The Boeing Company	Inspection Date
Project Name	Santa Susana	Inspector Name
County	Ventura County	Inspector Company
State	California	Project Manager
Inspection Type(s)	Stormwater Inspection	Precip. Present

Insert photo here

Insert photo here

Photo OF 009 Filter Basket Overview

Photo 1: ILBMP0009-1: Filter Basket Influent

Insert photo here

Photo 2: ILBMP0010-1: Filter Basket Effluent

General Comments:
OF009 Lower Parking Lot BMP Performance Inspection Checklist

Client	The Boeing Company
Project Name	Santa Susana
County	Ventura County
State	California
Inspection Type(s)	Stormwater Inspection

Inspection Date Inspector Name Inspector Company Project Manager Precip. Present

OF009 Lower Parking Lot

-- ...

Inspection Status: **Conducted/Not Conducted**

Inspection Checklist Questions:	Inspection Answers:
During Rain Event Inspection	
Any odors, suspended materials, floating material, etc. observed?	No/Yes/NA with comment
Are erosion/sediment controls in good condition?	No/Yes/NA with comment
Is the area near or along the cistern drain inlet clear of unwanted sediment/debris?	No/Yes/NA with comment
Is runoff along the 24-inch drain being diverted by the low flow diversion weir to the	No/Yes/NA with comment
cistern?	
Is the gravel area/gravel bag berm (north of fence) in good condition?	No/Yes/NA with comment
Is the wood retaining wall in good condition?	No/Yes/NA with comment
Are upstream areas free of erosion or sediment?	No/Yes/NA with comment
What is the approximate depth of water present in the low flow diversion structure?	No/Yes/NA with comment

No/Yes/NA with comment
No/Yes/NA with comment

Client Project Name County State Inspection Type(s) The Boeing Company Santa Susana Ventura County California Stormwater Inspection

OF009 Lower Parking Lot BMP Performance Inspection Checklist

Inspection Date Inspector Name Inspector Company Project Manager Precip. Present

Insert photo here

Insert photo here

Photo LPL-1: Cistern area

Photo LPL-2: Looking down into low flow diversion structure

Insert photo here

Photo LPL-3: Grated inlet and concrete curb

Dhoto I DI 4. Mandar setaining

General Comments:

Insert photo here

Photo LPL-4: Wooden retaining wall

Client Project Name County State Inspection Type(s) The Boeing Company Santa Susana Ventura County California Stormwater Inspection

OF009 Lower Parking Lot BMP Performance Inspection Checklist

Inspection Date Inspector Name Inspector Company Project Manager Precip. Present

Insert photo here

Insert photo here

Photo 17: LPBMP0002: Lower Lot Area, Upstream BMP; Sample Port in Cistern Discharge Pipe Photo 18: LPBMP0002: Lower Lot Area, Upstream BMP; Sample Port in Cistern Discharge Pipe

Insert photo here

Insert photo here

Photo 19: LPBMP0003: Lower Lot Area, Mid-Point Lower Lot BMP; Sediment Basin Outlet Box Photo 20: LPBMP0003: Lower Lot Area, Mid-Point Lower Lot BMP; Sediment Basin Outlet Box

General Comments:

The Boeing Company Santa Susana

Project Name County State Inspection Type(s)

Client

The Boeing Company Santa Susana Ventura County California Stormwater Inspection

OF009 Lower Parking Lot BMP Performance Inspection Checklist

Inspection Date Inspector Name Inspector Company Project Manager Precip. Present

Insert photo here

Insert photo here

Photo 21: LPBMP0004: Lower Lot Area, Downstream Lower Lot Treatment BMP; Discharge from Biofilter Effluent Pipe Photo 22: LPBMP0004: Lower Lot Area, Downstream Lower Lot Treatment BMP; Discharge from Biofilter Effluent Pipe

General Comments:

OF009 Sediment Basin BMP Performance Inspection Checklist

The Boeing Company
Santa Susana
Ventura County
California
Stormwater Inspection

Inspection Date Inspector Name Inspector Company Project Manager Precip. Present

OF009 Sediment Basin

Inspection Status: Conducted/Not Conducted

No/Yes/NA with comment

Inspection Checklist Questions:	Inspection Answers:
During Rain Event Inspection	
Any odors, suspended materials, floating material, etc. observed?	No/Yes/NA with comment
Are erosion/sediment controls in good condition?	No/Yes/NA with comment
Is there overflow into the lower lot?	No/Yes/NA with comment
If above is YES, please record a video.	N/A
72 Hours After the End of the Rain Event Inspection	
Any odors, suspended materials, floating material, etc. observed?	No/Yes/NA with comment
Are erosion/sediment controls in good condition?	No/Yes/NA with comment
Is the outlet box clear of unwanted sediment/debris?	No/Yes/NA with comment

Is there ponded water in the Sediment Basin?

If above is YES, note approximate depth to water from top of outlet box No/Yes/NA with comment

OF009 Sediment Basin BMP Performance Inspection Checklist

Client Project Name County State Inspection Type(s) The Boeing Company Santa Susana Ventura County California Stormwater Inspection Inspection Date Inspector Name Inspector Company Project Manager Precip. Present

Insert photo here

Insert photo here

Photo SB-1: Sediment Basin Overview

Photo SB-2: Inside Sediment Basin Riser Structure

General Notes:

Client Project Name County State Inspection Type(s) The Boeing Company Santa Susana Ventura County California Stormwater Inspection Inspection Date Inspector Name Inspector Company Project Manager Precip. Present

Inspection Status: Conducted/Not Conducted

Inspection Checklist Questions:	Inspection Answers:
During Rain Event Inspection	
Any odors, suspended materials, floating material, etc. observed?	No/Yes/NA with comment
Are erosion/sediment controls in good condition?	No/Yes/NA with comment
Are upstream areas free of erosion or sediment?	No/Yes/NA with comment
Is there flow overtopping the riser structure?	No/Yes/NA with comment
If above is YES, does the underdrain appear to be constricted?	No/Yes/NA with comment
If above is YES, please record a video.	N/A
Is there flow in the riser structure?	No/Yes/NA with comment
72 Hours After the End of the Rain Event Inspection	
Any odors, suspended materials, floating material, etc. observed?	No/Yes/NA with comment
Are erosion/sediment controls in good condition?	No/Yes/NA with comment
Are upstream areas free of erosion or sediment?	No/Yes/NA with comment
Are underdrain(s) clear of unwanted sediment/debris?	No/Yes/NA with comment
Are underurantity dear of unwanted sediment/debris:	Noj resj NA with comment

Is there ponded water in the Biofilter? No/Yes/NA with comment If above is YES, record approximate depth from top of riser structure under Depth comments Are percolation holes in the concrete apron (at the sediment basin effluent pipe) No/Yes/NA with comment

clear of unwanted sediment/debris?

Client Project Name County State Inspection Type(s) The Boeing Company Santa Susana Ventura County California Stormwater Inspection Inspection Date Inspector Name Inspector Company Project Manager Precip. Present

Insert photo here

Insert photo here

Photo BF-1: Sediment Basin Discharge Pipe

Insert photo here

Photo BF-3: Biofilter Discharge Pipe

Signature

Photo BF-2: Biofilter Overview

Insert photo here

Photo BF-4: Biofilter Outlet Structure

General Notes:

OF009 BIOFILTER

BMP Performance Inspection Checklist

Client Project Name County State Inspection Type(s) The Boeing Company Santa Susana Ventura County California Stormwater Inspection

Inspection Date Inspector Name Inspector Company Project Manager Precip. Present

OF009 CM-9 AILF Area	Inspection Status:	Conducted/Not Conducted
Inspection Checklist Questions:		Inspection Answers:
During Rain Event Inspection		
Any odors, suspended materials, floating material, etc. observed?		No/Yes/NA with comment
Are erosion/sediment controls in good condition?		No/Yes/NA with comment
Are upstream areas free of erosion or sediment?		No/Yes/NA with comment
Is there flow overtopping the weir board?		No/Yes/NA with comment
If above is YES, does the underdrain appear to be constricted?		No/Yes/NA with comment
If above is YES, please record a video.		N/A
Is the upstream perforated pipeline draining properly?		No/Yes/NA with comment
Is the culvert basin clear of unwanted sediment/debris?		No/Yes/NA with comment
If above is NO, note approximate depth		Depth
Is the inlet swale along Area II Road clear of unwanted sediment/	debris?	No/Yes/NA with comment
Is rip rap berm clear of unwanted sediment/debris?		No/Yes/NA with comment
Is any water observed coming out of landfill slope?		No/Yes/NA with comment
Does the CM-9 discharge pipe (north of Area II Road) show any ac	dditional signs of	No/Yes/NA with comment
erosion?		
72 Hours After the End of the Rain Event Inspection		
Any odors, suspended materials, floating material, etc. observed?		No/Yes/NA with comment
Are erosion/sediment controls in good condition?		No/Yes/NA with comment
Are upstream areas free of erosion or sediment?		No/Yes/NA with comment
Are underdrain(s) clear of unwanted sediment/debris?		No/Yes/NA with comment
Is weir board filter fabric in good condition?		No/Yes/NA with comment
Is the culvert basin clear of unwanted sediment/debris?		No/Yes/NA with comment
If above is NO, note approximate depth		Depth
Is a recent high-water mark visible on weir boards?		No/Yes/NA with comment
If above is YES, note approximate depth from top of weir boards		Depth
Is water ponded in front of weir boards?		No/Yes/NA with comment
If above is YES, note approximate depth from top of weir boards		Depth
Is the inlet swale along Area II Road clear of unwanted sediment/	debris?	No/Yes/NA with comment
Is rip rap berm clear of unwanted sediment/debris?		No/Yes/NA with comment
Does the CM-9 discharge pipe (north of Area II Road) show any ac erosion?	dditional signs of	No/Yes/NA with comment

Corrective action identified during this inspection event: No/Yes/NA with comment

Client Project Name County State Inspection Type(s) The Boeing Company Santa Susana Ventura County California Stormwater Inspection

OF009 CM-9 AILF Area BMP Performance Inspection Checklist

Inspection Date Inspector Name Inspector Company Project Manager Precip. Present

Insert photo here

Insert photo here

Photo CM9-1: Asphalt Swale Inlet from Area 2 Road – ILBMP0002

Photo CM9-2a: CM-9 Basin Overview (Upstream)

Insert photo here

Insert photo here

Photo CM9-2b: CM-9 Basin Overview (Towards Weir Boards) Photo CM9-3a: Along Perforated Pipeline (upstream)

General Notes:

Client Project Name County State Inspection Type(s) The Boeing Company Santa Susana Ventura County California Stormwater Inspection Inspection Date Inspector Name Inspector Company Project Manager Precip. Present

Insert photo here

Insert photo here

Photo CM9-3b: Along Perforated Pipeline (downstream)

Insert photo here

Photo CM9-4b: Rip Rap Berm (downstream)

Photo CM9-4a: Rip Rap Berm (upstream)

Insert photo here

Photo 17: A1BMP0002: CM-9 Area, Upstream (South), CM-9 BMPs

General Notes:

.

OF009 CM-9 AILF Area

BMP Performance Inspection Checklist

Client Project Name County State Inspection Type(s) The Boeing Company Santa Susana Ventura County California Stormwater Inspection OF009 CM-9 AILF Area BMP Performance Inspection Checklist

Inspection Date Inspector Name Inspector Company Project Manager Precip. Present

Insert photo here

Insert photo here

Photo 18: A1BMP0002: CM-9 Area, Upstream (South), CM-9 BMPs Photo 19: A1BMP0003: CM-9 Area, Downstream, CM-9 BMPs; CM-9 Underdrains

Insert photo here

Insert photo here

Photo 20: A1BMP0003: CM-9 Area, Downstream, CM-9 BMPs; CM-9 Underdrains Photo 21: ILBMP0002: CM-9 Area, Upstream (East), CM-9 BMPs; Culvert Inlet Off Area II Road

General Notes:

OF009 CM-9 AILF Area BMP Performance Inspection Checklist

Client Project Name County State Inspection Type(s) The Boeing Company Santa Susana Ventura County California Stormwater Inspection Inspection Date Inspector Name Inspector Company Project Manager Precip. Present

Insert photo here

Photo 22: ILBMP0002: CM-9 Area, Upstream (East), CM-9 BMPs; Culvert Inlet Off Area II Road

General Notes:

OF009 B-1 Retention Basin

BMP Performance Inspection Checklist

Client Project Name County State Inspection Type(s)

The Boeing Company Santa Susana Ventura County California Stormwater Inspection Inspection Date Inspector Name Inspector Company Project Manager Precip. Present

OF009 B-1 Retention Basin

Inspection Status: Conducted/Not Conducted

Inspection Checklist Questions:	Inspection Answers:
During Rain Event Inspection	
Any odors, suspended materials, floating material, etc. observed?	No/Yes/NA with comment
Are erosion/sediment controls in good condition?	No/Yes/NA with comment
Are upstream areas free of erosion or sediment?	No/Yes/NA with comment
Is the retention basin clear of unwanted sediment/debris?	No/Yes/NA with comment
Is the perimeter of the basin free of erosion?	No/Yes/NA with comment
72 Hours After the End of the Rain Event Inspection	
Any odors, suspended materials, floating material, etc. observed?	No/Yes/NA with comment
Are erosion/sediment controls in good condition?	No/Yes/NA with comment
Are upstream areas free of erosion or sediment?	No/Yes/NA with comment
Is the retention basin clear of unwanted sediment/debris?	No/Yes/NA with comment
Is the perimeter of the basin free of erosion?	No/Yes/NA with comment

Client Project Name County State Inspection Type(s) The Boeing Company Santa Susana Ventura County California Stormwater Inspection

OF009 B-1 Retention Basin BMP Performance Inspection Checklist

Inspection Date Inspector Name Inspector Company Project Manager Precip. Present

Insert photo here

Insert photo here

Photo B1RB-1: B-1 Retention Overview

Photo B1RB-2: Close-up of Riser Structure in Retention Basin

General Notes:

OF009 Upper Lot Media Filter

BMP Performance Inspection Checklist

Client	The Boein
Project Name	Santa Sus
County	Ventura C
State	California
Inspection Type(s)	Stormwat

he Boeing Company anta Susana Yentura County California tormwater Inspection Inspection Date Inspector Name Inspector Company Project Manager Precip. Present

OF009 Upper Lot Media Filter

Inspection Status: Conducted/Not Conducted

Inspection Checklist Questions:	Inspection Answers:
During Rain Event Inspection	
Any odors, suspended materials, floating material, etc. observed?	No/Yes/NA with comment
Are erosion/sediment controls in good condition?	No/Yes/NA with comment
Are upstream areas free of erosion or sediment?	No/Yes/NA with comment
Is there flow overtopping the box?	No/Yes/NA with comment
If above is YES, does the underdrain appear to be constricted?	No/Yes/NA with comment
If above is YES, please record a video.	N/A
Is hillside free of erosion?	No/Yes/NA with comment
Is the asphalt/gunite swale going towards Upper Lot Media Filter clear of unwanted sediment/debris?	No/Yes/NA with comment
Note % flow from each underdrain	%

72 Hours After the End of the Rain Event Inspection	
Any odors, suspended materials, floating material, etc. observed?	No/Yes/NA with comment
Are erosion/sediment controls in good condition?	No/Yes/NA with comment
Are upstream areas free of erosion or sediment?	No/Yes/NA with comment
Are underdrain(s) clear of unwanted sediment/debris?	No/Yes/NA with comment
Is hillside free of erosion?	No/Yes/NA with comment
Is the asphalt/gunite swale going towards Upper Lot Media Filter clear of unwanted sediment/debris?	No/Yes/NA with comment
Is there ponded water present in media filter area?	No/Yes/NA with comment
If above is YES, record approximate depth from the top of riser structure	Depth
Is hillside free of erosion?	No/Yes/NA with comment
Is the asphalt/gunite swale going towards Upper Lot Media Filter clear of unwanted sediment/debris?	No/Yes/NA with comment

Client Project Name County State Inspection Type(s)

The Boeing Company Santa Susana Ventura County California Stormwater Inspection

OF009 Upper Lot Media Filter BMP Performance Inspection Checklist

Inspection Date Inspector Name Inspector Company Project Manager Precip. Present

Insert photo here

Insert photo here

Photo ULMF-1: Upper Lot Media Filter Overview

Photo ULMF-2: Upper Lot Retention Basin Discharge Pipe (inside of the riser structure)

Insert photo here

Insert photo here

Photo ULMF-3: ULMF Area, Gunite Swale Conveying Road Runoff Photo 10: B1BMP0009: B-1 Area, Gunite Swale Conveying Road Runoff

General Notes:

Client Project Name County State Inspection Type(s)

The Boeing Company Santa Susana Ventura County California Stormwater Inspection

OF009 Upper Lot Media Filter BMP Performance Inspection Checklist

Inspection Date Inspector Name Inspector Company Project Manager Precip. Present

Insert photo here

Insert photo here

Photo 11: B1BMP0009: B-1 Area, Gunite Swale Conveying Road Runoff Photo 12: B1BMP0010: B-1 Area, Culvert Outlet from Upper Parking Lot Area

Insert photo here

Insert photo here

Photo 13: B1BMP0010: B-1 Area, Culvert Outlet from Upper Parking Lot Area Photo 14: B1BMP0011: B-1 Area, Underdrains

OF009 Upper Lot Media Filter BMP Performance Inspection Checklist

Client Project Name County State Inspection Type(s) The Boeing Company Santa Susana Ventura County California Stormwater Inspection Inspection Date Inspector Name Inspector Company Project Manager Precip. Present

Insert photo here

Photo 15: B1BMP0011: B-1 Area, Underdrains

General Notes:

Inspection Type(s)

Client

County

State

The Boeing Company Project Name Santa Susana Ventura County

California

Stormwater Inspection

Inspection Date Inspector Name **Inspector Company** Project Manager Precip. Present

OF009 Detention Bioswales

Conducted/Not Conducted Inspection Status:

Inspection Checklist Questions:	Inspection Answers:
During Rain Event Inspection	
Any odors, suspended materials, floating material, etc. observed?	No/Yes/NA with comment
Are erosion/sediment controls in good condition?	No/Yes/NA with comment
Are upstream areas free of erosion or sediment?	No/Yes/NA with comment
Is rip rap swale clear of unwanted sediment/debris?	No/Yes/NA with comment
Are vegetated swales in good condition?	No/Yes/NA with comment
Note % flow from northern underdrain	%
Note % flow from southern underdrain	%
72 Hours After the End of the Rain Event Inspection	
Any odors, suspended materials, floating material, etc. observed?	No/Yes/NA with comment

Are erosion/sediment controls in good condition?	No/Yes/NA with comment
Are upstream areas free of erosion or sediment?	No/Yes/NA with comment
Are underdrain(s) clear of unwanted sediment/debris?	No/Yes/NA with comment
Is rip rap swale clear of unwanted sediment/debris?	No/Yes/NA with comment

Corrective action identified during this inspection event: No/Yes/NA with comment

BMP Performance Inspection Checklist

OF009 Detention Bioswales BMP Performance Inspection Checklist

Client Project Name County State Inspection Type(s) The Boeing Company Santa Susana Ventura County California Stormwater Inspection Inspection Date Inspector Name Inspector Company Project Manager Precip. Present

Insert photo here

Insert photo here

Photo B1DB-1: Northern B1436 Bioswale Overview (from the north end)

Photo B1DB-2: Northern B1436 Bioswale Overview (from the south end)

Insert photo here

Insert photo here

Photo B1DB-3: Southern B1436 Bioswale Overview (from the north end)

Photo B1DB-4: Southern B1436 Bioswale Overview (from the south end)

OF009 Detention Bioswales BMP Performance Inspection Checklist

Client Project Name County State Inspection Type(s) The Boeing Company Santa Susana Ventura County California Stormwater Inspection Inspection Date Inspector Name Inspector Company Project Manager Precip. Present

Insert photo here

Insert photo here

Photo B1DB-5: Western Swale Inlet to Southern B1436 Bioswale Photo B1DB-6: Eastern Swale Inlet to Southern B1436 Bioswale

Insert photo here

Insert photo here

Photo 1: ILBMP0008: Upstream, B1436 Southern Detention Bioswale (Concrete Swale Diverting Sheet Flow into Rock Crib – East) Photo 2: ILBMP0008: Upstream, B1436 Southern Detention Bioswale (Concrete Swale Diverting Sheet Flow into Rock Crib – East)

Client Project Name County State Inspection Type(s) The Boeing Company Santa Susana Ventura County California Stormwater Inspection

OF009 Detention Bioswales BMP Performance Inspection Checklist

Inspection Date Inspector Name Inspector Company Project Manager Precip. Present

Insert photo here

Insert photo here

Photo 3: ILBMP0004: Upstream, B1436 Southern Detention Bioswale (Concrete Swale Diverting Sheet Flow into Rock Crib – West) Photo 4: ILBMP0004: Upstream, B1436 Southern Detention Bioswale (Concrete Swale Diverting Sheet Flow into Rock Crib – West)

Insert photo here

Insert photo here

Photo 5: ILBMP0005: Downstream, B1436 Southern Detention Bioswale; 12-inch Underdrain Photo 6: ILBMP0005: Downstream, B1436 Southern Detention Bioswale; 12-inch Underdrain

OF009 CM-8 BMP Performance Inspection Checklist

Client Project Name County State Inspection Type(s) The Boeing Company Santa Susana Ventura County California Stormwater Inspection Inspection Date Inspector Name Inspector Company Project Manager Precip. Present

Inspection Status: Conducted/Not Conducted

Inspection Checklist Questions:	Inspection Answers:
During Rain Event Inspection	
Any odors, suspended materials, floating material, etc. observed?	No/Yes/NA with comment
Are erosion/sediment controls in good condition?	No/Yes/NA with comment
Are upstream areas free of erosion or sediment?	No/Yes/NA with comment
Is the culvert basin clear of unwanted sediment/debris?	No/Yes/NA with comment
If above is NO, note approximate depth	Depth
Is there flow overtopping the weir boards?	No/Yes/NA with comment
If above is YES, does the underdrain appear to be constricted?	No/Yes/NA with comment
If above is YES, please record a video.	N/A

72 Hour Storm Inspection Any odors, suspended materials, floating material, etc. observed? No/Yes/NA with comment Are erosion/sediment controls in good condition? No/Yes/NA with comment Are upstream areas free of erosion or sediment? No/Yes/NA with comment No/Yes/NA with comment Are underdrain(s) clear of unwanted sediment/debris? Is weir board filter fabric in good condition? No/Yes/NA with comment Is the culvert basin clear of unwanted sediment/debris? No/Yes/NA with comment If above is NO, note approximate depth Depth Is a recent high-water mark visible on weir boards? No/Yes/NA with comment If above is YES, note approximate depth from top of weir boards Depth Is water ponded in front of weir boards? No/Yes/NA with comment If above is YES, note approximate depth from top of weir boards Depth

Client Project Name County State Inspection Type(s) The Boeing Company Santa Susana Ventura County California Stormwater Inspection Inspection Date Inspector Name Inspector Company Project Manager Precip. Present

Insert photo here

Insert photo here

Photo CM8-1a: CM-8 Basin Overview (Upstream)

Photo CM8-1b: CM-8 Basin Overview (Towards Weir Boards)

General Notes:

OF009 CM-11 BMP Performance Inspection Checklist

N/A

Client Project Name County State Inspection Type(s) The Boeing Company Santa Susana Ventura County California Stormwater Inspection Inspection Date Inspector Name Inspector Company Project Manager Precip. Present

OF009 CM-11	Inspection Status:	Conducted/Not Conducted
Inspection Checklist Questions:		Inspection Answers:
During Rain Event Inspection		
Any odors, suspended materials, floating material, etc. observed?		No/Yes/NA with comment
Are erosion/sediment controls in good condition?		No/Yes/NA with comment
Are upstream areas free of erosion or sediment?		No/Yes/NA with comment
Is the culvert basin clear of unwanted sediment/debris?		No/Yes/NA with comment
If above is NO, note approximate depth		Depth
Is there flow overtopping the weir boards?		No/Yes/NA with comment
If above is YES, does the underdrain appear to be constricted?		No/Yes/NA with comment

If above is YES, please record a video.

72 Hours After the End of the Rain Event Inspection	
Any odors, suspended materials, floating material, etc. observed?	No/Yes/NA with comment
Are erosion/sediment controls in good condition?	No/Yes/NA with comment
Are upstream areas free of erosion or sediment?	No/Yes/NA with comment
Are underdrain(s) clear of unwanted sediment/debris?	No/Yes/NA with comment
Is weir board filter fabric in good condition?	No/Yes/NA with comment
Is the culvert basin clear of unwanted sediment/debris?	No/Yes/NA with comment
If above is NO, note approximate depth	Depth
Is a recent high-water mark visible on weir boards?	No/Yes/NA with comment
If above is YES, note approximate depth from top of weir boards	Depth
Is water ponded in front of weir boards?	No/Yes/NA with comment
If above is YES, note approximate depth from top of weir boards	Depth

Client Project Name County State Inspection Type(s) The Boeing Company Santa Susana Ventura County California Stormwater Inspection BMP Performance Inspection Checklist
Inspection Date

OF009 CM-11

Inspection Date Inspector Name Inspector Company Project Manager Precip. Present

Insert photo here

Insert photo here

Photo CM11-1a: CM-11 Basin Overview (Upstream)

Photo CM11-1b: CM-11 Basin Overview (Towards Weir Boards)

General Notes:

Client Project Name County State Inspection Type(s) The Boeing Company Santa Susana Ventura County California Stormwater Inspection Inspection Date Inspector Name Inspector Company Project Manager Precip. Present

OF009 CM-7

Inspection Status: Conducted/Not Conducted

Inspection Checklist Questions:	Inspection Answers:
During Rain Event Inspection	
Any odors, suspended materials, floating material, etc. observed?	No/Yes/NA with comment
Are erosion/sediment controls in good condition?	No/Yes/NA with comment
Are upstream areas free of erosion or sediment?	No/Yes/NA with comment
Are the upstream swales clear of unwanted sediment/debris?	No/Yes/NA with comment
72 Hours After the End of the Rain Event Inspection	
Any odors, suspended materials, floating material, etc. observed?	No/Yes/NA with comment
Are erosion/sediment controls in good condition?	No/Yes/NA with comment
Are upstream areas free of erosion or sediment?	No/Yes/NA with comment
Are the upstream swales clear of unwanted sediment/debris?	No/Yes/NA with comment

OF009 CM-7 BMP Performance Inspection Checklist

Client Project Name County State Inspection Type(s) The Boeing Company Santa Susana Ventura County California Stormwater Inspection Inspection Date Inspector Name Inspector Company Project Manager Precip. Present

Insert photo here

Photo CM7-1a: CM-7 Upstream

General Notes:

OF009 CM-6 BMP Performance Inspection Checklist

Conducted/Not Conducted

Client Project Name County State Inspection Type(s) **The Boeing Company** Santa Susana Ventura County California **Stormwater Inspection** Inspection Date

Inspection Status:

During Rain Event Inspection	-
Inspection Checklist Questions:	
OF009 CM-6	

Inspector Name **Inspector Company Project Manager** Precip. Present

Inspection Checklist Questions:	Inspection Answers:
During Rain Event Inspection	
Any odors, suspended materials, floating material, etc. observed?	No/Yes/NA with comment
Are erosion/sediment controls in good condition?	No/Yes/NA with comment
Are upstream areas free of erosion or sediment?	No/Yes/NA with comment
Is the culvert basin clear of unwanted sediment/debris?	No/Yes/NA with comment
If above is NO, note approximate depth	Depth
Is there flow overtopping the weir boards?	No/Yes/NA with comment
If above is YES, does the underdrain appear to be constricted?	No/Yes/NA with comment
If above is YES, please record a video.	N/A

72 Hours After the End of the Rain Event Inspection	
Any odors, suspended materials, floating material, etc. observed?	No/Yes/NA with comment
Are erosion/sediment controls in good condition?	No/Yes/NA with comment
Are upstream areas free of erosion or sediment?	No/Yes/NA with comment
Are underdrain(s) clear of unwanted sediment/debris?	No/Yes/NA with comment
Is weir board filter fabric in good condition?	No/Yes/NA with comment
Is the culvert basin clear of unwanted sediment/debris?	No/Yes/NA with comment
If above is NO, note approximate depth	Depth
Is a recent high-water mark visible on weir boards?	No/Yes/NA with comment
If above is YES, note approximate depth from top of weir boards	Depth
Is water ponded in front of weir boards?	No/Yes/NA with comment
If above is YES, note approximate depth from top of weir boards	Depth

Client Project Name County State Inspection Type(s) The Boeing Company Santa Susana Ventura County California Stormwater Inspection OF009 CM-6 BMP Performance Inspection Checklist

Inspection Date Inspector Name Inspector Company Project Manager Precip. Present

Insert photo here

Insert photo here

Photo CM6-1a: CM-6 Basin Overview (Upstream)

Photo CM6-1b: CM-6 Basin Overview (Towards Weir Boards)

General Notes:

Conducted/Not Conducted

Client Project Name County State Inspection Type(s) The Boeing Company Santa Susana Ventura County California Stormwater Inspection Inspection Date Inspector Name Inspector Company Project Manager Precip. Present

Inspection Status:

OF009 CM-5 Sage Ranch

Inspection Checklist Questions: Inspection Answers: **During Rain Event Inspection** Any odors, suspended materials, floating material, etc. observed? No/Yes/NA with comment Are erosion/sediment controls in good condition? No/Yes/NA with comment Are upstream areas free of erosion or sediment? No/Yes/NA with comment Is the culvert basin clear of unwanted sediment/debris? No/Yes/NA with comment If above is NO, note approximate depth Depth Is there flow overtopping the weir boards? No/Yes/NA with comment If above is YES, does the underdrain appear to be constricted? No/Yes/NA with comment N/A If above is YES, please record a video.

72 Hours After the End of the Rain Event Inspection

Any odors, suspended materials, floating material, etc. observed?	No/Yes/NA with comment
Are erosion/sediment controls in good condition?	No/Yes/NA with comment
Are upstream areas free of erosion or sediment?	No/Yes/NA with comment
Are underdrain(s) clear of unwanted sediment/debris?	No/Yes/NA with comment
Is weir board filter fabric in good condition?	No/Yes/NA with comment
Is the culvert basin clear of unwanted sediment/debris?	No/Yes/NA with comment
If above is NO, note approximate depth	Depth
Is a recent high-water mark visible on weir boards?	No/Yes/NA with comment
If above is YES, note approximate depth from top of weir boards	Depth
Is water ponded in front of weir boards?	No/Yes/NA with comment
If above is YES, note approximate depth from top of weir boards	Depth

OF009 CM-5 Sage Ranch BMP Performance Inspection Checklist

Client Project Name County State Inspection Type(s) The Boeing Company Santa Susana Ventura County California Stormwater Inspection Inspection Date Inspector Name Inspector Company Project Manager Precip. Present

Insert photo here

Insert photo here

Photo CM5-1a: CM-5 Basin Overview (Upstream)

Photo CM5-1b: CM-5 Basin Overview (Towards Weir Boards)

General Notes:

Client Project Name County State Inspection Type(s)

The Boeing Company Santa Susana Ventura County California Stormwater Inspection Inspection Date Inspector Name Inspector Company Project Manager Precip. Present

Inspection Status:

OF009 CM-12 Sage Ranch

Inspection Checklist Questions:	Inspection Answers:
During Rain Event Inspection	
Any odors, suspended materials, floating material, etc. observed?	No/Yes/NA with comment
Are erosion/sediment controls in good condition?	No/Yes/NA with comment
Are upstream areas free of erosion or sediment?	No/Yes/NA with comment
Is the culvert basin clear of unwanted sediment/debris?	No/Yes/NA with comment
If above is NO, note approximate depth	Depth
Is there flow overtopping the weir boards?	No/Yes/NA with comment
If above is YES, does the underdrain appear to be constricted?	No/Yes/NA with comment
If above is YES, please record a video.	N/A

72 Hours After the End of the Rain Event Inspection	
Any odors, suspended materials, floating material, etc. observed?	No/Yes/NA with comment
Are erosion/sediment controls in good condition?	No/Yes/NA with comment
Are upstream areas free of erosion or sediment?	No/Yes/NA with comment
Is weir board filter fabric in good condition?	No/Yes/NA with comment
Is the culvert basin clear of unwanted sediment/debris?	No/Yes/NA with comment
If above is NO, note approximate depth	Depth
Is a recent high-water mark visible on weir boards?	No/Yes/NA with comment
If above is YES, note approximate depth from top of weir boards	Depth
Is water ponded in front of weir boards?	No/Yes/NA with comment
If above is YES, note approximate depth from top of weir boards	Depth

Corrective action identified during this inspection event: No/Yes/NA with comment

Conducted/Not Conducted

BMP Performance Inspection Checklist

OF009 CM-12 Sage Ranch BMP Performance Inspection Checklist

Client Project Name County State Inspection Type(s) The Boeing Company Santa Susana Ventura County California Stormwater Inspection Inspection Date Inspector Name Inspector Company Project Manager Precip. Present

Insert photo here

Insert photo here

Photo CM12-1a: CM-12 Basin Overview (Upstream)

Photo CM12-1b: CM-12 Basin Overview (Towards Weir Boards)

General Notes:

OF009 CM-4 BMP Performance Inspection Checklist

Conducted/Not Conducted

N/A

Client Project Name County State Inspection Type(s)

OF009 CM-4

The Boeing Company Santa Susana Ventura County California Stormwater Inspection Inspection Date Inspector Name Inspector Company Project Manager Precip. Present

Inspection Status:

Inspection Checklist Questions:	Inspection Answers:
During Rain Event Inspection	
Any odors, suspended materials, floating material, etc. observed?	No/Yes/NA with comment
Are erosion/sediment controls in good condition?	No/Yes/NA with comment
Are upstream areas free of erosion or sediment?	No/Yes/NA with comment
Is the culvert basin clear of unwanted sediment/debris?	No/Yes/NA with comment
If above is NO, note approximate depth	Depth
Is there flow overtopping the weir boards?	No/Yes/NA with comment
If above is YES, does the underdrain appear to be constricted?	No/Yes/NA with comment

If above is YES, please record a video.

72 Hours After the End of the Rain Event Inspection	
Any odors, suspended materials, floating material, etc. observed?	No/Yes/NA with comment
Are erosion/sediment controls in good condition?	No/Yes/NA with comment
Are upstream areas free of erosion or sediment?	No/Yes/NA with comment
Are underdrain(s) clear of unwanted sediment/debris?	No/Yes/NA with comment
Is weir board filter fabric in good condition?	No/Yes/NA with comment
Is the culvert basin clear of unwanted sediment/debris?	No/Yes/NA with comment
If above is NO, note approximate depth	Depth
Is a recent high-water mark visible on weir boards?	No/Yes/NA with comment
If above is YES, note approximate depth from top of weir boards	Depth
Is water ponded in front of weir boards?	No/Yes/NA with comment
If above is YES, note approximate depth from top of weir boards	Depth
Client Project Name County State Inspection Type(s) The Boeing Company Santa Susana Ventura County California Stormwater Inspection BMP Performance Inspection Checklist
Inspection Date
Inspector Name

OF009 CM-4

Inspector Name Inspector Company Project Manager Precip. Present

Insert photo here

Insert photo here

Photo CM4-1a: CM-4 Basin Overview (Upstream)

Photo CM4-1b: CM-4 Basin Overview (Towards Weir Boards)

General Notes:

Signature

OF009 CM-3 BMP Performance Inspection Checklist

Client Project Name County State Inspection Type(s) The Boeing Company Santa Susana Ventura County California Stormwater Inspection Inspection Date Inspector Name Inspector Company Project Manager Precip. Present

OF009 CM-3

Inspection Status: Conducted/Not Conducted

Inspection Checklist Questions:	Inspection Answers:
During Rain Event Inspection	
Any odors, suspended materials, floating material, etc. observed?	No/Yes/NA with comment
Are erosion/sediment controls in good condition?	No/Yes/NA with comment
Are upstream areas free of erosion or sediment?	No/Yes/NA with comment
Is the culvert basin clear of unwanted sediment/debris?	No/Yes/NA with comment
If above is NO, note approximate depth	Depth
Is there flow overtopping the weir boards?	No/Yes/NA with comment
If above is YES, does the underdrain appear to be constricted?	No/Yes/NA with comment
If above is YES, please record a video.	N/A
Is the drop inlet on the north side of the road clogged or otherwise obstructed?	No/Yes/NA with comment
Is there erosion at the diversion pipe outlet?	No/Yes/NA with comment

72 Hours After the End of the Rain Event Inspection	
Any odors, suspended materials, floating material, etc. observed?	No/Yes/NA with comment
Are erosion/sediment controls in good condition?	No/Yes/NA with comment
Are upstream areas free of erosion or sediment?	No/Yes/NA with comment
Are underdrain(s) clear of unwanted sediment/debris?	No/Yes/NA with comment
Is weir board filter fabric in good condition?	No/Yes/NA with comment
Is the culvert basin clear of unwanted sediment/debris?	No/Yes/NA with comment
If above is NO, note approximate depth	Depth
Is a recent high-water mark visible on weir boards?	No/Yes/NA with comment
If above is YES, note approximate depth from top of weir boards	Depth
Is water ponded in front of weir boards?	No/Yes/NA with comment
If above is YES, note approximate depth from top of weir boards	Depth
Is the drop inlet on the north side of the road clogged or otherwise obstructed?	No/Yes/NA with comment
Is there erosion at the diversion pipe outlet?	No/Yes/NA with comment

Corrective action identified during this inspection event: No/Yes/NA with comment

General Notes:

Client Project Name County State Inspection Type(s) **The Boeing Company** Santa Susana Ventura County California **Stormwater Inspection**

BMP Performance Inspection Checklist Inspection Date

Inspector Name **Inspector Company Project Manager** Precip. Present

Insert photo here

Insert photo here

Photo CM3-1a: CM-3 Basin Overview (Upstream)

Photo CM3-1b: CM-3 Basin Overview (Towards Weir Boards)

Insert photo here

Photo CM3-3: CM-3 Diversion Outlet

General Notes:

Signature

Insert photo here

Photo CM3-2: CM-3 Roadway Inlet

OF009 CM-3

Client Project Name County State Inspection Type(s) The Boeing Company Santa Susana Ventura County California Stormwater Inspection

OF009 CM-3 BMP Performance Inspection Checklist

Inspection Date Inspector Name Inspector Company Project Manager Precip. Present

Insert photo here

Insert photo here

Photo 25: LXBMP0010: CM-3 Area, upstream of Service Area Road BMP; Outlet on South Side of Road Photo 25: LXBMP0010: CM-3 Area, upstream of Service Area Road BMP; Outlet on South Side of Road

Insert photo here

Insert photo here

Photo 26: LXBMP0011: CM-3 Area, Upstream of Service Area Road BMP, Natural Drainage Upstream of CM-3 Photo 26: LXBMP0011: CM-3 Area, Upstream of Service Area Road BMP, Natural Drainage Upstream of CM-3

General Notes:

OF009 CM-10 BMP Performance Inspection Checklist

Conducted

Client Project Name County State Inspection Type(s)

OF009 CM-10

The Boeing Company Santa Susana Ventura County California **Stormwater Inspection** Inspection Date Inspector Name **Inspector Company Project Manager** Precip. Present

Inspection Status:	Conducted/Not

Inspection Checklist Questions:	Inspection Answers:
During Rain Event Inspection	
Any odors, suspended materials, floating material, etc. observed?	No/Yes/NA with comment
Are erosion/sediment controls in good condition?	No/Yes/NA with comment
Are upstream areas free of erosion or sediment?	No/Yes/NA with comment
Is there flow overtopping the weir boards?	No/Yes/NA with comment
If above is YES, does the underdrain appear to be constricted?	No/Yes/NA with comment
If above is YES, please record a video.	N/A
Is there sediment accumulation in the culvert basin?	No/Yes/NA with comment
If above is YES, record approximate depth.	Depth
Is there erosion at the diversion pipe outlet?	No/Yes/NA with comment
72 House After the Field of the Dain French Incorportion	

72 Hours After the End of the Rain Event inspection	
Any odors, suspended materials, floating material, etc. observed?	No/Yes/NA with comment
Are erosion/sediment controls in good condition?	No/Yes/NA with comment
Are upstream areas free of erosion or sediment?	No/Yes/NA with comment
Is there sediment accumulation in the culvert basin?	No/Yes/NA with comment
If above is YES, record approximate depth.	Depth
Is there erosion at the diversion pipe outlet?	No/Yes/NA with comment
Is a recent high-water mark visible on weir boards?	No/Yes/NA with comment
If above is YES, note approximate depth from top of weir boards	Depth
Is water ponded in front of weir boards?	No/Yes/NA with comment
If above is YES, note approximate depth from top of weir boards	Depth
Are underdrain(s) clear of unwanted sediment/debris?	No/Yes/NA with comment
Is weir board filter fabric in good condition?	No/Yes/NA with comment

Corrective action identified during this inspection event: No/Yes/NA with comment

General Notes:

Client Project Name County State Inspection Type(s) The Boeing Company Santa Susana Ventura County California Stormwater Inspection BMP Performance Inspection Checklist
Inspection Date
Inspector Name

OF009 CM-10

Inspector Name Inspector Company Project Manager Precip. Present

Insert photo here

Insert photo here

Photo CM10-1a: CM-10 Basin Overview (Upstream)

Photo CM10-1b: CM-10 Basin Overview (Towards Weir Boards)

General Notes:

Signature

OF009 CM-2 BMP Performance Inspection Checklist

Conducted/Not Conducted

Client Project Name County State Inspection Type(s) **The Boeing Company** Santa Susana Ventura County California **Stormwater Inspection** Inspection Date **Inspector Name Inspector Company Project Manager** Precip. Present

OF009 CM-2	Inspection Status:	Conducted/Not Conducted
Inspection Checklist Questions:		Inspection Answers:
During Rain Event Inspection		
Any odors, suspended materials, floating material, etc. observed?		No/Yes/NA with comment
Are erosion/sediment controls in good condition?		No/Yes/NA with comment
Are upstream areas free of erosion or sediment?		No/Yes/NA with comment
Is there sediment accumulation in the culvert basin?		No/Yes/NA with comment
If above is YES, record approximate depth.		Depth
Is there flow overtopping the weir boards?		No/Yes/NA with comment
If above is YES, does the underdrain appear to be constricted?		No/Yes/NA with comment
If above is YES, please record a video.		N/A
72 Hours After the End of the Rain Event Inspection		

/ L hours / the Line of the num Event inspection	
Any odors, suspended materials, floating material, etc. observed?	No/Yes/NA with comment
Are erosion/sediment controls in good condition?	No/Yes/NA with comment
Are upstream areas free of erosion or sediment?	No/Yes/NA with comment
Is there sediment accumulation in the culvert basin?	No/Yes/NA with comment
If above is YES, record approximate depth.	Depth
Is a recent high-water mark visible on weir boards?	No/Yes/NA with comment
If above is YES, note approximate depth from top of weir boards	Depth
Are underdrain(s) clear of unwanted sediment/debris?	
Is weir board filter fabric in good condition?	No/Yes/NA with comment

Corrective action identified during this inspection event: No/Yes/NA with comment

General Notes:

Client Project Name County State Inspection Type(s) The Boeing Company Santa Susana Ventura County California Stormwater Inspection OF009 CM-2 BMP Performance Inspection Checklist

Inspection Date Inspector Name Inspector Company Project Manager Precip. Present

Insert photo here

Insert photo here

Photo CM2-1a: CM-2 Basin Overview (Upstream)

Photo CM2-1b: CM-2 Basin Overview (Towards Weir Boards)

General Notes:

Signature

Date/Time of Inspection		
Inspector's Name/Title		Signature
	Weather and Obs	servations
Precipitation present during inspection? Yes	s No	
LOX Area BMPs		
Photo #	Photo Location:	LOX Berm Overview (West End)
Photo #	Photo Location:	LOX Berm Overview (East End)
Photo #	Photo Location:	Northern Drainage Overview Where Slope Drains Discharge
Photo #	Additional Photo(s):	
During Rain Event Inspection	Yes No N/A	Comments/Corrective Action:
Any odors, suspended material, floating material, etc. observed?		
Are erosion/sediment controls in good condition?		
Are slope drains in good condition?		
Is the gravel bag berm in good condition?		
Are upstream areas free of erosion or sediment? If no, note location and description under comments.		
72 Hours After the End of the Rain Event Inspection		
Any odors, suspended material, floating material, etc. observed?		
Are slope drains in good condition?		
Is the gravel bag berm in good condition?		
Are upstream areas free of erosion or sediment? If no, note location and description under comments.		
Other		

Sandbag Berm – Near LOX Area				
Photo #	Photo Location:			
Photo #	Photo	D Location:		
Photo #	Photo	D Location:		
Photo #	Addit	ional Photo	o(s):	
During Rain Event Inspection	Yes	No	N/A	Comments/Corrective Action:
Any odors, suspended material, floating material, etc. observed?				
Are the sandbags in good condition?				
Is area behind sandbag berm free of debris/sediment buildup?				
Are upstream areas free of erosion or sediment? If no, note location and description under comments.				
72 Hours After the End of the Rain Event Inspection				
Any odors, suspended material, floating material, etc. observed?				
Are slope drains in good condition?				
Are the sandbags in good condition?				
Is area behind sandbag berm free of debris/sediment buildup?				
Are upstream areas free of erosion or sediment? If no, note location and description under comments.				
Other				

CM-1 Area				
Photo #	Pho	to Locatio	n:	CM-1 Basin Overview (Upstream and Towards Weir Boards)
Photo #	Pho	to Locatio	n:	CM-1 Underdrains
Photo #	Pho	to Locatio	n:	CM-1 Discharge Pipe
Photo #	Photo Location:			Rip Rap Berm Northwest of CM-1
Photo #	Photo Location:		n:	Stormwater Diversion to CM-1
During Rain Event Inspection	Yes	No	N/A	Comments/Corrective Action:
Any odors, suspended materials, floating naterial, etc. observed?				
Are erosion/sediment controls in good condition?				
s there flow overtopping the weir boards? If /es, does the underdrain appear to be constricted? If yes, please record a video.				
Are underdrains in good condition? Note approximate % flow from each underdrain under comments.				
s there sediment accumulation in the culvert asin? If yes, record approximate depth inder comments.				
Any excessive ponding in front of sandbags at NW entrance?				
Are upstream areas free of erosion or sediment? If no, note location and description under comments.				
s the drop inlet on the north side of the road logged or otherwise obstructed?				
s there erosion at the diversion pipe outlet?				

CM-1 Area				
72 Hours After the End of the Rain Event Inspection	Yes	No	N/A	Comments/Corrective Action:
Any odors, suspended materials, floating material, etc. observed?				
Are erosion/sediment controls in good condition?				
Is a recent high-water mark visible on weir boards? If yes, record depth from top of weir boards.				
Is water ponded in front of weir boards? If yes, record depth from top of weir boards.				
Is weir board filter fabric in good condition?				
Is there sediment accumulation in the culvert basin? If yes, record approximate depth under comments.				
Are upstream areas free of erosion or sediment? If no, note location and description under comments.				
Is the drop inlet on the north side of the road clogged or otherwise obstructed?				
Is there erosion at the diversion pipe outlet?				
Other				

ELV Treatment BMP & ELV Char	nel		
Photo #	Photo Lo	cation:	ELV Channel (Up- and Downstream)
Photo #	Photo Lo	cation:	ELV Settling Basin (looking towards intake pipe)
Photo #	Photo Lo	cation:	ELV Settling Basin (looking towards overflow bypass and culvert inlet)
Photo #	Photo Lo	cation:	ELV Treatment BMP Discharge Pipe
Photo #	Photo Lc	cation:	ELV Treatment BMP Tank Array Overview
Photo #	Additiona	al Photo(s):	
During Rain Event Inspection / 72	Hours Yes No	o N/A	Comments/Corrective Action:
Are erosion/sediment controls in good condition?			
s ELV channel rip rap in good conditior	?		
Are fiber rolls and jute matting in good condition?			
s influent screen free of debris (no logging)?			
s basin intake pipe in good condition?			
s the settling basin in good condition?			
s tank array and associated piping in g condition?	od		
s effluent pipe in good condition?			
Are upstream areas free of erosion or sediment? If no, note location and desc under comments.	iption		
Other			

Sandbag Berm – Near ELV Treatment BMP											
Photo #	Pho	oto Locati	on:								
Photo #	Pho	oto Locati	on:								
Photo #	Pho	oto Locati	on:								
Photo #	Ado	ditional Ph	noto(s):								
During Rain Event Inspection	Yes	No	N/A	Comments/Corrective Action:							
Are the sandbags in good condition?											
Is area behind sandbag berm free of debris/sediment buildup?											
Are upstream areas free of erosion or sediment? If no, note location and description under comments.											
72 Hours After the End of the Rain Event Inspection											
Are the sandbags in good condition?											
Is area behind sandbag berm free of debris/sediment buildup?											
Are upstream areas free of erosion or sediment? If no, note location and description under comments.											
Is water ponded in front of sandbags? If yes, record depth from top of weir boards.											
Other											

Helipad Area BMPs				
Photo #	F	Photo Locat	ion:	Helipad Berm Overview (Eastern Berm)
Photo #	F	Photo Locat	ion:	Helipad Berm Overview (Western Berm)
Photo #	F	Photo Locat	ion:	Culvert Inlet Passing Beneath Helipad Road
Photo #		Photo Locat	ion:	
Photo #	/	Additional P	hoto(s):	
	Yes	No	N/A	Comments/Corrective Action:
During Rain Event Inspection				
Are the Helipad Berms in good condition?				
Are upstream areas free of erosion or sediment? If no, note location and description under comments.				
Is area behind Helipad Berms free of debris/sediment buildup?				
Is parking lot free of excessive debris/sediment?				
Is water overtopping the Helipad Berm? If yes, note which berm(s) are being overtopped. If yes, please record a video.				
72 Hours After the End of the Rain Event Inspection				
Are the Helipad Berms in good condition?				
Are upstream areas free of erosion or sediment? If no, note location and description under comments.				
Is area behind Helipad Berms free of debris/sediment buildup?				
Is parking lot free of excessive debris/sediment?				
Other				

Additional Notes/Observations

Boeing 7	2 Hours	After Rai	n Event	Ponding	Inspection	Form

Date/Time of Inspection

Inspector's Name/Title

Signature

Ponding?											
Culvert Modification	Yes	No	Depth (feet)								
CM-2											
CM-3											
CM-4											
CM-5											
CM-6											
CM-7											
CM-8											
CM-9											
CM-10											
CM-11											
CM-12											
SEDIMENT BASIN											
BIOFILTER											
UPPER LOT MEDIA FILTER											
NORTHERN DETENTION BIOSWALE											
SOUTHERN DETENTION BIOSWALE											
ADMIN AREA FILTER BASKET											

OF009 Lower Lot - Cistern Inspection Checklist Questions:

Amount of volume pumped from the cistern?

What was the resulting depth of the cistern?

Record the totalizer reading

Inspection Answers:

Volume

Depth

Total

NASA 72 Hours After Rain Event Ponding Inspection Form

	Signature	
Pond	ling?	
Yes	Νο	Depth (feet)
_		
_ L		
	Pond Yes	Signature Ponding? Yes No

	Sampling Responsibility: NASA Inspector/Sampler: Date: Outfall/Watershed 009						Weather: Rain Event Start Date/Time:							
			Sample Trackin	g Information				Sample Field N	leasurements			Leaf	Test	
	ISRA Area(s) & Location	Qualitative Flow Observations*	Photo Number(s)	Object ID	Sample ID (Object ID_yyyymmdd)	Sample/Observation Time	Conductivity (mS or uS)	рН	Temperature (°C)	Turbidity (NTU)	Distance (ft)	Time (s)	Speed (ft/s)	Water Depth (in)
0	Culvert inlet; runoff will only be present when rain events exceed ELV BMP design storm			EVBMP0001	EVBMP0001_									
MP AND HELIPAI	Sample port in BMP influent pipe prior to "T" connection			EVBMP0007	EVBMP0007_									
LV TREATMENT B	Discharge from media filter tank pipe			EVBMP0008	EVBMP0008_									
Ξ	Composite of samples from eastern and western sample ports between settling tanks and media filter			EVBMP0009	EVBMP0009_									

Notes:

*Qualitative Flow Observations:							
No Flow	NPDES Permit Limits:	ALL RECEIVING AND SAMPLE COLLECTION BOTTLES MUST BE PRE-					
Low Flow: Trickle or minor amount of flow.		RINSED 3 TIMES WITH SOURCE WATER, PRIOR TO COLLECTION OF THE					
Moderate Flow: Water is flowing normally, no	Temperature < 86 °F	SAMPLE.					
significant erosion or turbid water.							
High Flow: Significant water flow/velocity, slope		EXCEPTION IS THE HNO3 (NITRIC) PRESERVED POLY BOTTLES -					
erosion.	рН 6.5 - 8.5	DO NOT PRE-RINSE THE HNO3 PRESERVED POLY'S					

Additional Observations:

Sample	Observations
--------	--------------

Notes

(color, odor, sheen, foam, biological material, nearby erosion, etc.)

	Sampling Responsibility: <u>NASA</u> Inspector/Sampler: Date: Outfall/Watershed				009	Weather: Rain Event Start Date/Time:									
			Sample Tracking	Information			Sample Field Me	asurements				Leaf	Test		
	ISRA Area(s) & Location	Qualitative Flow Observations*	Photo Number(s)	Object ID	Sample ID (Object ID_yyyymmdd)	Sample/Observation Time	Conductivity (mS or uS)	pН	Temperature (°C)	Turbidity (NTU)	Distance (ft)	Time (s)	Speed (ft/s)	Water Depth (in)	
REA II ROAD	Sheetflow along Area II Road upstream of sandbag berm			EVBMP0003	EVBMP0003_										
AND AI	CM-1 eastern tributary drainage			A2BMP0006	A2BMP0006_										
CM-1	CM-1 culvert outlet			A2BMP0007	A2BMP0007_										
	Outlet pipe south side of road			A2BMP0012	A2BMP0012_										

Notes:

*Qualitative Flow Observations: ALL RECEIVING AND SAMPLE COLLECTION BOTTLES MUST BE PRE-NPDES Permit Limits: No Flow RINSED 3 TIMES WITH SOURCE WATER, PRIOR TO COLLECTION OF THE Low Flow: Trickle or minor amount of flow. Moderate Flow: Water is flowing normally, no Temperature < 86 °F significant erosion or turbid water.

High Flow: Significant water flow/velocity, slope pH 6.5 - 8.5 erosion.

Additional Observations:

EXCEPTION IS THE HNO3 (NITRIC) PRESERVED POLY BOTTLES -DO NOT PRE-RINSE THE HNO3 PRESERVED POLY'S

SAMPLE.

Sample Observations

Notes (color, odor, sheen, foam, biological material, nearby erosion, etc.)

	Sampling Responsibility:	Boeing	Inspector/Samp Date: Outfall/Waters	bler: hed	009			Weather: Rain Event Start Date/Time:					_			
			Sample Tracking I	nformation				Sample Field N	leasurements			Leaf	Test			
	ISRA Area(s) & Location	Qualitative Flow Observations*	Photo Number(s)	Object ID	Sample ID (Object ID_yyyymmdd)	Sample/Observation Time	Conductivity (mS or uS)	рН	Temperature (°C)	Turbidity (NTU)	Distance (ft)	Time (s)	Speed (ft/s)	Water Depth (in)		
	Upstream of Service Area Road BMP, outlet pipe on south side of road			LXBMP0010	LXBMP0010_											
CM-3 AREA	Upstream of Service Area Road BMP, natural drainage upstream of CM-3			LXBMP0011	LXBMP0011_											
	Downstream of Service Area Road BMP, underdrains			LXBMP0012	LXBMP0012_											
Note	Additional Observations:															

*Qualitative Flow Observations:		
No Flow	NPDES Permit Limits:	ALL RECEIVING AND SAMPLE COLLECTION BOTTLES MUST BE PRE-
Low Flow: Trickle or minor amount of flow.		RINSED 3 TIMES WITH SOURCE WATER, PRIOR TO COLLECTION OF THE
Moderate Flow: Water is flowing normally, no	Temperature < 86 °F	SAMPLE.
significant erosion or turbid water.		
High Flow: Significant water flow/velocity, slope		EXCEPTION IS THE HNO3 (NITRIC) PRESERVED POLY BOTTLES -
erosion.	рН 6.5 - 8.5	DO NOT PRE-RINSE THE HNO3 PRESERVED POLY'S

Sample Observations

Notes

(color, odor, sheen, foam, biological material, nearby erosion, etc.)

	Sampling Responsibility: <u>Boeing</u> Inspector/Sampler: Date: Outfall/Watershed 009							Weather: Rain Event Star							
			Sample Tracking	Information			Sample Field Measurements					Leaf Test			
	ISRA Area(s) & Location	Qualitative Flow Observations*	Photo Number(s)	Object ID	Sample ID (Object ID_yyyymmdd)	Sample/Observation Time	Conductivity (mS or uS)	рН	Temperature (°C)	Turbidity (NTU)	Distance (ft)	Time (s)	Speed (ft/s)	Water Depth (in)	
	Gunite swale conveying road runoff			B1BMP0009	B1BMP0009_										
B-1 AREA	Culvert outlet from upper parking lot area			B1BMP0010	B1BMP0010_										
	Underdrains			B1BMP0011	B1BMP0011_										
Notes:								Additional Observations:							
*Qı	ualitative Flow Observations	<u>:</u>													

No Flow	NPDES Permit Limits:	ALL RECEIVING AND SAMPLE COLLECTION BOTTLES MUST BE PRE-
Low Flow: Trickle or minor amount of flow.		RINSED 3 TIMES WITH SOURCE WATER, PRIOR TO COLLECTION OF THE
Moderate Flow: Water is flowing normally, no	Temperature < 86 °F	SAMPLE.
significant erosion or turbid water.		
High Flow: Significant water flow/velocity, slope		EXCEPTION IS THE HNO3 (NITRIC) PRESERVED POLY BOTTLES -
erosion.	pH 6.5 - 8.5	DO NOT PRE-RINSE THE HNO3 PRESERVED POLY'S
	No Flow Low Flow: Trickle or minor amount of flow. Moderate Flow: Water is flowing normally, no significant erosion or turbid water. High Flow: Significant water flow/velocity, slope erosion.	No FlowNPDES Permit Limits:Low Flow: Trickle or minor amount of flow.Moderate Flow: Water is flowing normally, no significant erosion or turbid water.Temperature < 86 °F

Sample Observations

Notes

(color, odor, sheen, foam, biological material, nearby erosion, etc.)

Sampling Responsibility:	Boeing	Inspector/Sam Date: Outfall/Waters	pler: shed	009		•	Weather: Rain Event Sta	rt Date/Time:				-		
		Sample Tracking I	nformation				Sample Field N	leasurements			Leaf	Test		Sample Observations
ISRA Area(s) & Location	Qualitative Flow Observations*	Photo Number(s)	Object ID	Sample ID (Object ID_yyyymmdd)	Sample/Observation Time	Conductivity (mS or uS)	рН	Temperature (°C)	Turbidity (NTU)	Distance (ft)	Time (s)	Speed (ft/s)	Water Depth (in)	Notes (color, odor, sheen, foam, biological material, nearby erosion, etc.)
Upstream Lower Lot Treatment BMP; sample port in cistern discharge pipeline			LPBMP0002	LPBMP0002_										
Mid-Point Lower Lot BMP; Sediment Basin outlet box			LPBMP0003	LPBMP0003_										
Downstream Lower Lot Treatment BMP; discharge from Biofilter effluent pipe			LPBMP0004	LPBMP0004_										
Filter basket influent in the administration buildings area parking lot.			ILBMP0009	ILBMP0009_										
Filter basket effluent in the administration buildings area parking lot.			ILBMP0010	ILBMP0010_										
Upstream (South), CM-9 BMPs			A1BMP0002	A1BMP0002_										
Downstream, CM-9 BMPs; CM-9 underdrains			A1BMP0003	A1BMP0003_										
Upstream (East), CM-9 BMPs; culvert inlet off Area II Road			ILBMP0002	ILBMP0002_										
· · ·	•	•		·	•	•	•						-	

Notes:

*Qualitative Flow Observations:

No Flow Low Flow: Trickle or minor amount of flow. Moderate Flow: Water is flowing normally, no significant erosion or turbid water.	<u>NPDES Permit Limits:</u> Temperature < 86 °F	ALL RECEIVING AND SAMPLE COLLECTION BOTTLES MUST BE <u>PRE-</u> <u>RINSED 3 TIMES</u> WITH SOURCE WATER, PRIOR TO COLLECTION OF THE SAMPLE.
High Flow: Significant water flow/velocity, slope erosion.	рН 6.5 - 8.5	EXCEPTION IS THE HNO3 (NITRIC) PRESERVED POLY BOTTLES - DO NOT PRE-RINSE THE HNO3 PRESERVED POLY'S

Additional Observations:

	Sampling Responsibility: <u>Boeing</u> Inspector/Sampler: Date: Outfall/Watershed Sample Tracking Information				009			Weather: Rain Event Sta	rt Date/Time:				-		
			Sample Tracking	Information			Sample Field Me	asurements				Leaf	f Test		
	ISRA Area(s) & Location	Qualitative Flow Observations*	Photo Number(s)	Object ID	Sample ID (Object ID_yyyymmdd)	Sample/Observation Time	Conductivity (mS or uS)	рН	Temperature (°C)	Turbidity (NTU)	Distance (ft)	Time (s)	Speed (ft/s)	Water Depth (in)	
	Upstream, B1436 southern detention bioswale (concrete swale diverting sheet flow into rock crib - west)			ILBMP0004	ILBMP0004_										
ETENTION BIO	Downstream, B1436 southern detention bioswale; 12-inch underdrain			ILBMP0005	ILBMP0005_										
B1436 D	Upstream, B1436 southern detention bioswale (concrete swale diverting sheet flow into rock crib - east)			ILBMP0008	ILBMP0008_										

Notes:

*Qualitative Flow Observations:		
No Flow Low Flow: Trickle or minor amount of flow. Moderate Flow: Water is flowing normally, no significant erosion or turbid water.	<u>NPDES Permit Limits:</u> Temperature < 86 °F	ALL RECEIVING AND SAMPLE COLLECTION BOTTLES MUST BE <u>PRE-</u> <u>RINSED 3 TIMES</u> WITH SOURCE WATER, PRIOR TO COLLECTION OF THE SAMPLE.
High Flow: Significant water flow/velocity, slope erosion.	pH 6.5 - 8.5	EXCEPTION IS THE HNO3 (NITRIC) PRESERVED POLY BOTTLES - DO NOT PRE-RINSE THE HNO3 PRESERVED POLY'S

Additional Observations:

Sample Observations

Notes (color, odor, sheen, foam, biological material, nearby erosion, etc.)

	Sampling Responsibility:	Boeing	Inspector/Sam Date: Outfall/Water	npler: shed	001			Weather: Rain Event Sta	irt Date/Time:			-					
			Sample Tracking	Information		Sample Field Measurements						Leaf Test					
	ISRA Area(s) & Location	Qualitative Flow Observations*	Photo Number(s)	Object ID	Sample ID (Object ID_yyyymmdd)	Sample/Observation Time	Conductivity (mS or uS)	рН	Temperature (°C)	Turbidity (NTU)	Distance (ft)	Time (s)	Speed (ft/s)	Water Depth (in)			
	Potential BMP location, Outfall 001 watershed (located at the low spot along Bell Canyon Road north of the road heading to Outfall 001).			EPSW001BG01	EPSW001BG01_												
05001	Potential BMP location, Outfall 001 watershed (at the bottom of the hill to the north of the intersection of the Southern Buffer Zone Road and Outfall 01			EPSW001IE01	EPSW001IE01_												
	Potential BMP location, Outfall 001 watershed (south side of the road heading towards Outfall 001 at the intersection of Outfall 001 road and Bell Canyon Road).			EPSW001PV01	EPSW001PV01_												
N	es:									Additional Observ	vations:						

N	lo Flow	NPDES Permit Limits:	ALL RECEIVING
L	ow Flow: Trickle or minor amount of flow.		<u>RINSED 3 TIMES</u> W
N si	Noderate Flow: Water is flowing normally, no ignificant erosion or turbid water.	Temperature < 86 °F	
н е	ligh Flow: Significant water flow/velocity, slope rosion.	pH 6.5 - 8.5	EXCEPTION IS DO NOT

 ALL RECEIVING AND SAMPLE COLLECTION BOTTLES MUST BE <u>PRE-</u>

 RINSED 3 TIMES

 %F

 SAMPLE.

XCEPTION IS THE HNO3 (NITRIC) PRESERVED POLY BOTTLES -DO NOT PRE-RINSE THE HNO3 PRESERVED POLY'S

Sample Observations

Notes (color, odor, sheen, foam, biological material, nearby erosion, etc.)

	Sampling Responsibility:	Boeing	_Inspector/Sam Date: Outfall/Water:	pler: shed	002	-									
			Sample Tracking	Information			Sample Field M	easurements				Test			
	ISRA Area(s) & Location	Qualitative Flow Observations*	Photo Number(s)	Object ID	Sample ID (Object ID_yyyymmdd)	Sample/Observation Time	Conductivity (mS or uS)	рН	Temperature (°C)	Turbidity (NTU)	Distance (ft)	Time (s)	Speed (ft/s)	Water Depth (in)	
	Potential BMP location, Outfall 002 watershed (located past the second water guzzler just before the steep incline into Outfall 002. Road delineator to the west of culvert).			EPSW002BG01	EPSW002BG01_										
OF002	Potential BMP location, Outfall 002 watershed (at STLV-IV. Immediately past the gates to the south east; adjacent to the new telephone pole).			EPSW002IE01	EPSW002IE01_										
	Potential BMP location, Outfall 002 watershed (located along the Southern Buffer Zone Road at the culvert inlet on the north side of the road. Approximately 400 feet east of the turnout).			EPSW002IE02	EPSW002IE02_										
No	tes:					•				Additional Observ	ations:				

*Qualitative Flow Observations:		
No Flow Low Flow: Trickle or minor amount of flow. Moderate Flow: Water is flowing normally, no significant erosion or turbid water.	<u>NPDES Permit Limits:</u> Temperature < 86 °F	ALL RECEIVING AND SAMPLE COLLECTION BOTTLES MUST BE <u>PRE-</u> <u>RINSED 3 TIMES</u> WITH SOURCE WATER, PRIOR TO COLLECTION OF THE SAMPLE.
High Flow: Significant water flow/velocity, slope erosion.	рН 6.5 - 8.5	EXCEPTION IS THE HNO3 (NITRIC) PRESERVED POLY BOTTLES - DO NOT PRE-RINSE THE HNO3 PRESERVED POLY'S

Sample Observations

Notes

(color, odor, sheen, foam, biological material, nearby erosion, etc.)

	Sampling Responsibility:	Boeing	Inspector/Sam Date: Outfall/Water	npler: shed	003		Weather: Rain Event Sta	rt Date/Time:							
			Sample Tracking	Information			Sample Field Me	asurements				Leaf	Test		
	ISRA Area(s) & Location	Qualitative Flow Observations*	Photo Number(s)	Object ID	Sample ID (Object ID, vyvymmdd)	Sample/Observation	Conductivity (mS or uS)	pН	Temperature (°C)	Turbidity (NTU)	Distance (ft)	Time (s)	Speed (ft/s)	Water Depth (in)	
OF003				RMHF0001	RMHF0001_					(((())))		(0)	(10)0)		
Not	es:								,	Additional Observ	ations:				
*Q	ualitative Flow Observation	ns:] [

No Flow	NPDES Permit Limits:	ALL RECEIVING AND SAMPLE COLLECTION BOTTLES MUST BE PRE-
Low Flow: Trickle or minor amount of flow.		<u>RINSED 3 TIMES</u> WITH SOURCE WATER, PRIOR TO COLLECTION OF THE
Moderate Flow: Water is flowing normally, no significant erosion or turbid water.	Temperature < 86 °F	SAMPLE.
High Flow: Significant water flow/velocity, slope erosion.	рН 6.5 - 8.5	EXCEPTION IS THE HNO3 (NITRIC) PRESERVED POLY BOTTLES - DO NOT PRE-RINSE THE HNO3 PRESERVED POLY'S

Sample Observations

Notes

(color, odor, sheen, foam, biological material, nearby erosion, etc.)

Appendix B: 2020/21 BMP Program Laboratory Reports

LABORATORY REPORTS

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<u>Boeing</u>

1	440-276656-1 - December 28, 2020, Eurofins Calscience Analytical Report
2	440-276656-2 - December 28, 2020, Eurofins Calscience Analytical Report
3	440-278183-1 – January 29, 2021, Eurofins Calscience Analytical Report
4	440-278183-2 – January 29, 2021, Eurofins Calscience Analytical Report
5	440-278183-3 – January 29, 2021, Eurofins Calscience Analytical Report
6	440-278184-1 – January 29, 2021, Eurofins Calscience Analytical Report
7	570-53559-1 – March 10, 2021, Eurofins Calscience Analytical Report
8	570-53559-2 – March 10, 2021, Eurofins Calscience Analytical Report

eurofins 🔅

Environment Testing America

ANALYTICAL REPORT

Eurofins Calscience Irvine 17461 Derian Ave Suite 100 Irvine, CA 92614-5817 Tel: (949)261-1022

Laboratory Job ID: 440-276656-1 Client Project/Site: Routine Outfall 003 RMHF GRAB

For:

Haley & Aldrich, Inc. 400 E Van Buren St. Suite 545 Phoenix, Arizona 85004

Attn: Katherine Miller

Authorized for release by: 1/11/2021 3:26:02 PM Christian Bondoc, Project Manager I (949)260-3218 Christian.Bondoc@Eurofinset.com

The test results in this report meet all 2003 NELAC, 2009 TNI, and 2016 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

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

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



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Sample Summary

Client: Haley & Aldrich, Inc. Project/Site: Routine Outfall 003 RMHF GRAB

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	A٩
440-276656-1	RMHF_20201228_Grab	Water	12/28/20 08:00	12/28/20 16:38	
440-276656-2	RMHF 20201228 Grab F	Water	12/28/20 08:00	12/28/20 16:38	

Eurofins Calscience Irvine

Job ID: 440-276656-1

Laboratory: Eurofins Calscience Irvine

Narrative

Job Narrative 440-276656-1

Comments

No additional comments.

Receipt

The samples were received on 12/28/2020 4:38 PM; the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.8° C.

Dioxin

Method 1613B: EPA Method 1613B specifies a +/- 15 second retention time difference between the recovery standard in the initial calibration (ICAL) and the continuing calibration verification (CCV010621A). The 13C-1,2,3,4-TCDD and 13C-1,2,3,7,8,9-HxCDD associated with the following samples run on instrument 10D5 exceeded this criteria: RMHF_20201228_Grab (440-276656-1), (CCV 320-449084/15), (LCS 320-447136/2-A), (MB 320-447136/1-A) and (WDM 320-449084/16). This retention time shift is due to normal and reasonable column maintenance and does not affect the instrument chromatography resolution, sensitivity, or identification of target analytes. System retention times have been updated for proper analyte identification.

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

Metals

Method FILTRATION: The following sample requested dissolved metals and was not filtered in the field: RMHF_20201228_Grab_F (440-276656-2). This sample was filtered and preserved upon receipt to the laboratory.

12/29/20 @ 1318 hours 2.5 mL HNO3 HNO3 Lot # 0000245675

Method 200.7 Rev 4.4: The matrix spike / matrix spike duplicate (MS/MSD) recoveries of Aluminum for preparation batch 440-635081 and analytical batch 440-635192 were outside control limits. Sample matrix interference and/or non-homogeneity are suspected. The associated laboratory control sample (LCS) recovery was within acceptance limits.

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

General Chemistry

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

Dioxin Prep

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

Client: Haley & Aldrich, Inc. Project/Site: Routine Outfall 003 RMHF GRAB

Client Sample ID: RMHF_20201228_Grab Date Collected: 12/28/20 08:00 Date Received: 12/28/20 16:38

Lab Sample ID: 440-276656-1

Matrix: Water

	u i ulalis (ilix					_	- ·		.
Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDD	ND		0.000010	0.0000016	ug/L		12/30/20 11:29	01/07/21 03:38	1
2,3,7,8-TCDF	ND		0.000010	0.0000008	ug/L		12/30/20 11:29	01/07/21 03:38	1
	0 0000066		0 000051	0 0000021	ua/l		12/30/20 11.29	01/07/21 03:38	1
	0.0000000		0.000051	0.0000021	ug/L		12/30/20 11:29	01/07/21 03:38	
2 3 4 7 8-PoCDE	0.0000013		0.000001	0.0000014	ug/L		12/30/20 11:29	01/07/21 03:38	1
1 2 3 4 7 8-HyCDD	0.0000025	J,DX q	0.000051	0.0000013	ug/L		12/30/20 11:29	01/07/21 03:38	1
1 2 3 6 7 8-HxCDD	0.000077		0.000051	0.0000019	ug/L		12/30/20 11:29	01/07/21 03:38	
1 2 3 7 8 9-HxCDD	0.000027		0.000051	0.0000018	ug/L		12/30/20 11:29	01/07/21 03:38	1
1 2 3 4 7 8-HxCDF	ND	0,01	0.000051	0.0000020	ua/l		12/30/20 11:29	01/07/21 03:38	1
123678-HxCDF	ND		0.000051	0.0000023	ua/l		12/30/20 11:29	01/07/21 03:38	
1 2 3 7 8 9-HxCDF	ND		0.000051	0.0000012	ug/L		12/30/20 11:29	01/07/21 03:38	1
2 3 4 6 7 8-HxCDF	0.000029	J.DX a MB	0.000051	0.0000014	ua/l		12/30/20 11:29	01/07/21 03:38	1
1 2 3 4 6 7 8-HpCDD	0.00044	MB	0.000051	0.0000053	ua/L		12/30/20 11:29	01/07/21 03:38	· · · · · · · · 1
1.2.3.4.6.7.8-HpCDF	0.000059	a MB	0.000051	0.0000018	ua/L		12/30/20 11:29	01/07/21 03:38	1
1 2 3 4 7 8 9-HpCDF	0.0000038		0.000051	0.0000022	ua/L		12/30/20 11:29	01/07/21 03:38	1
OCDD	0.0056	MB	0.00010	0.0000046	ua/L		12/30/20 11:29	01/07/21 03:38	
OCDF	0.000083	J.DX	0.00010	0.0000011	ua/L		12/30/20 11:29	01/07/21 03:38	1
Total TCDD	0.000013	MB	0.000010	0.0000016	ua/L		12/30/20 11:29	01/07/21 03:38	1
Total TCDF	ND		0.000010	0.0000008	ua/L		12/30/20 11:29	01/07/21 03:38	1
				0	0				
Total PeCDD	0.000012	J,DX q	0.000051	0.0000021	ug/L		12/30/20 11:29	01/07/21 03:38	1
Total PeCDF	0.000022	J,DX q	0.000051	0.0000014	ug/L		12/30/20 11:29	01/07/21 03:38	1
Total HxCDD	0.00018	q	0.000051	0.0000019	ug/L		12/30/20 11:29	01/07/21 03:38	1
Total HxCDF	0.000080	q MB	0.000051	0.0000017	ug/L		12/30/20 11:29	01/07/21 03:38	1
Total HpCDD	0.0013	MB	0.000051	0.0000053	ug/L		12/30/20 11:29	01/07/21 03:38	1
Total HpCDF	0.00016	q MB	0.000051	0.0000020	ug/L		12/30/20 11:29	01/07/21 03:38	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C-2,3,7,8-TCDD	71		25 - 164				12/30/20 11:29	01/07/21 03:38	1
13C-2,3,7,8-TCDF	73		24 - 169				12/30/20 11:29	01/07/21 03:38	1
13C-1,2,3,7,8-PeCDD	69		25 - 181				12/30/20 11:29	01/07/21 03:38	1
13C-1,2,3,7,8-PeCDF	63		24 - 185				12/30/20 11:29	01/07/21 03:38	1
13C-2,3,4,7,8-PeCDF	63		21 - 178				12/30/20 11:29	01/07/21 03:38	1
13C-1,2,3,4,7,8-HxCDD	76		32 - 141				12/30/20 11:29	01/07/21 03:38	1
13C-1,2,3,6,7,8-HxCDD	74		28 - 130				12/30/20 11:29	01/07/21 03:38	1
13C-1,2,3,4,7,8-HxCDF	82		26 - 152				12/30/20 11:29	01/07/21 03:38	1
13C-1,2,3,6,7,8-HxCDF	74		26 - 123				12/30/20 11:29	01/07/21 03:38	1
13C-1,2,3,7,8,9-HxCDF	81		29 - 147				12/30/20 11:29	01/07/21 03:38	1
13C-2,3,4,6,7,8-HxCDF	80		28 - 136				12/30/20 11:29	01/07/21 03:38	1
13C-1,2,3,4,6,7,8-HpCDD	93		23 - 140				12/30/20 11:29	01/07/21 03:38	1
13C-1,2,3,4,6,7,8-HpCDF	87		28 - 143				12/30/20 11:29	01/07/21 03:38	1
13C-1,2,3,4,7,8,9-HpCDF	89		26 - 138				12/30/20 11:29	01/07/21 03:38	1
13C-OCDD	105		17 - 157				12/30/20 11:29	01/07/21 03:38	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	93		35 - 197				12/30/20 11:29	01/07/21 03:38	1
Mothod: 200 7 Poy 4.4 Mot			ablo						
Method: 200.7 Rev 4.4 - Meta	als (ICP) - Tot	al Recovera	able RI	мо	Unit	п	Prepared	Analyzed	Dil Fac

Client: Haley & Aldrich, Inc. Project/Site: Routine Outfall 003 RMHF GRAB

Client Sample ID: RMHF_20201228_Grab Date Collected: 12/28/20 08:00 Date Received: 12/28/20 16:38

Lab Sample ID: 440-276656-1 Matrix: Water

Method: 200.7 Rev 4.4 - Meta	als (ICP) - 100					_			
Analyte	Result	Qualifier		MDL	Unit	D	Prepared	Analyzed	Dil Fac
Zinc	1500		20	12	ug/L		12/31/20 15:03	01/04/21 11:23	1
Iron	2500		100	50	ug/L		12/31/20 15:03	01/04/21 11:23	1
Vanadium	16		10	5.0	ug/L		12/31/20 15:03	01/04/21 11:23	1
Boron	35	J,DX	50	25	ug/L		12/31/20 15:03	01/04/21 11:23	1
Aluminum	1400		100	50	ug/L		12/31/20 15:03	01/04/21 11:23	1
Manganese	210		20	15	ug/L		12/31/20 15:03	01/04/21 11:23	1
Method: 200.8 - Metals (ICP/	MS) - Total R	ecoverable							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silver	ND		1.0	0.50	ug/L		12/31/20 15:09	01/04/21 09:30	1
Cadmium	1.3		1.0	0.25	ug/L		12/31/20 15:09	01/04/21 09:30	1
Copper	62		2.0	0.50	ug/L		12/31/20 15:09	01/04/21 09:30	1
Lead	18		1.0	0.50	ug/L		12/31/20 15:09	01/04/21 09:30	1
Antimony	0.75	J,DX	2.0	0.50	ug/L		12/31/20 15:09	01/04/21 09:30	1
Selenium	0.94	J,DX	2.0	0.50	ug/L		12/31/20 15:09	01/04/21 09:30	1
Thallium	ND		1.0	0.20	ug/L		12/31/20 15:09	01/04/21 09:30	1
Method: 245.1 - Mercury (C\	/AA)								
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.10	ug/L		12/31/20 10:45	12/31/20 15:27	1
Method: SM 2340B - Total H	ardness (as C	aCO3) by ca	alculation -	Total R	ecovera	ble			
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hardness, as CaCO3	54		0.33	0.17	mg/L			01/05/21 02:58	1
General Chemistry									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	210		6.7	3.3	mg/L			12/31/20 14:53	1
lient Sample ID: RMHF	20201228	Grab_F				La	b Sample	ID: 440-276	656-2
ata Callastadi 12/20/20 00:0	0							Matrix	: Water
ate Received: 12/28/20 16:38	8								
ate Conected: 12/28/20 08.0 ate Received: 12/28/20 16:30 Method: 200.7 Rev 4.4 - Met	8 als (ICP) - Dis	solved							
ate Conected: 12/28/20 08:0 ate Received: 12/28/20 16:34 Method: 200.7 Rev 4.4 - Meta Analyte	8 als (ICP) - Dis Result	<mark>solved</mark> Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ate Conected: 12/28/20 08:0 ate Received: 12/28/20 16:3 Method: 200.7 Rev 4.4 - Meta Analyte Aluminum	8 als (ICP) - Dis 	Solved Qualifier J,DX	RL 100	MDL 50	Unit ug/L	D	Prepared 01/04/21 11:56	Analyzed 01/04/21 17:33	Dil Fac
Ate Conected: 12/26/20 08:0 ate Received: 12/28/20 16:3 Method: 200.7 Rev 4.4 - Meta Analyte Aluminum Boron	8 als (ICP) - Dis Result 95 32	solved Qualifier J,DX J,DX	RL 100 50	MDL 50 25	Unit ug/L ug/L	D	Prepared 01/04/21 11:56 01/04/21 11:56	Analyzed 01/04/21 17:33 01/04/21 17:33	Dil Fac
ate Conected: 12/26/20 06:0 ate Received: 12/28/20 16:3 Method: 200.7 Rev 4.4 - Met Analyte Aluminum Boron Iron	als (ICP) - Dis 	Solved Qualifier J,DX J,DX	RL 100 50 100	MDL 50 25 50	Unit ug/L ug/L ug/L	D	Prepared 01/04/21 11:56 01/04/21 11:56 01/04/21 11:56	Analyzed 01/04/21 17:33 01/04/21 17:33 01/04/21 17:33	Dil Fac
ate Conected: 12/26/20 06:0 ate Received: 12/28/20 16:3 Method: 200.7 Rev 4.4 - Met Analyte Aluminum Boron Iron Nickel	als (ICP) - Dis 	Solved Qualifier J,DX J,DX	RL 100 50 100 10	MDL 50 25 50 5.0	Unit ug/L ug/L ug/L ug/L	<u>D</u>	Prepared 01/04/21 11:56 01/04/21 11:56 01/04/21 11:56 01/04/21 11:56	Analyzed 01/04/21 17:33 01/04/21 17:33 01/04/21 17:33 01/04/21 17:33	Dil Fac 1 1 1 1
Ate Conected: 12/28/20 06:0 ate Received: 12/28/20 16:3 Method: 200.7 Rev 4.4 - Met Analyte Aluminum Boron Iron Nickel Vanadium	8 als (ICP) - Dis Result 95 32 260 10	solved Qualifier J,DX J,DX	RL 100 50 100 10	MDL 50 25 50 5.0 5.0	Unit ug/L ug/L ug/L ug/L ug/L	<u> </u>	Prepared 01/04/21 11:56 01/04/21 11:56 01/04/21 11:56 01/04/21 11:56 01/04/21 11:56	Analyzed 01/04/21 17:33 01/04/21 17:33 01/04/21 17:33 01/04/21 17:33 01/04/21 17:33	Dil Fac 1 1 1 1

Method: 200.8 - Metal	s (ICP/MS) - Dissolv	ved							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		2.0	0.50	ug/L		12/30/20 08:08	12/30/20 15:19	1
Cadmium	0.72	J,DX	1.0	0.25	ug/L		12/30/20 08:08	12/30/20 15:19	1
Copper	43		2.0	0.50	ug/L		12/30/20 08:08	12/30/20 15:19	1
Lead	3.5		1.0	0.50	ug/L		12/30/20 08:08	12/30/20 15:19	1
Selenium	0.62	J,DX	2.0	0.50	ug/L		12/30/20 08:08	12/30/20 15:19	1
Silver	ND		1.0	0.50	ug/L		12/30/20 08:08	12/30/20 15:19	1

20

160

Manganese

15 ug/L

Eurofins Calscience Irvine

01/04/21 11:56 01/04/21 17:33

1

Client Sample Results

Client: Haley & Aldrich, Inc.
Project/Site: Routine Outfall 003 RMHF GRAB

Job ID: 440-276656-1

Client Sample ID: RMHF_20201228_Grab_F Date Collected: 12/28/20 08:00 Date Received: 12/28/20 16:38						La	656-2 Water		
Method: 200.8 - Metals (IC	P/MS) - Dissolv	ved (Continu	ed)						
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Thallium	ND		1.0	0.20	ug/L		12/30/20 08:08	12/30/20 15:19	1
Method: SM 2340B - Total	Hardness (as C	CaCO3) by c	alculation -	Dissolv	ved				
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as CaCO3	43		0.33	0.17	mg/L			01/06/21 02:58	1
Method Summary

Client: Haley & Aldrich, Inc. Project/Site: Routine Outfall 003 RMHF GRAB

Job ID: 440-276656-1

Method	Method Description	Protocol	Laboratory
1613B	Dioxins and Furans (HRGC/HRMS)	EPA	TAL SAC
200.7 Rev 4.4	Metals (ICP)	EPA	TAL IRV
200.8	Metals (ICP/MS)	EPA	TAL IRV
245.1	Mercury (CVAA)	EPA	TAL IRV
SM 2340B	Total Hardness (as CaCO3) by calculation	SM	TAL IRV
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL IRV
1613B	Separatory Funnel (L/L) Extraction with Soxhlet Extraction of Dioxin and Furans	EPA	TAL SAC
200.2	Preparation, Total Recoverable Metals	EPA	TAL IRV
245.1	Preparation, Mercury	EPA	TAL IRV
FILTRATION	Sample Filtration	None	TAL IRV

Protocol References:

EPA = US Environmental Protection Agency

None = None

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

Laboratory References:

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

Client: Haley & Aldrich, Inc. Project/Site: Routine Outfall 003 RMHF GRAB

Job ID: 440-276656-1

Client Sample ID: RMHF_20201228_Grab Date Collected: 12/28/20 08:00 Date Received: 12/28/20 16:38

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	1613B			983.4 mL	20.0 uL	447136	12/30/20 11:29	NR	TAL SAC
Total/NA	Analysis	1613B		1			449084	01/07/21 03:38	SMA	TAL SAC
Total Recoverable	Prep	200.2			25 mL	25 mL	635081	12/31/20 15:03	M1G	TAL IRV
Total Recoverable	Analysis	200.7 Rev 4.4		1			635192	01/04/21 11:23	VS	TAL IRV
Total Recoverable	Prep	200.2			25 mL	25 mL	635082	12/31/20 15:09	M1G	TAL IRV
Total Recoverable	Analysis	200.8		1			635168	01/04/21 09:30	Y2WS	TAL IRV
Total/NA	Prep	245.1			20 mL	20 mL	635044	12/31/20 10:45	MA6V	TAL IRV
Total/NA	Analysis	245.1		1			635090	12/31/20 15:27	MA6V	TAL IRV
Total Recoverable	Analysis	SM 2340B		1			634523	01/05/21 02:58	P1R	TAL IRV
Total/NA	Analysis	SM 2540D		1	150 mL	1000 mL	635080	12/31/20 14:53	KMY	TAL IRV

Client Sample ID: RMHF_20201228_Grab_F Date Collected: 12/28/20 08:00 Date Received: 12/28/20 16:38

Lab Sample ID: 440-276656-2

Matrix: Water

_	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Dissolved	Filtration	FILTRATION			200 mL	200 mL	634790	12/29/20 13:02	M1G	TAL IRV
Dissolved	Prep	200.2			25 mL	25 mL	635191	01/04/21 11:56	M1G	TAL IRV
Dissolved	Analysis	200.7 Rev 4.4		1			635229	01/04/21 17:33	P1R	TAL IRV
Dissolved	Filtration	FILTRATION			200 mL	200 mL	634790	12/29/20 13:02	M1G	TAL IRV
Dissolved	Prep	200.2			25 mL	25 mL	634809	12/30/20 08:08	M1G	TAL IRV
Dissolved	Analysis	200.8		1			634962	12/30/20 15:19	MQP	TAL IRV
Dissolved	Analysis	SM 2340B		1			634523	01/06/21 02:58	P1R	TAL IRV

Laboratory References:

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

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

Lab Sample ID: 440-276656-1 **Matrix: Water** 5 6 7

5

8

Method: 1613B - Dioxins and Furans (HRGC/HRMS)

Lab Sample ID: MB 320-447136/1-A Matrix: Water

Analysis Batch: 449084

13C-OCDD

	MB	MB							
Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDD	ND		0.000010	0.0000013	ug/L		12/30/20 11:29	01/07/21 02:08	1
2,3,7,8-TCDF	ND		0.000010	0.0000006	ug/L		12/30/20 11:29	01/07/21 02:08	1
1,2,3,7,8-PeCDD	ND		0.000050	0.0000026	ug/L		12/30/20 11:29	01/07/21 02:08	1
1,2,3,7,8-PeCDF	ND		0.000050	0.0000016	ug/L		12/30/20 11:29	01/07/21 02:08	1
2,3,4,7,8-PeCDF	ND		0.000050	0.0000018	ug/L		12/30/20 11:29	01/07/21 02:08	1
1,2,3,4,7,8-HxCDD	ND		0.000050	0.0000013	ug/L		12/30/20 11:29	01/07/21 02:08	1
1,2,3,6,7,8-HxCDD	ND		0.000050	0.0000012	ug/L		12/30/20 11:29	01/07/21 02:08	1
1,2,3,7,8,9-HxCDD	ND		0.000050	0.0000011	ug/L		12/30/20 11:29	01/07/21 02:08	1
1,2,3,4,7,8-HxCDF	ND		0.000050	0.0000016	ug/L		12/30/20 11:29	01/07/21 02:08	1
1,2,3,6,7,8-HxCDF	ND		0.000050	0.0000016	ug/L		12/30/20 11:29	01/07/21 02:08	1
1,2,3,7,8,9-HxCDF	ND		0.000050	0.0000009 2	ug/L		12/30/20 11:29	01/07/21 02:08	1
2,3,4,6,7,8-HxCDF	0.00000184	J,DX	0.000050	0.0000011	ug/L		12/30/20 11:29	01/07/21 02:08	1
1,2,3,4,6,7,8-HpCDD	0.00000517	J,DX	0.000050	0.0000010	ug/L		12/30/20 11:29	01/07/21 02:08	1
1,2,3,4,6,7,8-HpCDF	0.00000339	J,DX q	0.000050	0.0000007 5	ug/L		12/30/20 11:29	01/07/21 02:08	1
1,2,3,4,7,8,9-HpCDF	ND		0.000050	0.0000009 5	ug/L		12/30/20 11:29	01/07/21 02:08	1
OCDD	0.00000647	J,DX q	0.00010	0.0000012	ug/L		12/30/20 11:29	01/07/21 02:08	1
OCDF	ND		0.00010	0.0000012	ug/L		12/30/20 11:29	01/07/21 02:08	1
Total TCDD	0.0000102	q	0.000010	0.0000013	ug/L		12/30/20 11:29	01/07/21 02:08	1
Total TCDF	ND		0.000010	0.0000006 5	ug/L		12/30/20 11:29	01/07/21 02:08	1
Total PeCDD	ND		0.000050	0.0000026	ug/L		12/30/20 11:29	01/07/21 02:08	1
Total PeCDF	ND		0.000050	0.0000018	ug/L		12/30/20 11:29	01/07/21 02:08	1
Total HxCDD	ND		0.000050	0.0000013	ug/L		12/30/20 11:29	01/07/21 02:08	1
Total HxCDF	0.00000184	J,DX	0.000050	0.0000013	ug/L		12/30/20 11:29	01/07/21 02:08	1
Total HpCDD	0.0000871	J,DX	0.000050	0.0000010	ug/L		12/30/20 11:29	01/07/21 02:08	1
Total HpCDF	0.00000339	J,DX q	0.000050	0.0000008 5	ug/L		12/30/20 11:29	01/07/21 02:08	1
	MB	MB							
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C-2,3,7,8-TCDD	67		25 - 164				12/30/20 11:29	01/07/21 02:08	1
13C-2,3,7,8-TCDF	71		24 - 169				12/30/20 11:29	01/07/21 02:08	1
13C-1,2,3,7,8-PeCDD	66		25 - 181				12/30/20 11:29	01/07/21 02:08	1
13C-1,2,3,7,8-PeCDF	65		24 - 185				12/30/20 11:29	01/07/21 02:08	1
13C-2,3,4,7,8-PeCDF	65		21 - 178				12/30/20 11:29	01/07/21 02:08	1
13C-1,2,3,4,7,8-HxCDD	75		32 - 141				12/30/20 11:29	01/07/21 02:08	1
13C-1,2,3,6,7,8-HxCDD	71		28 - 130				12/30/20 11:29	01/07/21 02:08	1
13C-1,2,3,4,7,8-HxCDF	74		26 - 152				12/30/20 11:29	01/07/21 02:08	1
13C-1,2,3,6,7,8-HxCDF	77		26 - 123				12/30/20 11:29	01/07/21 02:08	1
13C-1,2,3,7,8,9-HxCDF	80		29 - 147				12/30/20 11:29	01/07/21 02:08	1
13C-2,3,4,6,7,8-HxCDF	79		28 - 136				12/30/20 11:29	01/07/21 02:08	1
13C-1,2,3,4,6,7,8-HpCDD	82		23 - 140				12/30/20 11:29	01/07/21 02:08	1
13C-1,2,3,4,6,7,8-HpCDF	80		28 - 143				12/30/20 11:29	01/07/21 02:08	1
13C-1,2,3,4,7,8,9-HpCDF	80		26 - 138				12/30/20 11:29	01/07/21 02:08	1

Client Sample ID: Method Blank Prep Type: Total/NA Prep Batch: 447136

Eurofins Calscience Irvine

12/30/20 11:29 01/07/21 02:08

17 - 157

88

ole ID: Method Blank Prep Type: Total/NA Prep Batch: 447136 Dil Fac

8

		QC	Samp	le Resi	ults					70050 4
Client: Haley & Aldrich, Inc. Project/Site: Routine Outfall 003	3 RMHF GRA	В							Job ID: 440-2	76656-1
Method: 1613B - Dioxins	and Furan	s (HRG	C/HRN	IS) (Cont	tinued)					
Lab Sample ID: MB 320-447 Matrix: Water Analysis Batch: 449084	136/1-A						Clie	ent Samp	ole ID: Metho Prep Type: 1 Prep Batch:	d Blank Fotal/NA 447136
	MB	MB								
Surrogate	%Recovery	Qualifier	Limi	ts			P	repared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	87		35 - 1	197			12/3	80/20 11:29	01/07/21 02:08	1
Lab Sample ID: LCS 320-447 Matrix: Water Analysis Batch: 449084	7136/2-A					Client	Sar	nple ID:	Lab Control Prep Type: 1 Prep Batch:	Sample Fotal/NA 447136
			Spike	LCS	LCS				%Rec.	
Analyte			Added	Result	Qualifier	Unit	D	%Rec	Limits	
2,3,7,8-TCDD		0	.000200	0.000226		ug/L		113	67 - 158	
2,3,7,8-TCDF		0	.000200	0.000219		ug/L		109	75 - 158	
1,2,3,7,8-PeCDD			0.00100	0.00102		ug/L		102	70_142	
1,2,3,7,8-PeCDF			0.00100	0.00111		ug/L		111	80 - 134	
2,3,4,7,8-PeCDF			0.00100	0.00111		ug/L		111	68 - 160	
1,2,3,4,7,8-HxCDD			0.00100	0.00113		ug/L		113	70 - 164	
1,2,3,6,7,8-HxCDD			0.00100	0.00103		ug/L		103	76 - 134	
1,2,3,7,8,9-HxCDD			0.00100	0.00106		ug/L		106	64 - 162	
1,2,3,4,7,8-HXCDF			0.00100	0.00105		ug/L		105	72 - 134	
			0.00100	0.00102		ug/L		102	84 - 130	
			0.00100	0.00100	MD	ug/L		100	70 - 130	
			0.00100	0.00104		ug/L		104	70 - 150	
			0.00100	0.000992		ug/L		99 105	70 - 140	
1,2,3,4,0,7,89-HpCDF			0.00100	0.00105		ug/L		105	78 138	
OCDD			0.00100	0.00103	MB	ug/L		00	78 144	
OCDE			0.00200	0.00190		ug/L		94 94	63 170	
	LCS LCS	6	0.00200	0.00107		49/L		54	00-170	

Isotope Dilution	%Recovery	Qualifier	Limits
13C-2,3,7,8-TCDD	75		20 - 175
13C-2,3,7,8-TCDF	77		22 - 152
13C-1,2,3,7,8-PeCDD	75		21 - 227
13C-1,2,3,7,8-PeCDF	72		21 - 192
13C-2,3,4,7,8-PeCDF	72		13 - 328
13C-1,2,3,4,7,8-HxCDD	82		21 - 193
13C-1,2,3,6,7,8-HxCDD	81		25 - 163
13C-1,2,3,4,7,8-HxCDF	86		19 - 202
13C-1,2,3,6,7,8-HxCDF	85		21 - 159
13C-1,2,3,7,8,9-HxCDF	90		17 - 205
13C-2,3,4,6,7,8-HxCDF	89		22 - 176
13C-1,2,3,4,6,7,8-HpCDD	99		26 - 166
13C-1,2,3,4,6,7,8-HpCDF	95		21 - 158
13C-1,2,3,4,7,8,9-HpCDF	94		20 - 186
13C-OCDD	109		13 - 199
	LCS	LCS	
Surrogate	%Recovery	Qualifier	Limits
37Cl4-2,3,7,8-TCDD	93		31 - 191

Client Sample ID: Method Blank

Prep Type: Total Recoverable

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 440-635081/1-A Matrix: Water Analysis Batch: 635192

Analysis Batch: 635192								Prep Batch:	635081
-	MB	MB							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nickel	ND		10	5.0	ug/L		12/31/20 15:03	01/04/21 11:19	1
Zinc	ND		20	12	ug/L		12/31/20 15:03	01/04/21 11:19	1
Iron	ND		100	50	ug/L		12/31/20 15:03	01/04/21 11:19	1
Vanadium	ND		10	5.0	ug/L		12/31/20 15:03	01/04/21 11:19	1
Boron	ND		50	25	ug/L		12/31/20 15:03	01/04/21 11:19	1
Aluminum	ND		100	50	ug/L		12/31/20 15:03	01/04/21 11:19	1
Manganese	ND		20	15	ug/L		12/31/20 15:03	01/04/21 11:19	1

Lab Sample ID: LCS 440-635081/2-A **Matrix: Water**

Analysis Batch: 635192

Analysis Datch. 055152							Fiep Batch. 055001
	Spike	LCS	LCS				%Rec.
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits
Nickel	500	496		ug/L		99	85 - 115
Zinc	500	497		ug/L		99	85 - 115
Iron	500	498		ug/L		100	85 - 115
Vanadium	500	488		ug/L		98	85 - 115
Boron	500	485		ug/L		97	85 - 115
Aluminum	500	478		ug/L		96	85 - 115
Manganese	500	490		ug/L		98	85 - 115

Lab Sample ID: 440-276656-1 MS Matrix: Water Analysis Batch: 635192

	Sample	Sample	Spike	MS	MS				%Rec.	
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits	
Nickel	14		500	519		ug/L		101	70 - 130	
Zinc	1500		500	2010		ug/L		105	70 - 130	
Iron	2500		500	3470	BB	ug/L		189	70 - 130	
Vanadium	16		500	522		ug/L		101	70 - 130	
Boron	35	J,DX	500	536		ug/L		100	70 - 130	
Aluminum	1400		500	2680	LM	ug/L		251	70 - 130	
Manganese	210		500	711		ug/L		101	70_130	

Lab Sample ID: 440-276656-1 MSD Matrix: Water Analysis Batch: 635192

Client Sample ID: RMHF_20201228_Grab **Prep Type: Total Recoverable** Prep Batch: 635081

Client Sample ID: RMHF_20201228_Grab

Prep Type: Total Recoverable

Prep Batch: 635081

·····,											
	Sample	Sample	Spike	MSD	MSD				%Rec.		RPD
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Nickel	14		500	524		ug/L		102	70 - 130	1	20
Zinc	1500		500	2030		ug/L		108	70 - 130	1	20
Iron	2500		500	3590	BB	ug/L		213	70 - 130	3	20
Vanadium	16		500	529		ug/L		103	70 - 130	1	20
Boron	35	J,DX	500	543		ug/L		102	70 - 130	1	20
Aluminum	1400		500	2790	LM	ug/L		272	70 - 130	4	20
Manganese	210		500	722		ug/L		103	70 - 130	1	20

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Client Sample ID: Lab Control Sample Prep Type: Total Recoverable Prep Batch: 635081

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Client Sample ID: Method Blank Prep Type: Dissolved Prep Batch: 635191

Method: 200.7 Rev 4.4 - Metals (ICP) (Continued)

Lab Sample ID: MB 440-634790/1-E **Matrix: Water** Analysis Batch: 635229

	MB	MB							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nickel	ND		10	5.0	ug/L		01/04/21 11:56	01/04/21 17:04	1
Zinc	ND		20	12	ug/L		01/04/21 11:56	01/04/21 17:04	1
Iron	ND		100	50	ug/L		01/04/21 11:56	01/04/21 17:04	1
Vanadium	ND		10	5.0	ug/L		01/04/21 11:56	01/04/21 17:04	1
Boron	ND		50	25	ug/L		01/04/21 11:56	01/04/21 17:04	1
Aluminum	ND		100	50	ug/L		01/04/21 11:56	01/04/21 17:04	1
Manganese	ND		20	15	ug/L		01/04/21 11:56	01/04/21 17:04	1

Lab Sample ID: LCS 440-634790/2-E **Matrix: Water**

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Analysis Batch: 635229							Ргер Ват	CN: 635191
	Spike	LCS	LCS				%Rec.	
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	
Nickel	500	484		ug/L		97	85 - 115	
Zinc	500	484		ug/L		97	85 - 115	
Iron	500	483		ug/L		97	85 - 115	
Vanadium	500	482		ug/L		96	85 - 115	
Boron	500	473		ug/L		95	85 - 115	
Aluminum	500	469		ug/L		94	85 - 115	
Manganese	500	483		ug/L		97	85 - 115	

Lab Sample ID: 440-276596-C-2-G MS Matrix: Water Analysis Batch: 635229

Analysis Batch: 635229									Prep Batch: 635191
-	Sample	Sample	Spike	MS	MS				%Rec.
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits
Nickel	15		500	485		ug/L		94	70 - 130
Zinc	3600		500	4000	BB	ug/L		84	70 - 130
Iron	75	J,DX	500	558		ug/L		96	70 - 130
Vanadium	7.7	J,DX	500	490		ug/L		97	70 - 130
Boron	540		500	1010		ug/L		95	70 - 130
Aluminum	ND		500	518		ug/L		104	70 - 130
Manganese	97		500	572		ug/L		95	70 - 130

Lab Sample ID: 440-276596-C-2-H MSD **Matrix: Water** Analysis Batch: 635229

Prep Batch: 635191 Sample Sample Spike MSD MSD %Rec. RPD Analyte Result Qualifier Added **Result Qualifier** Unit D %Rec Limits RPD Limit Nickel 15 500 496 ug/L 70 - 130 2 20 96 Zinc 3600 500 3990 BB 81 70 - 130 20 ug/L 0 500 97 70 - 130 20 Iron 75 J,DX 560 ug/L 1 Vanadium 7.7 J,DX 500 500 ug/L 99 70 - 130 2 20 Boron 540 500 1020 ug/L 97 70 - 130 20 1 Aluminum ND 500 533 ug/L 107 70 - 130 3 20 Manganese 97 500 583 ug/L 97 70 - 130 2 20

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Client Sample ID: Matrix Spike Prep Type: Dissolved

Client Sample ID: Matrix Spike Duplicate

Client Sample ID: Lab Control Sample

Prep Type: Dissolved

Prep Type: Dissolved

Method: 200.8 - Metals (ICP/MS)

Lab Sample ID: MB 440-635082/1-A Matrix: Water Analysis Batch: 635168

	MB	MB							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		1.0	0.25	ug/L		12/31/20 15:09	01/04/21 09:54	1
Copper	ND		2.0	0.50	ug/L		12/31/20 15:09	01/04/21 09:54	1
Lead	ND		1.0	0.50	ug/L		12/31/20 15:09	01/04/21 09:54	1
Antimony	ND		2.0	0.50	ug/L		12/31/20 15:09	01/04/21 09:54	1
Selenium	ND		2.0	0.50	ug/L		12/31/20 15:09	01/04/21 09:54	1
Silver	ND		1.0	0.50	ug/L		12/31/20 15:09	01/04/21 09:54	1
Thallium	ND		1.0	0.20	ug/L		12/31/20 15:09	01/04/21 09:54	1

Lab Sample ID: LCS 440-635082/2-A **Matrix: Water**

Analysis Batch: 635168							Prep Batch: 635082
-	Spike	LCS	LCS				%Rec.
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits
Cadmium	80.0	80.3		ug/L		100	85 - 115
Copper	80.0	80.5		ug/L		101	85 - 115
Lead	80.0	80.0		ug/L		100	85 - 115
Antimony	80.0	85.2		ug/L		106	85 - 115
Selenium	80.0	77.9		ug/L		97	85 - 115
Silver	80.0	83.2		ug/L		104	85 - 115
Thallium	80.0	79.6		ug/L		100	85 - 115

Lab Sample ID: 440-276656-1 MS Matrix: Water Analysis Batch: 635168

Analysis Batch: 635168									Prep Batch: 635082
-	Sample	Sample	Spike	MS	MS				%Rec.
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits
Silver	ND		80.0	79.2		ug/L		99	70 - 130
Cadmium	1.3		80.0	85.5		ug/L		105	70 - 130
Copper	62		80.0	146		ug/L		105	70 - 130
Lead	18		80.0	101		ug/L		104	70 - 130
Antimony	0.75	J,DX	80.0	75.7		ug/L		94	70 - 130
Selenium	0.94	J,DX	80.0	72.8		ug/L		90	70 - 130
Thallium	ND		80.0	81.4		ug/L		102	70 - 130

Lab Sample ID: 440-276656-1 MSD Matrix: Water Analysis Batch: 635168

Client Sample ID: RMHF_20201228_Grab

Prep Type: Total Recoverable

Client Sample ID: Lab Control Sample

Prep Type: Total Recoverable

Client Sample ID: RMHF_20201228_Grab Prep Type: Total Recoverable Prep Batch: 635082

	Sample	Sample Qualifier	Spike	MSD Result	3D MSD				%Rec.		RPD
Analyte	Result		Added		Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Silver	ND		80.0	70.8		ug/L		88	70 - 130	11	20
Cadmium	1.3		80.0	81.0		ug/L		100	70 - 130	5	20
Copper	62		80.0	138		ug/L		95	70 - 130	5	20
Lead	18		80.0	95.0		ug/L		96	70 - 130	7	20
Antimony	0.75	J,DX	80.0	71.8		ug/L		89	70 - 130	5	20
Selenium	0.94	J,DX	80.0	69.5		ug/L		86	70 - 130	5	20
Thallium	ND		80.0	77.0		ug/L		96	70 - 130	6	20

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Job ID: 440-276656-1

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Method: 200.8 - Metals (ICP/MS) (Continued)

Lab Sample ID: MB 440-634790/1-B **Matrix: Water** Analysis Batch: 634962

-	MB	МВ							
Analyte R	esult	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		1.0	0.25	ug/L		12/30/20 08:08	12/30/20 14:49	1
Copper	ND		2.0	0.50	ug/L		12/30/20 08:08	12/30/20 14:49	1
Lead	ND		1.0	0.50	ug/L		12/30/20 08:08	12/30/20 14:49	1
Antimony	ND		2.0	0.50	ug/L		12/30/20 08:08	12/30/20 14:49	1
Selenium	ND		2.0	0.50	ug/L		12/30/20 08:08	12/30/20 14:49	1
Silver	ND		1.0	0.50	ug/L		12/30/20 08:08	12/30/20 14:49	1
Thallium	ND		1.0	0.20	ug/L		12/30/20 08:08	12/30/20 14:49	1

Lab Sample ID: LCS 440-634790/2-B **Matrix: Water**

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Analysis Batch: 634962							Prep Batch: 634809
	Spike	LCS	LCS				%Rec.
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits
Cadmium	80.0	75.1		ug/L		94	85 - 115
Copper	80.0	73.1		ug/L		91	85 - 115
Lead	80.0	74.2		ug/L		93	85 - 115
Antimony	80.0	82.0		ug/L		102	85 - 115
Selenium	80.0	74.5		ug/L		93	85 - 115
Silver	80.0	76.4		ug/L		96	85 - 115
Thallium	80.0	74.2		ug/L		93	85 - 115

Lab Sample ID: 440-276656-2 MS Matrix: Water Analysis Batch: 634962

Analysis Batch: 634962									Prep Batch: 634809
-	Sample	Sample	Spike	MS	MS				%Rec.
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits
Cadmium	0.72	J,DX	80.0	75.6		ug/L		94	70 - 130
Copper	43		80.0	115		ug/L		90	70 - 130
Lead	3.5		80.0	75.4		ug/L		90	70 - 130
Antimony	ND		80.0	81.9		ug/L		102	70 - 130
Selenium	0.62	J,DX	80.0	70.3		ug/L		87	70 - 130
Silver	ND		80.0	76.1		ug/L		95	70 - 130
Thallium	ND		80.0	72.4		ug/L		90	70 - 130

Lab Sample ID: 440-276656-2 MSD Matrix: Water Analysis Batch: 634962

Client Sample ID: RMHF_20201228_Grab_F **Prep Type: Dissolved**

Client Sample ID: RMHF_20201228_Grab_F

Client Sample ID: Lab Control Sample

Prep Type: Dissolved

Prep Type: Dissolved

Analysis Batch: 634962									Prep Ba	tch: 6	34809
-	Sample Result	Sample	Spike	MSD	MSD				%Rec.		RPD
Analyte		Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Cadmium	0.72	J,DX	80.0	74.4		ug/L		92	70 - 130	2	20
Copper	43		80.0	113		ug/L		88	70 - 130	1	20
Lead	3.5		80.0	76.0		ug/L		91	70 - 130	1	20
Antimony	ND		80.0	79.9		ug/L		100	70 - 130	2	20
Selenium	0.62	J,DX	80.0	69.9		ug/L		87	70 - 130	1	20
Silver	ND		80.0	73.7		ug/L		92	70 - 130	3	20
Thallium	ND		80.0	72.0		ug/L		90	70 - 130	0	20

QC Sample Results

Client: Haley & Aldrich, Inc. Project/Site: Routine Outfall 003 RMHF GRAB

Job ID: 440-276656-1

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Lab Sample ID: MB 440-63	5044/1-A						Clie	ent Sam	ple ID: Metho	d Blank
Matrix: water									Prep Type:	I Otal/NA
Analysis Batch: 635090									Prep Batch	635044
Analyte	Res	wid wid sult Qualifier		RI	MDI Unit	п	Р	renared	Analyzed	Dil Fac
Mercury		ND dualities		0.20	0.10 ug/L		12/3	1/20 10:45	5 12/31/20 15:18	$\frac{1}{3}$
Lab Sample ID: LCS 440-63	35044/2-A					Clien	t Sai	mple ID:	Lab Control	Sample
Matrix: Water									Prep Type:	Total/NA
Analysis Batch: 635090									Prep Batch	635044
			Spike	LCS	LCS				%Rec.	
Analyte			Added	Result	Qualifier	Unit	D	%Rec	Limits	
Mercury			4.00	4.04		ug/L		101	85 - 115	
Lab Sample ID: 440-276656	6-1 MS					Client S	amp	le ID: RI	WHF_202012	28_Grat
Matrix: Water									Prep Type:	Total/N/
Analysis Batch: 635090							Prep Batch	635044
	Sample	Sample	Spike	MS	MS		_	~~ -	%Rec.	
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit		%Rec	Limits	
Mercury	ND		4.00	4.20		ug/L		105	75 - 125	
Lab Sample ID: 440-276656	5-1 MSD					Client S	amp	le ID: RI	MHF_202012	28_Grat
Matrix: Water									Prep Type:	Total/N/
Analysis Batch: 635090									Prep Batch	635044
	Sample	Sample	Spike	MSD	MSD		_	~~ -	%Rec.	RPD
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	_ <u>D</u>	<u>%Rec</u>	Limits RF	D Limi
Mercury	ND		4.00	4.02		ug/L		100	75 - 125	4 20
lethod: SM 2540D - So	lids, Tota	Suspend	ed (TS	S)						
Lab Sample ID: MB 440-63	5080/1						Clie	ent Sam	ple ID: Metho	d Blank
Matrix: Water									Prep Type:	Total/N/
Analysis Batch: 635080										
		MB MB								
Analyte	Res	sult Qualifier		RL	MDL Unit	D	P	repared	Analyzed	Dil Fac
Total Suspended Solids		ND		1.0	0.50 mg/L				12/31/20 14:53	3 1
Lab Sample ID: LCS 440-63	35080/2					Clien	t Sai	mple ID:	Lab Control	Sample
Matrix: Water									Prep Type:	Total/N
Analysis Batch: 635080										
			Spike	LCS	LCS				%Rec.	
Analyte			Added	Result	Qualifier	Unit	_ <u>D</u>	%Rec	Limits	
Total Suspended Solids			1000	943		mg/L		94	85 - 115	
Lab Sample ID: 440-276697	'-A-1 DU							Client	Sample ID: D	uplicate
Lab Sample ID: 440-276697 Matrix: Water	'-A-1 DU							Client	Sample ID: D Prep Type: ⁻	uplicate
Lab Sample ID: 440-276697 Matrix: Water Analysis Batch: 635080	'-A-1 DU							Client	Sample ID: D Prep Type: `	uplicate Total/NA
Lab Sample ID: 440-276697 Matrix: Water Analysis Batch: 635080	'-A-1 DU Sample	Sample		DU	DU			Client	Sample ID: D Prep Type: ⁻	uplicate Total/NA RPE

12.4

mg/L

12

Total Suspended Solids

10

QC Association Summary

Client: Haley & Aldrich, Inc. Project/Site: Routine Outfall 003 RMHF GRAB

Client Sample ID

Lab Control Sample

Method Blank

RMHF_20201228_Grab

Method

1613B

1613B

1613B

Prep Batch

Analysis Batch: 449084

Specialty Organics

Prep Batch: 447136

Lab Sample ID

MB 320-447136/1-A

LCS 320-447136/2-A

440-276656-1

Lab Sample ID 440-276656-1	Client Sample ID RMHF_20201228_Grab	Prep Type Total/NA	Matrix Water	Method 1613B	Prep Batch 447136
MB 320-447136/1-A	Method Blank	Total/NA	Water	1613B	447136
LCS 320-447136/2-A	Lab Control Sample	Total/NA	Water	1613B	447136

Prep Type

Total/NA

Total/NA

Total/NA

Matrix

Water

Water

Water

Metals

Analysis Batch: 634523

Lab Sample ID 440-276656-1	Client Sample ID RMHF_20201228_Grab	Prep Type Total Recoverable	Matrix Water	Method SM 2340B	Prep Batch
440-276656-2	RMHF_20201228_Grab_F	Dissolved	Water	SM 2340B	
Filtration Batch: 63479	0				

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-276656-2	RMHF_20201228_Grab_F	Dissolved	Water	FILTRATION	
MB 440-634790/1-B	Method Blank	Dissolved	Water	FILTRATION	
MB 440-634790/1-E	Method Blank	Dissolved	Water	FILTRATION	
LCS 440-634790/2-B	Lab Control Sample	Dissolved	Water	FILTRATION	
LCS 440-634790/2-E	Lab Control Sample	Dissolved	Water	FILTRATION	
440-276596-C-2-G MS	Matrix Spike	Dissolved	Water	FILTRATION	
440-276596-C-2-H MSD	Matrix Spike Duplicate	Dissolved	Water	FILTRATION	
440-276656-2 MS	RMHF_20201228_Grab_F	Dissolved	Water	FILTRATION	
440-276656-2 MSD	RMHF_20201228_Grab_F	Dissolved	Water	FILTRATION	

Prep Batch: 634809

Lab Sample ID 440-276656-2	Client Sample ID RMHF_20201228_Grab_F	Prep Type Dissolved	Matrix Water	Method 200.2	Prep Batch 634790
MB 440-634790/1-B	Method Blank	Dissolved	Water	200.2	634790
LCS 440-634790/2-B	Lab Control Sample	Dissolved	Water	200.2	634790
440-276656-2 MS	RMHF_20201228_Grab_F	Dissolved	Water	200.2	634790
440-276656-2 MSD	RMHF_20201228_Grab_F	Dissolved	Water	200.2	634790

Analysis Batch: 634962

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-276656-2	RMHF_20201228_Grab_F	Dissolved	Water	200.8	634809
MB 440-634790/1-B	Method Blank	Dissolved	Water	200.8	634809
LCS 440-634790/2-B	Lab Control Sample	Dissolved	Water	200.8	634809
440-276656-2 MS	RMHF_20201228_Grab_F	Dissolved	Water	200.8	634809
440-276656-2 MSD	RMHF_20201228_Grab_F	Dissolved	Water	200.8	634809

Prep Batch: 635044

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-276656-1	RMHF_20201228_Grab	Total/NA	Water	245.1	
MB 440-635044/1-A	Method Blank	Total/NA	Water	245.1	
LCS 440-635044/2-A	Lab Control Sample	Total/NA	Water	245.1	
440-276656-1 MS	RMHF_20201228_Grab	Total/NA	Water	245.1	

Prep Type

Prep Type

Prep Type

Total Recoverable

Total Recoverable

Total Recoverable

Total Recoverable

Total Recoverable

Total Recoverable

Total Recoverable

Total Recoverable

Total Recoverable

Total Recoverable

Total/NA

Matrix

Water

Matrix

Water

Water

Water

Water

Water

Matrix

Water

Water

Water

Water

Water

Client Sample ID

Client Sample ID

Lab Control Sample

Client Sample ID

Lab Control Sample

Method Blank

Method Blank

RMHF_20201228_Grab

RMHF 20201228 Grab

RMHF_20201228_Grab

RMHF 20201228 Grab

RMHF_20201228_Grab

RMHF 20201228 Grab

RMHF_20201228_Grab

Metals (Continued)

Lab Sample ID

Lab Sample ID

440-276656-1

440-276656-1 MSD

Prep Batch: 635081

MB 440-635081/1-A

LCS 440-635081/2-A

440-276656-1 MS

Lab Sample ID

440-276656-1

440-276656-1 MSD

Prep Batch: 635082

MB 440-635082/1-A

LCS 440-635082/2-A

440-276656-1 MS

440-276656-1 MSD

Analysis Batch: 635090

Prep Batch: 635044 (Continued)

Method

Method

200.2

200.2

200.2 200.2

200.2

Method

200.2

200.2 200.2

200.2

200.2

245.1

Prep Batch

Prep Batch

Prep Batch

9

Lab Sample ID **Client Sample ID** Method Prep Type Matrix Prep Batch RMHF_20201228_Grab 440-276656-1 Total/NA Water 245.1 635044 MB 440-635044/1-A Method Blank Total/NA Water 245.1 635044 Total/NA LCS 440-635044/2-A Lab Control Sample Water 245.1 635044 440-276656-1 MS RMHF 20201228 Grab Total/NA Water 245.1 635044 440-276656-1 MSD RMHF_20201228_Grab Total/NA Water 245.1 635044

Analysis Batch: 635168

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-276656-1	RMHF_20201228_Grab	Total Recoverable	Water	200.8	635082
MB 440-635082/1-A	Method Blank	Total Recoverable	Water	200.8	635082
LCS 440-635082/2-A	Lab Control Sample	Total Recoverable	Water	200.8	635082
440-276656-1 MS	RMHF_20201228_Grab	Total Recoverable	Water	200.8	635082
440-276656-1 MSD	RMHF_20201228_Grab	Total Recoverable	Water	200.8	635082

Prep Batch: 635191

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-276656-2	RMHF_20201228_Grab_F	Dissolved	Water	200.2	634790
MB 440-634790/1-E	Method Blank	Dissolved	Water	200.2	634790
LCS 440-634790/2-E	Lab Control Sample	Dissolved	Water	200.2	634790
440-276596-C-2-G MS	Matrix Spike	Dissolved	Water	200.2	634790
440-276596-C-2-H MSD	Matrix Spike Duplicate	Dissolved	Water	200.2	634790

Analysis Batch: 635192

Lab Sample ID	Client Sample ID	Ргер Туре	Matrix	Method	Prep Batch
440-276656-1	RMHF_20201228_Grab	Total Recoverable	Water	200.7 Rev 4.4	635081
MB 440-635081/1-A	Method Blank	Total Recoverable	Water	200.7 Rev 4.4	635081
LCS 440-635081/2-A	Lab Control Sample	Total Recoverable	Water	200.7 Rev 4.4	635081
440-276656-1 MS	RMHF_20201228_Grab	Total Recoverable	Water	200.7 Rev 4.4	635081
440-276656-1 MSD	RMHF_20201228_Grab	Total Recoverable	Water	200.7 Rev 4.4	635081

QC Association Summary

Client: Haley & Aldrich, Inc. Project/Site: Routine Outfall 003 RMHF GRAB Job ID: 440-276656-1

Metals

Analysis Batch: 635229

Lab Sample ID 440-276656-2	Client Sample ID RMHF_20201228_Grab_F	Prep Type Dissolved	Matrix Water	Method 200.7 Rev 4.4	Prep Batch 635191
MB 440-634790/1-E	Method Blank	Dissolved	Water	200.7 Rev 4.4	635191
LCS 440-634790/2-E	Lab Control Sample	Dissolved	Water	200.7 Rev 4.4	635191
440-276596-C-2-G MS	Matrix Spike	Dissolved	Water	200.7 Rev 4.4	635191
440-276596-C-2-H MSD	Matrix Spike Duplicate	Dissolved	Water	200.7 Rev 4.4	635191

General Chemistry

Analysis Batch: 635080

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-276656-1	RMHF_20201228_Grab	Total/NA	Water	SM 2540D	
MB 440-635080/1	Method Blank	Total/NA	Water	SM 2540D	
LCS 440-635080/2	Lab Control Sample	Total/NA	Water	SM 2540D	
440-276697-A-1 DU	Duplicate	Total/NA	Water	SM 2540D	

Definitions/Glossary

Client: Haley & Aldrich, Inc. Project/Site: Routine Outfall 003 RMHF GRAB

Job ID: 440-276656-1

Qualifiers

Project/Site:	Routine Outfall 003 RMHF GRAB	
Qualifiers		
Dioxin Qualifier	Qualifier Description	
J,DX	Estimated value; value < lowest standard (MQL), but >than MDL	
MB	Analyte present in the method blank	5
q	The reported result is the estimated maximum possible concentration of this analyte, quantitated using the theoretical ion ratio. The measured ion ratio does not meet qualitative identification criteria and indicates a possible interference.	6
Metals		
Qualifier	Qualifier Description	
BB	Sample > 4X spike concentration	
J,DX	Estimated value; value < lowest standard (MQL), but >than MDL	0
LM	MS and/or MSD above acceptance limits. See Blank Spike (LCS)	0
Glossary		9
Abbreviation	These commonly used abbreviations may or may not be present in this report.	
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis	10
%R	Percent Recovery	
CFL	Contains Free Liquid	
CFU	Colony Forming Unit	
CNF	Contains No Free Liquid	
DER	Duplicate Error Ratio (normalized absolute difference)	
Dil Fac	Dilution Factor	13
DL	Detection Limit (DoD/DOE)	
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample	

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Client: Haley & Aldrich, Inc. Project/Site: Routine Outfall 003 RMHF GRAB

Laboratory: Eurofins Calscience Irvine

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Pro	ogram	Identification Number	Expiration Date
California	Sta	ate	2706	06-30-21
The following applyte	in all tale of in Alata mana	المتعامية والمتعامية والمتعادية المتعادية المتعادية المتعادية والمتعادية والمتع		T1 1 1 1 4 1 1 1 1 1 1 1
the agency does not o	offer certification.	rt, but the laboratory is r	for certified by the governing authority.	I his list may include
the agency does not of Analysis Method	offer certification. Prep Method	nt, but the laboratory is r Matrix	Analyte	i nis list may includ
the agency does not a Analysis Method SM 2340B	offer certification.	Matrix Water	Analyte Hardness, as CaCO3	I his list may include

Laboratory: Eurofins TestAmerica, Sacramento

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

Authority	Program	Identification Number	Expiration Date
Alaska (UST)	State	17-020	01-20-21
ANAB	Dept. of Defense ELAP	L2468 01-20-21	
ANAB	Dept. of Energy	L2468.01	01-20-21
ANAB	ISO/IEC 17025	L2468	01-20-21
Arizona	State	AZ0708	08-11-21
Arkansas DEQ	State	88-0691	06-17-21
California	State	2897	01-31-22
Colorado	State	CA0004	08-31-21
Connecticut	State	PH-0691	06-30-21
Florida	NELAP	E87570	06-30-21
Georgia	State	4040	01-30-21
Hawaii	State	<cert no.=""></cert>	01-29-21
Illinois	NELAP	200060	03-17-21
Kansas	NELAP	E-10375	02-01-21
Louisiana	NELAP	01944	06-30-21
Maine	State	CA00004	04-14-22
Michigan	State	9947	08-03-23
Nevada	State	CA000442021-2	07-31-21
New Hampshire	NELAP	2997	04-18-21
New Jersey	NELAP	CA005	06-30-21
New York	NELAP	11666	04-01-21
Oregon	NELAP	4040	01-29-21
Pennsylvania	NELAP	68-01272	03-31-21
Texas	NELAP	T104704399-19-13	06-01-21
US Fish & Wildlife	US Federal Programs	58448	07-31-21
USDA	US Federal Programs	P330-18-00239	07-31-21
Utah	NELAP	CA000442019-01	02-28-21
/ermont	State	VT-4040	04-16-21
√irginia	NELAP	460278	03-14-21
Washington	State	C581	05-05-21
West Virginia (DW)	State	9930C	12-31-20 *
Wisconsin	State	998204680	08-31-21
Wyoming	State Program	8TMS-L	01-28-19 *

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

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1/11/2021

Rainy Season 2019-2020 Version 2

Irvine	
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Eurofins	17461 Derian

Chain of Custody Record



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Client Information (Sub Contract Lab)	Sampler:			Lab PM: Bondo	c. Chris	tian N	-				Carrier Track	ing No(s)		04	20C No: 140-165300.1	
Client Contact: Shipping/Receiving	Phone:			E-Mail: Christi	an.Bond	doc@	Eurofii	1set.c	Б		State of Origi California	Ë			bage: Page 1 of 1	
Company: TestAmerica Laboratories, Inc.				¥Ο	creditatic tate Pro	ons Ree	quired (- Calit	See no fornia	te):					24	lob #: 140-276656-1	
Address: 13715 Rider Trail North,	Due Date Request 1/11/2021	:pa						Ani	alysi	s Re(quested				reservation C	odes:
City. Earth City	TAT Requested (d	ays):				-			-			-			A - HCL B - NaOH C - Zn Acetate	M - Hexane N - None O - AsNaO2
State. Zp: MO, 63045					2										D - Nitric Acid E - NaHSO4	P - Na204S Q - Na2SO3
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	HO #:			(0	.er-mu	uniu	e								F - MeOH G - Amchlor H - Ascorhic Acid	R - Na2S203 S - H2SO4 I T - TSP Dodecahvdrate
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RMHF_20201228_Grab (440-276656-1)	12/28/20	08:00		Water	Ê	×	×	×	+^ ×	×				2	Boeing SSFL; D	O NOT FILTER; use prej
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Note: Since laboratory accreditations are subject to change, Eurofins Calsci maintain accreditation in the State of Origin listed above for analysis/tests/m Calscience attention immediately. If all requested accreditations are current	ence places the ownersh atrix being analyzed, the to date, return the signer	p of method, a samples must I Chain of Cus	analyte & accre be shipped ba stody attesting	ditation complianc ck to the Eurofins to said complicanc	e upon o Calscien e to Eurc	ut subo ce labo ofins Ca	contract sratory c alscienc	t labora or other e.	tories. instruc	This sa tions wi	mple shipment Il be provided.	is forwar Any cha	ded unde nges to a	er chain-o	of-custody. If the tion status should	laboratory does not current d be brought to Eurofins
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er: 11/01/2020

Client: Haley & Aldrich, Inc.

Login Number: 276656 List Number: 1 Creator: Skinner, Alma D

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

Job Number: 440-276656-1

List Source: Eurofins Irvine

Client: Haley & Aldrich, Inc.

Login Number: 276656 List Number: 2 Creator: Nuval, Mark-Anthony M

List Source: Eurofins T	estAmerica, Sacramento
List Cre	ation: 12/30/20 10:53 AM

Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>True</td> <td></td>	True	
The cooler's custody seal, if present, is intact.	True	Seal present with no number.
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	1.0C
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	Received project as a subcontract.
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

TCDF

(24-169)

73

71

HxCF

(29-147)

81

80

TCDD

(25-164)

71

67

HxDF

(26-123)

74

77

Method: 1613B - Dioxins and Furans (HRGC/HRMS)

Client Sample ID

Client Sample ID

Method Blank

Method Blank

RMHF_20201228_Grab

RMHF_20201228_Grab

Prep Type: Total/NA

HxCDF

(26-152)

82

74

HxDD

(28 - 130)

74

71

OCDD

(17 - 157)

105

88

Prep Type: Total/NA

Percent Isotope Dilution Recovery (Acceptance Limits)

Percent Isotope Dilution Recovery (Acceptance Limits)

PeCF

(21-178)

63

65

HpCDF

(28-143)

87

80

HxCDD

(32-141)

76

75

HpCDF2

(26-138)

89

80

PeCDF

(24 - 185)

63

65

HpCDD

(23-140)

93

82

PeCDD

(25-181)

69

66

13CHxCF

(28-136)

80

79

	5
	8
	9
	13
1	4

Surrogate	Legend

MB 320-447136/1-A

Matrix: Water

Lab Sample ID

Lab Sample ID

440-276656-1

MB 320-447136/1-A

440-276656-1

TCDD = 13C-2,3,7,8-TCDD TCDF = 13C-2,3,7,8-TCDF PeCDD = 13C-1,2,3,7,8-PeCDD PeCF = 13C-1,2,3,7,8-PeCDF PeCF = 13C-2,3,4,7,8-PeCDF HxCDD = 13C-1,2,3,4,7,8-HxCDD HxDD = 13C-1,2,3,6,7,8-HxCDF HxCF = 13C-1,2,3,6,7,8-HxCDF HxCF = 13C-1,2,3,7,8,9-HxCDF 13CHxCF = 13C-2,3,4,6,7,8-HxCDF HpCDD = 13C-1,2,3,4,6,7,8-HpCDD HpCDF = 13C-1,2,3,4,6,7,8-HpCDF HpCDF = 13C-1,2,3,4,6,7,8-HpCDF HpCDF = 13C-1,2,3,4,7,8,9-HpCDF OCDD = 13C-0CDD

Method: 1613B - Dioxins and Furans (HRGC/HRMS) Matrix: Water

-			Perc	ent Isotope	Dilution Re	ecovery (Ac	ceptance L	imits)	
		TCDD	TCDF	PeCDD	PeCDF	PeCF	HxCDD	HxDD	HxCDF
Lab Sample ID	Client Sample ID	(20-175)	(22-152)	(21-227)	(21-192)	(13-328)	(21-193)	(25-163)	(19-202)
LCS 320-447136/2-A	Lab Control Sample	75	77	75	72	72	82	81	86
			Perc	ent Isotope	Dilution Re	ecovery (Ac	ceptance L	imits)	
		HxDF	HxCF	13CHxCF	HpCDD	HpCDF	HpCDF2	OCDD	
Lab Sample ID	Client Sample ID	(21-159)	(17-205)	(22-176)	(26-166)	(21-158)	(20-186)	(13-199)	
LCS 320-447136/2-A	Lab Control Sample	85	90	89	99	95	94	109	
Surrogate Legend									
TCDD = 13C-2,3,7,8-1	TCDD								
TCDF = 13C-2,3,7,8-T	CDF								
PeCDD = 13C-1,2,3,7	,8-PeCDD								
PeCDF = 13C-1,2,3,7	,8-PeCDF								
PeCF = 13C-2,3,4,7,8	-PeCDF								
HxCDD = 13C-1,2,3,4	,7,8-HxCDD								
HxDD = 13C-1,2,3,6,7	,8-HxCDD								
HxCDF = 13C-1,2,3,4	,7,8-HxCDF								
HxDF = 13C-1,2,3,6,7	,8-HxCDF								
HxCF = 13C-1,2,3,7,8	,9-HxCDF								
13CHxCF = 13C-2,3,4	I,6,7,8-HxCDF								
HpCDD = 13C-1,2,3,4	.6,7,8-HpCDD								

Isotope Dilution Summary

Client: Haley & Aldrich, Inc. Project/Site: Routine Outfall 003 RMHF GRAB HpCDF = 13C-1,2,3,4,6,7,8-HpCDF HpCDF2 = 13C-1,2,3,4,7,8,9-HpCDF OCDD = 13C-OCDD

eurofins	Sacramento 2
TestAmerica	3 Sample Receiving Notes
	cking # :
	5
440-276656 Field Sheet	O / PO / FO / SAT / 2-Day / Ground / UPS / CDO / Courier
	7
Use this form to record Sample Custody Seal, Cooler Custody Seal, Ter File in the job folder with the COC.	8
Therm ID: Corr Factor: $(+/-)$ °C	Notes:
	10
Ice Wet Gel Other	
Cooler Custody Seal:	11
Cooler ID:	12
Temp Observed:°C Corrected:°C From: Temp Blank D Sample D	13
	14
Opening/Processing The Shipment <u>Yes No NA</u>	
Cooler compromised/tampered with?	
Frozen samples show signs of thaw?	
Initials: MAN Date: 12/30/20	
Unpacking/Labeling The Samples <u>Yes</u> <u>No</u> <u>NA</u>	
Samples compromised/tampered with?	
Sample containers have legible labels?	
Sample custody seal?	
Containers are not broken or leaking?	
Sample date/times are provided?	Trizma Lot #(s):
Appropriate containers are used?	
Sample bottles are completely filled?	
Sample preservatives verified?	
Samples w/o discrepancies?	
Zero headspace?*	Login Completion <u>Yes</u> <u>No</u> <u>NA</u>
Aikalinity has no headspace?	Receipt l'emperature on COC?
(Methods 314, 331, 6850)	Samples received within hold time?
Multiphasic samples are not present?	Log Release checked in TALS?
*Containers requiring zero headspace have no headspace, or bubble < 6 mm (1/4")	
Initials: MAN Date: 12 30 20	Initials: MAN Date: 12 30 10

INTACORPICORPIQAIQA_FACILITIESISACRAMENTO-QAIDOCUMENT-MANAGEMENTIFORMSIQA-812 SAMPLE RECEIVING NOTES.DOC

🔅 eurofins

Environment Testing America

ANALYTICAL REPORT

Eurofins Calscience Irvine 17461 Derian Ave Suite 100 Irvine, CA 92614-5817 Tel: (949)261-1022

Laboratory Job ID: 440-276656-2

Client Project/Site: Routine Outfall 003 RMHF GRAB Revision: 1

For:

LINKS

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Expert

Haley & Aldrich, Inc. 400 E Van Buren St. Suite 545 Phoenix, Arizona 85004

Attn: Katherine Miller

Authorized for release by: 2/23/2021 3:35:50 PM Christian Bondoc, Project Manager I (949)260-3218 Christian.Bondoc@Eurofinset.com

The test results in this report meet all 2003 NELAC, 2009 TNI, and 2016 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

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

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

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Sample Summary

Client: Haley & Aldrich, Inc. Project/Site: Routine Outfall 003 RMHF GRAB

Job ID: 440-276656-2

		N - failer	0.11	D		3
440-276656-1	RMHF_20201228_Grab	Water	12/28/20 08:00	12/28/20 16:38	Asset ID	A
						5
						8
						9
						13

Job ID: 440-276656-2

Laboratory: Eurofins Calscience Irvine

Narrative

Job Narrative 440-276656-2

Case Narrative

Comments

No additional comments.

Revision

The report being provided is a revision of the original report sent on 1/27/2021. The report (revision 1) is being revised due to: Client requested additional tests for RAD work.

Receipt

The samples were received on 12/28/2020 4:38 PM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.8° C.

RAD

Methods 900.0, 9310: Gross Alpha/Beta Prep Batch 160-493900

The gross Alpha matrix spike (MS/MSD) is recovering (MS-61% MSD-61%) outside of the control limits of (70-130). Sample matrix interference is suspected because the associated gross alpha laboratory control sample (LCS) recovery is within acceptance limits. The data have been reported with this narrative.

(280-144105-A-1-B MS) and (280-144105-A-1-C MSD)

Methods 900.0, 9310: GAB prep batch 493900

Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.

RMHF_20201228_Grab (440-276656-1), (LCS 160-493900/2-A), (LCSB 160-493900/3-A), (MB 160-493900/1-A), (280-144105-A-1-A), (280-144105-A-1-D MSBT), (280-144105-A-1-E MSBTD) and (280-144105-A-1-C MSD)

Method 901.1: GAmma batch 160-493549

The MDC in the sample (20.9) was slightly above the requested limit of 20.0 pCi/L. The sample activity is well below the detection goal and achieved MDC. In addition, the sample duplicate MDC of 10.3 was below the requested limit.

RMHF_20201228_Grab (440-276656-1)

Method 901.1: Gamma Prep Batch 160-493549

Many isotopes requested for analysis do not have any gamma emissions, or the gamma emissions they do have are very poor. Often, such analytes are reported by gamma spectrometry assuming secular equilibrium with a longer-lived parent. The client should ensure that such inference is acceptable for their sample based upon process knowledge. The following assumptions were made for this report: Inferred from Reported to Analyte

Th-234	Pa-234
Th-234	U-238
Pb-210	Po-210
Pb-210	Bi-210
Cs-137	Ba-137m
Pb-212	Po-216
Xe-131m	Xe-131
Sb-125	Te-125m
Ag-108m	Ag-108
Rh-106	Ru-106
Pb-212	Th-228
Pb-212	Ra-224
U-235	Th-231

Job ID: 440-276656-2 (Continued)

Laboratory: Eurofins Calscience Irvine (Continued)

 Ac-228
 Th-232

 Ac-228
 Ra-228

 Th-227
 Ra-223

 Th-227
 Ac-227

 Th-227
 Bi-211

 Th-227
 Pb-211

 Bi-214
 Ra-226

Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative.

Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.

**The method blank (MB) Z-score is within limits and is located in the level IV raw data

RMHF_20201228_Grab (440-276656-1) and (440-276656-F-1-B DU)

Method 903.0: 903 prep batch 493744

Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.

RMHF_20201228_Grab (440-276656-1), (LCS 160-493744/1-A), (LCSD 160-493744/2-A) and (MB 160-493744/6-A)

Method 904.0: 904 prep batch 495876

The Ra228 laboratory control sample/laboratory control sample duplicate (LCS/LCSD) recovery (LCS-155 / LCSD-158) associated with the following sample(s) is outside the upper QC limit of (60-140) indicating a potential positive bias for that analyte. This analyte was not observed above the MDC/RL in the associated samples; therefore the sample data is not adversely affected by this excursion. The data have been reported with this narrative.

(LCS 160-495876/1-A) and (LCSD 160-495876/2-A)

Method 904.0: 904 prep batch 495876

Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.

RMHF_20201228_Grab (440-276656-1), (LCS 160-495876/1-A), (LCSD 160-495876/2-A) and (MB 160-495876/7-A)

Method 905: 905 Prep batch 493937

Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.

RMHF_20201228_Grab (440-276656-1), (LCS 160-493937/1-A), (LCSD 160-493937/2-A) and (MB 160-493937/6-A)

Method 906.0: Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative.

Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.

RMHF_20201228_Grab (440-276656-1), (LCS 160-495065/2-A), (MB 160-495065/1-A), (160-40980-A-1-A), (160-40980-A-1-C DU) and (160-40980-A-1-B MS)

Method A-01-R: Isotopic Plutonium Prep Batch 160-798748

Job ID: 440-276656-2 (Continued)

Laboratory: Eurofins Calscience Irvine (Continued)

Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative.

Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date. RMHF_20201228_Grab (440-276656-1), (LCS 160-498748/2-A), (MB 160-498748/1-A), (440-278183-A-1-I) and (440-278183-A-1-J DU)

Methods A-01-R, U-02-RC: Isotopic Uranium Prep Batch 160-493932 Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative.

Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date. RMHF_20201228_Grab (440-276656-1), (LCS 160-493932/2-A), (MB 160-493932/1-A), (680-193399-A-1-C) and (680-193399-B-1-E DU)

Methods A-01-R, U-02-RC: Uranium batch 160- 493932

Detectors 189 was calibrated in December therefore the monthly calibration check (CCV) was not required and will not be included in the deliverable. Note: because a ccv was not analyzed, it is possible that an older CCV will pull into the deliverable. This CCV is not applicable

(LCS 160-493932/2-A)

Method A-01-R: U batch 160-493932

The sample was inadvertently counted on a detector which failed daily check for energy/centroid. However, the tracer peak and spike peaks in the actual sample count are at the expected energies, and the LCS spike recovery is within limits. The laboratory does not believe this excursion adversely affects the data

RMHF_20201228_Grab (440-276656-1)

Method ExtChrom: Plutonium Prep Batch 160-498748:

The following sample was prepared at a reduced aliquot due to discoloration: RMHF_20201228_Grab (440-276656-1).

The sample has yellow discoloration and light sediment.

Method LSC_Dist_Susp: H3 preparation batch 160-495065

The following sample was prepped using an aliquot preserved with nitric acid. Additional sodium hydroxide pellets were added ti ensure sample was basic

RMHF_20201228_Grab (440-276656-1)

Method PrecSep_0: Radium 228 Prep Batch 160-493746: Sample 440-276656-1 was prepared at a reduced aliquot due to brown discoloration, a cloudy appearance, and heavy sediment levels:

Sample 160-70936-1 was prepared at a reduced aliquot to insure sufficient volume remains if needed for analysis:

Method PrecSep_0: Radium 228 Prep Batch 160-493746:

Insufficient sample volume was available to perform a sample duplicate for the following samples: RMHF_20201228_Grab (440-276656-1). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead to demonstrate batch precision.

Method PrecSep_0: Radium 228 Prep batch 160-495876:

Insufficient sample volume was available to perform a sample duplicate for the following samples: RMHF_20201228_Grab (440-276656-1). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead to demonstrate batch precision.

Method PrecSep-21: Radium 226 Prep Batch 160-493744: Insufficient sample volume was available to perform a sample duplicate for the following samples: RMHF_20201228_Grab

Job ID: 440-276656-2 (Continued)

Laboratory: Eurofins Calscience Irvine (Continued)

(440-276656-1). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead to demonstrate batch precision.

Method PrecSep-21: Radium 226 Prep Batch 160-493744:

Sample 440-276656-1 was prepared at a reduced aliquot due to brown discoloration, a cloudy appearance, and heavy sediment levels: Sample 160-70936-1 was prepared at a reduced aliquot to insure sufficient volume remains if needed for analysis:

Method PrecSep-7: Strontium 90 Prep batch 160-493937:

Insufficient sample volume was available to perform a sample duplicate for the following samples: RMHF_20201228_Grab (440-276656-1). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead to demonstrate batch precision.

Method PrecSep-7: Strontium 90 Prep batch 160-493937:

The following sample was prepared at a reduced aliquot due to the tan/orange haze and dark brown particulates: RMHF_20201228_Grab (440-276656-1). This could indicated possible matrix interference.

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

Client Sample Results

Client: Haley & Aldrich, Inc. Project/Site: Routine Outfall 003 RMHF GRAB Job ID: 440-276656-2

Client Sample Date Collected: 12 Date Received: 12	ID: RMHF_ 2/28/20 08:00	_ 2020122	28_Grab					Lab Sample	ID: 440-276 Matrix	656-1 : Water
	Gross Alpha	and Gros	e Bota Par	lioactivity						
Wethou: 500.0 - (SIUSS Alpha		S Dela Rat	Total						
			Uncert	Uncert						
Analyta	Posult	Qualifier	(2g+/_)	(2g+/-)	PI	MDC	Unit	Propared	Analyzod	Dil Eac
Gross Alpha		Quaimer	1 39	1 44	3.00	1 73		<u>01/05/21 09:10</u>		1
Gross Rota	27.6		1.80	3 30	4.00	0 080	pOi/L	01/05/21 00:10	01/08/21 14:00	1
-	21.0		1.00	0.00	4.00	0.000	POIL	01/03/21 03:10	01/00/21 14.00	'
Method: 901.1 - 0	Cesium 137	& Other G	amma Emi	tters (GS)						
			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2 σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Cesium-137	2.86	UG	16.6	16.6	20.0	20.9	pCi/L	12/31/20 07:19	01/02/21 11:57	1
Potassium-40	87.4	U	105	105		163	pCi/L	12/31/20 07:19	01/02/21 11:57	1
Method: 903.0 - F	Radium-226	(GFPC)								
		. ,	Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2 σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.177	U	0.177	0.178	1.00	0.275	pCi/L	01/04/21 10:35	01/26/21 05:59	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	67.0		40 - 110					01/04/21 10:35	01/26/21 05:59	1
_ Method: 904 0 - F	Radium-228	(GEPC)								
		(0110)	Count	Total						
			Uncert.	Uncert.						
Analvte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.579	U *	0.575	0.577	1.00	0.931	pCi/L	01/20/21 17:35	01/25/21 09:18	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	75.2		40 - 110					01/20/21 17:35	01/25/21 09:18	1
Y Carrier	87.5		40 - 110					01/20/21 17:35	01/25/21 09:18	1
- Method: 905 - Sti	rontium-90 ((GFPC)								
			Count	Total						
			Uncert.	Uncert.						
Analvte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Strontium-90	0.761	U	0.664	0.667	3.00	1.06	pCi/L	01/05/21 19:02	01/13/21 16:55	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Sr Carrier	95.6		40 - 110					01/05/21 19:02	01/13/21 16:55	1
Y Carrier	86.0		40 - 110					01/05/21 19:02	01/13/21 16:55	1
- Method: 906.0 - 1	Fritium Tota	L(LSC)								
	,		Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2 σ +/-)	(2 σ+/-)	RL	MDC	Unit	Prepared	Analvzed	Dil Fac
Tritium	-3.15	U	168	168	500	305	pCi/L	01/14/21 11:20	01/16/21 00:15	1
-										
Method: A-01-R	- Isotopic Pl	utonium a	nd Neptun	ium (Alpha	Spectro	metry)				
			Count	Iotal						
Averalista	.	0	Uncert.	Uncert.			11	. .	A	B 11 -
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	KL -	MDC		Prepared	Analyzed	DII Fac
Plutonium-238	-0.310	U	0.266	0.267	1.00	0.801	pCi/L	02/12/21 12:52	02/19/21 11:08	1

Client Sample Results

Client: Haley & Aldrich, Inc. Project/Site: Routine Outfall 003 RMHF GRAB

Client Sample ID: RMHF_20201228_Grab Date Collected: 12/28/20 08:00 Date Received: 12/28/20 16:38

Job ID: 440-276656-2

Lab Sample ID: 440-276656-1 Matrix: Water

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			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Plutonium-239/240	-0.118	U	0.0836	0.0842	1.00	0.485	pCi/L	02/12/21 12:52	02/19/21 11:08	1
Tracer	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Pu-242 (T)	48.4		30 - 110					02/12/21 12:52	02/19/21 11:08	1
Method: A-01-R - I	sotopic Ur	anium (Al	p <mark>ha Spectr</mark> Count	r <mark>ometry)</mark> Total						
Method: A-01-R - I	sotopic Ur	anium (Al	pha Spectr Count Uncert.	Total Uncert.	Ы	MDC	11-14	Dronword	Anolymod	
Method: A-01-R - I	Result	Qualifier	pha Spectr Count Uncert. (2σ+/-)	rometry) Total Uncert. (2σ+/-)	<u></u>	MDC	Unit	Prepared	Analyzed	Dil Fac
Method: A-01-R - I Analyte Uranium-234	Result 0.209	Qualifier	pha Spectr Count Uncert. (2σ+/-) 0.296	rometry) Total Uncert. (2σ+/-) 0.297	RL 1.00	MDC 0.501	Unit pCi/L	Prepared 01/05/21 17:01	Analyzed 01/14/21 13:29	Dil Fac
Method: A-01-R - I Analyte Uranium-234 Uranium-235	Result 0.209 0.130	Qualifier U	pha Spectr Count Uncert. (2σ+/-) 0.296 0.184	cometry) Total Uncert. (2σ+/-) 0.297 0.185	RL 1.00 1.00	MDC 0.501 0.195	Unit pCi/L pCi/L	Prepared 01/05/21 17:01 01/05/21 17:01	Analyzed 01/14/21 13:29 01/14/21 13:29	Dil Fac 1 1
Method: A-01-R - I Analyte Uranium-234 Uranium-235 Uranium-238	Result 0.209 0.130 0.157	Qualifier U	pha Spectr Count Uncert. (2σ+/-) 0.296 0.184 0.181	rometry) Total Uncert. (2σ+/-) 0.297 0.185 0.181	RL 1.00 1.00 1.00	MDC 0.501 0.195 0.157	Unit pCi/L pCi/L pCi/L	Prepared 01/05/21 17:01 01/05/21 17:01 01/05/21 17:01	Analyzed 01/14/21 13:29 01/14/21 13:29 01/14/21 13:29	Dil Fac 1 1 1
Method: A-01-R - I Analyte Uranium-234 Uranium-235 Uranium-238 Total Uranium	Result 0.209 0.130 0.157 0.496	Qualifier U U	pha Spectr Count Uncert. (2σ+/-) 0.296 0.184 0.181 0.393	cometry) Total Uncert. (2σ+/-) 0.297 0.185 0.181 0.394	RL 1.00 1.00 1.00 1.00	MDC 0.501 0.195 0.157 0.501	Unit pCi/L pCi/L pCi/L pCi/L	Prepared 01/05/21 17:01 01/05/21 17:01 01/05/21 17:01 01/05/21 17:01	Analyzed 01/14/21 13:29 01/14/21 13:29 01/14/21 13:29 01/14/21 13:29	Dil Fac 1 1 1 1
Method: A-01-R - I Analyte Uranium-234 Uranium-235 Uranium-238 Total Uranium Tracer	Result 0.209 0.130 0.157 0.496 %Yield	Qualifier U U Qualifier	pha Spectr Count Uncert. (2σ+/-) 0.296 0.184 0.181 0.393 Limits	cometry) Total Uncert. (2σ+/-) 0.297 0.185 0.181 0.394	RL 1.00 1.00 1.00 1.00	MDC 0.501 0.195 0.157 0.501	Unit pCi/L pCi/L pCi/L pCi/L	Prepared 01/05/21 17:01 01/05/21 17:01 01/05/21 17:01 01/05/21 17:01 Prepared	Analyzed 01/14/21 13:29 01/14/21 13:29 01/14/21 13:29 01/14/21 13:29 Analyzed	Dil Fac 1 1 1 1 1 Dil Fac

Method Summary

Client: Haley & Aldrich, Inc. Project/Site: Routine Outfall 003 RMHF GRAB

Method	Method Description	Protocol	Laboratory
900.0	Gross Alpha and Gross Beta Radioactivity	EPA	TAL SL
901.1	Cesium 137 & Other Gamma Emitters (GS)	EPA	TAL SL
903.0	Radium-226 (GFPC)	EPA	TAL SL
904.0	Radium-228 (GFPC)	EPA	TAL SL
905	Strontium-90 (GFPC)	EPA	TAL SL
906.0	Tritium, Total (LSC)	EPA	TAL SL
A-01-R	Isotopic Plutonium and Neptunium (Alpha Spectrometry)	DOE	TAL SL
A-01-R	Isotopic Uranium (Alpha Spectrometry)	DOE	TAL SL
Evaporation	Preparation, Evaporation	None	TAL SL
ExtChrom	Preparation, Extraction Chromatography Resin Actinide Separation	None	TAL SL
Fill_Geo-0	Fill Geometry, No In-Growth	None	TAL SL
LSC_Dist_Susp	Distillation and Suspension (LSC)	None	TAL SL
PrecSep_0	Preparation, Precipitate Separation	None	TAL SL
PrecSep-21	Preparation, Precipitate Separation (21-Day In-Growth)	None	TAL SL
PrecSep-7	Preparation, Precipitate Separation (7-Day In-Growth)	None	TAL SL

Protocol References:

DOE = U.S. Department of Energy EPA = US Environmental Protection Agency

None = None

Laboratory References:

TAL SL = Eurofins TestAmerica, St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Client: Haley & Aldrich, Inc. Project/Site: Routine Outfall 003 RMHF GRAB

Client Sample ID: RMHF_20201228_Grab Date Collected: 12/28/20 08:00 Date Received: 12/28/20 16:38

Lab Sample ID: 440-276656-1 Matrix: Water

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-	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	Evaporation			199.98 mL	1.0 g	493900	01/05/21 09:10	HRT	TAL SL
Total/NA	Analysis	900.0		1	1.0 mL	1.0 mL	494357	01/08/21 14:09	TMS	TAL SL
Total/NA	Prep	Fill_Geo-0			1000 mL	1.0 g	493549	12/31/20 07:19	HIO	TAL SL
Total/NA	Analysis	901.1		1			493705	01/02/21 11:57	JLP	TAL SL
Total/NA	Prep	PrecSep-21			500.32 mL	1.0 g	493744	01/04/21 10:35	AVB	TAL SL
Total/NA	Analysis	903.0		1			496647	01/26/21 05:59	FLC	TAL SL
Total/NA	Prep	PrecSep_0			499.69 mL	1.0 g	495876	01/20/21 17:35	KMP	TAL SL
Total/NA	Analysis	904.0		1			496465	01/25/21 09:18	FLC	TAL SL
Total/NA	Prep	PrecSep-7			250.02 mL	1.0 g	493937	01/05/21 19:02	JEC	TAL SL
Total/NA	Analysis	905		1			494901	01/13/21 16:55	GRW	TAL SL
Total/NA	Prep	LSC_Dist_Susp			100.2 mL	1.0 g	495065	01/14/21 11:20	LTC	TAL SL
Total/NA	Analysis	906.0		1			495498	01/16/21 00:15	JLP	TAL SL
Total/NA	Prep	ExtChrom			99.85 mL	1.0 mL	493932	01/05/21 17:01	MNH	TAL SL
Total/NA	Analysis	A-01-R		1			495120	01/14/21 13:29	TJR	TAL SL
Total/NA	Prep	ExtChrom			249.92 mL	1.0 mL	498748	02/12/21 12:52	LTC	TAL SL
Total/NA	Analysis	A-01-R		1			499372	02/19/21 11:08	TJR	TAL SL

Laboratory References:

TAL SL = Eurofins TestAmerica, St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Job ID: 440-276656-2

5

Method: 900.0 - Gross Alpha and Gross Beta Radioactivity

Lab Sample ID Matrix: Water Analysis Bate): MB 160-	4939	00/1-A						Cl	ient Samp	ole ID: Me Prep Typ Prep Ba	ethod	Blank al/NA
Analysis Bato				Count	Total						Перва		
		мв	МВ	Uncert.	Uncert.								
Analvte	R	esult	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit		Prepared	Analvz	ed	Dil Fac
Gross Alpha	0	0000	<u>u</u>	0.652	0.652	3.00	1 24	pCi/l		05/21 09·10	01/08/21	<u>14·10</u> –	1
Gross Beta	-0.	4897	U	0.407	0.409	4.00	0.835	pCi/L	01/	05/21 09:10	01/08/21	14:10	1
								F = =					
Lab Sample ID Matrix: Water	: LCS 160	-493	900/2-A					Cli	ent Sa	ample ID:	Lab Con Prep Tyr	trol Sa	ample al/NA
Analysis Batc	h: 494357										Prep Ba	tch: 4	93900
						Total							
			Spike	LCS	LCS	Uncert.					%Rec.		
Analyte			Added	Result	Qual	(2 σ+/-)	RL	MDC	Unit	%Rec	Limits		
Gross Alpha			51.5	45.57		6.64	3.00	2.03	pCi/L	89	75 - 125	·	
									•				
Lab Sample ID Matrix: Water	: LCSB 16	60-49	3900/3-A					Cli	ent Sa	ample ID:	Lab Con Prep Typ	trol Sa be: Tof	ample al/NA
Analysis Batc	h: 494357										Prep Ba	tch: 4	93900
						Total							
			Spike	LCSB	LCSB	Uncert.					%Rec.		
Analyte			Added	Result	Qual	(2 σ+/-)	RL	MDC	Unit	%Rec	Limits		
Gross Beta			83.0	80.73		8.60	4.00	0.833	pCi/L	97	75 - 125		
Lab Sample ID	: 280-144	105-/	A-1-B MS						C	lient San	nple ID: N	latrix	Spike
Matrix: Water											Prep Typ	e: Tot	al/NA
Analysis Batc	h: 49 4357										Prep Ba	tch: 49	93900
						Total							
	Sample S	ample	Spike	MS	MS	Uncert.					%Rec.		
Analyte	Result Q	ual	Added	Result	Qual	(2σ+/-)	RL	MDC	Unit	%Rec	Limits	<u> </u>	
Gross Alpha	0.990 U		51.5	32.35	F1	5.36	3.00	2.06	pCi/L	61	70 - 130		
	000 444							0	•				
Lab Sample ID): 280-144	105-4	A-1-C MSD					Clien	Sam		atrix Spik	e Dup	licate
Matrix: water	40 40 57										Prep Typ)e: 101	
Analysis Batc	n: 494357					T . 4 . 1					Ргер Ва	tcn: 4	93900
						Iotal					~ -		
	Sample S	ample	Spike	MSD	MSD	Uncert.				a/ 5	%Rec.		RER
Analyte	Result Q	ual	Added	Result		<u>(2σ+/-)</u>		MDC	Unit		Limits	RER	Limit
Gross Alpha	0.990 U		51.5	32.16	F1	5.00	3.00	1.83	pCı/L	61	70 - 130	0.02	1
Lab Sample ID	: 280-144 ⁻	105-4	A-1-D MSBT						c	lient San	nple ID: N	latrix	Spike
Matrix: Water											Prep Typ	be: Tot	al/NA
Analysis Batc	h: 494357										Prep Ba	tch: 4	93900
-						Total							
	Sample S	ample	Spike	MSBT	MSBT	Uncert.					%Rec.		
Analyte	Result Q	ual	Added	Result	Qual	(2 σ +/-)	RL	MDC	Unit	%Rec	Limits		

8.62

4.00

0.986 pCi/L

96

70 - 130

83.0

80.85

Gross Beta

1.52

QC Sample Results

8

Method: 900.0 - Gross Alpha and Gross Beta Radioactivity (Continued) Lab Sample ID: 280-144105-A-1-E MSBTD **Client Sample ID: Matrix Spike Duplicate** Matrix: Water Prep Type: Total/NA Analysis Batch: 494357 Prep Batch: 493900 Total Spike MSBTD MSBTD Uncert. %Rec. RER Sample Sample Analyte **Result Qual** Added **Result Qual** (2σ+/-) RL MDC Unit %Rec Limits RER Limit Gross Beta 1.52 83.0 79.75 8.51 4.00 1.12 pCi/L 94 70 - 130 0.06 1 Method: 901.1 - Cesium 137 & Other Gamma Emitters (GS) Lab Sample ID: MB 160-493549/1-A **Client Sample ID: Method Blank Matrix: Water** Prep Type: Total/NA Analysis Batch: 493707 **Prep Batch: 493549** Count Total MB MB Uncert. Uncert. Analyte Result Qualifier $(2\sigma + / -)$ (2σ+/-) RL MDC Unit Prepared Analyzed Dil Fac Cesium-137 2.811 U 10.4 10.4 20.0 13.0 pCi/L 12/31/20 07:19 01/02/21 12:02 1 Potassium-40 -84.23 U 132 133 217 pCi/L 12/31/20 07:19 01/02/21 12:02 1 **Client Sample ID: Lab Control Sample** Lab Sample ID: LCS 160-493549/2-A **Matrix: Water** Prep Type: Total/NA Analysis Batch: 493702 Prep Batch: 493549 Total LCS LCS %Rec. Spike Uncert. (2**σ**+/-) Analyte Added Result Qual RL MDC Unit %Rec Limits Americium-241 136000 142200 16700 478 pCi/L 105 90 - 111 Cesium-137 43000 44000 5180 20.0 129 pCi/L 102 90 - 111 Cobalt-60 23900 24300 2860 89.5 pCi/L 102 89 - 110 Lab Sample ID: 440-276656-1 DU Client Sample ID: RMHF 20201228 Grab Matrix: Water Prep Type: Total/NA Analysis Batch: 493702 Prep Batch: 493549 Total DU DU Sample Sample Uncert. RER Analyte **Result Qual** Result Qual (2σ+/-) RL MDC Unit RER Limit Cesium-137 2.86 UG 4.580 U 8.68 20.0 10.3 pCi/L 0.07 1 87.4 U Potassium-40 62.77 U 149 0.1 157 pCi/L 1 Method: 903.0 - Radium-226 (GFPC) Lab Sample ID: MB 160-493744/6-A **Client Sample ID: Method Blank** Matrix: Water **Prep Type: Total/NA** Analysis Batch: 496647 Prep Batch: 493744 Count Total MB MB Uncert. Uncert. Analyte **Result Qualifier** (2σ+/-) (2σ+/-) RL MDC Unit Prepared Analyzed Dil Fac Radium-226 -0.01529 U 0.0419 0.0420 1.00 0.102 pCi/L 01/04/21 10:35 01/26/21 06:01

	MB	MB				
Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	85.0		40 - 110	01/04/21 10:35	01/26/21 06:01	1

Job ID: 440-276656-2

Method: 903.0 - Radium-226 (GFPC) (Continued)

Lab Sample	D: LCS	160-493	8744/1-A					Cli	ent Sa	mple ID:	Lab Cont	trol Sa	ample
	tch: 1966	47									Prop Bat	tch: 10	027 <i>11</i>
Analysis Da	11CH. 4900	/ **				Total					гтер Ба	ICH. 4	33744
			Snike	LCS	LCS	Uncert					%Rec		
Analyte			Added	Result	Qual	(2σ+/-)	RL	MDC	Unit	%Rec	Limits		
Radium-226				11 04		1 18	1 00	0 154	pCi/l	97	75 - 125		
								01101	p 0., 2	0.	10-120		
	LCS	LCS											
Carrier	%Yield	Qualifier	r Limits	_									
Ba Carrier	77.4		40 - 110										
Lab Sample Matrix: Wate	e ID: LCSI er	D 160-49	93744/2-A					Client S	ample	ID: Lab	Control S Prep Typ	Sample be: Tot	e Dup tal/NA
Analysis Ba	atch: 4966	647									Prep Bat	tch: 4	93744
-						Total					•		
			Spike	LCSD	LCSD	Uncert.					%Rec.		RE
Analyte			Added	Result	Qual	(2 σ+/-)	RL	MDC	Unit	%Rec	Limits	RER	Limi
Radium-226			11.3	11.10		1.18	1.00	0.126	pCi/L	98	75 - 125	0.02	
	LCSD	LCSD											
Carrier	%Yield	Qualifier	r Limits										
Ba Carrier	80.4		40 - 110	_									
Lab Sample	ID: MB 1	60-4958	376/7-A						Clie	ent Sam	ole ID: Me Pren Tyr	ethod	Blani tal/N
Lab Sample Matrix: Wate Analysis Ba	e ID: MB 1 er atch: 4964	60-4958 165	376/7-A	Count	Total				Clie	ent Samı	ole ID: Me Prep Typ Prep Bat	ethod be: Tot tch: 4	Blank tal/NA 95876
Lab Sample Matrix: Wate Analysis Ba	e ID: MB 1 er atch: 4964	60-4958 165 мв	376/7-A MB	Count	Total				Clie	ent Sam	ole ID: Me Prep Typ Prep Bat	ethod be: Tot tch: 4	Blank tal/NA 95876
Lab Sample Matrix: Wate Analysis Ba	e ID: MB 1 er atch: 4964	60-4958 165 MB Result	B76/7-A MB Qualifier	Count Uncert.	Total Uncert. (2σ+/-)	RI	MDC	Unit	Clie	ent Sam	ole ID: Me Prep Typ Prep Bat	ethod be: Tot tch: 4	Blank tal/NA 95876
Lab Sample Matrix: Wate Analysis Ba Analyte Radium-228	e ID: MB 1 er atch: 4964	60-4958 165 MB Result 0.1114	<mark>МВ Qualifier</mark>	Count Uncert. (2σ+/-) 0.269	Total Uncert. (2σ+/-) 0.269	<u></u>	MDC 0.467	Unit pCi/L	Clie P 01/2	repared	Prep Typ Prep Bat Analyze	ethod be: Tot tch: 4	Blani tal/N/ 95870 Dil Fac
Lab Sample Matrix: Wate Analysis Ba Analyte Radium-228	e ID: MB 1 er atch: 4964	60-4958 165 MB Result 0.1114	MB Qualifier	Count Uncert. (2σ+/-) 0.269	Total Uncert. (2σ+/-) 0.269	RL 1.00	MDC 0.467	Unit pCi/L	Clie P 01/2	repared 20/21 17:35	Die ID: Me Prep Typ Prep Bat Analyze	ethod be: Tot tch: 4 ed 09:20	Blani tal/N/ 95876 Dil Fa
Lab Sample Matrix: Wate Analysis Ba Analyte Radium-228	e ID: MB 1 er atch: 4964	60-4958 165 MB <u>Result</u> 0.1114 <i>MB</i>	MB Qualifier U MB	Count Uncert. (2σ+/-) 0.269	Total Uncert. (2σ+/-) 0.269	RL 1.00	MDC 0.467	Unit pCi/L	Clie <u>P</u> 	repared 20/21 17:35	Prep Typ Prep Bat Analyze	ethod be: Tot tch: 4 ed 09:20	Blank tal/NA 95876 Dil Fac
Lab Sample Matrix: Wate Analysis Ba Analyte Radium-228 Carrier	e ID: MB 1 er atch: 4964	60-4958 165 MB Result 0.1114 MB %Yield	MB Qualifier U MB Qualifier	Count Uncert. (2σ+/-) 0.269 Limits	Total Uncert. (2σ+/-) 0.269	RL 1.00	MDC 0.467	Unit pCi/L	Clie 	repared 20/21 17:35	Analyze	ethod be: Tot tch: 4 ed b9:20	Blank tal/NA 95870 Dil Fac
Lab Sample Matrix: Wate Analysis Ba Analyte Radium-228 Carrier Ba Carrier	e ID: MB 1 er atch: 4964	60-4958 MB Result 0.1114 <i>MB</i> %Yield 87.5	MB Qualifier U MB Qualifier	Count Uncert. (2σ+/-) 0.269 Limits 40 - 110	Total Uncert. (2σ+/-) 0.269	RL 1.00	MDC 0.467	Unit pCi/L	Clie P 01/2 P 01/2 01/2	repared 20/21 17:35 20/21 17:35	Analyze 01/25/21 0	ethod be: Tot tch: 4 99:20	Blank tal/NA 95876 Dil Fac
Lab Sample Matrix: Wate Analysis Ba Analyte Radium-228 Carrier Ba Carrier Y Carrier	e ID: MB 1 er atch: 4964	60-4958 MB Result 0.1114 MB %Yield 87.5 88.6	MB Qualifier U MB Qualifier	Count Uncert. (2σ+/-) 0.269 Limits 40 - 110 40 - 110	Total Uncert. (2σ+/-) 0.269	RL 1.00	MDC 0.467	Unit pCi/L	P 01/2 P 01/2	repared 20/21 17:35 20/21 17:35 20/21 17:35	Analyze 01/25/21 0 01/25/21 0	ethod be: Tot tch: 4 b9:20 ed b9:20 b9:20	Blank tal/NA 95876 Dil Fac
Lab Sample Matrix: Wate Analysis Ba Analyte Radium-228 Carrier Ba Carrier Y Carrier Lab Sample Matrix: Wate	e ID: MB 1 er atch: 4964	60-4958 MB Result 0.1114 <i>MB</i> %Yield 87.5 88.6 160-495	MB Qualifier U MB Qualifier	Count Uncert. (2σ+/-) 0.269 Limits 40 - 110 40 - 110	Total Uncert. (2σ+/-) 0.269	<u></u>	MDC 0.467	Unit pCi/L	Clic — <u>P</u> 01/2 <u>P</u> 01/2 01/2 ent Sal	repared 20/21 17:35 20/21 17:35 20/21 17:35 20/21 17:35 mple ID:	Analyze 01/25/21 0 Analyze 01/25/21 0 01/25/21 0 Lab Cont Prep Typ	ethod be: Tot tch: 4 ed 09:20 09:20 09:20 trol Sa be: Tot	Blani tal/N/ 95870 Dil Fa Dil Fa
Lab Sample Matrix: Wate Analysis Ba Analyte Radium-228 Carrier Ba Carrier Y Carrier Lab Sample Matrix: Wate Analysis Ba	e ID: MB 1 er atch: 4964 	60-4958 MB Result 0.1114 <i>MB</i> %Yield 87.5 88.6 160-495	MB Qualifier U MB Qualifier	Count Uncert. (2σ+/-) 0.269 Limits 40 - 110 40 - 110	Total Uncert. (2σ+/-) 0.269	RL 1.00	MDC 0.467	Unit pCi/L	Clie <u>P</u> 01/2 01/2 01/2 ent Sau	repared 20/21 17:35 20/21 17:35 20/21 17:35 20/21 17:35 20/21 17:35 20/21 17:35	Analyze Analyze 01/25/21 0 Analyze 01/25/21 0 Analyze 01/25/21 0 Analyze 01/25/21 0 Prep Typ Prep Typ Prep Typ Prep Bat	ethod be: Tot tch: 4 be: Tot ch: 4 be: Tot ch: 4 be: Tot tch: 4	Blani tal/N/ 95870 Dil Fac Dil Fac ample tal/N/ 95870
Lab Sample Matrix: Wate Analysis Ba Analyte Radium-228 Carrier Ba Carrier Y Carrier Lab Sample Matrix: Wate Analysis Ba	e ID: MB 1 er atch: 4964 	60-4958 MB <u>Result</u> 0.1114 <i>MB</i> %Yield 87.5 88.6 160-495	MB Qualifier U MB Qualifier	Count Uncert. (2σ+/-) 0.269 Limits 40 - 110 40 - 110	Total Uncert. (2σ+/-) 0.269	RL 1.00	MDC 0.467	Unit pCi/L	P 01/2 01/2 01/2 01/2 ent Sar	repared 20/21 17:35 20/21 17:35 20/21 17:35 20/21 17:35 mple ID:	Analyze Analyze Analyze 01/25/21 0 Analyze 01/25/21 0 01/25/21 0 Lab Cont Prep Typ Prep Bat	ed be: Tot tch: 4 ed 09:20 ed 09:20 trol Sa be: Tot tch: 4	Blanl tal/N/ 95870 Dil Fa Dil Fa ample tal/N/ 95870
Lab Sample Matrix: Wate Analysis Ba Analyte Radium-228 Carrier Ba Carrier Y Carrier Lab Sample Matrix: Wate Analysis Ba	e ID: MB 1 er atch: 4964 	60-4958 MB Result 0.1114 <i>MB</i> %Yield 87.5 88.6 160-495	MB Qualifier U MB Qualifier	Count Uncert. (2σ+/-) 0.269 Limits 40 - 110 40 - 110	Total Uncert. (2σ+/-) 0.269	RL 1.00	<u>MDC</u> 0.467	Unit pCi/L	P 01/2 01/2 01/2 ent Sar	repared 20/21 17:35 20/21 17:35 20/21 17:35 20/21 17:35 mple ID:	Analyze Prep Bat Analyze 01/25/21 0 Analyze 01/25/21 0 01/25/21 0 Lab Cont Prep Typ Prep Bat %Rec.	ethod be: Tot tch: 4 be: 20 be: 20 be: 20 be: 70 tch: 4	Blanl tal/N/ 95870 Dil Fa Dil Fa ample tal/N/ 95870
Lab Sample Matrix: Wate Analysis Ba Analyte Radium-228 Carrier Ba Carrier Y Carrier Lab Sample Matrix: Wate Analysis Ba	e ID: MB 1 er atch: 4964 	60-4958 MB Result 0.1114 <i>MB</i> %Yield 87.5 88.6 160-495	MB Qualifier U MB Qualifier 5876/1-A Spike Added	Count Uncert. (2σ+/-) 0.269 Limits 40 - 110 40 - 110 40 - 110	Total Uncert. (2σ+/-) 0.269 LCS Qual	RL 1.00 Total Uncert. (20+/-)	MDC 0.467	Unit pCi/L Clin	Clic P 01/2 01/2 01/2 01/2 01/2 01/2 01/2 01/2 01/2 01/2 01/2 01/2 01/2 01/2 01/2	repared 20/21 17:35 20/21 17:35 20/21 17:35 20/21 17:35 20/21 17:35 mple ID:	Analyze Analyze O1/25/21 C Analyze O1/25/21 C O1/25/21 C O1/25/21 C D1/25/21 C D1/25/21 C D1/25/21 C Analyze O1/25/21 C O1/25/21 C Analyze O1/25/21 C Analyze O1/	ethod be: Tot tch: 4 be: 20 be: 20 be: 20 be: 70 tch: 4	Blanl tal/N/ 95870 Dil Fa Dil Fa ample tal/N/ 95870
Lab Sample Matrix: Wate Analysis Ba Analyte Radium-228 Carrier Ba Carrier Y Carrier Lab Sample Matrix: Wate Analysis Ba Analyte Radium-228	e ID: MB 1 er atch: 4964 	60-4958 MB Result 0.1114 %Yield 87.5 88.6 160-495	MB Qualifier U MB Qualifier 5876/1-A Spike Added 9.97	Count Uncert. (2σ+/-) 0.269 <i>Limits</i> 40 - 110 40 - 110 40 - 110 LCS Result	Total Uncert. (2σ+/-) 0.269 U.269	RL 1.00 Total Uncert. (2σ+/-) 1.75	MDC 0.467 RL 1.00	Unit pCi/L Cliv MDC 0.581	Clie P 01/2 01/2 01/2 01/2 ent Sat Unit pCi/L	repared 20/21 17:35 20/21 17:35 20/21 17:35 20/21 17:35 mple ID: - <u>%Rec</u> 155	Analyze 01/25/21 0 01/25	ethod be: Tot tch: 4 be: Tot toh: 4 be: Tot toh: 4	Blani tal/N/ 95870 Dil Fa Dil Fa ample tal/N/ 95870
Lab Sample Matrix: Wate Analysis Ba Analyte Radium-228 Carrier Ba Carrier Y Carrier Lab Sample Matrix: Wate Analysis Ba Analyte Radium-228	e ID: MB 1 er atch: 4964 er atch: 4964 er atch: 4964	60-4958 MB Result 0.1114 %Yield 87.5 88.6 160-495 465	MB Qualifier U MB Qualifier 5876/1-A Spike Added 9.97	Count Uncert. (2σ+/-) 0.269 Limits 40 - 110 40 - 110 40 - 110 LCS Result 15.47	Total Uncert. (2σ+/-) 0.269 LCS Qual *	RL 1.00 Total Uncert. (2σ+/-) 1.75	MDC 0.467 RL 1.00	Unit pCi/L Cli MDC 0.581	Clie <u>P</u> 01/2 01/2 01/2 ent Sau Unit pCi/L	repared 20/21 17:35 20/21 17:35 20/21 17:35 20/21 17:35 mple ID: 	Die ID: Me Prep Typ Prep Bat Analyze 01/25/21 0 Analyze 01/25/21 0 01/25/21 0 Lab Com Prep Typ Prep Bat %Rec. Limits 75 - 125	ethod be: Tot tch: 4 ed 09:20 ed 09:20 trol Sa be: Tot tch: 4	Blank tal/N/ 95870 Dil Fac Dil Fac ample tal/N/ 95870
Lab Sample Matrix: Wate Analysis Ba Analyte Radium-228 Carrier Ba Carrier Y Carrier Lab Sample Matrix: Wate Analysis Ba Analyte Radium-228 Carrier	e ID: MB 1 er atch: 4964 e ID: LCS er atch: 4964 <i>L</i> CS %Yield	60-4958 MB Result 0.1114 <i>MB</i> %Yield 87.5 88.6 160-495 165 LCS Qualifier	B76/7-A MB Qualifier U MB Qualifier 5876/1-A Spike Added 9.97	Count Uncert. (2σ+/-) 0.269 Limits 40 - 110 40 - 110 40 - 110 LCS Result 15.47	Total Uncert. (2σ+/-) 0.269 LCS Qual *	RL 1.00 Total Uncert. (2σ+/-) 1.75	MDC 0.467 	Unit pCi/L Clin MDC 0.581	Clie P 01/2 01/2 01/2 ent Sau Unit pCi/L	repared 20/21 17:35 20/21 17:35 20/21 17:35 20/21 17:35 mple ID: 	Die ID: Me Prep Typ Prep Bat 01/25/21 0 <i>Analyze</i> 01/25/21 0 <i>Analyze</i> 01/25/21 0 <i>Analyze</i> 01/25/21 0 <i>Analyze</i> 01/25/21 0 <i>Analyze</i> 01/25/21 0 <i>Analyze</i> 01/25/21 0 <i>Analyze</i> 01/25/21 0	ethod be: Tot tch: 4 ed 09:20 ed 09:20 trol Sa be: Tot tch: 4	Blank tal/NA 95876 Dil Fac Dil Fac ample tal/NA 95876
Lab Sample Matrix: Wate Analysis Ba Analyte Radium-228 Carrier Ba Carrier Y Carrier Lab Sample Matrix: Wate Analysis Ba Analyte Radium-228 Carrier Ba Carrier	e ID: MB 1 er atch: 4964 e ID: LCS er atch: 4964 	60-4958 MB Result 0.1114 <i>MB</i> %Yield 87.5 88.6 160-495 465 465	B76/7-A MB Qualifier U MB Qualifier 6876/1-A Spike Added 9.97 Limits 40 - 110	Count Uncert. (2σ+/-) 0.269 Limits 40 - 110 40 - 110 40 - 110 LCS Result 15.47	Total Uncert. (2σ+/-) 0.269 LCS Qual *	RL 1.00 Total Uncert. (2σ+/-) 1.75	<u>MDC</u> 0.467 <u>RL</u> 1.00	Unit pCi/L Cli MDC 0.581	Clie P 01/2 01/2 01/2 ent Sau Unit pCi/L	repared 20/21 17:35 20/21 17:35 20/21 17:35 20/21 17:35 mple ID: - <u>%Rec</u> 155	Die ID: Me Prep Typ Prep Bat 01/25/21 0 <i>Analyze</i> 01/25/21 0 01/25/21 0 1/25/21 0 Lab Cont Prep Typ Prep Bat %Rec. Limits 75 - 125	ethod be: Tot tch: 4 be: Tot 29:20 be: Tot tch: 4	Blank tal/NA 95876 Dil Fac

Y Carrier

85.2

40 - 110

QC Sample Results

Job ID: 440-276656-2

3 4 5

Method: 904.0 - Radium-228 (GFPC) (Continued)

Matrix: Wate	er er	00-49	101012-A					Cheft S	ample		Prep Typ	bainpl	e Dup tal/NA
Analysis Ba	tch: 4964	165									Prep Ba	tch: 4	95876
						Total							
Analyta			Spike	LCSD	LCSD	Uncert.	ы	MDC	11	% D a a	%Rec.	DED	REF
Analyte Radium-228				15 75		<u>(2σ+/-)</u>		0.554		%Rec	75 125	0.08	
Naulum-220			5.57	15.75		1.77	1.00	0.004	poi/L	150	10-120	0.00	
	LCSD	LCSD											
Carrier	%Yield	Qualifier	- Limits	-									
Ba Carrier	90.8		40 - 110										
	07.9		40 - 110										
lethod: 90	5 - Stro	ntium-	90 (GFPC)									
Lab Sample	ID: MB 1	60-4939	37/6-A						Cli	ent Samp	ole ID: Me	ethod	Blank
Matrix: Wate	er										Prep Typ	be: To	tal/N/
Analysis Ba	itch: 4949	901		Count	Total						Ргер Ва	tch: 4	9393
		MB	MB	Uncort	Uncort								
Analyte		Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	F	Prepared	Analyz	ed	Dil Fa
Strontium-90		-0.09689		0.280	0.280	3.00	0.525	pCi/L	01/	05/21 19:02	01/13/21	16:55	Burg
		MB	MR										
Carrier		WiB %Vield	Qualifier	l imits					,	Prenared	Δnalvz	ed	Dil Fa
Sr Carrier		98.4		40 - 110					01/	05/21 19:02	01/13/21	16:55	Birra
Y Carrier		83.4		40 - 110					01/	05/21 19:02	01/13/21	16:55	
Lab Sample	ID: LCS	160-493	937/1-A					Cli	ent Sa	mple ID:	Lab Con	trol S	ample
Apolycic Ro	er Itab: 4040	001									Prep Typ)e: 10 tob: 4	tal/N/
Allalysis Da	1011. 4543					Total					гтер Ба	1011. 4	3333
			Spike	LCS	LCS	Uncert.					%Rec.		
Analyte			Added	Result	Qual	(2σ+/-)	RL	MDC	Unit	%Rec	Limits		
Strontium-90			8.30	7.298		0.962	3.00	0.581	pCi/L	88	75 - 125		
	109	105											
Carrier	%Vield	Qualifier	l imits										
Sr Carrier	98.1	Quanner	40 - 110	-									
Y Carrier	84.1		40 - 110										
l ah Sample		7 160-49	3937/2-4					Client S	Sample	D' I ab	Control S	Samnl	e Dur
Matrix: Wate	er										Prep Tvr	be: To	tal/N/
Analysis Ba	tch: 4949	901				Tatal					Prep Ba	tch: 4	93937
			Snike	1.000		Iotai					% D oo		DET
Analyte			24464 24464	Rocult	Qual	(2σ+/-)	RI	мос	Unit	%Rec	imite	RED	rcci I imi
Strontium-90			8.30	6.308		0.850	3 00	0.503	pCi/l	76	75, 125	0.55	
			0.00	5.000		0.000	0.00	0.000	P0"L	70	10-120	0.00	
. .	LCSD	LCSD											
Carrier	%Yield	Qualifier	Limits	-									
Sr Carrier	102		40 - 110										
QC Sample Results

Job ID: 440-276656-2

Method: 906.0 - Tritium, Total (LSC)

0.0008561 U

Total Uranium

Lab Sample I	D: MB 16	6 <mark>0-495</mark> 0)65/1-A						Cli	ent Samp	ole ID: Method	l Blank
Matrix: Water											Prep Type: To	otal/NA
Analysis Batc	h: 49549	98									Prep Batch:	495065
-				Count	Total							
		MB	МВ	Uncert.	Uncert.							
Analyte		Result	Qualifier	(2 σ+/-)	(2σ+/-)	RL	MDC	Unit	F	Prepared	Analyzed	Dil Fac
Tritium		32.88	U	174	174	500	309	pCi/L	01/	14/21 11:20	01/15/21 17:28	1
Lab Sample I): LCS 1	60-495	065/2-A					Cli	ent Sa	mple ID:	Lab Control S	Sample
Matrix: Water											Prep Type: To	otal/NA
Analysis Batc	h: 49549	98									Prep Batch:	495065
						Total						
			Spike	LCS	LCS	Uncert.					%Rec.	
Analyte			Added	Result	Qual	(2σ+/-)	RL	MDC	Unit	%Rec	Limits	
Tritium			2370	2342		403	500	305	pCi/L	99	75 - 114	
	D• 160_40		-1-R MS							liont Sam	nlo ID: Matrix	Sniko
Matrix: Water	. 100-40	0000-A							Ŭ		Pron Type: T	
Analysis Bate	h. 19510	28									Prop Batch:	105065
Analysis Date	11. 43343	50				Total					Fiep Datch.	+33003
	Sampla	Sample	s Spika	МС	MS	Uncort					% Boc	
Analyto	Docult	Oual		Posult	Qual	(2a+/-)	DI	MDC	Unit	%Pac	/intec.	
	24.8		2380	2658		435	500	311			67 130	
	24.0	0	2000	2000		400	000	011	poi/E		07 - 100	
Lab Sample ID): 160-40	0980-A	-1-C DU							Client S	ample ID: Du	plicate
Matrix: Water											Prep Type: To	tal/NA
Analysis Batc	h: 49549	98									Prep Batch:	495065
						Total						
	Sample	Sample	9	DU	DU	Uncert.						RER
Analyte	Result	Qual		Result	Qual	(2 σ +/-)	RL	MDC	Unit		REF	Limit
Tritium	24.8	U		94.59	U	181	500	309	pCi/L		0.20)1
Method: A-0'	1-R - Is	otopi	c Uranium	(Alpha	Spectr	ometry)						
			o oranian		opeen	onioù y)						
Lab Sample II	D: MB 16	60-4939)32/1-A						Cli	ent Samp	ole ID: Method	Blank
watrix: Water		-									Prep Type: To	
Analysis Batc	n: 49502	25		Count	Total						Prep Batch:	493932
			МВ	Count	IU(a)							
Analyta		MB		Uncert.	uncert.		MDA	l lmit		Duement	Analyzard	
		Result		(2 0+/-)	(2σ+/-)	KL				-repared		
Uranium-234	-	0.04001	U	0.0566	0.0567	1.00	0.173	pCI/L	01/	05/21 17:01	01/13/21 10:59	1
Uranium-235		0.02490	U	0.0739	0.0739	1.00	0.157	pCI/L	01/	05/21 17:01	01/13/21 10:59	1
oranium-238		0.01597	U	0.0479	0.0479	1.00	0.107	pUI/L	01/	05/21 17:01	01/13/21 10:59	1

	MB	MB				
Tracer	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Uranium-232	91.5		30 - 110	01/05/21 17:01	01/13/21 10:59	1

1.00

0.1047

0.173 pCi/L

0.1047

Eurofins Calscience Irvine

01/05/21 17:01 01/13/21 10:59

Lab Sample ID: LCS 160-493932/2-A

Matrix: Water

8

Method: A-01-R - Isotopic Uranium (Alpha Spectrometry) (Continued) **Client Sample ID: Lab Control Sample Prep Type: Total/NA**

Spike Added 12.7 0.607 13.0 Mifier Limits 30 - 110 Sego-B-1-E DU	LCS Result 12.87 0.6257 13.83	LCS Qual	Total Uncert. (2σ+/-) 1.50 0.283 1.58	RL 1.00 1.00 1.00	MDC 0.342 0.261 0.128	Unit pCi/L pCi/L pCi/L	- %Rec 101 103 106 Client \$	%Rec. Limits 75 - 125 75 - 125 Sample ID: Dug	licate
Spike Added 12.7 0.607 13.0 Selifier Limits 30 - 110 S99-B-1-E DU	LCS Result 12.87 0.6257 13.83	LCS Qual	Uncert. (2σ+/-) 1.50 0.283 1.58	RL 1.00 1.00 1.00	MDC 0.342 0.261 0.128	Unit pCi/L pCi/L pCi/L	- %Rec 101 103 106	%Rec. Limits 75 - 125 75 - 125 Sample ID: Dup	licate
Added 12.7 0.607 13.0 0.607 10.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	Result 12.87 0.6257 13.83	Qual	- <u>(2σ+/-)</u> 1.50 0.283 1.58	RL 1.00 1.00 1.00	MDC 0.342 0.261 0.128	Unit pCi/L pCi/L pCi/L	<u>%Rec</u> 101 103 106	Limits 75 - 125 75 - 125 Sample ID: Dup	licate
12.7 0.607 13.0 Mifier <u>Limits</u> 30 - 110	12.87 0.6257 13.83		1.50 0.283 1.58	1.00 1.00 1.00	0.342 0.261 0.128	pCi/L pCi/L pCi/L	101 103 106	75 - 125 75 - 125 Sample ID: Dup	licate
0.607 13.0 Ilifier <u>Limits</u> 30 - 110	0.6257 13.83		0.283 1.58	1.00 1.00	0.261 0.128	pCi/L pCi/L	103 106 Client \$	75 - 125 Sample ID: Dup	licate
13.0 <u>Ilifier</u> <u>Limits</u> <u>30 - 110</u> 199-B-1-E DU	13.83		1.58	1.00	0.128	pCi/L	106 Client \$	75 - 125 Sample ID: Dup	licate
e <mark>lifier <u>Limits</u> 30 - 110 199-B-1-E DU</mark>							Client S	Sample ID: Dup	licate
lifier <u>Limits</u> 30 - 110 9 99-B-1-E DU							Client S	Sample ID: Dup	licate
30 - 110							Client S	Sample ID: Dup	licate
99-B-1-E DU							Client S	Sample ID: Dup	licate
								Prep Type: To Prep Batch: 4	tal/NA 93932
			Total						
imple	DU	DU	Uncert.						RER
ual	Result	Qual	(2σ+/-)	RL	MDC	Unit		RER	Limit
	1.071		0.302	1.00	0.241	pCi/L		0.18	1
	0.04052	U	0.0860	1.00	0.166	pCi/L		0.13	1
	0.7069		0.227	1.00	0.122	pCi/L		0.50	1
	1.818		0.387	1.00	0.241	pCi/L		0.15	1
lifier Limits									
30 - 110									
	Infier Limits 30 - 110	Imple DU Ial Result 1.071 0.04052 0.7069 1.818 Ilifier Limits 30 - 110 Opic Plutonium and	Imple DU DU Ial Result Qual 1.071 1.071 0.04052 U 0.7069 1.818	Imple DU DU Uncert. Ial Result Qual (2σ+/-) 1.071 0.302 0.04052 0.04052 U 0.0860 0.7069 0.227 1.818 0.387	Imple DU DU Uncert. Imple Result Qual (2σ+/-) RL 1.071 0.302 1.00 0.04052 0.0860 1.00 0.04052 U 0.0860 1.00 0.7069 0.227 1.00 1.818 0.387 1.00 1.818 0.387 1.00	Imple DU DU Uncert. Imple Result Qual (2σ+/-) RL MDC 1.071 0.302 1.00 0.241 0.04052 U 0.0860 1.00 0.166 0.7069 0.227 1.00 0.122 1.818 0.387 1.00 0.241 Mifier Limits 30 - 110 0 0	Imple DU DU Uncert. Ial Result Qual (2σ+/-) RL MDC Unit 1.071 0.302 1.00 0.241 pCi/L 0.04052 U 0.0860 1.00 0.166 pCi/L 0.7069 0.227 1.00 0.122 pCi/L 1.818 0.387 1.00 0.241 pCi/L	Imple DU DU Uncert. Ial Result Qual (2σ+/-) RL MDC Unit	Imple DU DU Uncert. Imple Result Qual (2σ+/-) RL MDC Unit 0.18 0.04052 U 0.0860 1.00 0.166 pCi/L 0.13 0.7069 0.227 1.00 0.122 pCi/L 0.50 1.818 0.387 1.00 0.241 pCi/L 0.50 1.818 0.387 1.00 0.241 pCi/L 0.15

Matrix: Water Analysis Batch: 499370

Analysis Batch: 4	99370								Prep Batch:	498748
-	MB	мв	Count Uncert	Total Uncert						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Plutonium-238	-0.06003	U	0.106	0.107	1.00	0.256	pCi/L	02/12/21 12:52	02/19/21 11:08	1
Plutonium-239/240	-0.02146	U	0.0192	0.0193	1.00	0.122	pCi/L	02/12/21 12:52	02/19/21 11:08	1
	MB	MB								
Tracer	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac

30 - 110

Pu-242 (T) 81.0 Lab Sample ID: LCS 160-498748/2-A

Matrix: Water Analysis Batch: 499535

				Total				
	Spike	LCS	LCS	Uncert.				%Rec.
Analyte	Added	Result	Qual	(2σ+/-)	RL	MDC Unit	%Rec	Limits
Plutonium-238	10.4	10.44		1.08	1.00	0.167 pCi/L	100	79 - 115
Plutonium-239/2 40	10.6	10.20		1.06	1.00	0.127 pCi/L	97	85 - 120

	LCS	LCS	
Tracer	%Yield	Qualifier	Limits
Pu-242 (T)	96.5		30 - 110

Prep Type: Total/NA

Prep Batch: 498748

02/12/21 12:52 02/19/21 11:08

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

1

Method: A-01-R - Isotopic Plutonium and Neptunium (Alpha Spectrometry)

Lab Sample II Matrix: Water Analysis Bato	D: 440-2 ch: 4993	78183-A-1 76	-J DU			Tatal				Client Sample II Prep Ty Prep Ba	D: Dup pe: Tot atch: 49	licate al/NA 98748
	Sample	Sample		DU	DU	Uncert.						RER
Analyte	Result	Qual		Result	Qual	(2σ+/-)	RL	MDC	Unit		RER	Limit
Plutonium-238	-0.0360	U		-0.06736	U	0.0984	1.00	0.246	pCi/L		0.15	1
Plutonium-239/2 40	-0.0241	U		-0.02529	U	0.0430	1.00	0.149	pCi/L		0.01	1
	DU	DU										
Tracer	%Yield	Qualifier	Limits									
Pu-242 (T)	78.7		30 - 110									

QC Association Summary

Client: Haley & Aldrich, Inc. Project/Site: Routine Outfall 003 RMHF GRAB Job ID: 440-276656-2

Client Sample ID	Prep Type	Matrix	Method	Prep Batch	
RMHF_20201228_Grab	Total/NA	Water	Fill_Geo-0		
Method Blank	Total/NA	Water	Fill_Geo-0		5
Lab Control Sample	Total/NA	Water	Fill_Geo-0		
RMHF_20201228_Grab	Total/NA	Water	Fill_Geo-0		
Client Sample ID	Prep Type	Matrix	Method	Prep Batch	
RMHF_20201228_Grab	Total/NA	Water	PrecSep-21		8
Method Blank	Total/NA	Water	PrecSep-21		
Lab Control Sample	Total/NA	Water	PrecSep-21		9
Lab Control Sample Dup	Total/NA	Water	PrecSep-21		
Client Sample ID	Prep Type	Matrix	Method	Prep Batch	
RMHF_20201228_Grab	Total/NA	Water	Evaporation		
Method Blank	Total/NA	Water	Evaporation		
Lab Control Sample	Total/NA	Water	Evaporation		
Lab Control Sample	Total/NA	Water	Evaporation		
Matrix Spike	Total/NA	Water	Evaporation		13
Matrix Spike Duplicate	Total/NA	Water	Evaporation		
Matrix Spike	Total/NA	Water	Evaporation		
Matrix Spike Duplicate	Total/NA	Water	Evaporation		
Client Sample ID	Prep Type	Matrix	Method	Prep Batch	
RMHF_20201228_Grab	Iotal/NA	Water	ExtChrom		
Method Blank	Total/NA	Water	ExtChrom		
Lab Control Sample	Total/NA	Water	ExtChrom		
Duplicate	Total/NA	Water	ExtChrom		
Client Semale ID	Dren Tune	Metrix	Mathad	Dran Batah	
RMHE 20201228 Grab	Total/NA	Water	PrecSen-7	Fiep Batch	
Method Blank	Total/NA	Water	PrecSep-7		
Lab Control Sample	Total/NA	Water	PrecSep-7		
Lab Control Sample Dup	Total/NA	Water	ProcSop 7		
	IUlai/NA	Water	Fieldep-1		
Client Sample ID	Prep Type	Matrix	Method	Prep Batch	
RMHF_20201228_Grab	Total/NA	Water	LSC_Dist_Susp		
Method Blank	Total/NA	Water	LSC_Dist_Susp		
Lab Control Sample	Total/NA	Water	LSC_Dist_Susp		
Matrix Spike	Total/NA	Water	LSC_Dist_Susp		
Duplicate	Total/NA	Water	LSC_Dist_Susp		

LCSD 160-493744/2-A Prep Batch: 493900

Prep Batch: 493549

MB 160-493549/1-A LCS 160-493549/2-A

440-276656-1 DU

Lab Sample ID

MB 160-493744/6-A

LCS 160-493744/1-A

440-276656-1

Prep Batch: 493744

Lab Sample ID

440-276656-1

Rad

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-276656-1	RMHF_20201228_Grab	Total/NA	Water	Evaporation	
MB 160-493900/1-A	Method Blank	Total/NA	Water	Evaporation	
LCS 160-493900/2-A	Lab Control Sample	Total/NA	Water	Evaporation	
LCSB 160-493900/3-A	Lab Control Sample	Total/NA	Water	Evaporation	
280-144105-A-1-B MS	Matrix Spike	Total/NA	Water	Evaporation	
280-144105-A-1-C MSD	Matrix Spike Duplicate	Total/NA	Water	Evaporation	
280-144105-A-1-D MSBT	Matrix Spike	Total/NA	Water	Evaporation	
280-144105-A-1-E MSBTD	Matrix Spike Duplicate	Total/NA	Water	Evaporation	

Prep Batch: 493932

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-276656-1	RMHF_20201228_Grab	Total/NA	Water	ExtChrom	
MB 160-493932/1-A	Method Blank	Total/NA	Water	ExtChrom	
LCS 160-493932/2-A	Lab Control Sample	Total/NA	Water	ExtChrom	
680-193399-B-1-E DU	Duplicate	Total/NA	Water	ExtChrom	

Prep Batch: 493937

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-276656-1	RMHF_20201228_Grab	Total/NA	Water	PrecSep-7	
MB 160-493937/6-A	Method Blank	Total/NA	Water	PrecSep-7	
LCS 160-493937/1-A	Lab Control Sample	Total/NA	Water	PrecSep-7	
LCSD 160-493937/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep-7	

Prep Batch: 495065

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-276656-1	RMHF_20201228_Grab	Total/NA	Water	LSC_Dist_Susp	
MB 160-495065/1-A	Method Blank	Total/NA	Water	LSC_Dist_Susp	
LCS 160-495065/2-A	Lab Control Sample	Total/NA	Water	LSC_Dist_Susp	
160-40980-A-1-B MS	Matrix Spike	Total/NA	Water	LSC_Dist_Susp	
160-40980-A-1-C DU	Duplicate	Total/NA	Water	LSC_Dist_Susp	

Prep Batch: 495876

Lab Sample ID 440-276656-1	Client Sample ID RMHF_20201228_Grab	Prep Type Total/NA	Matrix Water	Method PrecSep_0	Prep Batch
MB 160-495876/7-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-495876/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
LCSD 160-495876/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep_0	

QC Association Summary

Client: Haley & Aldrich, Inc. Project/Site: Routine Outfall 003 RMHF GRAB Job ID: 440-276656-2

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Rad

Prep Batch: 498748

Lab Sample ID 440-276656-1	Client Sample ID RMHF_20201228_Grab	Prep Type Total/NA	Matrix Water	Method Prep Batch ExtChrom
MB 160-498748/1-A	Method Blank	Total/NA	Water	ExtChrom
LCS 160-498748/2-A	Lab Control Sample	Total/NA	Water	ExtChrom
440-278183-A-1-J DU	Duplicate	Total/NA	Water	ExtChrom

Client: Haley & Aldrich, Inc. Project/Site: Routine Outfall 003 RMHF GRAB

Job ID: 440-276656-2

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Qualifiers

Rad		
Qualifier	Qualifier Description	
*	LCS or LCSD is outside acceptance limits.	
F1	MS and/or MSD recovery exceeds control limits.	
G	The Sample MDC is greater than the requested RL.	
U	Result is less than the sample detection limit.	

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Client: Haley & Aldrich, Inc. Project/Site: Routine Outfall 003 RMHF GRAB

Job ID: 440-276656-2

Laboratory: Eurofins TestAmerica, St. Louis

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

 Authority	Program	Identification Number	Expiration Date
Alaska (UST)	State	20-001	05-06-22
ANAB	Dept. of Defense ELAP	L2305	04-06-22
ANAB	Dept. of Energy	L2305.01	04-06-22
ANAB	ISO/IEC 17025	L2305	04-06-22
Arizona	State	AZ0813	12-08-21
California	Los Angeles County Sanitation Districts	10259	06-30-21
California	State	2886	06-30-21
Connecticut	State	PH-0241	03-31-21
Florida	NELAP	E87689	06-30-21
HI - RadChem Recognition	State	n/a	06-30-21
Illinois	NELAP	004553	11-30-21
lowa	State	373	12-01-22
Kansas	NELAP	E-10236	10-31-21
Kentucky (DW)	State	KY90125	12-31-20 *
Louisiana	NELAP	04080	06-30-21
Louisiana (DW)	State	LA011	12-31-21
Maryland	State	310	09-30-21
MI - RadChem Recognition	State	9005	06-30-21
Missouri	State	780	06-30-22
Nevada	State	MO000542020-1	07-31-21
New Jersey	NELAP	MO002	06-30-21
New York	NELAP	11616	04-01-21
North Dakota	State	R-207	06-30-21
NRC	NRC	24-24817-01	12-31-22
Oklahoma	State	9997	08-31-21
Oregon	NELAP	4157	09-01-21
Pennsylvania	NELAP	68-00540	02-28-21
South Carolina	State	85002001	06-30-21
Texas	NELAP	T104704193-19-13	07-31-21
US Fish & Wildlife	US Federal Programs	058448	07-31-21
USDA	US Federal Programs	P330-17-00028	03-11-23
Utah	NELAP	MO000542019-11	07-31-21
Virginia	NELAP	10310	06-14-21
Washington	State	C592	08-30-21
West Virginia DEP	State	381	10-31-21

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

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Chain of Custody Record



Operations Operati	Client Contact: Chipping/Receiving Company: TestMartica Laboratories, Inc. Address: 13715 Rider Trail North. 13715 Rider	Phone: Due Date Requested: 1111/2021 TAT Requested (days): PO #:	E-Ma Chri	ili: intine Bondi				0						
Contraction of the contract of the contence of the contract of the contract of the contract of the cont	Company: TestAmerica Laboratories, Inc. Address: 13715 Rider Trail North, , 110 City Earth City State. Zp: MO, 63045 Phone: MO, 63045 Phone: MO, 63045 Phone: MO, 63045 Phone: Propert Name: Project Name: Project Name: Stet:	Due Date Requested: 1/11/2021 TAT Requested (days): PO #:		Slian. DUI w	oc@Euro	finset.co	E	n N N	te of Origi lifornia	e		Page: Page	1 of 1	
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Bits Of () (0.0000/ (0.0000/ 0.	City: Earth City State. Zp: MO, 63045 Phone: 314-298-8566(Tel) 314-298-8757(Fax) Phone: 314-298-8566(Tel) 314-298-8757(Fax) Phone: Phone: Phone: Phone: Phone: State: Protect Name: Protect Name: Prot	TAT Requested (days): PO #:				Ana	lysis I	Seque	sted			Preser	vation Cod	68:
Normalization Distribution	Phone: 314-298-8566(Tel) 314-298-8757(Fax) Email: Project Name: DNU (TotalAccess) Boeing NPDES SSFL Outf Site:	PO #:											L DH Acetate ic Acid HSO4	M - Hexane N - None O = AsNaO2 P - Na2O4S Q - Na2SO3
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And in the control of the control	RMHF_20201228_Grab (440-276656-1)	12/28/20 08:00	Water	×	×	×	×	×				2 Boeing	SSFL; DO I	NOT FILTER; use prep
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Eurofins	17461 Derian

Chain of Custody Record



rvine. CA 92614-5817 Phone: 949-261-1022 Fax: 949-260-3297	,		sno i	rouy Ker					Environment lesting America
Client Information (Sub Contract Lab)	Sampler.			Lab PM: Bondoo	Christian M	Carrier Tracking	No(s):	COC No:	
lient contact: Shipping/Receiving	Phone:			E-Mail:	Pondoo@Euroficant com	State of Origin:		440-105299.1 Page:	
Company: DestAmerica aboratorias nc				Acc	editations Required (See note):	California		Lage 1 of 1 Job #:	
Address:	Due Date Request	ed:		013	le Program - California			440-276656-1	
380 Riverside Parkway,	1/11/2021				Analysi	s Requested		Preservation Cod	les:
bity: Nest Sacramento	TAT Requested (d	ays):			5			A - HCL B - NaOH	M - Hexane N - None
state. Zp: 2A, 95605					letoT \\			C - Zn Acetate D - Nitric Acid E - NaHSO4	0 - ASNAU2 P - Na204S Q - Na2S03
^{thone:} 316-373-5600(Tel) 916-372-1059(Fax)	# Od			(1	w tsij			F - MeOH G - Amchlor	R - Na2S2O3 S - H2SO4
mail:	:# OM			OF NO	ס) נוס			H - Ascorbic Acid I - Ice	T - TSP Dodecahydrate U - Acetone
roject Name: DNU (TotalAccess) Boeing NPDES SSFL Outf	Project #: 44009879			50 <u>)</u>)	s or N		ainers	u - UI water K - EDTA L - EDA	v - MCAA W - pH 4-5 Z - other (specify)
	#MOSS			elqms	(dəS_xc		t conta	Other:	
			Sample Type	Matrix (www.eter S=solid,	B/1613B_56		Number o		
Sample Identification - Client ID (Lab ID)	Sample Date	Time	(c=comp, G=grab)	Orwaste/oll,	1613 Perfe		Total	Special In	structions/Note:
	X	X	Preserva	tion Code:					
RMHF_20201228_Grab (440-276656-1)	12/28/20	08:00 Docifio		Water	×		-	See QAS, Boeing	w/u to zero, ug/L; Use
								boeing glassware.	
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tole: Since laboratory accreditations are subject to change, Eurofins Calsc naintain accreditation in the State of Origin listed above for analysistleststim calscience attention immediately. If all requested accreditations are curren	ience places the ownershi natrix being analyzed, the s it to date, return the signed	p of method, ar samples must t I Chain of Cust	nalyte & accre be shipped ba ody attesting t	ditation compliance i ck to the Eurofins Ca o said complicance t	upon out subcontract laboratories. Iscience laboratory or other instruct to Eurofins Calscience.	This sample shipment is ions will be provided. An	forwarded under chain by changes to accredita	of-custody. If the lal tion status should be	ooratory does not currently a brought to Eurofins
Possible Hazard Identification					sample Disposal (A fee ma	v be assessed if sa	moles are retaine	d longer than 1	month)
Inconfirmed					Return To Client	Disposal Bv Lai	b Archi	e For	Months
beliverable Requested: t, II, III, IV, Other (specify)	Primary Delivera	able Rank: 2			pecial Instructions/QC Requ	irements:			2000
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elinquished by: FED EX	Date/Time:			Company	Received by M		Date/Time: 17 /36 /2020	1016	Company C TO C+1
elinquished by:	Date/Time:			Company	Received by:		Date/Time:	2	Company

Ver: 11/01/2020

company

Cooler Temperature(s) °C and Other Remarks:

Custody Seal No .:

Client: Haley & Aldrich, Inc.

Login Number: 276656 List Number: 1 Creator: Skinner, Alma D

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

List Source: Eurofins Irvine

Client: Haley & Aldrich, Inc.

Login Number: 276656 List Number: 3 Creator: Mazariegos, Leonel A

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		9
1		3

List Source: Eurofins TestAmerica, St. Louis List Creation: 12/30/20 02:31 PM

Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>True</td> <td></td>	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	Sample 440-276656-G-1 preserved upon arrival to lab.
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Tracer/Carrier Summary

Prep Type: Total/NA

Prep Type: Total/NA

Prep Type: Total/NA

5

14

Method: 903.0 - Radium-226 (GFPC)

Matrix: Water

	Percent Yield (Acceptance Limits)				
		Ва			
Lab Sample ID	Client Sample ID	(40-110)			
440-276656-1	RMHF_20201228_Grab	67.0			
LCS 160-493744/1-A	Lab Control Sample	77.4			
LCSD 160-493744/2-A	Lab Control Sample Dup	80.4			
MB 160-493744/6-A	Method Blank	85.0			
Tracer/Carrier Legend	1				

Ba = Ba Carrier

Method: 904.0 - Radium-228 (GFPC)

Matrix: Water

				Percent Yield (Acceptance Limits)
		Ва	Y	
Lab Sample ID	Client Sample ID	(40-110)	(40-110)	
440-276656-1	RMHF_20201228_Grab	75.2	87.5	
LCS 160-495876/1-A	Lab Control Sample	87.8	89.7	
LCSD 160-495876/2-A	Lab Control Sample Dup	90.8	87.9	
MB 160-495876/7-A	Method Blank	87.5	88.6	
Tracer/Carrier Legend	1			
Ba = Ba Carrier			-	

Y = Y Carrier

Method: 905 - Strontium-90 (GFPC)

Matrix: Water

				Percent Yield (Acceptance Limits)
		Sr	Y	
Lab Sample ID	Client Sample ID	(40-110)	(40-110)	
440-276656-1	RMHF_20201228_Grab	95.6	86.0	
LCS 160-493937/1-A	Lab Control Sample	98.1	84.1	
LCSD 160-493937/2-A	Lab Control Sample Dup	102	85.2	
MB 160-493937/6-A	Method Blank	98.4	83.4	

Tracer/Carrier Legend

```
Sr = Sr Carrier
```

Y = Y Carrier

Method: A-01-R - Isotopic Plutonium and Neptunium (Alpha Spectrometry) Matrix: Water

Prep	Type:	Total/NA

	Percent Yield (Acceptance Limits)				
		Pu-242 (T)			
Lab Sample ID	Client Sample ID	(30-110)			
440-276656-1	RMHF_20201228_Grab	48.4			
440-278183-A-1-J DU	Duplicate	78.7			
LCS 160-498748/2-A	Lab Control Sample	96.5			
MB 160-498748/1-A	Method Blank	81.0			
Tracer/Carrier Legend	i				

Pu-242 (T) = Pu-242 (T)

Tracer/Carrier Summary

Client: Haley & Aldrich, Inc. Project/Site: Routine Outfall 003 RMHF GRAB

Method: A-01-R - Isotopic Uranium (Alpha Spectrometry) Matrix: Water

		Percent Yield (Acceptance Limits)			
		U-232			
Lab Sample ID	Client Sample ID	(30-110)			
440-276656-1	RMHF_20201228_Grab	33.4			
680-193399-B-1-E DU	Duplicate	87.4			
LCS 160-493932/2-A	Lab Control Sample	64.5			
MB 160-493932/1-A	Method Blank	91.5			
Tracer/Carrier Legend	1				
11-232 = 11ranium-232					

Prep Type: Total/NA

Job ID: 440-276656-2

14

Eurofins Calscience Irvine

Pag

Environment Testing	Sacramento 2 Sample Receiving Notes
lestAmerica	
	Tracking # : 5
440-276656 Field Sheet	SO / PO / FO / SAT / 2-Day / Ground / UPS / CDO / Courier
Job:	GSO / OnTrac / Goldstreak / USPS / Other 7
Use this form to record Sample Custody Seal, Cooler Custody File in the job folder with the COC.	Seal, Temperature & corrected Temperature & other observations.
Therm. ID: Corr. Factor: (+ / -)	_°C Notes:9
Ice Wet Gel Other	10
Cooler ID:	12
Temp Observed:°C Corrected:	_°C 13
From: Temp Blank D Sample D	
Opening/Processing The Shipment Ves No	NA 14
Cooler compromised/tampered with?	<u> </u>
Cooler Temperature is acceptable?	
Frozen samples show signs of thaw?	<u>x</u>
Initials: MAN Date: 12/30/2	2
Unpacking/Labeling The Samples <u>Yes</u> <u>No</u>	<u>NA</u>
CoC is complete w/o discrepancies?	
Samples compromised/tampered with?	
Sample custody seal?	
Containers are not broken or leaking?	
Sample date/times are provided?	
Appropriate containers are used?	Trizma Lot #(s):
Sample bottles are completely filled?	
Sample preservatives verified?	
Samples w/o discrepancies?	
Zero headspace?*	
Alkalinity has no headspace?	Login completion Yes No NA IN Receipt Temperature on COC2 To To To
Perchlorate has headspace?	Samples received within hold time?
(Methods 314, 331, 6850)	NCM Filed?
Multiphasic samples are not present?	Log Release checked in TALS?
*Containers requiring zero headspace have no headspace, or bubble < 6 mm	n (1/4")
Initials: MAN Date: 12 30 20	Initials: MAN Date: 12/30/20

INTACORPICORPIQAIQA_FACILITIESISACRAMENTO-QAIDOCUMENT-MANAGEMENTIFORMSIQA-B12 SAMPLE RECEIVING NOTES.DOC

🔅 eurofins

Environment Testing America

ANALYTICAL REPORT

Eurofins Calscience Irvine 17461 Derian Ave Suite 100 Irvine, CA 92614-5817 Tel: (949)261-1022

Laboratory Job ID: 440-278183-1

Client Project/Site: Boeing NPDES SSFL Outfalls Revision: 1

For:

LINKS

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Expert

Haley & Aldrich, Inc. 400 E Van Buren St. Suite 545 Phoenix, Arizona 85004

Attn: Ms. Katherine Miller

Virentra R Paty

Authorized for release by: 3/19/2021 2:36:19 PM

Virendra Patel, Project Manager I (714)895-5494 Virendra.Patel@eurofinset.com

The test results in this report meet all 2003 NELAC, 2009 TNI, and 2016 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

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

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

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Sample Summary

Client: Haley & Aldrich, Inc. Project/Site: Boeing NPDES SSFL Outfalls

Job ID: 440-278183-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Pacaivad	Acast ID	3
440-278183-1	RMHF_20210129_Grab	Water	01/29/21 07:45	01/29/21 16:30	Asset ID	
						5
						8
						9
						13

Job ID: 440-278183-1

Laboratory: Eurofins Calscience Irvine

Narrative

Job Narrative 440-278183-1

Comments

No additional comments.

Revision

The report being provided is a revision of the original report sent on 2/8/2021. The report (revision 1) is being revised due to: Reports revised to include EPA 200.7 (Ca/Mg) results per client request.

Receipt

The sample was received on 1/29/2021 4:30 PM. Unless otherwise noted below, the sample arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.6° C.

Reports revised to include EPA 200.7 (Ca/Mg) results per client request.

Metals

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

Client: Haley & Aldrich, Inc. Project/Site: Boeing NPDES SSFL Outfalls

Client Sample ID: RMHF_20210129_Grab Date Collected: 01/29/21 07:45 Date Received: 01/29/21 16:30

Job	ID:	440-	278	183- ⁻
000	10.	0	210	100

Lab Sample ID: 440-278183-1 Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	81	J,DX	100	50	ug/L		02/04/21 09:54	02/04/21 17:50	1
Boron	ND		50	25	ug/L		02/04/21 09:54	02/04/21 17:50	1
Calcium	3.2		0.10	0.050	mg/L		02/04/21 09:54	02/04/21 17:50	1
Iron	130		100	50	ug/L		02/04/21 09:54	02/04/21 17:50	1
Magnesium	0.56		0.020	0.010	mg/L		02/04/21 09:54	02/04/21 17:50	1
Manganese	27		20	15	ug/L		02/04/21 09:54	02/04/21 17:50	1
Nickel	ND		10	5.0	ug/L		02/04/21 09:54	02/04/21 17:50	1
Vanadium	ND		10	5.0	ug/L		02/04/21 09:54	02/04/21 17:50	1
Zinc	200		20	12	ug/L		02/04/21 09:54	02/04/21 17:50	1

Analyte Result Qualifier MDL Unit Prepared Dil Fac RL D Analyzed Silver 1.0 02/04/21 09:51 02/04/21 17:40 ND 0.50 ug/L 1 Cadmium ND 1.0 0.25 ug/L 02/04/21 09:51 02/04/21 17:40 1 02/04/21 09:51 02/04/21 17:40 2.0 0.50 ug/L Copper 13 1 1.4 1.0 0.50 ug/L 02/04/21 09:51 02/04/21 17:40 1 Lead ND 2.0 0.50 ug/L 02/04/21 09:51 02/04/21 17:40 Antimony 1 Selenium ND 2.0 0.50 ug/L 02/04/21 09:51 02/04/21 17:40 1 Thallium ND 1.0 0.20 ug/L 02/04/21 09:51 02/04/21 17:40 1

Method: SM 2340B - Total Hardness (as CaCO3) by calculation - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hardness, as CaCO3	10		0.33	0.17	mg/L			02/04/21 18:00	1
Calcium hardness as calcium carbonate	8.1		0.25	0.12	mg/L			02/04/21 18:00	1
Magnesium hardness as calcium carbonate	2.3		0.082	0.041	mg/L			02/04/21 18:00	1

Method Summary

Client: Haley & Aldrich, Inc. Project/Site: Boeing NPDES SSFL Outfalls

Method	Method Description	Protocol	Laboratory
200.7 Rev 4.4	Metals (ICP)	EPA	TAL IRV
200.8	Metals (ICP/MS)	EPA	TAL IRV
SM 2340B	Total Hardness (as CaCO3) by calculation	SM	TAL IRV
200.2	Preparation, Total Recoverable Metals	EPA	TAL IRV

Protocol References:

EPA = US Environmental Protection Agency

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

Laboratory References:

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

Client: Haley & Aldrich, Inc. Project/Site: Boeing NPDES SSFL Outfalls

Client Sample ID: RMHF_20210129_Grab Date Collected: 01/29/21 07:45 Date Received: 01/29/21 16:30

Lab Sample ID: 440-278183-1 Matrix: Water

_	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total Recoverable	Prep	200.2			25 mL	25 mL	637895	02/04/21 09:54	LZY7	TAL IRV
Total Recoverable	Analysis	200.7 Rev 4.4		1			637962	02/04/21 17:50	P1R	TAL IRV
Total Recoverable	Prep	200.2			25 mL	25 mL	637894	02/04/21 09:51	LZY7	TAL IRV
Total Recoverable	Analysis	200.8		1			637960	02/04/21 17:40	SQ5O	TAL IRV
Total Recoverable	Analysis	SM 2340B		1			637440	02/04/21 18:00	P1R	TAL IRV

Laboratory References:

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

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 440-637895/1-A **Matrix: Water** Analysis Batch: 637962

MB	MB							
Analyte Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum ND		100	50	ug/L		02/04/21 09:54	02/04/21 17:12	1
Boron ND		50	25	ug/L		02/04/21 09:54	02/04/21 17:12	1
Calcium ND		0.10	0.050	mg/L		02/04/21 09:54	02/04/21 17:12	1
Iron ND		100	50	ug/L		02/04/21 09:54	02/04/21 17:12	1
Magnesium ND		0.020	0.010	mg/L		02/04/21 09:54	02/04/21 17:12	1
Manganese ND		20	15	ug/L		02/04/21 09:54	02/04/21 17:12	1
Nickel ND		10	5.0	ug/L		02/04/21 09:54	02/04/21 17:12	1
Vanadium ND		10	5.0	ug/L		02/04/21 09:54	02/04/21 17:12	1
Zinc ND		20	12	ug/L		02/04/21 09:54	02/04/21 17:12	1

Lab Sample ID: LCS 440-637895/2-A

Matrix: Water Analysis Batch: 637962

Analysis Batch: 637962							Prep Batch: 637895
	Spike	LCS	LCS				%Rec.
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits
Aluminum	500	474		ug/L		95	85 - 115
Boron	500	492		ug/L		98	85 - 115
Iron	500	483		ug/L		97	85 - 115
Manganese	500	479		ug/L		96	85 - 115
Nickel	500	496		ug/L		99	85 - 115
Vanadium	500	485		ug/L		97	85 - 115
Zinc	500	501		ug/L		100	85 - 115

Lab Sample ID: 440-278304-B-1-B MS Matrix: Water Analysis Batch: 637962

		0/ D
Sample Sample Spike MS MS		%Rec.
Analyte Result Qualifier Added Result Qualifier Unit	D %Rec	Limits
Aluminum ND 500 532 ug/L	106	70 - 130
Boron ND 500 512 ug/L	102	70 - 130
Iron ND 500 527 ug/L	105	70 - 130
Manganese ND 500 493 ug/L	99	70 - 130
Nickel ND 500 503 ug/L	101	70 - 130
Vanadium ND 500 497 ug/L	99	70 - 130
Zinc 33 500 538 ug/L	101	70 - 130

Lab Sample ID: 440-278304-B-1-C MSD **Matrix: Water**

Analysis Batch: 637962 Prep Batch: 637895 MSD MSD RPD Sample Sample Spike %Rec. **Result Qualifier** Added Result Qualifier Limits RPD Limit Analyte Unit D %Rec Aluminum ND 500 531 70 - 130 20 ug/L 106 0 Boron ND 500 511 ug/L 102 70 - 130 0 20 70 - 130 Iron ND 500 529 ug/L 106 20 0 Manganese ND 500 492 ug/L 98 70 - 130 0 20 Nickel ND 500 502 ug/L 100 70 - 130 0 20 500 496 99 Vanadium ND ug/L 70 - 130 0 20 Zinc 33 500 538 ug/L 101 70 - 130 0 20

Client Sample ID: Matrix Spike Prep Type: Total Recoverable Pren Batch: 637895

Client Sample ID: Lab Control Sample

Prep Type: Total Recoverable

Client Sample ID: Matrix Spike Duplicate Prep Type: Total Recoverable

Eurofins Calscience Irvine

Job ID: 440-278183-1

Prep Batch: 637895

Client Sample ID: Method Blank

Prep Type: Total Recoverable

Method: 200.8 - Metals (ICP/MS)

Lab Sample ID: MB 440-637894/1-A Matrix: Water Analysis Batch: 637960

	MB	MB							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silver	ND		1.0	0.50	ug/L		02/04/21 09:51	02/04/21 17:28	1
Cadmium	ND		1.0	0.25	ug/L		02/04/21 09:51	02/04/21 17:28	1
Copper	ND		2.0	0.50	ug/L		02/04/21 09:51	02/04/21 17:28	1
Lead	ND		1.0	0.50	ug/L		02/04/21 09:51	02/04/21 17:28	1
Antimony	ND		2.0	0.50	ug/L		02/04/21 09:51	02/04/21 17:28	1
Selenium	ND		2.0	0.50	ug/L		02/04/21 09:51	02/04/21 17:28	1
Thallium	ND		1.0	0.20	ug/L		02/04/21 09:51	02/04/21 17:28	1

Lab Sample ID: LCS 440-637894/2-A **Matrix: Water**

Analysis Batch: 637960							Prep Batch: 637894
-	Spike	LCS	LCS				%Rec.
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits
Silver	80.0	76.0		ug/L		95	85 - 115
Cadmium	80.0	76.4		ug/L		96	85 - 115
Copper	80.0	78.4		ug/L		98	85 - 115
Lead	80.0	75.6		ug/L		94	85 - 115
Antimony	80.0	79.8		ug/L		100	85 - 115
Selenium	80.0	75.9		ug/L		95	85 - 115
Thallium	80.0	77.6		ug/L		97	85 - 115

Lab Sample ID: 440-278182-A-1-B MS Matrix: Water Analysis Batch: 637960

Analysis Batch: 637960									Prep Batch: 637894
	Sample	Sample	Spike	MS	MS				%Rec.
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits
Silver	ND		80.0	75.1		ug/L		94	70 - 130
Cadmium	ND		80.0	76.2		ug/L		95	70 - 130
Copper	17		80.0	95.0		ug/L		98	70 - 130
Lead	10		80.0	87.1		ug/L		96	70 - 130
Antimony	ND		80.0	79.0		ug/L		99	70 - 130
Selenium	ND		80.0	73.8		ug/L		92	70 - 130
Thallium	ND		80.0	63.3		ug/L		79	70 - 130

Lab Sample ID: 440-278182-A-1-C MSD Matrix: Water Analysis Batch: 637960

Client Sample ID: Matrix Spike Duplicate Prep Type: Total Recoverable Prep Batch: 637894

·····,											
	Sample	Sample	Spike	MSD	MSD				%Rec.		RPD
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Silver	ND		80.0	77.0		ug/L		96	70 - 130	3	20
Cadmium	ND		80.0	78.2		ug/L		98	70 - 130	3	20
Copper	17		80.0	97.9		ug/L		101	70 - 130	3	20
Lead	10		80.0	89.2		ug/L		98	70 - 130	2	20
Antimony	ND		80.0	81.0		ug/L		101	70 - 130	3	20
Selenium	ND		80.0	76.0		ug/L		95	70 - 130	3	20
Thallium	ND		80.0	65.3		ug/L		82	70 - 130	3	20

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Prep Batch: 637894

Client Sample ID: Lab Control Sample

Prep Type: Total Recoverable

Client Sample ID: Matrix Spike

Prep Type: Total Recoverable

Client Sample ID: Method Blank

Prep Type: Total Recoverable

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QC Association Summary

Job ID: 440-278183-1

Metals

Analysis Batch: 637440

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-278183-1	RMHF_20210129_Grab	Total Recoverable	Water	SM 2340B	
Prep Batch: 637894					
Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-278183-1	RMHF_20210129_Grab	Total Recoverable	Water	200.2	
MB 440-637894/1-A	Method Blank	Total Recoverable	Water	200.2	
LCS 440-637894/2-A	Lab Control Sample	Total Recoverable	Water	200.2	
440-278182-A-1-B MS	Matrix Spike	Total Recoverable	Water	200.2	
440-278182-A-1-C MSD	Matrix Spike Duplicate	Total Recoverable	Water	200.2	
Prep Batch: 637895					
Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-278183-1	RMHF_20210129_Grab	Total Recoverable	Water	200.2	
MB 440-637895/1-A	Method Blank	Total Recoverable	Water	200.2	
LCS 440-637895/2-A	Lab Control Sample	Total Recoverable	Water	200.2	
440-278304-B-1-B MS	Matrix Spike	Total Recoverable	Water	200.2	
440-278304-B-1-C MSD	Matrix Spike Duplicate	Total Recoverable	Water	200.2	
Analysis Batch: 6379	60				
Lab Sample ID	Client Sample ID	Ргер Туре	Matrix	Method	Prep Batch
440-278183-1	RMHF_20210129_Grab	Total Recoverable	Water	200.8	637894
MD 440 627004/4 A	Mathad Diank	Total Deseverable	Matar	200.0	627004

•					•
440-278183-1	RMHF_20210129_Grab	Total Recoverable	Water	200.8	637894
MB 440-637894/1-A	Method Blank	Total Recoverable	Water	200.8	637894
LCS 440-637894/2-A	Lab Control Sample	Total Recoverable	Water	200.8	637894
440-278182-A-1-B MS	Matrix Spike	Total Recoverable	Water	200.8	637894
440-278182-A-1-C MSD	Matrix Spike Duplicate	Total Recoverable	Water	200.8	637894

Analysis Batch: 637962

Lab Sample ID	Client Sample ID	Ргер Туре	Matrix	Method	Prep Batch
440-278183-1	RMHF_20210129_Grab	Total Recoverable	Water	200.7 Rev 4.4	637895
MB 440-637895/1-A	Method Blank	Total Recoverable	Water	200.7 Rev 4.4	637895
LCS 440-637895/2-A	Lab Control Sample	Total Recoverable	Water	200.7 Rev 4.4	637895
440-278304-B-1-B MS	Matrix Spike	Total Recoverable	Water	200.7 Rev 4.4	637895
440-278304-B-1-C MSD	Matrix Spike Duplicate	Total Recoverable	Water	200.7 Rev 4.4	637895

Client: Haley & Aldrich, Inc. Project/Site: Boeing NPDES SSFL Outfalls

Qualifiers

Project/Site: I	Boeing NPDES SSFL Outfalls	
Qualifiers		
Metals Qualifier	Qualifier Description	
J,DX	Estimated value; value < lowest standard (MQL), but >than MDL	
Glossary		5
Abbreviation	These commonly used abbreviations may or may not be present in this report.	
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis	
%R	Percent Recovery	
CFL	Contains Free Liquid	
CFU	Colony Forming Unit	•
CNF	Contains No Free Liquid	ð
DER	Duplicate Error Ratio (normalized absolute difference)	
Dil Fac	Dilution Factor	9
DL	Detection Limit (DoD/DOE)	
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample	10
DLC	Decision Level Concentration (Radiochemistry)	
EDL	Estimated Detection Limit (Dioxin)	
LOD	Limit of Detection (DoD/DOE)	
LOQ	Limit of Quantitation (DoD/DOE)	
MCL	EPA recommended "Maximum Contaminant Level"	
MDA	Minimum Detectable Activity (Radiochemistry)	13
MDC	Minimum Detectable Concentration (Radiochemistry)	
MDL	Method Detection Limit	
ML	Minimum Level (Dioxin)	
MPN	Most Probable Number	
MQL	Method Quantitation Limit	
NC	Not Calculated	
ND	Not Detected at the reporting limit (or MDL or EDL if shown)	
NEG	Negative / Absent	
POS	Positive / Present	
PQL	Practical Quantitation Limit	
PRES	Presumptive	
QC	Quality Control	
RER	Relative Error Ratio (Radiochemistry)	
RL	Reporting Limit or Requested Limit (Radiochemistry)	
RPD	Relative Percent Difference, a measure of the relative difference between two points	
TEF	Toxicity Equivalent Factor (Dioxin)	
TEQ	Toxicity Equivalent Quotient (Dioxin)	

TNTC Too Numerous To Count

11 12 13

Laboratory: Eurofins Calscience Irvine Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below. Authority Program

Authority		Program	Identification Number	Expiration Date
California		State	2706	02-21-21
The following analyte the agency does not o	s are included in this offer certification.	report, but the laboratory is	not certified by the governing authority.	This list may include analytes for which
Analysis Method	Prep Method	Matrix	Analyte	
SM 2340B		Water	Calcium hardness as calciur	n carbonate
SM 2340B		Water	Hardness, as CaCO3	
SM 2340B		Water	Magnesium hardness as cal	cium

carbonate



CHAIN OF CUSTODY FORM

Page 1 of 1

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Client Name/Ar	ddress:											ANALY	SIS REQUIRED				Field Readings	Meter seriel #	_
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Rainy Season 2019-2020 Version 2 Client: Haley & Aldrich, Inc.

Login Number: 278183 List Number: 1 Creator: Escalante, Maria I

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

Job Number: 440-278183-1

List Source: Eurofins Irvine

🔅 eurofins

Environment Testing America

ANALYTICAL REPORT

Eurofins Calscience Irvine 17461 Derian Ave Suite 100 Irvine, CA 92614-5817 Tel: (949)261-1022

Laboratory Job ID: 440-278183-2

Client Project/Site: Boeing NPDES SSFL Outfalls Revision: 1

For:

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Haley & Aldrich, Inc. 400 E Van Buren St. Suite 545 Phoenix, Arizona 85004

Attn: Katherine Miller

Virentra R Paty

Authorized for release by: 3/2/2021 1:47:53 PM

Virendra Patel, Project Manager I (714)895-5494 Virendra.Patel@eurofinset.com

The test results in this report meet all 2003 NELAC, 2009 TNI, and 2016 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

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

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

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Sample Summary

Client: Haley & Aldrich, Inc. Project/Site: Boeing NPDES SSFL Outfalls

Job ID: 440-278183-2

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID	<u> </u>
440-278183-1	RMHF_20210129_Grab	Water	01/29/21 07:45	01/29/21 16:30		4
						5
						8
						9
						13

Job ID: 440-278183-2

Laboratory: Eurofins Calscience Irvine

Narrative

Job Narrative 440-278183-2

Case Narrative

Comments

No additional comments.

Revision

The report being provided is a revision of the original report sent on 3/1/2021. The report (revision 1) is being revised due to: All methods were not approved for reportng..

Receipt

The sample was received on 1/29/2021 4:30 PM. Unless otherwise noted below, the sample arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.6° C.

RAD

Methods 900.0, 9310: 900 prep batch 497770

Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.

RMHF_20210129_Grab (440-278183-1), (LCS 160-497770/2-A), (LCSB 160-497770/3-A), (MB 160-497770/1-A), (570-49663-AJ-3-A), (570-49663-AJ-3-D DU), (570-49663-AJ-3-B MS) and (570-49663-AJ-3-C MSBT)

Methods 900.0, 9310:

Method 901.1: Gamma prep batch 160-497409:

The cesium-137 MDC (27.2 pCi/L) for the method blank (MB) is above the requested limit of 20 pCi/L. Cesium-137 activity was not observed in the MB above the MDC or RL. The MDC for the associated samples is less than the requested limit. The data have been reported with the MDC achieved. (MB 160-497409/1-A).

Method 901.1: Gamma prep batch 160-497409:

Many isotopes requested for analysis do not have any gamma emissions, or the gamma emissions they do have are very poor. Often, such analytes are reported by gamma spectrometry assuming secular equilibrium with a longer-lived parent. The client should ensure that such inference is acceptable for their sample based upon process knowledge. The following assumptions were made for this report: Inferred from Reported to Analyte

interred norm	rioportou to / a
Th-234	Pa-234
Th-234	U-238
Pb-210	Po-210
Pb-210	Bi-210
Cs-137	Ba-137m
Pb-212	Po-216
Xe-131m	Xe-131
Sb-125	Te-125m
Ag-108m	Ag-108
Rh-106	Ru-106
Pb-212	Th-228
Pb-212	Ra-224
U-235	Th-231
Ac-228	Th-232
Ac-228	Ra-228
Th-227	Ra-223

Job ID: 440-278183-2 (Continued)

Laboratory: Eurofins Calscience Irvine (Continued)

Th-227	Ac-227
Th-227	Bi-211
Th-227	Pb-211
Bi-214	Ra-226

Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative.

Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date. RMHF_20210129_Grab (440-278183-1), (LCS 160-497409/2-A), (MB 160-497409/1-A) and (440-278183-A-1-B DU)

Method 903.0: Radium-226 prep batch 160-497782:

Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date. RMHF_20210129_Grab (440-278183-1), (LCS 160-497782/1-A), (MB 160-497782/18-A), (160-41146-A-8-A), (160-41146-A-8-B MS) and (160-41146-B-8-A MSD)

Method 904.0: 904 prep batch 497785

Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.

RMHF_20210129_Grab (440-278183-1), (LCS 160-497785/1-A), (MB 160-497785/18-A), (160-41146-A-8-C), (160-41146-A-8-D MS) and (160-41146-B-8-B MSD)

Method 905: strontium-90 prep batch 497942

Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative.

Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.

RMHF_20210129_Grab (440-278183-1), (LCS 160-497942/1-A), (LCSD 160-497942/2-A) and (MB 160-497942/7-A)

Method 906.0: Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative.

Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.

RMHF_20210129_Grab (440-278183-1), (LCS 160-497965/2-A), (MB 160-497965/1-A), (570-49989-D-2-A), (570-49989-D-2-D DU) and (570-49989-D-2-E MS)

Method 906.0: Tritium prep batch 160-497965

The batch closing daily check for Aqua (analyzed 2/9) contained a warning. The initial daily check was fine (no warning) and all batch QC was within limits. Data is reported with this narrative.

Job ID: 440-278183-2 (Continued)

Laboratory: Eurofins Calscience Irvine (Continued)

RMHF_20210129_Grab (440-278183-1), (LCS 160-497965/2-A), (MB 160-497965/1-A), (570-49989-D-2-A), (570-49989-D-2-D DU) and (570-49989-D-2-E MS)

Method A-01-R: Isotopic Plutonium Prep Batch 160-798748 Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative.

Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date. RMHF_20210129_Grab (440-278183-1), (LCS 160-498748/2-A), (MB 160-498748/1-A) and (440-278183-A-1-J DU)

Methods A-01-R, U-02-RC: Isotopic Uranium Prep Batch 160-497766 Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative.

Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date. (LCS 160-497766/2-A), (MB 160-497766/1-A) and (440-278183-A-1-D DU)

Method PrecSep_0: Radium 226 Prep Batch 160-497785:

The following samples were prepared at a reduced aliquot: RMHF_20210129_Grab (440-278183-1). Sample 440-278183-1 contained a yellow discoloration and a noticeable sediment level. Samples 160-41157-1 and 160-41159-1 were reduced to insure sufficient volume remains if needed for analysis.

Method PrecSep-21: Radium 226 Prep Batch 160-497782:

The following samples were prepared at a reduced aliquot: RMHF_20210129_Grab (440-278183-1). Sample 440-278183-1 contained a yellow discoloration and a noticeable sediment level. Samples 160-41157-1 and 160-41159-1 were reduced to insure sufficient volume remains if needed for analysis.

Method PrecSep-7: Strontium 90 Prep Batch 160-497942: Insufficient sample volume was available to perform a sample duplicate for the following samples: RMHF_20210129_Grab (440-278183-1). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead to demonstrate batch precision.

Method PrecSep-7: Strontium 90 Prep Batch 160-497942:

The following samples were prepared at a reduced aliquot due to yellow discoloration: RMHF_20210129_Grab (440-278183-1). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead of a sample duplicate (DUP) to demonstrate batch precision.

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

Job ID: 440-278183-2

Method: 900.0 - Gross Alpha and Gross Beta Radioactivity Count Total Uncert. MDC Unit Analyte Result Qualifier (2σ+/-) (2σ+/-) RL MDC Unit Gross Alpha 0.519 U 0.874 0.876 3.00 1.50 pC/L Gross Beta 6.25 0.985 1.17 4.00 1.03 pC/L Method: 901.1 - Cesium 137 & Other Gamma Emitters (GS) Count Total Uncert. Analyte Result Qualifier (2σ+/-) (2σ+/-) RL MDC Unit Cesium-137 3.57 U 8.23 8.24 20.0 14.2 pC/L Potassium-40 -41.8 U 169 169 178 pC/L Method: 903.0 - Radium-226 (GFPC) Count Total Uncert. NDC Unit Radium-226 0.0692 U 0.0852 0.0854 1.00 0.140 pC/L Carrier % Yield Qualifier Limits 40.110 <th>Prepared 02/04/21 11:47 02/04/21 11:47 02/04/21 11:47 02/02/21 11:47 02/02/21 14:13 02/02/21 14:13 02/02/21 14:13 02/02/21 14:13 02/02/21 14:13 02/02/21 14:13 02/02/21 13:52 Prepared 02/04/21 13:52</th> <th>Analyzed 02/08/21 14:34 02/08/21 14:34 02/08/21 14:34 02/03/21 07:48 02/03/21 07:48 02/03/21 07:48 02/03/21 07:48 02/03/21 07:48 02/03/21 07:48 02/26/21 07:42 Analyzed 02/26/21 07:42</th> <th>Dil Fac 1 1 Dil Fac 1 Dil Fac 1 Dil Fac</th>	Prepared 02/04/21 11:47 02/04/21 11:47 02/04/21 11:47 02/02/21 11:47 02/02/21 14:13 02/02/21 14:13 02/02/21 14:13 02/02/21 14:13 02/02/21 14:13 02/02/21 14:13 02/02/21 13:52 Prepared 02/04/21 13:52	Analyzed 02/08/21 14:34 02/08/21 14:34 02/08/21 14:34 02/03/21 07:48 02/03/21 07:48 02/03/21 07:48 02/03/21 07:48 02/03/21 07:48 02/03/21 07:48 02/26/21 07:42 Analyzed 02/26/21 07:42	Dil Fac 1 1 Dil Fac 1 Dil Fac 1 Dil Fac
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Cesium-137 3.57 U 8.23 8.24 20.0 14.2 pCi/L Potassium-40 -41.8 U 169 169 178 pCi/L Method: 903.0 - Radium-226 (GFPC) Count Total Uncert. Qualifier ($2\sigma+l$) RL MDC Unit Radium-226 0.0692 U 0.0852 0.0854 1.00 0.140 pCi/L Carrier % Yield Qualifier Limits 40.110 Total Uncert. Method: 904.0 - Radium-228 (GFPC) Count Total Uncert. Qualifier Limits Radium-228 Qualifier Limits 40.110 0.371 0.371 0.0675 Qi/L Carrier % Yield Qualifier Limits 40.110 0.371 0.0675 Qi/L Carrier 90.5 40.110 Count Total MDC Unit Method: 905 - Strontium-90 (GFPC) Count Total Uncert. Qualifier Limits Method: 905 - Strontium-90 (GFPC) Count Total	02/02/21 14:13 02/02/21 14:13 Prepared 02/04/21 13:52 Prepared 02/04/21 13:52	02/03/21 07:48 02/03/21 07:48 02/03/21 07:48 02/26/21 07:42 Analyzed 02/26/21 07:42	1 1 <u>Dil Fac</u> 1 <i>Dil Fac</i>
Potassium-40 -41.8 U 169 169 178 pCi/L Method: 903.0 - Radium-226 (GFPC) Count Uncert. Total Uncert. Analyte Result Qualifier (2σ +/-) RL MDC Unit Radium-226 0.0692 U 0.0852 0.0854 1.00 MDC Unit Carrier % Yield Qualifier Limits MDC Uncert. Ba Carrier 79.6 Qualifier Limits MDC Uncert. Method: 904.0 - Radium-228 (GFPC) Count Total Uncert. MDC Unit Madium-228 0.0940 Qualifier Limits Qualifier Limits MDC Unit Ba Carrier 79.6 Qualifier Limits Qualifier Limits Qualifier Limits Ba Carrier 79.6 Qualifier Limits Qualifier Limits Qualifier Qualifier Qualifier Limits Y Carrier 90.5 40 - 110 Qualifier Limits Qualifier Qualifier Qualifier Qualifier Qualifier	02/02/21 14:13 Prepared 02/04/21 13:52 Prepared 02/04/21 13:52	02/03/21 07:48 Analyzed 02/26/21 07:42 Analyzed 02/26/21 07:42	1 Dil Fac 1 Dil Fac
Method: 903.0 - Radium-226 (GFPC)AnalyteResultQualifier(2 σ +/-)RLMDCUnitRadium-2260.0692U0.08520.08541.000.140pCi/LCarrier%YieldQualifierLimitsBa Carrier79.6CountTotalMethod: 904.0 - Radium-228 (GFPC)CountTotalMethod: 905.0040U0.3710.371Carrier%YieldQualifierBa Carrier79.640.110Y Carrier90.540.110Method: 905 - Strontium-90 (GFPC)CountTotalImage: Strontium 900.242U0.230Strontium 900.244U0.230CountTotalUncert.Image: Strontium 900.244UCountTotalImage: Strontium 900.244Carrier2.00CountTotalImage: Strontium 900.244Uncert.0.230Count0.231Count0.230Count0.231Count0.231Count0.231Count0.231Count0.231Count0.231Count0.231Count0.231<	Prepared 02/04/21 13:52 Prepared 02/04/21 13:52	Analyzed 02/26/21 07:42 Analyzed 02/26/21 07:42	Dil Fac 1 Dil Fac
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Prepared 02/04/21 13:52 Prepared 02/04/21 13:52	Analyzed 02/26/21 07:42 Analyzed 02/26/21 07:42	Dil Fac 1 Dil Fac
Analyte Radium-226Result 0.0692Qualifier U $(2\sigma+l-)$ 0.0852RL $(2\sigma+l-)$ MDC $(2\sigma+l-)$ Unit D Carrier Ba Carrier% Yield 79.6Qualifier 40 - 110Limits 40 - 1100.140 $\nabla Ci/L$ Method: 904.0 - Radium-228 (GFPC)Count Uncert.Total Uncert.MDC Uncert.Unit D Method: 904.0 - Radium-228 (GFPC)Count Uncert.Total Uncert.MDC Uncert.Unit Uncert.Analyte Radium-228Result -0.0940Qualifier U $(2\sigma+l-)$ 0.371RL 0.371MDC D.675Unit PCi/LCarrier Ba Carrier Y Carrier% Yield 90.5Qualifier 40 - 110Limits H0 - 110NDC UUnit 0.675Method: 905 - Strontium-90 (GFPC)Count Uncert.Total Uncert.Uncert. Uncert.NDC Unit Uncert.Analyte Stroptium-90Result Qualifier Q 0.243Qualifier Uncert.Limits Uncert.NDC Q 0.2300.230Analyte Stroptium-90Result Qualifier Q 0.243Qualifier Uncert.Count Q 0.230NDC Q 0.230One Count Q 0.230	Prepared 02/04/21 13:52 Prepared 02/04/21 13:52	Analyzed 02/26/21 07:42 Analyzed 02/26/21 07:42	Dil Fac 1 Dil Fac
Analyte Radium-226Result 0.0692Qualifier U $(2\sigma+l-)$ 0.0852RL $(2\sigma+l-)$ MDC UUnit 0.140 Carrier Ba Carrier% Yield 79.6Qualifier 40.110Limits 40.110Method: 904.0 - Radium-228 (GFPC)Count Uncert. Uncert.Total Uncert. Uncert.Malyte Radium-228Result UQualifier ULimits 40.110MDC Uncert.Method: 904.0 - Radium-228 (GFPC)Count UTotal Uncert.MDC Uncert.Malyte Radium-228Result 0.0940Qualifier ULimits (2\sigma+l-)RL (2\sigma+l-)MDC UUnit 0.675Carrier Ba Carrier Y Carrier% Yield 90.5Qualifier 40.110Limits 40.110MDC UUnit 0.675Method: 905 - Strontium-90 (GFPC)Count Uncert. Uncert.Total Uncert. Uncert.MDC Unit 	Prepared 02/04/21 13:52 Prepared 02/04/21 13:52	Analyzed 02/26/21 07:42 Analyzed 02/26/21 07:42	Dil Fac 1 Dil Fac
Interpret	02/04/21 13:52 Prepared 02/04/21 13:52	Analyzed 02/26/21 07:42 Analyzed 02/26/21 07:42	Dil Fac
$\begin{array}{c cccc} \hline Carrier & \frac{\% Yield}{79.6} & \frac{Qualifier}{40.110} & \frac{Limits}{40.110} \\ \hline \\ $	Prepared 02/04/21 13:52	Analyzed 02/26/21 07:42	Dil Fac
Carrier%Yield 79.6Qualifier 40 - 110Limits 40 - 110Method: 904.0 - Radium-228 (GFPC)Method: 904.0 - Radium-228 (GFPC)AnalyteResult -0.0940Qualifier U(2 σ +/-) 0.371RL 0.371MDC 0.0371Unit 0.675Carrier Ba Carrier Y Carrier%Yield 90.5Qualifier 40 - 110Limits (2 σ +/-) 40 - 110MDC 0.675Unit pCi/LMethod: 905 - Strontium-90 (GFPC)Count Uncert. Uncert.Total Uncert. Uncert.MDC 0.210Unit Total Uncert.Analyte Strontium 90Result 0.243Qualifier U(2 σ +/-) 0.210RL 0.220MDC 0.220Unit 0.220	Prepared 02/04/21 13:52	Analyzed 02/26/21 07:42	Dil Fac
Ba Carrier79.640 - 110Method:904.0 - Radium-228 (GFPC)CountTotal Uncert.AnalyteResultQualifier $(2\sigma+l-)$ RLMDCRadium-228 -0.0940 U 0.371 0.371 0.371 1.00 0.675 Unit pCi/LCarrier% YieldQualifierLimitsBa Carrier% YieldQualifierLimitsY Carrier90.540 - 110Method:905 - Strontium-90 (GFPC)AnalyteResultQualifier $(2\sigma+l-)$ RLMDCUnitStrontium 90 0.243 Uncert.Uncert.Uncert.	02/04/21 13:52	02/26/21 07:42	
Method: 904.0 - Radium-228 (GFPC)AnalyteResultQualifier(2 σ +/-)CountTotalAnalyteResultQualifier(2 σ +/-)(2 σ +/-)RLMDCUnitRadium-228-0.0940U0.3710.3711.000.675pCi/LCarrier% YieldQualifierLimitsBa Carrier79.640 - 110Y Carrier90.540 - 110Method: 905 - Strontium-90 (GFPC)CountTotalAnalyteResultQualifier(2 σ +/-)(2 σ +/-)RLMDCUnitStrontium 900.213U0.2100.2203.000.251 σ ///			1
Count Total Uncert.AnalyteResult -0.0940Qualifier U $(2\sigma+l-)$ 0.371RL $(2\sigma+l-)$ MDC $(2\sigma+l-)$ Unit 0.371 Carrier% Yield PCi/LQualifier ULimits 40 - 110Carrier% Yield 79.6Qualifier 40 - 110Limits 40 - 110Y carrier90.540 - 110Method:905 - Strontium-90 (GFPC)Count Total Uncert.Total Uncert.AnalyteResult 0.243Qualifier U $(2\sigma+l-)$ 0.2410RL 0.220MDC 0.220Unit 0.220			
AnalyteResultQualifierUncert.Uncert.Radium-228 -0.0940 U 0.371 0.371 1.00 0.675 pCi/L Carrier%YieldQualifierLimitsBa Carrier79.6 $40 - 110$ $40 - 110$ Y Carrier90.5 $40 - 110$ $40 - 110$ Method:905 - Strontium-90 (GFPC)CountTotalAnalyteResultQualifier $(2\sigma+l-)$ $(2\sigma+l-)$ Strontium 90 0.243 U 0.243 U 0.240			
AnalyteResultQualifier $(2\sigma+l-)$ $(2\sigma+l-)$ RLMDCUnitRadium-228 -0.0940 U 0.371 0.371 1.00 0.675 pCi/L Carrier%YieldQualifierLimitsBa Carrier 79.6 $40 - 110$ Y Carrier 90.5 $40 - 110$ Method:905 - Strontium-90 (GFPC)AnalyteResultQualifier $(2\sigma+l-)$ $(2\sigma+l-)$ AnalyteResultQualifier $(2\sigma+l-)$ $(2\sigma+l-)$ RL Strontium 90 0.243 U 0.240 0.220 2.00 0.251			
AnalyteResult 0.243QualifierLimits 0.371Result 0.371IncIncIncCarrier Ba Carrier%Yield 79.6Qualifier 40 - 110Limits 40 - 110Y Carrier90.540 - 110Y Carrier90.540 - 110Method: 905 - Strontium-90 (GFPC)Count Uncert. Uncert.Total Uncert. Uncert.AnalyteResult 0.243Qualifier Uncert(2σ+/-) 0.210RL 0.220MDC 0.220	Prenared	Analyzed	Dil Fac
Carrier%Yield 79.6Qualifier 40 - 110Limits 40 - 110Y Carrier90.540 - 110Method: 905 - Strontium-90 (GFPC)Count Uncert.Total Uncert.AnalyteResult 0.243Qualifier Uncert. $(2\sigma+/-)$ 0.240RL 0.220MDC 0.2100.243Unit Uncert.	1100000000000000000000000000000000000	$\frac{100}{02/10/21}$	1
Carrier%YieldQualifierLimitsBa Carrier79.640 - 110Y Carrier90.540 - 110Method: 905 - Strontium-90 (GFPC)CountTotalMalyteResultQualifier $(2\sigma+/-)$ $(2\sigma+/-)$ Strontium 900.243Uncert0.2400.220		/	
Ba Carrier79.640 - 110Y Carrier90.540 - 110Y Carrier90.540 - 110Method: 905 - Strontium-90 (GFPC)CountTotalImage: AnalyteResultQualifier $(2\sigma+/-)$ $(2\sigma+/-)$ Strontium 900.243Image: Analyte $(2\sigma+/-)$ $(2\sigma+/-)$ $(2\sigma+/-)$	Prepared	Analyzed	Dil Fac
Y Carrier90.540 - 110Method:905 - Strontium-90 (GFPC)CountTotal Uncert.AnalyteResultQualifier $(2\sigma+/-)$ $(2\sigma+/-)$ RLMDCUnit 0.210 Strontium 900.243U0.243U $(2\sigma+/-)$ $(2\sigma+/$	02/04/21 14:24	02/10/21 09:45	1
Method: 905 - Strontium-90 (GFPC)Count Total Uncert. Uncert.AnalyteResultQualifier $(2\sigma + l-)$ $(2\sigma + l-)$ RLMDCUnitStrontium 900.24310.2400.2402.000.251 $\sigma c / l / l$	02/04/21 14:24	02/10/21 09:45	1
Method: 905 - Strontium-90 (GFPC)Count Total Uncert. Uncert.AnalyteResultQualifier $(2\sigma+/-)$ $(2\sigma+/-)$ RLMDCUnitStrontium 900.24310.2400.2400.2200.251 $\sigma^{0/4}$			
AnalyteResultQualifier $(2\sigma+/-)$ RLMDCUnitStrontium 900.24310.2400.2402.202.000.251 $\sigmaCi//$			
AnalyteResultQualifier $(2\sigma+/-)$ RL MDCUnitStrontium 900.24310.2400.2402.2002.000.251			
$\frac{\text{Allarge}}{\text{Strontium 00}} = \frac{\text{Result}}{0.243} \frac{\text{Qualifier}}{11} = \frac{(20+7-7)}{0.240} = \frac{(20+7-7)}{0.220} = \frac{\text{RL}}{3.00} = \frac{\text{MDC}}{0.254} = \frac{1}{2007}$	Bronorod	Analyzad	
	02/05/21 14:07	02/17/21 15:27	
	02/03/21 14:07	02/11/21 13:21	
Carrier %Yield Qualifier Limits	Prepared	Analyzed	Dil Fac
Sr Carrier 86.5 40 - 110	02/05/21 14:07	02/17/21 15:27	1
Y Carrier 86.7 40 - 110	02/05/21 14:07	02/17/21 15:27	1
Method: 906.0 Tritium Total (ISC)			
wethou. 300.0 - IIIliuiii, Iolai (LSC)			
Guint IUtal			
Uncert. Uncert.	Drevered	Analyzad	
$\frac{\text{Analyte}}{\text{Tritium}} = \frac{\text{Result}}{24.8} \frac{\text{Qualifier}}{11} = \frac{(20+7-)}{462} = \frac{(20+7-)}{462} = \frac{\text{RL}}{500} = \frac{\text{MDC}}{204} = \frac{1}{207}$			
-24.8 U 163 163 500 301 pCi/L	02/07/21 08:35	02/08/21 19:05	1
Method: A-01-R - Isotopic Plutonium and Neptunium (Alpha Spectrometry)			
Count Total			
Uncert. Uncert.			
Analyte Result Qualifier (2σ+/-) (2σ+/-) RL MDC Unit			Dil Fac
Plutonium-238 -0.0360 U 0.104 0.104 1.00 0.237 pCi/L	Prepared	Analyzed	
Client Sample ID: RMHF_20210129_Grab Date Collected: 01/29/21 07:45 Date Received: 01/29/21 16:30

Lab Sample ID: 440-278183-1 Matrix: Water

natrix: water

		utomum a	Count	Total	opeono	nicit y)	(ucu)			5
Analyte	Result	Qualifier	Uncert. (2σ+/-)	Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac	6
Plutonium-239/240	-0.0241	U	0.0409	0.0409	1.00	0.141	pCi/L	02/12/21 12:52	02/19/21 11:08	1	
Tracer	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac	
Pu-242 (T)	87.5		30 - 110					02/12/21 12:52	02/19/21 11:08	1	2
Method: A-01-R -	Isotopic Ur	anium (Al	pha Spectr Count	r <mark>ometry)</mark> Total							9
Method: A-01-R -	Isotopic Ur Result	anium (Al	pha Spectr Count Uncert. (2σ+/-)	r <mark>ometry)</mark> Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac	9 1(
Method: A-01-R - Analyte Uranium-234	Result	Qualifier	pha Spectr Count Uncert. (2σ+/-) 0.0653	rometry) Total Uncert. (2σ+/-) 0.0654	RL 1.00	MDC 0.133	Unit pCi/L	Prepared 02/04/21 10:37	Analyzed 02/17/21 12:39	Dil Fac	9 1(
Method: A-01-R - Analyte Uranium-234 Uranium-235/236	Result 0.0267 -0.0332	Qualifier	pha Spectr Count Uncert. (2σ+/-) 0.0653 0.0271	rometry) Total Uncert. (2σ+/-) 0.0654 0.0272	RL 1.00 1.00	MDC 0.133 0.166	Unit pCi/L pCi/L	Prepared 02/04/21 10:37 02/04/21 10:37	Analyzed 02/17/21 12:39 02/17/21 12:39	Dil Fac	9 1(1
Method: A-01-R - Analyte Uranium-234 Uranium-235/236 Uranium-238	Result 0.0267 -0.0332 -0.00887	Qualifier U U U	pha Spectr Count Uncert. (2σ+/-) 0.0653 0.0271 0.0416	cometry) Total Uncert. (2σ+/-) 0.0654 0.0272 0.0416	RL 1.00 1.00 1.00	MDC 0.133 0.166 0.133	Unit pCi/L pCi/L pCi/L	Prepared 02/04/21 10:37 02/04/21 10:37 02/04/21 10:37	Analyzed 02/17/21 12:39 02/17/21 12:39 02/17/21 12:39	Dil Fac 1 1 1	9 1(11
Method: A-01-R - Analyte Uranium-234 Uranium-235/236 Uranium-238 Total Uranium	Result 0.0267 -0.0332 -0.00887 -0.0154	Qualifier U U U U	Count Uncert. (2σ+/-) 0.0653 0.0271 0.0416 0.08203	rometry) Total Uncert. (2σ+/-) 0.0654 0.0272 0.0416 0.08214	RL 1.00 1.00 1.00 1.00	MDC 0.133 0.166 0.133 0.166	Unit pCi/L pCi/L pCi/L pCi/L	Prepared 02/04/21 10:37 02/04/21 10:37 02/04/21 10:37 02/04/21 10:37	Analyzed 02/17/21 12:39 02/17/21 12:39 02/17/21 12:39 02/17/21 12:39	Dil Fac 1 1 1 1	9 10 11 12

Method Summary

Client: Haley & Aldrich, Inc. Project/Site: Boeing NPDES SSFL Outfalls

Method	Method Description	Protocol	Laboratory
900.0	Gross Alpha and Gross Beta Radioactivity	EPA	TAL SL
901.1	Cesium 137 & Other Gamma Emitters (GS)	EPA	TAL SL
903.0	Radium-226 (GFPC)	EPA	TAL SL
904.0	Radium-228 (GFPC)	EPA	TAL SL
905	Strontium-90 (GFPC)	EPA	TAL SL
906.0	Tritium, Total (LSC)	EPA	TAL SL
A-01-R	Isotopic Plutonium and Neptunium (Alpha Spectrometry)	DOE	TAL SL
A-01-R	Isotopic Uranium (Alpha Spectrometry)	DOE	TAL SL
Evaporation	Preparation, Evaporation	None	TAL SL
ExtChrom	Preparation, Extraction Chromatography Resin Actinide Separation	None	TAL SL
Fill_Geo-0	Fill Geometry, No In-Growth	None	TAL SL
LSC_Dist_Susp	Distillation and Suspension (LSC)	None	TAL SL
PrecSep_0	Preparation, Precipitate Separation	None	TAL SL
PrecSep-21	Preparation, Precipitate Separation (21-Day In-Growth)	None	TAL SL
PrecSep-7	Preparation. Precipitate Separation (7-Day In-Growth)	None	TAL SL

Protocol References:

DOE = U.S. Department of Energy EPA = US Environmental Protection Agency

None = None

Laboratory References:

TAL SL = Eurofins TestAmerica, St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Client: Haley & Aldrich, Inc. Project/Site: Boeing NPDES SSFL Outfalls

Client Sample ID: RMHF_20210129_Grab Date Collected: 01/29/21 07:45 Date Received: 01/29/21 16:30

Lab Sample ID: 440-278183-1 Matrix: Water

-	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	Evaporation			200.07 mL	1.0 g	497770	02/04/21 11:47	JEC	TAL SL
Total/NA	Analysis	900.0		1			498081	02/08/21 14:34	ANW	TAL SL
Total/NA	Prep	Fill_Geo-0			1000 mL	1.0 g	497409	02/02/21 14:13	HIO	TAL SL
Total/NA	Analysis	901.1		1			497556	02/03/21 07:48	JLP	TAL SL
Total/NA	Prep	PrecSep-21			749.91 mL	1.0 g	497782	02/04/21 13:52	KMP	TAL SL
Total/NA	Analysis	903.0		1			500104	02/26/21 07:42	ANW	TAL SL
Total/NA	Prep	PrecSep_0			749.91 mL	1.0 g	497785	02/04/21 14:24	KMP	TAL SL
Total/NA	Analysis	904.0		1			498531	02/10/21 09:45	FLC	TAL SL
Total/NA	Prep	PrecSep-7			749.68 mL	1.0 g	497942	02/05/21 14:07	KMP	TAL SL
Total/NA	Analysis	905		1			499002	02/17/21 15:27	ANW	TAL SL
Total/NA	Prep	LSC_Dist_Susp			99.9 mL	1.0 g	497965	02/07/21 08:35	MAV	TAL SL
Total/NA	Analysis	906.0		1			498099	02/08/21 19:05	JLP	TAL SL
Total/NA	Prep	ExtChrom			500.59 mL	1.0 mL	497766	02/04/21 10:37	LTC	TAL SL
Total/NA	Analysis	A-01-R		1			499091	02/17/21 12:39	TJR	TAL SL
Total/NA	Prep	ExtChrom			499.72 mL	1.0 mL	498748	02/12/21 12:52	LTC	TAL SL
Total/NA	Analysis	A-01-R		1			499375	02/19/21 11:08	TJR	TAL SL

Laboratory References:

TAL SL = Eurofins TestAmerica, St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Gross Beta

-0.0211 U

QC Sample Results

Job ID: 440-278183-2

Method: 900.0 - Gross Alpha and Gross Beta Radioactivity

Lab Sample Matrix: Wate	ID: MB 16 r	60-4977	770/1-A						Cli	ent Samı	ole ID: Method Prep Type: T	d Blank otal/NA
Analysis Bat	ch: 49808	31		•							Prep Batch:	497770
				Count	Total							
A		MB	MB	Uncert.	Uncert.		MDO	11		Dueueeee	A	
		Result	Qualifier	(2σ+/-)	(2σ+/-)	RL			<u> </u>	Prepared		
Gross Alpha		0 7261	U	0.003	0.007	3.00	0.001	pCi/L	02/	04/21 11:47	02/06/21 14:32	1
Gloss Bela		-0.7301	0	0.407	0.493	4.00	0.991	pCI/L	02/	04/21 11:47	02/06/21 14:32	I
Lab Sample	ID: LCS 1	60-497	770/2-A					Cli	ent Sa	mple ID:	Lab Control	Sample
Matrix: Wate	r										Prep Type: T	otal/NA
Analysis Bat	ch: 49808	31									Prep Batch:	497770
						Total						
			Spike	LCS	LCS	Uncert.					%Rec.	
Analyte			Added	Result	Qual	(2 σ+/-)	RL	MDC	Unit	%Rec	Limits	
Gross Alpha			51.5	49.32		7.16	3.00	1.97	pCi/L	96	75 - 125	
		400.44						0.1				
Lab Sample	ID: LCSB	160-49	97770/3-A					Cli	ent Sa	imple ID:	Lab Control	Sample
Matrix: wate	r 										Prep Type: 1	otal/NA
Analysis Bat	CN: 49808	51				Tatal					Prep Batch:	49///0
			Cuilta			Iotai					9/ Doo	
Analyta			Spike	LUSB	LUSB	Uncert.	ы	MDC	11	0/ Dee	%Rec.	
Gross Beta				82.00	Quai	8 72	4.00					
			02.0	02.00		0.72	4.00	0.905	poi/L	55	75-125	
Lab Sample	ID: 570-49	9663-A	J-3-B MS						C	lient San	nple ID: Matrix	x Spike
Matrix: Wate	r										Prep Type: Te	otal/NA
Analysis Bat	ch: 49808	31									Prep Batch:	497770
						Total						
	Sample	Sample	e Spike	MS	MS	Uncert.					%Rec.	
Analyte	Result	Qual	Added	Result	Qual	(2 σ +/-)	RL	MDC	Unit	%Rec	Limits	
Gross Alpha	0.103	U	51.5	55.45		7.32	3.00	1.09	pCi/L	107	70 - 130	
Lab Sample	ID: 570 40								~	liont San	oplo ID: Matrix	v Spiko
Lab Sample Matrix: Wata	iD. 570-4: r	5003-A	J-3-C 1413D1						U U	Silent San	Bron Type: T	
Analysis Bat	1 ch: 19809	20									Prop Batch:	107770
Analysis Dat	CII. 43000	00				Total					Fiep Datch.	43///0
	Sample	Sample	a Snika	MORT	MSBT	Uncert					%Rec	
Analyte	Result	Qual		Result	Qual	(2σ+/-)	RI	MDC	Unit	%Rec	l imits	
Gross Beta	-0.0211	U	82.9	79.01		8.41	4.00	0.958	pCi/L	95	70 - 130	
0.000 2014	0.02	0	0210			0		0.000	P 0." -		10-100	
Lab Sample	ID: 570-49	9663-A	J-3-D DU							Client S	Sample ID: Du	plicate
Matrix: Wate	r										Prep Type: Te	otal/NA
Analysis Bat	ch: 49808	38									Prep Batch:	497770
						Total						
	Sample	Sample	e	DU	DU	Uncert.						RER
Analyte	Result	Qual		Result	Qual	(2σ+/-)	RL	MDC	Unit		REF	R Limit
Gross Alpha	0.103	U		0.3551	U	0.672	3.00	1.18	pCi/L		0.1	9 1

Eurofins Calscience Irvine

0.518

4.00

0.844 pCi/L

0.4294 U

0.45

1

Method: 901.1 - Cesium 137 & Other Gamma Emitters (GS)

Lab Sample Matrix: Wate	ID: MB 1 er	60-4974	09/1-A						Clie	ent Samp	le ID: Metho Prep Type: T	d Blank otal/NA
Analysis Ba	tch: 4975	63									Prep Batch:	497409
				Count	Total							
		MB	MB	Uncert.	Uncert.							
Analyte		Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	P	repared	Analyzed	Dil Fac
Cesium-137		2.343	UG	15.3	15.3	20.0	27.2	pCi/L	02/0)2/21 14:13	02/03/21 07:17	1
Potassium-40		-47.85	U	162	162		245	pCi/L	02/0)2/21 14:13	02/03/21 07:17	1
Lab Sample Matrix: Wate	ID: LCS er	160-497	409/2-A					Cli	ent Sa	mple ID:	Lab Control S Prep Type: T	Sample otal/NA
Allalysis Da	ICH. 4973	02				Total					Prep Batch.	49/409
			Spike	LCS	LCS	Uncert.					%Rec.	
Analyte			Added	Result	Qual	(2σ+/-)	RL	MDC	Unit	%Rec	Limits	
Americium-241			136000	122200		14400		622	pCi/L	90	90 - 111	
Cesium-137			42900	44020		5190	20.0	165	pCi/L	103	90 - 111	
Cobalt-60			23600	24380		2880		84.2	pCi/L	103	89 - 110	
Lab Sample Matrix: Wate Analysis Ba	ID: 440-2 er tch: 4975	278183-1 559	I DU					Client	: Samp	ole ID: RN	IHF_2021012 Prep Type: T Prep Batch:	9_Grab otal/NA 497409
						Total						
	Sample	e Sample	•	DU	DU	Uncert.						RER
Analyte	Resul	t Qual		Result	Qual	(2 σ+/-)	RL	MDC	Unit		REI	R Limit
Cesium-137	3.5	7 U		-5.673	U	6.18	20.0	17.9	pCi/L		0.6	4 1
Potassium-40	-41.8	8 U		-44.09	U	95.0		154	pCi/L		0.0	1 1
Method: 90	3.0 - Ra	dium-2	226 (GFPC	2)								
				- /								
Lab Sample Matrix: Wate Analysis Ba	ID: MB 1 er tch: 5001	60-4977 06	82/18-A						Clie	ent Samp	Prep Type: T Prep Batch:	d Blank otal/NA 497782
-				Count	Total							
		MB	MB	Uncert.	Uncert.							
Analyte		Result	Qualifier	(2 σ+/-)	(2 σ+/-)	RL	MDC	Unit	P	repared	Analyzed	Dil Fac
Radium-226	0	.0007354	U	0.0672	0.0672	1.00	0.132	pCi/L	02/0	04/21 13:52	02/26/21 07:43	1
		МВ	МВ									
Carrier		%Yield	Qualifier	Limits					F	Prepared	Analyzed	Dil Fac
Ba Carrier		86.5		40 - 110					02/0	04/21 13:52	02/26/21 07:43	1
Lab Sample Matrix: Wate Analysis Ba	ID: LCS er tch: 5001	160-497 04	782/1-A			Total		Cli	ent Sa	mple ID:	Lab Control S Prep Type: T Prep Batch:	Sample otal/NA 497782
			Snike	LCS	LCS	Uncert.					%Rec.	
Analyte			Added	Result	Qual	(2σ+/-)	RL	MDC	Unit	%Rec	Limits	
Radium-226			11.3	11.17		1.15	1.00	0.124	pCi/L	98	75 - 125	
		1.00										
Comien	LCS	LUS	1									
	70 0	Qualifier		-								
Da Gaillei	190											

Job ID: 440-278183-2

Method: 903.0 - Radium-226 (GFPC) (Continued)

Lab Sample	ID: 160-4	1146-A	-8-B MS						CI	lient San	iple ID: M	atrix S	Spike
watrix: Wate	er tobi 5004	0.4									Prep Type	e: lot	
Analysis Ba	itch: 5001	04				Total					Ргер Ват	cn: 48	0//82
	Sample	Sample	s Snike	MS	MS	Uncert					%Rec		
Analyte	Result			Result	Qual	(2σ+/-)	RI	MDC	Unit	%Rec	l imits		
Radium-226	0 150			12 18		1 24	1 00	0.0975	pCi/l	106	75 - 138		
	0.100		11.0	12.10		1.24	1.00	0.0070	pol/L	100	10-100		
	MS	MS											
Carrier	%Yield	Qualifier	Limits	_									
Ba Carrier	82.6		40 - 110										
Loh Comple	ID: 400.4	44.4C D						Client	Comp		the Chailes	Dum	liaata
Lab Sample	010:100-4	1140-D	-0-A WISD					Client	Samp		Bron Tun	Dup	
	er toby 5004	0.4									Prep Type	9: 10L	al/INA
Analysis ba	11CH: 5001	04				Total					Ргер Ба	cn: 48	01102
	Sample	Sample	enika	Men	MSD	Uncort					%Rec		REP
Analyte	Docult		- Shike	Result	Qual	(2σ+/-)	DI	MDC	Unit	%Pac	/indu.	RED	Limit
Radium-226	0 150			11 65		1 10	1.00	0.0933		- <u>/0Rec</u>	75 138	0.22	1
Naulum-220	0.150		11.5	11.05		1.15	1.00	0.0955	poi/L	101	75-150	0.22	1
	MSD	MSD											
Carrier	%Yield	Qualifier	Limits	_									
Po Corrier	86.2		40 - 110										
lethod: 90 Lab Sample Matrix: Wate	94.0 - Ra 1D: MB 10 er	dium-2 60-4977	228 (GFPC ′85/18-A)					Clie	ent Samp	ole ID: Met Prep Type	thod I e: Tot	3lank al/NA
Aethod: 90 Lab Sample Matrix: Wate Analysis Ba	94.0 - Ra 1D: MB 10 er atch: 4985	dium-/ 60-4977 31	228 (GFPC ′85/18-A	Count	Total				Clie	ent Samp	ole ID: Met Prep Type Prep Bate	thod I e: Tot ch: 49	Blank al/NA 97785
Lab Sample Matrix: Wate Analysis Ba	94.0 - Ra D: MB 10 er atch: 4985	dium-: 60-4977 31 мв	228 (GFPC ′85/18-А мв	Count Uncert.	Total Uncert.				Clie	ent Samp	ole ID: Met Prep Type Prep Bate	thod I e: Tot ch: 49	Blank al/NA 97785
Lab Sample Matrix: Wate Analysis Ba	94.0 - Ra 10: MB 10 er atch: 4985	dium- 60-4977 31 MB Result	228 (GFPC 85/18-A MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Clie	ent Samp	ole ID: Met Prep Type Prep Bate Analyze	thod I e: Tot ch: 49	Blank al/NA 97785 Dil Fac
Analyte Radium-228	94.0 - Ra 1D: MB 10 er 1tch: 4985	dium-2 60-4977 31 MB <u>Result</u> -0.07156	228 (GFPC 785/18-A MB Qualifier	Count Uncert. (2σ+/-) 0.248	Total Uncert. (2σ+/-) 0.248	RL 1.00	MDC 0.453	Unit pCi/L	Clie P 	ent Samp repared 14/21 14:24	Die ID: Met Prep Type Prep Bat Analyze 02/10/21 05	thod I e: Tot ch: 49 d 9:45	Blank al/NA 97785 Dil Fac 1
Analyte Radium-228	94.0 - Ra D: MB 10 er otch: 4985	dium-2 60-4977 31 MB Result -0.07156 <i>MB</i>	228 (GFPC '85/18-A '85/18-A '85/18-A '85/18-A '85/18-A '85/18-A '85/18-A '85/18-A '85/18-A '85/18-A '85/18-A '85/18-A	Count Uncert. (2σ+/-) 0.248	Total Uncert. (2σ+/-) 0.248	RL 1.00	MDC 0.453	Unit pCi/L	Clie P 02/0	ent Samp repared 14/21 14:24	Die ID: Met Prep Type Prep Bate Analyze 02/10/21 05	thod I e: Tot ch: 49 d <u>d</u> 2:45	Blank al/NA 97785 Dil Fac 1
Aethod: 90 Lab Sample Matrix: Wate Analysis Ba Analyte Radium-228 Carrier	94.0 - Ra D: MB 10 er Mch: 4985	dium-3 60-4977 31 MB Result -0.07156 <i>MB</i> %Yield	228 (GFPC '85/18-A '85/18-A 'B Qualifier U MB Qualifier	Count Uncert. (2σ+/-) 0.248	Total Uncert. (2σ+/-) 0.248	<u></u>	MDC 0.453	Unit pCi/L	Clie — <u>P</u> 02/0	repared 14/21 14:24	Die ID: Met Prep Type Prep Bate Malyze 02/10/21 09 Analyze	thod I e: Tot ch: 49 d 9:45	Blank al/NA 97785 Dil Fac 1 Dil Fac
Aethod: 90 Lab Sample Matrix: Wate Analysis Ba Analyte Radium-228 Carrier Ba Carrier	94.0 - Ra 1D: MB 10 er 1tch: 4985	dium-5 60-4977 31 MB Result -0.07156 MB %Yield 86.5	228 (GFPC 85/18-A MB Qualifier U MB Qualifier	Count Uncert. (2σ+/-) 0.248 Limits 40 - 110	Total Uncert. (2σ+/-) 0.248	RL 1.00	MDC 0.453	Unit pCi/L	Clie 	repared 14/21 14:24 17 14:24 17 14:24	Die ID: Met Prep Type Prep Bat 02/10/21 09 <u>Analyze</u> 02/10/21 09	thod I e: Tot ch: 49 d 9:45	Blank al/NA 97785 Dil Fac 1 Dil Fac 1
Analyte Radium-228	94.0 - Ra 1D: MB 10 er 1tch: 4985	dium-2 60-4977 31 MB <u>Result</u> -0.07156 <i>MB</i> %Yield 86.5 91.2	228 (GFPC 85/18-A MB Qualifier U MB Qualifier	Count Uncert. (2σ+/-) 0.248 Limits 40 - 110 40 - 110	Total Uncert. (2σ+/-) 0.248	RL 1.00	MDC 0.453	Unit pCi/L	Clie P 02/0 0 	repared 4/21 14:24 Prepared 94/21 14:24 94/21 14:24	Die ID: Met Prep Type Prep Bat 02/10/21 05 Analyze 02/10/21 05 02/10/21 05	thod I e: Tot ch: 49 d 9:45	Blank al/NA 97785 Dil Fac 1 Dil Fac 1 1
Analyte Radium-228 Carrier Ba Carrier Y Carrier Lab Sample Matrix: Wate Analysis Ba	94.0 - Ra ID: MB 10 er Itch: 4985	dium-2 60-4977 31 MB Result -0.07156 <i>MB</i> %Yield 86.5 91.2 160-497 31	228 (GFPC 85/18-A MB Qualifier U MB Qualifier	Count Uncert. (2σ+/-) 0.248 Limits 40 - 110 40 - 110	Total Uncert. (2σ+/-) 0.248	RL 1.00	MDC 0.453	Unit pCi/L	Clie — P 02/0 P 02/2 02/2 02/2	repared 14/21 14:24 14/21 14:24 14/21 14:24 14/21 14:24 14/21 14:24 mple ID:	Analyze 02/10/21 05 02/10/21 05 02/10/200000000000000000000000000000000	thod I e: Tot ch: 49 d 9:45 d 9:45 9:45 9:45 rol Sa e: Tot ch: 49	Blank al/NA 97785 Dil Fac 1 Dil Fac 1 1 mple al/NA 97785
Analyte Radium-228 Carrier Ba Carrier Y Carrier Lab Sample Matrix: Wate Analysis Ba	4.0 - Ra D: MB 10 or Mch: 4985	dium-2 60-4977 31 MB Result -0.07156 MB %Yield 86.5 91.2 160-497 31	228 (GFPC '85/18-A '85/18-A <u>MB Qualifier</u> 785/1-A	Count Uncert. (2σ+/-) 0.248 Limits 40 - 110 40 - 110	Total Uncert. (2σ+/-) 0.248	<u></u> 1.00 -	MDC 0.453	Unit pCi/L	Clie — <u>P</u> 02/0 — 02/0 02/0 02/0	ent Samp repared 4/21 14:24 repared 04/21 14:24 04/21 14:24 mple ID:	Analyze 02/10/21 05 02/10/21 05 02/10/20 02/10/	thod I e: Tot ch: 49 d 0:45 d 0:45 0:45 rol Sa e: Tot ch: 49	Blank al/NA 97785 Dil Fac 1 Dil Fac 1 1 mple al/NA 97785
Analyte Radium-228 Carrier Ba Carrier Y Carrier Lab Sample Matrix: Wate Analysis Ba	4.0 - Ra D: MB 10 er ttch: 4985	dium-3 60-4977 31 MB Result -0.07156 <i>MB</i> %Yield 86.5 91.2 160-497 31	228 (GFPC '85/18-A '85/18-A '85/18-A '85/1-A Spike	Count Uncert. (2σ+/-) 0.248 Limits 40 - 110 40 - 110	Total Uncert. (2σ+/-) 0.248	RL 1.00 -	MDC 0.453	Unit pCi/L	Clie — <u>P</u> 02/0 02/0 02/0 02/0 02/0	repared 94/21 14:24 97777 94/21 14:24 94/21 14:24 94/21 14:24 99977 9997	Die ID: Met Prep Type Prep Bate 02/10/21 09 02/10/21 09	thod I e: Tot ch: 49 d 9:45 d 9:45 rol Sa e: Tot ch: 49	Blank al/NA 97785 Dil Fac 1 Dil Fac 1 mple al/NA 97785
Analyte Analysis Ba Analysis Ba Analysis Ba Analyte Radium-228 Carrier Ba Carrier Y Carrier Lab Sample Matrix: Wate Analysis Ba	e ID: LCS 1 er ttch: 4985	dium-3 60-4977 31 MB Result -0.07156 <i>MB</i> %Yield 86.5 91.2 160-497 31	228 (GFPC 85/18-A MB Qualifier U MB Qualifier 785/1-A Spike Added	Count Uncert. (2σ+/-) 0.248 Limits 40 - 110 40 - 110 40 - 110	Total Uncert. (2σ+/-) 0.248 LCS Qual	RL 1.00 Total Uncert. (2σ+/-)	<u>MDC</u> 0.453	Unit pCi/L Cliu	Clie — <u>P</u> 02/0 02/0 02/0 ent Sau	repared 14/21 14:24 14/21 14:24 14/21 14:24 14/21 14:24 14/21 14:24 mple ID: %Rec	Die ID: Met Prep Type Prep Bate 02/10/21 05 02/10/21 05 05 05 05 05 05 05 05 05 05 05 05 05 0	thod I e: Tot ch: 49 d 9:45 9:45 rol Sa e: Tot ch: 49	Blank al/NA 97785 Dil Fac 1 Dil Fac 1 1 mple al/NA 97785
Aethod: 90 Lab Sample Matrix: Wate Analysis Ba Analyte Radium-228 Carrier Ba Carrier Y Carrier Lab Sample Matrix: Wate Analysis Ba Analysis Ba Analyte Radium-228	• ID: LCS 1 er ID: LCS 1 er Itch: 4985	dium-3 60-4977 31 MB Result -0.07156 MB %Yield 86.5 91.2 160-497 31	228 (GFPC 85/18-A MB Qualifier U MB Qualifier 785/1-A Spike Added 7.44	Count Uncert. (2σ+/-) 0.248 Limits 40 - 110 40 - 110 40 - 110 LCS Result 7.798	Total Uncert. (2σ+/-) 0.248 LCS Qual	RL 1.00 Uncert. (2σ+/-) 0.986	<u>MDC</u> 0.453	Unit pCi/L Cliu MDC 0.454	Clie P 02/0 P 02/C 02/C ent Sau Unit pCi/L	repared 14/21 14:24 14/21 14:24 14/21 14:24 14/21 14:24 mple ID: <u>%Rec</u> 105	Die ID: Met Prep Type Prep Bat 02/10/21 08 02/10/21 08 02/10/210 02/10/210 00/10/2000000000000	thod I e: Tot ch: 49 d 9:45 9:45 9:45 rol Sa e: Tot ch: 49	Blank al/NA 97785 Dil Fac 1 Dil Fac 1 1 mple al/NA 97785
Aethod: 90 Lab Sample Matrix: Wate Analysis Ba Analyte Radium-228 Carrier Ba Carrier Y Carrier Lab Sample Matrix: Wate Analysis Ba Analyte Radium-228	4.0 - Ra D: MB 10 er tch: 4985	dium-3 60-4977 31 MB Result -0.07156 MB %Yield 86.5 91.2 160-497 31	228 (GFPC 85/18-A MB Qualifier U MB Qualifier 785/1-A Spike Added 7.44	Count Uncert. (2σ+/-) 0.248 Limits 40 - 110 40 - 110 40 - 110 LCS Result 7.798	Total Uncert. (2σ+/-) 0.248 LCS Qual	RL 1.00 Total Uncert. (2σ+/-) 0.986	MDC 0.453 RL 1.00	Unit pCi/L Clia MDC 0.454	Clie P 02/0 P 02/C 02/C ent Sau <u>Unit</u> pCi/L	repared 4/21 14:24 repared 04/21 14:24 04/21 14:24 mple ID: - <u>%Rec</u> 105	Die ID: Met Prep Type Prep Bat 02/10/21 05 02/10/21 05 02/10/200000000000000000000000000000000	thod I e: Tot ch: 49 d 9:45 d 9:45 9:45 rol Sa e: Tot ch: 49	Blank al/NA 97785 Dil Fac 1 Dil Fac 1 1 mple al/NA 97785
Analyte Analyte Analyte Analyte Radium-228 Carrier Y Carrier Y Carrier Lab Sample Matrix: Wate Analysis Ba Analyte Radium-228	4.0 - Ra D: MB 10 or Mch: 4985 D: LCS 10 or Mch: 4985	dium-3 60-4977 31 MB <u>Result</u> -0.07156 <i>MB</i> %Yield 86.5 91.2 160-497 31	228 (GFPC 85/18-A MB Qualifier U MB Qualifier 785/1-A Spike Added 7.44	Count Uncert. (2σ+/-) 0.248 Limits 40 - 110 40 - 110 40 - 110 LCS Result 7.798	Total Uncert. (2σ+/-) 0.248 LCS Qual	RL 1.00 Total Uncert. (2σ+/-) 0.986	MDC 0.453 RL 1.00	Unit pCi/L Clia MDC 0.454	Clie P 02/0 P 02/2 02/2 02/2 ent Sau Unit pCi/L	repared 4/21 14:24 repared 4/21 14:24 repared 04/21 14:24 mple ID: 	Analyze 02/10/21 05 02/10/21 05 02/10/210000000000000000000000000000000	thod I e: Tot ch: 49 d 2:45 d 2:45 ch: 49 ch: 49	Blank al/NA 97785 Dil Fac 1 1 Dil Fac 1 1 1 mple al/NA 97785
Analyte Analyte Radium-228 Carrier Ba Carrier Y Carrier Lab Sample Matrix: Wate Analysis Ba Analyte Radium-228 Carrier Carrier Radium-228 Carrier Carrier Radium-228	4.0 - Ra D: MB 10 or Mch: 4985 D: LCS 7 or Mch: 4985	dium-3 60-4977 31 MB Result -0.07156 <i>MB</i> %Yield 86.5 91.2 160-497 31	228 (GFPC 85/18-A MB Qualifier U MB Qualifier 785/1-A Spike Added 7.44	Count Uncert. (2σ+/-) 0.248 Limits 40 - 110 40 - 110 40 - 110 LCS Result 7.798	Total Uncert. (2σ+/-) 0.248 LCS Qual	RL 1.00 Total Uncert. (2σ+/-) 0.986	<u>MDC</u> 0.453 <u>RL</u> 1.00	Unit pCi/L Clia MDC 0.454	Clie P 02/0 0 0 0 0 0 0 0 0 0 0 0 0 0	repared 4/21 14:24 repared 4/21 14:24 repared 04/21 14:24 mple ID: %Rec 105	Analyze 02/10/21 05 02/10/21 05 00/10/10/21 05 02/10/10/10/10/10/10/10/10/10/10/10/10/10/	thod I e: Tot ch: 49 d 0:45 d 0:45 d 0:45 rol Sa e: Tot ch: 49	Blank al/NA 97785 Dil Fac 1 Dil Fac 1 1 mple al/NA 97785
Vethod: 90 Lab Sample Matrix: Wate Analysis Ba Analyte Radium-228 Carrier Ba Carrier Y Carrier Lab Sample Matrix: Wate Analysis Ba Analyte Radium-228 Carrier Ba Carrier Ba Carrier	4.0 - Ra D: MB 10 er Mch: 4985 ID: LCS 7 er Mch: 4985 LCS %Yield 79.0	dium-3 60-4977 31 MB Result -0.07156 <i>MB</i> %Yield 86.5 91.2 160-497 31	228 (GFPC 785/18-A MB Qualifier U MB Qualifier 785/1-A 785/1-A 785/1-A 5 5 5 6 6 7.44 7.44	Count Uncert. (2σ+/-) 0.248 <i>Limits</i> 40 - 110 40 - 110 40 - 110 LCS <u>Result</u> 7.798	Total Uncert. (2σ+/-) 0.248 LCS Qual	RL 1.00 Total Uncert. (2σ+/-) 0.986	<u>MDC</u> 0.453 <u>RL</u> 1.00	Unit pCi/L Clia MDC 0.454	Clie — P 02/0 — 2/0 02/0 02/0 ent Sau Unit pCi/L	ent Samp repared 14/21 14:24 04/21 14:24 04/21 14:24 04/21 14:24 mple ID: %Rec 105	Analyze 02/10/21 09 02/10/21 09 00/10/21 09 02/10/21 09 02/10/200000000000000000000000000000000	thod I e: Tot ch: 49 d 9:45 d 9:45 rol Sa e: Tot ch: 49	Blank al/NA 97785 Dil Fac 1 Dil Fac 1 1 mple al/NA 97785

Method: 904.0 - Radium-228 (GFPC) (Continued)

Lab Sample	D: 160-4	114 <mark>6-A</mark> -	-8-D MS						C	Client Sam	ple ID: Matr	ix Spike
Matrix: Wat	er										Prep Type:	Fotal/N/
Analysis Ba	atcn: 4985	51				Total					Prep Batch:	49//8
	Sample	Sample	s Snike	MS	MS	Uncert					%Rec	
Analyte	Result	Qual	estique de la construcción de la	Result	Qual	(2σ+/-)	RI	MDC	Unit	%Rec	l imits	
Radium-228	0.390		7.43	8.512		1.04	1.00	0.411	pCi/L	109	45 - 150	
		-						•••••	F = =			
	MS	MS										
Carrier	%Yield	Qualifier		_								
Ba Carrier	82.0 97.1		40 - 110									
r Carrier	07.1		40 - 110									
Lab Sample	D: 160-4	1146-B-	-8-B MSD					Clien	t Sam	ple ID: Ma	atrix Spike D	uplicate
Matrix: Wat	er										Prep Type:	Total/NA
Analysis Ba	atch: 4985	31									Prep Batch:	497785
						Total						
	Sample	Sample	e Spike	MSD	MSD	Uncert.					%Rec.	RER
Analyte	Result	Qual	Added	Result	Qual	(2 σ+/-)	RL	MDC	Unit	%Rec	Limits RE	R Limit
Radium-228	0.390	U	7.43	8.476		1.03	1.00	0.423	pCi/L	109	45 - 150 0.0	02 1
	MSD	MSD										
Carrior	%Viold	Qualifior	Limite									
Ba Carrier	86.2	Quanner	<u></u>	_								
V Carrier	90.1		40 110									
Lab Sample Matrix: Wat	er	50-4979	142/ <i>1</i> - A						CI	ient Samp	Prep Type:	o Blank Fotal/NA
Analysis Ba	atch: 4990	02		0	T . (.)						Prep Batch:	497942
		MD	MD	Count	lotai							
Analyto		Posult	NID	(2a+/-)	(2a+/-)	DI	MDC	Unit		Proparad	Analyzod	Dil Eac
Strontium-90		0.05836		0 168	0 168	3.00	0.312		- 02	/05/21 14·07	02/17/21 15·28	
		0.00000	0	0.100	0.100	0.00	0.012	poi/L	02	100/21 14:01	02/11/21 10:20	, ,
		MB	MB									
Carrier		%Yield	Qualifier	Limits						Prepared	Analyzed	Dil Fac
Sr Carrier		84.7		40 - 110					02	/05/21 14:07	02/17/21 15:28	3 1
Y Carrier		84.5		40 - 110					02	/05/21 14:07	02/17/21 15:28	3 1
Lab Sample	D: LCS 1	60-497	942/1-A					Cli	ent Sa	ample ID:	Lab Control	Sample
Matrix: Wat	er							•			Prep Type:]	
Analysis Ba	atch: 4990	02									Prep Batch:	497942
						Total						
			Spike	LCS	LCS	Uncert.					%Rec.	
Analyte			Added	Result	Qual	(2 σ +/-)	RL	MDC	Unit	%Rec	Limits	
-												
Strontium-90			8.28	7.682		0.821	3.00	0.275	pCi/L	93	75 - 125	
Strontium-90		1.09	8.28	7.682		0.821	3.00	0.275	pCi/L	93	75 - 125	
Strontium-90	LCS %Viold	LCS	8.28	7.682		0.821	3.00	0.275	pCi/L	93	75 - 125	

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Method: 905 - Strontium-90 (GFPC) (Continued)

Lab Sample	D: LCSD	160-49	7942/2-A					Client S	ampl	e ID: Lab	Control S	ampl	e Dup
Matrix: Wat	er										Prep Typ	e: Tot	tal/NA
Analysis Ba	tch: 4990	02									Prep Bat	tch: 4	97942
						Total							
			Spike	LCSD	LCSD	Uncert.					%Rec.		RER
Analyte			Added	Result	Qual	(2σ+/-)	RL	MDC	Unit	%Rec	Limits	RER	Limit
Strontium-90			8.28	8.566		0.896	3.00	0.284	pCi/L	103	75 - 125	0.52	1
	LCSD	LCSD											
Carrier	%Yield	Qualifier	Limits										
Sr Carrier	84.9		40 - 110	-									
Y Carrier	86.0		40 - 110										
Method: 90	6.0 - Trit	ium, 1	Total (LSC)									
Lab Sample	D: MB 16	60-4979	65/1-A						CI	ient Sam	ole ID: Me	thod	Blank
Matrix: Wat	er										Prep Typ	e: Tot	tal/NA
Analysis Ba	tch: 4980	99									Prep Bat	tch: 4	97965
				Count	Total								
		MB	MB	Uncert.	Uncert.								
Analyte		Result	Qualifier	(2 σ+/-)	(2 σ+/-)	RL	MDC	Unit		Prepared	Analyze	əd	Dil Fac
Tritium		56.31	U	167	168	500	292	pCi/L	02	/07/21 08:34	02/08/21 1	7:35	1
Lab Sample	ID: LCS 1	60-497	965/2-A					Cli	ent Sa	ample ID:	Lab Cont	trol Sa	ample
Matrix: Wat	er										Prep Typ	e: Tot	tal/NA
Analysis Ba	tch: 4980	99									Prep Bat	tch: 4	97965
						Total							
			Spike	LCS	LCS	Uncert.					%Rec.		
Analyte			Added	Result	Qual	(2σ+/-)	RL	MDC	Unit	%Rec	Limits		
Tritium			2360	2224		379	500	305	pCi/L	94	75 - 114		
Lab Sample	D: 570-4	9989-D	-2-E MS						C	Client San	nple ID: N	latrix	Spike
Matrix: Wat	er										Prep Typ	e: Tot	tal/NA
Analysis Ba	tch: 4980	99									Prep Bat	tch: 4	97965
						Total							
	Sample	Sample	e Spike	MS	MS	Uncert.					%Rec.		
Analyte	Result	Qual	Added	Result	Qual	(2σ+/-)	RL	MDC	Unit	%Rec	Limits		
Tritium	-111	U	2370	2553		400	500	289	pCi/L	108	67 - 130		
Lab Sample	ID: 570-4	9989-D	-2-D DU							Client S	Sample ID	: Dup	licate
Matrix: wat	er toby 4000										Prep Typ		
Analysis Ba	itch: 4980	99				Total					Ргер Ва	(Cn: 4)	9/965
	Sampla	Sample		БЦ	Ы	IUncort							DED
Analyto	Bocult	Oual	,	Bocult	Oual	(2a+/)	ы	MDC	Unit			DED	Limit
Tritium				-26.58		<u>(20+/-)</u> 150	<u> </u>	203				0.28	1
Mothod: A		otoni		-20.30	- Speet-		500	293	POI/L			0.20	
	-01-R - IS	οτορι	c Oranium	(Alpha	Spectr	ometry)							
Lab Sample	ID: MB 16	6 <mark>0-497</mark> 7	'66/1-A						CI	ient Samp	ole ID: Me	thod	Blank
Matrix: Wat	er										Prep Typ	e: Tot	tal/NA
Analysis Ba	atch: 4988	60									Prep Bat	tch: 4	97766
				Count	Total								
		MB	MB	Uncert.	Uncert.								

	MB	мв	Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Uranium-234	-0.01535	U	0.0614	0.0614	1.00	0.159	pCi/L	02/04/21 10:37	02/13/21 09:28	1

Job ID: 440-278183-2

Project/Site: Bo	eing NP	DES SS	FL Outfalls										
Method: A-0)1-R - Is	sotopi	c Uranium	ו (Alpha	a Spectr	ometry)	(Conti	nued)					
Lab Sample I Matrix: Water Analysis Bat	D: MB 1 r ch: 4988	60-4977 60	766/1-A						Cli	ent Samı	ole ID: Method Prep Type: To Prep Batch: 4	l Blank otal/NA 497766	4
		МВ	МВ	Count Uncert.	Total Uncert.								5
Analyte		Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	F	Prepared	Analyzed	Dil Fac	
Uranium-235/236	-	0.009553	U	0.0135	0.0135	1.00	0.107	pCi/L	02/0	04/21 10:37	02/13/21 09:28	1	
Uranium-238		0.03065	U	0.0552	0.0553	1.00	0.102	pCi/L	02/0	04/21 10:37	02/13/21 09:28	1	
Total Uranium		0.005739	U	0.08366	0.08373	1.00	0.159	pCi/L	02/0	04/21 10:37	02/13/21 09:28	1	
		МВ	МВ										8
Tracer		%Yield	Qualifier	Limits					F	Prepared	Analyzed	Dil Fac	
Uranium-232		96.0		30 - 110					02/	04/21 10:37	02/13/21 09:28	1	9
Lab Sample I Matrix: Water	D: LCS	160-497	766/2-A					Cli	ent Sa	mple ID:	Lab Control S	Sample	
Analysis Bat	ch [.] 4988	61									Pren Batch:	497766	
, analyoio Dat						Total					Top Datom		
			Spike	LCS	LCS	Uncert.					%Rec.		
Analvte			Added	Result	Qual	(2σ+/-)	RL	MDC	Unit	%Rec	Limits		
Uranium-234			12.7	11.75		1.35	1.00	0.121	pCi/L	92	75 - 125		
Uranium-238			13.0	13.19		1.48	1.00	0.112	pCi/L	101	75 - 125		
	LCS	LCS											
Tracer	%Yield	Qualifie	r Limits	_									
Uranium-232	93.2		30 - 110										
Lab Sample I Matrix: Water	D: 440-2	278183-	1 DU					Client	t Samp	ole ID: RN	MHF_20210129 Prep Type: To	Grab Grab/NA	
Analysis Bat	cn: 4991	10									Prep Batch: 4	497766	
						Total							
	Sample	e Sampl	e	DU	DU	Uncert.						RER	
Analyte	Resul	t Qual		Result	Qual	<u>(2σ+/-)</u>	RL	MDC	Unit			Limit	
Uranium-234	0.0267	/ U		0.05973	U	0.101	1.00	0.179	pCi/L		0.20) 1	
Uranium-235/23 6	-0.0332	2 U		0.03252	U	0.0534	1.00	0.0899	pCi/L		0.81	1	
Uranium-238	-0.00887	7 U		-0.02235	U	0.0606	1.00	0.161	pCi/L		0.13	3 1	
Total Uranium	-0.0154	4 U		0.06989	U	0.129	1.00	0.179	pCi/L		0.40) 1	
	DU	DU											
Tracar	% Viold	Qualifia	r Limito										

Tracer Limits %Yield Qualifier Uranium-232 100 30 - 110

Method: A-01-R - Isotopic Plutonium and Neptunium (Alpha Spectrometry)

Lab Sample ID: ME Matrix: Water Analysis Batch: 49	8 160-4987 9370	7 48/1-A						Client Samp	le ID: Method Prep Type: To Prep Batch:	l Blank otal/NA 498748
	МВ	МВ	Count Uncert.	Total Uncert.					-	
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Plutonium-238	-0.06003	U	0.106	0.107	1.00	0.256	pCi/L	02/12/21 12:52	02/19/21 11:08	1
Plutonium-239/240	-0.02146	U	0.0192	0.0193	1.00	0.122	pCi/L	02/12/21 12:52	02/19/21 11:08	1
	МВ	MB								
Tracer	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Pu-242 (T)	81.0		30 - 110					02/12/21 12:52	02/19/21 11:08	1

Eurofins Calscience Irvine

3/2/2021 (Rev. 1)

Method: A-01-R - Isotopic Plutonium and Neptunium (Alpha Spectrometry)

Lab Sample I Matrix: Water	ID: LCS 160-49874 r	18/2-A					Cli	ent Sa	mple ID:	Lab Control Sa Prep Type: Tot	mple al/NA	
Analysis Bat	ch: 499535				Total					Prep Batch: 49	98748	5
Analyto		Spike Added	LCS Bosult		Uncert.	ы	MDC	Unit	%Pac	%Rec.		
Diutonium 229			10.44	Quai	1.09	1.00	0 167		100	70 115		
Plutonium-236		10.4	10.44		1.00	1.00	0.107	pCi/L	100	79-115		
40		10.6	10.20		1.06	1.00	0.127	pCI/L	97	85 - 120		
	LCS LCS											8
Tracer	%Yield Qualifier	Limits										
Pu-242 (T)	96.5	30 - 110										9
Lab Sample I Matrix: Water Analysis Bat	ID: 440-278183-1 [r ch: 499376	U			Takal		Client	: Samp	le ID: RI	MHF_20210129_ Prep Type: Tot Prep Batch: 49	Grab al/NA 98748	10 11
	Comple Comple		БЦ	БЦ	Iotai						DED	
Analyta			Du	Ouel		ы	MDO	11		DED		
		·	Result	Quai	(20+/-)							
Plutonium-238	-0.0360 U		-0.06736	U	0.0984	1.00	0.246	pCi/L		0.15	1	10
Plutonium-239/2	-0.0241 U		-0.02529	U	0.0430	1.00	0.149	pCi/L		0.01	1	13
40												
40	DU DU											
40 Tracer	DU DU %Yield Qualifier	Limits										

Client: Haley & Aldrich, Inc. Project/Site: Boeing NPDES SSFL Outfalls

Rad

Prep Batch: 497409

LCS 160-497965/2-A

570-49989-D-2-E MS

Lab Control Sample

Matrix Spike

Job ID: 440-278183-2

Prep Batch

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method
440-278183-1	RMHF_20210129_Grab	Total/NA	Water	Fill_Geo-0
MB 160-497409/1-A	Method Blank	Total/NA	Water	Fill_Geo-0
LCS 160-497409/2-A	Lab Control Sample	Total/NA	Water	Fill_Geo-0
440-278183-1 DU	RMHF_20210129_Grab	Total/NA	Water	Fill_Geo-0
Prep Batch: 497766				
Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method
440-278183-1	RMHF_20210129_Grab	Total/NA	Water	ExtChrom
MB 160-497766/1-A	Method Blank	Total/NA	Water	ExtChrom
LCS 160-497766/2-A	Lab Control Sample	Total/NA	Water	ExtChrom
440-278183-1 DU	RMHF_20210129_Grab	Total/NA	Water	ExtChrom
Prep Batch: 497770				
Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method
440-278183-1	RMHF_20210129_Grab	Total/NA	Water	Evaporation
MB 160-497770/1-A	Method Blank	Total/NA	Water	Evaporation
LCS 160-497770/2-A	Lab Control Sample	Total/NA	Water	Evaporation
LCSB 160-497770/3-A	Lab Control Sample	Total/NA	Water	Evaporation
570-49663-AJ-3-B MS	Matrix Spike	Total/NA	Water	Evaporation
570-49663-AJ-3-C MSBT	Matrix Spike	Total/NA	Water	Evaporation
570-49663-AJ-3-D DU	Duplicate	Total/NA	Water	Evaporation
Prep Batch: 497782				
Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method
440-278183-1	RMHF_20210129_Grab	Total/NA	Water	PrecSep-21
MB 160-497782/18-A	Method Blank	Total/NA	Water	PrecSep-21
LCS 160-497782/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21
160-41146-A-8-B MS	Matrix Spike	Total/NA	Water	PrecSep-21
160-41146-B-8-A MSD	Matrix Spike Duplicate	Total/NA	Water	PrecSep-21
Prep Batch: 497785				
Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method
440-278183-1	RMHF_20210129_Grab	Total/NA	Water	PrecSep_0
MB 160-497785/18-A	Method Blank	Total/NA	Water	PrecSep_0
LCS 160-497785/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0
160-41146-A-8-D MS	Matrix Spike	Total/NA	Water	PrecSep_0
160-41146-B-8-B MSD	Matrix Spike Duplicate	Total/NA	Water	PrecSep_0
Prep Batch: 497942				
Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method
440-278183-1	RMHF_20210129_Grab	Total/NA	Water	PrecSep-7
MB 160-497942/7-A	Method Blank	Total/NA	Water	PrecSep-7
LCS 160-497942/1-A	Lab Control Sample	Total/NA	Water	PrecSep-7
LCSD 160-497942/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep-7
Prep Batch: 497965				
_ Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method
440-278183-1	RMHF_20210129_Grab	Total/NA	Water	LSC_Dist_Susp
MB 160-497965/1-A	Method Blank	Total/NA	Water	LSC_Dist_Susp

QC Association Summary

Eurofins Calscience Irvine

LSC Dist Susp

LSC_Dist_Susp

Total/NA

Total/NA

Water

Water

1 2 3 4 5 6 7 8 9 10 11

Rad (Continued) Prep Batch: 497965 (Continued)

Lab Sample ID 570-49989-D-2-D DU	Client Sample ID Duplicate	Prep Type Total/NA	Matrix Water	Method LSC_Dist_Susp	Prep Batch
Prep Batch: 498748					
Lab Sample ID 440-278183-1	Client Sample ID RMHF_20210129_Grab	Prep Type Total/NA	Matrix Water	Method ExtChrom	Prep Batch
MB 160-498748/1-A	Method Blank	Total/NA	Water	ExtChrom	
LCS 160-498748/2-A	Lab Control Sample	Total/NA	Water	ExtChrom	
440-278183-1 DU	RMHF_20210129_Grab	Total/NA	Water	ExtChrom	

10

Qualifiers

Ra	d
1 Car	

Rad Qualifier	Qualifier Description	
G	The Sample MDC is greater than the requested RL.	
U	Result is less than the sample detection limit.	5

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Client: Haley & Aldrich, Inc. Project/Site: Boeing NPDES SSFL Outfalls

Job ID: 440-278183-2

Laboratory: Eurofins TestAmerica, St. Louis

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

Authority	Program	Identification Number	Expiration Date
Alaska (UST)	State	20-001	05-06-22
ANAB	Dept. of Defense ELAP	L2305	04-06-22
ANAB	Dept. of Energy	L2305.01	04-06-22
ANAB	ISO/IEC 17025	L2305	04-06-22
Arizona	State	AZ0813	12-08-21
California	Los Angeles County Sanitation Districts	10259	06-30-21
California	State	2886	06-30-21
Connecticut	State	PH-0241	03-31-21
Florida	NELAP	E87689	06-30-21
HI - RadChem Recognition	State	n/a	06-30-21
Illinois	NELAP	004553	11-30-21
lowa	State	373	12-01-22
Kansas	NELAP	E-10236	10-31-21
Kentucky (DW)	State	KY90125	01-01-22
Louisiana	NELAP	04080	06-30-21
Louisiana (DW)	State	LA011	12-31-21
Maryland	State	310	09-30-21
MI - RadChem Recognition	State	9005	06-30-21
Missouri	State	780	06-30-22
Nevada	State	MO000542020-1	07-31-21
New Jersey	NELAP	MO002	06-30-21
New York	NELAP	11616	04-01-21
North Dakota	State	R-207	06-30-21
NRC	NRC	24-24817-01	12-31-22
Oklahoma	State	9997	08-31-21
Oregon	NELAP	4157	09-01-21
Pennsylvania	NELAP	68-00540	03-01-22
South Carolina	State	85002001	06-30-21
Texas	NELAP	T104704193-19-13	07-31-21
US Fish & Wildlife	US Federal Programs	058448	07-31-21
USDA	US Federal Programs	P330-17-00028	03-11-23
Utah	NELAP	MO000542019-11	07-31-21
Virginia	NELAP	10310	06-14-21
Washington	State	C592	08-30-21
West Virginia DEP	State	381	10-31-21



CHAIN OF CUSTODY FORM

Page 1 of 1

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Rainy Season 2019-2020 Version 2

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Eurofins	17461 Deria	Irvine, CA	040-040

Chain of Custody Record



	Sampler:		Lab PM:					Carrie	r Tracking	No(s):		COC No:	
	Phone		Bondoc	Christia	Σ							440-165989.1	
Shipping/Receiving			Christian	opudo.	c@Euro	finset.cc	E	Califo Califo	of Origin: ornia			Page: Page 1 of 1	
Сотралу: TestAmerica Laboratories, Inc.			Acc	reditations ite Progr	: Required am - Ca	i (See not lifornia						Job #: 440-278183-1	
Address: 13715 Rider Trail North,	Due Date Requested: 2/11/2021					Ana	lvsis R	equest	pa			Preservation Coc	les:
City: Earth City State, Zip:	TAT Requested (days):		1 Ard				,					A - HCL B - NaOH C - Zn Acetate D - Nitric Acid	M - Hexane N - None O - ASNaO2 P - Na2O4S
MO, 63045 Phone: 	PO#:		•	751-n	۳				_			E - NaHSO4 F - MeOH	Q - Na2SO3 R - Na2S2O3 8 - U2SO3
314-230-0300(161) 314-290-013/(FAX) Email:	:# OM		OL NO)	o) NuiseO	inerU ti a/Beta	9	06-u		_			H - Ascorbic Acid 1 - Ice	T - TSP Dodecahydrate
Project Name: Boeing NPDES SSFL Outfalls	Project #: 44024446		89 <u>7</u>) 9	N 10 ee	stoT nit rqlA aa	in m-226	trontiur	wnau				J - Ul water K - EDTA L - EDA	V - MCAA W - pH 4-5 Z - other (specify)
Site:	:#MOSS		Iqms	ю ⁻ 0 К	оА_то 	beA t	s ∠⁻de	dsne				Other:	
Sample Identification - Client ID (Lab ID)	Sami Sample Date	Sample Type ole (C=comp, e G≃grab) _в	Matrix (W=water S=solid. O=waste/oil. Field Fillfered S=solid.	Perform MS/M	A01R_U/ExtChro	2_q923919\0.509	902_Sr90/PrecSe				o ted multi leto I	Special In	structions (Note:
	X	Preservati	on Code: X	X					100				
RMHF_20210129_Grab (440-278183-1)	1/29/21 07:4	2	Water	×	×	×	×	- ×				, Boeing SSFL; DO	NOT FILTER; use prep
		<u> </u>								+		date from preserva	ation
					+		1	1		-	_		
				_					-				
									_				
				_									
					-								
Vote: Since laboratory accreditations are subject to change. Eurofins Cal: naintain accreditation in the State of Origin listed above for analysis/tests calscience attention immediately. If all requested accreditations are curre	science places the ownership of meth matrix being analyzed, the samples ent to date, return the signed Chain c	rod, analyte & accred must be shipped bac f Custody attesting to	litation compliance k to the Eurofins C said complicance	upon out alscience to Eurofin	subcontra laboratory s Calscier	ct laborato or other in the	rries. This Instructions	sample sh will be pro	ipment is 1 vided. An	orwarded y change:	under cha	in-of-custody. If the lai	ooratory does not currently brought to Eurofins
Possible Hazard Identification				Sample	Dispos	al (A fe	e may be	asses	ed if sa	mples a	ire retai	ned longer than 1	month)
Unconfirmed] ן	eturn To	Client		Dispos	al By Lai	4	Arc	hive For	Months
Jeirverable Requested: I, II, IV, Other (specify)	Primary Deliverable Ra	nk: 2	- 2	Special	Instructio	ons/QC	Requiren	ents:					
Empty Kit Relinquished by:	Date:		Tin .	ie:				É	Aethod of :	Shipment:			
tellinginated by CARCICS	Date/Time:	1700 0	ompany EQ-1RC	Recei	ived by:					Date/Tim	ä		Company
PED EX	Date/Time:	0	ompany	Rece	Ved by l	lun	DS U	3		Date/Tim		OX55	Company TA-S+L
kelinquished by:	Date/Time:	0	ompany	Rece	ived by:		\$			Date/Tim			Company
Custody Seals Intact: Custody Seal No.:			に調け	Coole	r Temper	ature(s) °C	and Other	Remarks		3	100		
													Ver: 11/01/2020

5 6

Client: Haley & Aldrich, Inc.

Login Number: 278183 List Number: 1 Creator: Escalante, Maria I

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

Job Number: 440-278183-2

List Source: Eurofins Irvine

Client: Haley & Aldrich, Inc.

Login Number: 278183 List Number: 2 Creator: Worthington, Sierra M

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

Job Number: 440-278183-2

List Creation: 02/02/21 12:50 PM

List Source: Eurofins TestAmerica, St. Louis

Prep Type: Total/NA

Prep Type: Total/NA

Prep Type: Total/NA

Prep Type: Total/NA

Method: 903.0 - Radium-226 (GFPC)

Matrix: Water

			Percent Yield (Acceptance Limits)
		Ва	
Lab Sample ID	Client Sample ID	(40-110)	
160-41146-A-8-B MS	Matrix Spike	82.6	
160-41146-B-8-A MSD	Matrix Spike Duplicate	86.2	
440-278183-1	RMHF_20210129_Grab	79.6	
LCS 160-497782/1-A	Lab Control Sample	79.0	
MB 160-497782/18-A	Method Blank	86.5	
Tracer/Carrier Legend	I		
Ba = Ba Carrier			

Method: 904.0 - Radium-228 (GFPC) **Matrix: Water**

				Percent Yield (Acceptance Limits)	
		Ва	Y		
Lab Sample ID	Client Sample ID	(40-110)	(40-110)		
160-41146-A-8-D MS	Matrix Spike	82.6	87.1		
160-41146-B-8-B MSD	Matrix Spike Duplicate	86.2	90.1		
440-278183-1	RMHF_20210129_Grab	79.6	90.5		
LCS 160-497785/1-A	Lab Control Sample	79.0	89.3		
MB 160-497785/18-A	Method Blank	86.5	91.2		

Tracer/Carrier Legend

Ba = Ba Carrier

Y = Y Carrier

Method: 905 - Strontium-90 (GFPC)

Matrix: Water

				Percent Yield (Acceptance Limits)
		Sr	Y	
Lab Sample ID	Client Sample ID	(40-110)	(40-110)	
440-278183-1	RMHF_20210129_Grab	86.5	86.7	
LCS 160-497942/1-A	Lab Control Sample	86.1	84.9	
LCSD 160-497942/2-A	Lab Control Sample Dup	84.9	86.0	
MB 160-497942/7-A	Method Blank	84.7	84.5	

Tracer/Carrier Legend

Sr = Sr Carrier

Y = Y Carrier

Method: A-01-R - Isotopic Plutonium and Neptunium (Alpha Spectrometry)

Μ	atri	x: W	later

			Percent Yield (Acceptance Limits)
		Pu-242 (T)	
Lab Sample ID	Client Sample ID	(30-110)	
440-278183-1	RMHF_20210129_Grab	87.5	
440-278183-1 DU	RMHF_20210129_Grab	78.7	
LCS 160-498748/2-A	Lab Control Sample	96.5	
MB 160-498748/1-A	Method Blank	81.0	
Tracer/Carrier Legen	d		

Pu-242 (T) = Pu-242 (T)

Prep Type: Total/NA

Method: A-01-R - Isotopic Uranium (Alpha Spectrometry) Matrix: Water

			Percent Yield (Acceptance Limits)
		U-232	
Lab Sample ID	Client Sample ID	(30-110)	
440-278183-1	RMHF_20210129_Grab	93.6	
440-278183-1 DU	RMHF_20210129_Grab	100	
_CS 160-497766/2-A	Lab Control Sample	93.2	
VB 160-497766/1-A	Method Blank	96.0	

U-232 = Uranium-232

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LINKS

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Environment Testing America

ANALYTICAL REPORT

Eurofins Calscience Irvine 17461 Derian Ave Suite 100 Irvine, CA 92614-5817 Tel: (949)261-1022

Laboratory Job ID: 440-278183-3 Client Project/Site: Boeing NPDES SSFL Outfalls

For: Haley & Aldrich, Inc. 400 E Van Buren St.

Suite 545 Phoenix, Arizona 85004

Attn: Katherine Miller

Virentra R Paty

Authorized for release by: 3/10/2021 5:10:10 PM

Virendra Patel, Project Manager I (714)895-5494 Virendra.Patel@eurofinset.com

The test results in this report meet all 2003 NELAC, 2009 TNI, and 2016 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

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

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

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Receipt Checklists	13

Sample Summary

Client: Haley & Aldrich, Inc. Project/Site: Boeing NPDES SSFL Outfalls

Job ID: 440-278183-3

l ah Samnle ID	Client Sample ID	Matrix	Collected Receive	ed Accet ID	3
440-278183-1	RMHF_20210129_Grab	Water	01/29/21 07:45 01/29/21 1	6:30 ASSET ID	4
					5
					8
					9
					13

Job ID: 440-278183-3

Laboratory: Eurofins Calscience Irvine

Narrative

Job Narrative 440-278183-3

Comments

No additional comments.

Receipt

The sample was received on 1/29/2021 4:30 PM. Unless otherwise noted below, the sample arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.6° C.

Metals

Method 245.1: The following sample was prepared outside of preparation holding time due to method requested after holding time had expired : RMHF 20210129 Grab (440-278183-1).

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

Client Sample Results

Client: Haley & Aldrich, Inc. Project/Site: Boeing NPDES SSFL Outfalls Job ID: 440-278183-3

Client Sample ID: RMHF_20210129_Grab Date Collected: 01/29/21 07:45						ab Sample	ID: 440-278 Matrix	183-1 Water
AA)								
Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
ND	BU	0.20	0.10	ug/L		03/10/21 10:46	03/10/21 15:06	1
	AA) Result	AA) <u>Result</u> Qualifier ND BU	AA) <u>Result</u> <u>Qualifier</u> <u>RL</u> <u>ND</u> <u>BU</u> 0.20	AA) <u>Result</u> Qualifier RL MDL ND BU 0.20 0.10	AA) <u>Result</u> Qualifier <u>RL</u> <u>MDL</u> Unit ND BU 0.20 0.10 ug/L	AA) <u>Result Qualifier</u> <u>RL</u> <u>MDL</u> <u>Unit</u> <u>D</u> ND BU 0.20 0.10 ug/L	AA)Result \overline{ND} Qualifier \overline{BU} RL 0.20 MDL 0.10 Unit $\overline{ug/L}$ D \overline{D} Prepared $03/10/21$	ZOZ TOTZ9_Grad Lab Sample 1D. 440-270 Matrix AA) Result Qualifier RL MDL Unit D Prepared Analyzed ND BU 0.20 0.10 ug/L D Prepared Analyzed

Client: Haley & Aldrich, Inc. Project/Site: Boeing NPDES SSFL Outfalls

Method	Method Description	Protocol	Laboratory
245.1	Mercury (CVAA)	EPA	TAL IRV
245.1	Preparation, Mercury	EPA	TAL IRV

Protocol References:

EPA = US Environmental Protection Agency

Laboratory References:

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

Matrix: Water

Lab Sample ID: 440-278183-1

Client Sample ID: RMHF_20210129_Grab Date Collected: 01/29/21 07:45 Date Received: 01/29/21 16:30

_	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	245.1			20 mL	30 mL	640903	03/10/21 10:46	MA6V	TAL IRV
Total/NA	Analysis	245.1		1			640951	03/10/21 15:06	MA6V	TAL IRV

Laboratory References:

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

Job ID: 440-278183-3

Method: 245.1 - Mercury (CVAA)

Lab Sample ID: MB 440-640 Matrix: Water Analysis Batch: 640951	903/1-A									C	lie	nt Sam	ple ID: M Prep Ty Prep Ba	ethod pe: Tot atch: 64	Blank al/NA 40903
		MB	MB												
Analyte	Re	sult	Qualifier		RL	I	MDL	Unit		D	Pr	epared	Analyz	zed	Dil Fac
Mercury		ND			0.20		0.10	ug/L		03	8/10)/21 10:46	6 03/10/21	15:01	1
Lab Sample ID: LCS 440-64 Matrix: Water Analysis Batch: 640951	0903/2-A								Cli	ent S	an	nple ID:	Lab Cor Prep Ty Prep Ba	ntrol Sa pe: Tot atch: 64	imple al/NA 40903
				Spike		LCS	LCS						%Rec.		
Analyte				Added		Result	Qua	lifier	Unit	I	D	%Rec	Limits		
Mercury				6.00		5.64			ug/L			94	85 - 115		
Lab Sample ID: 440-278183 Matrix: Water Analysis Batch: 640951	-1 MS								Client	Sam	pl	e ID: RI	MHF_202 Prep Ty Prep Ba	10129_ pe: Tot atch: 64	_Grab al/NA 40903
-	Sample	Sam	nple	Spike		MS	MS						%Rec.		
Analyte	Result	Qua	lifier	Added		Result	Qua	lifier	Unit	I	D	%Rec	Limits		
Mercury	ND	BU		6.00		6.13			ug/L			102	75 - 125		
Lab Sample ID: 440-278183 Matrix: Water Analysis Batch: 640951	-1 MSD								Client	Sam	pl	e ID: RI	MHF_202 Prep Ty Prep Ba	10129_ pe: Tot atch: 64	_Grab al/NA 40903
-	Sample	Sam	nple	Spike		MSD	MSD)					%Rec.		RPD
Analyte	Result	Qua	lifier	Added		Result	Qua	lifier	Unit	I	D	%Rec	Limits	RPD	Limit
Mercury	ND	BU		6.00		5.89			ug/L			98	75 - 125	4	20

Job ID: 440-278183-3

Metals

Prep Batch: 640903

Lab Sample ID	Client Sample ID	Ргер Туре	Matrix	Method	Prep Batch
440-278183-1	RMHF_20210129_Grab	Total/NA	Water	245.1	
MB 440-640903/1-A	Method Blank	Total/NA	Water	245.1	
LCS 440-640903/2-A	Lab Control Sample	Total/NA	Water	245.1	
440-278183-1 MS	RMHF_20210129_Grab	Total/NA	Water	245.1	
440-278183-1 MSD	RMHF_20210129_Grab	Total/NA	Water	245.1	
Analysis Batch: 6409	951				
Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-278183-1	RMHF_20210129_Grab	Total/NA	Water	245.1	640903
MB 440-640903/1-A	Method Blank	Total/NA	Water	245.1	640903
LCS 440-640903/2-A	Lab Control Sample	Total/NA	Water	245.1	640903
440-278183-1 MS	RMHF_20210129_Grab	Total/NA	Water	245.1	640903
440-278183-1 MSD	RMHF_20210129_Grab	Total/NA	Water	245.1	640903

QC Association Summary

Definitions/Glossary

Client: Haley & Aldrich, Inc. Project/Site: Boeing NPDES SSFL Outfalls

Job ID: 440-278183-3

Qualifiers

TEQ

TNTC

Toxicity Equivalent Quotient (Dioxin)

Too Numerous To Count

Qualifiers		3
Metals Qualifier	Qualifier Description	
BU	Analyzed out of holding time	
Glossary		5
Abbreviation	These commonly used abbreviations may or may not be present in this report.	6
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis	
%R	Percent Recovery	
CFL	Contains Free Liquid	
CFU	Colony Forming Unit	0
CNF	Contains No Free Liquid	ð.
DER	Duplicate Error Ratio (normalized absolute difference)	
Dil Fac	Dilution Factor	9
DL	Detection Limit (DoD/DOE)	
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample	10
DLC	Decision Level Concentration (Radiochemistry)	
EDL	Estimated Detection Limit (Dioxin)	
LOD	Limit of Detection (DoD/DOE)	
LOQ	Limit of Quantitation (DoD/DOE)	
MCL	EPA recommended "Maximum Contaminant Level"	
MDA	Minimum Detectable Activity (Radiochemistry)	
MDC	Minimum Detectable Concentration (Radiochemistry)	
MDL	Method Detection Limit	
ML	Minimum Level (Dioxin)	
MPN	Most Probable Number	
MQL	Method Quantitation Limit	
NC	Not Calculated	
ND	Not Detected at the reporting limit (or MDL or EDL if shown)	
NEG	Negative / Absent	
POS	Positive / Present	
PQL	Practical Quantitation Limit	
PRES	Presumptive	
QC	Quality Control	
RER	Relative Error Ratio (Radiochemistry)	
RL	Reporting Limit or Requested Limit (Radiochemistry)	
RPD	Relative Percent Difference, a measure of the relative difference between two points	
TEF	Toxicity Equivalent Factor (Dioxin)	

	Accreditation/C	ertification Summary		
Client: Haley & Aldrich, I Project/Site: Boeing NPI	nc. DES SSFL Outfalls		Job ID: 440-278183-3	
_aboratory: Eurofin	IS Calscience Irvine s listed below are applicable to this report.			
Authority	Program	Identification Number	Expiration Date	
California	State	2706	06-30-21	5
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CHAIN OF CUSTODY FORM

Page 1 of 1

Market Market 100 100 100 100	dress:		-						KA	¥	A K		SIS REQUIRI	_ 	*	A	*	Field Readings Meter serial #	
Construction Construction Construction	Suite 300				Boe	Project: ing SSFL RMHI Contrations BA	" ¹¹		88 8994D	(0023)	(0000)	ise ssaup	1000) 1019 1019	au -n 'to '	٧	542'1) (908)	1 E E	edd Readings: (Include units) $\frac{1}{2} \int \frac{1}{1} \int \frac{1}{2}$ into of Readings: $\frac{1}{2}$	T
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Image: Description Image: Descripion Image: Description Image: D	CoC) shall be performed in accordance with the Ti and Haley & Addrich, Inc., its subsidiaries and all	FaCs within Rianket Service A ₄ Bokes, and TestAmerica Labor.	-		Project Ma 520.289.66	nager Katherir 06, 520,904,69	he Miller 44 (cell)		Cq' Cn 3' Fe' M able M	egnoo l	IC/E490	onasini Biyan di Fe, n	qinu 3 69063 (0'006 0'000 0 'PO	µ∧ z 36 K≪10' €804'0	1200-CI	e9-etas M elde	eyeM bi	heating by: AB	
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Ministration Ministration Ministration experision ministration ministration ministration experint ministration ministration <td></td> <td></td> <td>MM</td> <td>23 08 049</td> <td></td> <td></td> <td>9</td> <td></td> <td></td> <td></td> <td>1</td> <td>-</td> <td>Ť</td> <td></td> <td>-</td> <td></td> <td>, </td> <td>United and industrial analysis, beyond a for a nor botholder.</td> <td>· · · ·</td>			MM	23 08 049			9				1	-	Ť		-		, 	United and industrial analysis, beyond a for a nor botholder.	· · · ·
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$\frac{1}{10000000000000000000000000000000000$			WM	1 Gef Cube	"	None	8									ł		eve: abs vent	
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Rainy Season 2019-2020 Version 2

Login Sample Receipt Checklist

Client: Haley & Aldrich, Inc.

Login Number: 278183 List Number: 1

Creator: Escalante, Maria I

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

Job Number: 440-278183-3

List Source: Eurofins Irvine

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🔅 eurofins

Environment Testing America

ANALYTICAL REPORT

Eurofins Calscience Irvine 17461 Derian Ave Suite 100 Irvine, CA 92614-5817 Tel: (949)261-1022

Laboratory Job ID: 440-278184-1 Client Project/Site: BMP

For:

LINKS

Review your project results through

Total Access

Have a Question?

Ask-

The

www.eurofinsus.com/Env

Visit us at:

Expert

Haley & Aldrich, Inc. 400 E Van Buren St. Suite 545 Phoenix, Arizona 85004

Attn: Katherine Miller

The

Authorized for release by: 2/16/2021 9:59:31 AM Christian Bondoc, Project Manager I (949)260-3218 Christian.Bondoc@Eurofinset.com

The test results in this report meet all 2003 NELAC, 2009 TNI, and 2016 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

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

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

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Sample Summary

Client: Haley & Aldrich, Inc. Project/Site: BMP

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
440-278184-1	LPBMP0002_20210129	Water	01/29/21 08:35	01/29/21 16:30	
440-278184-2	LPBMP0003_20210129	Water	01/29/21 08:48	01/29/21 16:30	
440-278184-3	LPBMP0004_20210129	Water	01/29/21 08:52	01/29/21 16:30	
Job ID: 440-278184-1

Laboratory: Eurofins Calscience Irvine

Narrative

Job Narrative 440-278184-1

Case Narrative

Comments

No additional comments.

Receipt

The samples were received on 1/29/2021 4:30 PM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 2.3° C.

Dioxin

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

Metals

Methods 200.2, FILTRATION: The following samples requested dissolved metals and were not filtered in the field: LPBMP0002_20210129 (440-278184-1), LPBMP0003_20210129 (440-278184-2) and LPBMP0004_20210129 (440-278184-3). These samples were filtered and preserved past the 24 hrs from receipt in the laboratory due to samples received with insufficient time to filter within the HT.

02/01/21 @ 0900 hours 2.5 mL HNO3 HNO3 Lot # 0000245675

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

General Chemistry

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

Organic Prep

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

Dioxin Prep

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

Eurofins Calscience Irvine

2/16/2021

Client Sample ID: LPBMP0002_20210129 Date Collected: 01/29/21 08:35 Date Received: 01/29/21 16:30

Lab Sample ID: 440-278184-1 Matrix: Water

ter 3 — 4 _{Fac} 5

Method: 1613B - Dioxins and Analyte	Furans (HR Result	GC/HRMS) Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2.3.7.8-TCDD	ND		0.000010	0.0000006	ua/L	_	02/04/21 15:49	02/09/21 02:42	1
_,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			0.0000.0	4			02/01/21 10110	02,00,2102.12	
1,2,3,7,8-PeCDD	ND		0.000052	0.0000008 9	ug/L		02/04/21 15:49	02/09/21 02:42	1
1,2,3,7,8-PeCDF	ND		0.000052	0.0000008	ug/L		02/04/21 15:49	02/09/21 02:42	1
2,3,4,7,8-PeCDF	ND		0.000052	0.0000009	ug/L		02/04/21 15:49	02/09/21 02:42	1
1,2,3,4,7,8-HxCDD	0.0000029	J,DX MB	0.000052	0.0000009	ug/L		02/04/21 15:49	02/09/21 02:42	1
1,2,3,6,7,8-HxCDD	0.0000026	J,DX	0.000052	0.0000009	ug/L		02/04/21 15:49	02/09/21 02:42	1
1,2,3,7,8,9-HxCDD	0.0000027	J,DX	0.000052	0.0000008	ug/L		02/04/21 15:49	02/09/21 02:42	1
1,2,3,4,7,8-HxCDF	0.0000026	J,DX	0.000052	0.0000007	ug/L		02/04/21 15:49	02/09/21 02:42	1
1,2,3,6,7,8-HxCDF	0.0000014	J,DX	0.000052	0.0000000	ug/L		02/04/21 15:49	02/09/21 02:42	1
1,2,3,7,8,9-HxCDF	0.0000088	J,DX	0.000052	8 0.0000006	ug/L		02/04/21 15:49	02/09/21 02:42	1
2,3,4,6,7,8-HxCDF	0.0000020	J,DX	0.000052	0.0000005	ug/L		02/04/21 15:49	02/09/21 02:42	1
1,2,3,4,6,7,8-HpCDD	0.000018	J,DX MB	0.000052	9 0.0000006	ug/L		02/04/21 15:49	02/09/21 02:42	1
1,2,3,4,6,7,8-HpCDF	0.000011	J,DX	0.000052	8 0.0000006	ug/L		02/04/21 15:49	02/09/21 02:42	1
1,2,3,4,7,8,9-HpCDF	0.0000015	J,DX q	0.000052	0.0000006	ug/L		02/04/21 15:49	02/09/21 02:42	1
0000	0 00012	MD	0.00010	0 000013	ug/l		02/04/21 15:40	02/00/21 02.42	1
OCDE	0.00013		0.00010	0.0000013	ug/L		02/04/21 15:49	02/09/21 02:42	
OCDF	0.000013	J,DA IVID	0.00010	0.0000009	ug/L		02/04/21 13.49	02/09/21 02.42	I
Total TCDD	0.0000068	J,DX q MB	0.000010	0.0000006	ug/L		02/04/21 15:49	02/09/21 02:42	1
Total TCDF	0.0000011	J,DX	0.000010	0.0000004	ug/L		02/04/21 15:49	02/09/21 02:42	1
Total PeCDD	0.0000020	J,DX	0.000052	0.0000008 9	ug/L		02/04/21 15:49	02/09/21 02:42	1
Total PeCDF	ND		0.000052	0.0000008	ug/L		02/04/21 15:49	02/09/21 02:42	1
Total HxCDD	0.000015	J,DX q MB	0.000052	0.0000008	ug/L		02/04/21 15:49	02/09/21 02:42	1
Total HxCDF	0.000012	J,DX	0.000052	0.0000005 Q	ug/L		02/04/21 15:49	02/09/21 02:42	1
Total HpCDD	0.000041	J,DX MB	0.000052	0.0000006	ug/L		02/04/21 15:49	02/09/21 02:42	1
Total HpCDF	0.000018	J,DX q MB	0.000052	0.0000006	ug/L		02/04/21 15:49	02/09/21 02:42	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C-2,3,7,8-TCDD	72		25 - 164				02/04/21 15:49	02/09/21 02:42	1
13C-2,3,7,8-TCDF	84		24 - 169				02/04/21 15:49	02/09/21 02:42	1
13C-1,2,3,7,8-PeCDD	69		25 - 181				02/04/21 15:49	02/09/21 02:42	1
13C-1,2,3,7,8-PeCDF	76		24 - 185				02/04/21 15:49	02/09/21 02:42	1
13C-2,3,4,7,8-PeCDF	75		21 - 178				02/04/21 15:49	02/09/21 02:42	1
13C-1,2,3,4,7,8-HxCDD	70		32 - 141				02/04/21 15:49	02/09/21 02:42	1
13C-1,2,3,6,7,8-HxCDD	74		28 - 130				02/04/21 15:49	02/09/21 02:42	1

Fine Sand (0.125 to 0.25mm)

Gravel (greater than 2 mm)

Client Sample ID: LPBMP0002_20210129 Date Collected: 01/29/21 08:35 Date Received: 01/29/21 16:30

Lab Sample ID: 440-278184-1 Matrix: Water

Matrix: Water

5

Method: 1613B - Dioxins an	id Furans (HR	GC/HRMS) (Continue	a)					
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C-1,2,3,4,7,8-HxCDF	83		26 - 152				02/04/21 15:49	02/09/21 02:42	1
13C-1,2,3,6,7,8-HxCDF	86		26 - 123				02/04/21 15:49	02/09/21 02:42	1
13C-1,2,3,7,8,9-HxCDF	86		29 - 147				02/04/21 15:49	02/09/21 02:42	1
13C-2,3,4,6,7,8-HxCDF	88		28 - 136				02/04/21 15:49	02/09/21 02:42	1
13C-1,2,3,4,6,7,8-HpCDD	69		23 - 140				02/04/21 15:49	02/09/21 02:42	1
13C-1,2,3,4,6,7,8-HpCDF	78		28 - 143				02/04/21 15:49	02/09/21 02:42	1
13C-1,2,3,4,7,8,9-HpCDF	73		26 - 138				02/04/21 15:49	02/09/21 02:42	1
13C-OCDD	70		17 - 157				02/04/21 15:49	02/09/21 02:42	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD 	90		35 - 197				02/04/21 15:49	02/09/21 02:42	1
Method: 1613B - Dioxins an	d Furans (HR	GC/HRMS) - RA						
Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDF	ND		0.000010	0.0000006	ug/L		02/04/21 15:49	02/12/21 14:54	1
Isotope Dilution	%Recoverv	Qualifier	Limits	2			Prepared	Analvzed	Dil Fac
13C-2,3,7,8-TCDF	80		24 - 169				02/04/21 15:49	02/12/21 14:54	1
Surrogate	%Recoverv	Qualifier	l imits				Prenared	Analyzed	Dil Far
37CI4-2 3 7 8-TCDD		<u></u>	35 197				$\frac{110\mu}{02/04/21}$ 15.49	$\frac{1100}{02/12/21}$ 14.54	1
Analyte Cadmium	Result ND	Qualifier	RL 1.0	0.25	Unit ug/L	D	Prepared 02/08/21 09:37	Analyzed 02/08/21 18:39	Dil Fac
Cadmium	ND		1.0	0.25	ug/L		02/08/21 09:37	02/08/21 18:39	1
Copper	11		2.0	0.50	ug/L		02/08/21 09:37	02/08/21 18:39	1
Lead 	1.3		1.0	0.50	ug/L		02/08/21 09:37	02/08/21 18:39	1
Method: 200.8 - Metals (ICP	/MS) - Dissolv	ed							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		1.0	0.25	ug/L		02/01/21 09:17	02/01/21 11:18	1
Copper	8.7		2.0	0.50	ug/L		02/01/21 09:17	02/01/21 11:18	1
Lead	0.57	J,DX	1.0	0.50	ug/L		02/01/21 09:17	02/01/21 11:18	1
- Method: 245.1 - Mercury (C	VAA)								
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.10	ug/L		02/09/21 11:44	02/09/21 16:51	1
- Method: 245.1 - Mercury (C	VAA) - Dissolv	ved							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.10	ug/L		02/09/21 11:33	02/09/21 16:42	1
_ General Chemistry									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analvzed	Dil Fac
Total Suspended Solids	7.6		1.0	0.50	mg/L			02/02/21 14:28	1
Mathad: D//64 - Particla Si	zo Distributio	of Cataly	tic Matoria	l (Lacor li	aht soo	ttoring	\		
Analyte		Qualifier		i (Lasti II Di	Init	nei ing	/ Prenared	Analyzad	Dil Eac
Clav/less than 0 00301 mm)		Quanner	0.01	0.01	<u>%</u>		Tepareu	02/05/21 17·//6	1
Coarse Sand (0 5mm to 1mm)			0.01	0.01	%			02/05/21 17:40	1
			0.01	0.01	/0				

02/05/21 17:46

02/05/21 17:46

0.01

0.01

0.01 %

0.01 %

54.85

ND

1

Client Sample ID: LPBMP0002_20210129 Date Collected: 01/29/21 08:35 Date Received: 01/29/21 16:30

Lab Sample ID: 440-278184-1 Matrix: Water

Lab Sample ID: 440-278184-2

Matrix: Water

5

Analyte	Result Qualifier	r RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Medium Sand (0.25 to 0.5 mm)	0.90	0.01	0.01	%			02/05/21 17:46	1
Silt (0.00391 to 0.0625mm)	4.78	0.01	0.01	%			02/05/21 17:46	1
Total Silt and Clay (0 to 0.0626mm)	4.78	0.01	0.01	%			02/05/21 17:46	1
Very Coarse Sand (1 to 2mm)	ND	0.01	0.01	%			02/05/21 17:46	1
Very Fine Sand (0.0625 to 0.125	39.47	0.01	0.01	%			02/05/21 17:46	1

Client Sample ID: LPBMP0003_20210129 Date Collected: 01/29/21 08:48 Date Received: 01/29/21 16:30

Method: 1613B - Dioxins and	Furans (HR Result	GC/HRMS)	RI	EDI	Unit	п	Prepared	Analyzod	Dil Fac
2.3.7.8-TCDD	ND		0.000010	0 0000006	ua/L		02/04/21 15:49	02/09/21 03:30	1
,, ,				3					
2,3,7,8-TCDF	ND		0.000010	0.0000004	ug/L		02/04/21 15:49	02/09/21 03:30	1
			0 000052	6	ua/l		02/04/21 15:40	02/00/21 03:30	1
1,2,3,7,0-1 6000	ND		0.000032	0.0000009	ug/L		02/04/21 13:49	02/03/21 03:50	
1,2,3,7,8-PeCDF	ND		0.000052	0.000008	ug/L		02/04/21 15:49	02/09/21 03:30	1
			0 000050	7			02/04/24 45:40	02/00/24 02:20	1
2,3,4,7,6-FECDF	ND		0.000052	0.0000009	ug/L		02/04/21 15.49	02/09/21 03.30	I
1,2,3,4,7,8-HxCDD	0.0000038	J,DX MB	0.000052	0.0000009	ug/L		02/04/21 15:49	02/09/21 03:30	1
		1.5.4	0 000050	8			00/04/04 45 40	00/00/04 00 00	
1,2,3,6,7,8-HXCDD	0.0000029	J,DX	0.000052	0.0000009 9	ug/L		02/04/21 15:49	02/09/21 03:30	1
1,2,3,7,8,9-HxCDD	0.0000024	J,DX q	0.000052	0.0000009	ug/L		02/04/21 15:49	02/09/21 03:30	1
				0					
1,2,3,4,7,8-HxCDF	0.0000021	J,DX	0.000052	0.0000008	ug/L		02/04/21 15:49	02/09/21 03:30	1
1,2,3,6,7,8-HxCDF	0.0000016	J,DX	0.000052	0.0000007	ug/L		02/04/21 15:49	02/09/21 03:30	1
				5					
1,2,3,7,8,9-HxCDF	ND		0.000052	0.0000006	ug/L		02/04/21 15:49	02/09/21 03:30	1
2.3.4.6.7.8-HxCDF	0.0000018	J,DX	0.000052	0.0000006	ug/L		02/04/21 15:49	02/09/21 03:30	1
				5					
1,2,3,4,6,7,8-HpCDD	0.000034	J,DX MB	0.000052	0.000008	ug/L		02/04/21 15:49	02/09/21 03:30	1
1.2.3.4.6.7.8-HpCDF	0.000018	J.DX	0.000052	0.0000007	ua/L		02/04/21 15:49	02/09/21 03:30	1
·,_,o, ·,o, · ,o · · p · - ·		•,==		7	5				
1,2,3,4,7,8,9-HpCDF	ND		0.000052	0.0000008	ug/L		02/04/21 15:49	02/09/21 03:30	1
OCDD	0 00025	MB	0 00010	9 0 0000016	ua/l		02/04/21 15:49	02/09/21 03:30	1
OCDF	0.000019	J.DX a MB	0.00010	0.0000009	ug/L		02/04/21 15:49	02/09/21 03:30	1
		-,		5	0				
Total TCDD	0.0000083	J,DX q MB	0.000010	0.0000006	ug/L		02/04/21 15:49	02/09/21 03:30	1
Total TCDF	ND		0 000010	0 0000004	ua/l		02/04/21 15:49	02/09/21 03:30	
			01000010	6	~9/=		02,0 ,,200	02,00721 00100	
Total PeCDD	ND		0.000052	0.000009	ug/L		02/04/21 15:49	02/09/21 03:30	1
Total PeCDE	חוא		0 000052	4	ua/l		02/04/21 15.40	02/09/21 03:30	1
	ND		0.000002	0.0000000	ug/L		02/07/21 10.40	02/00/21 00.00	1

Client Sample ID: LPBMP0003_20210129 Date Collected: 01/29/21 08:48 Date Received: 01/29/21 16:30

Lab Sample ID: 440-278184-2 Matrix: Water

5

13

Wethou: 1613B - Dioxins a		GC/HRWS)	(Continue	ea)	1194	-	D	A	D!! E
Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
Total HxCDD	0.000020	J,DX q MB	0.000052	0.0000009	ug/L		02/04/21 15:49	02/09/21 03:30	1
Total HxCDF	0.000015	J,DX	0.000052	0.0000006	ug/L		02/04/21 15:49	02/09/21 03:30	1
Total HpCDD	0.000077	MB	0.000052	0.0000008	ug/L		02/04/21 15:49	02/09/21 03:30	1
Total HpCDF	0.000028	J,DX MB	0.000052	0.0000007	ug/L		02/04/21 15:49	02/09/21 03:30	1
Isotope Dilution	%Recovery	Qualifier	Limits	1			Prepared	Analyzed	Dil Fac
13C-2,3,7,8-TCDD	66		25 - 164				02/04/21 15:49	02/09/21 03:30	1
13C-2,3,7,8-TCDF	77		24 - 169				02/04/21 15:49	02/09/21 03:30	1
13C-1,2,3,7,8-PeCDD	60		25 - 181				02/04/21 15:49	02/09/21 03:30	1
13C-1,2,3,7,8-PeCDF	66		24 - 185				02/04/21 15:49	02/09/21 03:30	1
13C-2,3,4,7,8-PeCDF	65		21 - 178				02/04/21 15:49	02/09/21 03:30	1
13C-1,2,3,4,7,8-HxCDD	62		32 - 141				02/04/21 15:49	02/09/21 03:30	1
13C-1,2,3,6,7,8-HxCDD	65		28 - 130				02/04/21 15:49	02/09/21 03:30	1
13C-1,2,3,4,7,8-HxCDF	73		26 - 152				02/04/21 15:49	02/09/21 03:30	1
13C-1,2,3,6,7,8-HxCDF	76		26 - 123				02/04/21 15:49	02/09/21 03:30	1
13C-1,2,3,7,8,9-HxCDF	76		29 - 147				02/04/21 15:49	02/09/21 03:30	1
13C-2,3,4,6,7,8-HxCDF	77		28 - 136				02/04/21 15:49	02/09/21 03:30	1
13C-1,2,3,4,6,7,8-HpCDD	59		23 - 140				02/04/21 15:49	02/09/21 03:30	1
13C-1,2,3,4,6,7,8-HpCDF	68		28 - 143				02/04/21 15:49	02/09/21 03:30	1
13C-1,2,3,4,7,8,9-HpCDF	63		26 - 138				02/04/21 15:49	02/09/21 03:30	1
13C-OCDD	61		17 - 157				02/04/21 15:49	02/09/21 03:30	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	87		35 - 197				02/04/21 15:49	02/09/21 03:30	1
Method: 200.8 - Metals (IC	CP/MS) - Total R	ecoverable							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		1.0	0.25	ug/L		02/08/21 09:37	02/08/21 18:41	1
Copper	6.4		2.0	0.50	ug/L		02/08/21 09:37	02/08/21 18:41	1
Lead	1.2		1.0	0.50	ug/L		02/08/21 09:37	02/08/21 18:41	1
Method: 200.8 - Metals (IC	CP/MS) - Dissolv	ved							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		1.0	0.25	ug/L		02/01/21 09:17	02/01/21 11:25	1
Copper	5.8		2.0	0.50	ug/L		02/01/21 09:17	02/01/21 11:25	1
Lead	ND		1.0	0.50	ug/L		02/01/21 09:17	02/01/21 11:25	1
Method: 245.1 - Mercury ((CVAA)								
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.10	ug/L		02/09/21 11:44	02/09/21 17:02	1
Method: 245.1 - Mercury (CVAA) - Dissolv	/ed							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.10	ug/L		02/09/21 11:33	02/09/21 16:44	1
General Chemistry	-	-	-				_		
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	6.6		1.1	0.53	mg/L			02/02/21 14:28	1

Client Sample ID: LPBMP0003_20210129 Date Collected: 01/29/21 08:48 Date Received: 01/29/21 16:30

Lab Sample ID: 440-278184-2 Matrix: Water

Lab Sample ID: 440-278184-3

ix: Water

Analyte	Result (Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Clay(less than 0.00391 mm)	3.30		0.01	0.01	%			02/05/21 17:52	1
Coarse Sand (0.5mm to 1mm)	ND		0.01	0.01	%			02/05/21 17:52	1
Fine Sand (0.125 to 0.25mm)	53.42		0.01	0.01	%			02/05/21 17:52	1
Gravel (greater than 2 mm)	ND		0.01	0.01	%			02/05/21 17:52	1
Medium Sand (0.25 to 0.5 mm)	ND		0.01	0.01	%			02/05/21 17:52	1
Silt (0.00391 to 0.0625mm)	18.59		0.01	0.01	%			02/05/21 17:52	1
Total Silt and Clay (0 to 0.0626mm)	21.88		0.01	0.01	%			02/05/21 17:52	1
Very Coarse Sand (1 to 2mm)	ND		0.01	0.01	%			02/05/21 17:52	1
Very Fine Sand (0.0625 to 0.125 mm)	24.70		0.01	0.01	%			02/05/21 17:52	1

Client Sample ID: LPBMP0004_20210129 Date Collected: 01/29/21 08:52

Date Received: 01/29/21 16:30

Method: 1613B - Dioxins and Furans (HRGC/HRMS) Analvte Result Qualifier RL EDL Unit D Prepared Analyzed Dil Fac 02/04/21 15:49 02/09/21 04:18 2,3,7,8-TCDD ND 0.000010 0.0000006 ug/L 1 3 02/04/21 15:49 02/09/21 04:18 0.000052 0.0000009 1,2,3,7,8-PeCDD 0.0000030 J,DX ug/L 3 1,2,3,7,8-PeCDF ND 0.000052 0.000007 02/04/21 15:49 02/09/21 04:18 ug/L 1 8 2,3,4,7,8-PeCDF ND 0.000052 0.000008 02/04/21 15:49 02/09/21 04:18 ug/L 1 6 1,2,3,4,7,8-HxCDD 0.0000054 J,DX MB 0.000052 0.0000011 ug/L 02/04/21 15:49 02/09/21 04:18 1 0.000052 0.0000011 ug/L 02/04/21 15:49 02/09/21 04:18 1,2,3,6,7,8-HxCDD 0.0000034 J,DX 1 1 1,2,3,7,8,9-HxCDD 0.0000044 J,DX 0.000052 0.0000009 ug/L 02/04/21 15:49 02/09/21 04:18 8 0.000052 0.0000007 ug/L 02/04/21 15:49 02/09/21 04:18 1,2,3,4,7,8-HxCDF 0.0000035 J,DX 1 4 0.0000006 ug/L 0.000052 02/04/21 15:49 02/09/21 04:18 1,2,3,6,7,8-HxCDF 0.0000030 J,DX 1 7 02/04/21 15:49 02/09/21 04:18 1,2,3,7,8,9-HxCDF 0.0000025 J,DX q 0.000052 0.0000005 ua/L 1 9 2,3,4,6,7,8-HxCDF 0.0000038 J,DX 0.000052 0.000006 ug/L 02/04/21 15:49 02/09/21 04:18 1 0.000023 J,DX MB 0.000052 0.000009 ug/L 02/04/21 15:49 02/09/21 04:18 1,2,3,4,6,7,8-HpCDD 1 0 0.000052 0.0000007 02/04/21 15:49 02/09/21 04:18 1,2,3,4,6,7,8-HpCDF 0.000011 J,DX ug/L 1 7 8000000.0 02/04/21 15:49 02/09/21 04:18 0.000052 1,2,3,4,7,8,9-HpCDF 0.0000030 J,DX q ug/L 1 8 OCDD 0.00017 MB 0.00010 0.0000017 ug/L 02/04/21 15:49 02/09/21 04:18 1 OCDF 0.00010 0.0000011 ug/L 02/04/21 15:49 02/09/21 04:18 0.000017 J,DX q MB 1 **Total TCDD** 0.000010 0.0000006 02/04/21 15:49 02/09/21 04:18 0.0000094 J,DX MB ug/L 1 3 **Total TCDF** 0.0000014 J,DX 0.000010 0.0000004 ug/L 02/04/21 15:49 02/09/21 04:18 1 02/04/21 15:49 02/09/21 04:18 **Total PeCDD** 0.0000030 J,DX 0.000052 0.000009 ug/L 1 3 Total PeCDF ND 0.000052 02/04/21 15:49 02/09/21 04:18 0.0000007 ug/L 1 8

Eurofins Calscience Irvine

Matrix: Water

Client Sample ID: LPBMP0004_20210129 Date Collected: 01/29/21 08:52 Date Received: 01/29/21 16:30

Method: 1613B - Dioxins and	Furans (HR	GC/HRMS)	(Continue	ed)					
Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
Total HxCDD	0.000018	J,DX q MB	0.000052	0.0000009	ug/L		02/04/21 15:49	02/09/21 04:18	1
Total HxCDF	0.000015	J,DX q	0.000052	0.0000005	ug/L		02/04/21 15:49	02/09/21 04:18	1
Total HpCDD	0.000048	J,DX MB	0.000052	0.0000009	ug/L		02/04/21 15:49	02/09/21 04:18	1
Total HpCDF	0.000019	J,DX q MB	0.000052	0.0000007	ug/L		02/04/21 15:49	02/09/21 04:18	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C-2,3,7,8-TCDD	69		25 - 164				02/04/21 15:49	02/09/21 04:18	1
13C-2,3,7,8-TCDF	82		24 - 169				02/04/21 15:49	02/09/21 04:18	1
13C-1,2,3,7,8-PeCDD	63		25 - 181				02/04/21 15:49	02/09/21 04:18	1
13C-1,2,3,7,8-PeCDF	69		24 - 185				02/04/21 15:49	02/09/21 04:18	1
13C-2,3,4,7,8-PeCDF	69		21 - 178				02/04/21 15:49	02/09/21 04:18	1
13C-1,2,3,4,7,8-HxCDD	59		32 - 141				02/04/21 15:49	02/09/21 04:18	1
13C-1,2,3,6,7,8-HxCDD	62		28 - 130				02/04/21 15:49	02/09/21 04:18	1
13C-1,2,3,4,7,8-HxCDF	69		26 - 152				02/04/21 15:49	02/09/21 04:18	1
13C-1,2,3,6,7,8-HxCDF	72		26 - 123				02/04/21 15:49	02/09/21 04:18	1
13C-1,2,3,7,8,9-HxCDF	71		29 - 147				02/04/21 15:49	02/09/21 04:18	1
13C-2,3,4,6,7,8-HxCDF	74		28 - 136				02/04/21 15:49	02/09/21 04:18	1
13C-1,2,3,4,6,7,8-HpCDD	56		23 - 140				02/04/21 15:49	02/09/21 04:18	1
13C-1,2,3,4,6,7,8-HpCDF	64		28 - 143				02/04/21 15:49	02/09/21 04:18	1
13C-1,2,3,4,7,8,9-HpCDF	58		26 - 138				02/04/21 15:49	02/09/21 04:18	1
13C-OCDD	56		17 - 157				02/04/21 15:49	02/09/21 04:18	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	96		35 - 197				02/04/21 15:49	02/09/21 04:18	1

Method: 1613B - Dioxins and Furans (HRGC/HRMS) - RA

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDF	ND		0.000010	0.000007	ug/L		02/04/21 15:49	02/12/21 15:32	1
				4					
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C-2,3,7,8-TCDF	73		24 - 169				02/04/21 15:49	02/12/21 15:32	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	98		35 - 197				02/04/21 15:49	02/12/21 15:32	1
- Method: 200.8 - Metals ((ICP/MS) - Total R	ecoverable	•						
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		1.0	0.25	ug/L		02/08/21 09:37	02/08/21 18:44	1

Copper	5.2	2.0	0.50	ug/L		02/08/21 09:37	02/08/21 18:44	1
Lead	ND	1.0	0.50	ug/L		02/08/21 09:37	02/08/21 18:44	1
_ Method: 200.8 - Meta	Is (ICP/MS) - Dissolved							
Analyte	Result Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND	1.0	0.25	ug/L		02/01/21 09:17	02/01/21 11:27	1
Conner		0.0	0.50			00/04/04 00:47	00/01/01 11:07	1
Copper	4.7	2.0	0.50	ug/L		02/01/21 09:17	02/01/21 11:27	1

2.0

Job ID: 440-278184-1

Matrix: Water

Lab Sample ID: 440-278184-3

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Client Sample ID: LPBMP0004_20210129 Date Collected: 01/29/21 08:52 Date Received: 01/29/21 16:30

Lab Sample ID: 440-278184-3

Matrix: Water

5

Method: 245.1 - Mercury (C\	/AA)								
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.10	ug/L		02/09/21 11:44	02/09/21 17:05	1
 Method: 245.1 - Mercury (C\	/AA) - Dissolv	ved							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.10	ug/L		02/09/21 11:33	02/09/21 16:36	1
General Chemistry									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	3.3		1.0	0.50	mg/L			02/02/21 14:28	1

Method: D4464 - Particle Size Distribution of Catalytic Material (Laser light scattering)

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac	
Clay(less than 0.00391 mm)	ND		0.01	0.01	%			02/05/21 17:58	1	
Coarse Sand (0.5mm to 1mm)	ND		0.01	0.01	%			02/05/21 17:58	1	
Fine Sand (0.125 to 0.25mm)	ND		0.01	0.01	%			02/05/21 17:58	1	
Gravel (greater than 2 mm)	ND		0.01	0.01	%			02/05/21 17:58	1	
Medium Sand (0.25 to 0.5 mm)	ND		0.01	0.01	%			02/05/21 17:58	1	l
Silt (0.00391 to 0.0625mm)	ND		0.01	0.01	%			02/05/21 17:58	1	
Total Silt and Clay (0 to 0.0626mm)	ND		0.01	0.01	%			02/05/21 17:58	1	
Very Coarse Sand (1 to 2mm)	ND		0.01	0.01	%			02/05/21 17:58	1	
Very Fine Sand (0.0625 to 0.125 mm)	ND		0.01	0.01	%			02/05/21 17:58	1	

2/16/2021

PARTICLE SIZE SUMMARY

(ASTM D422 / D4464M)

Haley & Aldrich, Inc.	Date Sampled:	01/29/21
	Date Received:	01/30/21
	Work Order No:	440-278184
	Date Analyzed:	02/05/21
	Method:	ASTM D4464M

Project:

Sample ID	Depth ft	Description	Mean Grain Size mm	
LPBMP0002 20210129		Fine Sand	0.138	

Particle Size Distribution, wt by percent									
	Very				Very			Total	
Total	Coarse	Coarse	Medium	Fine	Fine			Silt &	
Gravel	Sand	Sand	Sand	Sand	Sand	Silt	Clay	Clay	
0.00	0.00	0.00	0.90	54.85	39.47	4.78	0.00	4.78	



V 3.0

PARTICLE SIZE SUMMARY

(ASTM D422 / D4464M)

Haley & Aldrich, Inc.	Date Sampled:	01/29/21
	Date Received:	01/30/21
	Work Order No:	440-278184
	Date Analyzed:	02/05/21
	Method:	ASTM D4464M

Project:

Sample ID	Depth ft	Description	Mean Grain Size mm
LPBMP0003 20210129		Very Fine Sand	0.115

Particle Size Distribution, wt by percent									
	Very				Very			Total	
Total	Coarse	Coarse	Medium	Fine	Fine			Silt &	
Gravel	Sand	Sand	Sand	Sand	Sand	Silt	Clay	Clay	
0.00	0.00	0.00	0.00	53.42	24.70	18.59	3.30	21.88	





C:\LS13320\440-278184C3_ 440-278184C3_5 Feb 2021_	5 Feb 2021_17.5 17.58.14.\$ls	8.14.\$ls
440-278184C3		
440-278184C3		
C4LT		
17		
ASTM D4464M , LPSA 1		
Fraunhofer.rf780d		
3.83%		
Aqueous Liquid Module		
17:57 5 Feb 2021	Run length:	60 seconds
49	-	
2%		
Water		
6.01	Firmware:	4.00
	C:\LS13320\440-278184C3_ 440-278184C3_5 Feb 2021_ 440-278184C3 440-278184C3 C4LT 17 ASTM D4464M , LPSA 1 Fraunhofer.rf780d 3.83% Aqueous Liquid Module 17:57 5 Feb 2021 49 2% Water 6.01	C:\LS13320\440-278184C3_5 Feb 2021_17.5 440-278184C3_5 Feb 2021_17.58.14.\$ls 440-278184C3 440-278184C3 C4LT 17 ASTM D4464M , LPSA 1 Fraunhofer.rf780d 3.83% Aqueous Liquid Module 17:57 5 Feb 2021 Run length: 49 2% Water 6.01 Firmware:



Volume:		0%						
Mean:		0.000 µm	S.D.:	0 µm				
Median:		0.000 µm	Variance:	$0 \mu m^2$				
Mean/Media	n ratio:	0.000	Skewness:	0				
Mode:		0.000 µm	Kurtosis:	0				
d ₁₀ : 0.000	μm	d ₅₀ : 0.0)00 µm	d ₉₀ :	0.000 µm			
Folk and Wa	ard Statist	ics (Phi)						
Mean:	0.00	Median:	0.00	Deviation:	0.00			
Skewness:	0.00	Kurtosis:	0.00					
<5%	<16%	<25%	<40%	<50%	<75%	<84%	<95%	
0.000 µm	0.000 µ	ım 0.000 μm	ο 0.000 μm	0.000 µ	um 0.000 μm	0.000 µm	0.000 µm	



Particle	440-278184C
Diameter	3 5 Feb
μm	2021 17.58
	.14.\$ls
	Volume
	%
0.04	0
0.4	0
1.95	0
3.91	0
62.5	0
125	0
250	0
500	0
1000	0
2000	

440-278184C3	_ 5 Feb 2021_1	7.58.14.\$ls				
Channel	Diff.	Channel	Diff.	Channel	Diff.	
Diameter	Volume	Diameter	Volume	Diameter	Volume	
(Lower)	%	(Lower)	%	(Lower)	%	
μm		μm		μm		
0.375	0	24.95	0	1660	0	
0.412	0	27.39	0	1822	0	
0.452	0	30.07	0	2000		
0.496	0	33.01	0			
0.545	0	36.24	0			
0.598	0	39.78	0			
0.657	0	43.67	0			
0.721	0	47.94	0			
0.791	0	52.63	0			
0.869	0	57.77	0			
0.954	0	63.42	0			
1.047	0	69.62	0			
1.149	0	76.43	0			
1.261	0	83.90	0			
1.385	0	92.10	0			
1.520	0	101.1	0			
1.669	0	111.0	0			
1.832	0	121.8	0			
2.011	0	133.7	0			
2.208	0	140.8	0			
2.423	0	176.0	0			
2.000	0	170.9	0			
2.920	0	213.2	0			
3 519	0	234.1	0			
3 863	0	256.9	0			
4 241	0	282.1	0			
4.656	Õ	309.6	0 0			
5.111	0 0	339.9	0 0			
5.611	0	373.1	0			
6.159	0	409.6	0			
6.761	0	449.7	0			
7.422	0	493.6	0			
8.148	0	541.9	0			
8.944	0	594.9	0			
9.819	0	653.0	0			
10.78	0	716.9	0			
11.83	0	786.9	0			
12.99	0	863.9	0			
14.26	0	948.3	0			
15.65	0	1041	0			
17.18	0	1143	0			
18.86	0	1255	0			
20.71	0	1377	0			
22.73	0	1512	0			

Method Summary

Client: Haley & Aldrich, Inc. Project/Site: BMP

Method	Method Description	Protocol	Laboratory
1613B	Dioxins and Furans (HRGC/HRMS)	EPA	TAL SAC
200.8	Metals (ICP/MS)	EPA	TAL IRV
245.1	Mercury (CVAA)	EPA	TAL IRV
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL IRV
D4464	Particle Size Distribution of Catalytic Material (Laser light scattering)	ASTM	ECL 1
1613B	Separatory Funnel (L/L) Extraction with Soxhlet Extraction of Dioxin and Furans	EPA	TAL SAC
200.2	Preparation, Total Recoverable Metals	EPA	TAL IRV
245.1	Preparation, Mercury	EPA	TAL IRV
FILTRATION	Sample Filtration	None	TAL IRV

Protocol References:

ASTM = ASTM International

EPA = US Environmental Protection Agency

None = None

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

Laboratory References:

ECL 1 = Eurofins Calscience LLC Lincoln, 7440 Lincoln Way, Garden Grove, CA 92841, TEL (714)895-5494 TAL IRV = Eurofins Calscience Irvine, 17461 Derian Ave, Suite 100, Irvine, CA 92614-5817, TEL (949)261-1022 TAL SAC = Eurofins TestAmerica, Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Initial

Amount

956.3 mL

956.3 mL

100 mL

25 mL

25 mL

100 mL

20 mL

20 mL

1000 mL

Final

Amount

20 uL

20 uL

100 mL

25 mL

25 mL

100 mL

30 mL

30 mL

1000 mL

Batch

Number

458769

461724

458769

459925

637490

637494

637525

638122

638176

637490

638238

638349

638239

638349

637676

127713

Dil

1

1

1

1

1

1

1

1

Factor

Run

RA

RA

Prep Type

Total/NA

Total/NA

Total/NA

Total/NA

Dissolved

Dissolved

Dissolved

Dissolved

Dissolved

Dissolved

Total/NA

Total/NA

Total/NA

Total/NA

Total Recoverable

Total Recoverable

Client Sample ID: LPBMP0002_20210129 Date Collected: 01/29/21 08:35 Date Received: 01/29/21 16:30

Batch

Method

1613B

1613B

1613B

1613B

200.2

200.8

200.2

200.8

245.1

245.1

245.1

245.1

D4464

SM 2540D

FILTRATION

FILTRATION

Batch

Туре

Prep

Prep

Prep

Prep

Prep

Prep

Analysis

Analysis

Filtration

Analysis

Analysis

Filtration

Analysis

Analysis

Analysis

Analysis

Lab

TAL SAC

TAL SAC

TAL SAC

TAL SAC

TAL IRV

ECL 1

Lab Sample ID: 440-278184-1 Matrix: Water

Analyst

FC

Prepared

or Analyzed

02/04/21 15:49

02/12/21 14:54 SMA

02/04/21 15:49 FC

02/09/21 02:42 KSS

02/01/21 08:57 LZY7

02/01/21 09:17 LZY7

02/01/21 11:18 Y2WS

02/08/21 09:37 LZY7

02/08/21 18:39 SQ5O

02/01/21 08:57 LZY7

02/09/21 11:33 C0YH

02/09/21 16:42 C0YH

02/09/21 11:44 C0YH

02/09/21 16:51 C0YH

02/02/21 14:28 ZL7L

02/05/21 17:46 C4LT

Client Sample ID: LPBMP0003_20210129 Date Collected: 01/29/21 08:48 Date Received: 01/29/21 16:30

Lab Sample ID: 440-278184-2 Matrix: Water

15

_	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	1613B			964.5 mL	20 uL	458769	02/04/21 15:49	FC	TAL SAC
Total/NA	Analysis	1613B		1			459925	02/09/21 03:30	KSS	TAL SAC
Dissolved	Filtration	FILTRATION			100 mL	100 mL	637490	02/01/21 08:57	LZY7	TAL IRV
Dissolved	Prep	200.2			25 mL	25 mL	637494	02/01/21 09:17	LZY7	TAL IRV
Dissolved	Analysis	200.8		1			637525	02/01/21 11:25	Y2WS	TAL IRV
Total Recoverable	Prep	200.2			25 mL	25 mL	638122	02/08/21 09:37	LZY7	TAL IRV
Total Recoverable	Analysis	200.8		1			638176	02/08/21 18:41	SQ5O	TAL IRV
Dissolved	Filtration	FILTRATION			100 mL	100 mL	637490	02/01/21 08:57	LZY7	TAL IRV
Dissolved	Prep	245.1			20 mL	30 mL	638238	02/09/21 11:33	C0YH	TAL IRV
Dissolved	Analysis	245.1		1			638349	02/09/21 16:44	C0YH	TAL IRV
Total/NA	Prep	245.1			20 mL	30 mL	638239	02/09/21 11:44	C0YH	TAL IRV
Total/NA	Analysis	245.1		1			638349	02/09/21 17:02	C0YH	TAL IRV
Total/NA	Analysis	SM 2540D		1	950 mL	1000 mL	637676	02/02/21 14:28	ZL7L	TAL IRV
Total/NA	Analysis	D4464		1			127713	02/05/21 17:52	C4LT	ECL 1

Client Sample ID: LPBMP0004_20210129 Date Collected: 01/29/21 08:52 Date Received: 01/29/21 16:30

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	1613B	RA		962.2 mL	20 uL	458769	02/04/21 15:49	FC	TAL SAC
Total/NA	Analysis	1613B	RA	1			461724	02/12/21 15:32	SMA	TAL SAC

Eurofins Calscience Irvine

Lab Sample ID: 440-278184-3

Matrix: Water

Client Sample ID: LPBMP0004_20210129 Date Collected: 01/29/21 08:52 Date Received: 01/29/21 16:30

5

6 7 8

Lab Sample ID: 440-278184-3 Matrix: Water

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	1613B			962.2 mL	20 uL	458769	02/04/21 15:49	FC	TAL SAC
Total/NA	Analysis	1613B		1			459925	02/09/21 04:18	KSS	TAL SAC
Dissolved	Filtration	FILTRATION			100 mL	100 mL	637490	02/01/21 08:57	LZY7	TAL IRV
Dissolved	Prep	200.2			25 mL	25 mL	637494	02/01/21 09:17	LZY7	TAL IRV
Dissolved	Analysis	200.8		1			637525	02/01/21 11:27	Y2WS	TAL IRV
Total Recoverable	Prep	200.2			25 mL	25 mL	638122	02/08/21 09:37	LZY7	TAL IRV
Total Recoverable	Analysis	200.8		1			638176	02/08/21 18:44	SQ5O	TAL IRV
Dissolved	Filtration	FILTRATION			100 mL	100 mL	637490	02/01/21 08:57	LZY7	TAL IRV
Dissolved	Prep	245.1			20 mL	30 mL	638238	02/09/21 11:33	C0YH	TAL IRV
Dissolved	Analysis	245.1		1			638349	02/09/21 16:36	C0YH	TAL IRV
Total/NA	Prep	245.1			20 mL	30 mL	638239	02/09/21 11:44	C0YH	TAL IRV
Total/NA	Analysis	245.1		1			638349	02/09/21 17:05	C0YH	TAL IRV
Total/NA	Analysis	SM 2540D		1	1000 mL	1000 mL	637676	02/02/21 14:28	ZL7L	TAL IRV
Total/NA	Analysis	D4464		1			127713	02/05/21 17:58	C4LT	ECL 1

Laboratory References:

ECL 1 = Eurofins Calscience LLC Lincoln, 7440 Lincoln Way, Garden Grove, CA 92841, TEL (714)895-5494 TAL IRV = Eurofins Calscience Irvine, 17461 Derian Ave, Suite 100, Irvine, CA 92614-5817, TEL (949)261-1022

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

Method: 1613B - Dioxins and Furans (HRGC/HRMS)

Lab Sample ID: MB 320-458769/1-A **Matrix: Water**

Client Sample ID: Method Blank Analysis Batch: 459925 MB MB Result Qualifier Analyte RL EDL Unit D 2,3,7,8-TCDD 0.000010 0.0000005 ug/L ND

2,3,7,8-TCDD	ND		0.000010	0.0000005	ug/L	02/04/21 15:49	02/09/21 01:06	1
2,3,7,8-TCDF	ND		0.000010	6 0.0000003	ug/L	02/04/21 15:49	02/09/21 01:06	1
1,2,3,7,8-PeCDD	ND		0.000050	1 0.0000007	ug/L	02/04/21 15:49	02/09/21 01:06	1
1,2,3,7,8-PeCDF	ND		0.000050	3 0.0000006	ug/L	02/04/21 15:49	02/09/21 01:06	1
2,3,4,7,8-PeCDF	ND		0.000050	1 0.0000006	ug/L	02/04/21 15:49	02/09/21 01:06	1
1,2,3,4,7,8-HxCDD	0.00000199	J,DX	0.000050	9 0.0000007	ug/L	02/04/21 15:49	02/09/21 01:06	1
1,2,3,6,7,8-HxCDD	ND		0.000050	7 0.0000007	ug/L	02/04/21 15:49	02/09/21 01:06	1
1,2,3,7,8,9-HxCDD	ND		0.000050	9 0.0000007	ug/L	02/04/21 15:49	02/09/21 01:06	1
1,2,3,4,7,8-HxCDF	ND		0.000050	1 0.0000006	ug/L	02/04/21 15:49	02/09/21 01:06	1
1,2,3,6,7,8-HxCDF	ND		0.000050	5 0.0000005	ug/L	02/04/21 15:49	02/09/21 01:06	1
1,2,3,7,8,9-HxCDF	ND		0.000050	9 0.0000005	ug/L	02/04/21 15:49	02/09/21 01:06	1
2,3,4,6,7,8-HxCDF	ND		0.000050	1 0.0000005	ug/L	02/04/21 15:49	02/09/21 01:06	1
1,2,3,4,6,7,8-HpCDD	0.00000426	J,DX	0.000050	3 0.0000004	ug/L	02/04/21 15:49	02/09/21 01:06	1
1,2,3,4,6,7,8-HpCDF	ND		0.000050	8 800000008	ug/L	02/04/21 15:49	02/09/21 01:06	1
1,2,3,4,7,8,9-HpCDF	ND		0.000050	1 0.0000008	ug/L	02/04/21 15:49	02/09/21 01:06	1
	0 0000142	אחו	0.00010	4	ua/I	02/04/21 15:40	02/00/21 01:06	
OCDF	0.00000291	J.DX	0.00010	0.00000072	ug/L	02/04/21 15:49	02/09/21 01:06	1
	0.0000020.	0,270	0.00010	6		02/01/21 10110	02/00/210100	·
Total TCDD	0.00000258	J,DX	0.000010	0.0000005	ug/L	02/04/21 15:49	02/09/21 01:06	1
Total TCDF	ND		0.000010	0.0000003	ug/L	02/04/21 15:49	02/09/21 01:06	1
Total PeCDD	ND		0.000050	0.0000007	ug/L	02/04/21 15:49	02/09/21 01:06	1
Total PeCDF	ND		0.000050	0.0000006	ug/L	02/04/21 15:49	02/09/21 01:06	1
Total HxCDD	0.00000199	J,DX	0.000050	0.0000007	ug/L	02/04/21 15:49	02/09/21 01:06	1
Total HxCDF	ND		0.000050	0.0000005	ug/L	02/04/21 15:49	02/09/21 01:06	1
Total HpCDD	0.00000756	J,DX q	0.000050	0.0000004	ug/L	02/04/21 15:49	02/09/21 01:06	1
Total HpCDF	0.00000307	J,DX	0.000050	0.0000008	ug/L	02/04/21 15:49	02/09/21 01:06	1
	MB	MB		1				
Isotope Dilution	%Recoverv	Qualifier	Limits			Prepared	Analyzed	Dil Fac
13C-2,3,7,8-TCDD			25 - 164			02/04/21 15:49	02/09/21 01:06	1
13C-2,3,7,8-TCDF	86		24 - 169			02/04/21 15:49	02/09/21 01:06	1
13C-1,2,3,7,8-PeCDD	74		25 - 181			02/04/21 15:49	02/09/21 01:06	1

Job ID: 440-278184-1

Prep Type: Total/NA

Prep Batch: 458769

Analyzed

Prepared

Dil Fac

8

Limits

24 - 185

21 - 178

32 - 141

28 - 130

26 - 152

26 - 123

29 - 147

28 - 136

23 - 140

28 - 143

26 - 138

17 - 157

Limits

35 - 197

Method: 1613B - Dioxins and Furans (HRGC/HRMS) (Continued)

%Recovery

MB MB

79

80

74

76

87

90

89

91

73

81

78

75

89

%Recovery

MB MB

Qualifier

Qualifier

Lab Sample ID: MB 320-458769/1-A Matrix: Water

Analysis Batch: 459925

Isotope Dilution

13C-1,2,3,7,8-PeCDF

13C-2,3,4,7,8-PeCDF

13C-1,2,3,4,7,8-HxCDD

13C-1,2,3,6,7,8-HxCDD

13C-1,2,3,4,7,8-HxCDF

13C-1,2,3,6,7,8-HxCDF

13C-1,2,3,7,8,9-HxCDF

13C-2,3,4,6,7,8-HxCDF

13C-1,2,3,4,6,7,8-HpCDD

13C-1,2,3,4,6,7,8-HpCDF

13C-1,2,3,4,7,8,9-HpCDF

13C-OCDD

Surrogate

37CI4-2,3,7,8-TCDD

Prep Type: Total/NA

Prep Batch: 458769

Analyzed

Analyzed

Prep Type: Total/NA

Prep Batch: 458769

Client Sample ID: Method Blank

02/04/21 15:49 02/09/21 01:06

02/04/21 15:49 02/09/21 01:06

02/04/21 15:49 02/09/21 01:06

02/04/21 15:49 02/09/21 01:06

02/04/21 15:49 02/09/21 01:06

02/04/21 15:49 02/09/21 01:06

02/04/21 15:49 02/09/21 01:06

02/04/21 15:49 02/09/21 01:06

02/04/21 15:49 02/09/21 01:06

02/04/21 15:49 02/09/21 01:06

02/04/21 15:49 02/09/21 01:06

02/04/21 15:49 02/09/21 01:06

02/04/21 15:49 02/09/21 01:06

Client Sample ID: Lab Control Sample

Prepared

Prepared

Dil Fac

1

1

1

1

1

1

7 8 9 10 11

1 <u>Dil Fac</u> 1

Lab Sample ID: LCS 320-458769/2-A Matrix: Water Analysis Batch: 459925

-			Spike	LCS	LCS				%Rec.	
Analyte			Added	Result	Qualifier	Unit	D	%Rec	Limits	
2,3,7,8-TCDD			0.000200	0.000229		ug/L		115	67 _ 158	
2,3,7,8-TCDF			0.000200	0.000240		ug/L		120	75 - 158	
1,2,3,7,8-PeCDD			0.00100	0.00116		ug/L		116	70 - 142	
1,2,3,7,8-PeCDF			0.00100	0.00122		ug/L		122	80 - 134	
2,3,4,7,8-PeCDF			0.00100	0.00125		ug/L		125	68 - 160	
1,2,3,4,7,8-HxCDD			0.00100	0.00124	MB	ug/L		124	70 - 164	
1,2,3,6,7,8-HxCDD			0.00100	0.00119		ug/L		119	76_134	
1,2,3,7,8,9-HxCDD			0.00100	0.00119		ug/L		119	64 - 162	
1,2,3,4,7,8-HxCDF			0.00100	0.00120		ug/L		120	72 - 134	
1,2,3,6,7,8-HxCDF			0.00100	0.00122		ug/L		122	84 - 130	
1,2,3,7,8,9-HxCDF			0.00100	0.00117		ug/L		117	78 - 130	
2,3,4,6,7,8-HxCDF			0.00100	0.00121		ug/L		121	70 - 156	
1,2,3,4,6,7,8-HpCDD			0.00100	0.00109	MB	ug/L		109	70_140	
1,2,3,4,6,7,8-HpCDF			0.00100	0.00115		ug/L		115	82 - 122	
1,2,3,4,7,8,9-HpCDF			0.00100	0.00115		ug/L		115	78 - 138	
OCDD			0.00200	0.00210	MB	ug/L		105	78_144	
OCDF			0.00200	0.00240	MB	ug/L		120	63 - 170	
	LCS	LCS								
Isotope Dilution	%Recovery	Qualifier	Limits							
13C-2,3,7,8-TCDD	76		20 - 175							
13C-2,3,7,8-TCDF	88		22 - 152							
13C-1,2,3,7,8-PeCDD	72		21 - 227							
13C-1,2,3,7,8-PeCDF	78		21 - 192							
13C-2,3,4,7,8-PeCDF	79		13 - 328							
13C-1,2,3,4,7,8-HxCDD	75		21 - 193							
13C-1,2,3,6,7,8-HxCDD	81		25 - 163							
13C-1,2,3,4,7,8-HxCDF	90		19 - 202							

Job ID: 440-278184-1

8

Method: 1613B - Dioxins and Furans (HRGC/HRMS) (Continued)

Lab Sample ID: LCS 320-4 Matrix: Water	458769/2-A			Client Sample ID: Lab Control Sample Prep Type: Total/NA
Analysis Batch: 459925				Prep Batch: 458769
	LCS	LCS		
Isotope Dilution	%Recovery	Qualifier	Limits	
13C-1,2,3,6,7,8-HxCDF	91		21 - 159	
13C-1,2,3,7,8,9-HxCDF	93		17 - 205	
13C-2,3,4,6,7,8-HxCDF	93		22 - 176	
13C-1,2,3,4,6,7,8-HpCDD	77		26 - 166	
13C-1,2,3,4,6,7,8-HpCDF	83		21 - 158	
13C-1,2,3,4,7,8,9-HpCDF	81		20 - 186	
13C-OCDD	77		13 - 199	
	LCS	LCS		
Surrogate	%Recovery	Qualifier	Limits	
37Cl4-2,3,7,8-TCDD	89		31 - 191	

Method: 200.8 - Metals (ICP/MS)

Lab Sample ID: MB 440-638122/1-A **Matrix: Water** Analysis Batch: 638176

	MB	MB							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		1.0	0.25	ug/L		02/08/21 09:37	02/08/21 16:45	1
Copper	ND		2.0	0.50	ug/L		02/08/21 09:37	02/08/21 16:45	1
Lead	ND		1.0	0.50	ug/L		02/08/21 09:37	02/08/21 16:45	1

Lab Sample ID: LCS 440-638122/2-A **Matrix: Water**

Analysis Batch: 638176

-	Spike	LCS	LCS				%Rec.	
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	
Cadmium	80.0	76.9		ug/L		96	85 - 115	
Copper	80.0	77.2		ug/L		97	85 - 115	
Lead	80.0	76.4		ug/L		96	85 - 115	

Lab Sample ID: 440-278162-B-1-C MS Matrix: Water

Analysis Batch: 638176

	Sample	Sample	Spike	MS	MS				%Rec.
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits
Cadmium	ND		80.0	75.4		ug/L		94	70 - 130
Copper	10		80.0	83.8		ug/L		92	70 - 130
Lead	2.3		80.0	76.7		ug/L		93	70 - 130

Lab Sample ID: 440-278162-B-1-D MSD Motrix: Motor

viatrix: water								гер ту	pe: Total I	Recove	rable
Analysis Batch: 638176								Prep Ba	38122		
	Sample	Sample	Spike	MSD	MSD				%Rec.		RPD
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Cadmium	ND		80.0	76.1		ug/L		95	70 - 130	1	20
Copper	10		80.0	85.6		ug/L		94	70 - 130	2	20
Lead	2.3		80.0	76.8		ug/L		93	70 - 130	0	20

Prep Batch: 638122

Client Sample ID: Method Blank

Prep Type: Total Recoverable

Client Sample ID: Lab Control Sample Prep Type: Total Recoverable Prep Batch: 638122

Client Sample ID: Matrix Spike

Prep Type: Total Recoverable

Prep Batch: 638122

Prep	Type:	Tota	al Rec	overable
	P	rep	Batch	: 638122

Client Sample ID: Matrix Spike Duplicate

Eurofins Calscience Irvine

Prep Type: Dissolved

Prep Type: Dissolved

Client Sample ID: Lab Control Sample

Client Sample ID: LPBMP0002_20210129

Client Sample ID: LPBMP0002_20210129

Client Sample ID: Method Blank Prep Type: Dissolved Prep Batch: 637494

8

Method: 200.8 - Metals (ICP/MS) (Continued)

Matrix: Water Analysis Batch: 637525							Р	rep Type: Dis Prep Batch: (solved 637494
-	MB	МВ							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		1.0	0.25	ug/L		02/01/21 09:17	02/01/21 11:13	1
Copper	ND		2.0	0.50	ug/L		02/01/21 09:17	02/01/21 11:13	1
Lead	ND		1.0	0.50	ug/L		02/01/21 09:17	02/01/21 11:13	1

Lab Sample ID: LCS 440-637490/2-B Matrix: Water Analysis Batch: 637525

Lab Sample ID: MB 440-637490/1-B

Analysis Batch: 637525							Prep Ba	tch: 637494
	Spike	LCS	LCS				%Rec.	
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	
Cadmium	80.0	73.4		ug/L		92	85 - 115	
Copper	80.0	72.2		ug/L		90	85 - 115	
Lead	80.0	71.2		ug/L		89	85 - 115	

Lab Sample ID: 440-278184-1 MS Matrix: Water Analysis Batch: 637525

Analysis Batch: 637525									Prep Batch: 637494
	Sample	Sample	Spike	MS	MS				%Rec.
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits
Cadmium	ND		80.0	75.0		ug/L		94	70 - 130
Copper	8.7		80.0	84.2		ug/L		94	70 - 130
Lead	0.57	J,DX	80.0	72.2		ug/L		90	70 - 130

Lab Sample ID: 440-278184-1 MSD Matrix: Water

Matrix: Water Analysis Batch: 637525									Prep Type Prep Ba	e: Diss atch: 63	olved 37494
-	Sample	Sample	Spike	MSD	MSD				%Rec.		RPD
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Cadmium	ND		80.0	73.7		ug/L		92	70 - 130	2	20
Copper	8.7		80.0	83.0		ug/L		93	70 - 130	1	20
_Lead	0.57	J,DX	80.0	73.4		ug/L		91	70 - 130	2	20

Method: 245.1 - Mercury (CVAA)

Lab Sample ID: MB 440-638239/1-A Matrix: Water Analysis Batch: 638349 MB MB									Clie	ent Samp	ole ID: Method Prep Type: To Prep Batch:	d Blank otal/NA 638239
Analyte	MB Result	MB Qualifier		RL		MDL	Unit	D	Р	repared	Analvzed	Dil Fac
Mercury	ND			0.20		0.10	ug/L	=	02/0)9/21 11:44	02/09/21 16:47	1
Lab Sample ID: LCS 440-638 Matrix: Water Analysis Batch: 638349	239/2-A							Client	Sa	mple ID:	Lab Control S Prep Type: To Prep Batch:	Sample otal/NA 638239
-			Spike		LCS	LCS					%Rec.	
Analyte			Added		Result	Qua	lifier	Unit	D	%Rec	Limits	
Mercury			6.00		5.59			ug/L		93	85 - 115	

Job ID: 440-278184-1

 Lab Sample ID: 440-278184	4-1 MS						Client	Samp	le ID: LI	PBMP000	2 202	10129
Matrix: Water										Prep Tv	pe: To	tal/NA
Analysis Batch: 638349										Prep Ba	atch: 6	38239
· ·····, ··· · ··· · · · · · · · · · ·	Sample	Sample	Spike		MS	MS				%Rec.		
Analyte	Result	Qualifier	Added	F	Result	Qualifier	Unit	D	%Rec	Limits		
Mercury	ND		6.00		5.72		ug/L		95	75 - 125		
Lab Sample ID: 440-278184	L-1 MSD						Client	Samn	le ID: LI	PBMP000	2 202	10129
Matrix: Water								•••••		Prep Tv	ne: To	tal/NA
Analysis Batch: 638349										Pren Ba	atch: 6	38239
	Sample	Sample	Spike		MSD	MSD				%Rec.		RPD
Analvte	Result	Qualifier	Added	F	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limi
Mercury	ND		6.00		5.49		ug/L		92	75 - 125	4	20
Lab Sample ID: MR 440.63	7490/1_D							Cliv	ont Sam		othod	Blank
Matrix: Water	1430/1-D							Circ		Dron Tyn		Dialik
Analysis Batch: 638349										Bron Br	otch: 6	28228
Analysis Batch. 030349										гіер Ба	aten. o	50250
Analyte	Re	sult Qualifier		RI		MDI Unit		пр	ronarod	Δnalv:	bot	Dil Fac
Moreup				0.20				$\frac{D}{2} \frac{F}{020}$	10/21 11:23		16·21 -	1
Analysis Batch: 638349			Spike		LCS	LCS	11:0:14		% D oo	%Rec.	atch: 6	38238
Analyte			Added		F 71	Qualifier		D	%Rec	Limits		
			0.00		5.71		ug/L		95	00-110		
Lab Sample ID: 440-278184	1-3 MS						Client	Samp	le ID: Ll	PBMP000	4_202	10129
Matrix: Water										Prep Typ	e: Diss	solved
Analysis Batch: 638349										Prep Ba	atch: 6	38238
	Sample	Sample	Spike		MS	MS				%Rec.		
Analyte	Result	Qualifier	Added	F	Result	Qualifier	Unit	D	%Rec	Limits		
Mercury	ND		6.00		5.52		ug/L		92	75 - 125		
Lab Sample ID: 440-278184	I-3 MSD						Client	Samp	le ID: Ll	PBMP000	4_202	10129
Matrix: Water										Prep Typ	e: Diss	solved
Analysis Batch: 638349										Prep Ba	atch: 6	38238
	Sample	Sample	Spike		MSD	MSD				%Rec.		RPD
Analyte	Result	Qualifier	Added	F	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Mercury	ND		6.00		5.60		ug/L		93	75 - 125	1	20
lethod: SM 2540D - So	lids, Tota	I Suspend	led (TS	SS)								
Lab Sample ID: MB 440-63	7676/1							Clie	ent Sam	ple ID: M	ethod	Blank
Matrix: Water										Prep Tv	pe: To	tal/NA
Analysis Ratch: 627676											-	

	MB	MB							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		1.0	0.50	mg/L			02/02/21 14:28	1

Job ID: 440-278184-1

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

Lab Sample ID: LCS 440-6 Matrix: Water Analysis Batch: 637676	37676/2					Clie	ent Sai	nple ID	: Lab Cor Prep Ty	ntrol Sa pe: Tot	mple al/NA
			Spike	LCS	LCS				%Rec.		
Analyte			Added	Result	Qualifier	Unit	D	%Rec	Limits		
Total Suspended Solids			1000	1030		mg/L		103	85 - 115		
Lab Sample ID: 440-27818 Matrix: Water Analysis Batch: 637676	1-B-1 DU							Client	Sample I Prep Ty	D: Dup pe: Tot	licate al/NA
-	Sample	Sample		DU	DU						RPD
Analyte	Result	Qualifier		Result	Qualifier	Unit	D			RPD	Limit
Total Suspended Solids	150			147		mg/L				0.7	10

Specialty Organics

Prep Batch: 458769

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-278184-1 - RA	LPBMP0002_20210129	Total/NA	Water	1613B	
440-278184-1	LPBMP0002_20210129	Total/NA	Water	1613B	
440-278184-2	LPBMP0003_20210129	Total/NA	Water	1613B	
440-278184-3 - RA	LPBMP0004_20210129	Total/NA	Water	1613B	
440-278184-3	LPBMP0004_20210129	Total/NA	Water	1613B	
MB 320-458769/1-A	Method Blank	Total/NA	Water	1613B	
LCS 320-458769/2-A	Lab Control Sample	Total/NA	Water	1613B	
Analysis Batch: 4599	925				
Lab Sample ID	Client Sample ID	Ргер Туре	Matrix	Method	Prep Batch
440-278184-1	LPBMP0002_20210129	Total/NA	Water	1613B	458769
440-278184-2	LPBMP0003_20210129	Total/NA	Water	1613B	458769
440-278184-3	LPBMP0004_20210129	Total/NA	Water	1613B	458769
MB 320-458769/1-A	Method Blank	Total/NA	Water	1613B	458769
LCS 320-458769/2-A	Lab Control Sample	Total/NA	Water	1613B	458769
Analysis Batch: 461	724				
Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-278184-1 - RA	LPBMP0002_20210129	Total/NA	Water	1613B	458769
440-278184-3 - RA	LPBMP0004_20210129	Total/NA	Water	1613B	458769

Metals

Filtration Batch: 637490

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-278184-1	LPBMP0002_20210129	Dissolved	Water	FILTRATION	
440-278184-2	LPBMP0003_20210129	Dissolved	Water	FILTRATION	
440-278184-3	LPBMP0004_20210129	Dissolved	Water	FILTRATION	
MB 440-637490/1-B	Method Blank	Dissolved	Water	FILTRATION	
MB 440-637490/1-D	Method Blank	Dissolved	Water	FILTRATION	
LCS 440-637490/2-B	Lab Control Sample	Dissolved	Water	FILTRATION	
LCS 440-637490/2-D	Lab Control Sample	Dissolved	Water	FILTRATION	
440-278184-1 MS	LPBMP0002_20210129	Dissolved	Water	FILTRATION	
440-278184-1 MSD	LPBMP0002_20210129	Dissolved	Water	FILTRATION	
440-278184-3 MS	LPBMP0004_20210129	Dissolved	Water	FILTRATION	
440-278184-3 MSD	LPBMP0004_20210129	Dissolved	Water	FILTRATION	

Prep Batch: 637494

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-278184-1	LPBMP0002_20210129	Dissolved	Water	200.2	637490
440-278184-2	LPBMP0003_20210129	Dissolved	Water	200.2	637490
440-278184-3	LPBMP0004_20210129	Dissolved	Water	200.2	637490
MB 440-637490/1-B	Method Blank	Dissolved	Water	200.2	637490
LCS 440-637490/2-B	Lab Control Sample	Dissolved	Water	200.2	637490
440-278184-1 MS	LPBMP0002_20210129	Dissolved	Water	200.2	637490
440-278184-1 MSD	LPBMP0002_20210129	Dissolved	Water	200.2	637490

Analysis Batch: 637525

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-278184-1	LPBMP0002_20210129	Dissolved	Water	200.8	637494
440-278184-2	LPBMP0003_20210129	Dissolved	Water	200.8	637494

Metals (Continued)

Analysis Batch: 637525 (Continued)

Lab Sample ID 440-278184-3	Client Sample ID LPBMP0004_20210129	Prep Type Dissolved	Matrix Water	Method 200.8	Prep Batch 637494
MB 440-637490/1-B	Method Blank	Dissolved	Water	200.8	637494
LCS 440-637490/2-B	Lab Control Sample	Dissolved	Water	200.8	637494
440-278184-1 MS	LPBMP0002_20210129	Dissolved	Water	200.8	637494
440-278184-1 MSD	LPBMP0002_20210129	Dissolved	Water	200.8	637494

Prep Batch: 638122

Lab Sample ID	Client Sample ID	Ргер Туре	Matrix	Method	Prep Batch
440-278184-1	LPBMP0002_20210129	Total Recoverable	Water	200.2	
440-278184-2	LPBMP0003_20210129	Total Recoverable	Water	200.2	
440-278184-3	LPBMP0004_20210129	Total Recoverable	Water	200.2	
MB 440-638122/1-A	Method Blank	Total Recoverable	Water	200.2	
LCS 440-638122/2-A	Lab Control Sample	Total Recoverable	Water	200.2	
440-278162-B-1-C MS	Matrix Spike	Total Recoverable	Water	200.2	
440-278162-B-1-D MSD	Matrix Spike Duplicate	Total Recoverable	Water	200.2	

Analysis Batch: 638176

Lab Sample ID	Client Sample ID	Ргер Туре	Matrix	Method	Prep Batch
440-278184-1	LPBMP0002_20210129	Total Recoverable	Water	200.8	638122
440-278184-2	LPBMP0003_20210129	Total Recoverable	Water	200.8	638122
440-278184-3	LPBMP0004_20210129	Total Recoverable	Water	200.8	638122
MB 440-638122/1-A	Method Blank	Total Recoverable	Water	200.8	638122
LCS 440-638122/2-A	Lab Control Sample	Total Recoverable	Water	200.8	638122
440-278162-B-1-C MS	Matrix Spike	Total Recoverable	Water	200.8	638122
440-278162-B-1-D MSD	Matrix Spike Duplicate	Total Recoverable	Water	200.8	638122

Prep Batch: 638238

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-278184-1	LPBMP0002_20210129	Dissolved	Water	245.1	637490
440-278184-2	LPBMP0003_20210129	Dissolved	Water	245.1	637490
440-278184-3	LPBMP0004_20210129	Dissolved	Water	245.1	637490
MB 440-637490/1-D	Method Blank	Dissolved	Water	245.1	637490
LCS 440-637490/2-D	Lab Control Sample	Dissolved	Water	245.1	637490
440-278184-3 MS	LPBMP0004_20210129	Dissolved	Water	245.1	637490
440-278184-3 MSD	LPBMP0004_20210129	Dissolved	Water	245.1	637490

Prep Batch: 638239

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-278184-1	LPBMP0002_20210129	Total/NA	Water	245.1	
440-278184-2	LPBMP0003_20210129	Total/NA	Water	245.1	
440-278184-3	LPBMP0004_20210129	Total/NA	Water	245.1	
MB 440-638239/1-A	Method Blank	Total/NA	Water	245.1	
LCS 440-638239/2-A	Lab Control Sample	Total/NA	Water	245.1	
440-278184-1 MS	LPBMP0002_20210129	Total/NA	Water	245.1	
440-278184-1 MSD	LPBMP0002 20210129	Total/NA	Water	245.1	

Analysis Batch: 638349

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-278184-1	LPBMP0002_20210129	Dissolved	Water	245.1	638238
440-278184-1	LPBMP0002_20210129	Total/NA	Water	245.1	638239
440-278184-2	LPBMP0003_20210129	Dissolved	Water	245.1	638238

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Job ID: 440-278184-1

Metals (Continued)

Analysis Batch: 638349 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-278184-2	LPBMP0003_20210129	Total/NA	Water	245.1	638239
440-278184-3	LPBMP0004_20210129	Dissolved	Water	245.1	638238
440-278184-3	LPBMP0004_20210129	Total/NA	Water	245.1	638239
MB 440-637490/1-D	Method Blank	Dissolved	Water	245.1	638238
MB 440-638239/1-A	Method Blank	Total/NA	Water	245.1	638239
LCS 440-637490/2-D	Lab Control Sample	Dissolved	Water	245.1	638238
LCS 440-638239/2-A	Lab Control Sample	Total/NA	Water	245.1	638239
440-278184-1 MS	LPBMP0002_20210129	Total/NA	Water	245.1	638239
440-278184-1 MSD	LPBMP0002_20210129	Total/NA	Water	245.1	638239
440-278184-3 MS	LPBMP0004_20210129	Dissolved	Water	245.1	638238
440-278184-3 MSD	LPBMP0004_20210129	Dissolved	Water	245.1	638238

General Chemistry

Analysis Batch: 637676

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-278184-1	LPBMP0002_20210129	Total/NA	Water	SM 2540D	
440-278184-2	LPBMP0003_20210129	Total/NA	Water	SM 2540D	
440-278184-3	LPBMP0004_20210129	Total/NA	Water	SM 2540D	
MB 440-637676/1	Method Blank	Total/NA	Water	SM 2540D	
LCS 440-637676/2	Lab Control Sample	Total/NA	Water	SM 2540D	
440-278181-B-1 DU	Duplicate	Total/NA	Water	SM 2540D	

Geotechnical

Analysis Batch: 127713

Lab Sample ID 440-278184-1	Client Sample ID LPBMP0002_20210129	Prep Type Total/NA	Matrix Water	Method D4464	Prep Batch
440-278184-2	LPBMP0003_20210129	Total/NA	Water	D4464	
440-278184-3	LPBMP0004_20210129	Total/NA	Water	D4464	

Job ID: 440-278184-1

Definitions/Glossary

Qualifiers

Dissis		
DIOXIN Qualifier	Qualifier Description	
	Estimated value: value < lowest standard (MQL) but >than MDL	_ · ·
MB	Analyte present in the method blank	5
q	The reported result is the estimated maximum possible concentration of this analyte, quantitated using the theoretical ion ratio. The measured ion ratio does not meet qualitative identification criteria and indicates a possible interference.	5
Metals		
Qualifier	Qualifier Description	
J,DX	Estimated value; value < lowest standard (MQL), but >than MDL	
Glossary		8
Abbreviation	These commonly used abbreviations may or may not be present in this report.	
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis	- 9
%R	Percent Recovery	
CFL	Contains Free Liquid	10
CFU	Colony Forming Unit	
CNF	Contains No Free Liquid	
DER	Duplicate Error Ratio (normalized absolute difference)	
Dil Fac	Dilution Factor	
DL	Detection Limit (DoD/DOE)	
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample	
DLC	Decision Level Concentration (Radiochemistry)	
EDL	Estimated Detection Limit (Dioxin)	
LOD	Limit of Detection (DoD/DOE)	
LOQ	Limit of Quantitation (DoD/DOE)	
MCL	EPA recommended "Maximum Contaminant Level"	
MDA	Minimum Detectable Activity (Radiochemistry)	
MDC	Minimum Detectable Concentration (Radiochemistry)	
MDL	Method Detection Limit	
ML	Minimum Level (Dioxin)	
MPN	Most Probable Number	
MQL	Method Quantitation Limit	
NC	Not Calculated	
ND	Not Detected at the reporting limit (or MDL or EDL if shown)	
NEG	Negative / Absent	
POS	Positive / Present	
PQL	Practical Quantitation Limit	
PRES	Presumptive	
QC	Quality Control	
RER	Relative Error Ratio (Radiochemistry)	
RL	Reporting Limit or Requested Limit (Radiochemistry)	
RPD	Relative Percent Difference, a measure of the relative difference between two points	
TEF	Toxicity Equivalent Factor (Dioxin)	
TEQ	Toxicity Equivalent Quotient (Dioxin)	
TNTC	Too Numerous To Count	

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Laboratory: Eurofins Calscience Irvine

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Pr	ogram	Identification Number	Expiration Date
California	Sta	ate	2706	06-30-21
The following englyte	a are included in this read	ort but the leberatory is r	ot partified by the governing outbority	This list may include analyte
The following analyte the agency does not of Analysis Method	s are included in this repo offer certification. Prep Method	ort, but the laboratory is r Matrix	not certified by the governing authority. Analyte	This list may include analyte

Laboratory: Eurofins Calscience LLC

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

Authority	Program	Identification Number	Expiration Date
California	Los Angeles County Sanitation	10109	09-30-21
	Districts		
California	SCAQMD LAP	17LA0919	11-30-21
California	State	2944	09-30-21
Guam	State	20-003R	10-31-20 *
Nevada	State	CA00111	07-31-21
Oregon	NELAP	CA300001	01-30-22
USDA	US Federal Programs	P330-20-00034	02-10-23
Washington	State	C916-18	10-11-21

Laboratory: Eurofins TestAmerica, Sacramento

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

Authority	Program	Identification Number	Expiration Date
Alaska (UST)	State	17-020	02-20-24
ANAB	Dept. of Defense ELAP	L2468	01-20-24
ANAB	Dept. of Energy	L2468.01	01-20-21 *
ANAB	ISO/IEC 17025	L2468	01-20-21 *
Arizona	State	AZ0708	08-11-21
Arkansas DEQ	State	88-0691	06-17-21
California	State	2897	01-31-22
Colorado	State	CA0004	08-31-21
Connecticut	State	PH-0691	06-30-21
Florida	NELAP	E87570	06-30-21
Georgia	State	4040	01-29-22
Hawaii	State	<cert no.=""></cert>	01-29-22
Illinois	NELAP	200060	03-17-21
Kansas	NELAP	E-10375	02-01-21 *
Louisiana	NELAP	01944	06-30-21
Maine	State	CA00004	04-14-22
Michigan	State	9947	01-29-21 *
Nevada	State	CA000442021-2	07-31-21
New Hampshire	NELAP	2997	04-18-21
New Jersey	NELAP	CA005	06-30-21
New York	NELAP	11666	04-01-21
Ohio	State	41252	01-29-22
Oregon	NELAP	4040	01-29-22
Pennsylvania	NELAP	68-01272	03-31-21
Texas	NELAP	T104704399-19-13	06-01-21
US Fish & Wildlife	US Federal Programs	58448	07-31-21
USDA	US Federal Programs	P330-18-00239	07-31-21

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

Client: Haley & Aldrich, Inc. Project/Site: BMP Job ID: 440-278184-1

Laboratory: Eurofins TestAmerica, Sacramento (Continued)

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

Authority	Program	Identification Number	Expiration Date
Utah	NELAP	CA000442019-01	02-28-21
Vermont	State	VT-4040	04-16-21
Virginia	NELAP	460278	03-14-21
Washington	State	C581	05-05-21
West Virginia (DW)	State	9930C	12-31-21
Wisconsin	State	998204680	08-31-21
Wyoming	State Program	8TMS-L	01-28-19 *

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

irvine

phone (949) 261-1022 fax (949) 260-3299 17461 Derian Avenue, Suite 100 Irvine, CA 92614

Chain of Custody Record for Haley & Aldrich, Inc. Blanket Service Agreement #2019-22-TestAmerica



TestAmerica Laboratories, Inc.

Regulatory Program. • DW • NPDEs • RCRA • CUen. TestAmenca's services under this CoC shall be performed in accordance with the T&Cs within Blanket Service Agreement# 2015-18-TestAmerica by and between Haley & Aldnch, Inc. its subsidiaries and affiliates, and TestAmerica Laboratories Inc.

Client Contact	H&A Project Mar	nager Kati	herine Milk	er		H&A SIL	e Contact	: Matt Birn	ey (818) 4	66-8782				ä	tte: 17.	2 4/ a	3		COC No:	
Haley & Aldrich, Inc.	Tel/Fax: (520) 28	9098-6				Lab Cor	ttact: Urv	ashi Patel	(949) 333	-9055				ö	Irrier				1 of 1 cocs	
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(619) 280-9415 FAX		2 weeks				(N					63 J	6 7 ,		^		_			Lab Sampling:	
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							250ml 1-	250ml		11-1	11 1-500	m 1-50	0ml 1-50	V-ml					Field Suff Mide: Lab may substitute 35	Am Paketon for metals
						-	- - -			1	<u></u>				×				Only need to fill half of 500mL. Must fill	TSS to the top.
LPBMP0002_20210129	1/29/21	0835	σ	MM	9	z	×	×	×	×	-								Lower Parking Lot; sarriple port in ce	stern discharge pipe
LPBMP0003_20210129	1/29/21	0848	U	ŴŴ	w	z	×	×	×	×								 	Lower Periting Lot; Sediment Basin c	writer box
LPBMP0004_20210129	1/29/21	0852	υ	MM	ø	z	×	×	×	×									Lower Parking Lot, discharge from B	iofitter effluent pipe
					Π															
Preservation Used: 4= (ce, 2= Hc); 3= H.	SON: 4-HNO3; 5	S-NaOH; 6	~ Other				1 1	4			1	<u> </u>			1 1					
Pessible Hazard Identification:						Sam	ole Dispos	ĩai												
Are any samples from a listed EPA Hazardo Compete in the Comments Section if the lab i	us Waste? Pleas s to dispose of the	se List any • sample.	EPA Wast	e Code	s for the															
Ca Non-Hazard a Flammable a Su	in Instant	8	aon B	a Unki	UMOL	ř	eturn to Cliau	*				5	isposal by Lat	r			* Arc	hive for	.6 Months	
Applecial Instructions/OC Requirements & I Please email data to kmiller@haleyaldrich.c	Comments: om and post to To	tal Access;	Bill to Hal	ey & Ak	Irich at A	\P@hale	yaldrich.cx	om; Report	Level II D	ata Packa	ge and pn	wide EDD;	: All dissoly	ved met	ıl sample:	sare to b	e filtered	within 24	hours of receipt, even those placed	l an hold.
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440-278184 Chain of Custody

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17461 Derian Ave Suite 100 Irvine, CA 92614-5817 Phone: 949-261-1022 Eav. 0.

Chain of Custody Record



5987.1	of 1	8184-1	ation Codes:	H N - None	cerare U - AsnaUZ c Acid P - Na2O4S SO4 Q - Na2SO3	0H R - Na2S203 5 - H2S04	orbic Acid I - ISP Dodecahydrate U - Acetone 'ater V - MCAA	A W - pH 4-5 Z - other (specify)		medial Instructions (Note.		.S, Boeing_w/u to zero	S, Boeing_w/u to zero	S, Boeing_w/u to zero				dy. If the laboratory does not currently us should be brought to Eurofins	er than 1 month)	Months			Company	Company	Company	_
Tracking No(s): COC No: 440-16:	Origin: Page: Dage 1	مهر - مهر - مرود المعرف - مرود 1440-77	Preserv	A - HCL B - NaO		F - MeO	H - Asco	tainers	ot con	Fotal Number of		2 See QA	2 See QA	2 See QA				ment is forwarded under chain-of-custoc ided. Any changes to accreditation statu	ed if samples are retained long	By Lab Archive For		ethod of Shipment:	Date/Time: 217/07 970	Date/Time:	Date/Time:	-
Carrier	State of C@Eurofinset.com Califor	s Required (See note): am - California	Analysis Requeste															subcontract laboratories. This sample ship laboratory or other instructions will be prov is Calscience.	Disposal (A fee may be assesse	eturn To Client	Instructions/QC Requirements:	Me	ived by:	ived by:	ived by:	
Lab PM: Bondoc, Christia	E-Mait: Christian.Bondoo	Accreditations State Progr		S	vi Total	(c	or Nc	e (Yes	l98_xo Iqms2	Tple Matrix Participation pe Sandut Filtertas Sandut Constants Perform MS/M rabb Berfaseloil, Berfaseloil, Berfaseloil, Berfaseloil, Berfaseloil, Filtertas	servation Code: XX	Water X	Water X	Water X				& accreditation compliance upon out pped back to the Eurofins Calscience testing to said complicance to Eurofin	Sample		Special I	Time:	Company Recei	Company Recei	Company Recei	
ampler:	:enor		ue Date Requested: 12/2021	AT Requested (days):		#C	0#:	oject #: 4009815	SOW#:	Sam Tyl Sample (C=c. Sample G=gi	Pre	1/29/21 08:35 Pacific	1/29/21 08:48	1/29/21 08:52				aces the ownership of method, analyte { ing analyzed, the samples must be ship , return the signed Chain of Custody att			rimary Deliverable Rank: 2	Date:	2/1/2/ 170C	ate/Time:	ate/Time:	The second se
ent Information (Sub Contract Lab)	nt Contact: pping/Receiving	npany: stAmerica Laboratories, Inc.	ress:) Riverside Parkway,	st Sacramento	e, Zip: , 95605	ne: 	ait	ect Name: Pr. 24		nple Identification - Client ID (Lab ID)		3MP0002_20210129 (440-278184-1)	3MP0003_20210129 (440-278184-2)	3MP0004_20210129 (440-278184-3)				3: Since laboratory accreditations are subject to change. Eurofins Calscience pla Nain accreditation in the State of Origin listed above for analysis/tests/matrix beir cience attention immediately. If all requested accreditations are current to date.	ssible Hazard Identification	confirmed	iverable Requested: I, II, III, IV, Other (specify)	pty Kit Relinquished by:		Paduished by:	nquished by: Da	iistodu Seals Intact - Ciistodu Seal No

Irvine	
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17461 Derian Ave Suite 100 Irvine, CA 92614-5817 Phone 949-261-1022 Fax 949-260-329

Chain of Custody Record



INS Environment Testing America

Phone 949-261-1022 Fax. 949-260-3297												
Client Information (Sub Contract Lab)	Sampler			Lab PN Bondo	: oc, Christia	Wu		Carrier Trac	cking No(s);		COC No: 440-165965 1	
Client Contact: Shipping/Receiving	Phone.			E-Mail Christ	an Bondoo	@Eurofinse	tcom	State of Ori California	din		Page: Daria 1 of 1	
Company Furbitins Calscience I I C					ccreditations	Required (See	note):				Job #:	
Address:	Die Date Reduet	ind.			state Progr	am - Califort	g				440-278184-1	
7440 Lincoln Way, ,	2/11/2021	.na				4	nalysis Re	equested			Preservation C	odes.
City Garden Grove	TAT Requested (d	ays):									A - HCL B - NaOH C - Zn Acetate	M - Hexane N - None O - AsNaO2
State Zp [.] CA, 92841											D - Nitric Acid E - NaHSO4	P - Na2045 Q - Na2S03
Phone 714-895-5494(Tel) 714-894-7501(Fax)	#Od				10						F - MeOH G - Amchlor H - Arcorbio Acid	R - Na2S203 S - H2SO4 T TEP Podoretident
Email.	:# OM				(o)					S	n - Ascorate Acta 1 - Ice J - DI Water	I - ISP Dodecanyorate U - Acetone V - MCAA
Project Name: BMP	Project #: 44009815				Size					tainet	K - EDTA L - EDA	W - pH 4-5 Z - other (specify)
Site:	SSOW#:			<i>p</i>	article SD (Y					ol con	Other-	
		Sample	Sample Type (C=comp,	Matrix (w=water s=solid, O=waste/oil,	1-49440 /494 Liotm MS/M					tedmuN lei		
Sample Identification - Client ID (Lab ID)	Sample Date	Lime	G=grab) _s Preservat	st-theue, A-AF)	D4					01 🗙	Special	Instructions/Note:
LPBMP0002_20210129 (440-278184-1)	1/29/21	08.35 Pacific		Water	×						Normal TAT	
LPBMP0003_20210129 (440-278184-2)	1/29/21	08.48 Pacific		Water	×					-	Normal TAT	
LPBMP0004_20210129 (440-278184-3)	1/29/21	08:52 Pacific		Water	×					-	Normal TAT	
Note: Since laboratory accreditations are subject to change, Eurofins Calscienco maintain accreditation in the State of Origin listed above for analysis/tests/matrix Calscience attention immediately if all requested accreditations are current to d	e places the ownersh x being analyzed the date return the signe	iip of method, a samples must d Chain of Cus	inalyte & accrec be shipped bac tody attesting to	litation complian of to the Eurofins o said complican	ce upon out s calscience l ce to Eurofin	subcontract lab aboratory or ot s Calscience	oratories. This s her instructions v	ample shipmer will be provided	nt is forwardec 1. Any change	l under chain- is to accredita	of-custody If the tion status should	laboratory does not currently be brought to Eurofins
Possible Hazard Identification					Sample	Disposal (/	l fee may be	assessed	if samples	are retaine	d longer than	1 month)
Unconfirmed Deliverable Requested 1, II, III, IV, Other (specify)	Primary Deliver	able Rank. 2			Special 1	turn To Clie	nt CRequirem	Disposal By ents.	r Lab	Archiv	re For	Months
Emoty X't Dollars dated to:												
		Late		_	ime.			Metho	d of Shipment			
reinquished by Belinnuished hr	Uate/Time: フェジン 4 Date/Time:	7 12	57	in M	2 Second	ved by			Date/Tim	10-22	21 12 1	Company
reinquere of Balinenished her	Date/Time				IBOBY C	vea by				::		Company
fo parsient	Date/ I me:		<u>.</u>	ompany	Recei	ved by:			Date/Tim	ġ		Company
Custody Seals Intact: Custody Seal No A Yes A No				- A	Coole	r Temperature(s) °C and Other	Remarks:		7.4	(1)	って
				5+		1						Ver 11/01/2020
				20		3	1		8 9		5 6	

Client: Haley & Aldrich, Inc.

Login Number: 278184 List Number: 1 Creator: Escalante, Maria I

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

Job Number: 440-278184-1

List Source: Eurofins Irvine

Client: Haley & Aldrich, Inc.

Login Number: 278184 List Number: 2 Creator: Rivera, Isaac

Job Number: 440-27818	84-1
-----------------------	------

List Source: Eurofins Calscience

List Creation: 01/30/21 04:37 PM

Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>N/A</td> <td></td>	N/A	
The cooler's custody seal, if present, is intact.	N/A	Not present
Sample custody seals, if present, are intact.	N/A	Not Present
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	1.3
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	False	Received project as a subcontract.
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Answer

True

True

N/A

True

True

True

True

True

True

True False

True

True

True

True

True

True

True N/A

True

True

True

True

N/A

Client: Haley & Aldrich, Inc.

Login Number: 278184 List Number: 3 Creator: Nelson, Kym D

The cooler's custody seal, if present, is intact.

COC is filled out with all pertinent information.

Is the Field Sampler's name present on COC?

Sample custody seals, if present, are intact.

Samples were received on ice. Cooler Temperature is acceptable.

Cooler Temperature is recorded.

COC is filled out in ink and legible.

Sample containers have legible labels.

Sample collection date/times are provided.

Appropriate sample containers are used.

Containers are not broken or leaking.

Sample bottles are completely filled.

Multiphasic samples are not present.

Samples do not require splitting or compositing.

Sample Preservation Verified.

Residual Chlorine Checked.

Radioactivity wasn't checked or is </= background as measured by a survey

There are no discrepancies between the containers received and the COC.

Samples are received within Holding Time (excluding tests with immediate

There is sufficient vol. for all requested analyses, incl. any requested

Containers requiring zero headspace have no headspace or bubble is

The cooler or samples do not appear to have been compromised or

Question

tampered with.

COC is present.

HTs)

MS/MSDs

<6mm (1/4").

meter.

ist Source: Eurofins TestAmerica. Sacramento	
List Creation: 02/02/21 05:06 PM	5
Comment	
Seal	
	8
	9
1.90	
Not requested on COC.	13

List Source:	Eurofins	TestAmerica,	Sacramento
	List C	reation: 02/02	/21 05:06 PM

Isotope Dilution Summary

Method: 1613B - Dioxins and Furans (HRGC/HRMS) Matrix: Water

14

Percent Isotope Dilution Recovery (Acceptance Limits) TCDD PeCDD PeCDF PeCF HxCDD HxCDF TCDF HxDD (25-181) (32-141) (28-130) (26-152) Lab Sample ID **Client Sample ID** (25-164) (24-169) (24 - 185)(21 - 178)440-278184-1 LPBMP0002 20210129 72 84 69 76 75 70 74 83 440-278184-1 - RA LPBMP0002_20210129 80 440-278184-2 LPBMP0003 20210129 66 77 60 66 65 62 65 73 440-278184-3 LPBMP0004 20210129 69 82 63 69 69 59 62 69 440-278184-3 - RA LPBMP0004 20210129 73 79 MB 320-458769/1-A Method Blank 86 76 74 80 74 76 87 Percent Isotope Dilution Recovery (Acceptance Limits) HpCDF HpCDF2 HxDF 13CHxCF HpCDD OCDD HxCF Lab Sample ID **Client Sample ID** (26 - 123)(29-147) (28-136) (23-140) (28 - 143)(26-138) (17 - 157)86 440-278184-1 LPBMP0002 20210129 86 88 69 78 73 70 LPBMP0002_20210129 440-278184-1 - RA 440-278184-2 LPBMP0003_20210129 76 76 77 59 68 63 61 440-278184-3 LPBMP0004_20210129 72 71 74 56 58 56 64 440-278184-3 - RA LPBMP0004 20210129 MB 320-458769/1-A Method Blank 90 89 91 73 81 78 75 Surrogate Legend TCDD = 13C-2,3,7,8-TCDD TCDF = 13C-2,3,7,8-TCDF PeCDD = 13C-1,2,3,7,8-PeCDD PeCDF = 13C-1,2,3,7,8-PeCDF PeCF = 13C-2,3,4,7,8-PeCDF HxCDD = 13C-1,2,3,4,7,8-HxCDD HxDD = 13C-1,2,3,6,7,8-HxCDD HxCDF = 13C-1,2,3,4,7,8-HxCDF HxDF = 13C-1,2,3,6,7,8-HxCDF HxCF = 13C-1,2,3,7,8,9-HxCDF 13CHxCF = 13C-2,3,4,6,7,8-HxCDF HpCDD = 13C-1,2,3,4,6,7,8-HpCDD HpCDF = 13C-1,2,3,4,6,7,8-HpCDF HpCDF2 = 13C-1,2,3,4,7,8,9-HpCDF

OCDD = 13C-OCDD

Method: 1613B - Dioxins and Furans (HRGC/HRMS) Matrix: Water

Prep Type: Total/NA

_			Perc	ent Isotope	Dilution Re	ecovery (Ac	ceptance L	imits)	
		TCDD	TCDF	PeCDD	PeCDF	PeCF	HxCDD	HxDD	HxCDF
Lab Sample ID	Client Sample ID	(20-175)	(22-152)	(21-227)	(21-192)	(13-328)	(21-193)	(25-163)	(19-202)
LCS 320-458769/2-A	Lab Control Sample	76	88	72	78	79	75	81	90
			Perc	ent Isotope	Dilution Re	ecovery (Ac	ceptance L	imits)	
		HxDF	HxCF	13CHxCF	HpCDD	HpCDF	HpCDF2	OCDD	
Lab Sample ID	Client Sample ID	(21-159)	(17-205)	(22-176)	(26-166)	(21-158)	(20-186)	(13-199)	
LCS 320-458769/2-A	Lab Control Sample	91	93	93	77	83	81	77	
Surrogate Legend									
TCDD = 13C-2,3,7,8-T	CDD								
TCDF = 13C-2,3,7,8-T	CDF								
PeCDD = 13C-1,2,3,7,8	8-PeCDD								
PeCDF = 13C-1,2,3,7,8	3-PeCDF								

Isotope Dilution Summary

Client: Haley & Aldrich, Inc. Project/Site: BMP PeCF = 13C-2,3,4,7,8-PeCDF HxCDD = 13C-1,2,3,4,7,8-HxCDD HxDD = 13C-1,2,3,6,7,8-HxCDD HxCDF = 13C-1,2,3,4,7,8-HxCDF HxDF = 13C-1,2,3,7,8,9-HxCDF HxCF = 13C-1,2,3,4,6,7,8-HxCDF HpCDD = 13C-1,2,3,4,6,7,8-HpCDD HpCDF = 13C-1,2,3,4,6,7,8-HpCDF HpCDF2 = 13C-1,2,3,4,7,8,9-HpCDF OCDD = 13C-0CDD

Environment TestAmerica	Testing		Sacramento Sample Receiving Notes
		Tra	acking #: 1540 4111 6444
440-278184 Field Sheet		S . G	SO / PO / FO / SAT / 2-Day / Ground / UPS / CDO / Courier SSO / OnTrac / Goldstreak / USPS / Other
e this form to record Sample Custody Seal, a in the job folder with the COC.	Cooler Custod	y Seal, Tei	mperature & corrected Temperature & other observations.
Therm. ID: <u>6</u> Corr. Factor	: (+ / -) 🦯	_°C	Notes:
ice Wet Gel Cooler Custody Seal: પ્રિ ા	_ Other		
Cooler ID: I SF 2			
remp Observed: <u>ا ج</u> °C Correc From: Temp Blank کم	bted: ple □	_°C	
Opening/Processing The Shipment Cooler compromised/tampered with?	<u>Yes No</u>	<u>NA</u>	
cooler Temperature is acceptable? rozen samples show signs of thaw?		ם ک	
nitials:57_ Date:	212121		
npacking/Labeling The Samples	Yes <u>No</u>	<u>NA</u>	
amples compromised/tampered with? ample containers have legible labels?			
ample custody seal? ontainers are not broken or leaking?			
ample date/times are provided? ppropriate containers are used?			Trizma Lot #(s):
ample bottles are completely filled? ample preservatives verified?			
ero headspace?*		-10-	Login Completion Yes No NA
kalinity has no headspace? erchlorate has headspace?			Receipt Temperature on COC? D D Samples received within hold time? D D NCM Filed D D
ultiphasic samples are not present?		D	Log Release checked in TALS?
Environment Testing America

ANALYTICAL REPORT

Eurofins Calscience LLC 7440 Lincoln Way Garden Grove, CA 92841 Tel: (714)895-5494

Laboratory Job ID: 570-53559-1

Client Project/Site: BMP Performace OF 001, 002 and/or 009

For:

Haley & Aldrich, Inc. 400 E Van Buren St. Suite 545 Phoenix, Arizona 85004

Attn: Ms. Katherine Miller

Authorized for release by: 3/25/2021 12:52:30 PM Don Burley, Senior Project Manager (714)895-5494 Donald.Burley@eurofinset.com

Designee for

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Expert

Virendra Patel, Project Manager I (714)895-5494 Virendra.Patel@eurofinset.com

The test results in this report meet all 2003 NELAC, 2009 TNI, and 2016 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

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

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

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QC Sample Results	35
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Lab Chronicle	44
Certification Summary	50
Method Summary	51
Sample Summary	52
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Definitions/Glossary

Client: Haley & Aldrich, Inc. Project/Site: BMP Performace OF 001, 002 and/or 009

Qualifiers

Qualifiers		3
Metals Qualifier	Qualifier Description	4
J,DX	Estimated value; value < lowest standard (MQL), but >than MDL	
Glossary		5
Abbreviation	These commonly used abbreviations may or may not be present in this report.	6
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis	
%R	Percent Recovery	
CFL	Contains Free Liquid	
CFU	Colony Forming Unit	0
CNF	Contains No Free Liquid	Ŏ
DER	Duplicate Error Ratio (normalized absolute difference)	
Dil Fac	Dilution Factor	9
DL	Detection Limit (DoD/DOE)	
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample	
DLC	Decision Level Concentration (Radiochemistry)	
EDL	Estimated Detection Limit (Dioxin)	
LOD	Limit of Detection (DoD/DOE)	
LOQ	Limit of Quantitation (DoD/DOE)	
MCL	EPA recommended "Maximum Contaminant Level"	
MDA	Minimum Detectable Activity (Radiochemistry)	13
MDC	Minimum Detectable Concentration (Radiochemistry)	
MDL	Method Detection Limit	
ML	Minimum Level (Dioxin)	
MPN	Most Probable Number	
MQL	Method Quantitation Limit	
NC	Not Calculated	
ND	Not Detected at the reporting limit (or MDL or EDL if shown)	
NEG	Negative / Absent	
POS	Positive / Present	
PQL	Practical Quantitation Limit	
PRES	Presumptive	
QC	Quality Control	
RER	Relative Error Ratio (Radiochemistry)	
RL	Reporting Limit or Requested Limit (Radiochemistry)	
RPD	Relative Percent Difference, a measure of the relative difference between two points	
TEF	Toxicity Equivalent Factor (Dioxin)	
TEO		

- TEQ Toxicity Equivalent Quotient (Dioxin)
- TNTC Too Numerous To Count

Job ID: 570-53559-1

Laboratory: Eurofins Calscience LLC

Narrative

Job Narrative 570-53559-1

Comments

No additional comments.

Receipt

The samples were received on 3/11/2021 6:30 PM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 4 coolers at receipt time were 2.2° C, 2.4° C, 2.6° C and 2.7° C.

Receipt Exception

The number of containers for the following samples did not match the information listed on the Chain-of-Custody (COC): B1BMP0009_20210310 (570-53559-1), B1BMP0010_20210310 (570-53559-2), B1BMP0011_20210310 (570-53559-3), ILBMP0004_20210310 (570-53559-4), ILBMP0005_20210310 (570-53559-5), ILBMP0008_20210310 (570-53559-6), ILBMP0009_20210310 (570-53559-7), ILBMP0010_20210310 (570-53559-8), LPBMP0002_20210311 (570-53559-9), LPBMP0003_20210311 (570-53559-10) and LPBMP0004_20210311 (570-53559-11). Received 7 containers, while the COC lists 6 (received 2 containers for dissolved metals-250ml plastic unpreserved).

Metals

Method FILTRATION: The following samples requested dissolved metals and were not filtered in the field: B1BMP0009_20210310 (570-53559-1), B1BMP0010_20210310 (570-53559-2), B1BMP0011_20210310 (570-53559-3), ILBMP0004_20210310 (570-53559-4), ILBMP0005_20210310 (570-53559-5), ILBMP0008_20210310 (570-53559-6), ILBMP0009_20210310 (570-53559-7), ILBMP0010_20210310 (570-53559-8), LPBMP0002_20210311 (570-53559-9), LPBMP0003_20210311 (570-53559-10) and LPBMP0004_20210311 (570-53559-11). These samples were filtered and preserved upon receipt to the laboratory.

03/12/21 @ 1135 hours by ST 2.5 mL HNO3 HNO3 Lot # 0000245675

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

General Chemistry

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

Organic Prep

Method D4464: The sample duplicate precision for the following sample associated with analytical batch 570-138287 was flagged as being outside control limits due to a LIMS limitation: LPBMP0002_20210311 (570-53559-9) and (570-53559-C-9 DU). The mean grain size for the sample and sample duplicate were within RPD acceptance criteria.

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

Detection Summary

RL

2.0

1.0

2.0

3.3

0.01

0.01

0.01

0.01

0.01

0.01

MDL Unit

0.50 ug/L

0.50 ug/L

0.50 ug/L

0.01 %

0.01 %

0.01 %

0.01 %

0.01 %

0.01 %

1.7 mg/L

Result Qualifier

9.6

2.5

5.9

30

6.36

22.62

0.05

53.26

59.62

17.71

Client: Haley & Aldrich, Inc. Project/Site: BMP Performace OF 001, 002 and/or 009

Client Sample ID: B1BMP0009_20210310

Analyte

Copper

Lead

Copper

Total Suspended Solids

Clay(less than 0.00391 mm)

Fine Sand (0.125 to 0.25mm)

Silt (0.00391 to 0.0625mm)

Medium Sand (0.25 to 0.5 mm)

Total Silt and Clay (0 to 0.0626mm)

Very Fine Sand (0.0625 to 0.125 mm)

Prep Type

Dissolved

Total/NA

Total/NA

Total/NA

Total/NA

Total/NA

Total/NA

Total/NA

Total Recoverable

Total Recoverable

Lab Sample ID: 570-53559-2

Lab Sample ID: 570-53559-1

Dil Fac D Method

1

1

1

1

1

1

1

1

1

1

200.8

200.8

200.8

D4464

D4464

D4464

D4464

D4464

D4464

SM 2540D

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Copper	16		2.0	0.50	ug/L	1	_	200.8	Total
									Recoverable
Lead	1.1		1.0	0.50	ug/L	1		200.8	Total
									Recoverable
Copper	5.5		2.0	0.50	ug/L	1		200.8	Dissolved
Total Suspended Solids	12		2.0	1.0	mg/L	1		SM 2540D	Total/NA
Clay(less than 0.00391 mm)	4.40		0.01	0.01	%	1		D4464	Total/NA
Fine Sand (0.125 to 0.25mm)	27.97		0.01	0.01	%	1		D4464	Total/NA
Silt (0.00391 to 0.0625mm)	51.01		0.01	0.01	%	1		D4464	Total/NA
Total Silt and Clay (0 to 0.0626mm)	55.40		0.01	0.01	%	1		D4464	Total/NA
Very Fine Sand (0.0625 to 0.125 mm)	16.63		0.01	0.01	%	1		D4464	Total/NA

Client Sample ID: B1BMP0011_20210310

Client Sample ID: B1BMP0010_20210310

Lab Sample ID: 570-53559-3

Lab Sample ID: 570-53559-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Copper	7.0		2.0	0.50	ug/L	1	_	200.8	Total
									Recoverable
Lead	0.94	J,DX	1.0	0.50	ug/L	1		200.8	Total
									Recoverable
Copper	7.5		2.0	0.50	ug/L	1		200.8	Dissolved
Total Suspended Solids	6.0		1.3	0.67	mg/L	1		SM 2540D	Total/NA
Clay(less than 0.00391 mm)	1.33		0.01	0.01	%	1		D4464	Total/NA
Fine Sand (0.125 to 0.25mm)	62.38		0.01	0.01	%	1		D4464	Total/NA
Silt (0.00391 to 0.0625mm)	13.75		0.01	0.01	%	1		D4464	Total/NA
Total Silt and Clay (0 to 0.0626mm)	15.08		0.01	0.01	%	1		D4464	Total/NA
Very Fine Sand (0.0625 to 0.125 mm)	22.55		0.01	0.01	%	1		D4464	Total/NA

Client Sample ID: ILBMP0004_20210310

 Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Ргер Туре
Cadmium	0.44	J,DX	1.0	0.25	ug/L	1	_	200.8	Total
									Recoverable
Copper	12		2.0	0.50	ug/L	1		200.8	Total
									Recoverable
Lead	4.5		1.0	0.50	ug/L	1		200.8	Total
									Recoverable
Copper	4.2		2.0	0.50	ug/L	1		200.8	Dissolved
Total Suspended Solids	100		5.0	2.5	mg/L	1		SM 2540D	Total/NA
Clay(less than 0.00391 mm)	9.79		0.01	0.01	%	1		D4464	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: Haley & Aldrich, Inc. Project/Site: BMP Performace OF 001, 002 and/or 009

Client Sample ID: ILBMP0004_20210310 (Continued)

Analyte	Result 21.90	Qualifier	RL 0.01	RL 0.01	Unit %	Dil Fac	Method	Prep Type Total/NA
Medium Sand (0.25 to 0.5 mm)	0.21		0.01	0.01	%		D4464	Total/NA
Silt (0.00391 to 0.0625mm)	56.33		0.01	0.01	%	1	D4464	Total/NA
Total Silt and Clay (0 to 0.0626mm)	66.12		0.01	0.01	%	1	D4464	Total/NA
Very Fine Sand (0.0625 to 0.125 mm)	11.78		0.01	0.01	%	1	D4464	Total/NA

Client Sample ID: ILBMP0005_20210310

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Ргер Туре
Copper	8.2		2.0	0.50	ug/L	1	_	200.8	Total
									Recoverable
Lead	1.2		1.0	0.50	ug/L	1		200.8	Total
									Recoverable
Copper	6.3		2.0	0.50	ug/L	1		200.8	Dissolved
Total Suspended Solids	12		1.1	0.53	mg/L	1		SM 2540D	Total/NA
Clay(less than 0.00391 mm)	3.59		0.01	0.01	%	1		D4464	Total/NA
Fine Sand (0.125 to 0.25mm)	43.71		0.01	0.01	%	1		D4464	Total/NA
Medium Sand (0.25 to 0.5 mm)	0.72		0.01	0.01	%	1		D4464	Total/NA
Silt (0.00391 to 0.0625mm)	34.10		0.01	0.01	%	1		D4464	Total/NA
Total Silt and Clay (0 to 0.0626mm)	37.70		0.01	0.01	%	1		D4464	Total/NA
Very Fine Sand (0.0625 to 0.125 mm)	17.88		0.01	0.01	%	1		D4464	Total/NA

Client Sample ID: ILBMP0008_20210310

- Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Cadmium	1.5		1.0	0.25	ug/L	1	_	200.8	Total
									Recoverable
Copper	17		2.0	0.50	ug/L	1		200.8	Total
									Recoverable
Lead	12		1.0	0.50	ug/L	1		200.8	Total
									Recoverable
Cadmium	0.47	J,DX	1.0	0.25	ug/L	1		200.8	Dissolved
Copper	6.4		2.0	0.50	ug/L	1		200.8	Dissolved
Lead	0.83	J,DX	1.0	0.50	ug/L	1		200.8	Dissolved
Total Suspended Solids	120		10	5.0	mg/L	1		SM 2540D	Total/NA
Clay(less than 0.00391 mm)	10.40		0.01	0.01	%	1		D4464	Total/NA
Fine Sand (0.125 to 0.25mm)	24.90		0.01	0.01	%	1		D4464	Total/NA
Medium Sand (0.25 to 0.5 mm)	0.01		0.01	0.01	%	1		D4464	Total/NA
Silt (0.00391 to 0.0625mm)	46.66		0.01	0.01	%	1		D4464	Total/NA
Total Silt and Clay (0 to 0.0626mm)	57.06		0.01	0.01	%	1		D4464	Total/NA
Very Fine Sand (0.0625 to 0.125 mm)	18.03		0.01	0.01	%	1		D4464	Total/NA

Client Sample ID: ILBMP0009_20210310

Lab Sample ID: 570-53559-7

_ Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Copper	9.7		2.0	0.50	ug/L	1	_	200.8	Total
Lond	5.0		1.0	0.50		1		200.9	Recoverable
Lead	5.9		1.0	0.50	ug/L	1		200.8	Iotal Recoverable
Copper	4.1		2.0	0.50	ug/L	1		200.8	Dissolved
Total Suspended Solids	42		3.3	1.7	mg/L	1		SM 2540D	Total/NA
Clay(less than 0.00391 mm)	14.37		0.01	0.01	%	1		D4464	Total/NA
Fine Sand (0.125 to 0.25mm)	8.49		0.01	0.01	%	1		D4464	Total/NA
Silt (0.00391 to 0.0625mm)	66.48		0.01	0.01	%	1		D4464	Total/NA

This Detection Summary does not include radiochemical test results.

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Lab Sample ID: 570-53559-4

Lab Sample ID: 570-53559-5

Lab Sample ID: 570-53559-6

Detection Summary

Client: Haley & Aldrich, Inc. Project/Site: BMP Performace OF 001, 002 and/or 009

Job ID: 570-53559-1

Lab Sample ID: 570-53559-7

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Client Sample ID: ILBMP0009_20210310 (Continued)

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Total Silt and Clay (0 to 0.0626mm)	80.85		0.01	0.01	%	1	_	D4464	Total/NA
Very Fine Sand (0.0625 to 0.125 mm)	10.66		0.01	0.01	%	1		D4464	Total/NA
Client Sample ID: ILBMP00	10 2021	0310				Lab S	Sa	mple ID:	570-53559-8

Client Sample ID: ILBMP0010 20210310

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Copper	10		2.0	0.50	ug/L	1	_	200.8	Total
									Recoverable
Lead	4.8		1.0	0.50	ug/L	1		200.8	Total
									Recoverable
Copper	4.2		2.0	0.50	ug/L	1		200.8	Dissolved
Total Suspended Solids	28		2.5	1.3	mg/L	1		SM 2540D	Total/NA
Clay(less than 0.00391 mm)	8.83		0.01	0.01	%	1		D4464	Total/NA
Fine Sand (0.125 to 0.25mm)	28.28		0.01	0.01	%	1		D4464	Total/NA
Medium Sand (0.25 to 0.5 mm)	1.40		0.01	0.01	%	1		D4464	Total/NA
Silt (0.00391 to 0.0625mm)	52.85		0.01	0.01	%	1		D4464	Total/NA
Total Silt and Clay (0 to 0.0626mm)	61.69		0.01	0.01	%	1		D4464	Total/NA
Very Fine Sand (0.0625 to 0.125 mm)	8.64		0.01	0.01	%	1		D4464	Total/NA

Client Sample ID: LPBMP0002_20210311

Lab Sample ID: 570-53559-9

Lab Sample ID: 570-53559-10

Lab Sample ID: 570-53559-11

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Copper	10		2.0	0.50	ug/L	1	_	200.8	Total
									Recoverable
Lead	2.5		1.0	0.50	ug/L	1		200.8	Total
									Recoverable
Copper	7.3		2.0	0.50	ug/L	1		200.8	Dissolved
Total Suspended Solids	14		2.0	1.0	mg/L	1		SM 2540D	Total/NA
Clay(less than 0.00391 mm)	5.29		0.01	0.01	%	1		D4464	Total/NA
Fine Sand (0.125 to 0.25mm)	36.04		0.01	0.01	%	1		D4464	Total/NA
Silt (0.00391 to 0.0625mm)	27.43		0.01	0.01	%	1		D4464	Total/NA
Total Silt and Clay (0 to 0.0626mm)	32.72		0.01	0.01	%	1		D4464	Total/NA
Very Fine Sand (0.0625 to 0.125 mm)	31.23		0.01	0.01	%	1		D4464	Total/NA

Client Sample ID: LPBMP0003_20210311

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Ргер Туре
Copper	9.9		2.0	0.50	ug/L	1	_	200.8	Total
									Recoverable
Lead	2.2		1.0	0.50	ug/L	1		200.8	Total
									Recoverable
Copper	7.3		2.0	0.50	ug/L	1		200.8	Dissolved
Total Suspended Solids	12		1.3	0.67	mg/L	1		SM 2540D	Total/NA
Clay(less than 0.00391 mm)	1.53		0.01	0.01	%	1		D4464	Total/NA
Fine Sand (0.125 to 0.25mm)	42.81		0.01	0.01	%	1		D4464	Total/NA
Silt (0.00391 to 0.0625mm)	14.84		0.01	0.01	%	1		D4464	Total/NA
Total Silt and Clay (0 to 0.0626mm)	16.37		0.01	0.01	%	1		D4464	Total/NA
Very Fine Sand (0.0625 to 0.125 mm)	40.82		0.01	0.01	%	1		D4464	Total/NA

Client Sample ID: LPBMP0004_20210311

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Copper	19		2.0	0.50	ug/L	1	_	200.8	Total
Copper	5.0		2.0	0.50	ug/L	1		200.8	Recoverable Dissolved

This Detection Summary does not include radiochemical test results.

This Detection Summary does not include radiochemical test results.

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Client: Haley & Aldrich, Inc. Project/Site: BMP Performace OF 001, 002 and/or 009

 Client Sample ID: LPBMP0004_20210311 (Continued)
 Lab Sample ID: 570-53559-11

 Analyte
 Result
 Qualifier
 RL
 MDL
 Unit
 Dil Fac
 D
 Method
 Prep Type

 Total Suspended Solids
 1.5
 1.0
 0.50
 mg/L
 1
 D
 Method
 Prep Type

Page 8 of 57

RL

1.0

2.0

1.0

RL

1.0

2.0

1.0

MDL Unit

0.25 ug/L

0.50 ug/L

0.50 ug/L

MDL Unit

0.25 ug/L

0.50 ug/L

0.50 ug/L

D

D

Prepared

Prepared

03/15/21 07:35 03/15/21 20:22

03/15/21 07:35 03/15/21 20:22

03/15/21 07:35 03/15/21 20:22

03/15/21 07:35 03/15/21 20:28

Client: Haley & Aldrich, Inc. Project/Site: BMP Performace OF 001, 002 and/or 009

Client Sample ID: B1BMP0009_20210310

Client Sample ID: B1BMP0010 20210310

Client Sample ID: B1BMP0011_20210310

Date Collected: 03/10/21 11:20

Date Received: 03/11/21 18:30

Date Collected: 03/10/21 11:25

Date Received: 03/11/21 18:30

Date Collected: 03/10/21 11:30

Analyte

Cadmium

Copper

Analyte

Cadmium

Copper

Lead

Lead

Method: 200.8 - Metals (ICP/MS) - Total Recoverable

Result Qualifier

Result Qualifier

ND

9.6

2.5

ND

16

1.1

Job ID: 570-53559-1

Matrix: Water

Matrix: Water

Dil Fac

1

1

1

Lab Sample ID: 570-53559-1

Analyzed

Lab Sample ID: 570-53559-2

Analyzed

6

03/15/21 07:35 03/15/21 20:28 03/15/21 07:35 03/15/21 20:28

Dil Fac

1

Lab Sample ID: 570-53559-3 Matrix: Water

Lab Sample ID: 570-53559-4

Matrix: Water

Date Received: 03/11/21 18:30									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		1.0	0.25	ug/L		03/15/21 07:35	03/15/21 20:30	1
Copper	7.0		2.0	0.50	ug/L		03/15/21 07:35	03/15/21 20:30	1
Lead	0.94	J,DX	1.0	0.50	ug/L		03/15/21 07:35	03/15/21 20:30	1

Client Sample ID: ILBMP0004_20210310 Date Collected: 03/10/21 11:05 Date Received: 03/11/21 18:30

Client Sample ID: ILBMP0005 20210310

Client Sample ID: ILBMP0008_20210310

Date Collected: 03/10/21 11:10

Date Collected: 03/10/21 11:00

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	0.44	J,DX	1.0	0.25	ug/L		03/15/21 07:35	03/15/21 20:32	1
Copper	12		2.0	0.50	ug/L		03/15/21 07:35	03/15/21 20:32	1
Lead	4.5		1.0	0.50	ug/L		03/15/21 07:35	03/15/21 20:32	1

Lab Sample ID: 570-53559-5 **Matrix: Water**

Date Received: 03/11/21 18:30								
Analyte	Result Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND	1.0	0.25	ug/L		03/15/21 07:35	03/15/21 20:34	1
Copper	8.2	2.0	0.50	ug/L		03/15/21 07:35	03/15/21 20:34	1
Lead	1.2	1.0	0.50	ug/L		03/15/21 07:35	03/15/21 20:34	1

Lab Sample ID: 570-53559-6 Matrix: Water

Lab Sample ID: 570-53559-7

Date Received: 03/11/21 18:30									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	1.5		1.0	0.25	ug/L		03/15/21 07:35	03/15/21 20:40	1
Copper	17		2.0	0.50	ug/L		03/15/21 07:35	03/15/21 20:40	1
Lead	12		1.0	0.50	ug/L		03/15/21 07:35	03/15/21 20:40	1

Client Sample ID: ILBMP0009 20210310 Date Collected: 03/10/21 10:50

Matrix: Water Date Received: 03/11/21 18:30 Analvte **Result Qualifier** RL MDL Unit D Prepared Analvzed Dil Fac Cadmium ND 1.0 0.25 ug/L 03/15/21 07:35 03/15/21 20:42 Copper 9.7 2.0 0.50 ug/L 03/15/21 07:35 03/15/21 20:42 Lead 5.9 10 0.50 ug/L 03/15/21 07:35 03/15/21 20:42

Eurofins Calscience LLC

1

1

RL

1.0

2.0

1.0

RL

1.0

2.0

1.0

MDL Unit

0.25 ug/L

0.50 ug/L

0.50 ug/L

MDL Unit

0.25 ug/L

0.50 ug/L

0.50 ug/L

D

D

Prepared

Prepared

03/15/21 07:35 03/15/21 20:44

03/15/21 07:35 03/15/21 20:44

03/15/21 07:35 03/15/21 20:44

03/15/21 07:35 03/15/21 20:46

03/15/21 07:35 03/15/21 20:46

03/15/21 07:35 03/15/21 20:46

Client: Haley & Aldrich, Inc. Project/Site: BMP Performace OF 001, 002 and/or 009

Client Sample ID: ILBMP0010_20210310

Client Sample ID: LPBMP0002_20210311

Client Sample ID: LPBMP0003_20210311

Date Collected: 03/10/21 10:55

Date Received: 03/11/21 18:30

Date Collected: 03/11/21 09:40

Date Received: 03/11/21 18:30

Analyte

Cadmium

Copper

Analyte

Cadmium

Copper

Lead

Lead

Method: 200.8 - Metals (ICP/MS) - Total Recoverable

Result Qualifier

Result Qualifier

ND

10

4.8

ND

10

2.5

Job ID: 570-53559-1

Matrix: Water

Matrix: Water

Matrix: Water

Dil Fac

1

1

1

Lab Sample ID: 570-53559-8

Analyzed

Lab Sample ID: 570-53559-9

Analyzed

6

Dil Fac 1 1

1

Lab Sample	ID: 570-53559-1	10
	Matrix: Wat	er

Lab Sample ID: 570-53559-11

Date Collected: 03/11/21 09:50							Matrix	: Water
Date Received: 03/11/21 18:30								
Analyte	Result Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND	1.0	0.25	ug/L		03/15/21 07:35	03/15/21 20:48	1
Copper	9.9	2.0	0.50	ug/L		03/15/21 07:35	03/15/21 20:48	1
Lead	2.2	1.0	0.50	ug/L		03/15/21 07:35	03/15/21 20:48	1

Client Sample ID: LPBMP0004_20210311	

Date Collected: 03/11/21 10:00 Date Received: 03/11/21 18:30

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		1.0	0.25	ug/L		03/15/21 07:35	03/15/21 20:50	1
Copper	19		2.0	0.50	ug/L		03/15/21 07:35	03/15/21 20:50	1
Lead	ND		1.0	0.50	ug/L		03/15/21 07:35	03/15/21 20:50	1

RL

1.0

2.0

1.0

RL

1.0

2.0

1.0

Result Qualifier

Result Qualifier

ND

5.9

ND

ND

5.5

ND

MDL Unit

0.25 ug/L

0.50 ug/L

0.50 ug/L

MDL Unit

0.25 ug/L

0.50 ug/L

0.50 ug/L

Client: Haley & Aldrich, Inc. Project/Site: BMP Performace OF 001, 002 and/or 009

Method: 200.8 - Metals (ICP/MS) - Dissolved

Client Sample ID: B1BMP0009_20210310

Client Sample ID: B1BMP0010_20210310

Client Sample ID: B1BMP0011_20210310

Date Collected: 03/10/21 11:20

Date Received: 03/11/21 18:30

Date Collected: 03/10/21 11:25

Date Received: 03/11/21 18:30

Date Collected: 03/10/21 11:30

Analyte

Cadmium

Copper

Analyte

Cadmium

Copper

Lead

Lead

Job ID: 570-53559-1

Matrix: Water

Matrix: Water

Dil Fac

1

1

1

Lab Sample ID: 570-53559-1

Analyzed

Lab Sample ID: 570-53559-2

Analyzed

03/12/21 15:22 03/12/21 16:44

03/12/21 15:22 03/12/21 16:44

03/12/21 15:22 03/12/21 16:44

03/12/21 15:22 03/12/21 16:51

Prepared

Prepared

D

D

6

03/12/21 15:22 03/12/21 16:51 1
03/12/21 15:22 03/12/21 16:51 1

Dil Fac

1

Lab Sample ID: 57 Mat

Lab Sample ID: 570-53559-4

Matrix: Water

Date Received: 03/11/21 18:30									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		1.0	0.25	ug/L		03/12/21 15:22	03/12/21 16:54	1
Copper	7.5		2.0	0.50	ug/L		03/12/21 15:22	03/12/21 16:54	1
Lead	ND		1.0	0.50	ug/L		03/12/21 15:22	03/12/21 16:54	1

Client Sample ID: ILBMP0004_20210310 Date Collected: 03/10/21 11:05

Client Sample ID: ILBMP0005 20210310

Client Sample ID: ILBMP0008_20210310

Date Collected: 03/10/21 11:10

Date Collected: 03/10/21 11:00

Date Received: 03/11/21 18:30									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		1.0	0.25	ug/L		03/12/21 15:22	03/12/21 16:56	1
Copper	4.2		2.0	0.50	ug/L		03/12/21 15:22	03/12/21 16:56	1
Lead	ND		1.0	0.50	ug/L		03/12/21 15:22	03/12/21 16:56	1

Lab Sample ID: 570-53559-5 Matrix: Water

Date Received: 03/11/21 18:30								
Analyte	Result Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND	1.0	0.25	ug/L		03/12/21 15:22	03/12/21 16:59	1
Copper	6.3	2.0	0.50	ug/L		03/12/21 15:22	03/12/21 16:59	1
Lead	ND	1.0	0.50	ug/L		03/12/21 15:22	03/12/21 16:59	1

Lab Sample ID: 570-53559-6 Matrix: Water

Lab Sample ID: 570-53559-7

Date Received: 03/11/21 18:30									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	0.47	J,DX	1.0	0.25	ug/L		03/12/21 15:22	03/12/21 17:01	1
Copper	6.4		2.0	0.50	ug/L		03/12/21 15:22	03/12/21 17:01	1
Lead	0.83	J,DX	1.0	0.50	ug/L		03/12/21 15:22	03/12/21 17:01	1

Client Sample ID: ILBMP0009_20210310 Date Collected: 03/10/21 10:50

Date Collected: 03/10/21 10:50	te Collected: 03/10/21 10:50							Matrix: Wate		
Date Received: 03/11/21 18:30										
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac	
Cadmium	ND		1.0	0.25	ug/L		03/12/21 15:22	03/12/21 17:08	1	
Copper	4.1		2.0	0.50	ug/L		03/12/21 15:22	03/12/21 17:08	1	
Lead	ND		1.0	0.50	ug/L		03/12/21 15:22	03/12/21 17:08	1	

RL

MDL Unit

D

Prepared

Client: Haley & Aldrich, Inc. Project/Site: BMP Performace OF 001, 002 and/or 009

Method: 200.8 - Metals (ICP/MS) - Dissolved

Result Qualifier

Client Sample ID: ILBMP0010_20210310

Date Collected: 03/10/21 10:55

Date Received: 03/11/21 18:30

Analyte

Job ID: 570-53559-1

Matrix: Water

Dil Fac

Lab Sample ID: 570-53559-8

Analyzed

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Cadmium	ND		1.0	0.25	ug/L		03/12/21 15:22	03/12/21 17:11	1
Copper	4.2		2.0	0.50	ug/L		03/12/21 15:22	03/12/21 17:11	1
Lead	ND		1.0	0.50	ug/L		03/12/21 15:22	03/12/21 17:11	1
Client Sample ID: LPBMP0002_	20210311						Lab San	nple ID: 570-5	3559-9
Date Collected: 03/11/21 09:40								Matrix	: Water
Date Received: 03/11/21 18:30									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		1.0	0.25	ug/L		03/12/21 15:22	03/12/21 17:13	1
Copper	7.3		2.0	0.50	ug/L		03/12/21 15:22	03/12/21 17:13	1
Lead	ND		1.0	0.50	ug/L		03/12/21 15:22	03/12/21 17:13	1
Client Sample ID: LPBMP0003_ Date Collected: 03/11/21 09:50 Date Received: 03/11/21 18:30	20210311						Lab Sam	ple ID: 570-53 Matrix	559-10 : Water
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		1.0	0.25	ug/L		03/12/21 15:22	03/12/21 17:15	1
Copper	7.3		2.0	0.50	ug/L		03/12/21 15:22	03/12/21 17:15	1
Lead	ND		1.0	0.50	ug/L		03/12/21 15:22	03/12/21 17:15	1
Client Sample ID: LPBMP0004	20210311						Lab Sam	ple ID: 570-53	3559-11
Date Collected: 03/11/21 10:00								Matrix	: Water
Date Received: 03/11/21 18:30									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		1.0	0.25	ug/L		03/12/21 15:22	03/12/21 17:18	1
Copper	5.0		2.0	0.50	ug/L		03/12/21 15:22	03/12/21 17:18	1
Lead	ND		1.0	0.50	ug/L		03/12/21 15:22	03/12/21 17:18	1

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Client: Haley & Aldrich, Inc. Project/Site: BMP Performace OF 001, 002 and/or 009 Job ID: 570-53559-1

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Method: 245.1 - Mercury (CVAA)

Client Sample ID: B1BMP0009 Date Collected: 03/10/21 11:20 Date Received: 03/11/21 18:30	_20210310						Lab Sam	nple ID: 570-5 Matrix:	3559-1 Water
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.10	ua/L		03/23/21 11:20	03/23/21 16:59	1
									-
Client Sample ID: B1BMP0010_	20210310						Lab Sam	nple ID: 570-5	3559-2
Date Collected: 03/10/21 11:25								Matrix	Water
Date Received: 03/11/21 18:30									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.10	ug/L		03/23/21 11:20	03/23/21 17:05	1
	00040040						Lab Ora		
Client Sample ID: B1BMP0011_	20210310						Lab San	ipie ID: 570-5	3559-3
Date Collected: 03/10/21 11:30								Watrix	water
Date Received: 03/11/21 16:30	Pocult	Qualifier	ы	МПІ	Unit	п	Bronarod	Applyzod	Dil Eac
		Quanner	0.20	0.10			03/23/21 11·20	03/23/21 17:08	
wercury	ND		0.20	0.10	ug/L		03/23/21 11.20	03/23/21 17.00	1
Client Sample ID: ILBMP0004	20210310						Lab Sam	nple ID: 570-5	3559-4
Date Collected: 03/10/21 11:05								Matrix	Water
Date Received: 03/11/21 18:30									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND	. <u></u> .	0.20	0.10	ug/L		03/23/21 11:20	03/23/21 17:10	1
Client Sample ID: ILBMP0005_2	20210310						Lab Sam	nple ID: 570-5	3559-5
Date Collected: 03/10/21 11:10								Matrix	Water
Date Received: 03/11/21 18:30									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.10	ug/L		03/23/21 11:20	03/23/21 17:16	1
Client Semple ID: II PMP0008	00040040						Lob Som	na ID: 570 5	2550 6
Dete Collected: 02/10/21 11:00	20210310						Lap San	Ipie ID. 570-5 Motrix	Motor
Date Collected. 03/10/21 11:00								Iviau IX.	valer
	Rosult	Qualifier	RI	мы	Unit	п	Prepared	Analyzed	Dil Fac
	ND	quanner	0.20	0.10			03/23/21 11:20	03/23/21 17·19	1
increary	NB		0.20	0.10	ug/L		00/20/21 11.20	00/20/21 11:10	
Client Sample ID: ILBMP0009_2	20210310						Lab Sam	nple ID: 570-5	3559-7
Date Collected: 03/10/21 10:50								Matrix:	Water
Date Received: 03/11/21 18:30									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.10	ug/L		03/23/21 11:20	03/23/21 17:21	1
Client Sample ID: ILBMP0010_2	20210310						Lab San	ple ID: 570-5	3559-8
Date Collected: 03/10/21 10:55								Matrix	Water
Date Received: 03/11/21 18:30						_			
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.10	ug/L		03/23/21 11:20	03/23/21 17:23	1
Client Sample ID: I PRMP0002	20210311						Lah San	nie ID: 570-5	3550-0
Date Collected: 03/11/21 09:40							Lab Gall	Matriv	Water
Date Received: 03/11/21 18:30								Maula	mater
Analyte	Result	Qualifier	RL	MDI	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.10	ug/L		03/23/21 11:20	03/23/21 17:25	1

Client: Haley & Aldrich, Inc. Project/Site: BMP Performace OF 001, 002 and/or 009

Job ID: 570-53559-1

Method: 245.1 - Mercury (CVAA)

Client Sample ID: LPBMP0003_20210311 Date Collected: 03/11/21 09:50 Date Received: 03/11/21 18:30							Lab Sam	ple ID: 570-53 Matrix:	559-10 Water	
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac	
Mercury	ND		0.20	0.10	ug/L		03/23/21 11:20	03/23/21 17:28	1	
	20210311					Lab Sample ID: 570-53559				
Date Collected: 03/11/21 10:00								Matrix	Water	
Date Received: 03/11/21 18:30										
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac	
Mercury	ND		0.20	0.10	ug/L		03/23/21 11:20	03/23/21 17:30	1	

Client: Haley & Aldrich, Inc. Project/Site: BMP Performace OF 001, 002 and/or 009 Job ID: 570-53559-1

Method: 245.1 - Mercury (CVAA) - Dissolved

Client Sample ID: B1BMP0009_	20210310						Lab San	nple ID: 570-5	3559-1
Date Collected: 03/10/21 11:20								Matrix	Water
Date Received: 03/11/21 18:30									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.10	ug/L		03/23/21 11:09	03/23/21 16:28	1
Client Sample ID: B1BMP0010_	20210310						Lab San	nple ID: 570-5	3559-2
Date Collected: 03/10/21 11:25								Matrix	Water
Date Received: 03/11/21 18:30									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.10	ug/L		03/23/21 11:09	03/23/21 16:30	1
Client Complet D. D4DMD0044	20240240						Lab Car		2550.2
Client Sample ID: B1BMP0011_	20210310						Lab San	ipie ID: 570-5	3559-3
Date Collected: 03/10/21 11:30								Watrix	vvater
Date Received: 03/11/21 18:30	Decult	Qualifian	Ы	MDI	11		Drenered	Analyzad	
	Result	Qualifier	RL			D	Prepared		
Mercury	ND		0.20	0.10	ug/L		03/23/21 11:09	03/23/21 10:32	ſ
Client Sample ID: II BMP0004	20210310						Lab San	nole ID: 570-5	3559-4
Date Collected: 03/10/21 11:05							Lub Gui	Matrix	Water
Date Received: 03/11/21 18:30								Matrix	Water
Analyte	Result	Qualifier	RI	мы	Unit	р	Prepared	Analyzed	Dil Fac
Mercury			0.20	0 10			$\frac{110 \text{purea}}{03/23/21 \ 11.09}$	$\frac{7110}{03/23/21}$ 16.34	1
			0.20	0110	~g/=		00/20/21 1100	00,20,21 1010 1	•
Client Sample ID: ILBMP0005	20210310						Lab San	nple ID: 570-5	3559-5
Date Collected: 03/10/21 11:10								Matrix:	Water
Date Received: 03/11/21 18:30									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.10	ug/L		03/23/21 11:09	03/23/21 16:36	1
Client Sample ID: ILBMP0008_2	20210310						Lab San	nple ID: 570-5	3559-6
Date Collected: 03/10/21 11:00								Matrix	Water
Date Received: 03/11/21 18:30									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.10	ug/L		03/23/21 11:09	03/23/21 16:16	1
Client Sample ID: ILBMP0009_2	20210310						Lab San	nple ID: 570-5	3559-7
Date Collected: 03/10/21 10:50								Matrix	Water
Date Received: 03/11/21 18:30						_			
Analyte	Result	Qualifier		MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.10	ug/L		03/23/21 11:09	03/23/21 16:39	1
Client Sample ID: II BMD0010	00240240						Lab San	nolo ID: 570 5	2550.9
Data Collected: 03/10/21 10:55	20210310						Lab San	Matrix	Wator
Date Collected. 03/10/21 10:33								Watrix	Water
Analyto	Posult	Qualifier	DI	мы	Unit	п	Propared	Analyzod	Dil Eac
			0.20	0.10		<u> </u>	03/23/21 11:00	03/23/21 16·41	
			0.20	0.10	ug/L		55/20/21 11.09	55/25/21 10.41	1
Client Sample ID: LPBMP0002	20210311						Lab San	nple ID: 570-5	3559-9
Date Collected: 03/11/21 09:40								Matrix	Water
Date Received: 03/11/21 18:30									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.10	ug/L		03/23/21 11:09	03/23/21 16:43	1

Client: Haley & Aldrich, Inc. Project/Site: BMP Performace OF 001, 002 and/or 009 Job ID: 570-53559-1

Method: 245.1 - Mercury (CVAA) - Dissolved

Client Sample ID: LPBMP0003_20210311 Date Collected: 03/11/21 09:50 Date Received: 03/11/21 18:30							Lab Sam	ple ID: 570-53 Matrix	559-10 Water
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.10	ug/L		03/23/21 11:09	03/23/21 16:50	1
Client Sample ID: LPBMP0004_	20210311						Lab Sam	ple ID: 570-53	559-11
Date Collected: 03/11/21 10:00								Matrix	Water
Date Received: 03/11/21 18:30									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.10	ug/L		03/23/21 11:09	03/23/21 16:52	1

Client: Haley & Aldrich, Inc. Project/Site: BMP Performace OF 001, 002 and/or 009 Job ID: 570-53559-1

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Client Sample ID: B1BMP0009_2 Date Collected: 03/10/21 11:20	0210310						Lab Sa	mple ID: 570-5 Matrix:	3559-1 Water
Date Received: 03/11/21 18:30	D H	0				-	B	•	B !! F
Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	
lotal Suspended Solids	30		3.3	1.7	mg/L			03/16/21 15:17	1
Client Sample ID: B1BMP0010_2 Date Collected: 03/10/21 11:25 Date Reserved: 02/11/21 18:20	0210310						Lab Sa	mple ID: 570-5 Matrix:	3559-2 Water
Analyte	Result	Qualifier	RI	МП	Unit	П	Prenared	Analyzed	Dil Fac
Total Suspended Solids	12	Quanner	2.0	1.0	ma/l		Trepared	03/16/21 15:17	1
	12		2.0	1.0	mg/L			00/10/21 10:17	•
Client Sample ID: B1BMP0011_2 Date Collected: 03/10/21 11:30 Date Received: 03/11/21 18:30	0210310						Lab Sa	mple ID: 570-5 Matrix:	3559-3 Water
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	6.0		1.3	0.67	mg/L		•	03/16/21 15:17	1
Client Sample ID: ILBMP0004_20 Date Collected: 03/10/21 11:05 Date Received: 03/11/21 18:30	0210310				Ū		Lab Sa	mple ID: 570-5 Matrix:	3559-4 Water
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	100		5.0	2.5	mg/L		-	03/16/21 15:17	1
Client Sample ID: ILBMP0005_20 Date Collected: 03/10/21 11:10 Date Received: 03/11/21 18:30	0210310						Lab Sa	mple ID: 570-5 Matrix:	3559-5 Water
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	12		1.1	0.53	mg/L			03/16/21 15:17	1
Client Sample ID: ILBMP0008_20 Date Collected: 03/10/21 11:00 Date Received: 03/11/21 18:30	0210310						Lab Sa	mple ID: 570-5 Matrix:	3559-6 Water
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	120		10	5.0	mg/L			03/16/21 15:17	1
Client Sample ID: ILBMP0009_20 Date Collected: 03/10/21 10:50 Date Received: 03/11/21 18:30	0210310						Lab Sa	mple ID: 570-5 Matrix:	3559-7 Water
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	42		3.3	1.7	mg/L			03/16/21 15:17	1
Client Sample ID: ILBMP0010_20 Date Collected: 03/10/21 10:55 Date Received: 03/11/21 18:30	0210310						Lab Sa	mple ID: 570-5 Matrix:	3559-8 Water
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	28		2.5	1.3	mg/L			03/16/21 15:17	1
Client Sample ID: LPBMP0002_2 Date Collected: 03/11/21 09:40 Date Received: 03/11/21 18:30	0210311						Lab Sa	mple ID: 570-5 Matrix:	3559-9 Water
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	14	· ·	2.0	1.0	mg/L			03/16/21 15:41	1

Client: Haley & Aldrich, Inc. Project/Site: BMP Performace OF 001, 002 and/or 009 Job ID: 570-53559-1

General Chemistry

Client Sample ID: LPBMP0003_20210311 Date Collected: 03/11/21 09:50 Date Received: 03/11/21 18:30							Lab Sample ID: 570- Matr			
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac	
Total Suspended Solids	12		1.3	0.67	mg/L			03/16/21 15:41	1	
Client Sample ID: LPBMP0004_	20210311						Lab Sam	ple ID: 570-53	559-11	
Date Collected: 03/11/21 10:00								Matrix	Water	
Date Received: 03/11/21 18:30										
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac	
Total Suspended Solids	1.5		1.0	0.50	mg/L			03/16/21 15:41	1	

Method: D4464 - Particle Size Distribution of Catalytic Material (Laser light scattering)

Client Sample ID: B1BMP0009_2 Date Collected: 03/10/21 11:20	ient Sample ID: B1BMP0009_20210310 ite Collected: 03/10/21 11:20						Lab Sa	mple ID: 570-5 Matrix:	3559-1 Water
Date Received: 03/11/21 18:30									
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Clay(less than 0.00391 mm)	6.36		0.01	0.01	%			03/23/21 14:48	1
Coarse Sand (0.5mm to 1mm)	ND		0.01	0.01	%			03/23/21 14:48	1
Fine Sand (0.125 to 0.25mm)	22.62		0.01	0.01	%			03/23/21 14:48	1
Gravel (greater than 2 mm)	ND		0.01	0.01	%			03/23/21 14:48	1
Medium Sand (0.25 to 0.5 mm)	0.05		0.01	0.01	%			03/23/21 14:48	1
Silt (0.00391 to 0.0625mm)	53.26		0.01	0.01	%			03/23/21 14:48	1
Total Silt and Clay (0 to 0.0626mm)	59.62		0.01	0.01	%			03/23/21 14:48	1
Very Coarse Sand (1 to 2mm)	ND		0.01	0.01	%			03/23/21 14:48	1
Very Fine Sand (0.0625 to 0.125 _mm)	17.71		0.01	0.01	%			03/23/21 14:48	1

Client Sample ID: B1BMP0010_20210310

Date Collected: 03/10/21 11:25 Date Received: 03/11/21 18:30

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Clay(less than 0.00391 mm)	4.40		0.01	0.01	%			03/23/21 14:56	1
Coarse Sand (0.5mm to 1mm)	ND		0.01	0.01	%			03/23/21 14:56	1
Fine Sand (0.125 to 0.25mm)	27.97		0.01	0.01	%			03/23/21 14:56	1
Gravel (greater than 2 mm)	ND		0.01	0.01	%			03/23/21 14:56	1
Medium Sand (0.25 to 0.5 mm)	ND		0.01	0.01	%			03/23/21 14:56	1
Silt (0.00391 to 0.0625mm)	51.01		0.01	0.01	%			03/23/21 14:56	1
Total Silt and Clay (0 to 0.0626mm)	55.40		0.01	0.01	%			03/23/21 14:56	1
Very Coarse Sand (1 to 2mm)	ND		0.01	0.01	%			03/23/21 14:56	1
Very Fine Sand (0.0625 to 0.125 mm)	16.63		0.01	0.01	%			03/23/21 14:56	1

Client Sample ID: B1BMP0011_20210310 Date Collected: 03/10/21 11:30

Date Received: 03/11/21 18:30

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Clay(less than 0.00391 mm)	1.33		0.01	0.01	%		-	03/23/21 15:02	1
Coarse Sand (0.5mm to 1mm)	ND		0.01	0.01	%			03/23/21 15:02	1
Fine Sand (0.125 to 0.25mm)	62.38		0.01	0.01	%			03/23/21 15:02	1
Gravel (greater than 2 mm)	ND		0.01	0.01	%			03/23/21 15:02	1
Medium Sand (0.25 to 0.5 mm)	ND		0.01	0.01	%			03/23/21 15:02	1
Silt (0.00391 to 0.0625mm)	13.75		0.01	0.01	%			03/23/21 15:02	1
Total Silt and Clay (0 to 0.0626mm)	15.08		0.01	0.01	%			03/23/21 15:02	1
Very Coarse Sand (1 to 2mm)	ND		0.01	0.01	%			03/23/21 15:02	1
Very Fine Sand (0.0625 to 0.125 mm)	22.55		0.01	0.01	%			03/23/21 15:02	1

Client Sample ID: ILBMP0004_20210310 Date Collected: 03/10/21 11:05

Date Received: 03/11/21 18:30									
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Clay(less than 0.00391 mm)	9.79		0.01	0.01	%			03/23/21 15:18	1
Coarse Sand (0.5mm to 1mm)	ND		0.01	0.01	%			03/23/21 15:18	1
Fine Sand (0.125 to 0.25mm)	21.90		0.01	0.01	%			03/23/21 15:18	1
Gravel (greater than 2 mm)	ND		0.01	0.01	%			03/23/21 15:18	1
Medium Sand (0.25 to 0.5 mm)	0.21		0.01	0.01	%			03/23/21 15:18	1
Silt (0.00391 to 0.0625mm)	56.33		0.01	0.01	%			03/23/21 15:18	1
Clay(less than 0.00391 mm) Coarse Sand (0.5mm to 1mm) Fine Sand (0.125 to 0.25mm) Gravel (greater than 2 mm) Medium Sand (0.25 to 0.5 mm) Silt (0.00391 to 0.0625mm)	9.79 ND 21.90 ND 0.21 56.33		0.01 0.01 0.01 0.01 0.01 0.01	0.01 0.01 0.01 0.01 0.01 0.01	% % % % %			03/23/21 15:18 03/23/21 15:18 03/23/21 15:18 03/23/21 15:18 03/23/21 15:18 03/23/21 15:18	1 1 1 1 1

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Job ID: 570-53559-1

Lab Sample ID: 570-53559-2 Matrix: Water

Matrix: Water

Matrix: Water

Lab Sample ID: 570-53559-3

Lab Sample ID: 570-53559-4

Method: D4464 - Particle Size Distribution of Catalytic Material (Laser light scattering) (Continued)

Client: Haley & Aldrich, Inc. Project/Site: BMP Performace OF 001, 002 and/or 009

Client Sample ID: ILBMP0004_20210310

Job ID: 570-53559-1

Lab Sample ID: 570-53559-4 Matrix: Water

Lab Sample ID: 570-53559-6

Lab Sample ID: 570-53559-7

Matrix: Water

Matrix: Water

Date Collected: 03/10/21 11:05								Matrix	: Water
Date Received: 03/11/21 18:30									
Analyte	Result	Qualifier	RL	RL	Unit	<u>D</u>	Prepared	Analyzed	Dil Fac
Total Silt and Clay (0 to 0.0626mm)	66.12		0.01	0.01	%			03/23/21 15:18	1
Very Coarse Sand (1 to 2mm)	ND		0.01	0.01	%			03/23/21 15:18	1
Very Fine Sand (0.0625 to 0.125 _mm)	11.78		0.01	0.01	%			03/23/21 15:18	1
Client Sample ID: ILBMP0005_20 Date Collected: 03/10/21 11:10 Date Received: 03/11/21 18:30	0210310						Lab Sa	mple ID: 570-5 Matrix	3559-5 : Water
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Clay(less than 0.00391 mm)	3.59		0.01	0.01	%			03/23/21 15:24	1
Coarse Sand (0.5mm to 1mm)	ND		0.01	0.01	%			03/23/21 15:24	1
Fine Sand (0.125 to 0.25mm)	43.71		0.01	0.01	%			03/23/21 15:24	1
Gravel (greater than 2 mm)	ND		0.01	0.01	%			03/23/21 15:24	1
Medium Sand (0.25 to 0.5 mm)	0.72		0.01	0.01	%			03/23/21 15:24	1
Silt (0.00391 to 0.0625mm)	34.10		0.01	0.01	%			03/23/21 15:24	1
Total Silt and Clay (0 to 0.0626mm)	37.70		0.01	0.01	%			03/23/21 15:24	1
Very Coarse Sand (1 to 2mm)	ND		0.01	0.01	%			03/23/21 15:24	1
Very Fine Sand (0.0625 to 0.125 _mm)	17.88		0.01	0.01	%			03/23/21 15:24	1

Client Sample ID: ILBMP0008_20210310 Date Collected: 03/10/21 11:00 Date Received: 03/11/21 18:30

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Clay(less than 0.00391 mm)	10.40		0.01	0.01	%			03/23/21 15:31	1
Coarse Sand (0.5mm to 1mm)	ND		0.01	0.01	%			03/23/21 15:31	1
Fine Sand (0.125 to 0.25mm)	24.90		0.01	0.01	%			03/23/21 15:31	1
Gravel (greater than 2 mm)	ND		0.01	0.01	%			03/23/21 15:31	1
Medium Sand (0.25 to 0.5 mm)	0.01		0.01	0.01	%			03/23/21 15:31	1
Silt (0.00391 to 0.0625mm)	46.66		0.01	0.01	%			03/23/21 15:31	1
Total Silt and Clay (0 to 0.0626mm)	57.06		0.01	0.01	%			03/23/21 15:31	1
Very Coarse Sand (1 to 2mm)	ND		0.01	0.01	%			03/23/21 15:31	1
Very Fine Sand (0.0625 to 0.125 mm)	18.03		0.01	0.01	%			03/23/21 15:31	1

Client Sample ID: ILBMP0009_20210310 Date Collected: 03/10/21 10:50

Date Received: 03/11/21 18:30 Analyte **Result Qualifier** RL **RL** Unit D Prepared Analyzed Dil Fac 0.01 0.01 % 03/23/21 15:37 Clay(less than 0.00391 mm) 14.37 1 Coarse Sand (0.5mm to 1mm) ND 0.01 0.01 % 03/23/21 15:37 1 0.01 % 0.01 03/23/21 15:37 Fine Sand (0.125 to 0.25mm) 8.49 1 Gravel (greater than 2 mm) ND 0.01 0.01 % 03/23/21 15:37 1 Medium Sand (0.25 to 0.5 mm) ND 0.01 0.01 % 03/23/21 15:37 1 Silt (0.00391 to 0.0625mm) 66.48 0.01 0.01 % 03/23/21 15:37 1 0.01 0.01 % Total Silt and Clay (0 to 0.0626mm) 80.85 03/23/21 15:37 1 0.01 Very Coarse Sand (1 to 2mm) ND 0.01 % 03/23/21 15:37 1 Very Fine Sand (0.0625 to 0.125 0.01 0.01 % 03/23/21 15:37 10.66 1 mm)

Method: D4464 - Particle Size Distribution of Catalytic Material (Laser light scattering)

Client Sample ID: ILBMP0010_20 Date Collected: 03/10/21 10:55	ient Sample ID: ILBMP0010_20210310 ite Collected: 03/10/21 10:55								3559-8 Water
Date Received: 03/11/21 18:30									
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Clay(less than 0.00391 mm)	8.83		0.01	0.01	%			03/23/21 15:45	1
Coarse Sand (0.5mm to 1mm)	ND		0.01	0.01	%			03/23/21 15:45	1
Fine Sand (0.125 to 0.25mm)	28.28		0.01	0.01	%			03/23/21 15:45	1
Gravel (greater than 2 mm)	ND		0.01	0.01	%			03/23/21 15:45	1
Medium Sand (0.25 to 0.5 mm)	1.40		0.01	0.01	%			03/23/21 15:45	1
Silt (0.00391 to 0.0625mm)	52.85		0.01	0.01	%			03/23/21 15:45	1
Total Silt and Clay (0 to 0.0626mm)	61.69		0.01	0.01	%			03/23/21 15:45	1
Very Coarse Sand (1 to 2mm)	ND		0.01	0.01	%			03/23/21 15:45	1
Very Fine Sand (0.0625 to 0.125 _mm)	8.64		0.01	0.01	%			03/23/21 15:45	1

Client Sample ID: LPBMP0002_20210311

Date Collected: 03/11/21 09:40 Date Received: 03/11/21 18:30

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Clay(less than 0.00391 mm)	5.29		0.01	0.01	%			03/23/21 15:51	1
Coarse Sand (0.5mm to 1mm)	ND		0.01	0.01	%			03/23/21 15:51	1
Fine Sand (0.125 to 0.25mm)	36.04		0.01	0.01	%			03/23/21 15:51	1
Gravel (greater than 2 mm)	ND		0.01	0.01	%			03/23/21 15:51	1
Medium Sand (0.25 to 0.5 mm)	ND		0.01	0.01	%			03/23/21 15:51	1
Silt (0.00391 to 0.0625mm)	27.43		0.01	0.01	%			03/23/21 15:51	1
Total Silt and Clay (0 to 0.0626mm)	32.72		0.01	0.01	%			03/23/21 15:51	1
Very Coarse Sand (1 to 2mm)	ND		0.01	0.01	%			03/23/21 15:51	1
Very Fine Sand (0.0625 to 0.125 mm)	31.23		0.01	0.01	%			03/23/21 15:51	1

Client Sample ID: LPBMP0003_20210311 Date Collected: 03/11/21 09:50

Date Received: 03/11/21 18:30

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Clay(less than 0.00391 mm)	1.53		0.01	0.01	%		-	03/23/21 15:57	1
Coarse Sand (0.5mm to 1mm)	ND		0.01	0.01	%			03/23/21 15:57	1
Fine Sand (0.125 to 0.25mm)	42.81		0.01	0.01	%			03/23/21 15:57	1
Gravel (greater than 2 mm)	ND		0.01	0.01	%			03/23/21 15:57	1
Medium Sand (0.25 to 0.5 mm)	ND		0.01	0.01	%			03/23/21 15:57	1
Silt (0.00391 to 0.0625mm)	14.84		0.01	0.01	%			03/23/21 15:57	1
Total Silt and Clay (0 to 0.0626mm)	16.37		0.01	0.01	%			03/23/21 15:57	1
Very Coarse Sand (1 to 2mm)	ND		0.01	0.01	%			03/23/21 15:57	1
Very Fine Sand (0.0625 to 0.125 mm)	40.82		0.01	0.01	%			03/23/21 15:57	1

Client Sample ID: LPBMP0004_20210311 Date Collected: 03/11/21 10:00 Date Received: 03/11/21 18:30

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Clay(less than 0.00391 mm)	ND		0.01	0.01	%			03/23/21 16:37	1
Coarse Sand (0.5mm to 1mm)	ND		0.01	0.01	%			03/23/21 16:37	1
Fine Sand (0.125 to 0.25mm)	ND		0.01	0.01	%			03/23/21 16:37	1
Gravel (greater than 2 mm)	ND		0.01	0.01	%			03/23/21 16:37	1
Medium Sand (0.25 to 0.5 mm)	ND		0.01	0.01	%			03/23/21 16:37	1
Silt (0.00391 to 0.0625mm)	ND		0.01	0.01	%			03/23/21 16:37	1

Eurofins Calscience LLC

Lab Sample ID: 570-53559-9 Matrix: Water

Job ID: 570-53559-1

Lab Sample ID: 570-53559-10 **Matrix: Water**

Lab Sample ID: 570-53559-11

Matrix: Water

Method: D4464 - Particle Size Distribution of Catalytic Material (Laser light scattering) (Continued)

Client Sample ID: LPBMP0004_1	20210311						Lab San	nple ID: 570-53	559-11
Date Collected: 03/11/21 10:00								Matrix	: Water
Date Received: 03/11/21 18:30									
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Silt and Clay (0 to 0.0626mm)	ND		0.01	0.01	%			03/23/21 16:37	1
Very Coarse Sand (1 to 2mm)	ND		0.01	0.01	%			03/23/21 16:37	1
Very Fine Sand (0.0625 to 0.125 mm)	ND		0.01	0.01	%			03/23/21 16:37	1

(ASTM D422 / D4464M)

Haley & Aldrich, Inc.	Date Sampled:	03/10/21
	Date Received:	03/11/21
	Work Order No:	570-53559
	Date Analyzed:	03/23/21
	Method:	ASTM D4464M

Project:

Sample ID	Depth ft	Description	Mean Grain Size mm	
B1BMP0009 20210310		Very Fine Sand	0.068	

		Particle	e Size Distributio	n, wt by perc	ent			
	Very				Very			Total
Total	Coarse	Coarse	Medium	Fine	Fine			Silt &
Gravel	Sand	Sand	Sand	Sand	Sand	Silt	Clay	Clay
0.00	0.00	0.00	0.05	22.62	17.71	53.26	6.36	59.62



(ASTM D422 / D4464M)

Haley & Aldrich, Inc.	Date Sampled:	03/11/21
	Date Received:	03/11/21
	Work Order No:	570-53559
	Date Analyzed:	03/23/21
	Method:	ASTM D4464M

Project:

Sample ID	Depth ft	Description	Mean Grain Size mm
LPBMP0003 20210311		Very Fine Sand	0.107

		Particle	e Size Distributio	n, wt by perce	ent			
	Very				Very			Total
Total	Coarse	Coarse	Medium	Fine	Fine			Silt &
Gravel	Sand	Sand	Sand	Sand	Sand	Silt	Clay	Clay
0.00	0.00	0.00	0.00	42.81	40.82	14.84	1.53	16.37



V 3.0



File name:	C:\LS13320\570-53559C1 570-53559C11 23 Mar 20	1_23 Mar 2021_16 21 16.37.35.\$ls	0.37.35.\$ls
File ID:	570-53559C11		
Sample ID:	570-53559C11		
Operator:	C4LT		
Run number:	13		
Comment 1:	ASTM D4464M , LPSA 1		
Optical model:	Fraunhofer.rf780d		
Residual:	5.69%		
LS 13 320	Aqueous Liquid Module		
Start time:	16:36 23 Mar 2021	Run length:	60 seconds
Pump speed:	49		
Obscuration:	0%		
Fluid:	Water		
Software:	6.01	Firmware:	4.00



Volume: Mean: Median: Mean/Media Mode:	n ratio:	0% 0.000 μm 0.000 μm 0.000 0.000 μm	S.D.: Variance: Skewness: Kurtosis:	0 μm 0 μm ² 0 0				
d ₁₀ : 0.000	μm	d ₅₀ : 0.00	00 μm	d ₉₀ :	0.000 µm			
Folk and Wa Mean: Skewness:	ard Statist 0.00 0.00	ics (Phi) Median: Kurtosis:	0.00 0.00	Deviation:	0.00			
<5% 0.000 μm	<16% 0.000 µ	<25% ιm 0.000 μm	<40% 0.000 μm	<50% 0.000 լ	<75% ιm 0.000 μm	<84% 0.000 μm	<95% 0.000 μm	

5



		-	
Particle	570-53559C1		
Diameter	1 23 Mar		
μm	2021 16.37		
	.35.\$Is		_
	Volume		5
	%		
0.04	0		
0.4	0		6
1.95	0		
3.91	0		
62.5	0		
125	0		
250	0		Q
500	0		0
1000	0		
2000			Q

570-53559C11	I_23 Mar 2021_1	6.37.35.\$ls				
Channel	Diff.	Channel	Diff.	Channel	Diff.	
Diameter	Volume	Diameter	Volume	Diameter	Volume	
(Lower)	%	(Lower)	%	(Lower)	%	
`μm΄		`μm ΄		μm		
0.075	0	. 04.05	0	1000	0	
0.375	0	24.95	0	1660	0	
0.412	0	27.39	0	1822	0	
0.452	0	30.07	0	2000		
0.496	0	33.01	0			
0.545	0	36.24	0			
0.598	0	39.78	0			
0.657	0	43.67	0			
0.721	0	47.94	0			
0.791	0	52.63	0			
0.869	0	57.77	0			
0.954	0	63.42	0			
1.047	0	69.62	0			
1.149	0	76.43	0			
1.261	0	83.90	0			
1.385	0	92.10	0			
1.520	0	101.1	0			
1.669	0	111.0	0			
1.832	0	121.8	0			
2.011	0	133.7	0			
2.208	0	146.8	0			
2.423	Ő	161.2	Ő			
2 660	Ő	176.9	0 0			
2 920	Ő	194.2	0 0			
3 206	ů 0	213.2	Ő			
3 519	0	234.1	0			
3 863	0	256.9	0			
4 241	0	282.1	0			
4.241	0	309.6	0			
5 111	0	220.0	0			
5.111	0	070 1	0			
0.011	0	3/3.1 400 G	0			
0.109	0	409.0	0			
0./01	0	449.7	0			
7.422	U	493.6	U			
8.148	U	541.9	U			
8.944	U	594.9	U			
9.819	0	653.0	0			
10.78	0	716.9	0			
11.83	0	786.9	0			
12.99	0	863.9	0			
14.26	0	948.3	0			
15.65	0	1041	0			
17.18	0	1143	0			
18.86	0	1255	0			
20.71	0	1377	0			
22.73	0	1512	0			

(ASTM D422 / D4464M)

Haley & Aldrich, Inc.	Date Sampled:	03/10/21
	Date Received:	03/11/21
	Work Order No:	570-53559
	Date Analyzed:	03/23/21
	Method:	ASTM D4464M

Project:

Sample ID	Depth ft	Description	Mean Grain Size mm	
B1BMP0010 20210310		Very Fine Sand	0.068	

Particle Size Distribution, wt by percent								
	Very				Very			Total
Total	Coarse	Coarse	Medium	Fine	Fine			Silt &
Gravel	Sand	Sand	Sand	Sand	Sand	Silt	Clay	Clay
0.00	0.00	0.00	0.00	27.97	16.63	51.01	4.40	55.40



V 3.0

(ASTM D422 / D4464M)

Haley & Aldrich, Inc.	Date Sampled:	03/10/21
	Date Received:	03/11/21
	Work Order No:	570-53559
	Date Analyzed:	03/23/21
	Method:	ASTM D4464M

Project:

Sample ID	Depth ft	Description	Mean Grain Size mm	
B1BMP0011 20210310		Fine Sand	0.133	,

Particle Size Distribution, wt by percent								
	Very				Very			Total
Total	Coarse	Coarse	Medium	Fine	Fine			Silt &
Gravel	Sand	Sand	Sand	Sand	Sand	Silt	Clay	Clay
0.00	0.00	0.00	0.00	62.38	22.55	13.75	1.33	15.08



(ASTM D422 / D4464M)

Haley & Aldrich, Inc.	Date Sampled:	03/10/21
	Date Received:	03/11/21
	Work Order No:	570-53559
	Date Analyzed:	03/23/21
	Method:	ASTM D4464M

Project:

Sample ID	Depth ft	Description	Mean Grain Size mm
ILBMP0004 20210310		Silt	0.062

Particle Size Distribution, wt by percent								
	Very				Very			Total
Total	Coarse	Coarse	Medium	Fine	Fine			Silt &
Gravel	Sand	Sand	Sand	Sand	Sand	Silt	Clay	Clay
0.00	0.00	0.00	0.21	21.90	11.78	56.33	9.79	66.12



(ASTM D422 / D4464M)

Haley & Aldrich, Inc.	Date Sampled:	03/10/21
	Date Received:	03/11/21
	Work Order No:	570-53559
	Date Analyzed:	03/23/21
	Method:	ASTM D4464M

Project:

Sample ID	Depth ft	Description	Mean Grain Size mm
ILBMP0005 20210310		Very Fine Sand	0.103

Particle Size Distribution, wt by percent								
	Very				Very			Total
Total	Coarse	Coarse	Medium	Fine	Fine			Silt &
Gravel	Sand	Sand	Sand	Sand	Sand	Silt	Clay	Clay
0.00	0.00	0.00	0.72	43.71	17.88	34.10	3.59	37.70



V 3.0

(ASTM D422 / D4464M)

Haley & Aldrich, Inc.	Date Sampled:	03/10/21
	Date Received:	03/11/21
	Work Order No:	570-53559
	Date Analyzed:	03/23/21
	Method:	ASTM D4464M

Project:

Sample ID	Depth ft	Description	Mean Grain Size mm	
ILBMP0008_20210310		Very Fine Sand	0.066	

Particle Size Distribution, wt by percent								
	Very				Very			Total
Total	Coarse	Coarse	Medium	Fine	Fine			Silt &
Gravel	Sand	Sand	Sand	Sand	Sand	Silt	Clay	Clay
0.00	0.00	0.00	0.01	24.90	18.03	46.66	10.40	57.06



(ASTM D422 / D4464M)

Haley & Aldrich, Inc.	Date Sampled:	03/10/21
	Date Received:	03/11/21
	Work Order No:	570-53559
	Date Analyzed:	03/23/21
	Method:	ASTM D4464M

Project:

Sample ID	Depth ft	Description	Mean Grain Size mm
ILBMP0009 20210310		Silt	0.037

Particle Size Distribution, wt by percent								
	Very				Very			Total
Total	Coarse	Coarse	Medium	Fine	Fine			Silt &
Gravel	Sand	Sand	Sand	Sand	Sand	Silt	Clay	Clay
0.00	0.00	0.00	0.00	8.49	10.66	66.48	14.37	80.85



V 3.0

(ASTM D422 / D4464M)

Haley & Aldrich, Inc.	Date Sampled:	03/10/21
	Date Received:	03/11/21
	Work Order No:	570-53559
	Date Analyzed:	03/23/21
	Method:	ASTM D4464M

Project:

Sample ID	Depth ft	Description	Mean Grain Size mm
ILBMP0010 20210310		Very Fine Sand	0.074

Particle Size Distribution, wt by percent								
	Very				Very			Total
Total	Coarse	Coarse	Medium	Fine	Fine			Silt &
Gravel	Sand	Sand	Sand	Sand	Sand	Silt	Clay	Clay
0.00	0.00	0.00	1.40	28.28	8.64	52.85	8.83	61.69



V 3.0

(ASTM D422 / D4464M)

Haley & Aldrich, Inc.	Date Sampled:	03/11/21
	Date Received:	03/11/21
	Work Order No:	570-53559
	Date Analyzed:	03/23/21
	Method:	ASTM D4464M

Project:

Sample ID	Depth ft	Description	Mean Grain Size mm	
LPBMP0002 20210311		Very Fine Sand	0.092	•

Particle Size Distribution, wt by percent								
	Very				Very			Total
Total	Coarse	Coarse	Medium	Fine	Fine			Silt &
Gravel	Sand	Sand	Sand	Sand	Sand	Silt	Clay	Clay
0.00	0.00	0.00	0.00	36.04	31.23	27.43	5.29	32.72



V 3.0

Client Sample ID: Method Blank Prep Type: Total Recoverable Prep Batch: 641185

Client Sample ID: B1BMP0009_20210310

Client Sample ID: B1BMP0009_20210310

Client Sample ID: LPBMP0004_20210311

Client Sample ID: LPBMP0004 20210311

Prep Type: Total Recoverable

Prep Type: Total Recoverable

Prep Type: Total Recoverable

Prep Type: Total Recoverable

Prep Batch: 641185

Matrix: Water Analysis Batch: 641364 MB MB

Analyte	Result Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND	1.0	0.25	ug/L		03/15/21 07:35	03/15/21 20:18	1
Copper	ND	2.0	0.50	ug/L		03/15/21 07:35	03/15/21 20:18	1
Lead	ND	1.0	0.50	ug/L		03/15/21 07:35	03/15/21 20:18	1

Lab Sample ID: LCS 440-641185/2-A Matrix: Water Analysis Batch: 641364

Method: 200.8 - Metals (ICP/MS)

Lab Sample ID: MB 440-641185/1-A

Analysis Batch: 641364							Prep Batch: 641185
-	Spike	LCS	LCS				%Rec.
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits
Cadmium	80.0	74.9		ug/L		94	85 - 115
Copper	80.0	76.2		ug/L		95	85 - 115
Lead	80.0	74.2		ug/L		93	85 - 115

Lab Sample ID: 570-53559-1 MS **Matrix: Water** Analysis Batch: 641364

Analysis Batch: 641364									Prep Batch: 641185
-	Sample	Sample	Spike	MS	MS				%Rec.
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits
Cadmium	ND		80.0	75.2		ug/L		94	70 - 130
Copper	9.6		80.0	85.6		ug/L		95	70 - 130
Lead	2.5		80.0	75.5		ua/L		91	70 - 130

Lab Sample ID: 570-53559-1 MSD **Matrix: Water**

Analysis Batch: 641364

Analysis Batch: 641364									· Prep Ba	atch: 64	41185
	Sample	Sample	Spike	MSD	MSD				%Rec.		RPD
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Cadmium	ND		80.0	77.8		ug/L		97	70 - 130	3	20
Copper	9.6		80.0	88.1		ug/L		98	70 - 130	3	20
Lead	2.5		80.0	77.7		ug/L		94	70 - 130	3	20

Lab Sample ID: 570-53559-11 MS **Matrix: Water**

Analysis Batch: 641364

	Sample	Sample	Spike	MS	MS				%Rec.	
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits	
Cadmium	ND		80.0	75.8		ug/L		95	70 - 130	
Copper	19		80.0	82.3		ug/L		80	70 - 130	
Lead	ND		80.0	74.1		ug/L		93	70 - 130	

Lab Sample ID: 570-53559-11 MSD Matrix: Water

in Patch: 6/136/

Analysis Batch: 641364									Ргер ва	IICN: 64	1100
	Sample	Sample	Spike	MSD	MSD				%Rec.		RPD
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Cadmium	ND		80.0	76.0		ug/L		95	70 - 130	0	20
Copper	19		80.0	84.0		ug/L		82	70 - 130	2	20
Lead	ND		80.0	74.6		ug/L		93	70 - 130	1	20

Method: 200.8 - Metals (ICP/MS) (Continued)

Client Sample ID: Method Blank Prep Type: Dissolved Prep Batch: 641198

Analyzed

Prep Type: Dissolved

Prep Type: Dissolved

Prep Type: Dissolved

Prep Type: Dissolved

Prep Batch: 641198

03/12/21 15:22 03/12/21 16:40

03/12/21 15:22 03/12/21 16:40

03/12/21 15:22 03/12/21 16:40

Client Sample ID: B1BMP0009_20210310

Client Sample ID: B1BMP0009_20210310

Client Sample ID: LPBMP0004_20210311

Client Sample ID: LPBMP0004 20210311

Prepared

D

Lab Sample ID: MB 440-641167/1-B **Matrix: Water** Analysis Batch: 641218 MB MB Analyte Result Qualifier RL Cadmium ND 1.0 Copper ND 2.0

ND

Lab Sample ID: LCS 440-641167/2-B Matrix: Water makes a Detake 044040

Lead

Analysis Batch: 641218							Ргер Ва	CU: 041189
	Spike	LCS	LCS				%Rec.	
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	
Cadmium	80.0	72.9		ug/L		91	85 - 115	
Copper	80.0	68.2		ug/L		85	85 - 115	
Lead	80.0	73.8		ug/L		92	85 - 115	

1.0

MDL Unit

0.25 ug/L

0.50 ug/L

0.50 ug/L

Lab Sample ID: 570-53559-1 MS **Matrix: Water** Analysis Batch: 641218

Analysis Batch: 641218									Prep Batch: 641198
-	Sample	Sample	Spike	MS	MS				%Rec.
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits
Cadmium	ND		80.0	68.0		ug/L		85	70 - 130
Copper	5.9		80.0	73.4		ug/L		84	70 - 130
Lead	ND		80.0	70.2		ug/L		88	70 - 130

Lab Sample ID: 570-53559-1 MSD **Matrix: Water**

Analy	/sis	Batch:	641218
Allar	010	Duton.	

Analysis Batch: 641218									Prep Ba	atch: 64	411 <mark>9</mark> 8
	Sample	Sample	Spike	MSD	MSD				%Rec.		RPD
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Cadmium	ND		80.0	70.1		ug/L		88	70 - 130	3	20
Copper	5.9		80.0	74.3		ug/L		86	70 - 130	1	20
Lead	ND		80.0	71.3		ug/L		89	70 - 130	2	20

Lab Sample ID: 570-53559-11 MS **Matrix: Water**

Analysis Batch: 641218

-	Sample	Sample	Spike	MS	MS				%Rec.	
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits	
Cadmium	ND		80.0	68.5		ug/L		86	70 - 130	
Copper	5.0		80.0	70.3		ug/L		82	70 - 130	
Lead	ND		80.0	67.9		ug/L		85	70 - 130	

Lab Sample ID: 570-53559-11 MSD Matrix: Water

Δna	lvei	s Rate	h' 6	4121

Analysis Batch: 641218									Ргер Ва	tcn: 641198	
	Sample	Sample	Spike	MSD	MSD				%Rec.		RPD
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Cadmium	ND		80.0	68.3		ug/L		85	70 - 130	0	20
Copper	5.0		80.0	71.5		ug/L		83	70 - 130	2	20
Lead	ND		80.0	67.2		ug/L		84	70 - 130	1	20
QC Sample Results

Client: Haley & Aldrich, Inc. Project/Site: BMP Performace OF 001, 002 and/or 009

Mercury

Job ID: 570-53559-1

Method: 245.1 - Mercury (CVAA) Lab Sample ID: MB 440-642060/1-A Client Sample ID: Method Blank Matrix: Water Prep Type: Total/NA Analysis Batch: 642145 Prep Batch: 642060 MB MB **Result Qualifier** RL MDL Unit Analyzed Dil Fac Analyte D Prepared 0.20 Mercury ND 0.10 ug/L 03/23/21 11:20 03/23/21 16:54 1 Lab Sample ID: LCS 440-642060/2-A **Client Sample ID: Lab Control Sample Matrix: Water** Prep Type: Total/NA Prep Batch: 642060 Analysis Batch: 642145 Spike LCS LCS %Rec. Added **Result Qualifier** D %Rec Limits Analyte Unit 6.00 103 85 - 115 Mercury 6 17 ug/L Lab Sample ID: 570-53559-1 MS Client Sample ID: B1BMP0009 20210310 **Matrix: Water** Prep Type: Total/NA Analysis Batch: 642145 Prep Batch: 642060 Sample Sample Spike MS MS %Rec. **Result Qualifier** Added **Result Qualifier** Limits Analyte Unit D %Rec Mercury ND 6.00 6.02 100 75 - 125 ug/L Lab Sample ID: 570-53559-1 MSD Client Sample ID: B1BMP0009_20210310 **Matrix: Water** Prep Type: Total/NA Analysis Batch: 642145 Prep Batch: 642060 Spike MSD MSD %Rec. RPD Sample Sample Analyte **Result Qualifier** Added **Result Qualifier** Unit %Rec Limits RPD Limit D 6.00 5.88 75 - 125 Mercury ND ug/L 98 2 20 Lab Sample ID: MB 440-641167/1-C **Client Sample ID: Method Blank** Matrix: Water **Prep Type: Dissolved** Analysis Batch: 642145 Prep Batch: 642053 MB MB RL MDL Unit Analyte **Result Qualifier** D Prepared Analyzed Dil Fac 0.20 0.10 ug/L 03/23/21 11:09 03/23/21 16:12 Mercury ND Lab Sample ID: LCS 440-641167/2-C **Client Sample ID: Lab Control Sample** Matrix: Water **Prep Type: Dissolved** Analysis Batch: 642145 Prep Batch: 642053 Spike LCS LCS %Rec. Added **Result Qualifier** %Rec Limits Analyte Unit D 6 00 Mercury 5.87 ug/L 98 85 - 115 Lab Sample ID: 570-53559-6 MS Client Sample ID: ILBMP0008 20210310 Matrix: Water **Prep Type: Dissolved** Analysis Batch: 642145 Prep Batch: 642053 Sample Sample Spike MS MS %Rec. **Result Qualifier** Added **Result Qualifier** Limits Analyte Unit D %Rec ND 6.00 Mercury 5.99 ug/L 100 75 - 125 Lab Sample ID: 570-53559-6 MSD Client Sample ID: ILBMP0008_20210310 **Matrix: Water Prep Type: Dissolved** Analysis Batch: 642145 Prep Batch: 642053 Spike MSD MSD %Rec. RPD Sample Sample RPD Analyte **Result Qualifier** Added Limits **Result Qualifier** Unit D %Rec Limit

Eurofins Calscience LLC

75 - 125

95

5.67

ug/L

6.00

ND

20

6

QC Sample Results

Job ID: 570-53559-1

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

Lab Sample ID: MB 440-64 Matrix: Water Analysis Batch: 641455	1455/1							CI	ier	nt Sam	ple ID: Me Prep Typ	thod e: Tot	Blank tal/NA
		MB MB											
Analyte	Re	sult Qualifier		RL		MDL Unit		D	Pre	pared	Analyze	d	Dil Fac
Total Suspended Solids		ND Contraction		1.0		0.50 mg/L					03/16/21 1	5:17	1
Lab Sample ID: LCS 440-6 Matrix: Water	41455/2						Clie	nt Sa	am	ple ID:	Lab Cont Prep Typ	rol Sa e: Tot	ample tal/NA
Analysis Balch: 641455			Sniko		201	201					%Pac		
Analyte					Rosult	Qualifier	Unit	г	,	%Rec	/intec.		
Total Suspended Solids			1000		945	Quaimer	ma/L			95	85 - 115		
Lab Sample ID: 440-28047	0-A-1 DU									Client	Sample ID	: Dup	licate
Matrix: Water											Prep Typ	e: Tot	tal/NA
Analysis Batch: 641455													
	Sample	Sample			DU	DU							RPD
Analyte	Result	Qualifier		I	Result	Qualifier	Unit	0)			RPD	Limit
Total Suspended Solids	87				86.5		mg/L					0.6	10
Lab Sample ID: MB 440-64 Matrix: Water Analysis Batch: 641466	1466/1	MB MB						CI	ier	nt Sam	ple ID: Me Prep Typ	thod e: Tot	Blank tal/NA
Lab Sample ID: MB 440-64 Matrix: Water Analysis Batch: 641466 Analyte	1466/1 Re	MB MB esult Qualifier		RL		MDL Unit		CI D	ier Pre	nt Sam	ple ID: Me Prep Typ	thod e: Tot	Blank tal/NA Dil Fac
Lab Sample ID: MB 440-64 Matrix: Water Analysis Batch: 641466 Analyte Total Suspended Solids	1466/1 Re	MB MB esult Qualifier		RL 1.0		MDL Unit		CI	ier Pre	nt Sam	ple ID: Me Prep Typ - <u>Analyze</u> 03/16/21 11	thod e: Tot d 5:41	Blank tal/NA Dil Fac
Lab Sample ID: MB 440-64 Matrix: Water Analysis Batch: 641466 Analyte Total Suspended Solids Lab Sample ID: LCS 440-6 Matrix: Water Analysis Batch: 641466	1466/1 Re 41466/2	MB MB esult Qualifier		RL 1.0		MDL Unit 0.50 mg/L	Clie	CI	ier Pre	nt Sam	ple ID: Me Prep Typ <u>Analyze</u> 03/16/21 11 Lab Cont Prep Typ	thod e: Tot 5:41 rol Sa e: Tot	Blank tal/NA Dil Fac 1 ample tal/NA
Lab Sample ID: MB 440-64 Matrix: Water Analysis Batch: 641466 Analyte Total Suspended Solids Lab Sample ID: LCS 440-6 Matrix: Water Analysis Batch: 641466	1466/1 Re 41466/2	MB MB esult Qualifier		RL 1.0	LCS	MDL Unit 0.50 mg/L	Clie	CI D nt Sa	ier Pre	nt Sam epared uple ID:	ple ID: Me Prep Typ - <u>Analyze</u> 03/16/21 11 : Lab Cont Prep Typ %Rec.	thod e: Tot 5:41 - rol Sa e: Tot	Blank tal/NA Dil Fac 1 ample tal/NA
Lab Sample ID: MB 440-64 Matrix: Water Analysis Batch: 641466 Analyte Total Suspended Solids Lab Sample ID: LCS 440-6 Matrix: Water Analysis Batch: 641466 Analyte	1466/1 Re 41466/2	MB MB esult Qualifier	Spike Added	RL 1.0	LCS	MDL Unit 0.50 mg/L LCS Qualifier	Clie	CI	ier Pre	nt Sam opared ople ID: %Rec	ple ID: Me Prep Typ Analyze 03/16/21 1: Lab Cont Prep Typ %Rec. Limits	thod e: Tot ^{5:41} rol Sa e: Tot	Blank tal/NA Dil Fac 1 ample tal/NA
Lab Sample ID: MB 440-64 Matrix: Water Analysis Batch: 641466 Analyte Total Suspended Solids Lab Sample ID: LCS 440-6 Matrix: Water Analysis Batch: 641466 Analyte Total Suspended Solids	1466/1 Re 41466/2	MB MB esult Qualifier	Spike Added 1000	RL 1.0	LCS Result 966	MDL Unit 0.50 mg/L LCS Qualifier	Clie Unit mg/L	CI 	Pre am	nt Sam epared uple ID: %Rec 97 -	ple ID: Mer Prep Typ 03/16/21 1: Lab Cont Prep Typ %Rec. Limits 85 - 115	thod e: Tot 5:41 - rol Sa e: Tot	Blank tal/NA Dil Fac 1 ample tal/NA
Lab Sample ID: MB 440-64 Matrix: Water Analysis Batch: 641466 Analyte Total Suspended Solids Lab Sample ID: LCS 440-6 Matrix: Water Analysis Batch: 641466 Analysis Batch: 641466 Analyte Total Suspended Solids Lab Sample ID: LCS 440-6 Matrix: Water Analyte Total Suspended Solids Lab Sample ID: 440-28051 Matrix: Water	1466/1 41466/2 3-F-2 DU	MB MB esult Qualifier	Spike Added 1000	RL 1.0	LCS Result 966	MDL Unit 0.50 mg/L LCS Qualifier	Clie Unit mg/L	CI	Pre am	nt Sam epared uple ID: %Rec 97 - Client	Pie ID: Mer Prep Typ 03/16/21 1: Lab Cont Prep Typ %Rec. Limits 85 - 115 Sample ID Prep Typ	thod e: Tot 5:41 - rol Sa e: Tot : Dup e: Tot	Blank tal/NA Dil Fac 1 ample tal/NA
Lab Sample ID: MB 440-64 Matrix: Water Analysis Batch: 641466 Analyte Total Suspended Solids Lab Sample ID: LCS 440-6 Matrix: Water Analysis Batch: 641466 Analyte Total Suspended Solids Lab Sample ID: LCS 440-6 Matrix: Water Analyte Total Suspended Solids Lab Sample ID: 440-28051 Matrix: Water Analysis Batch: 641466	1466/1 41466/2 3-F-2 DU	MB MB esult Qualifier	Spike Added 1000	RL 1.0	LCS Result 966	MDL Unit 0.50 mg/L LCS Qualifier	Clie Unit mg/L	CI D	Pre am	nt Sam epared uple ID: %Rec 97 Client	Pie ID: Me Prep Typ 03/16/21 1: Lab Cont Prep Typ %Rec. Limits 85 - 115 Sample ID Prep Typ	thod e: Tot 5:41 - rol Sa e: Tot : Dup e: Tot	Blank tal/NA Dil Fac 1 ample tal/NA
Lab Sample ID: MB 440-64 Matrix: Water Analysis Batch: 641466 Analyte Total Suspended Solids Lab Sample ID: LCS 440-6 Matrix: Water Analysis Batch: 641466 Analyte Total Suspended Solids Lab Sample ID: LCS 440-6 Matrix: Water Analyte Total Suspended Solids Lab Sample ID: 440-28051 Matrix: Water Analysis Batch: 641466	1466/1	MB MB esult Qualifier	Spike Added 1000	RL 1.0	LCS Result 966 DU	MDL Unit 0.50 mg/L LCS Qualifier	Clie Unit mg/L	CI 	Pre am	nt Sam opared ople ID: %Rec 97 - Client	ple ID: Me Prep Typ Analyze 03/16/21 11 Lab Cont Prep Typ %Rec. Limits 85 - 115 Sample ID Prep Typ	thod l e: Tot 5:41 - rol Sa e: Tot : Dup e: Tot	Blank tal/NA Dil Fac 1 ample tal/NA Dilicate tal/NA RPD
Lab Sample ID: MB 440-64 Matrix: Water Analysis Batch: 641466 Analyte Total Suspended Solids Lab Sample ID: LCS 440-6 Matrix: Water Analysis Batch: 641466 Analyte Total Suspended Solids Lab Sample ID: LCS 440-6 Matrix: Water Analyte Total Suspended Solids Lab Sample ID: 440-28051 Matrix: Water Analysis Batch: 641466 Analysis Batch: 641466 Analysis Batch: 641466	1466/1Re 41466/2 3-F-2 DU Sample Result	MB MB esult Qualifier ND	Spike Added 1000	RL 1.0	LCS Result 966 DU Result	MDL Unit 0.50 mg/L LCS Qualifier	Clie Unit mg/L Unit	CI D nt Sa 	Pre am	nt Sam opared ople ID: <u>%Rec</u> 97 Client	ple ID: Me Prep Typ <u>Analyze</u> 03/16/21 13 Lab Cont Prep Typ %Rec. Limits 85 - 115 Sample ID Prep Typ	thod l e: Tot 5:41 rol Sa e: Tot : Dup e: Tot RPD	Blank tal/NA Dil Fac 1 ample tal/NA Dilcate tal/NA RPD Limit

Client: Haley & Aldrich, Inc. Project/Site: BMP Performace OF 001, 002 and/or 009 Job ID: 570-53559-1

8

Metals

Filtration Batch: 641167

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
570-53559-1	B1BMP0009_20210310	Dissolved	Water	FILTRATION	
570-53559-2	B1BMP0010_20210310	Dissolved	Water	FILTRATION	
570-53559-3	B1BMP0011_20210310	Dissolved	Water	FILTRATION	
570-53559-4	ILBMP0004_20210310	Dissolved	Water	FILTRATION	
570-53559-5	ILBMP0005_20210310	Dissolved	Water	FILTRATION	
570-53559-6	ILBMP0008_20210310	Dissolved	Water	FILTRATION	
570-53559-7	ILBMP0009_20210310	Dissolved	Water	FILTRATION	
570-53559-8	ILBMP0010_20210310	Dissolved	Water	FILTRATION	
570-53559-9	LPBMP0002_20210311	Dissolved	Water	FILTRATION	
570-53559-10	LPBMP0003_20210311	Dissolved	Water	FILTRATION	
570-53559-11	LPBMP0004_20210311	Dissolved	Water	FILTRATION	
MB 440-641167/1-B	Method Blank	Dissolved	Water	FILTRATION	
MB 440-641167/1-C	Method Blank	Dissolved	Water	FILTRATION	
LCS 440-641167/2-B	Lab Control Sample	Dissolved	Water	FILTRATION	
LCS 440-641167/2-C	Lab Control Sample	Dissolved	Water	FILTRATION	
570-53559-1 MS	B1BMP0009_20210310	Dissolved	Water	FILTRATION	
570-53559-1 MSD	B1BMP0009_20210310	Dissolved	Water	FILTRATION	
570-53559-6 MS	ILBMP0008_20210310	Dissolved	Water	FILTRATION	
570-53559-6 MSD	ILBMP0008_20210310	Dissolved	Water	FILTRATION	
570-53559-11 MS	LPBMP0004_20210311	Dissolved	Water	FILTRATION	
570-53559-11 MSD	LPBMP0004_20210311	Dissolved	Water	FILTRATION	

Lab Sample ID **Client Sample ID** Prep Type Matrix Method Prep Batch B1BMP0009_20210310 570-53559-1 Total Recoverable Water 200.2 570-53559-2 B1BMP0010_20210310 **Total Recoverable** Water 200.2 570-53559-3 B1BMP0011_20210310 Total Recoverable Water 200.2 570-53559-4 ILBMP0004_20210310 **Total Recoverable** Water 200.2 570-53559-5 ILBMP0005 20210310 Total Recoverable Water 200.2 570-53559-6 ILBMP0008_20210310 **Total Recoverable** 200.2 Water 200.2 570-53559-7 ILBMP0009_20210310 Total Recoverable Water Total Recoverable 570-53559-8 ILBMP0010_20210310 Water 200.2 570-53559-9 LPBMP0002 20210311 Total Recoverable Water 200.2 LPBMP0003_20210311 570-53559-10 **Total Recoverable** Water 200.2 570-53559-11 LPBMP0004_20210311 **Total Recoverable** Water 200.2 MB 440-641185/1-A Method Blank **Total Recoverable** Water 200.2 LCS 440-641185/2-A Lab Control Sample **Total Recoverable** Water 200.2 B1BMP0009_20210310 570-53559-1 MS Total Recoverable Water 200.2 570-53559-1 MSD B1BMP0009 20210310 **Total Recoverable** Water 200.2 570-53559-11 MS LPBMP0004_20210311 **Total Recoverable** Water 200.2 200.2 570-53559-11 MSD LPBMP0004_20210311 **Total Recoverable** Water

Prep Batch: 641198

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
570-53559-1	B1BMP0009_20210310	Dissolved	Water	200.2	641167
570-53559-2	B1BMP0010_20210310	Dissolved	Water	200.2	641167
570-53559-3	B1BMP0011_20210310	Dissolved	Water	200.2	641167
570-53559-4	ILBMP0004_20210310	Dissolved	Water	200.2	641167
570-53559-5	ILBMP0005_20210310	Dissolved	Water	200.2	641167
570-53559-6	ILBMP0008_20210310	Dissolved	Water	200.2	641167
570-53559-7	ILBMP0009 20210310	Dissolved	Water	200.2	641167

Client: Haley & Aldrich, Inc. Project/Site: BMP Performace OF 001, 002 and/or 009

Metals (Continued)

Prep Batch: 641198 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
570-53559-8	ILBMP0010_20210310	Dissolved	Water	200.2	641167
570-53559-9	LPBMP0002_20210311	Dissolved	Water	200.2	641167
570-53559-10	LPBMP0003_20210311	Dissolved	Water	200.2	641167
570-53559-11	LPBMP0004_20210311	Dissolved	Water	200.2	641167
MB 440-641167/1-B	Method Blank	Dissolved	Water	200.2	641167
LCS 440-641167/2-B	Lab Control Sample	Dissolved	Water	200.2	641167
570-53559-1 MS	B1BMP0009_20210310	Dissolved	Water	200.2	641167
570-53559-1 MSD	B1BMP0009_20210310	Dissolved	Water	200.2	641167
570-53559-11 MS	LPBMP0004_20210311	Dissolved	Water	200.2	641167
570-53559-11 MSD	LPBMP0004_20210311	Dissolved	Water	200.2	641167

Analysis Batch: 641218

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
570-53559-1	B1BMP0009_20210310	Dissolved	Water	200.8	641198
570-53559-2	B1BMP0010_20210310	Dissolved	Water	200.8	641198
570-53559-3	B1BMP0011_20210310	Dissolved	Water	200.8	641198
570-53559-4	ILBMP0004_20210310	Dissolved	Water	200.8	641198
570-53559-5	ILBMP0005_20210310	Dissolved	Water	200.8	641198
570-53559-6	ILBMP0008_20210310	Dissolved	Water	200.8	641198
570-53559-7	ILBMP0009_20210310	Dissolved	Water	200.8	641198
570-53559-8	ILBMP0010_20210310	Dissolved	Water	200.8	641198
570-53559-9	LPBMP0002_20210311	Dissolved	Water	200.8	641198
570-53559-10	LPBMP0003_20210311	Dissolved	Water	200.8	641198
570-53559-11	LPBMP0004_20210311	Dissolved	Water	200.8	641198
MB 440-641167/1-B	Method Blank	Dissolved	Water	200.8	641198
LCS 440-641167/2-B	Lab Control Sample	Dissolved	Water	200.8	641198
570-53559-1 MS	B1BMP0009_20210310	Dissolved	Water	200.8	641198
570-53559-1 MSD	B1BMP0009_20210310	Dissolved	Water	200.8	641198
570-53559-11 MS	LPBMP0004_20210311	Dissolved	Water	200.8	641198
570-53559-11 MSD	LPBMP0004_20210311	Dissolved	Water	200.8	641198

Analysis Batch: 641364

Lab Sample ID	Client Sample ID	Ргер Туре	Matrix	Method	Prep Batch
570-53559-1	B1BMP0009_20210310	Total Recoverable	Water	200.8	641185
570-53559-2	B1BMP0010_20210310	Total Recoverable	Water	200.8	641185
570-53559-3	B1BMP0011_20210310	Total Recoverable	Water	200.8	641185
570-53559-4	ILBMP0004_20210310	Total Recoverable	Water	200.8	641185
570-53559-5	ILBMP0005_20210310	Total Recoverable	Water	200.8	641185
570-53559-6	ILBMP0008_20210310	Total Recoverable	Water	200.8	641185
570-53559-7	ILBMP0009_20210310	Total Recoverable	Water	200.8	641185
570-53559-8	ILBMP0010_20210310	Total Recoverable	Water	200.8	641185
570-53559-9	LPBMP0002_20210311	Total Recoverable	Water	200.8	641185
570-53559-10	LPBMP0003_20210311	Total Recoverable	Water	200.8	641185
570-53559-11	LPBMP0004_20210311	Total Recoverable	Water	200.8	641185
MB 440-641185/1-A	Method Blank	Total Recoverable	Water	200.8	641185
LCS 440-641185/2-A	Lab Control Sample	Total Recoverable	Water	200.8	641185
570-53559-1 MS	B1BMP0009_20210310	Total Recoverable	Water	200.8	641185
570-53559-1 MSD	B1BMP0009_20210310	Total Recoverable	Water	200.8	641185
570-53559-11 MS	LPBMP0004_20210311	Total Recoverable	Water	200.8	641185
570-53559-11 MSD	LPBMP0004_20210311	Total Recoverable	Water	200.8	641185

Job ID: 570-53559-1

Prep Type

Dissolved

Matrix

Water

Client: Haley & Aldrich, Inc. Project/Site: BMP Performace OF 001, 002 and/or 009

Client Sample ID

B1BMP0009_20210310

B1BMP0010_20210310

B1BMP0011_20210310

ILBMP0004_20210310

ILBMP0005_20210310

ILBMP0008_20210310

ILBMP0009_20210310

ILBMP0010_20210310

LPBMP0002 20210311

LPBMP0003_20210311

LPBMP0004 20210311

ILBMP0008_20210310

ILBMP0008_20210310

Lab Control Sample

Method Blank

Job ID: 570-53559-1

Prep Batch

641167

641167

641167

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Prep Batch: 642060

Metals

Prep Batch: 642053

Lab Sample ID

570-53559-1

570-53559-2

570-53559-3

570-53559-4

570-53559-5

570-53559-6

570-53559-7

570-53559-8

570-53559-9

570-53559-10

570-53559-11

MB 440-641167/1-C

LCS 440-641167/2-C

570-53559-6 MS

570-53559-6 MSD

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
570-53559-1	B1BMP0009_20210310	Total/NA	Water	245.1	
570-53559-2	B1BMP0010_20210310	Total/NA	Water	245.1	
570-53559-3	B1BMP0011_20210310	Total/NA	Water	245.1	
570-53559-4	ILBMP0004_20210310	Total/NA	Water	245.1	
570-53559-5	ILBMP0005_20210310	Total/NA	Water	245.1	
570-53559-6	ILBMP0008_20210310	Total/NA	Water	245.1	
570-53559-7	ILBMP0009_20210310	Total/NA	Water	245.1	
570-53559-8	ILBMP0010_20210310	Total/NA	Water	245.1	
570-53559-9	LPBMP0002_20210311	Total/NA	Water	245.1	
570-53559-10	LPBMP0003_20210311	Total/NA	Water	245.1	
570-53559-11	LPBMP0004_20210311	Total/NA	Water	245.1	
MB 440-642060/1-A	Method Blank	Total/NA	Water	245.1	
LCS 440-642060/2-A	Lab Control Sample	Total/NA	Water	245.1	
570-53559-1 MS	B1BMP0009_20210310	Total/NA	Water	245.1	
570-53559-1 MSD	B1BMP0009 20210310	Total/NA	Water	245.1	

Analysis Batch: 642145

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
570-53559-1	B1BMP0009_20210310	Dissolved	Water	245.1	642053
570-53559-1	B1BMP0009_20210310	Total/NA	Water	245.1	642060
570-53559-2	B1BMP0010_20210310	Dissolved	Water	245.1	642053
570-53559-2	B1BMP0010_20210310	Total/NA	Water	245.1	642060
570-53559-3	B1BMP0011_20210310	Dissolved	Water	245.1	642053
570-53559-3	B1BMP0011_20210310	Total/NA	Water	245.1	642060
570-53559-4	ILBMP0004_20210310	Dissolved	Water	245.1	642053
570-53559-4	ILBMP0004_20210310	Total/NA	Water	245.1	642060
570-53559-5	ILBMP0005_20210310	Dissolved	Water	245.1	642053
570-53559-5	ILBMP0005_20210310	Total/NA	Water	245.1	642060
570-53559-6	ILBMP0008_20210310	Dissolved	Water	245.1	642053
570-53559-6	ILBMP0008_20210310	Total/NA	Water	245.1	642060
570-53559-7	ILBMP0009_20210310	Dissolved	Water	245.1	642053
570-53559-7	ILBMP0009_20210310	Total/NA	Water	245.1	642060
570-53559-8	ILBMP0010_20210310	Dissolved	Water	245.1	642053

Client: Haley & Aldrich, Inc. Project/Site: BMP Performace OF 001, 002 and/or 009

Metals (Continued)

Analysis Batch: 642145 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
570-53559-8	ILBMP0010_20210310	Total/NA	Water	245.1	642060
570-53559-9	LPBMP0002_20210311	Dissolved	Water	245.1	642053
570-53559-9	LPBMP0002_20210311	Total/NA	Water	245.1	642060
570-53559-10	LPBMP0003_20210311	Dissolved	Water	245.1	642053
570-53559-10	LPBMP0003_20210311	Total/NA	Water	245.1	642060
570-53559-11	LPBMP0004_20210311	Dissolved	Water	245.1	642053
570-53559-11	LPBMP0004_20210311	Total/NA	Water	245.1	642060
MB 440-641167/1-C	Method Blank	Dissolved	Water	245.1	642053
MB 440-642060/1-A	Method Blank	Total/NA	Water	245.1	642060
LCS 440-641167/2-C	Lab Control Sample	Dissolved	Water	245.1	642053
LCS 440-642060/2-A	Lab Control Sample	Total/NA	Water	245.1	642060
570-53559-1 MS	B1BMP0009_20210310	Total/NA	Water	245.1	642060
570-53559-1 MSD	B1BMP0009_20210310	Total/NA	Water	245.1	642060
570-53559-6 MS	ILBMP0008_20210310	Dissolved	Water	245.1	642053
570-53559-6 MSD	ILBMP0008_20210310	Dissolved	Water	245.1	642053

General Chemistry

Analysis Batch: 641455

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
570-53559-1	B1BMP0009_20210310	Total/NA	Water	SM 2540D	
570-53559-2	B1BMP0010_20210310	Total/NA	Water	SM 2540D	
570-53559-3	B1BMP0011_20210310	Total/NA	Water	SM 2540D	
570-53559-4	ILBMP0004_20210310	Total/NA	Water	SM 2540D	
570-53559-5	ILBMP0005_20210310	Total/NA	Water	SM 2540D	
570-53559-6	ILBMP0008_20210310	Total/NA	Water	SM 2540D	
570-53559-7	ILBMP0009_20210310	Total/NA	Water	SM 2540D	
570-53559-8	ILBMP0010_20210310	Total/NA	Water	SM 2540D	
MB 440-641455/1	Method Blank	Total/NA	Water	SM 2540D	
LCS 440-641455/2	Lab Control Sample	Total/NA	Water	SM 2540D	
440-280470-A-1 DU	Duplicate	Total/NA	Water	SM 2540D	

Analysis Batch: 641466

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
570-53559-9	LPBMP0002_20210311	Total/NA	Water	SM 2540D	
570-53559-10	LPBMP0003_20210311	Total/NA	Water	SM 2540D	
570-53559-11	LPBMP0004_20210311	Total/NA	Water	SM 2540D	
MB 440-641466/1	Method Blank	Total/NA	Water	SM 2540D	
LCS 440-641466/2	Lab Control Sample	Total/NA	Water	SM 2540D	
440-280513-F-2 DU	Duplicate	Total/NA	Water	SM 2540D	

Geotechnical

Analysis Batch: 138287

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
570-53559-1	B1BMP0009_20210310	Total/NA	Water	D4464	
570-53559-2	B1BMP0010_20210310	Total/NA	Water	D4464	
570-53559-3	B1BMP0011_20210310	Total/NA	Water	D4464	
570-53559-4	ILBMP0004_20210310	Total/NA	Water	D4464	
570-53559-5	ILBMP0005_20210310	Total/NA	Water	D4464	
570-53559-6	ILBMP0008_20210310	Total/NA	Water	D4464	
570-53559-7	ILBMP0009_20210310	Total/NA	Water	D4464	

Eurofins Calscience LLC

Job ID: 570-53559-1

5

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Client: Haley & Aldrich, Inc. Project/Site: BMP Performace OF 001, 002 and/or 009

Geotechnical (Continued)

Analysis Batch: 138287 (Continued)

Lab Sample ID 570-53559-8	Client Sample ID ILBMP0010_20210310	Prep Type Total/NA	Matrix Water	Method Prep Batch
570-53559-9	LPBMP0002_20210311	Total/NA	Water	D4464
570-53559-10	LPBMP0003_20210311	Total/NA	Water	D4464
570-53559-11	LPBMP0004_20210311	Total/NA	Water	D4464

Job ID: 570-53559-1

5

9

Client Sample ID: B1BMP0009_20210310 Date Collected: 03/10/21 11:20 Date Received: 03/11/21 18:30

Lab	Sample	ID:	570-53559-1
			Matrix: Water

-	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Dissolved	Filtration	FILTRATION			150 mL	150 mL	641167	03/12/21 11:31	LZY7	TAL IRV
Dissolved	Prep	200.2			25 mL	25 mL	641198	03/12/21 15:22	LZY7	TAL IRV
Dissolved	Analysis	200.8		1			641218	03/12/21 16:44	SQ5O	TAL IRV
	Instrumen	t ID: ICPMS5								
Total Recoverable	Prep	200.2			25 mL	25 mL	641185	03/15/21 07:35	LZY7	TAL IRV
Total Recoverable	Analysis	200.8		1			641364	03/15/21 20:22	SQ5O	TAL IRV
	Instrumen	t ID: ICPMS6								
Dissolved	Filtration	FILTRATION			150 mL	150 mL	641167	03/12/21 11:31	LZY7	TAL IRV
Dissolved	Prep	245.1			20 mL	30 mL	642053	03/23/21 11:09	C0YH	TAL IRV
Dissolved	Analysis	245.1		1			642145	03/23/21 16:28	C0YH	TAL IRV
	Instrumen	t ID: CV-HG5								
Total/NA	Prep	245.1			20 mL	30 mL	642060	03/23/21 11:20	C0YH	TAL IRV
Total/NA	Analysis	245.1		1			642145	03/23/21 16:59	C0YH	TAL IRV
	Instrumen	t ID: CV-HG5								
Total/NA	Analysis	SM 2540D		1	300 mL	1000 mL	641455	03/16/21 15:17	ZL7L	TAL IRV
	Instrumen	t ID: BAL065								
Total/NA	Analysis	D4464		1			138287	03/23/21 14:48	C4LT	ECL 1
	Instrumen	t ID: NOEQUIP								

Lab Chronicle

Client Sample ID: B1BMP0010_20210310 Date Collected: 03/10/21 11:25 Date Received: 03/11/21 18:30

Lab Sample ID: 570-53559-2 Matrix: Water

_	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Dissolved	Filtration	FILTRATION			100 mL	100 mL	641167	03/12/21 11:31	LZY7	TAL IRV
Dissolved	Prep	200.2			25 mL	25 mL	641198	03/12/21 15:22	LZY7	TAL IRV
Dissolved	Analysis	200.8		1			641218	03/12/21 16:51	SQ5O	TAL IRV
	Instrumen	t ID: ICPMS5								
Total Recoverable	Prep	200.2			25 mL	25 mL	641185	03/15/21 07:35	LZY7	TAL IRV
Total Recoverable	Analysis	200.8		1			641364	03/15/21 20:28	SQ5O	TAL IRV
	Instrumen	t ID: ICPMS6								
Dissolved	Filtration	FILTRATION			100 mL	100 mL	641167	03/12/21 11:31	LZY7	TAL IRV
Dissolved	Prep	245.1			20 mL	30 mL	642053	03/23/21 11:09	C0YH	TAL IRV
Dissolved	Analysis	245.1		1			642145	03/23/21 16:30	C0YH	TAL IRV
	Instrumen	t ID: CV-HG5								
Total/NA	Prep	245.1			20 mL	30 mL	642060	03/23/21 11:20	C0YH	TAL IRV
Total/NA	Analysis	245.1		1			642145	03/23/21 17:05	C0YH	TAL IRV
	Instrumen	t ID: CV-HG5								
Total/NA	Analysis	SM 2540D		1	500 mL	1000 mL	641455	03/16/21 15:17	ZL7L	TAL IRV
	Instrumen	t ID: BAL065								
Total/NA	Analysis	D4464		1			138287	03/23/21 14:56	C4LT	ECL 1
	Instrumen	t ID: NOEQUIP								

Lab

TAL IRV

ECL 1

Client Sample ID: B1BMP0011_20210310 Date Collected: 03/10/21 11:30 Date Received: 03/11/21 18:30

Batch

200.2

200.8

200.2

200.8

245.1

245.1

245.1

245.1

SM 2540D

D4464

FILTRATION

Instrument ID: ICPMS5

Instrument ID: ICPMS6

Instrument ID: CV-HG5

Instrument ID: CV-HG5

Instrument ID: BAL065

Instrument ID: NOEQUIP

Method

FILTRATION

Batch

Туре

Prep

Prep

Filtration

Analysis

Analysis

Filtration

Analysis

Analysis

Analysis

Analysis

Prep

Prep

Prep Type

Dissolved

Dissolved

Dissolved

Dissolved

Dissolved

Dissolved

Total/NA

Total/NA

Total/NA

Total/NA

Total Recoverable

Total Recoverable

Lab Sample	ID:	570-53559-3
		Matrix: Water

Analyst

LZY7

Prepared

or Analyzed

03/12/21 11:31

03/12/21 15:22 LZY7

03/12/21 16:54 SQ5O

03/15/21 07:35 LZY7

03/15/21 20:30 SQ5O

03/12/21 11:31 LZY7

03/23/21 11:09 C0YH

03/23/21 16:32 C0YH

03/23/21 11:20 C0YH

03/23/21 17:08 C0YH

03/16/21 15:17 ZL7L

03/23/21 15:02 C4LT

Client Sample ID: ILBMP0004_20210310 Date Collected: 03/10/21 11:05 Date Received: 03/11/21 18:30

Lab Sample ID: 570-53559-4 Matrix: Water

-	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Dissolved	Filtration	FILTRATION			100 mL	100 mL	641167	03/12/21 11:31	LZY7	TAL IRV
Dissolved	Prep	200.2			25 mL	25 mL	641198	03/12/21 15:22	LZY7	TAL IRV
Dissolved	Analysis	200.8		1			641218	03/12/21 16:56	SQ5O	TAL IRV
	Instrumen	t ID: ICPMS5								
Total Recoverable	Prep	200.2			25 mL	25 mL	641185	03/15/21 07:35	LZY7	TAL IRV
Total Recoverable	Analysis	200.8		1			641364	03/15/21 20:32	SQ5O	TAL IRV
	Instrumen	t ID: ICPMS6								
Dissolved	Filtration	FILTRATION			100 mL	100 mL	641167	03/12/21 11:31	LZY7	TAL IRV
Dissolved	Prep	245.1			20 mL	30 mL	642053	03/23/21 11:09	C0YH	TAL IRV
Dissolved	Analysis	245.1		1			642145	03/23/21 16:34	C0YH	TAL IRV
	Instrumen	t ID: CV-HG5								
Total/NA	Prep	245.1			20 mL	30 mL	642060	03/23/21 11:20	C0YH	TAL IRV
Total/NA	Analysis	245.1		1			642145	03/23/21 17:10	C0YH	TAL IRV
	Instrumen	t ID: CV-HG5								
Total/NA	Analysis	SM 2540D		1	200 mL	1000 mL	641455	03/16/21 15:17	ZL7L	TAL IRV
	Instrumen	t ID: BAL065								
Total/NA	Analysis	D4464		1			138287	03/23/21 15:18	C4LT	ECL 1
	Instrumen	t ID: NOEQUIP								

Lab Chronicle

Initial

Amount

100 mL

25 mL

25 mL

100 mL

20 mL

20 mL

750 mL

Final

Amount

100 mL

25 mL

25 mL

100 mL

30 mL

30 mL

1000 mL

Batch

Number

641167

641198

641218

641185

641364

641167

642053

642145

642060

642145

641455

138287

Dil

1

1

1

1

1

1

Factor

Run

Client Sample ID: ILBMP0005_20210310 Date Collected: 03/10/21 11:10 Date Received: 03/11/21 18:30

Lab Sample ID: 570-53559-5 Matrix: Water

5

9

-	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Dissolved	Filtration	FILTRATION			100 mL	100 mL	641167	03/12/21 11:31	LZY7	TAL IRV
Dissolved	Prep	200.2			25 mL	25 mL	641198	03/12/21 15:22	LZY7	TAL IRV
Dissolved	Analysis	200.8 t ID: ICPMS5		1			641218	03/12/21 16:59	SQ5O	TAL IRV
Total Recoverable	Pren	200.2			25 ml	25 ml	641185	03/15/21 07:35	1777	
Total Recoverable	Analysis	200.2 200.8 t ID: ICPMS6		1	20 ME	20 112	641364	03/15/21 20:34	SQ50	TAL IRV
Dissolved	Filtration	FILTRATION			100 mL	100 mL	641167	03/12/21 11:31	LZY7	TAL IRV
Dissolved	Prep	245.1			20 mL	30 mL	642053	03/23/21 11:09	C0YH	TAL IRV
Dissolved	Analysis Instrumen	245.1 t ID: CV-HG5		1			642145	03/23/21 16:36	C0YH	TAL IRV
Total/NA	Prep	245.1			20 mL	30 mL	642060	03/23/21 11:20	C0YH	TAL IRV
Total/NA	Analysis Instrumen	245.1 t ID: CV-HG5		1			642145	03/23/21 17:16	C0YH	TAL IRV
Total/NA	Analysis Instrumen	SM 2540D t ID: BAL065		1	950 mL	1000 mL	641455	03/16/21 15:17	ZL7L	TAL IRV
Total/NA	Analysis Instrumen	D4464 t ID: NOEQUIP		1			138287	03/23/21 15:24	C4LT	ECL 1

Lab Chronicle

Client Sample ID: ILBMP0008_20210310 Date Collected: 03/10/21 11:00 Date Received: 03/11/21 18:30

Lab Sample ID: 570-53559-6 Matrix: Water

Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Filtration	FILTRATION			100 mL	100 mL	641167	03/12/21 11:31	LZY7	TAL IRV
Prep	200.2			25 mL	25 mL	641198	03/12/21 15:22	LZY7	TAL IRV
Analysis	200.8		1			641218	03/12/21 17:01	SQ5O	TAL IRV
Instrument I	D: ICPMS5								
Prep	200.2			25 mL	25 mL	641185	03/15/21 07:35	LZY7	TAL IRV
Analysis	200.8		1			641364	03/15/21 20:40	SQ5O	TAL IRV
Instrument I	D: ICPMS6								
Filtration	FILTRATION			100 mL	100 mL	641167	03/12/21 11:31	LZY7	TAL IRV
Prep	245.1			20 mL	30 mL	642053	03/23/21 11:09	C0YH	TAL IRV
Analysis	245.1		1			642145	03/23/21 16:16	C0YH	TAL IRV
Instrument I	D: CV-HG5								
Prep	245.1			20 mL	30 mL	642060	03/23/21 11:20	C0YH	TAL IRV
Analysis	245.1		1			642145	03/23/21 17:19	C0YH	TAL IRV
Instrument I	D: CV-HG5								
Analysis	SM 2540D		1	100 mL	1000 mL	641455	03/16/21 15:17	ZL7L	TAL IRV
Instrument I	D: BAL065								
Analysis	D4464		1			138287	03/23/21 15:31	C4LT	ECL 1
Instrument I	D: NOEQUIP								
	Batch Type Filtration Prep Analysis Instrument I Prep Analysis Instrument I Prep Analysis Instrument I Analysis Instrument I Analysis Instrument I Analysis	BatchBatchTypeMethodFiltrationFILTRATIONPrep200.2Analysis200.8Instrument ID:ICPMS5Prep200.2Analysis200.8Instrument ID:ICPMS6FiltrationFILTRATIONPrep245.1Analysis245.1Instrument ID:CV-HG5Prep245.1Instrument ID:CV-HG5AnalysisSM 2540DInstrument ID:BAL065AnalysisD4464Instrument ID:NOEQUIP	BatchBatchTypeMethodRunFiltrationFILTRATIONPrep200.2Analysis200.8Instrument ID:ICPMS5Prep200.2Analysis200.8Instrument ID:ICPMS6FiltrationFILTRATIONPrep245.1Analysis245.1Instrument ID:CV-HG5Prep245.1Analysis245.1Instrument ID:CV-HG5AnalysisSM 2540DInstrument ID:BAL065AnalysisD4464Instrument ID:NOEQUIP	BatchBatchDilTypeMethodRunFactorFiltrationFILTRATIONPrep200.2Analysis200.81Instrument ID:ICPMS5Prep200.2Analysis200.81Instrument ID:ICPMS6FiltrationFILTRATIONPrep245.11Instrument ID:CV-HG5Prep245.11Instrument ID:CV-HG5Prep245.11Instrument ID:CV-HG5AnalysisSM 2540D1Instrument ID:BAL065AnalysisD44641Instrument ID:NOEQUIP	BarchBarchDilInitialTypeMethodRunFactorAmountFiltrationFILTRATION100 mLPrep200.225 mLAnalysis200.81Instrument ID:ICPMS5Prep200.225 mLAnalysis200.81Instrument ID:ICPMS6FiltrationFILTRATION100 mLPrep245.120 mLAnalysis245.11Instrument ID:CV-HG5Prep245.11Instrument ID:CV-HG5AnalysisSM 2540D1Instrument ID:BAL065AnalysisD44641Instrument ID:NOEQUIP	BatchBatchDilInitialFinalTypeMethodRunFactorAmountAmountFiltrationFILTRATION100 mL100 mL100 mLPrep200.225 mL25 mL25 mLAnalysis200.811100 mL25 mLInstrument ID:ICPMS525 mL25 mL25 mLPrep200.225 mL25 mL25 mLAnalysis200.81100 mL25 mLAnalysis200.81100 mL20 mLInstrument ID:ICPMS6100 mL100 mLFiltrationFILTRATION100 mL30 mLPrep245.111Instrument ID:CV-HG520 mL30 mLAnalysis245.11100 mL1000 mLInstrument ID:CV-HG51100 mL1000 mLInstrument ID:CV-HG51100 mL1000 mLInstrument ID:BAL0651100 mL1000 mLInstrument ID:BAL0651100 mL1000 mLInstrument ID:NOEQUIP1100 mL1000 mL	BatchBatchDilInitialFinalBatchTypeMethodRunFactorAmountAmountNumberFiltrationFILTRATION100 mL100 mL641167Prep200.225 mL25 mL641198Analysis200.81641218Instrument ID:ICPMS5641185Prep200.225 mL25 mLAnalysis200.81641364Instrument ID:ICPMS6100 mL100 mLFiltrationFILTRATION100 mL100 mLPrep245.1100 mLAnalysis245.11642053Analysis245.11642060Analysis245.11642060AnalysisSM 2540D1100 mL1000 mLInstrument ID:CV-HG51100 mL641455Instrument ID:CV-HG51100 mL1000 mLAnalysis245.11138287Instrument ID:NOEQUIP1138287	Batch Batch Dil Initial Final Batch Prepared Type Method Run Factor Amount Amount Number or Analyzed Filtration FILTRATION Run Factor Amount Mount Number or Analyzed Prep 200.2 25 mL 25 mL 25 mL 641198 03/12/21 15:22 Analysis 200.8 1 25 mL 25 mL 641185 03/15/21 07:35 Analysis 200.8 1 25 mL 25 mL 641185 03/15/21 07:35 Analysis 200.8 1 100 mL 25 mL 641185 03/15/21 07:35 Analysis 200.8 1 100 mL 25 mL 641167 03/12/21 11:20 Instrument ID: ICPMS6 100 mL 100 mL 100 mL 642145 03/23/21 11:20 Analysis 245.1 1 20 mL 30 mL 642060 03/23/21 11:20 Analysis 245.1 1 10	Batch Batch Dit Initial Final Batch Prepared Type Method Run Factor Amount Amount Number or Analyzed Analyst Filtration FILTRATION Initial Final Batch Or Analyzed Analyst Prep 200.2 25 mL 25 mL 641167 03/12/21 15:22 LZY7 Analysis 200.8 1 641218 03/12/21 07:35 LZY7 Analysis 200.8 1 641364 03/15/21 07:35 LZY7 Instrument ID: ICPMS6 100 mL 100 mL 641167 03/12/21 11:31 LZY7 Prep 245.1 1 20 mL 30 mL 642053 03/23/21 11:09 C0YH

Batch

200.2

200.8

200.2

200.8

245.1

245.1

245.1

245.1

SM 2540D

D4464

FILTRATION

Instrument ID: ICPMS5

Instrument ID: ICPMS6

Instrument ID: CV-HG5

Instrument ID: CV-HG5

Instrument ID: BAL065

Instrument ID: NOEQUIP

Method

FILTRATION

Client Sample ID: ILBMP0009_20210310 Date Collected: 03/10/21 10:50 Date Received: 03/11/21 18:30

Batch

Туре

Prep

Prep

Filtration

Analysis

Analysis

Filtration

Analysis

Analysis

Analysis

Analysis

Prep

Prep

Prep Type

Dissolved

Dissolved

Dissolved

Dissolved

Dissolved

Dissolved

Total/NA

Total/NA

Total/NA

Total/NA

Total Recoverable

Total Recoverable

Analyst

LZY7

Lab Sample ID: 570-53559-7 Matrix: Water

Lab

TAL IRV

ECL 1

Client Sample ID: ILBMP0010_20210310 Date Collected: 03/10/21 10:55 Date Received: 03/11/21 18:30

Lab Sample ID: 570-53559-8 Matrix: Water

_	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Dissolved	Filtration	FILTRATION			100 mL	100 mL	641167	03/12/21 11:31	LZY7	TAL IRV
Dissolved	Prep	200.2			25 mL	25 mL	641198	03/12/21 15:22	LZY7	TAL IRV
Dissolved	Analysis	200.8		1			641218	03/12/21 17:11	SQ5O	TAL IRV
	Instrumen	t ID: ICPMS5								
Total Recoverable	Prep	200.2			25 mL	25 mL	641185	03/15/21 07:35	LZY7	TAL IRV
Total Recoverable	Analysis	200.8		1			641364	03/15/21 20:44	SQ5O	TAL IRV
	Instrumen	t ID: ICPMS6								
Dissolved	Filtration	FILTRATION			100 mL	100 mL	641167	03/12/21 11:31	LZY7	TAL IRV
Dissolved	Prep	245.1			20 mL	30 mL	642053	03/23/21 11:09	C0YH	TAL IRV
Dissolved	Analysis	245.1		1			642145	03/23/21 16:41	C0YH	TAL IRV
	Instrumen	t ID: CV-HG5								
Total/NA	Prep	245.1			20 mL	30 mL	642060	03/23/21 11:20	C0YH	TAL IRV
Total/NA	Analysis	245.1		1			642145	03/23/21 17:23	C0YH	TAL IRV
	Instrumen	t ID: CV-HG5								
Total/NA	Analysis	SM 2540D		1	400 mL	1000 mL	641455	03/16/21 15:17	ZL7L	TAL IRV
	Instrumen	t ID: BAL065								
Total/NA	Analysis	D4464		1			138287	03/23/21 15:45	C4LT	ECL 1
	Instrumen	t ID: NOEQUIP								
	Instrumen	t ID: NOEQUIP								

Lab Chronicle

Initial

Amount

100 mL

25 mL

25 mL

100 mL

20 mL

20 mL

300 mL

Dil

1

1

1

1

1

1

Factor

Run

Batch

Number

641167

641198

641218

641185

641364

641167

642053

642145

642060

642145

641455

138287

Prepared

or Analyzed

03/12/21 11:31

03/12/21 15:22 LZY7

03/12/21 17:08 SQ5O

03/15/21 07:35 LZY7

03/15/21 20:42 SQ5O

03/12/21 11:31 LZY7

03/23/21 11:09 C0YH

03/23/21 16:39 C0YH

03/23/21 11:20 C0YH

03/23/21 17:21 C0YH

03/16/21 15:17 ZL7L

03/23/21 15:37 C4LT

Final

Amount

100 mL

25 mL

25 mL

100 mL

30 mL

30 mL

1000 mL

Batch

200.2

200.8

200.2

200.8

245.1

245.1

245.1

245.1

SM 2540D

D4464

FILTRATION

Instrument ID: ICPMS5

Instrument ID: ICPMS6

Instrument ID: CV-HG5

Instrument ID: CV-HG5

Instrument ID: BAL065

Instrument ID: NOEQUIP

Method

FILTRATION

Client Sample ID: LPBMP0002_20210311 Date Collected: 03/11/21 09:40 Date Received: 03/11/21 18:30

Batch

Туре

Prep

Prep

Filtration

Analysis

Analysis

Filtration

Analysis

Analysis

Analysis

Analysis

Prep

Prep

Prep Type

Dissolved

Dissolved

Dissolved

Dissolved

Dissolved

Dissolved

Total/NA

Total/NA

Total/NA

Total/NA

Total Recoverable

Total Recoverable

Matrix: Water

Lab

TAL IRV

ECL 1

Lab Sample ID: 570-53559-9

Analyst

LZY7

Prepared

or Analyzed

03/12/21 11:31

03/12/21 15:22 LZY7

03/12/21 17:13 SQ5O

03/15/21 07:35 LZY7

03/15/21 20:46 SQ5O

03/12/21 11:31 LZY7

03/23/21 11:09 C0YH

03/23/21 16:43 C0YH

03/23/21 11:20 C0YH

03/23/21 17:25 C0YH

03/16/21 15:41 ZL7L

03/23/21 15:51 C4LT

9 10 11 12 13

Client Sample ID: LPBMP0003_20210311 Date Collected: 03/11/21 09:50 Date Received: 03/11/21 18:30

Lab Sample ID: 570-53559-10 Matrix: Water

_	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Dissolved	Filtration	FILTRATION			100 mL	100 mL	641167	03/12/21 11:31	LZY7	TAL IRV
Dissolved	Prep	200.2			25 mL	25 mL	641198	03/12/21 15:22	LZY7	TAL IRV
Dissolved	Analysis	200.8		1			641218	03/12/21 17:15	SQ5O	TAL IRV
	Instrument	ID: ICPMS5								
Total Recoverable	Prep	200.2			25 mL	25 mL	641185	03/15/21 07:35	LZY7	TAL IRV
Total Recoverable	Analysis	200.8		1			641364	03/15/21 20:48	SQ5O	TAL IRV
	Instrument	ID: ICPMS6								
Dissolved	Filtration	FILTRATION			100 mL	100 mL	641167	03/12/21 11:31	LZY7	TAL IRV
Dissolved	Prep	245.1			20 mL	30 mL	642053	03/23/21 11:09	C0YH	TAL IRV
Dissolved	Analysis	245.1		1			642145	03/23/21 16:50	C0YH	TAL IRV
	Instrument	ID: CV-HG5								
Total/NA	Prep	245.1			20 mL	30 mL	642060	03/23/21 11:20	C0YH	TAL IRV
Total/NA	Analysis	245.1		1			642145	03/23/21 17:28	C0YH	TAL IRV
	Instrument	ID: CV-HG5								
Total/NA	Analysis	SM 2540D		1	750 mL	1000 mL	641466	03/16/21 15:41	ZL7L	TAL IRV
	Instrument	ID: BAL065								
Total/NA	Analysis	D4464		1			138287	03/23/21 15:57	C4LT	ECL 1
	Instrument	D: NOEQUIP								

Lab Chronicle

Initial

Amount

100 mL

25 mL

25 mL

100 mL

20 mL

20 mL

500 mL

Final

Amount

100 mL

25 mL

25 mL

100 mL

30 mL

30 mL

1000 mL

Batch

Number

641167

641198

641218

641185

641364

641167

642053

642145

642060

642145

641466

138287

Dil

1

1

1

1

1

1

Factor

Run

Lab Chronicle

Client: Haley & Aldrich, Inc. Project/Site: BMP Performace OF 001, 002 and/or 009

Job ID: 570-53559-1

9

Client Sample ID: LPBMP0004_20210311 Date Collected: 03/11/21 10:00 Date Received: 03/11/21 18:30

Lab Sample	ID:	570-53559-11
		Matrix: Water

_	Batch	Batch		ויח	Initial	Final	Batch	Prenared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Dissolved	Filtration	FILTRATION			100 mL	100 mL	641167	03/12/21 11:31	LZY7	TAL IRV
Dissolved	Prep	200.2			25 mL	25 mL	641198	03/12/21 15:22	LZY7	TAL IRV
Dissolved	Analysis Instrumen	200.8 t ID: ICPMS5		1			641218	03/12/21 17:18	SQ5O	TAL IRV
Total Recoverable	Prep	200.2			25 mL	25 mL	641185	03/15/21 07:35	LZY7	TAL IRV
Total Recoverable	Analysis Instrumen	200.8 t ID: ICPMS6		1			641364	03/15/21 20:50	SQ5O	TAL IRV
Dissolved	Filtration	FILTRATION			100 mL	100 mL	641167	03/12/21 11:31	LZY7	TAL IRV
Dissolved	Prep	245.1			20 mL	30 mL	642053	03/23/21 11:09	C0YH	TAL IRV
Dissolved	Analysis Instrumen	245.1 t ID: CV-HG5		1			642145	03/23/21 16:52	C0YH	TAL IRV
Total/NA	Prep	245.1			20 mL	30 mL	642060	03/23/21 11:20	C0YH	TAL IRV
Total/NA	Analysis Instrumen	245.1 t ID: CV-HG5		1			642145	03/23/21 17:30	C0YH	TAL IRV
Total/NA	Analysis Instrumen	SM 2540D t ID: BAL065		1	1000 mL	1000 mL	641466	03/16/21 15:41	ZL7L	TAL IRV
Total/NA	Analysis Instrumen	D4464 t ID: NOEQUIP		1			138287	03/23/21 16:37	C4LT	ECL 1

Laboratory References:

ECL 1 = Eurofins Calscience LLC Lincoln, 7440 Lincoln Way, Garden Grove, CA 92841, TEL (714)895-5494 TAL IRV = Eurofins Calscience Irvine, 17461 Derian Ave, Suite 100, Irvine, CA 92614-5817, TEL (949)261-1022

Accreditation/Certification Summary

Client: Haley & Aldrich, Inc. Project/Site: BMP Performace OF 001, 002 and/or 009

Laboratory: Eurofins Calscience LLC

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

CaliforniaLos Angeles County Sanitation1010909-30-21DistrictsDistrictsCaliforniaSCAQMD LAP17LA091911-30-21CaliforniaState294409-30-21GuamState20-003R10-31-20 *NevadaStateCA0011107-31-21OregonNELAPCA30000101-30-22USDAUS Federal ProgramsP330-20-0003402-10-23	Authority	Program	Identification Number	Expiration Date
DistrictsCaliforniaSCAQMD LAP17LA091911-30-21CaliforniaState294409-30-21GuamState20-003R10-31-20*NevadaStateCA0011107-31-21OregonNELAPCA3000101-30-22USDAUS Federal ProgramsP330-20-003402-10-23	California	Los Angeles County Sanitation	10109	09-30-21
California SCAQMD LAP 17LA0919 11-30-21 California State 2944 09-30-21 Guam State 20-003R 10-31-20* Nevada State CA00111 07-31-21 Oregon NELAP CA30001 01-30-22 USDA US Federal Programs P330-20-0034 02-10-23		Districts		
California State 2944 09-30-21 Guam State 20-003R 10-31-20* Nevada State CA00111 07-31-21 Oregon NELAP CA300001 01-30-22 USDA US Federal Programs P330-20-00034 02-10-23	California	SCAQMD LAP	17LA0919	11-30-21
Guam State 20-003R 10-31-20 * Nevada State CA00111 07-31-21 Oregon NELAP CA300001 01-30-22 USDA US Federal Programs P330-20-00034 02-10-23	California	State	2944	09-30-21
Nevada State CA00111 07-31-21 Oregon NELAP CA30001 01-30-22 USDA US Federal Programs P330-20-00334 02-10-23	Guam	State	20-003R	10-31-20 *
Oregon NELAP CA300001 01-30-22 USDA US Federal Programs P330-20-00034 02-10-23	Nevada	State	CA00111	07-31-21
USDA US Federal Programs P330-20-00034 02-10-23	Oregon	NELAP	CA300001	01-30-22
	USDA	US Federal Programs	P330-20-00034	02-10-23
Washington State C916-18 10-11-21	Washington	State	C916-18	10-11-21
	aboratory: Eurofin	is Calscience Irvine		
Laboratory: Eurofins Calscience Irvine	he accreditations/certifications	s listed below are applicable to this report.		

Authority	Program	Identification Number	Expiration Date
California	State	2706	06-30-21

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

Job ID: 570-53559-1

Method Summary

Client: Haley & Aldrich, Inc. Project/Site: BMP Performace OF 001, 002 and/or 009

Method	Method Description	Protocol	Laboratory
200.8	Metals (ICP/MS)	EPA	TAL IRV
245.1	Mercury (CVAA)	EPA	TAL IRV
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL IRV
D4464	Particle Size Distribution of Catalytic Material (Laser light scattering)	ASTM	ECL 1
200.2	Preparation, Total Recoverable Metals	EPA	TAL IRV
245.1	Preparation, Mercury	EPA	TAL IRV
FILTRATION	Sample Filtration	None	TAL IRV

Protocol References:

ASTM = ASTM International EPA = US Environmental Protection Agency None = None SM = "Standard Methods For The Examination Of Water And Wastewater"

Laboratory References:

ECL 1 = Eurofins Calscience LLC Lincoln, 7440 Lincoln Way, Garden Grove, CA 92841, TEL (714)895-5494 TAL IRV = Eurofins Calscience Irvine, 17461 Derian Ave, Suite 100, Irvine, CA 92614-5817, TEL (949)261-1022

Sample Summary

Client: Haley & Aldrich, Inc. Project/Site: BMP Performace OF 001, 002 and/or 009

Job ID: 570-53559-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
570-53559-1	B1BMP0009_20210310	Water	03/10/21 11:20	03/11/21 18:30	
570-53559-2	B1BMP0010_20210310	Water	03/10/21 11:25	03/11/21 18:30	
570-53559-3	B1BMP0011_20210310	Water	03/10/21 11:30	03/11/21 18:30	
570-53559-4	ILBMP0004_20210310	Water	03/10/21 11:05	03/11/21 18:30	
570-53559-5	ILBMP0005_20210310	Water	03/10/21 11:10	03/11/21 18:30	
570-53559-6	ILBMP0008_20210310	Water	03/10/21 11:00	03/11/21 18:30	
570-53559-7	ILBMP0009_20210310	Water	03/10/21 10:50	03/11/21 18:30	
570-53559-8	ILBMP0010_20210310	Water	03/10/21 10:55	03/11/21 18:30	
570-53559-9	LPBMP0002_20210311	Water	03/11/21 09:40	03/11/21 18:30	
570-53559-10	LPBMP0003_20210311	Water	03/11/21 09:50	03/11/21 18:30	
570-53559-11	LPBMP0004_20210311	Water	03/11/21 10:00	03/11/21 18:30	

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17461 Derlan Avenue, Suite 100 Irvine, CA 92614 phone (949) 261-1022 fax (949) 260-3299

Chain of Custody Record for Haley & Aldrich, Inc. Blanket Service Agreement #2019-22-TestAmerica



Cilent Contact	H&A Project M	anager: Kat	herine M	ller	H&A	Site Conta	ct: Matt Bi	rney (818)	166-8782	NIMARI -01-0	and oy and	Detweel Light	y & Aldric	1, INC., IIS SU B: 03/10/20	osidiaries al	la amilates, a		ica Laboratones Inc.	
Haley & Aldrich, Inc.	Tel/Fax: (520) :	89-8606			Lab	contact: L	Irvashi Pat	el (949) 33:	-9065				Car	rier.				1 of 1 COCs	
5333 Mission Center Road, Suite 300	Anal	ysis Tumaro	mIT bruc		L		-			ʻu	'u	L					Ů	milari M Rimav	
San Diego, California 92108	CALENDAR DAY	2 S	WORKING	DAYS	1	.,				W 9	W q						5[ŭ	ri abilisa Oniv:	
(619) 280-9210 Phone	TAT If di	ferent from Beld	Ņ		Г					9 , B	9 ,6		.,,					alk-in Client	
(619) 280-9415 FAX	D	2 weeks		Ì	(N	q				ы, Fo	94							b Sampling	
H&A Project Number 129095-004 SID 5.2		1 week			/) (N	ر, PI	Id 'I	,	ebi	10 1	no '						<u>}</u>		
Site: BMP Performance OF 001, 002, and/or		2 days) (ן ז' כו	(e) 10		lo2	PO '	PO '	(ə	(0.0	(0.0) (9			<u> </u>	a subsection of the section of the s	
009 Watershed					ISW) ejc	(рә/ бң: рე:	сар : Н9 СЧ	(beb (C delC	sA : 24	sA :	ідел Эн :	063	iden 1963 (Da			<u> </u>	o / SDG No.	
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Sample Identification	Date	ime G	orab) Ma	atrix Con	ЪЧ 	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	¥¥C €	W)	M) M)	₩ ≫S ₩ ₩	es ₩ ₩	2S	ē	er Cr	_			Sample Specific Notes	
						1-250mL P	1-250mL P	2-1L		۵ <mark>- 1</mark> -500)mL 1-500	- - - - -	L 1-1L	-isterne		ι, ρ	d Staff Notes: Lab may substitute 250mL Poly for v need to fill baif of 500mL Must fill TSS in the to	r 500mL for metals. o
B1BMP0009_20210310	3/10/2021	1120	5 N	9 N	Z	×	×	×	×								ġ į	Upper Parking Lot, Media Filter Gunite sw	ale conveying road
B1BMP0010_20210310	3/10/2021	1125	3	9 5	Z	×	×	×	×								і ф 1	Upper Parking Lot, Media Filter Culvert or	ttet from upper
B1BMP0011_20210310 3	3/10/2021	1130	3	9 5	Z	×	×	×	×				-				39	Upper Parking Lot, Underdrains	and the second
ILBMP0004_20210310	3/10/2021	105	5	9 5	z	×	×	×	×						ļ		5.4	stream, B1436 southern detention bioswale erting sheet flow into rock cnb-west	(concrete swale
ILBMP0005_20210310	3/10/2021	1110	8	9		×	×	×	×			1		+				wnstream, B1436 southern detention biosw	ale; 12-inch
- Прикросов_20210310	3/10/2021	100	5	8	z	×	×	×	×						 		55	stream B1436 southern detention bioswale enting sheet flow into rock crib - east	concrete swale
QILBMP0009_20210310	3/10/2021	1050	S	9	z	×	×	×	×						-			uent, filter basket, administration building a	(ea
2) ILBMP0010_20210310	3/10/2021	1055	1 2 0	9 7	Z	×	×	×	×			-	-		<u> </u>		<u>a</u>	uent, filter basket, administration building a	rea
2LPBMP0002_20210311	3/11/2021 (040	8	9 5	Z	×	×	×	×			-	-				19	ver Parking Lot, sample port in cestern disc	harge pipe
CLPBMP0003_20210311	3/11/2021 (950	5	9 5	Z	×	×	×	×		-	1	-				2	ver Parking Lot; Sediment Basin outlet box	
LPBMP0004_20210311 1/	3/11/2021	000	8	9 N	Z	×	×	×	×		<u></u>	-	-				<u> </u> 9	ver Parking Lot; discharge from Biofilter effi	uent pipe
															+				i and a second
Possible Hazard Identification: Are any samples from a listed EPA Hazardous	Waste? Pleas	e List any EF	A Waste	Codes for	the St	mple Disp	4 osal	-	-		-			-		_	-		
sample in the Comments Section if the lab is to	dispose of the Imtant	sample Poison B		Unknown	ľ	Return to	cllent				Ľ	sposal by Lab					or 6	Months	
Special instructions/QC Requirements & Co Please email data to kmiller@haleyaldrich.com	mments: and post to Tot	al Access; B	II to Hale	y & Aldrich	at AP@	haleyaldric	th.com; Rej	ort Level II	Data Packs	ge and prov	ide EDD;	All dissolve	d metal s	amples are	to be filte	red within 2	24 hours of	receipt, even those placed on hold.	
Custody Seals Intact: C YesNo	Custody Seal N	0			1(6:3	0		coler Tem	o. (°C). Obs	d.	Con'd.	á sa	Therm	D No.					[1] A second state state of the second state stat state state
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																		Form No. CA-C-WI-045, Rev. 1.	2, dated 1/8/2016
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3/25/2021

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Chain of Custody Record



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Client Information (Sub Contract Lab)				Pate	I, Virer	idra							Jalan B		570-87	390 1		-
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Company	-				Accred	tations	Required	(See no	e).						:# dol			Γ
Eurofins Calscience LLC		-			state	L rogr	an Ca	Itornia							5/0-53	1-9-1		T
Address: 17461 Derian Ave, Suite 100	Due Date Request 3/19/2021							An	alysi	s Rec	luest	ed			Preserv.	ation Cod	SS M House	
2hy: Irvine	TAT Requested (d	ays);													D N N N N N N N N N N N N N N N N N N N	4 cetate	N None O AsNaO2	
state Zip: CA, 92614-5817															С Ш Г С Ш Г	Acid 504	P Na204S Q Na2S03	
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Project Name 3MP Performace OF 001 002 and/or 009	Project# 44009815				e (Xes	pueds	10'PO 4								Hindre K EDTA FDA A TOA		W pH 4-5 Z other (specify)	
bite:	SSOW#:				iqmea V) OS	is isto	ad'no								of con			
		Sample	Sample Type (C=comp,	Matrix (W=water S=solid, O=waste/oi	i benetiiii bl M\SM mron	r ,sbilo2 \00	0,60 2.005/8.0 11 ANTJR/8.0								sedmuN ist			
Sample Identification Client ID (Lab ID)	Sample Date	Time	G=grab) Preserva	8T=TISSUE, A=Air) ation Code:	914 X	552	00Z 00Z								N Tol	oecial In:	tructions/Note	
B1BMP009_20210310 (570-53559-1)	3/10/21	11.20		Water		×	××		-	-		-			4 Filter w	thin 24 ho	Irs	Γ
B1BMP010_20210310 (570-53559-2)	3/10/21	11.25 Danific		Water		×	××		+	_					4 Filter w	thin 24 ho	Jrs	
B1BMP011_20210310 (570-53559-3)	3/10/21	11 30 Pacific		Water		×	× ×			-					4 Filter w	thin 24 ho	SI	Ţ
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ILBMP0009_20210310 (570-53559-7)	3/10/21	10.50 Pacific		Water		×	××								4 Filter w	ithin 24 ho	SI	
LBMP0010_20210310 (570-53559-8)	3/10/21	10·55 Parifir		Water		×	××			 					4 Filter w	thin 24 ho	Irs	
LPBMP0002_20210311 (570-53559-9)	3/11/21	09.40 Pacific		Water		×	××								4 Filterw	ithin 24 ho	IfS	
Note: Since laboratory accreditations are subject to change. Eurofins Calst maintain accreditation in the State of Ongin listed above for analysis/testst/ Calscience attention immediately. If all requested accreditations are currer	cience places the ownershi matrix being analyzed, the nt to date return the signer	p of method, ar samples must t I Chain of Cust	nalyte & accre be shipped ba ody attesting 1	ditation complia ck to the Eurofi to said complica	nce upo Is Calsc Ince to E	n out su ence la urofins	bcontrac boratory c Calscienc	t laborati or other i	sries. T	his sam ons will	ple shir be prov	ment is ided. An	ionwarded y change	l under ch s to accre	ain-of-custody ditation status	If the labo should be t	atory does not curren rought to Eurofins	à
Possible Hazard Identification					Sa	nple	Dispos	I (A F	ee ma	y be	ssess	ed if s	amples	are ret	ained long	er than 1	month)	Т
Unconfirmed						ا ھ	tum To	Client]	Dispos	al By L	ab	<u>]</u>	rchive For		Months	
Deliverable Requested 1 II II IV Other (specify)	Primary Deliver	able Rank.	CI.		<u>8</u>	ecial Ir	nstructic	ns/QC	Requ	iremei	ats:							
Empty Kit Relinquished by		Date [.]			Time [.]			$\left(\right)$				Aethod o	l Shipmei	¥				
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re(s) °C and Other Remarks:

Custody Seals Intact: Δ Yes Δ No

Custody Seal No

Eurofins Calscience LLC 7440 L ncoln Way Garden Grove, CA 92841

Chain of Custody Record

Phone: 714-895-5494 Fax. 714-894-7501										
Client Information (Sub Contract Lab)	Sampler	Lab PM Patel V	irendra			Car ler Trackli	ig No(s)	COC No: 570-8739	0 2	
	Phone:	E-Mai Virendr	Datel a	Deurofio	set com	State of Origin California		Page: Page: 2 of	2	
shipping/keceiving			reditation	a Decision	dot coto 4 (Saa note):			in and a set of the s	1	
Company Eurofins Caiscience LLC		St V	ate Prog	s kequire ram C	alifornia			570-5355	9-1	
Address: 17461 Derian Ave Suite 100.	Due Date Requested: 3/19/2021	-			Analysis	Requested		Preservati	on Codes M He	90024
City. Irvine	TAT Requested (days):							B NaOH C Zn Acet	ate A NO A S	NaO2
State, Zip: CA, 92614-5817								E NaHSO		2045 12803 128203
Phone: 949-261 1022(Tel) 949-260-3297(Fax)	₩04	(0	(\$\$					G Amchlor H Ascorbio	S H2 S Acid T TS	ISO4 P Dodecahydrate
Email	"#OM	N OL N	(oN T) bet	94.11				L Ice J DI Water	2 > 3 8 M 1	etone CAA
Project Name BMP Performace OF 001 002 and/or 009	Project # 44003815	99 (Jea	nabeud JO Se	0.60.81				enistin 	2 v 4	n 4-0 Ner (specify)
Site:	SSOW#:	qma2	Y) OSI S IstoT	on Di ^s Cn'bP				Other Other		
junita de la marina de	Sample Type Sample (C=com	Matrix (W=water (W=water s=solid. C=wastriolid.	VI/SM mones serior MS/N	,b0 2.002\8.00				redmuN listo] S	cial Instruct	ions/Note:
		vation Code: X	z IX	2						
LPBMP0003_20210311 (570-53559-10)	3/11/21 09·50	Water	×	×				4 Filter with	in 24 hours	
LPBMP0004_20210311 (570-53559-11)	3/11/21 10:00	Water	×	×				4 Filter with	in 24 hours	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1
Note: Since laboratory accreditations are subject to change, Eurofins Calscien maintain accreditation in the State of Orgin ised above for analysis/hests/mat Calscience attention immediately if all requested accreditations are current to	rce places the ownership of method, analyte & ac tix being analyzed, the samples must be shipped adter return the signed Chain of Custody attesti	creditation compliance back to the Eurofins C og to said complicance	upon out alscience to Eurofin	subcontra laborator) is Calscle	ct laboratories. T	his sample shipment is ons will be provided. A	forwarded under ny changes to acc	chain-of-custody II reditation status sh	i the laboratory o ould be brought	does not currently to Eurofins
Possible Hazard Identification			Sample	e Dispo	sal (A fee ma	y be assessed if	samples are r	etained longer	than 1 mont	(4)
Unconfirmed			׀֘֘ <mark>֘</mark>	Return T	o Client	Disposal By	Lab	Archive For	Ŵ	onths
Deliverable Requested 1, II II IV Other (specify)	Primary Deliverable Kank. 2		specia	Instruc	tions/uc kedi	lirements.				
Empty Kit Relinquished by	Date:	μ	ne [.]		\frown	Method	of Shipment:			
Reinquished by	Date Time Date Date Date	Company	Rec	eived by			Date/Time:	11 g.	14, LC	any T,JU
Relinquished by:	Date/Timd:	Company	Reo	elved by.	C	Æ	Date/Time:		Comp	any
Reinquished by A A	Date/Time:	Company (72 - 177	<u>پ</u>	Š	Jei ((Jundles	Date/Time: D	el 101	ال اق ال	NRU
Custody Seals Intact: Custody Seat No)	00 C00	ler Terre	rofture(s) °C and C	ther Remærks:	•			
									Ver	0707/10/11

Client: Haley & Aldrich, Inc.

Login Number: 53559 List Number: 1 Creator: Cruise, Noel

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

Job Number: 570-53559-1

List Source: Eurofins Calscience

Client: Haley & Aldrich, Inc.

Login Number: 53559 List Number: 2 Creator: Ornelas, Olga

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

Job Number: 570-53559-1

List Source: Eurofins Irvine

List Creation: 03/12/21 11:17 AM

🔅 eurofins

Environment Testing America

ANALYTICAL REPORT

Eurofins Calscience LLC 7440 Lincoln Way Garden Grove, CA 92841 Tel: (714)895-5494

Laboratory Job ID: 570-53559-2

Client Project/Site: BMP Performance OF 001, 002 and/or 009

For:

LINKS

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Expert

Haley & Aldrich, Inc. 400 E Van Buren St. Suite 545 Phoenix, Arizona 85004

Attn: Ms. Katherine Miller

Virentra R Paty

Authorized for release by: 4/6/2021 12:59:26 PM

Virendra Patel, Project Manager I (714)895-5494 Virendra.Patel@eurofinset.com

The test results in this report meet all 2003 NELAC, 2009 TNI, and 2016 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

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

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

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Definitions/Glossary

Client: Haley & Aldrich, Inc. Project/Site: BMP Performance OF 001, 002 and/or 009

Job ID: 570-53559-2

3

Qualifiers

Dioxin Qualifier	Qualifier Description
J,DX	Estimated value; value < lowest standard (MQL), but >than MDL
MB	Analyte present in the method blank
q	The reported result is the estimated maximum possible concentration of this analyte, quantitated using the theoretical ion ratio. The measured ion ratio does not meet qualitative identification criteria and indicates a possible interference.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 570-53559-2

Laboratory: Eurofins Calscience LLC

Narrative

Job Narrative 570-53559-2

Comments

No additional comments.

Receipt

The samples were received on 3/11/2021 6:30 PM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 4 coolers at receipt time were 2.2° C, 2.4° C, 2.6° C and 2.7° C.

Receipt Exceptions

The number of containers for the following samples did not match the information listed on the Chain-of-Custody (COC): B1BMP0009_20210310 (570-53559-1), B1BMP0010_20210310 (570-53559-2), B1BMP0011_20210310 (570-53559-3), ILBMP0004_20210310 (570-53559-4), ILBMP0005_20210310 (570-53559-5), ILBMP0008_20210310 (570-53559-6), ILBMP0009_20210310 (570-53559-7), ILBMP0010_20210310 (570-53559-8), LPBMP0002_20210311 (570-53559-9), LPBMP0003_20210311 (570-53559-10) and LPBMP0004_20210311 (570-53559-11). Received 7 containers, while the COC lists 6 (received 2 containers for dissolved metals-250ml plastic unpreserved).

Dioxin

Method 1613B: The following samples have one or more analytes with a concentration less than the corresponding estimated detection limit (EDL): B1BMP0009_20210310 (570-53559-1), B1BMP0010_20210310 (570-53559-2), B1BMP0011_20210310 (570-53559-3), ILBMP0004_20210310 (570-53559-4), ILBMP0005_20210310 (570-53559-5), ILBMP0008_20210310 (570-53559-6), LPBMP0002_20210311 (570-53559-9) and LPBMP0003_20210311 (570-53559-10). The associated peaks elute at the correct retention time for both characteristic ions and have a signal to noise ratio greater than the method required 2.5:1; therefore, per client request, the detections have been reported.

Method 1613B: EPA Method 1613B specifies a +/- 15 second retention time difference between the recovery standard in the initial calibration (ICAL) and the continuing calibration verification (CCV). The 13C-1,2,3,4-TCDD associated with the following samples run on instrument 11D2 exceeded this criteria: B1BMP0009_20210310 (570-53559-1), B1BMP0010_20210310 (570-53559-2), (CCV 320-477003/2) and (MB 320-472939/1-A). This retention time shift is due to normal and reasonable column maintenance and does not affect the instrument chromatography resolution, sensitivity, or identification of target analytes. System retention times have been updated for proper analyte identification.

Method 1613B: EPA Method 1613B specifies a +/- 15 second retention time difference between the recovery standard in the initial calibration (ICAL) and the continuing calibration verification (CCV). The 13C-1,2,3,4-TCDD associated with the following samples run on instrument 11D2 exceeded this criteria: B1BMP0011_20210310 (570-53559-3), ILBMP0004_20210310 (570-53559-4), ILBMP0005_20210310 (570-53559-5), ILBMP0008_20210310 (570-53559-6), ILBMP0009_20210310 (570-53559-7), ILBMP0010_20210310 (570-53559-8), LPBMP0003_20210311 (570-53559-10), LPBMP0004_20210311 (570-53559-11) and (CCV 320-477005/2). This retention time shift is due to normal and reasonable column maintenance and does not affect the instrument chromatography resolution, sensitivity, or identification of target analytes. System retention times have been updated for proper analyte identification.

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

Dioxin Prep

Method 1613B: Elevated reporting limits are provided for the following samples due to insufficient sample provided for preparation: B1BMP0009_20210310 (570-53559-1), B1BMP0010_20210310 (570-53559-2), ILBMP0004_20210310 (570-53559-4), ILBMP0005_20210310 (570-53559-5), ILBMP0008_20210310 (570-53559-6), ILBMP0009_20210310 (570-53559-7), ILBMP0010_20210310 (570-53559-8), LPBMP0002_20210311 (570-53559-9), LPBMP0003_20210311 (570-53559-10) and LPBMP0004_20210311 (570-53559-11). Nominal volume required by method is 1 liter.

preparation batch 320-472939 method: 1613B_Sox_Sep_P matrix: water

2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

Job ID: 570-53559-2 (Continued)

Laboratory: Eurofins Calscience LLC (Continued)

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

Client: Haley & Aldrich, Inc. Project/Site: BMP Performance OF 001, 002 and/or 009

Client Sample ID: B1BMP0009_20210310

Analyte	Result	Qualifier	RL	EDL	Unit	Dil Fac D	Method	Prep Type
1,2,3,7,8-PeCDD	0.000034	J,DX q	0.000057	0.000009	ug/L	1	1613B	Total/NA
				6	"		10105	T (1010
1,2,3,4,7,8-HxCDD	0.0000087	J,DX MB	0.000057	0.0000009	ug/L	1	1613B	Iotal/NA
1,2,3,6,7,8-HxCDD	0.0000093	J,DX q	0.000057	0.0000009	ug/L	1	1613B	Total/NA
				1				
1,2,3,7,8,9-HxCDD	0.000010	J,DX	0.000057	0.0000008	ug/L	1	1613B	Total/NA
1,2,3,4,7,8-HxCDF	0.0000035	J,DX q MB	0.000057	0.0000011	ug/L	1	1613B	Total/NA
1,2,3,6,7,8-HxCDF	0.0000021	J,DX q MB	0.000057	0.0000010	ug/L	1	1613B	Total/NA
1,2,3,7,8,9-HxCDF	0.00000070	J,DX q MB	0.000057	0.0000006	ug/L	1	1613B	Total/NA
2,3,4,6,7,8-HxCDF	0.0000019	J,DX MB	0.000057	0.0000007	ug/L	1	1613B	Total/NA
				2				
1,2,3,4,6,7,8-HpCDD	0.00028	MB	0.000057	0.000034	ug/L	1	1613B	Total/NA
1,2,3,4,6,7,8-HpCDF	0.000076	MB	0.000057	0.0000012	ug/L	1	1613B	Total/NA
1,2,3,4,7,8,9-HpCDF	0.0000040	J,DX q	0.000057	0.0000015	ug/L	1	1613B	Total/NA
OCDD	0.0033	MB	0.00011	0.0000024	ug/L	1	1613B	Total/NA
OCDF	0.00022	MB	0.00011	0.0000013	ug/L	1	1613B	Total/NA
Total TCDD	0.000012	q MB	0.000011	0.0000009	ug/L	1	1613B	Total/NA
Total TCDF	0.0000014	J,DX MB	0.000011	0.0000005	ug/L	1	1613B	Total/NA
T (15 055				2			40405	T (1/51A
Iotal PeCDD	0.0000066	J,DX q MB	0.000057	0.0000009	ug/L	1	1613B	Iotal/NA
Total PeCDF	0.0000062	J,DX q	0.000057	0.0000007	ug/L	1	1613B	Total/NA
Total HxCDD	0.000080	q MB	0.000057	2 0.0000008	ug/L	1	1613B	Total/NA
Total HxCDF	0.000081	q MB	0.000057	0.0000006	ug/L	1	1613B	Total/NA
Total HpCDD	0.00094	MB	0.000057	0.0000034	ug/L	1	1613B	Total/NA
_Total HpCDF	0.00024	q MB	0.000057	0.0000012	ug/L	1	1613B	Total/NA

Client Sample ID: B1BMP0010_20210310

Analyte	Result	Qualifier	RL	EDL	Unit	Dil Fac	Method	Prep Type
1,2,3,7,8-PeCDD	0.0000019	J,DX q	0.000054	0.0000009	ug/L	1	1613B	Total/NA
				4				
1,2,3,7,8-PeCDF	0.00000064	J,DX q	0.000054	0.0000005	ug/L	1	1613B	Total/NA
				7				
1,2,3,4,7,8-HxCDD	0.0000061	J,DX MB	0.000054	0.000009	ug/L	1	1613B	Total/NA
				8				
1,2,3,6,7,8-HxCDD	0.000067	J,DX	0.000054	0.0000010	ug/L	1	1613B	Total/NA
1,2,3,7,8,9-HxCDD	0.0000061	J,DX q	0.000054	0.0000009	ug/L	1	1613B	Total/NA
				3				
1,2,3,4,7,8-HxCDF	0.0000016	J,DX MB	0.000054	0.0000010	ug/L	1	1613B	Total/NA
1,2,3,6,7,8-HxCDF	0.0000013	J,DX q MB	0.000054	0.0000009	ug/L	1	1613B	Total/NA
				5				
1,2,3,7,8,9-HxCDF	0.0000086	J,DX MB	0.000054	0.0000006	ug/L	1	1613B	Total/NA
				2				
2,3,4,6,7,8-HxCDF	0.0000015	J,DX q MB	0.000054	0.0000006	ug/L	1	1613B	Total/NA
				8				
1,2,3,4,6,7,8-HpCDD	0.00019	MB	0.000054	0.0000021	ug/L	1	1613B	Total/NA
1,2,3,4,6,7,8-HpCDF	0.000033	J,DX MB	0.000054	0.0000007	ug/L	1	1613B	Total/NA
				4				

This Detection Summary does not include radiochemical test results.

Eurofins Calscience LLC

Job ID: 570-53559-2

Lab Sample ID: 570-53559-1

Client Sample ID: B1BMP0010_20210310 (Continued)

Analyte	Result	Qualifier	RL	EDL	Unit	Dil Fac	D	Method	Prep Type
1,2,3,4,7,8,9-HpCDF	0.0000015	J,DX q	0.000054	0.0000009	ug/L	1	_	1613B	Total/NA
				5					
OCDD	0.0016	MB	0.00011	0.0000017	ug/L	1		1613B	Total/NA
OCDF	0.000061	J,DX MB	0.00011	0.0000009	ug/L	1		1613B	Total/NA
				0					
Total TCDD	0.000011	q MB	0.000011	0.0000007	ug/L	1		1613B	Total/NA
				9					
Total TCDF	0.0000079	J,DX q MB	0.000011	0.000003	ug/L	1		1613B	Total/NA
				8					
Total PeCDD	0.000085	J,DX q MB	0.000054	0.0000009	ug/L	1		1613B	Total/NA
				4					
Total PeCDF	0.0000019	J,DX q	0.000054	0.0000005	ug/L	1		1613B	Total/NA
				7					
Total HxCDD	0.000055	q MB	0.000054	0.0000009	ug/L	1		1613B	Total/NA
				3					
Total HxCDF	0.000033	J,DX q MB	0.000054	0.0000006	ug/L	1		1613B	Total/NA
				2					
Total HpCDD	0.00047	MB	0.000054	0.0000021	ug/L	1		1613B	Total/NA
Total HpCDF	0.000090	q MB	0.000054	0.0000007	ug/L	1		1613B	Total/NA
				4					

Client Sample ID: B1BMP0011_20210310

Analyte	Result	Qualifier	RL	EDL	Unit	Dil Fac	D	Method	Prep Type
1,2,3,7,8-PeCDD	0.0000045	J,DX	0.000051	0.0000005	ug/L	1	_	1613B	Total/NA
1,2,3,7,8-PeCDF	0.0000022	J,DX	0.000051	0.0000004	ug/L	1		1613B	Total/NA
2,3,4,7,8-PeCDF	0.0000027	J,DX q	0.000051	0.0000004	ug/L	1		1613B	Total/NA
1,2,3,4,7,8-HxCDD	0.0000086	J,DX MB	0.000051	0.0000005	ug/L	1		1613B	Total/NA
1,2,3,6,7,8-HxCDD	0.0000078	J,DX	0.000051	0.0000005	ug/L	1		1613B	Total/NA
1,2,3,7,8,9-HxCDD	0.0000084	J,DX	0.000051	0.0000005	ug/L	1		1613B	Total/NA
1,2,3,4,7,8-HxCDF	0.0000062	J,DX MB	0.000051	0.0000006	ug/L	1		1613B	Total/NA
1,2,3,6,7,8-HxCDF	0.0000050	J,DX MB	0.000051	0.0000006	ug/L	1		1613B	Total/NA
1,2,3,7,8,9-HxCDF	0.0000045	J,DX MB	0.000051	0.0000003	ug/L	1		1613B	Total/NA
2,3,4,6,7,8-HxCDF	0.0000061	J,DX MB	0.000051	0.0000004	ug/L	1		1613B	Total/NA
1,2,3,4,6,7,8-HpCDD	0.00011	MB	0.000051	0.0000013	ug/L	1		1613B	Total/NA
1,2,3,4,6,7,8-HpCDF	0.000034	J,DX MB	0.000051	0.0000005 4	ug/L	1		1613B	Total/NA
1,2,3,4,7,8,9-HpCDF	0.0000084	J,DX	0.000051	0.0000006	ug/L	1		1613B	Total/NA
OCDD	0.0010	MB	0.00010	0.0000011	ug/L	1		1613B	Total/NA
OCDF	0.000088	J,DX MB	0.00010	0.0000006	ug/L	1		1613B	Total/NA
Total TCDD	0.000011	MB	0.000010	0.0000007	ug/L	1		1613B	Total/NA
Total TCDF	0.0000033	J,DX q MB	0.000010	0.0000002	ug/L	1		1613B	Total/NA
Total PeCDD	0.0000080	J,DX q MB	0.000051	0.0000005	ug/L	1		1613B	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Calscience LLC

Job ID: 570-53559-2

Client Sample ID: B1BMP0011_20210310 (Continued)

Analyte	Result	Qualifier	RL	EDL	Unit	Dil Fac	D	Method	Prep Type
Total PeCDF	0.000050	J,DX q	0.000051	0.0000004	ug/L	1	_	1613B	Total/NA
				5					
Total HxCDD	0.000043	J,DX q MB	0.000051	0.0000005	ug/L	1		1613B	Total/NA
				0					
Total HxCDF	0.000042	J,DX q MB	0.000051	0.0000003	ug/L	1		1613B	Total/NA
				7	-				
Total HpCDD	0.00029	MB	0.000051	0.0000013	ug/L	1		1613B	Total/NA
Total HpCDF	0.000089	MB	0.000051	0.0000005	ug/L	1		1613B	Total/NA
				4	0				

Client Sample ID: ILBMP0004_20210310

Analyte	Result	Qualifier	RL	EDL	Unit	Dil Fac	D	Method	Prep Type
2,3,7,8-TCDD	0.0000016	J,DX q	0.000011	0.0000007	ug/L	1	_	1613B	Total/NA
				2					
1,2,3,7,8-PeCDD	0.000012	J,DX	0.000053	0.0000010	ug/L	1		1613B	Total/NA
1,2,3,7,8-PeCDF	0.0000013	J,DX	0.000053	0.0000006	ug/L	1		1613B	Total/NA
				2					
2,3,4,7,8-PeCDF	0.0000019	J,DX	0.000053	0.0000006	ug/L	1		1613B	Iotal/NA
	0 000020		0 000053	0 000013	ua/l	1		1613B	Total/NA
1,2,3,4,7,0-1XCDD	0.000020		0.000053	0.0000013	ug/L	1		1613B	Total/NA
	0.000030		0.000053	0.0000013	ug/L	· · · · · · · · · · · · · · · · · · ·		1613B	Total/NA
	0.000038		0.000053	0.0000012	ug/L	1		1613B	Total/NA
	0.0000001		0.000053	0.0000012	ug/L	1		1013D 1613B	Total/NA
	0.0000031		0.000053	0.0000011	uy/L			10130	
2,3,4,0,7,0-HXCDF	0.0000040	J,DX IVID	0.000053	0.0000007	ug/L	I		10130	Total/INA
1.2.3.4.6.7.8-HpCDD	0.00060	МВ	0.000053	0.0000056	ua/L	1		1613B	Total/NA
1.2.3.4.6.7.8-HpCDF	0.000057	MB	0.000053	0.0000008	ua/L	1		1613B	Total/NA
· ,_ ,_ , · , - , · , - · · ·				1					
1,2,3,4,7,8,9-HpCDF	0.0000026	J,DX	0.000053	0.0000011	ug/L	1		1613B	Total/NA
OCDD	0.0089	MB	0.00011	0.0000046	ug/L	1		1613B	Total/NA
OCDF	0.00016	MB	0.00011	0.0000006	ug/L	1		1613B	Total/NA
				0					
Total TCDD	0.000017	q MB	0.000011	0.0000007	ug/L	1		1613B	Total/NA
				2					
Iotal ICDF	0.0000083	J,DX q MB	0.000011	0.0000003	ug/L	1		1613B	Iotal/NA
Total PeCDD	0 000030	I DX a MB	0 000053	9	ua/l	1		1613B	Total/NA
	0.000030		0.000053	0.0000000	ug/L	· · · · · · · · · · · · · · · · · · ·		1613B	Total/NA
	0.000024	3, ВХ Ч	0.0000000	0.00000000	ug/L	I		10130	Iotal/INA
Total HxCDD	0.00021	MB	0.000053	0.0000012	ug/L	1		1613B	Total/NA
Total HxCDF	0.000064	q MB	0.000053	0.0000006	ug/L	1		1613B	Total/NA
				9	2				
Total HpCDD	0.0015	MB	0.000053	0.0000056	ug/L	1		1613B	Total/NA
Total HpCDF	0.00013	MB	0.000053	0.000008	ug/L	1		1613B	Total/NA
				1					

Client Sample ID: ILBMP0005_20210310

Analyte	Result	Qualifier	RL	EDL	Unit	Dil Fac	D	Method	Ргер Туре
1,2,3,7,8-PeCDD	0.0000011	J,DX	0.000053	0.0000006	ug/L	1	_	1613B	Total/NA
1,2,3,4,7,8-HxCDD	0.0000027	J,DX MB	0.000053	0.0000004 6	ug/L	1		1613B	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Calscience LLC

Lab Sample ID: 570-53559-5

Job ID: 570-53559-2

Lab Sample ID: 570-53559-3

RL

0.000053

0.000053

0.000053

0.000053

0.000053

0.00011

0.00011

0.000011

0.000011

0.000053

0.000053

0.000053

0.000053

0.000053

0.000053

EDL Unit

ug/L

ug/L 3

ug/L

ug/L 0

ug/L

ug/L

ug/L

ug/L

ug/L

ug/L

0.0000004

0.0000004

0.0000007

0.0000004

0.0000006

0.000006

0.0000003 ug/L

8

C

5

8

9

4

7

3

4

0

0

0.0000002 ug/L

0.0000006 ug/L

0.0000004 ug/L

0.000004

0.0000003

0.000007

0.0000004

0.0000005 ug/L

Analyte

OCDD

OCDF

Total TCDD

Total TCDF

Total PeCDD

Total PeCDF

Total HxCDD

Total HxCDF

Total HpCDD

Total HpCDF

1,2,3,6,7,8-HxCDD

1,2,3,7,8,9-HxCDD

2,3,4,6,7,8-HxCDF

1,2,3,4,6,7,8-HpCDD

1,2,3,4,6,7,8-HpCDF

Client Sample ID: ILBMP0005 20210310 (Continued)

Result Qualifier

0.0000028 J,DX q

0.0000025 J,DX

0.00000074 J,DX q MB

0.000033 J,DX MB

0.0000043 J,DX q MB

0.00013 MB

0.0000057 J,DX MB

0.000012 q MB

0.00000079 J,DX MB

0.00000071 J,DX q

0.000060 MB

0.0000030 J,DX q MB

0.000020 J,DX q MB

0.0000062 J,DX q MB

0.0000072 J,DX q MB

Total/NA

Dil Fac D Method

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1613B

Lab Sample ID: 570-53559-5 Prep Type Total/NA Total/NA

5
6
8
9
13

Total/NA	

Client Sample ID: ILBMP0008 20210310

Lab Sample ID: 570-53559-6

Analyte	Result	Qualifier	RL	EDL	Unit	Dil Fac	D Me	ethod	Prep Type
1,2,3,7,8-PeCDD	0.0000041	J,DX	0.000053	0.000008	ug/L	1	16	13B	Total/NA
				0					
1,2,3,7,8-PeCDF	0.0000087	J,DX q	0.000053	0.0000006	ug/L	1	16	13B	Total/NA
2,3,4,7,8-PeCDF	0.0000013	J,DX q	0.000053	0.0000007	ug/L	1	16	13B	Total/NA
1,2,3,4,7,8-HxCDD	0.000088	J,DX MB	0.000053	0.0000010	ug/L	1	16	13B	Total/NA
1,2,3,6,7,8-HxCDD	0.000013	J,DX	0.000053	0.0000010	ug/L	1	16	13B	Total/NA
1,2,3,7,8,9-HxCDD	0.000014	J,DX	0.000053	0.0000009	ug/L	1	16	13B	Total/NA
				5					
1,2,3,4,7,8-HxCDF	0.000011	J,DX MB	0.000053	0.0000010	ug/L	1	16	13B	Total/NA
1,2,3,6,7,8-HxCDF	0.0000099	J,DX MB	0.000053	0.0000009	ug/L	1	16	13B	Total/NA
				4					
2,3,4,6,7,8-HxCDF	0.000069	J,DX MB	0.000053	0.0000006	ug/L	1	16	13B	Total/NA
				6					
1,2,3,4,6,7,8-HpCDD	0.00035	MB	0.000053	0.0000034	ug/L	1	16	13B	Total/NA
1,2,3,4,6,7,8-HpCDF	0.00021	MB	0.000053	0.0000018	ug/L	1	16	13B	Total/NA
1,2,3,4,7,8,9-HpCDF	0.0000073	J,DX	0.000053	0.0000022	ug/L	1	16	13B	Total/NA
OCDD	0.0037	MB	0.00011	0.0000028	ug/L	1	16	13B	Total/NA
OCDF	0.00032	MB	0.00011	0.0000009	ug/L	1	16	13B	Total/NA
				3	-				
Total TCDD	0.000014	MB	0.000011	0.0000007	ug/L	1	16	13B	Total/NA
				2					

This Detection Summary does not include radiochemical test results.

Client: Haley & Aldrich, Inc. Project/Site: BMP Performance OF 001, 002 and/or 009

Client Sample ID: ILBMP0008_20210310 (Continued)

Analyte	Result	Qualifier	RL	EDL	Unit	Dil Fac	D	Method	Prep Type
Total TCDF	0.0000075	J,DX q MB	0.000011	0.0000004	ug/L	1	_	1613B	Total/NA
				0					
Total PeCDD	0.000018	J,DX q MB	0.000053	0.000008	ug/L	1		1613B	Total/NA
				0					
Total PeCDF	0.000033	J,DX q	0.000053	0.0000006	ug/L	1		1613B	Total/NA
				7					
Total HxCDD	0.00012	MB	0.000053	0.0000009	ug/L	1		1613B	Total/NA
				5					
Total HxCDF	0.00017	MB	0.000053	0.0000006	ug/L	1		1613B	Total/NA
				1					
Total HpCDD	0.00092	MB	0.000053	0.0000034	ug/L	1		1613B	Total/NA
Total HpCDF	0.00036	MB	0.000053	0.0000018	ug/L	1		1613B	Total/NA
Client Sample ID: ILBMP0	Client Sample ID: ILBMP0009 20210310								570-53559-7

Client Sample ID: ILBMP0009_20210310

Analyte	Result	Qualifier	RL	EDL	Unit	Dil Fac	D	Method	Prep Type
2,3,7,8-TCDD	0.0000022	J,DX q	0.000012	0.0000005	ug/L	1	_	1613B	Total/NA
1,2,3,7,8-PeCDD	0.000011	J,DX	0.000059	0.0000007	ug/L	1		1613B	Total/NA
1,2,3,7,8-PeCDF	0.0000019	J,DX	0.000059	0.0000005	ug/L	1		1613B	Total/NA
2,3,4,7,8-PeCDF	0.0000023	J,DX	0.000059	0.0000006	ug/L	1		1613B	Total/NA
1,2,3,4,7,8-HxCDD	0.000022	J,DX MB	0.000059	0.0000008	ug/L	1		1613B	Total/NA
1,2,3,6,7,8-HxCDD	0.000044	J,DX	0.000059	0.0000009	ug/L	1		1613B	Total/NA
1,2,3,7,8,9-HxCDD	0.000040	J,DX	0.000059	0.0000008	ug/L	1		1613B	Total/NA
1,2,3,4,7,8-HxCDF	0.0000075	J,DX MB	0.000059	0.0000014	ug/L	1		1613B	Total/NA
1,2,3,6,7,8-HxCDF	0.0000065	J,DX MB	0.000059	0.0000012	ug/L	1		1613B	Total/NA
1,2,3,7,8,9-HxCDF	0.0000011	J,DX MB	0.000059	0.0000007	ug/L	1		1613B	Total/NA
2,3,4,6,7,8-HxCDF	0.0000056	J,DX MB	0.000059	0.0000008	ug/L	1		1613B	Total/NA
1,2,3,4,6,7,8-HpCDD	0.0012	MB	0.000059	0.0000091	ug/L	1		1613B	Total/NA
1,2,3,4,6,7,8-HpCDF	0.00016	MB	0.000059	0.0000017	ug/L	1		1613B	Total/NA
1,2,3,4,7,8,9-HpCDF	0.0000049	J,DX q	0.000059	0.0000022	ug/L	1		1613B	Total/NA
OCDD	0.012	MB	0.00012	0.0000053	ug/L	1		1613B	Total/NA
OCDF	0.00029	MB	0.00012	0.0000006 9	ug/L	1		1613B	Total/NA
Total TCDD	0.000018	q MB	0.000012	0.0000005 4	ug/L	1		1613B	Total/NA
Total TCDF	0.0000072	J,DX MB	0.000012	0.0000004	ug/L	1		1613B	Total/NA
Total PeCDD	0.000033	J,DX q MB	0.000059	0.0000007	ug/L	1		1613B	Total/NA
Total PeCDF	0.000040	J,DX q	0.000059	0.0000005	ug/L	1		1613B	Total/NA
Total HxCDD	0.00029	q MB	0.000059	0.0000008	ug/L	1		1613B	Total/NA
Total HxCDF	0.00017	q MB	0.000059	0.0000007	ug/L	1		1613B	Total/NA
Total HpCDD	0.0028	MB	0.000059	0.0000091	ug/L	1		1613B	Total/NA
Total HpCDF	0.00034	q MB	0.000059	0.0000017	ug/L	1		1613B	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Calscience LLC

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Job ID: 570-53559-2

Lab Sample ID: 570-53559-6

Page 10 of 50

Client: Haley & Aldrich, Inc. Project/Site: BMP Performance OF 001, 002 and/or 009

Client Sample ID: ILBMP0010_20210310

Analyte	Result	Qualifier	RL	EDL	Unit	Dil Fac	D	Method	Prep Type
2,3,7,8-TCDD	0.0000014	J,DX q	0.000011	0.0000004	ug/L	1	_	1613B	Total/NA
	0 000087		0 000053	2	ua/l	1		16120	Total/NA
1,2,3,7,8-FeCDD	0.0000087	J,DA	0.000055	0.0000007	ug/L	I		10130	TOTAI/INA
1,2,3,7,8-PeCDF	0.0000032	J,DX	0.000053	0.0000005	ug/L	1		1613B	Total/NA
		<u></u>							
2,3,4,7,8-PeCDF	0.0000031	J,DX	0.000053	0.0000005	ug/L	1		1613B	Iotal/NA
1,2,3,4,7,8-HxCDD	0.000013	J,DX MB	0.000053	0.0000006	ug/L	1		1613B	Total/NA
1,2,3,6,7,8-HxCDD	0.000023	J,DX	0.000053	0.0000006	ug/L	1		1613B	Total/NA
1,2,3,7,8,9-HxCDD	0.000023	J,DX	0.000053	7 0.0000006	ug/L	1		1613B	Total/NA
	0 000072		0 000053	1	ua/l	1		1613B	Total/NA
	0.0000072		0.000053	0.0000010	ug/L	1		16120	Total/NA
1,2,3,0,7,8-HXCDF	0.0000063		0.000055	0.0000009	ug/L	I		10130	TOTAI/INA
1,2,3,7,8,9-HxCDF	0.0000027	J,DX MB	0.000053	0.0000005	ug/L	1		1613B	Total/NA
2,3,4,6,7,8-HxCDF	0.0000064	J,DX MB	0.000053	0.0000006	ug/L	1		1613B	Total/NA
1,2,3,4,6,7,8-HpCDD	0.00053	MB	0.000053	0.0000044	ug/L	1		1613B	Total/NA
1,2,3,4,6,7,8-HpCDF	0.000095	MB	0.000053	0.0000015	ug/L	1		1613B	Total/NA
1,2,3,4,7,8,9-HpCDF	0.0000053	J,DX q	0.000053	0.0000019	ug/L	1		1613B	Total/NA
OCDD	0.0058	MB	0.00011	0.0000031	ua/L	1		1613B	Total/NA
OCDF	0.00018	MB	0.00011	0.0000007	ug/L			1613B	Total/NA
				6	•				
Total TCDD	0.000011	q MB	0.000011	0.0000004	ug/L	1		1613B	Total/NA
Total TCDF	0.0000030	J,DX q MB	0.000011	0.0000002	ug/L	1		1613B	Total/NA
				8					
Total PeCDD	0.000018	J,DX q MB	0.000053	0.0000007	ug/L	1		1613B	Total/NA
Total PeCDF	0.000021	J,DX	0.000053	ے 0.0000005	ug/L	1		1613B	Total/NA
				1					
Total HxCDD	0.00015	q MB	0.000053	0.0000006	ug/L	1		1613B	Total/NA
Total HxCDF	0.00010	q MB	0.000053	0.0000005	ug/L			1613B	Total/NA
		-		7	2				
Total HpCDD	0.0013	MB	0.000053	0.0000044	ug/L	1		1613B	Total/NA
Total HpCDF	0.00019	q MB	0.000053	0.0000015	ug/L	1		1613B	Total/NA

Client Sample ID: LPBMP0002_20210311

Lab Sample ID: 570-53559-9

Analyte	Result	Qualifier	RL	EDL	Unit	Dil Fac	D	Method	Prep Type
1,2,3,7,8-PeCDD	0.0000016	J,DX q	0.000054	0.0000005	ug/L	1	_	1613B	Total/NA
1,2,3,7,8-PeCDF	0.00000049	J,DX q	0.000054	0.0000004 0	ug/L	1		1613B	Total/NA
2,3,4,7,8-PeCDF	0.00000072	J,DX	0.000054	0.0000004 3	ug/L	1		1613B	Total/NA
1,2,3,4,7,8-HxCDD	0.0000051	J,DX q MB	0.000054	0.0000005 4	ug/L	1		1613B	Total/NA
1,2,3,6,7,8-HxCDD	0.0000061	J,DX q	0.000054	0.0000005 6	ug/L	1		1613B	Total/NA
1,2,3,7,8,9-HxCDD	0.0000073	J,DX	0.000054	0.0000005	ug/L	1		1613B	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Calscience LLC

Client Sample ID: LPBMP0002_20210311 (Continued)

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Lab Sample ID: 570-53559-9

Analyte	Result	Qualifier	RL	EDL	Unit	Dil Fac	D	Method	Prep Type
1,2,3,4,7,8-HxCDF	0.0000018	J,DX MB	0.000054	0.000006	ug/L	1	_	1613B	Total/NA
1,2,3,6,7,8-HxCDF	0.0000018	J,DX MB	0.000054	0.0000005 9	ug/L	1		1613B	Total/NA
1,2,3,7,8,9-HxCDF	0.00000051	J,DX q MB	0.000054	0.0000003 7	ug/L	1		1613B	Total/NA
2,3,4,6,7,8-HxCDF	0.0000020	J,DX MB	0.000054	0.0000004	ug/L	1		1613B	Total/NA
1,2,3,4,6,7,8-HpCDD	0.00017	MB	0.000054	0.0000015	ug/L	1		1613B	Total/NA
1,2,3,4,6,7,8-HpCDF	0.000032	J,DX MB	0.000054	0.0000010	ug/L	1		1613B	Total/NA
OCDD	0.0013	MB	0.00011	0.0000013	ug/L	1		1613B	Total/NA
OCDF	0.000049	J,DX MB	0.00011	0.0000004 6	ug/L	1		1613B	Total/NA
Total TCDD	0.0000059	J,DX MB	0.000011	0.0000004 0	ug/L	1		1613B	Total/NA
Total PeCDD	0.0000063	J,DX q MB	0.000054	0.0000005 5	ug/L	1		1613B	Total/NA
Total PeCDF	0.0000070	J,DX q	0.000054	0.0000004 0	ug/L	1		1613B	Total/NA
Total HxCDD	0.000055	q MB	0.000054	0.0000005 1	ug/L	1		1613B	Total/NA
Total HxCDF	0.000034	J,DX q MB	0.000054	0.0000003 7	ug/L	1		1613B	Total/NA
Total HpCDD	0.00034	MB	0.000054	0.0000015	ug/L	1		1613B	Total/NA
Total HpCDF	0.000059	MB	0.000054	0.0000010	ug/L	1		1613B	Total/NA

Client Sample ID: LPBMP0003_20210311

Lab Sample ID: 570-53559-10

Analyte	Result	Qualifier	RL	EDL	Unit	Dil Fac	D	Method	Prep Type
1,2,3,7,8-PeCDD	0.0000029	J,DX	0.000053	0.000008	ug/L	1	_	1613B	Total/NA
2,3,4,7,8-PeCDF	0.0000011	J,DX	0.000053	0.0000006 3	ug/L	1		1613B	Total/NA
1,2,3,4,7,8-HxCDD	0.0000054	J,DX MB	0.000053	0.0000006 5	ug/L	1		1613B	Total/NA
1,2,3,6,7,8-HxCDD	0.0000071	J,DX	0.000053	0.0000006 5	ug/L	1		1613B	Total/NA
1,2,3,7,8,9-HxCDD	0.0000075	J,DX	0.000053	0.0000006 0	ug/L	1		1613B	Total/NA
1,2,3,4,7,8-HxCDF	0.00000095	J,DX MB	0.000053	0.000008	ug/L	1		1613B	Total/NA
1,2,3,6,7,8-HxCDF	0.0000020	J,DX MB	0.000053	0.0000007 4	ug/L	1		1613B	Total/NA
1,2,3,7,8,9-HxCDF	0.0000014	J,DX MB	0.000053	0.0000004 6	ug/L	1		1613B	Total/NA
2,3,4,6,7,8-HxCDF	0.0000024	J,DX MB	0.000053	0.0000005 2	ug/L	1		1613B	Total/NA
1,2,3,4,6,7,8-HpCDD	0.00014	MB	0.000053	0.0000013	ug/L	1		1613B	Total/NA
1,2,3,4,6,7,8-HpCDF	0.000032	J,DX MB	0.000053	0.0000013	ug/L	1		1613B	Total/NA
1,2,3,4,7,8,9-HpCDF	0.0000026	J,DX q	0.000053	0.0000016	ug/L	1		1613B	Total/NA
OCDD	0.0012	MB	0.00011	0.0000015	ug/L	1		1613B	Total/NA
OCDF	0.000047	J,DX MB	0.00011	0.0000006 6	ug/L	1		1613B	Total/NA
Total TCDD	0.0000078	J,DX q MB	0.000011	0.0000004 5	ug/L	1		1613B	Total/NA
Total TCDF	0.00000072	J,DX MB	0.000011	0.0000002	ug/L	1		1613B	Total/NA

This Detection Summary does not include radiochemical test results.

Client: Haley & Aldrich, Inc. Project/Site: BMP Performance OF 001, 002 and/or 009

Client Sample ID: LPBMP0003_20210311 (Continued)

Analyte	Result	Qualifier	RL	EDL	Unit	Dil Fac	D	Method	Prep Type
Total PeCDD	0.0000059	J,DX q MB	0.000053	0.000008	ug/L	1	_	1613B	Total/NA
Total PeCDF	0.0000070	J,DX q	0.000053	0.0000005	ug/L	1		1613B	Total/NA
Total HxCDD	0.000048	J,DX q MB	0.000053	0.0000006	ug/L	1		1613B	Total/NA
Total HxCDF	0.000031	J,DX q MB	0.000053	0.0000004	ug/L	1		1613B	Total/NA
Total HpCDD	0.00029	MB	0.000053	0.0000013	ug/L	1		1613B	Total/NA
Total HpCDF	0.000057	q MB	0.000053	0.0000013	ug/L	1		1613B	Total/NA

Client Sample ID: LPBMP0004_20210311

Analyte	Result	Qualifier	RL	EDL	Unit	Dil Fac D	Method	Prep Type
2,3,7,8-TCDD	0.0000013	J,DX q	0.000011	0.0000004	ug/L	1	1613B	Total/NA
1,2,3,7,8-PeCDD	0.0000044	J,DX	0.000054	0.0000006	ug/L	1	1613B	Total/NA
1,2,3,7,8-PeCDF	0.0000038	J,DX	0.000054	0.0000004	ug/L	1	1613B	Total/NA
2,3,4,7,8-PeCDF	0.0000041	J,DX	0.000054	0.0000004	ug/L	1	1613B	Total/NA
1,2,3,4,7,8-HxCDD	0.0000058	J,DX q MB	0.000054	0.0000004	ug/L	1	1613B	Total/NA
1,2,3,6,7,8-HxCDD	0.0000058	J,DX	0.000054	0.0000004	ug/L	1	1613B	Total/NA
1,2,3,7,8,9-HxCDD	0.0000059	J,DX	0.000054	0.0000004	ug/L	1	1613B	Total/NA
1,2,3,4,7,8-HxCDF	0.0000046	J,DX MB	0.000054	0.0000005	ug/L	1	1613B	Total/NA
1,2,3,6,7,8-HxCDF	0.0000042	J,DX q MB	0.000054	0.0000005	ug/L	1	1613B	Total/NA
1,2,3,7,8,9-HxCDF	0.0000045	J,DX MB	0.000054	0.0000003	ug/L	1	1613B	Total/NA
2,3,4,6,7,8-HxCDF	0.0000046	J,DX q MB	0.000054	0.0000003	ug/L	1	1613B	Total/NA
1,2,3,4,6,7,8-HpCDD	0.000029	J,DX MB	0.000054	0.0000005	ug/L	1	1613B	Total/NA
1,2,3,4,6,7,8-HpCDF	0.0000090	J,DX MB	0.000054	0.0000006	ug/L	1	1613B	Total/NA
1,2,3,4,7,8,9-HpCDF	0.0000045	J,DX q	0.000054	0.0000007	ug/L	1	1613B	Total/NA
OCDD	0.00020	MB	0.00011	0.0000007	ug/L	1	1613B	Total/NA
OCDF	0.000022	J,DX MB	0.00011	0.0000006	ug/L	1	1613B	Total/NA
Total TCDD	0.0000078	J,DX q MB	0.000011	0.0000004	ug/L	1	1613B	Total/NA
Total TCDF	0.0000010	J,DX q MB	0.000011	0.0000002	ug/L	1	1613B	Total/NA
Total PeCDD	0.0000078	J,DX q MB	0.000054	0.0000006	ug/L	1	1613B	Total/NA
Total PeCDF	0.0000079	J,DX	0.000054	0.0000004	ug/L	1	1613B	Total/NA
Total HxCDD	0.000025	J,DX q MB	0.000054	4 0.0000004	ug/L	1	1613B	Total/NA
Total HxCDF	0.000019	J,DX q MB	0.000054	4 0.0000003 2	ug/L	1	1613B	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Calscience LLC

Job ID: 570-53559-2

Lab Sample ID: 570-53559-10

Job ID: 570-53559-2

5

Detection Summary

Client: Haley & Aldrich, Inc. Project/Site: BMP Performance OF 001, 002 and/or 009

Client Sample ID: LPBMP0	lient Sample ID: LPBMP0004_20210311 (Continued)							Lab Sample ID: 570-53559-1				
Analyte	Result	Qualifier	RL	EDL	Unit	Dil Fac	D	Method	Ргер Туре			
Total HpCDD	0.000057	MB	0.000054	0.0000005	ug/L	1	_	1613B	Total/NA			
				8								
Total HpCDF	0.000017	J,DX q MB	0.000054	0.0000006	ug/L	1		1613B	Total/NA			
				3								

RL

0.000057

0.000011 0.0000009 ug/L

EDL Unit

4

6

0.0000009 ug/L

D

Prepared

03/23/21 05:15 03/25/21 01:08

03/23/21 05:15 03/25/21 01:08

Method: 1613B - Dioxins and Furans (HRGC/HRMS)

ND

0.0000034 J,DX q

Client Sample ID: B1BMP0009_20210310 Date Collected: 03/10/21 11:20 Date Received: 03/11/21 18:30 Analyte **Result Qualifier**

2,3,7,8-TCDD

1,2,3,7,8-PeCDD

Lab Sample ID: 570-53559-1 **Matrix: Water**

Analyzed

Dil Fac 1 6 1

1,2,3,7,8-PeCDF	ND		0.000057	0.0000007	ug/L	03/23/21 05:15	03/25/21 01:08	1
2,3,4,7,8-PeCDF	ND		0.000057	0.0000007	ug/L	03/23/21 05:15	03/25/21 01:08	1
1,2,3,4,7,8-HxCDD	0.000087	J,DX MB	0.000057	0.0000009	ug/L	03/23/21 05:15	03/25/21 01:08	1
1,2,3,6,7,8-HxCDD	0.0000093	J,DX q	0.000057	0.0000009	ug/L	03/23/21 05:15	03/25/21 01:08	1
1,2,3,7,8,9-HxCDD	0.000010	J,DX	0.000057	0.0000008	ug/L	03/23/21 05:15	03/25/21 01:08	1
1.2.3.4.7.8-HxCDF	0.0000035	J.DX a MB	0.000057	0.0000011	ug/L	03/23/21 05:15	03/25/21 01:08	1
1.2.3.6.7.8-HxCDF	0.0000021	J.DX q MB	0.000057	0.0000010	ug/L	03/23/21 05:15	03/25/21 01:08	1
1,2,3,7,8,9-HxCDF	0.0000070	J,DX q MB	0.000057	0.0000006	ug/L	03/23/21 05:15	03/25/21 01:08	1
		· ·		7	-			
2,3,4,6,7,8-HxCDF	0.0000019	J,DX MB	0.000057	0.0000007	ug/L	03/23/21 05:15	03/25/21 01:08	1
1,2,3,4,6,7,8-HpCDD	0.00028	MB	0.000057	0.0000034	ug/L	03/23/21 05:15	03/25/21 01:08	1
1,2,3,4,6,7,8-HpCDF	0.000076	MB	0.000057	0.0000012	ug/L	03/23/21 05:15	03/25/21 01:08	1
1,2,3,4,7,8,9-HpCDF	0.000040	J,DX q	0.000057	0.0000015	ug/L	03/23/21 05:15	03/25/21 01:08	1
OCDD	0.0033	MB	0.00011	0.0000024	ug/L	03/23/21 05:15	03/25/21 01:08	1
OCDF	0.00022	MB	0.00011	0.0000013	ug/L	03/23/21 05:15	03/25/21 01:08	1
Total TCDD	0.000012	q MB	0.000011	0.0000009 4	ug/L	03/23/21 05:15	03/25/21 01:08	1
Total TCDF	0.0000014	J,DX MB	0.000011	0.0000005 2	ug/L	03/23/21 05:15	03/25/21 01:08	1
Total PeCDD	0.0000066	J,DX q MB	0.000057	0.0000009	ug/L	03/23/21 05:15	03/25/21 01:08	1
Total PeCDF	0.0000062	J,DX q	0.000057	0.0000007	ug/L	03/23/21 05:15	03/25/21 01:08	1
Total HxCDD	0.000080	q MB	0.000057	0.000008	ug/L	03/23/21 05:15	03/25/21 01:08	1
Total HxCDF	0.000081	q MB	0.000057	0.0000006	ug/L	03/23/21 05:15	03/25/21 01:08	1
Total HpCDD	0.00094	MB	0.000057	0.0000034	ug/L	03/23/21 05:15	03/25/21 01:08	1
Total HpCDF	0.00024	q MB	0.000057	0.0000012	ug/L	03/23/21 05:15	03/25/21 01:08	1
Isotope Dilution	%Recoverv	Qualifier	Limits			Prepared	Analvzed	Dil Fac
13C-2,3,7,8-TCDD	62		25 - 164			03/23/21 05:15	03/25/21 01:08	1
13C-2,3,7,8-TCDF	67		24 - 169			03/23/21 05:15	03/25/21 01:08	1
13C-1,2,3,7,8-PeCDD	56		25 - 181			03/23/21 05:15	03/25/21 01:08	1
13C-1,2,3,7,8-PeCDF	62		24 - 185			03/23/21 05:15	03/25/21 01:08	1
13C-2,3,4,7,8-PeCDF	62		21 - 178			03/23/21 05:15	03/25/21 01:08	1
13C-1,2,3,4,7,8-HxCDD	58		32 - 141			03/23/21 05:15	03/25/21 01:08	1
13C-1,2,3,6,7,8-HxCDD	59		28 - 130			03/23/21 05:15	03/25/21 01:08	1
13C-1,2,3,4,7,8-HxCDF	61		26 - 152			03/23/21 05:15	03/25/21 01:08	1
13C-1,2,3,6,7,8-HxCDF	63		26 - 123			03/23/21 05:15	03/25/21 01:08	1
13C-1,2,3,7,8,9-HxCDF	59		29 - 147			03/23/21 05:15	03/25/21 01:08	1
13C-2,3,4,6,7,8-HxCDF	61		28 - 136			03/23/21 05:15	03/25/21 01:08	1
13C-1,2,3,4,6,7,8-HpCDD	54		23 - 140			03/23/21 05:15	03/25/21 01:08	1
13C-1,2,3,4,6,7,8-HpCDF	61		28 - 143			03/23/21 05:15	03/25/21 01:08	1
Limits

Client: Haley & Aldrich, Inc. Project/Site: BMP Performance OF 001, 002 and/or 009

Client Sample ID: B1BMP0009_20210310

Date Collected: 03/10/21 11:20

Date Received: 03/11/21 18:30

Isotope Dilution

Method: 1613B - Dioxins and Furans (HRGC/HRMS) (Continued)

%Recovery Qualifier

Matrix: Water

Dil Fac

Lab Sample ID: 570-53559-1

Analyzed

Prepared

6

12C 1 2 2 4 7 8 0 HpCDE		·	26 128			02/22/21 05.15	02/25/21 01:08	1
130-1,2,3,4,7,0,9-11pCDF	07		20 - 130			03/23/21 05.15	03/25/21 01.00	1
13C-OCDD	45		17 - 157			03/23/21 05:15	03/25/21 01:08	1
Surrogate	%Recovery	Qualifier	Limits			Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	118		35 - 197			03/23/21 05:15	03/25/21 01:08	1
Client Sample ID: B1BMP00 Date Collected: 03/10/21 11: Date Received: 03/11/21 18:3	10_20210310 25 30			Lab Sample ID: 570-5 Matrix:				3559-2 Water
Analyte	Result	Qualifier	RL	EDL	Unit D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDD	ND		0.000011	0.0000007	ug/L	03/23/21 05:15	03/25/21 01:53	1
1,2,3,7,8-PeCDD	0.0000019	J,DX q	0.000054	9 0.0000009 4	ug/L	03/23/21 05:15	03/25/21 01:53	1
1,2,3,7,8-PeCDF	0.00000064	J,DX q	0.000054	0.0000005 7	ug/L	03/23/21 05:15	03/25/21 01:53	1
2,3,4,7,8-PeCDF	ND		0.000054	0.0000006	ug/L	03/23/21 05:15	03/25/21 01:53	1
1,2,3,4,7,8-HxCDD	0.0000061	J,DX MB	0.000054	0.0000009	ug/L	03/23/21 05:15	03/25/21 01:53	1
1.2.3.6.7.8-HxCDD	0.0000067	J.DX	0.000054	0.0000010	ua/L	03/23/21 05:15	03/25/21 01:53	1
1.2.3.7.8.9-HxCDD	0.0000061	J.DX a	0.000054	0.0000009	ug/L	03/23/21 05:15	03/25/21 01:53	1
			0 000054	3	.	00/00/04 05 45	00/05/04 04 50	
1,2,3,4,7,8-HxCDF	0.0000016	J,DX MB	0.000054	0.0000010	ug/L	03/23/21 05:15	03/25/21 01:53	1
1,2,3,6,7,8-HxCDF	0.0000013	J,DX q MB	0.000054	0.0000009	ug/L	03/23/21 05:15	03/25/21 01:53	1
1,2,3,7,8,9-HxCDF	0.0000086	J,DX MB	0.000054	0.0000006	ug/L	03/23/21 05:15	03/25/21 01:53	1
2,3,4,6,7,8-HxCDF	0.0000015	J,DX q MB	0.000054	0.0000006 8	ug/L	03/23/21 05:15	03/25/21 01:53	1
1,2,3,4,6,7,8-HpCDD	0.00019	MB	0.000054	0.0000021	ug/L	03/23/21 05:15	03/25/21 01:53	1
1,2,3,4,6,7,8-HpCDF	0.000033	J,DX MB	0.000054	0.0000007	ug/L	03/23/21 05:15	03/25/21 01:53	1
1,2,3,4,7,8,9-HpCDF	0.0000015	J,DX q	0.000054	0.0000009	ug/L	03/23/21 05:15	03/25/21 01:53	1
OCDD	0.0016	мв	0.00011	0.0000017	ug/L	03/23/21 05:15	03/25/21 01:53	1
OCDF	0.000061	J,DX MB	0.00011	0.0000009	ug/L	03/23/21 05:15	03/25/21 01:53	1
				0	-			
Total TCDD	0.000011	q MB	0.000011	0.0000007	ug/L	03/23/21 05:15	03/25/21 01:53	1
Total TCDF	0.00000079	J,DX q MB	0.000011	0.0000003	ug/L	03/23/21 05:15	03/25/21 01:53	1
Total PeCDD	0.000085	J,DX q MB	0.000054	0.0000009	ug/L	03/23/21 05:15	03/25/21 01:53	1
Total PeCDF	0.0000019	J,DX q	0.000054	ب 0.0000005 7	ug/L	03/23/21 05:15	03/25/21 01:53	1
Total HxCDD	0.000055	q MB	0.000054	0.0000009	ug/L	03/23/21 05:15	03/25/21 01:53	1
Total HxCDF	0.000033	J,DX q MB	0.000054	0.0000006	ug/L	03/23/21 05:15	03/25/21 01:53	1
Total HpCDD	0.00047	МВ	0.000054	0.0000021	ug/L	03/23/21 05:15	03/25/21 01:53	1
	0.000090	a MB	0.000054	0.0000007	ug/L	03/23/21 05:15	03/25/21 01:53	1

26 _ 152

26 - 123

29 - 147

28 - 136

23 - 140

28 - 143

26 - 138

17 - 157

Limits

35 - 197

Job ID: 570-53559-2

03/23/21 05:15 03/25/21 01:53

03/23/21 05:15 03/25/21 01:53

03/23/21 05:15 03/25/21 01:53

03/23/21 05:15 03/25/21 01:53

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03/23/21 05:15 03/25/21 01:53

03/23/21 05:15 03/25/21 01:53

03/23/21 05:15 03/25/21 01:53

Analyzed

Prepared

Method: 1613B - Dioxins and Furans (HRGC/HRMS) (Continued) %Recovery Qualifier Isotope Dilution Limits Prepared Analvzed 13C-2,3,7,8-TCDD 03/23/21 05:15 03/25/21 01:53 65 25 - 164 13C-2.3.7.8-TCDF 73 24 - 169 03/23/21 05:15 03/25/21 01:53 58 03/23/21 05:15 03/25/21 01:53 13C-1,2,3,7,8-PeCDD 25 - 181 13C-1.2.3.7.8-PeCDF 65 24 - 185 03/23/21 05:15 03/25/21 01:53 66 13C-2,3,4,7,8-PeCDF 21 - 178 03/23/21 05:15 03/25/21 01:53 03/23/21 05:15 03/25/21 01:53 13C-1,2,3,4,7,8-HxCDD 60 32 - 141 60 28 - 130 03/23/21 05:15 03/25/21 01:53 13C-1,2,3,6,7,8-HxCDD

66

64

62

64

57

63

63

44

%Recovery Qualifier

114

Client Sample ID: B1BMP0011_20210310	
Date Collected: 03/10/21 11:30	
Date Received: 03/11/21 18:30	

13C-1,2,3,4,7,8-HxCDF

13C-1,2,3,6,7,8-HxCDF

13C-1,2,3,7,8,9-HxCDF

13C-2,3,4,6,7,8-HxCDF

13C-1,2,3,4,6,7,8-HpCDD

13C-1,2,3,4,6,7,8-HpCDF

13C-1,2,3,4,7,8,9-HpCDF

37CI4-2,3,7,8-TCDD

13C-OCDD

Surrogate

Analyte **Result Qualifier** RL EDL Unit D Prepared Analyzed Dil Fac 2,3,7,8-TCDD ND 0.000010 0.000007 ug/L 03/23/21 05:15 03/25/21 02:38 1 0.0000045 J,DX 0.000051 0.0000005 03/23/21 05:15 03/25/21 02:38 1,2,3,7,8-PeCDD ug/L 1 1,2,3,7,8-PeCDF 0.0000022 J,DX 0.000051 0.0000004 ug/L 03/23/21 05:15 03/25/21 02:38 1 5 0.000051 0.0000004 03/23/21 05:15 03/25/21 02:38 2,3,4,7,8-PeCDF 0.0000027 J,DX q ug/L 1 8 1,2,3,4,7,8-HxCDD 0.0000086 J,DX MB 0.000051 0.0000005 ug/L 03/23/21 05:15 03/25/21 02:38 1 0.0000078 J,DX 0.000051 0.0000005 ug/L 03/23/21 05:15 03/25/21 02:38 1,2,3,6,7,8-HxCDD 1,2,3,7,8,9-HxCDD 0.0000084 J,DX 0.000051 0.000005 ug/L 03/23/21 05:15 03/25/21 02:38 1,2,3,4,7,8-HxCDF 0.0000062 J,DX MB 0.000051 0.000006 ug/L 03/23/21 05:15 03/25/21 02:38 1 5 1,2,3,6,7,8-HxCDF 0.0000050 J,DX MB 0.000051 0.0000006 ug/L 03/23/21 05:15 03/25/21 02:38 1 0 0.0000003 ug/L 03/23/21 05:15 03/25/21 02:38 0.000051 1,2,3,7,8,9-HxCDF 0.0000045 J,DX MB 1 7 2,3,4,6,7,8-HxCDF 0.0000061 J,DX MB 0.000051 0.0000004 ug/L 03/23/21 05:15 03/25/21 02:38 1 2 0.000051 0.0000013 ug/L 03/23/21 05:15 03/25/21 02:38 1,2,3,4,6,7,8-HpCDD 0.00011 MB 03/23/21 05:15 03/25/21 02:38 0.000051 0.000005 0.000034 J,DX MB ug/L 1 1,2,3,4,6,7,8-HpCDF 4 0.0000084 J,DX 0.000051 0.0000006 ug/L 03/23/21 05:15 03/25/21 02:38 1 1,2,3,4,7,8,9-HpCDF 8 0.00010 0.0000011 ug/L 03/23/21 05:15 03/25/21 02:38 OCDD 0.0010 MB OCDF 0.000088 J,DX MB 0.00010 0.000006 ug/L 03/23/21 05:15 03/25/21 02:38 1 5 **Total TCDD** 0.000010 0.0000007 ug/L 03/23/21 05:15 03/25/21 02:38 0.000011 MB 1 03/23/21 05:15 03/25/21 02:38 **Total TCDF** 0.00000033 J,DX q MB 0.000010 0.0000002 ug/L 9

Client: Haley & Aldrich, Inc. Project/Site: BMP Performance OF 001, 002 and/or 009

Method: 1613B - Dioxins and Furans (HRGC/HRMS) (Continued)

Client Sample ID: B1BMP0011 Date Collected: 03/10/21 11:30	20210310						Lab Sample ID: 570-53559-3 Matrix: Water			
Date Received: 03/11/21 18:30	Rosult	Qualifier	RI	EDI	Unit	п	Prenared	Analyzod	Dil Fac	
	0.000080		0.000051	0.0000005			03/23/21 05:15	03/25/21 02:38	1	
	0.0000000	0,87 9 118	0.000001	7	ug/L		00/20/21 00.10	00/20/21 02:00		
Total PeCDF	0.0000050	J,DX q	0.000051	0.0000004	ug/L		03/23/21 05:15	03/25/21 02:38	1	
				5						
Total HxCDD	0.000043	J,DX q MB	0.000051	0.0000005	ug/L		03/23/21 05:15	03/25/21 02:38	1	
			0 000054	0			00/00/04 05 45	00/05/04 00 00		
Total HxCDF	0.000042	J,DX q MB	0.000051	0.0000003	ug/L		03/23/21 05:15	03/25/21 02:38	1	
	0 00029	MB	0 000051	0.000013	ua/l		03/23/21 05:15	03/25/21 02:38	1	
	0.00023	MR	0.000001	0.00000010	ug/L		03/23/21 05:15	03/25/21 02:38	1	
	0.000003		0.000001	4	ug/L		00/20/21 00.10	00/20/21 02:00		
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac	
13C-2,3,7,8-TCDD	75		25 - 164				03/23/21 05:15	03/25/21 02:38	1	
13C-2,3,7,8-TCDF	85		24 - 169				03/23/21 05:15	03/25/21 02:38	1	
13C-1,2,3,7,8-PeCDD	70		25 - 181				03/23/21 05:15	03/25/21 02:38	1	
13C-1,2,3,7,8-PeCDF	77		24 - 185				03/23/21 05:15	03/25/21 02:38	1	
13C-2,3,4,7,8-PeCDF	78		21 - 178				03/23/21 05:15	03/25/21 02:38	1	
13C-1,2,3,4,7,8-HxCDD	73		32 - 141				03/23/21 05:15	03/25/21 02:38	1	
13C-1,2,3,6,7,8-HxCDD	70		28 - 130				03/23/21 05:15	03/25/21 02:38	1	
13C-1,2,3,4,7,8-HxCDF	77		26 - 152				03/23/21 05:15	03/25/21 02:38	1	
13C-1,2,3,6,7,8-HxCDF	76		26 - 123				03/23/21 05:15	03/25/21 02:38	1	
13C-1,2,3,7,8,9-HxCDF	75		29 - 147				03/23/21 05:15	03/25/21 02:38	1	
13C-2,3,4,6,7,8-HxCDF	77		28 - 136				03/23/21 05:15	03/25/21 02:38	1	
13C-1,2,3,4,6,7,8-HpCDD	68		23 - 140				03/23/21 05:15	03/25/21 02:38	1	
13C-1,2,3,4,6,7,8-HpCDF	76		28 - 143				03/23/21 05:15	03/25/21 02:38	1	
13C-1,2,3,4,7,8,9-HpCDF	76		26 - 138				03/23/21 05:15	03/25/21 02:38	1	
13C-OCDD	56		17_157				03/23/21 05:15	03/25/21 02:38	1	
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac	
37Cl4-2,3,7,8-TCDD	116		35 - 197				03/23/21 05:15	03/25/21 02:38	1	

Client Sample ID: ILBMP0004_20210310 Date Collected: 03/10/21 11:05 Date Received: 03/11/21 18:30

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDD	0.0000016	J,DX q	0.000011	0.0000007	ug/L		03/23/21 05:15	03/25/21 03:23	1
		-		2					
1,2,3,7,8-PeCDD	0.000012	J,DX	0.000053	0.0000010	ug/L		03/23/21 05:15	03/25/21 03:23	1
1,2,3,7,8-PeCDF	0.000013	J,DX	0.000053	0.0000006	ug/L		03/23/21 05:15	03/25/21 03:23	1
				2					
2,3,4,7,8-PeCDF	0.000019	J,DX	0.000053	0.0000006	ug/L		03/23/21 05:15	03/25/21 03:23	1
				6					
1,2,3,4,7,8-HxCDD	0.000020	J,DX MB	0.000053	0.0000013	ug/L		03/23/21 05:15	03/25/21 03:23	1
1,2,3,6,7,8-HxCDD	0.000030	J,DX	0.000053	0.0000013	ug/L		03/23/21 05:15	03/25/21 03:23	1
1,2,3,7,8,9-HxCDD	0.000038	J,DX	0.000053	0.0000012	ug/L		03/23/21 05:15	03/25/21 03:23	1
1,2,3,4,7,8-HxCDF	0.000061	J,DX q MB	0.000053	0.0000012	ug/L		03/23/21 05:15	03/25/21 03:23	1
1,2,3,6,7,8-HxCDF	0.000031	J,DX MB	0.000053	0.0000011	ug/L		03/23/21 05:15	03/25/21 03:23	1
1,2,3,7,8,9-HxCDF	ND		0.000053	0.0000006	ug/L		03/23/21 05:15	03/25/21 03:23	1
				9					
2,3,4,6,7,8-HxCDF	0.000040	J,DX MB	0.000053	0.0000007	ug/L		03/23/21 05:15	03/25/21 03:23	1
				9					
1,2,3,4,6,7,8-HpCDD	0.00060	MB	0.000053	0.0000056	ug/L		03/23/21 05:15	03/25/21 03:23	1

Eurofins Calscience LLC

Lab Sample ID: 570-53559-4

Matrix: Water

5 6

Job ID: 570-53559-2

Client: Haley & Aldrich, Inc. Project/Site: BMP Performance OF 001, 002 and/or 009

Client Sample ID: ILBMP0004_20210310

Date Collected: 03/10/21 11:05 Date Received: 03/11/21 18:30

Analyte

OCDD

OCDF

Total TCDD

Total TCDF

Total PeCDD

Total PeCDF

Total HxCDD

Total HxCDF

Total HpCDD

Total HpCDF

Isotope Dilution

13C-2,3,7,8-TCDD

13C-2.3.7.8-TCDF

13C-1,2,3,7,8-PeCDD

13C-1,2,3,7,8-PeCDF

13C-2,3,4,7,8-PeCDF

13C-1,2,3,4,7,8-HxCDD

13C-1,2,3,6,7,8-HxCDD

13C-1,2,3,4,7,8-HxCDF

13C-1,2,3,6,7,8-HxCDF

13C-1,2,3,7,8,9-HxCDF

13C-2,3,4,6,7,8-HxCDF

13C-1,2,3,4,6,7,8-HpCDD

13C-1,2,3,4,6,7,8-HpCDF

13C-1,2,3,4,7,8,9-HpCDF

37CI4-2,3,7,8-TCDD

Client Sample ID: ILBMP0005_20210310

Date Collected: 03/10/21 11:10

Date Received: 03/11/21 18:30

13C-OCDD

Surrogate

1,2,3,4,6,7,8-HpCDF

1,2,3,4,7,8,9-HpCDF

Method: 1613B - Dioxins and Furans (HRGC/HRMS) (Continued)

0.000057

0.0000026 J,DX

0.0089 MB

0.00016 MB

0.000017 q MB

0.0000083 J,DX q MB

0.000030 J,DX q MB

0.000024 J,DX q

0.00021 MB

0.000064 q MB

0.0015 MB

Qualifier

0.00013 MB

68

73

61

69

70

66

63

70

70

68

69

63

70

71

54

113

%Recoverv

Qualifier

%Recovery

Result Qualifier

MB

ID: 570-53559-4 Matrix: Water nalyzed <u>Dil Fac</u> 5/21 03:23 1	Lab San
ID: 570-53559-4 Matrix: Water nalyzed 5/21 03:23 Dil Fac 5/21 03:23 1	Lab San
nalyzed Dil Fac 5/21 03:23 1 5/21 03:23 1	
5/21 03:23 1 5/21 03:23 1	Prepared
5/21 03·23 1	/23/21 05:15
0/21 00.20	/23/21 05:15
5/21 03:23 1	/23/21 05:15
5/21 03:23 1	/23/21 05:15
5/21 03:23 1	/23/21 05:15
5/21 03:23 1	
5/21 03:23 1	/23/21 05:15

1

1

1

1

1

1

1

1

1

1

1

1

Dil Fac

6

03/23/21 05:15	03/25/21 03:23	1
03/23/21 05:15	03/25/21 03:23	1
03/23/21 05:15	03/25/21 03:23	1
03/23/21 05:15	03/25/21 03:23	1
03/23/21 05:15	03/25/21 03:23	1
03/23/21 05:15	03/25/21 03:23	1

Prepared Analyzed Dil Fac 03/23/21 05:15 03/25/21 03:23

Lab Sample ID: 570-53559-5 Matrix: Water

Analyte	Result Q	lualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDD	ND		0.000011	0.000006	ug/L		03/23/21 05:15	03/25/21 04:08	
1,2,3,7,8-PeCDD	0.0000011 J,	,DX	0.000053	0.0000006	ug/L		03/23/21 05:15	03/25/21 04:08	
1,2,3,7,8-PeCDF	ND	(0.000053	0.0000004 7	ug/L		03/23/21 05:15	03/25/21 04:08	
2,3,4,7,8-PeCDF	ND	(0.000053	0.0000005 1	ug/L		03/23/21 05:15	03/25/21 04:08	· · · · · · · · ·
1,2,3,4,7,8-HxCDD	0.0000027 J,	,DX MB	0.000053	0.0000004	ug/L		03/23/21 05:15	03/25/21 04:08	

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4/6/2021

EDL Unit

ug/L

ug/L

0.000008

0.0000006

0.0000011 ug/L

0.0000046 ug/L

0.0000007 ug/L

0.0000003 ug/L 9

0.0000010 ug/L

0.0000006 ug/L

0.0000012 ug/L

0.0000056 ug/L

0.0000008 ug/L

1

0.000006

2

ug/L 9

0

2

D

03/23/2

03/23/2

03/23/2

03/23/2

03/23/2

03/23/2

03/23/21 05:15 03/25/21 03:23

03/23/21 05:15 03/25/21 03:23

03/23/21 05:15 03/25/21 03:23

03/23/21 05:15 03/25/21 03:23

03/23/21 05:15 03/25/21 03:23

03/23/21 05:15 03/25/21 03:23

03/23/21 05:15 03/25/21 03:23

03/23/21 05:15 03/25/21 03:23

03/23/21 05:15 03/25/21 03:23

03/23/21 05:15 03/25/21 03:23

03/23/21 05:15 03/25/21 03:23

03/23/21 05:15 03/25/21 03:23

03/23/21 05:15 03/25/21 03:23

03/23/21 05:15 03/25/21 03:23

03/23/21 05:15 03/25/21 03:23

Analyzed

Prepared

RL

0.000053

0.000053

0.00011

0.00011

0.000011

0.000011

0.000053

0.000053

0.000053

0.000053

0.000053

0.000053

Limits

25 - 164

24 - 169

25 - 181

24 - 185

21 - 178

32 - 141

28 - 130

26 - 152

26 - 123

29 - 147

28 - 136

23 - 140

28 - 143

26 - 138

17 - 157

Limits

35 - 197

Client: Haley & Aldrich, Inc. Project/Site: BMP Performance OF 001, 002 and/or 009

13C-1,2,3,4,7,8,9-HpCDF

13C-OCDD

Method: 1613B - Dioxins and Furans (HRGC/HRMS) (Continued)

Client Sample ID: ILBMP0 Date Collected: 03/10/21 Date Received: 03/11/21 1	0005_20210310 11:10 8:30				Lab Sample ID: 570-53559-5 Matrix: Water					4
Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac	5
1,2,3,6,7,8-HxCDD	0.000028	J,DX q	0.000053	0.0000004	ug/L		03/23/21 05:15	03/25/21 04:08	1	6
1,2,3,7,8,9-HxCDD	0.0000025	J,DX	0.000053	0.0000004	ug/L		03/23/21 05:15	03/25/21 04:08	1	0
1,2,3,4,7,8-HxCDF	ND		0.000053	0.0000005	ug/L		03/23/21 05:15	03/25/21 04:08	1	7
1,2,3,6,7,8-HxCDF	ND		0.000053	0.0000005	ug/L		03/23/21 05:15	03/25/21 04:08	1	8
1,2,3,7,8,9-HxCDF	ND		0.000053	0.0000003 4	ug/L		03/23/21 05:15	03/25/21 04:08	1	9
2,3,4,6,7,8-HxCDF	0.00000074	J,DX q MB	0.000053	0.0000003 8	ug/L		03/23/21 05:15	03/25/21 04:08	1	
1,2,3,4,6,7,8-HpCDD	0.000033	J,DX MB	0.000053	0.0000007 0	ug/L		03/23/21 05:15	03/25/21 04:08	1	
1,2,3,4,6,7,8-HpCDF	0.0000043	J,DX q MB	0.000053	0.0000004 0	ug/L		03/23/21 05:15	03/25/21 04:08	1	
1,2,3,4,7,8,9-HpCDF	ND		0.000053	0.0000005 1	ug/L		03/23/21 05:15	03/25/21 04:08	1	
OCDD	0.00013	MB	0.00011	0.0000006 5	ug/L		03/23/21 05:15	03/25/21 04:08	1	13
OCDF	0.0000057	J,DX MB	0.00011	0.0000005 1	ug/L		03/23/21 05:15	03/25/21 04:08	1	
Total TCDD	0.000012	q MB	0.000011	0.0000006 8	ug/L		03/23/21 05:15	03/25/21 04:08	1	
Total TCDF	0.00000079	J,DX MB	0.000011	0.0000002 9	ug/L		03/23/21 05:15	03/25/21 04:08	1	
Total PeCDD	0.0000030	J,DX q MB	0.000053	0.0000006 4	ug/L		03/23/21 05:15	03/25/21 04:08	1	
Total PeCDF	0.00000071	J,DX q	0.000053	0.0000004 7	ug/L		03/23/21 05:15	03/25/21 04:08	1	
Total HxCDD	0.000020	J,DX q MB	0.000053	0.0000004 3	ug/L		03/23/21 05:15	03/25/21 04:08	1	
Total HxCDF	0.0000062	J,DX q MB	0.000053	0.0000003 4	ug/L		03/23/21 05:15	03/25/21 04:08	1	
Total HpCDD	0.000060	MB	0.000053	0.0000007 0	ug/L		03/23/21 05:15	03/25/21 04:08	1	
Total HpCDF	0.0000072	J,DX q MB	0.000053	0.0000004 0	ug/L		03/23/21 05:15	03/25/21 04:08	1	
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac	
13C-2,3,7,8-TCDD	65		25 - 164				03/23/21 05:15	03/25/21 04:08	1	
13C-2,3,7,8-TCDF	71		24 - 169				03/23/21 05:15	03/25/21 04:08	1	
13C-1,2,3,7,8-PeCDD	63		25 - 181				03/23/21 05:15	03/25/21 04:08	1	
13C-1,2,3,7,8-PeCDF	68		24 - 185				03/23/21 05:15	03/25/21 04:08	1	
13C-2,3,4,7,8-PeCDF	70		21 - 178				03/23/21 05:15	03/25/21 04:08	1	
13C-1,2,3,4,7,8-HxCDD	63		32 - 141				03/23/21 05:15	03/25/21 04:08	1	
13C-1,2,3,6,7,8-HxCDD	63		28 - 130				03/23/21 05:15	03/25/21 04:08	1	
13C-1,2,3,4,7,8-HxCDF	69		26 - 152				03/23/21 05:15	03/25/21 04:08	1	
13C-1,2,3,6,7,8-HxCDF	69		26 - 123				03/23/21 05:15	03/25/21 04:08	1	
13C-1,2,3,7,8,9-HxCDF	66		29 - 147				03/23/21 05:15	03/25/21 04:08	1	
13C-2,3,4,6,7,8-HxCDF	68		28 - 136				03/23/21 05:15	03/25/21 04:08	1	
13C-1,2,3,4,6,7,8-HpCDD	61		23 - 140				03/23/21 05:15	03/25/21 04:08	1	
13C-1,2,3,4,6,7,8-HpCDF	67		28 - 143				03/23/21 05:15	03/25/21 04:08	1	

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03/23/21 05:15 03/25/21 04:08

03/23/21 05:15 03/25/21 04:08

26 - 138

17 - 157

68

50

1

Method: 1613B - Dioxins and Furans (HRGC/HRMS) (Continued)

Surrogate	%Recovery	Qualifier	Limits			Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	120		35 - 197			03/23/21 05:15	03/25/21 04:08	1
	20240240					Lob Son	opio ID: 570 5	2550 6
Date Collected: 03/10/21 11:00	20210310					Lab San	npie ID: 570-5 Matrix	· Wator
Date Conected: 03/10/21 11:00							Watrix	. Water
Analyto	Posult	Qualifier	DI	EDI	Linit D	Propared	Analyzod	Dil Eac
	ND		0.000011			03/23/21 05·15	03/25/21 04·53	1
2,5,7,6-1000	NB		0.000011	2	ug/L	00/20/21 00.10	00/20/21 04.00	
1,2,3,7,8-PeCDD	0.0000041	J,DX	0.000053	0.0000008	ug/L	03/23/21 05:15	03/25/21 04:53	1
1,2,3,7,8-PeCDF	0.0000087	J,DX q	0.000053	0.0000006 7	ug/L	03/23/21 05:15	03/25/21 04:53	1
2,3,4,7,8-PeCDF	0.0000013	J,DX q	0.000053	0.0000007	ug/L	03/23/21 05:15	03/25/21 04:53	1
1,2,3,4,7,8-HxCDD	0.0000088	J,DX MB	0.000053	0.0000010	ug/L	03/23/21 05:15	03/25/21 04:53	1
1,2,3,6,7,8-HxCDD	0.000013	J,DX	0.000053	0.0000010	ug/L	03/23/21 05:15	03/25/21 04:53	1
1,2,3,7,8,9-HxCDD	0.000014	J,DX	0.000053	0.0000009	ug/L	03/23/21 05:15	03/25/21 04:53	1
1,2,3,4,7,8-HxCDF	0.000011	J,DX MB	0.000053	0.0000010	ug/L	03/23/21 05:15	03/25/21 04:53	1
1,2,3,6,7,8-HxCDF	0.0000099	J,DX MB	0.000053	0.0000009	ug/L	03/23/21 05:15	03/25/21 04:53	1
1,2,3,7,8,9-HxCDF	ND		0.000053	4 0.0000006	ug/L	03/23/21 05:15	03/25/21 04:53	1
2,3,4,6,7,8-HxCDF	0.0000069	J,DX MB	0.000053	1 0.0000006	ug/L	03/23/21 05:15	03/25/21 04:53	1
1234678 HpCDD	0.00035	MR	0 000053	6 0.000034	ug/l	03/23/21 05:15	03/25/21 04:53	1
	0.00035		0.000053	0.0000034	ug/L	03/23/21 05:15	03/25/21 04:53	
	0.00021		0.000055	0.0000018	ug/L	03/23/21 05:15	03/25/21 04.53	1
ОСПЛ	0.0000073	J,DA MR	0.0000000	0.0000022	ug/L	03/23/21 05:15	03/25/21 04:53	1
OCDE	0.0037		0.00011	0.0000020	ug/L	03/23/21 05:15	03/25/21 04:53	
OCDF	0.00032		0.00011	0.0000009	ug/L	03/23/21 03.13	03/23/21 04.33	I
Total TCDD	0.000014	MB	0.000011	0.0000007	ug/L	03/23/21 05:15	03/25/21 04:53	1
Total TCDF	0.0000075	J,DX q MB	0.000011	0.0000004 0	ug/L	03/23/21 05:15	03/25/21 04:53	1
Total PeCDD	0.000018	J,DX q MB	0.000053	0.0000008 0	ug/L	03/23/21 05:15	03/25/21 04:53	1
Total PeCDF	0.000033	J,DX q	0.000053	0.0000006 7	ug/L	03/23/21 05:15	03/25/21 04:53	1
Total HxCDD	0.00012	MB	0.000053	0.0000009 5	ug/L	03/23/21 05:15	03/25/21 04:53	1
Total HxCDF	0.00017	MB	0.000053	0.0000006	ug/L	03/23/21 05:15	03/25/21 04:53	1
Total HpCDD	0.00092	MB	0.000053	0.0000034	ug/L	03/23/21 05:15	03/25/21 04:53	1
Total HpCDF	0.00036	MB	0.000053	0.0000018	ug/L	03/23/21 05:15	03/25/21 04:53	1
Isotope Dilution	%Recovery	Qualifier	Limits			Prepared	Analyzed	Dil Fac
13C-2,3,7,8-TCDD	62		25 - 164			03/23/21 05:15	03/25/21 04:53	1
13C-2,3,7,8-TCDF	69		24 - 169			03/23/21 05:15	03/25/21 04:53	1
13C-1,2,3,7,8-PeCDD	57		25 - 181			03/23/21 05:15	03/25/21 04:53	1
13C-1,2,3,7,8-PeCDF	64		24 - 185			03/23/21 05:15	03/25/21 04:53	1
13C-2,3,4,7,8-PeCDF	65		21 - 178			03/23/21 05:15	03/25/21 04:53	1
13C-1,2,3,4,7,8-HxCDD	58		32 - 141			03/23/21 05:15	03/25/21 04:53	1
13C-1,2,3,6,7,8-HxCDD	58		28 - 130			03/23/21 05:15	03/25/21 04:53	1
13C-1,2,3,4,7,8-HxCDF	63		26 - 152			03/23/21 05:15	03/25/21 04:53	1
13C-1,2,3,6,7,8-HxCDF	64		26 - 123			03/23/21 05:15	03/25/21 04:53	1
13C-1,2,3,7,8,9-HxCDF	61		29 - 147			03/23/21 05:15	03/25/21 04:53	1

Eurofins Calscience LLC

Job ID: 570-53559-2

Limits

28 - 136

23 - 140

28 - 143

26 - 138

17 - 157

197

Client: Haley & Aldrich, Inc. Project/Site: BMP Performance OF 001, 002 and/or 009

Client Sample ID: ILBMP0008_20210310

Date Collected: 03/10/21 11:00

Date Received: 03/11/21 18:30

Isotope Dilution

13C-OCDD

13C-2,3,4,6,7,8-HxCDF

13C-1,2,3,4,6,7,8-HpCDD

13C-1,2,3,4,6,7,8-HpCDF

Job ID: 570-53559-2

Lab Sample ID: 570-53559-6 **Matrix: Water**

Dil Fac

1

1

1

1

1

1

Dil Fac

5/21	09:08	1	
5/21	09:08	1	
6/21	09:08	1	
5/21	09:08	1	
/21	09:08	1	
5/21	09:08	1	
5/21	09:08	1	
/21	09:08	1	

Lab	Sample	ID:	570-5	3559-7
		N	latrix:	Water

Analyzed

Analyzed

Prepared

Prepared

03/23/21 05:15 03/25/21 04:53

03/23/21 05:15 03/25/21 04:53

03/23/21 05:15 03/25/21 04:53

03/23/21 05:15 03/25/21 04:53

03/23/21 05:15 03/25/21 04:53

03/23/21 05:15 03/25/21 04:53

13C-1,2,3,4,7,8,9-HpCDF 63 46

Method: 1613B - Dioxins and Furans (HRGC/HRMS) (Continued)

%Recovery Qualifier

63

55

62

Surrogate	%Recovery Qualifier	Limits
37Cl4-2,3,7,8-TCDD	118	35 - 193

Client Sample ID: ILBMP0009_20210310 Date Collected: 03/10/21 10:50 Date Received: 03/11/21 18:30

Analyte	Result	Qualifier	RL	EDL	Unit D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDD	0.000022	J,DX q	0.000012	0.0000005	ug/L	03/23/21 05:15	03/25/21 09:08	1
1,2,3,7,8-PeCDD	0.000011	J,DX	0.000059	0.0000007	ug/L	03/23/21 05:15	03/25/21 09:08	1
1,2,3,7,8-PeCDF	0.0000019	J,DX	0.000059	0.0000005	ug/L	03/23/21 05:15	03/25/21 09:08	1
2,3,4,7,8-PeCDF	0.0000023	J,DX	0.000059	0.0000006	ug/L	03/23/21 05:15	03/25/21 09:08	1
1,2,3,4,7,8-HxCDD	0.000022	J,DX MB	0.000059	0.0000008	ug/L	03/23/21 05:15	03/25/21 09:08	1
1,2,3,6,7,8-HxCDD	0.000044	J,DX	0.000059	0.0000009	ug/L	03/23/21 05:15	03/25/21 09:08	1
1,2,3,7,8,9-HxCDD	0.000040	J,DX	0.000059	0.0000008	ug/L	03/23/21 05:15	03/25/21 09:08	1
1.2.3.4.7.8-HxCDF	0.0000075	J.DX MB	0.000059	0.0000014	ug/L	03/23/21 05:15	03/25/21 09:08	1
1.2.3.6.7.8-HxCDF	0.0000065	J.DX MB	0.000059	0.0000012	ug/L	03/23/21 05:15	03/25/21 09:08	1
1,2,3,7,8,9-HxCDF	0.0000011	J,DX MB	0.000059	0.0000007 5	ug/L	03/23/21 05:15	03/25/21 09:08	1
2,3,4,6,7,8-HxCDF	0.0000056	J,DX MB	0.000059	0.000008 6	ug/L	03/23/21 05:15	03/25/21 09:08	1
1,2,3,4,6,7,8-HpCDD	0.0012	MB	0.000059	0.0000091	ug/L	03/23/21 05:15	03/25/21 09:08	1
1,2,3,4,6,7,8-HpCDF	0.00016	MB	0.000059	0.0000017	ug/L	03/23/21 05:15	03/25/21 09:08	1
1,2,3,4,7,8,9-HpCDF	0.0000049	J,DX q	0.000059	0.0000022	ug/L	03/23/21 05:15	03/25/21 09:08	1
OCDD	0.012	MB	0.00012	0.0000053	ug/L	03/23/21 05:15	03/25/21 09:08	1
OCDF	0.00029	MB	0.00012	0.0000006 9	ug/L	03/23/21 05:15	03/25/21 09:08	1
Total TCDD	0.000018	q MB	0.000012	0.0000005 4	ug/L	03/23/21 05:15	03/25/21 09:08	1
Total TCDF	0.0000072	J,DX MB	0.000012	0.0000004 2	ug/L	03/23/21 05:15	03/25/21 09:08	1
Total PeCDD	0.000033	J,DX q MB	0.000059	0.0000007 6	ug/L	03/23/21 05:15	03/25/21 09:08	1
Total PeCDF	0.000040	J,DX q	0.000059	0.0000005 6	ug/L	03/23/21 05:15	03/25/21 09:08	1
Total HxCDD	0.00029	q MB	0.000059	0.0000008 3	ug/L	03/23/21 05:15	03/25/21 09:08	1
Total HxCDF	0.00017	q MB	0.000059	0.0000007 5	ug/L	03/23/21 05:15	03/25/21 09:08	1
Total HpCDD	0.0028	MB	0.000059	0.0000091	ug/L	03/23/21 05:15	03/25/21 09:08	1
Total HpCDF	0.00034	q MB	0.000059	0.0000017	ug/L	03/23/21 05:15	03/25/21 09:08	1

Limits

25 - 164

24 - 169

25 - 181

24 - 185

21 - 178

32 - 141

28 - 130

26 - 152

26 - 123

29 - 147

Isotope Dilution

13C-2,3,7,8-TCDD

13C-2,3,7,8-TCDF

13C-1,2,3,7,8-PeCDD

13C-1,2,3,7,8-PeCDF

13C-2,3,4,7,8-PeCDF

13C-1,2,3,4,7,8-HxCDD

13C-1,2,3,6,7,8-HxCDD

13C-1,2,3,4,7,8-HxCDF

13C-1,2,3,6,7,8-HxCDF

13C-1,2,3,7,8,9-HxCDF

1,2,3,7,8,9-HxCDF

2,3,4,6,7,8-HxCDF

1,2,3,4,6,7,8-HpCDD

1,2,3,4,6,7,8-HpCDF

1,2,3,4,7,8,9-HpCDF

OCDD

OCDF

Total TCDD

Total TCDF

Total PeCDD

Method: 1613B - Dioxins and Furans (HRGC/HRMS) (Continued)

%Recovery Qualifier

70

75

64

71

72

67

68

74

72

71

0.0000027 J,DX MB

0.0000064 J,DX MB

0.00053 MB

0.0000053 J,DX q

0.0058 MB

0.00018 MB

0.000011 q MB

0.0000030 J,DX q MB

0.000018 J,DX q MB

0.000095 MB

Job ID: 570-53559-2

Dil Fac Prepared Analyzed 03/23/21 05:15 03/25/21 09:08 1 03/23/21 05:15 03/25/21 09:08 1 03/23/21 05:15 03/25/21 09:08 1 03/23/21 05:15 03/25/21 09:08 1 6 03/23/21 05:15 03/25/21 09:08 1 03/23/21 05:15 03/25/21 09:08 1 03/23/21 05:15 03/25/21 09:08 1 03/23/21 05:15 03/25/21 09:08 1 03/23/21 05:15 03/25/21 09:08 1 03/23/21 05:15 03/25/21 09:08 1

03/23/21 05:15 03/25/21 09:53

03/23/21 05:15 03/25/21 09:53

03/23/21 05:15 03/25/21 09:53

03/23/21 05:15 03/25/21 09:53

03/23/21 05:15 03/25/21 09:53

03/23/21 05:15 03/25/21 09:53

03/23/21 05:15 03/25/21 09:53

03/23/21 05:15 03/25/21 09:53

03/23/21 05:15 03/25/21 09:53

03/23/21 05:15 03/25/21 09:53

13C-2,3,4,6,7,8-HxCDF	72		28 - 136				03/23/21 05:15	03/25/21 09:08	1
13C-1,2,3,4,6,7,8-HpCDD	65		23 - 140				03/23/21 05:15	03/25/21 09:08	1
13C-1,2,3,4,6,7,8-HpCDF	72		28 - 143				03/23/21 05:15	03/25/21 09:08	1
13C-1,2,3,4,7,8,9-HpCDF	72		26 - 138				03/23/21 05:15	03/25/21 09:08	1
13C-OCDD	54		17 - 157				03/23/21 05:15	03/25/21 09:08	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	114		35 - 197				03/23/21 05:15	03/25/21 09:08	1
Client Sample ID: ILBMP0	010_20210310						Lab San	nple ID: 570-5	53559-8
Date Collected: 03/10/21	10:55							Matrix	: Water
Date Received: 03/11/21 1	8:30								
Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDD	0.0000014	J,DX q	0.000011	0.0000004	ug/L		03/23/21 05:15	03/25/21 09:53	1
				2					
1,2,3,7,8-PeCDD	0.000087	J,DX	0.000053	0.0000007	ug/L		03/23/21 05:15	03/25/21 09:53	1
	0 000032	אחו	0 000053	0 000005	ua/l		03/23/21 05:15	03/25/21 09:53	1
1,2,3,7,0-FeCDF	0.0000032	3,07	0.000000	0.00000000	ug/L		00/20/21 00.10	00/20/21 00:00	
2,3,4,7,8-PeCDF	0.0000031	J,DX	0.000053	0.0000005	ug/L		03/23/21 05:15	03/25/21 09:53	1
				5					
1,2,3,4,7,8-HxCDD	0.000013	J,DX MB	0.000053	0.0000006	ug/L		03/23/21 05:15	03/25/21 09:53	1
			0.000052	4			02/02/04 05.15	02/25/24 00.52	4
1,2,3,6,7,8-HXCDD	0.000023	J,DX	0.000055	0.0000006	ug/L		03/23/21 05.15	03/25/21 09.55	1
1,2,3,7,8,9-HxCDD	0.000023	J,DX	0.000053	0.0000006	ug/L		03/23/21 05:15	03/25/21 09:53	1
				1	-				
1,2,3,4,7,8-HxCDF	0.0000072	J,DX MB	0.000053	0.0000010	ug/L		03/23/21 05:15	03/25/21 09:53	1
1,2,3,6,7,8-HxCDF	0.000063	J,DX MB	0.000053	0.0000009	ug/L		03/23/21 05:15	03/25/21 09:53	1

0.000053

0.000053

0.000053

0.000053

0.000053

0.00011

0.00011

0.000011

0.000011

0.000053

0.0000005 ug/L

0.0000006 ug/L

0.0000044 ug/L

0.0000015 ug/L

0.0000019 ug/L

0.0000031 ug/L

6

2 0.000002 ug/L

8

2

ug/L

ug/L

ug/L

0.000007

0.0000004

0.000007

7

1

1

1

1

1

1

1

1

Client: Haley & Aldrich, Inc. Project/Site: BMP Performance OF 001, 002 and/or 009

Client Sample ID: ILBMP0010_20210310

Analyte

Method: 1613B - Dioxins and Furans (HRGC/HRMS) (Continued)

Date Collected: 03/10/21 10:55 Matrix: Water Date Received: 03/11/21 18:30 Result Qualifier RL EDL Unit D Prepared Analyzed Dil Fac 0.000053 0.0000005 03/23/21 05:15 03/25/21 09:53 **Total PeCDF** 0.000021 J,DX ug/L 1 **Total HxCDD** 0.00015 q MB 0.000053 0.000006 ug/L 03/23/21 05:15 03/25/21 09:53 03/23/21 05:15 03/25/21 09:53 **Total HxCDF** 0.00010 g MB 0.000053 0.000005 ug/L 0.0000044 ug/L 03/23/21 05:15 03/25/21 09:53 **Total HpCDD** 0.000053 0.0013 MB 1 0.000053 0.0000015 ug/L 03/23/21 05:15 03/25/21 09:53 **Total HpCDF** 0.00019 q MB 1 Isotope Dilution Qualifier %Recovery Limits Prepared Analyzed Dil Fac 13C-2,3,7,8-TCDD 69 25 - 164 03/23/21 05:15 03/25/21 09:53 76 03/23/21 05:15 03/25/21 09:53 13C-2,3,7,8-TCDF 24 - 169 1 13C-1,2,3,7,8-PeCDD 63 25 - 181 03/23/21 05:15 03/25/21 09:53 1 03/23/21 05:15 03/25/21 09:53 70 13C-1,2,3,7,8-PeCDF 24 - 185 1 13C-2,3,4,7,8-PeCDF 71 21 - 178 03/23/21 05:15 03/25/21 09:53 1 13C-1,2,3,4,7,8-HxCDD 65 32 - 141 03/23/21 05:15 03/25/21 09:53 1 13C-1,2,3,6,7,8-HxCDD 64 28 - 130 03/23/21 05:15 03/25/21 09:53 1 13C-1,2,3,4,7,8-HxCDF 67 26 - 152 03/23/21 05:15 03/25/21 09:53 1 26 - 123 03/23/21 05:15 03/25/21 09:53 13C-1,2,3,6,7,8-HxCDF 68 1 13C-1.2.3.7.8.9-HxCDF 66 29 - 147 03/23/21 05:15 03/25/21 09:53 1 13C-2,3,4,6,7,8-HxCDF 69 28 - 136 03/23/21 05:15 03/25/21 09:53 13C-1,2,3,4,6,7,8-HpCDD 62 23 - 140 03/23/21 05:15 03/25/21 09:53 1 03/23/21 05:15 03/25/21 09:53

37Cl4-2,3,7,8-TCDD	116	35 - 197	03/23/21 05:15	03/25/21 09:53
Surrogate	%Recovery Qualifier	Limits	Prepared	Analyzed
13C-OCDD	50	17 - 157	03/23/21 05:15	03/25/21 09:53
13C-1,2,3,4,7,8,9-HpCDF	69	26 - 138	03/23/21 05:15	03/25/21 09:53
13C-1,2,3,4,6,7,8-HpCDF	68	28 - 143	03/23/21 05:15	03/25/21 09:53

Client Sample ID: LPBMP0002_20210311 Date Collected: 03/11/21 09:40 Date Received: 03/11/21 18:30

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDD	ND		0.000011	0.0000004	ug/L		03/23/21 05:15	03/25/21 10:38	1
				0					
2,3,7,8-TCDF	ND		0.000011	0.0000002	ug/L		03/23/21 05:15	03/25/21 10:38	1
				9					
1,2,3,7,8-PeCDD	0.0000016	J,DX q	0.000054	0.0000005	ug/L		03/23/21 05:15	03/25/21 10:38	1
		-		5					
1,2,3,7,8-PeCDF	0.0000049	J,DX q	0.000054	0.0000004	ug/L		03/23/21 05:15	03/25/21 10:38	1
				0					
2,3,4,7,8-PeCDF	0.0000072	J,DX	0.000054	0.0000004	ug/L		03/23/21 05:15	03/25/21 10:38	1
				3					
1,2,3,4,7,8-HxCDD	0.000051	J,DX q MB	0.000054	0.0000005	ug/L		03/23/21 05:15	03/25/21 10:38	1
				4					
1,2,3,6,7,8-HxCDD	0.0000061	J,DX q	0.000054	0.0000005	ug/L		03/23/21 05:15	03/25/21 10:38	1
				6					
1,2,3,7,8,9-HxCDD	0.0000073	J,DX	0.000054	0.0000005	ug/L		03/23/21 05:15	03/25/21 10:38	1
		· ·		1	-				
1,2,3,4,7,8-HxCDF	0.0000018	J,DX MB	0.000054	0.0000006	ug/L		03/23/21 05:15	03/25/21 10:38	1
		· ·		3	•				
1.2.3.6.7.8-HxCDF	0.0000018	J.DX MB	0.000054	0.0000005	ug/L		03/23/21 05:15	03/25/21 10:38	1
, , , , , , , = = = =		-,		0	0				

Eurofins Calscience LLC

Lab Sample ID: 570-53559-9

6

Dil Fac

Matrix: Water

1

Job ID: 570-53559-2

Method: 1613B - Dioxins and Furans (HRGC/HRMS) (Continued)

Job ID: 570-53559-2

6

Lab Sample ID: 570-53559-9 Matrix: Water

Date Collected: 03/11/21 09:40 Date Received: 03/11/21 18:30

1,2,3,7,8-PeCDD

Client Sample ID: LPBMP0002_20210311

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,3,7,8,9-HxCDF	0.0000051	J,DX q MB	0.000054	0.0000003	ug/L		03/23/21 05:15	03/25/21 10:38	1
2,3,4,6,7,8-HxCDF	0.0000020	J,DX MB	0.000054	0.0000004	ug/L		03/23/21 05:15	03/25/21 10:38	1
1,2,3,4,6,7,8-HpCDD	0.00017	MB	0.000054	0.0000015	ug/L		03/23/21 05:15	03/25/21 10:38	1
1,2,3,4,6,7,8-HpCDF	0.000032	J,DX MB	0.000054	0.0000010	ug/L		03/23/21 05:15	03/25/21 10:38	1
1,2,3,4,7,8,9-HpCDF	ND		0.000054	0.0000013	ug/L		03/23/21 05:15	03/25/21 10:38	1
OCDD	0.0013	MB	0.00011	0.0000013	ug/L		03/23/21 05:15	03/25/21 10:38	1
OCDF	0.000049	J,DX MB	0.00011	0.0000004	ug/L		03/23/21 05:15	03/25/21 10:38	1
Total TCDD	0.0000059	J,DX MB	0.000011	0.0000004	ug/L		03/23/21 05:15	03/25/21 10:38	1
Total TCDF	ND		0.000011	0.0000002	ug/L		03/23/21 05:15	03/25/21 10:38	1
Total PeCDD	0.0000063	J,DX q MB	0.000054	0.0000005 5	ug/L		03/23/21 05:15	03/25/21 10:38	1
Total PeCDF	0.0000070	J,DX q	0.000054	0.0000004 0	ug/L		03/23/21 05:15	03/25/21 10:38	1
Total HxCDD	0.000055	q MB	0.000054	0.0000005 1	ug/L		03/23/21 05:15	03/25/21 10:38	1
Total HxCDF	0.000034	J,DX q MB	0.000054	0.0000003 7	ug/L		03/23/21 05:15	03/25/21 10:38	1
Total HpCDD	0.00034	MB	0.000054	0.0000015	ug/L		03/23/21 05:15	03/25/21 10:38	1
Total HpCDF	0.000059	MB	0.000054	0.0000010	ug/L		03/23/21 05:15	03/25/21 10:38	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C-2,3,7,8-TCDD	70		25 - 164				03/23/21 05:15	03/25/21 10:38	1
13C-2,3,7,8-TCDF	78		24 - 169				03/23/21 05:15	03/25/21 10:38	1
13C-1,2,3,7,8-PeCDD	65		25 - 181				03/23/21 05:15	03/25/21 10:38	1
13C-1,2,3,7,8-PeCDF	73		24 - 185				03/23/21 05:15	03/25/21 10:38	1
13C-2,3,4,7,8-PeCDF	74		21 - 178				03/23/21 05:15	03/25/21 10:38	1
13C-1,2,3,4,7,8-HxCDD	69		32 - 141				03/23/21 05:15	03/25/21 10:38	1
13C-1,2,3,6,7,8-HxCDD	66		28 - 130				03/23/21 05:15	03/25/21 10:38	1
13C-1,2,3,4,7,8-HxCDF	74		26 - 152				03/23/21 05:15	03/25/21 10:38	1
13C-1,2,3,6,7,8-HxCDF	73		26 - 123				03/23/21 05:15	03/25/21 10:38	1
13C-1,2,3,7,8,9-HxCDF	71		29 - 147				03/23/21 05:15	03/25/21 10:38	1
13C-2,3,4,6,7,8-HxCDF	73		28 - 136				03/23/21 05:15	03/25/21 10:38	1
13C-1,2,3,4,6,7,8-HpCDD	65		23 - 140				03/23/21 05:15	03/25/21 10:38	1
13C-1,2,3,4,6,7,8-HpCDF	71		28 - 143				03/23/21 05:15	03/25/21 10:38	1
13C-1,2,3,4,7,8,9-HpCDF	73		26 - 138				03/23/21 05:15	03/25/21 10:38	1
13C-OCDD	54		17 - 157				03/23/21 05:15	03/25/21 10:38	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	119		35 - 197				03/23/21 05:15	03/25/21 10:38	1
Client Sample ID: LPBMP0003	20210311						Lab Sam	ole ID: 570-53	559-10
Date Collected: 03/11/21 09:50	-							Matrix	Water
Date Received: 03/11/21 18:30									
Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDD	ND		0.000011	0.000004	ug/L		03/23/21 05:15	03/25/21 11:23	1

03/23/21 05:15 03/25/21 11:23

0.000053 0.000008 ug/L

5

0.0000029 J,DX

RL

0.000053

0.000053

EDL Unit

0.0000005 ug/L

0.0000006 ug/L

5

D

Prepared

03/23/21 05:15 03/25/21 11:23

03/23/21 05:15 03/25/21 11:23

Client: Haley & Aldrich, Inc. Project/Site: BMP Performance OF 001, 002 and/or 009

Method: 1613B - Dioxins and Furans (HRGC/HRMS) (Continued)

ND

0.0000011 J,DX

Client Sample ID: LPBMP0003_20210311 Date Collected: 03/11/21 09:50 Date Received: 03/11/21 18:30 Analyte Result Qualifier

1,2,3,7,8-PeCDF

2,3,4,7,8-PeCDF

Lab Sample ID: 570-53559-10 **Matrix: Water**

Analyzed

59-10 Water	
Dil Fac	5
1	6
1	
1	
1	8
1	9
1	10
1	
1	
1	
1	13
1	
י 1	
1	

				3				
1,2,3,4,7,8-HxCDD	0.000054	J,DX MB	0.000053	0.0000006	ug/L	03/23/21 05:15	03/25/21 11:23	1
1,2,3,6,7,8-HxCDD	0.0000071	J,DX	0.000053	0.0000006	ug/L	03/23/21 05:15	03/25/21 11:23	1
1,2,3,7,8,9-HxCDD	0.0000075	J,DX	0.000053	0.0000006	ug/L	03/23/21 05:15	03/25/21 11:23	1
1,2,3,4,7,8-HxCDF	0.0000095	J,DX MB	0.000053	0 800000000	ug/L	03/23/21 05:15	03/25/21 11:23	1
1,2,3,6,7,8-HxCDF	0.0000020	J,DX MB	0.000053	4 0.0000007	ug/L	03/23/21 05:15	03/25/21 11:23	1
1,2,3,7,8,9-HxCDF	0.0000014	J,DX MB	0.000053	0.0000004	ug/L	03/23/21 05:15	03/25/21 11:23	1
2,3,4,6,7,8-HxCDF	0.0000024	J,DX MB	0.000053	0.0000005	ug/L	03/23/21 05:15	03/25/21 11:23	1
1,2,3,4,6,7,8-HpCDD	0.00014	MB	0.000053	0.0000013	ug/L	03/23/21 05:15	03/25/21 11:23	1
1,2,3,4,6,7,8-HpCDF	0.000032	J,DX MB	0.000053	0.0000013	ug/L	03/23/21 05:15	03/25/21 11:23	1
1,2,3,4,7,8,9-HpCDF	0.0000026	J,DX q	0.000053	0.0000016	ug/L	03/23/21 05:15	03/25/21 11:23	1
OCDD	0.0012	МВ	0.00011	0.0000015	ug/L	03/23/21 05:15	03/25/21 11:23	1
OCDF	0.000047	J,DX MB	0.00011	0.0000006	ug/L	03/23/21 05:15	03/25/21 11:23	1
Total TCDD	0.0000078	J,DX q MB	0.000011	6 0.0000004 5	ug/L	03/23/21 05:15	03/25/21 11:23	1
Total TCDF	0.00000072	J,DX MB	0.000011	0.0000002	ug/L	03/23/21 05:15	03/25/21 11:23	1
Total PeCDD	0.0000059	J,DX q MB	0.000053	0.0000008	ug/L	03/23/21 05:15	03/25/21 11:23	1
Total PeCDF	0.0000070	J,DX q	0.000053	0.0000005 5	ug/L	03/23/21 05:15	03/25/21 11:23	1
Total HxCDD	0.000048	J,DX q MB	0.000053	0.0000006	ug/L	03/23/21 05:15	03/25/21 11:23	1
Total HxCDF	0.000031	J,DX q MB	0.000053	0.0000004	ug/L	03/23/21 05:15	03/25/21 11:23	1
Total HpCDD	0.00029	MB	0.000053	0.0000013	ug/L	03/23/21 05:15	03/25/21 11:23	1
Total HpCDF	0.000057	q MB	0.000053	0.0000013	ug/L	03/23/21 05:15	03/25/21 11:23	1
Isotope Dilution	%Recoverv	Qualifier	Limits			Prepared	Analyzed	Dil Fac
13C-2.3.7.8-TCDD			25 - 164			03/23/21 05:15	03/25/21 11:23	1
13C-2 3 7 8-TCDF	64		24_169			03/23/21 05:15	03/25/21 11:23	1
13C-1 2 3 7 8-PeCDD	53		25 - 181			03/23/21 05:15	03/25/21 11:23	1
13C-1 2 3 7 8-PeCDF	59		24 - 185			03/23/21 05:15	03/25/21 11:23	
13C-2 3 4 7 8-PeCDE	59		21 - 178			03/23/21 05:15	03/25/21 11:23	1
13C-1 2 3 4 7 8-HyCDD	55		32 141			03/23/21 05:15	03/25/21 11:23	1
13C-1 2 3 6 7 8-HyCDD	53		28 130			03/23/21 05:15	03/25/21 11:23	
13C-1 2 3 4 7 8-HyCDE	58		26 152			03/23/21 05:15	03/25/21 11:23	1
13C-1 2 3 6 7 8-HVCDF	50		26 122			03/23/21 03.15	03/25/21 11.23	1
13C-1,2,3,0,7,0-1 ACDI	50		20 - 123			03/23/21 03.13 02/22/21 05.15	03/25/21 11.23	
	57		23 - 141 28 126			03/23/21 03.13	03/25/21 11.23	1
	00 E4		20-130			03/23/21 03.13	03/20/21 11.23	1
$130 - 1, 2, 3, 4, 0, 7, 0 - \Pi P C D D$	51 57		23 - 140			03/23/21 03.13	03/25/21 11.23	
130-1,2,3,4,0,7,8-HPCDF	57		28 - 143			03/23/21 05:15	03/25/21 11:23	1
130-1,2,3,4,7,8,9-HPCDF	57		20 - 138			03/23/21 05:15	03/25/21 11:23	1

Limits

Limits

35 - 197

17 - 157

Client: Haley & Aldrich, Inc. Project/Site: BMP Performance OF 001, 002 and/or 009

Client Sample ID: LPBMP0003_20210311

Client Sample ID: LPBMP0004_20210311

Date Collected: 03/11/21 09:50

Date Received: 03/11/21 18:30

Isotope Dilution

37Cl4-2,3,7,8-TCDD

13C-OCDD

Surrogate

Method: 1613B - Dioxins and Furans (HRGC/HRMS) (Continued)

%Recovery Qualifier

%Recovery Qualifier

118

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Lab Sample ID: 570-53559-10 **Matrix: Water** Dil Fac 1 6 Dil Fac 1

Lab Sample ID: 570-53559-11

Analyzed

Analyzed

Prepared

Prepared

03/23/21 05:15 03/25/21 11:23

03/23/21 05:15 03/25/21 11:23

Date Collected: 03/11/21 10:00 Date Received: 03/11/21 18:30							Matrix	Water
Analyte	Result	Qualifier	RL	EDL	Unit D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDD	0.0000013	J,DX q	0.000011	0.0000004 2	ug/L	03/23/21 05:15	03/25/21 12:08	1
1,2,3,7,8-PeCDD	0.0000044	J,DX	0.000054	0.0000006 3	ug/L	03/23/21 05:15	03/25/21 12:08	1
1,2,3,7,8-PeCDF	0.000038	J,DX	0.000054	0.0000004	ug/L	03/23/21 05:15	03/25/21 12:08	1
2,3,4,7,8-PeCDF	0.0000041	J,DX	0.000054	0.0000004	ug/L	03/23/21 05:15	03/25/21 12:08	1
1,2,3,4,7,8-HxCDD	0.000058	J,DX q MB	0.000054	0.0000004	ug/L	03/23/21 05:15	03/25/21 12:08	1
1,2,3,6,7,8-HxCDD	0.000058	J,DX	0.000054	0.0000004	ug/L	03/23/21 05:15	03/25/21 12:08	1
1,2,3,7,8,9-HxCDD	0.0000059	J,DX	0.000054	0.0000004	ug/L	03/23/21 05:15	03/25/21 12:08	1
1,2,3,4,7,8-HxCDF	0.000046	J,DX MB	0.000054	0.0000005	ug/L	03/23/21 05:15	03/25/21 12:08	1
1,2,3,6,7,8-HxCDF	0.0000042	J,DX q MB	0.000054	0.0000005	ug/L	03/23/21 05:15	03/25/21 12:08	1
1,2,3,7,8,9-HxCDF	0.0000045	J,DX MB	0.000054	0.0000003	ug/L	03/23/21 05:15	03/25/21 12:08	1
2,3,4,6,7,8-HxCDF	0.000046	J,DX q MB	0.000054	0.0000003	ug/L	03/23/21 05:15	03/25/21 12:08	1
1,2,3,4,6,7,8-HpCDD	0.000029	J,DX MB	0.000054	0.0000005	ug/L	03/23/21 05:15	03/25/21 12:08	1
1,2,3,4,6,7,8-HpCDF	0.0000090	J,DX MB	0.000054	0.0000006	ug/L	03/23/21 05:15	03/25/21 12:08	1
1,2,3,4,7,8,9-HpCDF	0.0000045	J,DX q	0.000054	0.0000007	ug/L	03/23/21 05:15	03/25/21 12:08	1
OCDD	0.00020	МВ	0.00011	0.0000007	ug/L	03/23/21 05:15	03/25/21 12:08	1
OCDF	0.000022	J,DX MB	0.00011	0.0000006	ug/L	03/23/21 05:15	03/25/21 12:08	1
Total TCDD	0.000078	J,DX q MB	0.000011	0.0000004	ug/L	03/23/21 05:15	03/25/21 12:08	1
Total TCDF	0.0000010	J,DX q MB	0.000011	0.0000002	ug/L	03/23/21 05:15	03/25/21 12:08	1
Total PeCDD	0.000078	J,DX q MB	0.000054	0.0000006	ug/L	03/23/21 05:15	03/25/21 12:08	1
Total PeCDF	0.000079	J,DX	0.000054	0.0000004	ug/L	03/23/21 05:15	03/25/21 12:08	1
Total HxCDD	0.000025	J,DX q MB	0.000054	4 0.0000004	ug/L	03/23/21 05:15	03/25/21 12:08	1
Total HxCDF	0.000019	J,DX q MB	0.000054	0.0000003	ug/L	03/23/21 05:15	03/25/21 12:08	1
Total HpCDD	0.000057	MB	0.000054	0.0000005	ug/L	03/23/21 05:15	03/25/21 12:08	1

Client: Haley & Aldrich, Inc. Project/Site: BMP Performance OF 001, 002 and/or 009

Method: 1613B - Dioxins and Furans (HRGC/HRMS) (Continued)

Client Sample ID: LPBMP0004_20210311 Date Collected: 03/11/21 10:00 Date Received: 03/11/21 18:30

Date Received: 03/11/21 18	:30								
Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
Total HpCDF	0.000017	J,DX q MB	0.000054	0.000006	ug/L		03/23/21 05:15	03/25/21 12:08	1
				3					
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C-2,3,7,8-TCDD	69		25 - 164				03/23/21 05:15	03/25/21 12:08	1
13C-2,3,7,8-TCDF	76		24 - 169				03/23/21 05:15	03/25/21 12:08	1
13C-1,2,3,7,8-PeCDD	61		25 - 181				03/23/21 05:15	03/25/21 12:08	1
13C-1,2,3,7,8-PeCDF	70		24 - 185				03/23/21 05:15	03/25/21 12:08	1
13C-2,3,4,7,8-PeCDF	70		21 - 178				03/23/21 05:15	03/25/21 12:08	1
13C-1,2,3,4,7,8-HxCDD	65		32 - 141				03/23/21 05:15	03/25/21 12:08	1
13C-1,2,3,6,7,8-HxCDD	62		28 - 130				03/23/21 05:15	03/25/21 12:08	1
13C-1,2,3,4,7,8-HxCDF	68		26 - 152				03/23/21 05:15	03/25/21 12:08	1
13C-1,2,3,6,7,8-HxCDF	68		26 - 123				03/23/21 05:15	03/25/21 12:08	1
13C-1,2,3,7,8,9-HxCDF	66		29 - 147				03/23/21 05:15	03/25/21 12:08	1
13C-2,3,4,6,7,8-HxCDF	67		28 - 136				03/23/21 05:15	03/25/21 12:08	1
13C-1,2,3,4,6,7,8-HpCDD	58		23 - 140				03/23/21 05:15	03/25/21 12:08	1
13C-1,2,3,4,6,7,8-HpCDF	64		28 - 143				03/23/21 05:15	03/25/21 12:08	1
13C-1,2,3,4,7,8,9-HpCDF	65		26 - 138				03/23/21 05:15	03/25/21 12:08	1
13C-OCDD	43		17 - 157				03/23/21 05:15	03/25/21 12:08	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
37Cl4-2.3.7.8-TCDD	118		35 - 197				03/23/21 05:15	03/25/21 12:08	1

Job ID: 570-53559-2

Matrix: Water

Lab Sample ID: 570-53559-11

Eurofins Calscience LLC

Job ID: 570-53559-2

5 6

Method: 1613B - Dioxins and Furans (HRGC/HRMS) - RA

Client Sample ID: B1BMP0009_	20210310						Lab San	nple ID: 570-5 Matrix	3559-1 Wator
Date Conected. 03/10/21 11:20								Watrix	. water
Date Received. 03/11/21 10.30	Pocult	Qualifier	Ы	EDI	Unit	п	Proparad	Analyzod	Dil Eac
	ND	Quaimer	0.000011	0.0000027			03/23/21 05:15	04/05/21 12·40	1
	A/ D	0	0.000011	0.0000027	ug/L		D	04/03/21 12:40	
	%Recovery	Qualifier					Prepared	Analyzed	
13C-2,3,7,8-1CDF	07		24 - 109				03/23/21 05.15	04/05/21 12.40	I
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	124		35 - 197				03/23/21 05:15	04/05/21 12:40	1
Client Sample ID: B1BMP0010	20210310						Lab San	nple ID: 570-5	3559-2
Date Collected: 03/10/21 11:25							Lub Gui	Matrix	: Water
Date Received: 03/11/21 18:30									
Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDF	ND		0.000011	0.0000022	ug/L		03/23/21 05:15	04/05/21 13:19	1
Isotope Dilution	%Recoverv	Qualifier	Limits				Prepared	Analvzed	Dil Fac
13C-2,3,7,8-TCDF	<u>69</u>		24 - 169				03/23/21 05:15	04/05/21 13:19	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	101		35 - 197				03/23/21 05:15	04/05/21 13:19	1
Client Sample ID: B1BMP0011	20210310						Lab San	nple ID: 570-5	3559-3
Date Collected: 03/10/21 11:30								Matrix	: Water
Date Received: 03/11/21 18:30									
Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDF	ND		0.000010	0.0000014	ug/L		03/23/21 05:15	04/05/21 21:15	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C-2,3,7,8-TCDF	90		24 - 169				03/23/21 05:15	04/05/21 21:15	1
	0/ D = = = = = = = = = =	Owellfier	Lincita				Due we we al	A	
	%Recovery	Qualifier	25 107				Prepared	Analyzed	
	114		55 - 191				03/23/21 03.13	04/00/21 21.10	1
Client Sample ID: ILBMP0004_2	20210310						Lab San	nple ID: 570-5	3559-4
Date Collected: 03/10/21 11:05								Matrix	: Water
Date Received: 03/11/21 18:30									
Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDF	ND		0.000011	0.0000022	ug/L		03/23/21 05:15	04/05/21 21:53	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C-2,3,7,8-TCDF	75		24 - 169				03/23/21 05:15	04/05/21 21:53	1
Surragata	%Pacovary	Qualifier	Limite				Proparod	Analyzod	Dil Eac
37C/4-2 3 7 8-TCDD	109	Quaimer	35 - 197				1000000000000000000000000000000000000	04/05/21 21:53	1
	100		00-101				00,20,21 00.10	0 // 00/21 21:00	,
Client Sample ID: ILBMP0005_2	20210310						Lab San	nple ID: 570-5	3559-5
Date Collected: 03/10/21 11:10								Matrix	: Water
Date Received: 03/11/21 18:30									
Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDF	ND		0.000011	0.0000025	ug/L		03/23/21 05:15	04/05/21 22:32	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C-2,3,7,8-TCDF	73		24 - 169				03/23/21 05:15	04/05/21 22:32	1
Surrogate	%Recovery	Qualifier	l imite				Prenared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	115		35 - 197				03/23/21 05:15	04/05/21 22:32	1

Client: Haley & Aldrich, Inc. Project/Site: BMP Performance OF 001, 002 and/or 009

37CI4-2,3,7,8-TCDD

Method: 1613B - Dioxins and Furans (HRGC/HRMS) - RA

Client Sample ID: ILBMP0008_ Date Collected: 03/10/21 11:00 Date Received: 03/11/21 18:30	20210310						Lab San	nple ID: 570-5 Matrix:	3559-6 Water
Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDF	ND		0.000011	0.0000032	ug/L		03/23/21 05:15	04/05/21 23:10	1
Isotope Dilution	%Recoverv	Qualifier	l imits				Prepared	Analyzed	Dil Fac
13C-2.3.7.8-TCDF	66	quanner	24 - 169				03/23/21 05:15	04/05/21 23:10	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	110		35 - 197				03/23/21 05:15	04/05/21 23:10	1
Client Sample ID: ILBMP0009_ Date Collected: 03/10/21 10:50	20210310						Lab San	nple ID: 570-5 Matrix:	3559-7 Water
Date Received: 03/11/21 18:30	Booult	Qualifiar	ы	EDI	Unit	Б	Droporod	Analyzad	
		Quaimer	0.000012	0.0000025			03/23/21 05:15	Analyzeu 04/05/21 23:48	
			0.000012	0.0000025	ug/L			04/03/21 23.40	
Isotope Dilution	%Recovery	Qualifier					Prepared	Analyzed	Dil Fac
13C-2,3,7,8-1CDF	78		24 - 769				03/23/21 05:15	04/05/21 23:48	1
Surrogate	%Recoverv	Qualifier	Limits				Prepared	Analvzed	Dil Fac
37Cl4-2,3,7,8-TCDD	118		35 - 197				03/23/21 05:15	04/05/21 23:48	1
_									
Client Sample ID: ILBMP0010_	20210310						Lab San	nple ID: 570-5	3559-8
Date Collected: 03/10/21 10:55								Matrix:	Water
Date Received: 03/11/21 18:30						_			
Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-1CDF	ND		0.000011	0.0000023	ug/L		03/23/21 05:15	04/06/21 00:27	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C-2,3,7,8-TCDF	76		24 - 169				03/23/21 05:15	04/06/21 00:27	1
Surrogata	% Beacharth	Qualifiar	Limito				Bronorod	Analyzad	Dil Eco
37C/4-2 3 7 8-TCDD		Quaimer	35 - 197				03/23/21 05·15	04/06/21 00·27	
	110		00-707				00/20/21 00:10	0 // 00/21 00:21	,
Client Sample ID: LPBMP0003	20210311						Lab Sam	ole ID: 570-53	559-10
Date Collected: 03/11/21 09:50								Matrix:	Water
Date Received: 03/11/21 18:30									
Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDF	ND		0.000011	0.0000031	ug/L		03/23/21 05:15	04/06/21 01:05	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C-2,3,7,8-TCDF	63		24 - 169				03/23/21 05:15	04/06/21 01:05	1
		o							
	%Recovery	Qualifier					Prepared	Analyzed	DIIFac
	117		35 - 197				03/23/21 05.15	04/06/21 01.05	1
Client Sample ID: LPBMP0004	20210311						Lab Sam	ole ID: 570-53	559-11
Date Collected: 03/11/21 10:00								Matrix:	Water
Date Received: 03/11/21 18:30									
Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDF	ND		0.000011	0.0000026	ug/L		03/23/21 05:15	04/06/21 01:44	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C-2,3,7,8-TCDF	79		24 - 169				03/23/21 05:15	04/06/21 01:44	1
							_		
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac

03/23/21 05:15 04/06/21 01:44 1

Eurofins Calscience LLC

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Job ID: 570-53559-2

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Surrogate Summary

Prep Type: Total/NA

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Method: 1613B - Dioxins and Furans (HRGC/HRMS) Matrix: Water

-			Percent Surrogate Recovery (Acceptance Limits)
		37TCDD	
Lab Sample ID	Client Sample ID	(35-197)	
570-53559-1	B1BMP0009_20210310	118	
570-53559-1 - RA	B1BMP0009_20210310	124	
570-53559-2	B1BMP0010_20210310	114	
570-53559-2 - RA	B1BMP0010_20210310	101	
570-53559-3	B1BMP0011_20210310	116	
570-53559-3 - RA	B1BMP0011_20210310	114	
570-53559-4	ILBMP0004_20210310	113	
570-53559-4 - RA	ILBMP0004_20210310	109	
570-53559-5	ILBMP0005_20210310	120	
570-53559-5 - RA	ILBMP0005_20210310	115	
570-53559-6	ILBMP0008_20210310	118	
570-53559-6 - RA	ILBMP0008_20210310	110	
570-53559-7	ILBMP0009_20210310	114	
570-53559-7 - RA	ILBMP0009_20210310	118	
570-53559-8	ILBMP0010_20210310	116	
570-53559-8 - RA	ILBMP0010_20210310	113	
570-53559-9	LPBMP0002_20210311	119	
570-53559-10	LPBMP0003_20210311	118	
570-53559-10 - RA	LPBMP0003_20210311	117	
570-53559-11	LPBMP0004_20210311	118	
570-53559-11 - RA	LPBMP0004_20210311	117	
MB 320-472939/1-A	Method Blank	115	
MB 320-472939/1-A - RA	Method Blank	115	
Surrogate Legend			

37TCDD = 37Cl4-2,3,7,8-TCDD

Method: 1613B - Dioxins and Furans (HRGC/HRMS)

Matrix: Water

-			Percent Surrogate Recovery (Acceptance Limits)
		37TCDD	
Lab Sample ID	Client Sample ID	(31-191)	
LCS 320-472939/2-A	Lab Control Sample	118	
LCSD 320-472939/3-A	Lab Control Sample Dup	119	
Surrogate Legend			

37TCDD = 37Cl4-2,3,7,8-TCDD

Prep Type: Total/NA

Isotope Dilution Summary

Client: Haley & Aldrich, Inc. Project/Site: BMP Performance OF 001, 002 and/or 009

Method: 1613B - Dioxins and Furans (HRGC/HRMS) Matrix: Water

		TCDD	TCDF	PeCDD	PeCDF	PeCF	HxCDD	HxDD	HxCDF
Lab Sample ID	Client Sample ID	(25-164)	(24-169)	(25-181)	(24-185)	(21-178)	(32-141)	(28-130)	(26-152)
570-53559-1	B1BMP0009_20210310	62	67	56	62	62	58	59	61
570-53559-1 - RA	B1BMP0009_20210310		67						
570-53559-2	B1BMP0010_20210310	65	73	58	65	66	60	60	66
570-53559-2 - RA	B1BMP0010_20210310		69						
570-53559-3	B1BMP0011_20210310	75	85	70	77	78	73	70	77
570-53559-3 - RA	B1BMP0011_20210310		90						
570-53559-4	ILBMP0004 20210310	68	73	61	69	70	66	63	70
570-53559-4 - RA	ILBMP0004_20210310		75						
570-53559-5	LBMP0005 20210310	65	71	63	68	70	63	63	69
570-53559-5 - RA	ILBMP0005_20210310		73						
570-53559-6	LBMP0008 20210310	62	69	57	64	65	58	58	63
570-53559-6 - RA			66						
570-53559-7		70	75	64	71	72	67	68	74
570-53559-7 - RA			78						
570-53559-8	ILBMP0010 20210310	69	76	63	70	71	65	64	67
570-53559-8 - RA			76						
570-53559-9	LPBMP0002 20210311	70	78	65	73	74	69	66	74
570-53559-10	LPBMP0003 20210311	59	64	53	59	59	55	53	58
570-53559-10 - RA	LPBMP0003 20210311		63						
570-53559-11	LPBMP0004 20210311	69	76	61	70	70	65	62	68
570-53559-11 - RA	LPBMP0004_20210311		79	•					
MB 320-472939/1-A	Method Blank	60	69	56	62	65	55	55	60
MB 320-472939/1-A - RA	Method Blank		70						
			Darra	nt la stana	Dilution De		oonton oo l	insite)	
			генсе		υπαποπ νε	LUVEIV IAL	Ceptance L	11111137	
				120Uv0E					
Lab Sampla ID	Client Semple ID	HxDF (26-123)	HxCF (29-147)	13CHxCF	HpCDD	HpCDF	HpCDF2	OCDD (17-157)	
Lab Sample ID	Client Sample ID	HxDF (26-123)	HxCF (29-147)	13CHxCF (28-136)	HpCDD (23-140)	HpCDF (28-143) 61	HpCDF2 (26-138)	OCDD (17-157)	
Lab Sample ID 570-53559-1 570-53559-1 - RA	Client Sample ID B1BMP0009_20210310 B1BMP0009_20210310	HxDF (26-123) 63	HxCF (29-147) 59	13CHxCF (28-136) 61	HpCDD (23-140) 54	HpCDF (28-143) 61	HpCDF2 (26-138) 61	OCDD (17-157) 45	
Lab Sample ID 570-53559-1 570-53559-1 - RA 570-53559-2	Client Sample ID B1BMP0009_20210310 B1BMP0009_20210310 B1BMP0010_20210310	HxDF (26-123) 63	HxCF (29-147) 59	13CHxCF (28-136) 61	HpCDD (23-140) 54	HpCDF (28-143) 61	HpCDF2 (26-138) 61	OCDD (17-157) 45	
Lab Sample ID 570-53559-1 570-53559-1 - RA 570-53559-2 570-53559-2 - RA	Client Sample ID B1BMP0009_20210310 B1BMP0009_20210310 B1BMP0010_20210310 B1BMP0010_20210310	HxDF (26-123) 63 64	HxCF (29-147) 59 62	13CHxCF (28-136) 61 64	HpCDD (23-140) 54 57	HpCDF (28-143) 61 63	HpCDF2 (26-138) 61 63	OCDD (17-157) 45 44	
Lab Sample ID 570-53559-1 570-53559-1 - RA 570-53559-2 570-53559-2 - RA 570-53559-3	Client Sample ID B1BMP0009_20210310 B1BMP0009_20210310 B1BMP0010_20210310 B1BMP0010_20210310 B1BMP0011_20210310	HxDF (26-123) 63 64 76	HxCF (29-147) 59 62 75	13CHxCF (28-136) 61 64	HpCDD (23-140) 54 57 68	HpCDF (28-143) 61 63 76	HpCDF2 (26-138) 61 63 76	OCDD (17-157) 45 44	
Lab Sample ID 570-53559-1 570-53559-1 - RA 570-53559-2 570-53559-2 - RA 570-53559-3 570-53559-3	Client Sample ID B1BMP0009_20210310 B1BMP0009_20210310 B1BMP0010_20210310 B1BMP0010_20210310 B1BMP0011_20210310 B1BMP0011_20210310	HxDF (26-123) 63 64 76	HxCF (29-147) 59 62 75	13CHxCF (28-136) 61 64 77	HpCDD (23-140) 54 57 68	HpCDF (28-143) 61 63 76	HpCDF2 (26-138) 61 63 76	OCDD (17-157) 45 44 56	
Lab Sample ID 570-53559-1 570-53559-1 - RA 570-53559-2 570-53559-2 - RA 570-53559-3 570-53559-3 - RA 570-53559-3 - RA	Client Sample ID B1BMP0009_20210310 B1BMP0009_20210310 B1BMP0010_20210310 B1BMP0010_20210310 B1BMP0011_20210310 B1BMP0011_20210310	HxDF (26-123) 63 64 76	HxCF (29-147) 59 62 75 68	13CHxCF (28-136) 61 64 77	HpCDD (23-140) 54 57 68 63	HpCDF (28-143) 61 63 76 70	HpCDF2 (26-138) 61 63 76 71	OCDD (17-157) 45 44 56	
Lab Sample ID 570-53559-1 570-53559-2 570-53559-2 570-53559-2 570-53559-3 570-53559-3 570-53559-3 - RA 570-53559-4 570-53559-4 570-53559-4	Client Sample ID B1BMP0009_20210310 B1BMP0009_20210310 B1BMP0010_20210310 B1BMP0010_20210310 B1BMP0011_20210310 B1BMP0011_20210310 ILBMP0004_20210310	HxDF (26-123) 63 64 76 70	HxCF (29-147) 59 62 75 68	13CHxCF (28-136) 61 64 77 69	HpCDD (23-140) 54 57 68 63	HpCDF (28-143) 61 63 76 70	HpCDF2 (26-138) 61 63 76 71	OCDD (17-157) 45 44 56 54	
Lab Sample ID 570-53559-1 570-53559-2 570-53559-2 570-53559-3 570-53559-3 570-53559-3 - RA 570-53559-4 570-53559-4 570-53559-4 - RA	Client Sample ID B1BMP0009_20210310 B1BMP0009_20210310 B1BMP0010_20210310 B1BMP0010_20210310 B1BMP0011_20210310 B1BMP0011_20210310 ILBMP0004_20210310 ILBMP0004_20210310	HxDF (26-123) 63 64 76 70 60	HxCF (29-147) 59 62 75 68 68	13CHxCF (28-136) 61 64 77 69 68	HpCDD (23-140) 54 57 68 63 63	HpCDF (28-143) 61 63 76 70 67	HpCDF2 (26-138) 61 63 76 71 68	OCDD (17-157) 45 44 56 54 54	
Lab Sample ID 570-53559-1 570-53559-2 570-53559-2 570-53559-2 570-53559-3 570-53559-3 570-53559-3 - RA 570-53559-4 570-53559-4 570-53559-5 570-53559-5 570-53559-5 570-53559-5	Client Sample ID B1BMP0009_20210310 B1BMP0009_20210310 B1BMP0010_20210310 B1BMP0010_20210310 B1BMP0011_20210310 B1BMP0011_20210310 ILBMP0004_20210310 ILBMP0005_20210310 ILBMP0005_20210310	HxDF (26-123) 63 64 76 70 69	HxCF (29-147) 59 62 75 68 68 66	13CHxCF (28-136) 61 64 77 69 68	HpCDD (23-140) 54 57 68 63 63 61	HpCDF (28-143) 61 63 76 70 67	HpCDF2 (26-138) 61 63 76 71 68	OCDD (17-157) 45 44 56 54 50	
Lab Sample ID 570-53559-1 570-53559-1 - RA 570-53559-2 570-53559-2 - RA 570-53559-3 - RA 570-53559-3 - RA 570-53559-4 - RA 570-53559-5 570-53559-5 - RA	Client Sample ID B1BMP0009_20210310 B1BMP0009_20210310 B1BMP0010_20210310 B1BMP0010_20210310 B1BMP0011_20210310 B1BMP0011_20210310 ILBMP0004_20210310 ILBMP0005_20210310 ILBMP0005_20210310 ILBMP0008_20210310	HxDF (26-123) 63 64 76 70 69 64	HxCF (29-147) 59 62 75 68 66 66	13CHxCF (28-136) 61 64 77 69 68 68	HpCDD (23-140) 54 57 68 63 63 61	HpCDF (28-143) 61 63 76 70 67 67	HpCDF2 (26-138) 61 63 76 71 68 63	OCDD (17-157) 45 44 56 54 50 46	
Lab Sample ID 570-53559-1 570-53559-2 570-53559-2 570-53559-2 - RA 570-53559-3 - RA 570-53559-3 - RA 570-53559-4 - RA 570-53559-5 570-53559-5 - RA 570-53559-6 570-53559-6 570-53559-6 570-53559-6 570-53559-6	Client Sample ID B1BMP0009_20210310 B1BMP0009_20210310 B1BMP0010_20210310 B1BMP0010_20210310 B1BMP0011_20210310 B1BMP0011_20210310 ILBMP0004_20210310 ILBMP0005_20210310 ILBMP0005_20210310 ILBMP0008_20210310 ILBMP0008_20210310	HxDF (26-123) 63 64 76 70 69 64	HxCF (29-147) 59 62 75 68 68 66 61	13CHxCF (28-136) 61 64 77 69 68 68 63	HpCDD (23-140) 54 57 68 63 63 61 55	HpCDF (28-143) 61 63 76 70 67 67	HpCDF2 (26-138) 61 63 76 71 68 63	OCDD (17-157) 45 44 56 54 50 46	
Lab Sample ID 570-53559-1 570-53559-2 570-53559-2 570-53559-2 570-53559-3 570-53559-3 570-53559-3 570-53559-4 570-53559-4 570-53559-5 570-53559-5 570-53559-6 570-53559-6 570-53559-6 570-53559-6 570-53559-6 570-53559-7 570-5359-7 570-570-7 570-570-7 570-570-7 570-570-7	Client Sample ID B1BMP0009_20210310 B1BMP0009_20210310 B1BMP0010_20210310 B1BMP0011_20210310 B1BMP0011_20210310 ILBMP0004_20210310 ILBMP0004_20210310 ILBMP0005_20210310 ILBMP0005_20210310 ILBMP0008_20210310 ILBMP0008_20210310	HxDF (26-123) 63 64 76 70 69 64	HxCF (29-147) 59 62 75 68 66 61	13CHxCF (28-136) 61 64 77 69 68 68 63	HpCDD (23-140) 54 57 68 63 63 61 55	HpCDF (28-143) 61 63 76 70 67 67 62	HpCDF2 (26-138) 61 63 76 71 68 63	OCDD (17-157) 45 44 56 54 50 46	
Lab Sample ID 570-53559-1 570-53559-2 570-53559-2 570-53559-2 570-53559-3 570-53559-3 570-53559-3 570-53559-4 570-53559-4 570-53559-5 570-53559-5 570-53559-6 570-53559-6 570-53559-7 570-5359-7 570-570-7 570-570-7 570-570-7 570-570-7 570-570-7 570-7	Client Sample ID B1BMP0009_20210310 B1BMP0009_20210310 B1BMP0010_20210310 B1BMP0010_20210310 B1BMP0011_20210310 B1BMP0004_20210310 ILBMP0004_20210310 ILBMP0005_20210310 ILBMP0005_20210310 ILBMP0008_20210310 ILBMP0008_20210310 ILBMP0009_20210310	HxDF (26-123) 63 64 76 70 69 64 72	HxCF (29-147) 59 62 75 68 66 61 71	13CHxCF (28-136) 61 64 77 69 68 68 63 72	HpCDD (23-140) 54 57 68 63 61 55 65	HpCDF (28-143) 61 63 76 70 67 62 72	HpCDF2 (26-138) 61 63 76 71 68 63 63 72	OCDD (17-157) 45 44 56 54 50 46 54	
Lab Sample ID 570-53559-1 570-53559-2 570-53559-2 570-53559-2 570-53559-3 570-53559-3 570-53559-4 570-53559-4 570-53559-5 570-53559-5 570-53559-6 570-53559-6 570-53559-6 570-53559-7 570-5359-7 570-570-7 570-570-7 570-570-7 570-570-7 570-570-7 570	Client Sample ID B1BMP0009_20210310 B1BMP0009_20210310 B1BMP0010_20210310 B1BMP0010_20210310 B1BMP0011_20210310 ILBMP0004_20210310 ILBMP0004_20210310 ILBMP0005_20210310 ILBMP0005_20210310 ILBMP0008_20210310 ILBMP0009_20210310 ILBMP0009_20210310 ILBMP0009_20210310	HxDF (26-123) 63 64 76 70 69 64 72 68	HxCF (29-147) 59 62 75 68 66 61 71 71	13CHxCF (28-136) 61 64 77 69 68 63 72 60	HpCDD (23-140) 54 57 68 63 61 55 65 65	HpCDF (28-143) 61 63 76 70 67 67 62 72 68	HpCDF2 (26-138) 61 63 76 71 68 63 72 60	OCDD (17-157) 45 44 56 54 50 46 54 54	
Lab Sample ID 570-53559-1 570-53559-2 570-53559-2 570-53559-2 570-53559-3 570-53559-3 570-53559-4 570-53559-4 570-53559-5 570-53559-5 570-53559-6 570-53559-6 570-53559-7 570-53559-7 570-53559-7 570-53559-7 570-53559-8 570-53559-8	Client Sample ID B1BMP0009_20210310 B1BMP0009_20210310 B1BMP0010_20210310 B1BMP0010_20210310 B1BMP0011_20210310 ILBMP0004_20210310 ILBMP0004_20210310 ILBMP0005_20210310 ILBMP0005_20210310 ILBMP0008_20210310 ILBMP0009_20210310 ILBMP0009_20210310 ILBMP0010_20210310	HxDF (26-123) 63 64 76 70 69 64 72 68	HxCF (29-147) 59 62 75 68 66 61 71 66	13CHxCF (28-136) 61 64 77 69 68 63 72 69	HpCDD (23-140) 54 57 68 63 61 55 65 65 62	HpCDF (28-143) 61 63 76 70 67 62 72 68	HpCDF2 (26-138) 61 63 76 71 68 63 72 69	OCDD (17-157) 45 44 56 54 50 46 54 50 54 50	
Lab Sample ID 570-53559-1 570-53559-1 - RA 570-53559-2 570-53559-2 - RA 570-53559-3 - RA 570-53559-4 - RA 570-53559-4 - RA 570-53559-5 570-53559-6 - RA 570-53559-6 - RA 570-53559-7 - RA 570-53559-7 - RA 570-53559-8 - RA	Client Sample ID B1BMP0009_20210310 B1BMP0009_20210310 B1BMP0010_20210310 B1BMP0010_20210310 B1BMP0011_20210310 B1BMP0011_20210310 ILBMP0004_20210310 ILBMP0005_20210310 ILBMP0005_20210310 ILBMP0008_20210310 ILBMP0009_20210310 ILBMP0009_20210310 ILBMP0010_20210310 ILBMP0010_20210310	HxDF (26-123) 63 64 76 70 69 64 72 68 72	HxCF (29-147) 59 62 75 68 66 61 71 66 71	13CHxCF (28-136) 61 64 77 69 68 63 72 69 72 73	HpCDD (23-140) 54 57 68 63 63 61 55 65 65 65 62	HpCDF (28-143) 61 63 76 70 67 62 72 68 72	HpCDF2 (26-138) 61 63 76 71 68 63 72 69 72	OCDD (17-157) 45 44 56 54 50 46 54 50 46 54 50	
Lab Sample ID 570-53559-1 570-53559-2 570-53559-2 570-53559-2 570-53559-3 570-53559-3 570-53559-4 570-53559-4 570-53559-5 570-53559-5 570-53559-6 570-53559-6 570-53559-7 570-53559-7 570-53559-7 570-53559-8 570-53559-8 570-53559-9 570-53559-1 570-5359-1 57	Client Sample ID B1BMP0009_20210310 B1BMP0009_20210310 B1BMP0010_20210310 B1BMP0010_20210310 B1BMP0011_20210310 B1BMP0011_20210310 ILBMP0004_20210310 ILBMP0005_20210310 ILBMP0005_20210310 ILBMP0008_20210310 ILBMP0009_20210310 ILBMP0009_20210310 ILBMP0010_20210310 ILBMP0010_20210311 ILBMP0002_20210311	HxDF (26-123) 63 64 76 70 69 64 72 68 73 73	HxCF (29-147) 59 62 75 68 66 61 71 66 71 57	13CHxCF (28-136) 61 64 77 69 68 63 72 69 73	HpCDD (23-140) 54 57 68 63 61 55 65 65 62 65 51	HpCDF (28-143) 61 63 76 70 67 62 72 68 71 57	HpCDF2 (26-138) 61 63 76 71 68 63 72 69 73 57	OCDD (17-157) 45 44 56 54 50 46 54 50 54 50 54	
Lab Sample ID 570-53559-1 570-53559-2 570-53559-2 570-53559-2 - RA 570-53559-3 - RA 570-53559-4 570-53559-4 570-53559-5 570-53559-5 570-53559-6 570-53559-6 570-53559-7 570-53559-7 570-53559-7 570-53559-8 570-53559-8 570-53559-8 570-53559-9 570-53559-9 570-53559-10 570-53559-10	Client Sample ID B1BMP0009_20210310 B1BMP0009_20210310 B1BMP0010_20210310 B1BMP0011_20210310 B1BMP0011_20210310 ILBMP0004_20210310 ILBMP0005_20210310 ILBMP0005_20210310 ILBMP0008_20210310 ILBMP0009_20210310 ILBMP0009_20210310 ILBMP0010_20210310 ILBMP0010_20210311 LPBMP0003_20210311 LPBMP0003_20210311	HxDF (26-123) 63 64 76 70 69 64 72 68 73 58	HxCF (29-147) 59 62 75 68 66 61 71 66 71 57	13CHxCF (28-136) 61 64 77 69 68 63 72 69 73 58	HpCDD (23-140) 54 57 68 63 63 61 55 65 65 62 65 51	HpCDF (28-143) 61 63 76 70 67 62 72 68 71 57	HpCDF2 (26-138) 61 63 76 71 68 63 72 69 73 57	OCDD (17-157) 45 44 56 54 50 46 54 50 46 54 50 54 39	
Lab Sample ID 570-53559-1 570-53559-2 570-53559-2 570-53559-2 570-53559-3 570-53559-3 570-53559-4 570-53559-4 570-53559-5 570-53559-5 570-53559-6 570-53559-6 570-53559-7 570-53559-7 570-53559-7 570-53559-8 570-53559-8 570-53559-8 570-53559-9 570-53559-9 570-53559-10 570-5359-10 570-5359-1	Client Sample ID B1BMP0009_20210310 B1BMP0009_20210310 B1BMP0010_20210310 B1BMP0011_20210310 B1BMP0011_20210310 ILBMP0004_20210310 ILBMP0005_20210310 ILBMP0005_20210310 ILBMP0008_20210310 ILBMP0009_20210310 ILBMP0009_20210310 ILBMP0010_20210310 ILBMP0010_20210311 LPBMP0003_20210311 LPBMP0003_20210311	HxDF (26-123) 63 64 76 70 69 64 72 68 73 58	HxCF (29-147) 59 62 75 68 66 61 71 66 71 57	13CHxCF (28-136) 61 64 77 69 68 63 72 69 73 58	HpCDD (23-140) 54 57 68 63 61 55 65 65 65 62 65 51	HpCDF (28-143) 61 63 76 70 67 62 72 68 71 57	HpCDF2 (26-138) 61 63 76 71 68 63 72 69 73 57	OCDD (17-157) 45 44 56 54 50 46 54 50 46 54 50 54 39	
Lab Sample ID 570-53559-1 570-53559-2 570-53559-2 570-53559-2 570-53559-3 570-53559-3 570-53559-4 570-53559-4 570-53559-5 570-53559-5 570-53559-6 570-53559-6 570-53559-7 570-53559-7 570-53559-7 570-53559-8 570-53559-8 570-53559-8 570-53559-9 570-53559-9 570-53559-10 570-53559-10 570-53559-11 570-5359-11 5	Client Sample ID B1BMP0009_20210310 B1BMP0009_20210310 B1BMP0010_20210310 B1BMP0011_20210310 B1BMP0011_20210310 ILBMP0004_20210310 ILBMP0005_20210310 ILBMP0005_20210310 ILBMP0008_20210310 ILBMP0009_20210310 ILBMP0009_20210310 ILBMP0010_20210310 ILBMP0010_20210311 LPBMP0003_20210311 LPBMP0004_20210311 LPBMP0004_20210311 LPBMP0004_20210311	HxDF (26-123) 63 64 76 70 69 64 72 68 73 58 68	HxCF (29-147) 59 62 75 68 66 61 71 66 71 57 66	13CHxCF (28-136) 61 64 77 69 68 63 72 69 73 58 67	HpCDD (23-140) 54 57 68 63 61 55 65 65 62 65 51 58	HpCDF (28-143) 61 63 76 70 67 62 72 68 71 57 64	HpCDF2 (26-138) 61 63 76 71 68 63 72 69 73 57 65	OCDD (17-157) 45 44 56 54 50 46 54 50 54 50 46 54 50 54 50 54 50 54 39 43	
Lab Sample ID 570-53559-1 570-53559-2 570-53559-2 570-53559-2 570-53559-3 570-53559-3 570-53559-4 570-53559-4 570-53559-5 570-53559-5 570-53559-6 570-53559-6 570-53559-7 570-53559-7 570-53559-7 570-53559-8 570-53559-8 570-53559-9 570-53559-9 570-53559-9 570-53559-10 570-53559-10 570-53559-11 570-5359-11 5	Client Sample ID B1BMP0009_20210310 B1BMP0009_20210310 B1BMP0010_20210310 B1BMP0011_20210310 B1BMP0011_20210310 ILBMP0004_20210310 ILBMP0005_20210310 ILBMP0005_20210310 ILBMP0008_20210310 ILBMP0009_20210310 ILBMP0009_20210310 ILBMP0010_20210310 ILBMP0010_20210311 LPBMP0003_20210311 LPBMP0004_20210311 LPBMP0004_20210311 LPBMP0004_20210311	HxDF (26-123) 63 64 76 70 69 64 72 68 73 58 68 68	HxCF (29-147) 59 62 75 68 66 61 71 66 71 57 66	13CHxCF (28-136) 61 64 77 69 68 63 72 69 73 58 67	HpCDD (23-140) 54 57 68 63 61 55 65 65 62 65 51 58	HpCDF (28-143) 61 63 76 70 67 62 72 68 71 57 64	HpCDF2 (26-138) 61 63 76 71 68 63 72 69 73 57 65	OCDD (17-157) 45 44 56 54 50 46 54 50 46 54 50 54 39 43	
Lab Sample ID 570-53559-1 570-53559-2 570-53559-2 570-53559-2 570-53559-3 570-53559-3 570-53559-4 570-53559-4 570-53559-5 570-53559-5 570-53559-6 570-53559-6 570-53559-7 570-53559-7 570-53559-7 570-53559-7 570-53559-8 570-53559-8 570-53559-9 570-53559-9 570-53559-10 570-53559-10 570-53559-11 570-53559-10 570-5359-10 570-535	Client Sample ID B1BMP0009_20210310 B1BMP0009_20210310 B1BMP0010_20210310 B1BMP0011_20210310 B1BMP0011_20210310 ILBMP0004_20210310 ILBMP0005_20210310 ILBMP0005_20210310 ILBMP0008_20210310 ILBMP0009_20210310 ILBMP0009_20210310 ILBMP0010_20210310 ILBMP0010_20210311 ILBMP0003_20210311 LPBMP0003_20210311 LPBMP0004_20210311 LPBMP0004_20210311 ILPBMP0004_20210311 Method Blank	HxDF (26-123) 63 64 76 70 69 64 72 68 73 58 68 68 68	HxCF (29-147) 59 62 75 68 66 61 71 66 71 57 66 58	13CHxCF (28-136) 61 64 77 69 68 63 72 69 73 58 67 61	HpCDD (23-140) 54 57 68 63 61 55 65 65 62 65 51 58 50	HpCDF (28-143) 61 63 76 70 67 62 72 68 71 57 64 58	HpCDF2 (26-138) 61 63 76 71 68 63 72 69 73 57 65 55	OCDD (17-157) 45 44 56 54 50 46 54 50 54 50 54 50 54 50 54 39 43 37	

Prep Type: Total/NA

Percent Isotope Dilution Recovery (Acceptance Limits)

Isotope Dilution Summary

Client: Haley & Aldrich, Inc. Project/Site: BMP Performance OF 001, 002 and/or 009

Surrogate Legend

Method: 1613B - Dioxins and Furans (HRGC/HRMS) Matrix: Water

Prep Type: Total/NA Percent Isotope Dilution Recovery (Acceptance Limits) TCDD PeCDD TCDF PeCDF PeCF HxCDD HxDD HxCDF (20-175) (22-152) (21-227) (21-192) (13-328) (21-193) (25-163) (19-202) Lab Sample ID **Client Sample ID** 74 LCS 320-472939/2-A Lab Control Sample 73 80 68 77 64 60 69 LCSD 320-472939/3-A Lab Control Sample Dup 73 78 74 77 75 68 69 69 Percent Isotope Dilution Recovery (Acceptance Limits) OCDD HxDF HxCF 13CHxCF HpCDD HpCDF HpCDF2 Lab Sample ID **Client Sample ID** (21-159) (17-205)(22-176) (26-166)(21 - 158)(20-186) (13-199)LCS 320-472939/2-A Lab Control Sample 68 66 70 56 64 63 44 LCSD 320-472939/3-A Lab Control Sample Dup 74 72 75 63 71 72 49

Surrogate Legend

TCDD = 13C-2,3,7,8-TCDD TCDF = 13C-2,3,7,8-TCDF PeCDD = 13C-1,2,3,7,8-PeCDD PeCF = 13C-1,2,3,7,8-PeCDF PeCF = 13C-2,3,4,7,8-PeCDF HxCDD = 13C-1,2,3,4,7,8-HxCDD HxDD = 13C-1,2,3,6,7,8-HxCDD HxCF = 13C-1,2,3,6,7,8-HxCDF HxCF = 13C-1,2,3,7,8,9-HxCDF 13CHxCF = 13C-2,3,4,6,7,8-HxCDF HpCDD = 13C-1,2,3,4,6,7,8-HpCDD HpCDF = 13C-1,2,3,4,6,7,8-HpCDF HpCDF = 13C-1,2,3,4,6,7,8-HpCDF HpCDF = 13C-1,2,3,4,6,7,8-HpCDF HpCDF = 13C-1,2,3,4,7,8,9-HpCDF DCDD = 13C-0CDD

Method: 1613B - Dioxins and Furans (HRGC/HRMS)

MB MB

Lab Sample ID: MB 320-472939/1-A Matrix: Water Analysis Batch: 473727

13C-1,2,3,7,8-PeCDF

Client Sample ID: Metho	d Blan
Prep Type:	Total/N
Prep Batch	: 47293

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDD	ND		0.000010	0.0000006	ug/L		03/23/21 05:15	03/24/21 22:06	1
1,2,3,7,8-PeCDD	ND		0.000050	4 0.0000006	ug/L		03/23/21 05:15	03/24/21 22:06	1
1,2,3,7,8-PeCDF	ND		0.000050	0.0000005	ug/L		03/23/21 05:15	03/24/21 22:06	1
2,3,4,7,8-PeCDF	ND		0.000050	9 0.0000006	ug/L		03/23/21 05:15	03/24/21 22:06	1
1,2,3,4,7,8-HxCDD	0.00000151	J,DX q	0.000050	0.0000005	ug/L		03/23/21 05:15	03/24/21 22:06	1
1,2,3,6,7,8-HxCDD	ND		0.000050	o 0.0000005	ug/L		03/23/21 05:15	03/24/21 22:06	1
1,2,3,7,8,9-HxCDD	ND		0.000050	0.0000005	ug/L		03/23/21 05:15	03/24/21 22:06	1
1,2,3,4,7,8-HxCDF	0.00000178	J,DX	0.000050	0.0000005	ug/L		03/23/21 05:15	03/24/21 22:06	1
1,2,3,6,7,8-HxCDF	0.00000872	J,DX q	0.000050	0.0000005	ug/L		03/23/21 05:15	03/24/21 22:06	1
1,2,3,7,8,9-HxCDF	0.000000659	J,DX q	0.000050	0.0000003	ug/L		03/23/21 05:15	03/24/21 22:06	1
2,3,4,6,7,8-HxCDF	0.00000188	J,DX	0.000050	0.0000003	ug/L		03/23/21 05:15	03/24/21 22:06	1
1,2,3,4,6,7,8-HpCDD	0.00000368	J,DX	0.000050	0.0000004	ug/L		03/23/21 05:15	03/24/21 22:06	1
1,2,3,4,6,7,8-HpCDF	0.00000262	J,DX	0.000050	0.0000004	ug/L		03/23/21 05:15	03/24/21 22:06	1
1,2,3,4,7,8,9-HpCDF	ND		0.000050	0.0000006	ug/L		03/23/21 05:15	03/24/21 22:06	1
OCDD	0.0000185	J,DX	0.00010	0.0000007	ug/L		03/23/21 05:15	03/24/21 22:06	1
OCDF	0.00000305	J,DX q	0.00010	0.0000007	ug/L		03/23/21 05:15	03/24/21 22:06	1
Total TCDD	0.0000156	q	0.000010	0.0000006	ug/L		03/23/21 05:15	03/24/21 22:06	1
Total TCDF	0.000000985	J,DX q	0.000010	0.0000003	ug/L		03/23/21 05:15	03/24/21 22:06	1
Total PeCDD	0.00000454	J,DX q	0.000050	0.0000006	ug/L		03/23/21 05:15	03/24/21 22:06	1
Total PeCDF	ND		0.000050	0.0000005	ug/L		03/23/21 05:15	03/24/21 22:06	1
Total HxCDD	0.00000559	J,DX q	0.000050	0.0000005	ug/L		03/23/21 05:15	03/24/21 22:06	1
Total HxCDF	0.00000638	J,DX q	0.000050	0.0000003	ug/L		03/23/21 05:15	03/24/21 22:06	1
Total HpCDD	0.00000707	J,DX	0.000050	0.0000004	ug/L		03/23/21 05:15	03/24/21 22:06	1
Total HpCDF	0.00000262	J,DX	0.000050	0.0000004	ug/L		03/23/21 05:15	03/24/21 22:06	1
	MR	MB		5					
Isotope Dilution	%Recovery	Qualifier	l imite				Prepared	Analyzed	Dil Fac
13C-2 3 7 8-TCDD	60		25, 164				03/23/21 05:15	03/24/21 22:06	1
13C-2 3 7 8-TCDF	00 00		24, 169				03/23/21 05:15	03/24/21 22:06	1
13C-1.2.3.7.8-PeCDD	56		25 - 181				03/23/21 05:15	03/24/21 22:00	1
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Eurofins Calscience LLC

03/23/21 05:15 03/24/21 22:06

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QC Sample Results

Method: 1613B - Dioxins and Furans (HRGC/HRMS) (Continued)

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Lab Sample ID: MB 320-472939/1-A **Matrix: Water** Analysis Batch: 473727

	MB	MB				
Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-2,3,4,7,8-PeCDF	65		21 - 178	03/23/21 05:15	03/24/21 22:06	1
13C-1,2,3,4,7,8-HxCDD	55		32 - 141	03/23/21 05:15	03/24/21 22:06	1
13C-1,2,3,6,7,8-HxCDD	55		28 - 130	03/23/21 05:15	03/24/21 22:06	1
13C-1,2,3,4,7,8-HxCDF	60		26 - 152	03/23/21 05:15	03/24/21 22:06	1
13C-1,2,3,6,7,8-HxCDF	60		26 - 123	03/23/21 05:15	03/24/21 22:06	1
13C-1,2,3,7,8,9-HxCDF	58		29 - 147	03/23/21 05:15	03/24/21 22:06	1
13C-2,3,4,6,7,8-HxCDF	61		28 - 136	03/23/21 05:15	03/24/21 22:06	1
13C-1,2,3,4,6,7,8-HpCDD	50		23 - 140	03/23/21 05:15	03/24/21 22:06	1
13C-1,2,3,4,6,7,8-HpCDF	58		28 - 143	03/23/21 05:15	03/24/21 22:06	1
13C-1,2,3,4,7,8,9-HpCDF	55		26 - 138	03/23/21 05:15	03/24/21 22:06	1
13C-OCDD	37		17 - 157	03/23/21 05:15	03/24/21 22:06	1
	МВ	МВ				
Surrogate	%Recoverv	Qualifier	Limits	Prepared	Analyzed	Dil Fac

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37C	14-2.	3.7.8-	TCDD	

Lab Sample ID: LCS 320-472939/2-A **Matrix: Water** Analysis Batch: 473727

			Spike	LCS	LCS				%Rec.
Analyte			Added	Result	Qualifier	Unit	D	%Rec	Limits
2,3,7,8-TCDD			0.000200	0.000235		ug/L		117	67 - 158
2,3,7,8-TCDF			0.000200	0.000216	MB	ug/L		108	75 - 158
1,2,3,7,8-PeCDD			0.00100	0.00118		ug/L		118	70 - 142
1,2,3,7,8-PeCDF			0.00100	0.00113		ug/L		113	80 - 134
2,3,4,7,8-PeCDF			0.00100	0.00109		ug/L		109	68 - 160
1,2,3,4,7,8-HxCDD			0.00100	0.00120	MB	ug/L		120	70 - 164
1,2,3,6,7,8-HxCDD			0.00100	0.00126		ug/L		126	76 - 134
1,2,3,7,8,9-HxCDD			0.00100	0.00128		ug/L		128	64 - 162
1,2,3,4,7,8-HxCDF			0.00100	0.00115	MB	ug/L		115	72 - 134
1,2,3,6,7,8-HxCDF			0.00100	0.00119	MB	ug/L		119	84 - 130
1,2,3,7,8,9-HxCDF			0.00100	0.00121	MB	ug/L		121	78 - 130
2,3,4,6,7,8-HxCDF			0.00100	0.00116	MB	ug/L		116	70 - 156
1,2,3,4,6,7,8-HpCDD			0.00100	0.00127	MB	ug/L		127	70 - 140
1,2,3,4,6,7,8-HpCDF			0.00100	0.00121	MB	ug/L		121	82 - 122
1,2,3,4,7,8,9-HpCDF			0.00100	0.00119		ug/L		119	78 - 138
OCDD			0.00200	0.00249	MB	ug/L		124	78 - 144
OCDF			0.00200	0.00285	MB	ug/L		142	63 - 170
	LCS	LCS							
Isotope Dilution	%Recovery	Qualifier	Limits						
13C-2,3,7,8-TCDD	73		20 - 175						
13C-2,3,7,8-TCDF	80		22 - 152						
13C-1,2,3,7,8-PeCDD	68		21 - 227						
13C-1,2,3,7,8-PeCDF	74		21 - 192						
13C-2,3,4,7,8-PeCDF	77		13 - 328						
13C-1,2,3,4,7,8-HxCDD	64		21 - 193						
13C-1,2,3,6,7,8-HxCDD	60		25 - 163						
13C-1,2,3,4,7,8-HxCDF	69		19 - 202						
13C-1,2,3,6,7,8-HxCDF	68		21 - 159						

Job ID: 570-53559-2

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1

Client Sample ID: Method Blank Prep Type: Total/NA Prep Batch: 472939

03/23/21 05:15 03/24/21 22:06

Client Sample ID: Lab Control Sample

Prep Type: Total/NA Prep Batch: 472939

QC Sample Results

Method: 1613B - Dioxins and Furans (HRGC/HRMS) (Continued)

Lab Sample ID: LCS 320-472939/2-A **Matrix: Water** Analysis Batch: 473727

	LCS	LCS	
Isotope Dilution	%Recovery	Qualifier	Limits
13C-1,2,3,7,8,9-HxCDF	66		17 - 205
13C-2,3,4,6,7,8-HxCDF	70		22 - 176
13C-1,2,3,4,6,7,8-HpCDD	56		26 - 166
13C-1,2,3,4,6,7,8-HpCDF	64		21 - 158
13C-1,2,3,4,7,8,9-HpCDF	63		20 - 186
13C-OCDD	44		13 - 199
	LCS	LCS	
Surrogate	%Recovery	Qualifier	Limits
37Cl4-2,3,7,8-TCDD			31 - 191

Lab Sample ID: LCSD 320-472939/3-A **Matrix: Water** Analysis Batch: 473727

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

%Rec.

Client Sample ID: Lab Control Sample

RPD

9

5

Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
2,3,7,8-TCDD	0.000200	0.000225		ug/L		112	67 - 158	4	50
2,3,7,8-TCDF	0.000200	0.000210	MB	ug/L		105	75 - 158	3	50
1,2,3,7,8-PeCDD	0.00100	0.00116		ug/L		116	70 - 142	2	50
1,2,3,7,8-PeCDF	0.00100	0.00111		ug/L		111	80 - 134	2	50
2,3,4,7,8-PeCDF	0.00100	0.00109		ug/L		109	68 - 160	1	50
1,2,3,4,7,8-HxCDD	0.00100	0.00117	MB	ug/L		117	70 - 164	3	50
1,2,3,6,7,8-HxCDD	0.00100	0.00113		ug/L		113	76 - 134	11	50
1,2,3,7,8,9-HxCDD	0.00100	0.00117		ug/L		117	64 - 162	9	50
1,2,3,4,7,8-HxCDF	0.00100	0.00110	MB	ug/L		110	72 - 134	5	50
1,2,3,6,7,8-HxCDF	0.00100	0.00113	MB	ug/L		113	84 - 130	5	50
1,2,3,7,8,9-HxCDF	0.00100	0.00114	MB	ug/L		114	78 - 130	6	50
2,3,4,6,7,8-HxCDF	0.00100	0.00113	MB	ug/L		113	70 - 156	3	50
1,2,3,4,6,7,8-HpCDD	0.00100	0.00120	MB	ug/L		120	70 - 140	6	50
1,2,3,4,6,7,8-HpCDF	0.00100	0.00114	MB	ug/L		114	82 - 122	5	50
1,2,3,4,7,8,9-HpCDF	0.00100	0.00111		ug/L		111	78 - 138	7	50
OCDD	0.00200	0.00237	MB	ug/L		118	78 - 144	5	50
OCDF	0.00200	0.00272	MB	ug/L		136	63 - 170	5	50

LCSD LCSD

Spike

	LCSD	LCSD	
Isotope Dilution	%Recovery	Qualifier	Limits
13C-2,3,7,8-TCDD	73		20 - 175
13C-2,3,7,8-TCDF	78		22 - 152
13C-1,2,3,7,8-PeCDD	68		21 - 227
13C-1,2,3,7,8-PeCDF	74		21 - 192
13C-2,3,4,7,8-PeCDF	77		13 - 328
13C-1,2,3,4,7,8-HxCDD	69		21 - 193
13C-1,2,3,6,7,8-HxCDD	69		25 - 163
13C-1,2,3,4,7,8-HxCDF	75		19 - 202
13C-1,2,3,6,7,8-HxCDF	74		21 - 159
13C-1,2,3,7,8,9-HxCDF	72		17 - 205
13C-2,3,4,6,7,8-HxCDF	75		22 - 176
13C-1,2,3,4,6,7,8-HpCDD	63		26 - 166
13C-1,2,3,4,6,7,8-HpCDF	71		21 - 158
13C-1,2,3,4,7,8,9-HpCDF	72		20 - 186

Eurofins Calscience LLC

Prep Type: Total/NA

Prep Batch: 472939

Prep Batch: 472939

Surrogate

37Cl4-2,3,7,8-TCDD - RA

Prepared

03/23/21 05:15 04/05/21 11:24

Analyzed

Dil Fac

1

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Method: 1613B - Dioxir	ns and Fur	ans (HF	RGC/HRMS)	(Continu	ied)				
Lab Sample ID: LCSD 320 Matrix: Water Analysis Batch: 473727	-472939/3-A				Clie	ent San	nple ID: Lab (Control Samp Prep Type: To Prep Batch:	ole Dup otal/NA 472939
Analysis Batch. 470727	LCSD	LCSD						Trop Baton.	472000
Isotope Dilution	%Recovery	Qualifier	Limits						
13C-OCDD	49		13 - 199						
	LCSD	LCSD							
Surrogate	%Recovery	Qualifier	Limits						
37Cl4-2,3,7,8-TCDD	119		31 - 191						
Method: 1613B - Dioxin	ns and Fur	ans (HF	RGC/HRMS)	- RA			011 / 0		
Lab Sample ID: MB 320-47	(2939/1-A						Client Samp	le ID: Method	Blank
Matrix: water								Prep Type: 1	otal/NA
Analysis Batch: 477003								Prep Batch:	472939
		MR MR				_			
Analyte	Res	ult Qualifi	er RL	EDL	Unit	D	Prepared	Analyzed	DIIFac
2,3,7,8-1CDF - RA		ND	0.000010	0.0000022	ug/L		03/23/21 05:15	04/05/21 11:24	1
	I	MB MB							
Isotope Dilution	%Recov	ery Qualif	ier Limits				Prepared	Analyzed	Dil Fac
13C-2,3,7,8-TCDF - RA		70	24 - 169				03/23/21 05:15	04/05/21 11:24	1
		MB MB							

Limits

35 - 197

%Recovery Qualifier

QC Association Summary

Client: Haley & Aldrich, Inc. Project/Site: BMP Performance OF 001, 002 and/or 009

Specialty Organics

Prep Batch: 472939

Lab Sample ID	Client Sample ID	Ргер Туре	Matrix	Method	Prep Batch
570-53559-1	B1BMP0009_20210310	Total/NA	Water	1613B	
570-53559-1 - RA	B1BMP0009_20210310	Total/NA	Water	1613B	
570-53559-2	B1BMP0010_20210310	Total/NA	Water	1613B	
570-53559-2 - RA	B1BMP0010_20210310	Total/NA	Water	1613B	
570-53559-3	B1BMP0011_20210310	Total/NA	Water	1613B	
570-53559-3 - RA	B1BMP0011_20210310	Total/NA	Water	1613B	
570-53559-4	ILBMP0004_20210310	Total/NA	Water	1613B	
570-53559-4 - RA	ILBMP0004_20210310	Total/NA	Water	1613B	
570-53559-5	ILBMP0005_20210310	Total/NA	Water	1613B	
570-53559-5 - RA	ILBMP0005_20210310	Total/NA	Water	1613B	
570-53559-6	ILBMP0008_20210310	Total/NA	Water	1613B	
570-53559-6 - RA	ILBMP0008_20210310	Total/NA	Water	1613B	
570-53559-7	ILBMP0009_20210310	Total/NA	Water	1613B	
570-53559-7 - RA	ILBMP0009_20210310	Total/NA	Water	1613B	
570-53559-8	ILBMP0010_20210310	Total/NA	Water	1613B	
570-53559-8 - RA	ILBMP0010_20210310	Total/NA	Water	1613B	
570-53559-9	LPBMP0002_20210311	Total/NA	Water	1613B	
570-53559-10	LPBMP0003_20210311	Total/NA	Water	1613B	
570-53559-10 - RA	LPBMP0003_20210311	Total/NA	Water	1613B	
570-53559-11	LPBMP0004_20210311	Total/NA	Water	1613B	
570-53559-11 - RA	LPBMP0004_20210311	Total/NA	Water	1613B	
MB 320-472939/1-A	Method Blank	Total/NA	Water	1613B	
MB 320-472939/1-A - RA	Method Blank	Total/NA	Water	1613B	
LCS 320-472939/2-A	Lab Control Sample	Total/NA	Water	1613B	
LCSD 320-472939/3-A	Lab Control Sample Dup	Total/NA	Water	1613B	

Analysis Batch: 473727

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
570-53559-1	B1BMP0009_20210310	Total/NA	Water	1613B	472939
570-53559-2	B1BMP0010_20210310	Total/NA	Water	1613B	472939
570-53559-3	B1BMP0011_20210310	Total/NA	Water	1613B	472939
570-53559-4	ILBMP0004_20210310	Total/NA	Water	1613B	472939
570-53559-5	ILBMP0005_20210310	Total/NA	Water	1613B	472939
570-53559-6	ILBMP0008_20210310	Total/NA	Water	1613B	472939
MB 320-472939/1-A	Method Blank	Total/NA	Water	1613B	472939
LCS 320-472939/2-A	Lab Control Sample	Total/NA	Water	1613B	472939
LCSD 320-472939/3-A	Lab Control Sample Dup	Total/NA	Water	1613B	472939

Analysis Batch: 473729

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
570-53559-7	ILBMP0009_20210310	Total/NA	Water	1613B	472939
570-53559-8	ILBMP0010_20210310	Total/NA	Water	1613B	472939
570-53559-9	LPBMP0002_20210311	Total/NA	Water	1613B	472939
570-53559-10	LPBMP0003_20210311	Total/NA	Water	1613B	472939
570-53559-11	LPBMP0004 20210311	Total/NA	Water	1613B	472939

Analysis Batch: 477003

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
570-53559-1 - RA	B1BMP0009_20210310	Total/NA	Water	1613B	472939
570-53559-2 - RA	B1BMP0010_20210310	Total/NA	Water	1613B	472939
MB 320-472939/1-A - RA	Method Blank	Total/NA	Water	1613B	472939

Eurofins Calscience LLC

Job ID: 570-53559-2

QC Association Summary

Client: Haley & Aldrich, Inc. Project/Site: BMP Performance OF 001, 002 and/or 009

Specialty Organics

Analysis Batch: 477005

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
570-53559-3 - RA	B1BMP0011_20210310	Total/NA	Water	1613B	472939
570-53559-4 - RA	ILBMP0004_20210310	Total/NA	Water	1613B	472939
570-53559-5 - RA	ILBMP0005_20210310	Total/NA	Water	1613B	472939
570-53559-6 - RA	ILBMP0008_20210310	Total/NA	Water	1613B	472939
570-53559-7 - RA	ILBMP0009_20210310	Total/NA	Water	1613B	472939
570-53559-8 - RA	ILBMP0010_20210310	Total/NA	Water	1613B	472939
570-53559-10 - RA	LPBMP0003_20210311	Total/NA	Water	1613B	472939
570-53559-11 - RA	LPBMP0004_20210311	Total/NA	Water	1613B	472939

Job ID: 570-53559-2

Client: Haley & Aldrich, Inc. Project/Site: BMP Performance OF 001, 002 and/or 009

Client Sample ID: B1BMP0009_20210310 Date Collected: 03/10/21 11:20 Date Received: 03/11/21 18:30

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	1613B			881.6 mL	20 uL	472939	03/23/21 05:15	FC	TAL SAC
Total/NA	Analysis	1613B		1			473727	03/25/21 01:08	SMA	TAL SAC
	Instrumer	nt ID: 10D5								
Total/NA	Prep	1613B	RA		881.6 mL	20 uL	472939	03/23/21 05:15	FC	TAL SAC
Total/NA	Analysis	1613B	RA	1			477003	04/05/21 12:40	ALM	TAL SAC
	Instrumen	nt ID· 11D2								

Client Sample ID: B1BMP0010_20210310 Date Collected: 03/10/21 11:25 Date Received: 03/11/21 18:30

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	1613B			920.7 mL	20 uL	472939	03/23/21 05:15	FC	TAL SAC
Total/NA	Analysis Instrumen	1613B tlD: 10D5		1			473727	03/25/21 01:53	SMA	TAL SAC
Total/NA	Prep	1613B	RA		920.7 mL	20 uL	472939	03/23/21 05:15	FC	TAL SAC
Total/NA	Analysis	1613B	RA	1			477003	04/05/21 13:19	ALM	TAL SAC
	Instrumen	it ID: 11D2								

Client Sample ID: B1BMP0011_20210310 Date Collected: 03/10/21 11:30 Date Received: 03/11/21 18:30

Dil Batch Batch Initial Final Batch Prepared Prep Type Туре Method Run Factor Amount Amount Number or Analyzed Analyst Lab Total/NA Prep 1613B 979.6 mL 20 uL 472939 03/23/21 05:15 FC TAL SAC Total/NA Analysis 1613B 1 473727 03/25/21 02:38 SMA TAL SAC Instrument ID: 10D5 Total/NA 1613B 979.6 mL 20 uL 472939 03/23/21 05:15 FC TAL SAC Prep RA Total/NA TAL SAC Analysis 1613B RA 477005 04/05/21 21:15 KSS 1 Instrument ID: 11D2

Client Sample ID: ILBMP0004_20210310 Date Collected: 03/10/21 11:05 Date Received: 03/11/21 18:30

Lab Sample ID: 570-53559-4

Matrix: Water

3:30

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	1613B			944.1 mL	20 uL	472939	03/23/21 05:15	FC	TAL SAC
Total/NA	Analysis	1613B		1			473727	03/25/21 03:23	SMA	TAL SAC
	Instrumen	it ID: 10D5								
Total/NA	Prep	1613B	RA		944.1 mL	20 uL	472939	03/23/21 05:15	FC	TAL SAC
Total/NA	Analysis	1613B	RA	1			477005	04/05/21 21:53	KSS	TAL SAC
	Instrumen	it ID: 11D2								

Eurofins Calscience LLC

 Image: State of the system

 Job ID: 570-53559-1

 Lab Sample ID: 570-53559-1

 Matrix: Water

 Prepared

 r

 Or Analyzed

 Matrix:
 Lab

 03/23/21 05:15
 FC

 TAL SAC
 7

 03/23/21 05:15
 FC

 TAL SAC
 7

 Bateria:
 8

 Lab Sample ID: 570-53559-2
 3

 Matrix:
 Water

Lab Sample ID: 570-53559-3 Matrix: Water

4/6/2021

Lab Chronicle

Client: Haley & Aldrich, Inc. Project/Site: BMP Performance OF 001, 002 and/or 009

Client Sample ID: ILBMP0005 20210310 Date Collected: 03/10/21 11:10 Date Received: 03/11/21 18:30

Ргер Туре

Batch	Batch		Dil	Initial	Final	Batch	Prepared
Туре	Method	Run	Factor	Amount	Amount	Number	or Analyze
Prep				944.8 mL	20 uL	472939	03/23/21 05

Total/NA	Prep	1613B			944.8 mL	20 uL	472939	03/23/21 05:15	FC
Total/NA	Analysis	1613B		1			473727	03/25/21 04:08	SMA
	Instrumer	nt ID: 10D5							
Total/NA	Prep	1613B	RA		944.8 mL	20 uL	472939	03/23/21 05:15	FC
Total/NA	Analysis	1613B	RA	1			477005	04/05/21 22:32	KSS
	Instrumer	nt ID: 11D2							

Client Sample ID: ILBMP0008 20210310 Date Collected: 03/10/21 11:00 Date Received: 03/11/21 18:30

_	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	1613B			946.5 mL	20 uL	472939	03/23/21 05:15	FC	TAL SAC
Total/NA	Analysis Instrumer	1613B tlD: 10D5		1			473727	03/25/21 04:53	SMA	TAL SAC
Total/NA	Prep	1613B	RA		946.5 mL	20 uL	472939	03/23/21 05:15	FC	TAL SAC
Total/NA	Analysis Instrumer	1613B it ID: 11D2	RA	1			477005	04/05/21 23:10	KSS	TAL SAC

Client Sample ID: ILBMP0009 20210310 Date Collected: 03/10/21 10:50 Date Received: 03/11/21 18:30

Dil Batch Batch Initial Final Batch Prepared Prep Type Туре Method Run Factor Amount Amount Number or Analyzed Analyst Lab Total/NA Prep 1613B 846.1 mL 20 uL 472939 03/23/21 05:15 FC TAL SAC Total/NA Analysis 1613B 1 473729 03/25/21 09:08 SMA TAL SAC Instrument ID: 10D5 Total/NA 1613B 846.1 mL 472939 03/23/21 05:15 FC TAL SAC Prep RA 20 uL Total/NA Analysis 1613B RA 477005 04/05/21 23:48 KSS TAL SAC 1 Instrument ID: 11D2

Client Sample ID: ILBMP0010 20210310 Date Collected: 03/10/21 10:55

Lab Sample ID: 570-53559-8

Lab Sample ID: 570-53559-7

Matrix: Water

Matrix: Water

Date Received: 03/11/21 18:30

Ргер Туре	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	1613B			941 mL	20 uL	472939	03/23/21 05:15	FC	TAL SAC
Total/NA	Analysis	1613B		1			473729	03/25/21 09:53	SMA	TAL SAC
	Instrumen	t ID: 10D5								
Total/NA	Prep	1613B	RA		941 mL	20 uL	472939	03/23/21 05:15	FC	TAL SAC
Total/NA	Analysis	1613B	RA	1			477005	04/06/21 00:27	KSS	TAL SAC
	Instrumen	t ID: 11D2								

Eurofins Calscience LLC

Matrix: Water

Lab

TAL SAC

TAL SAC

TAL SAC

TAL SAC

Lab Sample ID: 570-53559-5

Analyst

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Lab Chronicle

Client: Haley & Aldrich, Inc. Project/Site: BMP Performance OF 001, 002 and/or 009

Client Sample ID: LPBMP0002_20210311 Date Collected: 03/11/21 09:40 Date Received: 03/11/21 18:30

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	1613B			930.3 mL	20 uL	472939	03/23/21 05:15	FC	TAL SAC
Total/NA	Analysis	1613B		1			473729	03/25/21 10:38	SMA	TAL SAC
	Instrumen	t ID: 10D5								

Client Sample ID: LPBMP0003_20210311 Date Collected: 03/11/21 09:50 Date Received: 03/11/21 18:30

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	1613B			949 mL	20 uL	472939	03/23/21 05:15	FC	TAL SAC
Total/NA	Analysis	1613B		1			473729	03/25/21 11:23	SMA	TAL SAC
	Instrumer	nt ID: 10D5								
Total/NA	Prep	1613B	RA		949 mL	20 uL	472939	03/23/21 05:15	FC	TAL SAC
Total/NA	Analysis	1613B	RA	1			477005	04/06/21 01:05	KSS	TAL SAC
	Instrumer	nt ID: 11D2								

Client Sample ID: LPBMP0004_20210311 Date Collected: 03/11/21 10:00 Date Received: 03/11/21 18:30

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	1613B			920.6 mL	20 uL	472939	03/23/21 05:15	FC	TAL SAC
Total/NA	Analysis	1613B		1			473729	03/25/21 12:08	SMA	TAL SAC
	Instrumer	nt ID: 10D5								
Total/NA	Prep	1613B	RA		920.6 mL	20 uL	472939	03/23/21 05:15	FC	TAL SAC
Total/NA	Analysis	1613B	RA	1			477005	04/06/21 01:44	KSS	TAL SAC
	Instrumer	nt ID: 11D2								

Laboratory References:

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

4/6/2021

Matrix: Water

Matrix: Water

Lab Sample ID: 570-53559-9

Lab Sample ID: 570-53559-10

11 12

Lab Sample ID: 570-53559-11 Matrix: Water

Accreditation/Certification Summary

Client: Haley & Aldrich, Inc. Project/Site: BMP Performance OF 001, 002 and/or 009

Laboratory: Eurofins TestAmerica, Sacramento

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

state 17-020 02-20-24 NNAB Dept. of Defense ELAP L2468 01-20-24 NNAB Dept. of Energy L2468.01 01-20-24 NNAB Dept. of Energy L2468.01 01-20-24 NNAB ISO/IEC 17025 L2468 01-20-24 NNAB ISO/IEC 17025 L2468 01-20-24 vizona State A20708 08-11-21 vizona State A20708 08-11-21 zalifornia State 2897 01-31-22 Colorado State CA0004 08-31-21 Scolorado State PH-0691 06-30-21 Scolorado State V040 01-29-22 tawaii State State 01-29-22 tawaii State Cert No.> 01-29-22 taosas NELAP 200060 03-18-22 uisana NELAP 01944 06-30-21 dainsas NELAP 01944 06-30-21 tevada <t< th=""><th>Authority</th><th>Program</th><th>Identification Number</th><th>Expiration Date</th></t<>	Authority	Program	Identification Number	Expiration Date
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Nevada State CA000442021-2 07-31-21 New Hampshire NELAP 2997 04-18-21 New York NELAP CA005 06-30-21 New York NELAP 11666 04-01-22 Ohio State 41252 01-29-22 Oregon NELAP 4040 01-30-23 Veras NELAP 4040 01-30-23 Veras NELAP 06-01-21 06-01-21 Veras NELAP 7104704399-19-13 06-01-21 JS Fish & Wildlife US Federal Programs 58448 07-31-21 JSDA US Federal Programs P330-18-00239 07-31-21 JSDA NELAP CA000442021-12 02-28-21 * Vermont State VT-4040 04-16-21 /Irginia NELAP 460278 03-14-22 Vashington State C581 05-05-21 Verst Virginia (DW) State 9930C 12-31-21 Visconsin State Program 98204680 <	Michigan	State	9947	01-29-22
New Hampshire NELAP 2997 04-18-21 New Jersey NELAP CA005 06-30-21 New York NELAP 11666 04-01-22 Dhio State 41252 01-29-22 Dregon NELAP 4040 01-30-23 rexas NELAP T104704399-19-13 06-01-21 JS Fish & Wildlife US Federal Programs 58448 07-31-21 JSDA US Federal Programs P330-18-00239 07-31-21 Jthh NELAP CA000442021-12 02-28-21 * Vermont State VT-4040 04-16-21 /firginia NELAP 660278 03-14-22 Vashington State C581 05-05-21 Vest Virginia (DW) State 9930C 12-31-21 Visconsin State Program 998204680 08-31-21 Vyoming State Program 8TMS-L 01-28-19 *	Nevada	State	CA000442021-2	07-31-21
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New York NELAP 11666 04-01-22 Dho State 41252 01-29-22 Dregon NELAP 4040 01-30-23 Sexas NELAP 1104704399-19-13 06-01-21 JS Fish & Wildlife US Federal Programs 58448 07-31-21 JSDA US Federal Programs P330-18-00239 07-31-21 Jtah NELAP CA000442021-12 02-28-21 * Vermont State VT-4040 04-16-21 Vashington NELAP 660278 03-14-22 Vashington State C581 05-05-21 Vest Virginia (DW) State 9930C 12-31-21 Visconsin State Program 98204680 08-31-21	New Jersey	NELAP	CA005	06-30-21
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NELAP CA000442021-12 02-28-21 * /ermont State VT-4040 04-16-21 /irginia NELAP 460278 03-14-22 Vashington State C581 05-05-21 Vest Virginia (DW) State 9930C 12-31-21 Visconsin State 998204680 08-31-21 Vyoming State Program 8TMS-L 01-28-19 *	USDA	US Federal Programs	P330-18-00239	07-31-21
Vermont State VT-4040 04-16-21 /irginia NELAP 460278 03-14-22 Vashington State C581 05-05-21 Vest Virginia (DW) State 9930C 12-31-21 Visconsin State 998204680 08-31-21 Vyoming State Program 8TMS-L 01-28-19 *	Utah	NELAP	CA000442021-12	02-28-21 *
Virginia NELAP 460278 03-14-22 Vashington State C581 05-05-21 Vest Virginia (DW) State 9930C 12-31-21 Visconsin State 998204680 08-31-21 Vyoming State Program 8TMS-L 01-28-19 *	Vermont	State	VT-4040	04-16-21
Vashington State C581 05-05-21 Vest Virginia (DW) State 9930C 12-31-21 Visconsin State 998204680 08-31-21 Vyoming State Program 8TMS-L 01-28-19 *	Virginia	NELAP	460278	03-14-22
Vest Virginia (DW) State 9930C 12-31-21 Visconsin State 998204680 08-31-21 Vyoming State Program 8TMS-L 01-28-19 *	Washington	State	C581	05-05-21
Visconsin State 998204680 08-31-21 Vyoming State Program 8TMS-L 01-28-19 *	West Virginia (DW)	State	9930C	12-31-21
Vyoming State Program 8TMS-L 01-28-19 *	Wisconsin	State	998204680	08-31-21
	Wyoming	State Program	8TMS-L	01-28-19 *

Method Summary

Client: Haley & Aldrich, Inc. Project/Site: BMP Performance OF 001, 002 and/or 009

Method	Method Description	Protocol	Laboratory
1613B	Dioxins and Furans (HRGC/HRMS)	EPA	TAL SAC
1613B	Separatory Funnel (L/L) Extraction with Soxhlet Extraction of Dioxin and Furans	EPA	TAL SAC

Protocol References:

EPA = US Environmental Protection Agency

Laboratory References:

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

Sample Summary

Client: Haley & Aldrich, Inc. Project/Site: BMP Performance OF 001, 002 and/or 009

Job ID: 570-53559-2

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
570-53559-1	B1BMP0009_20210310	Water	03/10/21 11:20	03/11/21 18:30	
570-53559-2	B1BMP0010_20210310	Water	03/10/21 11:25	03/11/21 18:30	
570-53559-3	B1BMP0011_20210310	Water	03/10/21 11:30	03/11/21 18:30	
570-53559-4	ILBMP0004_20210310	Water	03/10/21 11:05	03/11/21 18:30	
570-53559-5	ILBMP0005_20210310	Water	03/10/21 11:10	03/11/21 18:30	
570-53559-6	ILBMP0008_20210310	Water	03/10/21 11:00	03/11/21 18:30	
570-53559-7	ILBMP0009_20210310	Water	03/10/21 10:50	03/11/21 18:30	
570-53559-8	ILBMP0010_20210310	Water	03/10/21 10:55	03/11/21 18:30	
570-53559-9	LPBMP0002_20210311	Water	03/11/21 09:40	03/11/21 18:30	
570-53559-10	LPBMP0003_20210311	Water	03/11/21 09:50	03/11/21 18:30	
570-53559-11	LPBMP0004_20210311	Water	03/11/21 10:00	03/11/21 18:30	

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Haley & Aldrich, Inc. Blanket Service Agreement #2019-22-TestAmerica Chain of Custody Record for

phone (949) 261-1022 fax (949) 260-3299 17461 Derlan Avenue, Suite 100 Irvine, CA 92614



TestAmerica Laboratories, Inc B-1 Upper Parking Lot: Media Filter Gunite swale conveying road may substitute 250mL Poly for 500mL for metals 1 500mL. Nust fill TSS to the top. Upstream) B1436 southern detention bloswaler, concrete swale diverting sheet flow into rock crib-west tion bioswale; concrete swale B-1 Upper Parking Lot, Media Filter: Culvert outlet from upper Jownstream, B1436 southern detention bioswale; 12-inch ower Parking Lot; sample port in cestern discharge pipe ower Parking Lot; discharge from Biofilter effluent pipe Effluent, fitter basket, administration building area nfluent, filter basket, administration building area -ower Parking Lot; Sediment Basin outlet box sample Specific Note \$4:81 ¹lesse email data to kmiller@haleyaldrich.com and post to Total Access. Bill to Haley & Aldrich at AP@haleyaldrich.com; Report Level II Data Package and provide EDD; All dissolved metal samples are to be filtered within 24 hours of receipt, even those placed on hold. 11,30 Upstream B1436 southern detention bi diverting sheet flow into rock crib - east parking lot area B-1 Upper Parking Lot: Underdrains COC COC Date/Time/ Date/Time/ Date/Time: Sampler, M Birney For Lab Use Only: Walk-in Client: T&CS within Blanket Service Agreement# 2015-18-TestAmerica by and between Haley & Adrich, Inc., its subsidiaries and affiliates, and TestAmerica Laboratories Inc. č ab Sampling: Job / SDG No COC NG nderdrain Months -Archive for 6. ちもの Company: Company Date: 03/10/2021 (eldenevoceA listoT (0.0063) shqiA eec arm ID No Carrier Gross Alpha (E900.0) (Total Dissolved) R CO4' (E300) 1-500 del yd lesoqsig Se, Zn Method 245.1: Hg (Total Recoverable) I: As, Cd, Cu, Fe, Pb Mn (bevioseid letoT 0H -1.345 bothew Rethod 245.1 - Hg lethod 200.8: As, Cd, Cu, Fe, Pb Mn Rethod ASTM D422) ξa × × × × × × × × × × × H&A Site Contact: Matt Birney (818) 466-8782 Lab Contact: Urvashi Patel (949) 333-9055 and 1 (COPSZ POLION × × × × × × × × × × × ebiloS bebneqeuS leto Sioxins Dioxins Dother: 2-1L × × × × × × × × × × × Received in Laboratory by Method 200,8: Cd, Cu, Pb Method 245,1: Hg (Total Recoverable) × × × × × × × × × × Sample Disposa Return to Clent Received by Method 200.8: Cd, Cu, Pb Method 245.1: Hg (Total Dissolved) × × × × × × × × × × × C RCRA (N / X) OSW / SM mohed Z z z z Z Z z z Z Z Z (N/X) eldmes beredil Date/Time: Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the # of Cont. 35117EL 9 ø ø ø ø ø ø ø Ģ ø 9 Analysis Turnaround Time Matrix H&A Project Manager: Katherine Miller MM MM WM MM MM MM ŴŴ MM MM MM MM ð 10:45 Type (Cecomp, Geomp, Regulatory Program: Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø TestAmerica's services under this CoC shall TAT if different from Below 2 weeks Tel/Fax: (520) 289-8606 1 week 2 days L day Sample Time Company' ECA. ample in the Comments Section if the lab is to dispose of the sampi Kon-Hazard | Flammable | \$tin Inflant Company JHA 1120 1130 1110 0940 0950 1000 1125 1105 1100 1050 1055 Custody Seal No. vation Used: 1= Ice, 2= HCI; 3= H2804; 4=HN03; 3/11/2021 3/11/2021 3/10/2021 3/10/2021 3/11/2021 3/10/2021 3/10/2021 3/10/2021 3/10/2021 3/10/2021 3/10/2021 Sample Date Company⁻ ents & Comments $\Box \Box \Box$ H&A Project Number 129095-004 SID 5.2 Site: BMP Performance OF 001, 002, and/or 009 Watershed t 5 ž FAX 129095-004 SID 5.2 ٢ 2 N e Ø Ò -M Phone 5333 Mission Center Road, Suite 300 is/QC Requires Sample Identification Statistics Yes **Client Contact** San Diego, California 92108 2 Ц цымероов_20210310 60 ццымероов_20210310 9 ццымероог_20210311 9 цевмероог_20210311 B1BMP0009_20210310 B1BMP0010_20210310 B1BMP0011_20210310 Custody Seals Intact: PBMP0003_20210311 LBMP0004_20210310 ILBMP0005_20210310 PBMP0004_20210311 ILBMP0008_20210310 Haley & Aldrich, Inc. Special Instructio (619) 280-9210 (619) 280-9415 Possible Hazard elinquished by **Relinquished by** Relinquished by H&A P O #

,≿ 570-53559 Chain of Cus

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Form No. CA-C-WI-045, Rev. 1.2, dated 1/8/2016

LLC		
Ilscience	~	CA 92841
Eurofins Ca	7440 Lincoln Way	Garden Grove, (

Chain of Custody Record



🛟 eurofins

Cliont Information (S.ih Contract Lab.)	Sampler			Lab PM	-	Carrier Tracking No(s):	COC No:	
Client Information (Sub Contract Lab)				Patel, Vin	endra		570-87542.1	
client contact Shipping/Receiving	Phone			E-Mail: Virendra.I	² atel@eurofinset.com	State of Origin California	Page: Page 1 of 2	
Company: TestAmerica Laboratories, Inc.				Accre	ditations Required (See note): 2 Program - California		Job # 20 101	
Address: 880 Riverside Parkwav	Due Date Request	ed:				Domoctod	Preservation C	odes:
City:	TAT Requested (d	ays):				Vednesten	A - HCL B - NaOH	M - Hexane N - None
west saciantento State, 20: CA, 95605					ZistoT		C - Zn Acetate D - Nitric Acid F - NaHSO4	0 - AsNaO2 P - Na2045 0 - Ma2045
Phone: 916-373-5600(Tel) 916-372-1059(Fax)	PO#:			0	/M }\$!]		F - MeOH G - Amchlor	R - N22203 S - H2SO4
Email:	#OM			OF NO	o) Disbin		H - Ascorbic Acid 1 - Ice	T - TSP Dodecahydrate U - Acetone V - MCAA
Project Name: BMP Performace OF 001, 002 and/or 009	Project #: 44009815			S0) 0	Ist? q_c		tainers K - EDTA L - EDA	V - MCAA W - pH 4-5 Z - other (specify)
Site:	SSOW#:			Iqms	les x		on Other:	
Samole Identification - Client ID (I ah ID)	Samnle Date	Sample	Sample Type (C=comp,	Matrix (W=water, S = solid. O = wasterolid.	2138/18138-29		o tedmuN letio	
			Preserva:	tion Code:			F Special	Instructions/Note:
B1BMP009_20210310 (570-53559-1)	3/10/21	11:20 Bacific		Water	×		2 See QAS, Boein	g_w/u to zero
B1BMP010_20210310 (570-53559-2)	3/10/21	11:25 Dacific		Water	×		2 See QAS, Boein	g_w/u to zero
B1BMP011_20210310 (570-53559-3)	3/10/21	11:30 Pacific		Water	×		2 See QAS, Boein	g_w/u to zero
ILBMP0004_20210310 (570-53559-4)	3/10/21	11:05 Pacific		Water	×		2 See QAS, Boein	g_w/u to zero
ILBMP0005_20210310 (570-53559-5)	3/10/21	11:10 Pacific		Water	×		2 See QAS, Boein	g_w/u to zero
ILBMP0008_20210310 (570-53559-6)	3/10/21	11:00 Pacific		Water	×		2 See QAS, Boein	g_w/u to zero
ILBMP0009_20210310 (570-53559-7)	3/10/21	10:50 Pacific		Water	×		2 See QAS, Boein	g_w/u to zero
ILBMP0010_20210310 (570-53559-8)	3/10/21	10:55 Pacific		Water	×		2 See QAS, Boein	g_w/u to zero
LPBMP0002_20210311 (570-53559-9)	3/11/21	09:40 Pacific		Water	×		2 See QAS, Boein	g_w/u to zero
Note: Since laboratory accreditations are subject to change, Eurofins Calsc. maintain accreditation in the State of Ongin listed above for analysis/thesis/ir, Calscience attention immediately. If all requested accreditations are current	ence places the ownershi latrix being analyzed, the t to date, return the signed	p of method, ar samples must b I Chain of Cust	nalyte & accrec se shipped bac ody attesting to	litation compliance up it to the Eurofins Cals said complicance to	on out subcontract laboratories. Th cience laboratory or other instructio. Eurofins Calscience.	s sample shipment is forwardec s will be provided. Any change	d under chain-of-custody. If the la	boratory does not currently e brought to Eurofins
Possible Hazard Identification				Ś	ample Disposal (A fee may	be assessed if samples	s are retained longer than	1 month)
Unconfirmed					Return To Client	Disposal Bv Lab	Archive For	Months
Deliverable Requested: I, II, III, IV, Other (specify)	Primary Deliver	able Rank: 2		Ś	pecial Instructions/QC Requir	ements:		
Empty Kit Relinquished by:		Date:		Time		Method of Shipmer	÷	
Relinquisheodoy	Date/Time	; / L	145	Company	Received by:	O der	13/21 905	Company
Relinquistred by	Date/Time			Company	Received by:	Date/Ti	me:	Company
Relinquished by:	Date/Time:		Ť	Company	Received by:	Date/Ti	me:	Company

Custody Seals Intact:

Custody Seal No.: <

Ver: 11/01/2020

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Cooler Temperature(s) °C and Other Remarks:

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nce LLC		~
Calsciel	Vay	. CA 9284
Eurofins (7440 Lincoln V	Garden Grove

Chain of Custody Record

Controphies Environment Texting

Garden Grove, CA 92841 Phone: 714-895-5494 Fax: 714-894-7501		5		5					America
Client Information (Sub Contract Lab)	Sampler:		Lab PI Patel	₀: , Virendra		Carrier Track	king No(s):	COC No: 570-87542.2	
Client Contact. Shipping/Receiving	Phone:		E-Mail Viren	idra.Patel@	eurofinset.com	State of Orig California	in:	Page: Page 2 of 2	
Company: TestAmerica Laboratories, Inc.				Accreditations State Progi	Required (See note): am - California			Job #: 570-53559-2	
Address: 880 Riverside Parkway,	Due Date Requested: 3/29/2021				Analy	sis Requested		Preservation C	odes:
City West Sacramento	TAT Requested (days):							A - HCL B - NaOH	M - Hexane N - None
State, Zip: CA, 95605				Totals				C - Zn Acetate D - Nithic Acid E - NaHSO4	U - ASNAUZ P - Na2O4S Q - Na2SO3
Phone: 916-373-5600(Tel) 916-372-1059(Fax)	:# Od			List w/				F - MeOH G - Amchlor	R - Na2S203 S - H2S04
Email:	WO #			or No Indard				h - Ascorpic Acid 1 - Ice J - DI Water	1 - 15P Dodecanydrate U - Acetone V - MCAA
Project Name: BMP Performace OF 001, 002 and/or 009	Project #: 44009815			e (Xes or h Sta				K - EDTA L - EDA	W - pH 4-5 Z - other (specify)
Site:	:#MOSS			SD (Ye				other:	
Sample Identification - Client ID (Lab ID)	Sar Sar Sar Sar	Type Type Type C=comp	Matrix (w-water, s=solid, 0=waste/oll, BT=Tissue, A=Air)	Perform MS/M Perform MS/M 1613B/1613B_S				Cotal Number of	Instructions (Note-
		A Preser	vation Code:	X					list actions/more.
LPBMP0003_20210311 (570-53559-10)	3/11/21 09	:50 cific	Water	×				2 See QAS, Boein	ig_w/u to zero
LPBMP0004_20210311 (570-53559-11)	3/11/21 10	:00 cific	Water	×				2 See QAS, Boein	g_w/u to zero
	5	2							
								6.53	
								100	
								0.00	
Note: Since laboratory accreditations are subject to change, Eurofins Calisc maintain accreditation in the State of Origin listed above for analysis/tests/r Calscience attention immediately. If all requested accreditations are currer	tience places the ownership of me natrix being analyzed, the sample at to date, return the signed Chain	thod, analyte & acc s must be shipped t of Custody attestin	creditation compliar back to the Eurofin g to said complicar	ice upon out s s Calscience la ice to Eurofins	ubcontract laboratories aboratory or other instr calscience.	This sample shipment uctions will be provided.	is forwarded under cha Any changes to accred	in-of-custody. If the Is litation status should b	aboratory does not currently e brought to Eurofins
Possible Hazard Identification				Sample	Disposal (A fee	nay be assessed it	^f samples are reta	ined longer than	1 month)
Unconfirmed					eturn To Client	Disposal By	Lab D	rchive For	Months
Deliverable Requested: I, II, III, IV, Other (specify)	Primary Deliverable F	łank: 2		Special	Instructions/QC R	equirements:			
Empty Kit Relinguished by:	Date			Time:		Method	l of Shipment:		
Kelinquisheddy	DaterTime: 3/11/21	1445	Company	Recei	ved hy:		Date/Time:	1 905	Company
Reinquished by:	Date/Time:		Company	Recei	Veel by:		Date/Time:		Company
Relinquished by:	Date/Time:		Company	Recei	ved by:		Date/Time:		Company
Gastody Seals Intact: Custody Seal Nor ∆ Yes No				Coole	r Temperature(s) °C ar	d Other Remarks:	1.1.2.4	. 1.4	_
									Ver: 11/01/2020

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Client: Haley & Aldrich, Inc.

Login Number: 53559 List Number: 1 Creator: Cruise, Noel

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

List Source: Eurofins Calscience

Client: Haley & Aldrich, Inc.

Login Number: 53559 List Number: 3 Creator: Cahill, Nicholas P

The cooler's custody seal, if present, is intact.

COC is filled out with all pertinent information.

Is the Field Sampler's name present on COC?

Sample custody seals, if present, are intact.

Samples were received on ice.

Cooler Temperature is acceptable.

COC is filled out in ink and legible.

Sample containers have legible labels.

Sample collection date/times are provided. Appropriate sample containers are used.

Containers are not broken or leaking.

Sample bottles are completely filled.

Sample Preservation Verified.

Cooler Temperature is recorded.

Radioactivity wasn't checked or is </= background as measured by a survey

There are no discrepancies between the containers received and the COC.

Samples are received within Holding Time (excluding tests with immediate

There is sufficient vol. for all requested analyses, incl. any requested

The cooler or samples do not appear to have been compromised or

Question

tampered with.

COC is present.

HTs)

meter.

nento 1 PM	
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List Source: Eu	rofins TestAmerica, Sacramento
	List Creation: 03/13/21 04:41 PM

Comment

1.0, 1.0, 0.8, 1.1, 1.4

Received project as a subcontract.

Seal

Answer

True

True

N/A

True

True

True

True

True

True

True False

True

True

True True

True

True

True

N/A

True

MS/MSDs	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True
Multiphasic samples are not present.	True
Samples do not require splitting or compositing.	True
Residual Chlorine Checked.	N/A

Appendix C: Exceeding Constituent Source Investigation

No exceeding constituent source investigation was done in 2020/21 due to no stormwater discharges and therefore no exceedances at the NPDES Outfalls in 2020/21.
Appendix D: 2020/21 BMP Performance Analysis

Prepared for

The Boeing Company Santa Susana Site 5800 Woolsey Canyon Road Canoga Park, California, 91304-1148

Appendix D: Best Management Practice (BMP) Performance Analysis

2020/2021 Reporting Year

Prepared by

The Surface Water Expert Panel

and



engineers | scientists | innovators

924 Anacapa Street, Suite 4A, Santa Barbara, CA, 93101

> CWR0654 October 2021

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Acronyms

ANOVA	Analysis of Variance
BMP	Best Management Practice
CA	California
CM	Culvert Modification
COC	Constituent of Concern
COV	Coefficient of Variation
DNQ	Detected not Quantified
ELV	Expendable Launch Vehicle
ENTS	Engineered Natural Treatment Systems
GIS	Geographic Information System
HDPE	High Density Polyethylene
ISRA	Interim Source Removal Action
µg/kg	micrograms per kilogram
μg/L	micrograms per liter
mg/L	milligram per liter
NASA	National Aeronautics and Space Administration
ND	Non-Detect
NPDES	National Pollutant Discharge Elimination System
POR	Period of Record
SSFL	Santa Susana Field Laboratory
SWMM	Storm Water Management Model
TCDD	Tetrachlorodibenzo-p-dioxin
TEQ	Toxic Equivalence
TSS	Total Suspended Solids

1. Introduction

The purpose of this memorandum is to evaluate the performance of existing stormwater treatment Best Management Practices (BMPs) in the Outfall 009 watershed of the Boeing Santa Susana Field Laboratory (Site). The BMPs have been installed at the direction of the Surface Water Expert Panel and have been in operation since 2009. The purpose of these BMPs is to reduce pollutants from stormwater prior to discharge at Outfall 009 to comply with the NPDES permit standards as issued to Boeing by the Los Angeles Regional Water Quality Control Board.

This is an update to the BMP performance analysis that is conducted annually, consistent with the *Site-Wide Stormwater Work Plan and 2014/15 Annual Report* ("2015 Work Plan") (Santa Susana Surface Water Expert Panel and Geosyntec Consultants, 2015). This memorandum incorporates 2020/2021 reporting year data into a dataset that initially began in December 2009. The National Pollutant Discharge Elimination System (NPDES) constituents of concern (COCs) addressed in this analysis include total suspended solids (TSS), total lead, total copper¹, and dioxins (TCDD TEQ, DNQ excluded, BAFs included). Data were collected to assess effectiveness of the culvert modification (CM) installations², upper lot media filter, lower parking lot sedimentation basin and biofilter (lower lot biofilter), ELV treatment BMP³, and B1436 detention bioswales⁴ (detention bioswales), and Boeing administrative area inlet filters (Boeing admin area inlet filters). This memorandum focuses on the performance of the BMPs listed above, which are located in Watershed 009. Although this memorandum currently only addresses BMPs in Watershed 009, Table 1 shows Permit Limits at all outfalls specified in the NPDES Permit for the aforementioned COCs, as context for goals for other potential BMPs constructed in other watersheds, if needed in the future.

Outfall	NPDES Permit Limit							
Outrail	TSS (mg/L) ¹	Total Lead (μg/L)	Total Copper (μg/L)	Dioxins (µg/L)				
001	45	5.2	14	2.80 x 10 ⁻⁸				
002	45	5.2	14	2.80 x 10 ⁻⁸				
003	-	5.2	13	2.80 x 10 ⁻⁸				
004	-	5.2	13	2.80 x 10 ⁻⁸				
005	-	5.2	13	2.80 x 10 ⁻⁸				
006	-	5.2	13	2.80 x 10 ⁻⁸				
007	-	5.2	13	2.80 x 10 ⁻⁸				
008	-	5.2	14	2.80 x 10 ⁻⁸				

Table 1. COC NPDES Permit Limits by Outfall

¹ Copper is not included as a pollutant of concern for the Outfall 009 watershed in the 2015 Work Plan. However, data for total copper are retained for the paired line plots.

² CM refers to a culvert modification BMP where detention and stormwater filtration occurs prior to entering culverts beneath roadways.

³ ELV refers to an area previously used by NASA to test the lunar lander engines.

⁴ Includes both the northern and southern detention bioswales. However, only the southern detention bioswale was sampled in 2017/2018 through 2020/2021.

Quitfall	NPDES Permit Limit							
Outrail	TSS (mg/L) ¹	Total Lead (μg/L)	Total Copper (μg/L)	Dioxins (µg/L)				
009	-	5.2	13	2.80 x 10 ⁻⁸				
010	-	5.2	13	2.80 x 10 ⁻⁸				
011 ²	45	5.2	14	2.80 x 10 ⁻⁸				
018 ²	45	5.2	14	2.80 x 10 ⁻⁸				
019	45	5.2	14	2.80 x 10 ⁻⁸				
020	45	5.2	14	2.80 x 10 ⁻⁸				

¹ TSS limit only applies to dry weather samples. There is no wet weather NPDES Permit Limit for TSS.

² Benchmark

Following the 2016/2017 reporting year, it was decided that BMP performance sampling would be reduced because many building demolitions have been completed and revegetated in the Outfall 009 watershed. In addition, BMP facilities have been in place for many years and performing well based on previous samplings. Starting in 2017/2018, sampling was only planned for two storm events per year at the upper lot media filter, southern detention bioswale, lower lot biofilter, Boeing admin area inlet filters, CM-1 (influent-west and effluent), and the ELV Treatment BMP.

During 2020/2021, there was significantly lower than average total precipitation as compared to other reporting years. Long-term average annual rainfall at SSFL from 1958/1959 through 2020/2021 is 16.8 inches⁵, compared to 4.54 inches recorded in 2020/2021⁶. Four rain events⁷ occurred in the 2020/2021 reporting year, with two of these storms being sampled at one or more BMP monitoring sites⁸. This is compared with between four and 14 total rain events per year in prior reporting years 2009/2010 through 2019/2020.

Table 2 summarizes rainfall events in which BMP performance data were collected for the 2009/2010 through 2020/2021 reporting years ("non-qualifying rain events" represent precipitation totals from rainfall not considered a rain event). As indicated by the gray cells, not all BMPs had influent and effluent flows during each rain event due to limited flows into or out of the BMP.

⁵ Data from the Simi Hills – Rocketdyne Lab gauge (Ventura County Watershed Protection District site 249) was used to determine annual rainfall from 1958/1959 through 2000/2001. However, rainfall data were not available at this gauge from 1977/1978 through 1984/1985. Data from the Area 4 gauge (which was moved to Area 1 on January 1, 2013) were used to determine annual rainfall from 2001/2002 through 2020/2021. This results in a period of record (POR) of 55 years.

⁶ A water year is typically defined as October 1 through September 30. However, due to the reporting timeline for the Annual Report, reporting years have been defined as June 1 through May 31.

⁷ A "rain event" is defined as greater than 0.1 inches of rainfall in a 24-hour period and preceded by at least 72 hours of dry weather.

⁸ Monitoring occurs when rain events result in observable flow and the maximum number of sampled events planned for the particular BMP has not been reached.

		•		•	Cumulative	
	Average	Max	Event	Event Duration	Rainfall for	Number of
Date(s)	Intensity	Intensity	Total		Qualifying	BMP Subarea
					Events	Monitoring
	(in/hr)	(in/hr)	(in)	(hrs)	(in)	Samples
10/13/2009 - 10/14/2009	0.05	0.24	2.48	35	2.48	_1
12/7/2009 - 12/13/2009	0.02	0.25	3.43	57	5.91	_1
1/17/2010 – 1/22/2010	0.05	0.52	6.88	123	12.79	-1
2/5/2010 – 2/6/2010	0.04	0.20	1.84	43	14.63	_1
2/9/2010	0.01	0.17	0.20	3	14.83	_1
2/19/2010	0.01	0.05	0.14	8	14.97	_1
2/24/2010	0.01	0.03	0.12	12	15.09	_1
2/27/2010	0.06	0.34	1.52	17	16.61	_1
3/6/2010	0.02	0.13	0.38	11	16.99	_1
4/4/2010 - 4/5/2010	0.03	0.23	0.86	13	17.85	_1
4/11/2010 - 4/12/2010	0.03	0.22	0.65	11	18.50	_1
Non-qualifying rain event total ²			0.89			
Total for 2009/2010 reporting year			19.39			_1
10/5/2010 - 10/6/2010	0.049	0.18	0.93	20	0.93	_1
10/16/2010 - 10/25/2010	0.003	0.22	0.69	216	1.62	_1
11/17/2010 - 11/21/2010	0.011	0.23	0.97	89	2.59	_1
12/5/2010	0.018	0.09	0.41	10	3.0	_1
12/17/2010 - 12/22/2010	0.054	0.37	7.22	131	10.22	_1
12/25/2010 - 12/26/2010	0.030	0.22	0.57	9	10.79	-1
12/29/2010	0.043	0.10	0.43	7	11.22	-1
1/2/2011 - 1/3/2011	0.014	0.12	0.38	17	11.60	-1
2/15/2011 – 2/20/2011	0.019	0.45	2.33	121	13.93	-1
2/25/2011 - 2/26/2011	0.030	0.22	1.50	20	15.43	-1
3/2/2011 - 3/3/2011	0.007	0.03	0.13	8	15.56	_1
3/6/2011 - 3/7/2011	0.006	0.02	0.12	10	15.68	_1
3/18/2011 - 3/27/2011	0.030		6.00	197	21.68	_1
5/15/2011 - 5/18/2011	0.009	0.08	0.67	76	22.35	_1
Non-qualifying rain event total ²			1.04			
Total for 2010/2011 reporting year			23.39			67
10/5/2011	0.090	0.18	0.90	9	0.90	_1
11/4/2011 - 11/6/2011	0.041	0.23	0.58	59	1.48	_1
11/11/2011 - 11/12/2011	0.035	0.26	0.76	22	2.24	_1
11/19/2011 - 11/21/2011	0.031	0.29	0.78	35	3.02	_1
12/12/2011 - 12/17/2011	0.006	0.21	0.80	137	3.82	_1
1/21/2012 – 1/23/2012	0.017	0.15	1.06	62	4.88	_1
2/27/2012			0.00		4.88	_1
3/16/2012 - 3/18/2012	0.052	0.31	1.51	29	6.39	_1
3/25/2012 – 3/26/2012	0.079	0.51	2.12	21	8.51	-1

Table 2. Sample Collection Event Rainfall Data Summary (gray cells indicate dates that did not have complete data pairs sampled at treatment devices)

	Average	Max	Event	Event	Cumulative Rainfall for	Number of BMP Subarea
Date(s)	Intensity	Intensity	Total	Duration	Qualifying	Monitoring
	(in/hr)	(in/hr)	(in)	(hrs)	(in)	Samples ¹
4/10/2012 - 4/13/2012	0.034	0.36	2.37	64	10.88	_1
4/23/2012 - 4/26/2012	0.003	0.09	0.26	80	11.14	_1
Non-qualifying rain event total ²			0.19			
Total for 2011/2012 reporting year			11.33			88
11/14/2012 – 11/18/2012	0.010	0.36	0.99	99	0.99	_1
11/28/2012 - 12/4/2012	0.011	0.12	1.49	139	2.48	_1
12/12/2012 – 12/18/2012	0.005	0.07	0.68	129	3.16	_1
12/22/2012 – 12/26/2012	0.013	0.18	1.13	87	4.29	_1
1/23/2013 – 1/27/2013	0.020	0.18	1.78	89	6.07	_1
2/8/2013 – 2/9/2013	0.008	0.07	0.12	15	6.19	_1
2/19/2013	0.025	0.09	0.25	10	6.44	_1
3/7/2013 – 3/8/2013	0.041	0.23	0.87	7	7.31	_1
5/5/2013 - 5/6/2013	0.040	0.16	0.48	7	7.79	_1
Non-qualifying rain event total ²			0.31			
Total for 2012/2013 reporting year			8.10			29
11/20/2013 - 11/21/2013	0.013	0.12	0.47	17	0.47	-1
12/7/2013	0.070	0.09	0.28	4	0.75	_1
2/6/2014 – 2/7/2014	0.015	0.15	0.28	16	1.03	-1
2/26/2014 – 3/2/2014	0.052	0.47	4.62	89	5.65	_1
4/1/2014 - 4/2/2014	0.008	0.14	0.22	28	5.87	_1
Non-qualifying rain event total ²			0.20			
Total for 2013/2014 reporting year			6.07			27
10/31/2014 - 11/1/2014	0.045	0.33	0.36	8	0.36	_1
11/30/2014 - 12/4/2014	0.033	0.40	3 20	97	3 56	_1
12/11/2014 - 12/12/2014	N/A ³	N/A ³	2.62	N/A ³	6.18	_1
12/15/2014 - 12/17/2014	0.025	0.33	0.91	36	7.09	_1
1/10/2015 – 1/11/2015	0.071	0.23	1.56	22	8.65	_1
1/26/2015 – 1/27/2015	0.015	0.06	0.25	17	8.90	_1
2/22/2015 - 2/23/2015	0.008	0.06	0.21	26	9.11	_1
3/1/2015 - 3/3/2015	0.024	0.22	1.44	60	10.55	_1
5/14/2015 - 5/15/2015	0.017	0.30	0.41	24	10.96	_1
Non-qualifying rain event total ²			0.26			
Total for 2014/2015 reporting year			11.22			17
7/18/2015 – 7/19/2015	0.027	0.32	0.83	31	0.83	0
9/14/2015 – 9/15/2015	0.050	0.39	1.10	22	1.93	8
10/5/2015 - 10/6/2015	0.025	0.32	0.45	18	2.38	0
12/13/2015	0.055	0.06	0.11	2	2.49	0
12/19/2015 – 12/22/2015	0.008	0.08	0.52	65	3.01	6

	Average	Max	Event	Event	Cumulative Rainfall for	Number of
Date(s)	Intensity	Intensity	Total	Duration	Qualifying	Monitoring
	<i></i>	<i></i>	<i>//</i> \		Events	Samples ¹
4/5/2016 4/40/2016	(in/hr)	(in/hr)	(in)	(hrs)	(in)	20
1/5/2016 - 1/10/2016	0.030	0.60	3.87	129	6.88	29
1/18/2016 - 1/20/2016	0.005	0.02	0.20	40	7.08	0
1/31/2016	0.108	0.27	0.86	8	7.94	0
2/1//2016 - 2/18/2016	0.027	0.10	0.57	21	8.51	1/
3/5/2016 - 3///2016	0.029	0.29	1.57	54	10.08	4
3/11/2016	0.088	0.34	0.44	5	10.52	15
4/7/2016 – 4/9/2016	0.010	0.10	0.52	52	11.04	16
5/6/2016	0.128	0.22	0.77	6	11.81	0
Non-qualifying rain event total ²			0.16			
Total for 2015/2016 reporting year			11.97			113
10/16/2016 – 10/17/2016 ⁴	0.008	0.05	0.22	28	0.22	0
10/28/2016 – 10/31/2016	0.006	0.16	0.41	68	0.63	5
11/20/2016 – 11/21/2016	0.024	0.18	0.53	22	1.16	3
11/26/2016	0.055	0.15	0.22	4	1.38	8
12/15/2016 – 12/16/2016	0.093	0.20	1.58	17	2.96	12
12/21/2016 – 12/24/2016	0.030	0.31	1.99	66	4.95	6
12/30/2016 – 12/31/2016	0.011	0.11	0.45	41	5.40	14
1/4/2017 – 1/13/2017	0.013	0.26	2.74	211	8.14	33
1/18/2017 – 1/23/2017	0.050	0.69	5.70	114	13.84	25
2/2/2017 – 2/11/2017	0.013	0.17	2.84	218	16.68	23
2/16/2017 – 2/21/2017	0.049	0.71	5.81	119	22.49	21
2/26/2017	0.022	0.05	0.20	9	22.69	0
3/21/2017 - 3/22/2017	0.028	0.07	0.36	13	23.05	0
4/7/2017 - 4/8/2017	0.024	0.08	0.17	7	23.22	0
Non-qualifying rain event total ²			0.13			
Total for 2016/2017 reporting year			23.35			150
1/8/2018 - 1/9/2018	0.068	0.37	2.78	41	2.78	11
2/26/2018 - 3/3/2018	0.015	0.15	1.66	109	4.44	10
3/10/2018 - 3/16/2018	0.012	0.30	1.92	155	6.36	0
3/21/2018 - 3/23/2018	0.059	0.45	2.94	50	9.30	15
Non-qualifying rain event total ²			0.45			
Total for 2017/2018 reporting year			9.75			36
10/12/2018 - 10/13/2018	0.037	0.13	0.48	13	0.48	0
11/21/2018 - 11/22/2018	0.092	0.26	0.55	6	1.03	0
11/28/2018 – 11/29/2018	0.045	0.30	1.17	26	2.20	14
12/5/2018 – 12/6/2018	0.068	0.44	2.51	37	4.71	16
1/5/2019 – 1/8/2019	0.030	0.31	1.69	57	6.40	12
1/12/2019 – 1/17/2019	0.043	0.34	5.68	133	12.08	8
1/31/2019 – 2/5/2019	0.053	0.56	6.27	119	18.35	8

Data(a)	Average	Max	Event	Event	Cumulative Rainfall for	Number of BMP Subarea
Date(s)	intensity	intensity	TOLAI	Duration	Events	Monitoring
	(in/hr)	(in/hr)	(in)	(hrs)	(in)	Samples ¹
2/9/2019 – 2/16/2019	0.018	0.39	3.12	172	21.47	8
2/27/2019 – 3/8/2019	0.016	0.25	3.21	195	24.68	11
3/20/2019 - 3/21/2019	0.0048	0.03	0.11	23	24.79	0
5/10/2019 – 5/11/2019	0.0045	0.04	0.13	29	24.92	0
5/16/2019 – 5/19/2019	0.014	0.21	1.17	82	25.96	9
Non-qualifying rain event total ²			0.20			
Total for 2018/2019 reporting year			26.29			86
11/20/2019	0.185	0.33	0.37	2	0.37	5
11/27/2019 – 11/30/2019	0.023	0.28	2.10	90	2.47	14
12/4/2019 – 12/8/2019	0.018	0.31	2.01	109	4.48	5
12/22/2019 – 12/26/2019	0.044	0.49	3.88	89	8.36	10
1/16/2020 – 1/17/2020	0.064	0.31	0.70	11	9.06	0
2/22/2020	0.037	0.10	0.11	3	9.17	0
3/10/2020 – 3/23/2020	0.022	0.40	7.08	319	16.25	9
4/5/2020 – 4/13/2020	0.021	0.29	3.81	187	20.06	4
5/18/2020	0.031	0.07	0.22	7	20.28	0
Non-qualifying rain event total ²			0.26			
Total for 2019/2020 reporting year			20.54			47
12/28/2020 - 12/29/2020	0.060	0.28	1.62	27	1.62	0
1/23/2021 – 1/25/2021	0.0064	0.11	0.32	50	1.94	0
1/28/2021 – 1/30/2021	0.040	0.27	1.32	33	3.26	3
3/10/2021 - 3/12/2021	0.018	0.16	0.94	51	4.20	11
3/15/2021	0.042	0.080	0.21	5	4.41	0
Non-qualifying rain event total ²			0.13		4.54	0
Total for 2020/2021 reporting year			4.54			14

¹ Includes total samples (influent, effluent, BMP subarea, background, etc.). Annual totals only are shown for early reporting years (as available), consistent with what was reported in past annual reports.

² Rainfall was measured, but not considered a rain event per the NPDES definition.

³ Area I weather station malfunctioned during rain event, rainfall totals from Station 436 used but hourly rainfall not available.

⁴ Rainfall from Station 436 was used for hour 3:00 on 10/16/2016 when the Area I station was off-line.

2. Overview

2.1 BMPs

Influent and effluent results for each stormwater BMP for the same storm event were compared to assess concentration reductions through the system. Although split samples were periodically collected and used for QA/QC purposes, only the primary samples were used in these analyses. For each of the six CM sites discussed herein⁹, the number of paired samples per BMP ranges from 3 to 37 pairs for TSS, 0 to 37 pairs for dioxins¹⁰, 0 to 37 pairs for lead¹¹, and 0 to 33 pairs for copper¹² for 2011/2012 through 2019/2020. No new CM paired samples were collected during this reporting year due to lack of sampleable flow, and it should be noted that sampling at the B-1 media filter ceased after the 2015/2016 reporting year due to sufficient data having been collected to quantify performance. However, periodic visual checks are made at all control locations to indicate any maintenance problems. The road runoff diversion to CM-1 was constructed during 2017/2018, and sampling to characterize road runoff influent to CM-1 began in 2018/2019. The road runoff inlet to CM-3 was completed on May 5, 2017. No effluent samples were collected during the one post-construction event during 2016/2017, no samples were collected in 2017/2018, and no effluent samples were collected during the one sampled event in 2018/2019. Paired influent and effluent data were collected for the first time in 2019/2020 (for three events). For two of these events, the influent sample included undeveloped area influent to CM-3. For one of these events, road runoff influent was sampled, in addition to undeveloped area influent to CM-3 (results from both locations were flow-weighted [based on drainage area size and estimated imperviousness] to determine the influent concentration).

Performance data for the **lower lot biofilter** (construction of which was completed in 2013) were collected from three locations within the system (influent, effluent, and a mid-point sample at the sedimentation basin outlet before the media filter inlet) during two storm events in the 2020/2021 sampling year. As a result, there are 30 total sample pairs associated with this location to date, including one 2013/2014 biofilter effluent sample reflecting a blend of filtered underdrain flows and overflows that bypassed the filter media.

⁹ Includes CM-1, CM-3, CM-8, CM-9, CM-11, and B-1. CM-3 pre-2016/2017 was excluded from this analysis due to post-storm dry weather flows observed at the outlet between February 2010 and March 2011 when no flows were observed entering the culvert, suggesting subsurface inflows were contributing to effluent samples, thus limiting the meaningfulness of an influent-effluent comparison. However, the road runoff inlet to CM-3 was completed on May 5, 2017. Therefore, CM-3 data starting in 2016/2017 are included in this memorandum. This includes single influent results for CM-3 road runoff from one event in 2016/2017 and one event in 2018/2019, in addition to paired influent and effluent data for three events in 2019/2020 (influent data also includes undeveloped area influent to CM-3).

¹⁰ There are no data pairs for dioxins at CM-8. Excluding CM-8, the lowest number of data pairs is three (CM-3).

¹¹ There are no data pairs for lead at CM-11. Excluding CM-11, the lowest number of data pairs is three (CM-3).

¹² There are no data pairs for copper at CM-8 and CM-11. Excluding CM-8 and CM-11, the lowest number of data pairs is three (CM-3).

Performance data for the **ELV treatment BMP** (implemented during the 2013/2014 reporting year) includes paired data from 12 events through 2019/2020¹³. Due to lack of flow at the ELV treatment BMP, no samples were collected during the 2020/2021 reporting year. These data are shown in the paired line plots and statistical analyses in the following sections, though it should be noted that it is possible that the media bed for this system may have been flushing fines during the first sampling event in 2013/2014 since this was the first rain event it experienced. During this event, the ELV treatment BMP was also heavily loaded by sediments eroded from the denuded ELV channel prior to implementation of erosion control improvements. Recent data have also shown evidence of solids export through the underdrain, based on the dioxins particulate strength decreasing through the media layer. As a result, the drainage layers and filter media were rebuilt in summer 2021.

The **B1436**¹⁴ **detention bioswales** (construction of which was completed in December 2014), were sampled for the first time during the 2015/2016 reporting year¹⁵. The detention bioswales are intended to capture and slowly release flow to the downstream lower lot biofilter, thus attenuating peak flowrates and distributing them over a longer period of time allowing more opportunity for the biofilter to treat these flows. Using the site-wide Stormwater Management Model (SWMM), the time period after completion of the detention bioswales (11/1/14) until 4/1/19 was simulated with and without the bioswales to estimate the increased biofilter runoff capture efficiency (i.e., the volume of treated water divided by the total runoff draining to the biofilter) due to implementation of the bioswales upstream. The model shows that installing the bioswales has increased the biofilter runoff capture efficiency from 59% to 73% (a 24% increase). When only considering the runoff from the lower parking lot (a priority treatment area), the runoff capture efficiency from this area has increased from 80% to 88% (an 10% increase).

Treatment occurs in the bioswales, although the primary purpose was to slow the influent runoff to the lower lot biofilter and reduce flows that bypasses the lower lot biofilter during large storm events. Samples were collected at three locations at the southern detention bioswale, which includes two influent locations (results from both locations were flow-weighted [based on drainage area size and estimated imperviousness] to determine the influent concentrations) and the effluent. Paired influent and effluent performance data were collected during 21 events at the southern detention bioswale prior to the current reporting year, and one sample pair was collected at both the influent and effluent locations of the northern detention bioswale during eight events during the 2015/2016 and 2016/2017 reporting years. Sampling was discontinued at the northern detention bioswale after the 2016/2017

¹³ The ELV treatment BMP has paired data from 12 events to date for TSS, dioxins, and lead. There are 11 data pairs for copper. Due to a power outage during the Woolsey wildfire, the ELV treatment BMP was not operational during 2018/2019 and therefore additional performance samples were not collected during the 2018/2019 reporting year. A generator has since been added at this location as the primary power source.

¹⁴ B1456 refers to a former building at this location that was demolished by Boeing as part of its effort to remove man-made structures at SSFL.

¹⁵ The effluent of the northern detention bioswale (ILBMP0007) was sampled in the 2014/2015 reporting year (May 2015). However, a paired influent sample was not collected during this event.

reporting year, as it was determined that sufficient data were collected at that location and the performance data for the detention bioswales are represented in the southern section.

Eight samples were collected from the **upper lot media filter** (construction of which was completed on May 16, 2017) during the 2016/2017 reporting year, but only at the influent location. Paired samples were collected for the first time at the upper lot media filter during 2017/2018 (for two events), and paired samples were collected during four events during the 2018/2019 reporting year¹⁶, two events during the 2019/2020 reporting year, and one event during the 2020/2021 reporting year.

The **Boeing admin area inlet filters** (filter basket with targeted media mix) were installed in 2017. The Boeing admin area inlet filters were sampled for the first time during the 2018/2019 reporting year (an influent and effluent sample were collected during one event). The filter lip was sealed in April 2019 to prevent bypass, but the samples from the 2018/2019 reporting year were collected before the lip was sealed. Paired samples were collected at the Boeing admin area inlet filters during two events during 2019/2020 and one event during 2020/2021.

Table 3 shows a summary of the BMPs discussed herein, including various BMP characteristics/components and which implemented BMPs include the various components.

	ВМР							
BMP Characteristic	CM Sites	B1 Media Filter	Upper Lot Media Filter	Lower ELV Lot Treatme Biofilter BMP		ELV Treatment BMP		
Media filtration-based ¹	х	х	х	х	х		х	
Subsurface storage-based						х		
Pretreatment incorporated		х		х	х			
Outlet controls				x	х	х		
Vegetation				х		х		
Vertical flow regime		x	х	х	х	x	х	
Horizontal flow regime	х	х						

Table 3. BMP Summary

¹ Using the SSFL sand, zeolite, and granulated activated carbon (GAC) media mixture.

2.2 Sampling

Influent grab samples are collected from flowing surface water upstream of the maximum extent of ponding at each CM as observed before that date¹⁷. All sampled CMs include a media filter and a HDPE lining through existing galvanized corrugated metal culvert pipes (zinc is not a COC at SSFL) with the

¹⁶ The upper lot media filter was also sampled during an additional event in 2018/2019, but only an effluent sample was collected (no paired influent sample).

¹⁷ When the extent of ponding increased at the CM-1 and CM-3 culvert basins on December 22, 2010 during a heavy rainfall, the influent sample locations were moved upstream a sufficient distance to remain above the maximum ponded water footprint.

exception of B-1, which is a media bed with no slip-lined element. Effluent grab samples at CM-1, CM-9, CM-3, and B-1 are collected from the underdrain outlet (beginning in October 2011, rather than the culvert outlet). CM effluent grab samples were collected at the culvert outlets on the downstream side of the road prior to October 2011 (which included all samples at CM-8 and CM-11), where the culvert pipes discharge to the Northern Drainage. Flows from the culvert outlets may represent treated runoff (via sedimentation and media filtration) and partially treated runoff (flowing through or over the weir boards); this is noted on the plots. At CM-3, the slip-lined HDPE pipes were inserted from both the influent and effluent sides and could not be sealed at the point where they meet, and subsurface flows through the road embankment are known to have entered the pipe during rain events from February 2010 through March 2011 because water was observed discharging from the HDPE pipe outlet when no water was flowing into the inlet. Therefore, CM-3 performance cannot be reliably assessed due to this bypassing of the media filter and sampling at this site was discontinued after the 2010/2011 reporting year. However, sampling was initiated during 2018/2019 after completion of the road runoff inlet and new slip-lining, as previously described. Sampling to characterize road runoff influent to CM-1 began in 2018/2019.

At the lower lot biofilter, influent samples are collected in the cistern discharge pipeline, the mid-point samples are collected at the sediment basin outlet box, and effluent samples are collected from the discharge of the biofilter effluent pipe. The Boeing admin area inlet filters influent and effluent samples are collected from the filter basket influent and effluent, respectively. Influent samples for the southern detention bioswale are collected from both the east and west portions of the concrete swale diverting sheetflow into the rock crib, and effluent samples are collected from the underdrain. Influent samples for the northern detention bioswale were collected from the curb cut along the east side of the bioswale, and effluent samples were collected from the bioswale underdrain. For the ELV treatment BMP, influent samples are collected from the influent pipe, mid-point samples are a composite of samples from the eastern and western sample ports between the settling tanks and media filter, and the effluent samples are collected from the effluent pipe from the middle tank.

2.3 Drainage Areas

Several CM/media filter locations (CM-1, CM-9, CM-3, the B-1 media filter, and the upper lot media filter) and the southern detention bioswale have multiple influent drainage areas:

- CM-1 receives runoff from an eastern tributary comprised of runoff from a largely undeveloped hillside and part of Building 212 (now demolished), a western tributary comprising paved road and ELV hillside runoff (ELV hillside runoff is only reflected in samples collected prior to November 2013), and another area mainly comprised of road runoff;
- CM-9 receives runoff from the Area I Landfill (A1LF) and former Building 1324 parking lot (demolished Summer/Fall 2011), as well as the paved road to the east (Area II road);
- B-1 receives runoff from the north, comprised of paved road runoff, and the south, comprised of the upper B-1 ISRA areas, the sedimentation basin, and paved road runoff.
- The southern detention bioswale receives runoff discharged from the rock crib swale and the paved area adjacent to the detention bioswales (contractor laydown area).

- The upper lot media filter receives runoff from the south/southeast of the road, which is predominately comprised of the hillside, and the southwest (via the culvert), which consists of both the parking lot and hillside.
- CM-3 receives runoff from the hillside south of the road (including a clean soil borrow area at the top of the watershed), in addition to a small portion of the road runoff (after the road runoff inlet was completed in May 2017).

Influent locations used in the paired analyses were evaluated on a case-by-case basis, with similar sample dates taking precedence (between influent and effluent); in instances when two or three influent samples were available for the same effluent-sampling storm event, an impervious area-weighted average (used as an estimate of proportioned flowrate from each influent stream) was used to represent a single composite influent value.

Background monitoring sites at CM-3, CM-8, and CM-11¹⁸ receive runoff from drainage areas that do not include any known historic industrial activities, although the CM-3 drainage area does include a clean soil borrow area at the top of the watershed. Therefore, influent sample results at these three CM locations (not including CM-3 road runoff) are of relatively good quality and considered reflective of "background" stormwater concentrations, making it difficult to achieve additional COC reductions through these CMs. These "background" CM locations were therefore statistically evaluated separately from the other CM locations. Sampling at these background CM locations was discontinued following the 2010/2011 reporting year, with the exception of the road runoff inlet to CM-3, which was completed in May 2017 and sampling was initiated again during the 2016/2017 reporting year.

The BMPs discussed in this memo and their respective drainage areas are shown in Table 4. The approximate percent impervious cover and portion of the drainage area burned during the Woolsey Fire is also shown in Table 4, for each BMP. While these areas are discussed specifically with respect to performance monitoring data, there are other areas of the SSFL site which are also addressed by BMPs, including CMs, asphalt removal, erosion control, and treatment control BMPs.

¹⁸ For all previous annual reports, the eastern tributary to CM-1 was considered to reflect background concentrations. Upon review of newly acquired information, it was recently determined that the CM-1 eastern tributary should not be considered representative of background concentrations, and this annual report (and subsequent annual reports) reflect that.

ВМР	BMP Drainage Area (acres)		Approximate Portion of Drainage Area Burned by Woolsey Fire (%)
CM-1	52.8 (pre-ELV improvements) 45.4 (post-ELV improvements)	6.5 10	87
CM-3	VI-3 16.6 0.25 (road runoff)		89 0
CM-8	2.6	36	11
CM-9	10.2	48	0
CM-11	5.7	26	31
B-1 Media Filter	8.6	53	0
ELV Treatment BMP	15.6 (Helipad plug in place) 6.6 (Helipad plug removed)	26 37	0
Lower Lot Biofilter	29.9 ¹	53	38 ²
Northern Detention Bioswale	2.6	50	31
Southern Detention Bioswale	14.2	50	60
Upper Lot Media Filter	5.1	35	2
Boeing Admin Area Inlet Filters	0.86	82	0

Table 4. BMP Sites and Drainage Areas

¹ A portion of the 24-inch stormdrain drainage area is diverted to the lower lot biofilter for treatment. As a result, the percent of runoff volume captured and treated from the smaller (approximately 11.7 acre) lower lot drainage area is greater than the percent of long-term runoff volume captured and treated from the larger (approximately 18.2 acre) 24-inch stormdrain drainage area. The average impervious cover of the smaller lower lot drainage area of 11.7 acres is 60%.

² Represents the portion of the smaller lower lot drainage area (11.7 acres) that was burned.

Regarding COCs entering the BMPs following the Woolsey fire, elevated influent concentrations post-fire were observed for all four analytes (lead, TSS, copper, and dioxins) at CM-1¹⁹. CM-9 also exhibited higher influent concentration following the Woolsey fire, even though the drainage area was not burned, but the increases in influent concentrations were less than with CM-1²⁰. Elevated concentrations were also observed post-fire for dioxins only at the ELV treatment BMP and TSS only at the upper lot media filter²¹. Significant changes in influent concentrations were not observed pre vs. post fire at the southern detention bioswale, CM-3, or the lower lot biofilter, all of which had significant portions of the drainage area burned. Effects related to the Woolsey fire were discussed in more detail in the 2018/2019 annual report.

 $^{^{19}}$ Influent concentrations pre vs. post fire at CM-1 are 24 vs. 40 mg/L for TSS, 2.9E-08 vs. 1.3E-05 µg/L for dioxins, 1.8 vs. 3.7 µg/L for lead, and 2.9 vs. 3.9 µg/L for copper.

 $^{^{20}}$ Influent concentrations pre vs. post fire at CM-9 are 27 vs. 44 mg/L for TSS, 6.4E-08 vs. 7.9E-08 μ g/L for dioxins, 7.3 vs. 11.7 μ g/L for lead, and 6.6 vs. 8.8 μ g/L for copper.

 $^{^{21}}$ Influent concentrations pre vs. post fire at the ELV treatment BMP are 1.0E-08 vs. 1.8E-07 μ g/L for dioxins. Influent concentrations pre vs. post fire at the upper lot media filter are 15 vs. 30 mg/L for TSS.

3. Multiple BMP Box Plots

Multiple BMP box plots for TSS, dioxins, and lead for all BMPs presented herein are shown in Figure 2, Figure 3, and Figure 4, respectively. These plots illustrate basic statistics of influent and effluent performance data, relative to each of the CM/media filter sites (B-1, upper lot media filter, CM-3 [post 2017/2018], CM-9, and CM-1 non-background sites), the lower lot biofilter, ELV treatment BMP, the detention bioswales, and the Boeing admin area inlet filters. As shown in Figure 1, the box plots reflect the median, 25th percentile, 75th percentile, 1.5 quartile values, in addition to less common values outside of the 1.5 quartiles, if applicable (shown as diamonds). These plots reflect paired data results only (the same data used in the statistical analyses, influent vs. effluent correlation charts, and probability plots). These plots are intended to illustrate the range of influent and effluent concentrations at each BMP and also show how influent and effluent concentrations compare (i.e., overall lower, higher, or equal effluent concentrations compared to the influent concentrations). If very unequal sample numbers were included in these plots, the comparison between influent and effluent concentrations sample results compared to the other.

The amount of overlap of the boxes indicates visual differences in the influent and effluent concentrations. Influent and effluent datasets that are widely separated (such as dioxins at the lower lot biofilter) indicate more robust controls. Influent and effluent datasets that have substantial overlaps²² (such as TSS also at the lower lot biofilter) indicate similar influent and effluent concentrations. The Admin area inlet filter only has four data pairs available. Available data are shown in the box plot for this filter; however, it is not possible to make conclusions on their performance until additional data become available.

For TSS, the detention bioswales was the only BMP to show no overlap between the interquartile ranges (IQR) of the influent and effluent concentrations. Although an overall decrease was noted for the CM/media filter sites and the lower lot biofilter, the differences in the box plots are still significant due to the large number of observations available. The ELV treatment BMP also shows large overlaps between the influent and effluent boxes, with an overall significant increase in TSS concentration observed.

For dioxins, the lower lot biofilter and detention bioswales did not show any overlap in the IQR of the influent and effluent boxes, with a decrease in concentrations from the influent to effluent. The CM/media filter sites and ELV treatment BMP both show an overall decrease in concentrations from the influent to effluent locations, but with more overlap in the influent and effluent boxes.

For lead, the CM/media filter sites, ELV treatment BMP, and the detention bioswales all show an overall decrease in concentration from the influent to effluent, but with overlap in the boxes for the CM/media filter sites and ELV treatment BMP, and no overlap in the IQRs for the detention bioswales. The lower lot

²² For small to intermediate data sets, if the median value of one set was larger than the 75th percentile value of the other set, or smaller than the 25th percentile value of the other set, it is expected that the sets are statistically different. For large datasets, less overlap between the two datasets may be present and they may still be statistically different. However, wider separation generally results in more robust performance.

biofilter showed similar concentrations of lead in the influent and effluent, as also indicated by the large overlap in the boxes.



Figure 1. Box Plot Legend (example, not to scale)



Figure 2. Multiple BMP Box Plot for TSS



Figure 3. Multiple BMP Box Plot for Dioxins



Figure 4. Multiple BMP Box Plot for Lead

4. Statistical Analysis

Statistical summaries of the Site cumulative paired data over the 2009-2021 sampling period using the non-parametric one-tailed sign test are shown for the paired datasets in Table 5 through Table 13. This test is used to evaluate statistical differences between paired data points, or in this case, between influent and effluent stormwater samples. The null hypothesis is that the number of data pairs showing an increase from influent to effluent concentrations equals the number of data pairs showing a decrease in concentration from the influent to effluent samples. If the p-value is less than 0.05, the null hypothesis is rejected with a 95 percent level of confidence. Rejection of the null hypothesis results in a statistically significant difference in the number of data pairs that show an increase in concentration from the influent and data pairs with a decrease in concentration from influent to effluent. If the p-value is greater than 0.05, there are insufficient numbers of paired data sets to indicate a significant difference. For this analysis, data pairs that were taken during observed bypass/overflow events were removed (specific locations, events, and rainfall characteristics were listed previously in Section 3).

4.1 Culvert Modification/Media Filter Areas

At the monitored CMs and media filters (B-1, CM-1, CM-3, CM-8, CM-9, CM-11, and the upper lot media filter), the total number of combined influent and effluent data pairs ranged from 101 (for dioxins) to 118 (for TSS)²³. Table 5 and Table 6 summarize the paired data statistics for these locations. CM-8 and CM-11 paired statistics are presented separately from the other locations because they serve as a background evaluation (Table 6). The influent flows to these sites come largely from background sites. Therefore, significant reduction of the COC concentrations (which are generally very low) in those flows by CMs is unlikely (although fairly significant reduction of the average and median concentrations for lead was observed). No paired data were collected from these background sites in the 2020/2021 reporting year. Data from the CM-3 background site (pre-2016/2017) were excluded since post-storm dry weather flows were observed at the outlet between February 2010 and March 2011 when no flows were observed entering the culvert, suggesting subsurface inflows were contributing to effluent samples. Therefore, this CM cannot be reliably assessed based on the effluent sample results (pre-2016/2017). Samples collected for road runoff to CM-3 during 2019/2020 are included in the statistical analyses²⁴.

At the B-1 media filter site, media washout was observed during initial sampling dates in the 2011/2012 reporting year. Since this was a malfunction that was subsequently corrected, results from these sample dates were removed from the analysis. The CM-1 effluent sample collected on 2/28/2014 represented a blend of underdrain flow and seepage through the upstream weir boards. A leaking seal was noted at

²³ Because copper is not included as a pollutant of concern in the Expert Panel Work Plan for watershed 009, which was submitted to the Regional Board in September 2015, results for copper are not included herein.

²⁴ Samples for road runoff to CM-3 from 2016/2017 and 2018/2019 are not included in the statistical analyses because an influent/effluent data pair was not collected. No samples were collected in 2017/2018. Severe sedimentation was observed at CM-3 during 2018/2019, which hindered sample collection until cleaned. Performance at CM-3 was also likely hindered due to the sedimentation.

CM-1 on 3/3/2017. It is unclear if this condition was also present during the 2/17/2017 sample that resulted in an exceedance of Permit Limits for dioxins. These results were included in the analysis.

Table 5 shows the number of influent samples with higher concentrations than their paired effluent samples, which shows an improvement in water quality from the influent to effluent of the CM/media filter. In the non-background CMs, the majority of sample pairs had higher influent concentrations than their paired effluent (66%, 63%, and 72% of total pairs of observations had influent samples with larger concentrations than effluent samples for TSS, dioxins, and lead, respectively). In addition, the number of data pairs with influent concentrations greater than the effluent concentrations were found to be statistically significant (p-value ≤ 0.05) for TSS, lead, and dioxins.

	TSS (r	ng/L)	Dioxin	ι (μg/L)	Lead (μg/L)		
	Influent	Effluent	Influent	Effluent	Influent	Effluent		
Minimum	0.70	0.53	1.0E-12	1.0E-12	0.09	0.09		
Maximum	1,800	610	3.6E-04	9.8E-07	55	39		
Average	64	28	5.6E-06	6.3E-08	6.2	3.1		
Median	17	11	5.8E-08	1.4E-09	2.8	1.6		
Standard Deviation	205	68	3.9E-05	1.3E-07	10	5.1		
Coefficient of Variation (COV)	3.2	2.4	7.0	2.0	1.6	1.6		
Total pairs of observations	97		90		97			
Number of influent samples having larger	6	4	57		7(C		
concentrations than effluent samples								
Number of effluent samples having larger	2	9	16		22			
concentrations than influent samples								
Number of samples having equal influent	L	ļ	1	.7	5			
and effluent concentrations								
n value by paired popparametric sign	<0.0	001	<0.	001	<0.0	001		
p-value by parred nonparametric sign	(statis	tically	(statis	stically	(statistically			
lesi	significant removal)		significant removal)		significant removal)			

Table 5. CM-1, CM-9, CM-3, B-1, and Upper Lot Media Filter Combined Non-Background Statistical Analysis

¹ One-tail sign test used to evaluate data. P values of \leq 0.05 are considered statistically significant.

There were a statistically significant (p-value ≤ 0.05) number of paired samples where the influent concentration was greater than the paired effluent concentration (compared to paired data where the effluent concentration was greater than the paired influent concentration) for TSS and lead at background sites, as shown in Table 6. It should be noted that no data were collected from these sites in the most recent reporting year. In addition, as noted earlier, the influent concentrations at these sites are very low (only one of the dioxins samples at these sites, either influent or effluent, were above Permit Limits), so further reductions would be difficult to achieve.

	TSS	(mg/L)	Dioxin	(µg/L)	Lead	(µg/L)		
	Influent	Effluent	Influent	Effluent	Influent	Effluent		
Minimum	1.0	1.0	1.0E-12	1.0E-12	0.20	0.20		
Maximum	82	33	1.5E-10	3.5E-10	11	7.0		
Average	13	7.6	2.7E-11	6.9E-11	3.2	1.6		
Median	3.0	2.0	1.0E-12	1.0E-12	0.58	0.29		
Standard Deviation	20.8	9.6	5.8E-11	1.3E-10	4.5	2.2		
Coefficient of Variation (COV)	1.6	1.3	2.1	1.9	1.4	1.4		
Total pairs of observations	21		11		10			
Number of influent samples having larger	1	.3	1			7		
concentrations than effluent samples								
Number of effluent samples having larger		3	3			1		
concentrations than influent samples								
Number of samples having equal influent	1	5	7	1		2		
and effluent concentrations								
	<0.	001	0.3	1 ³	0.0	011		
p-value by paired nonparametric sign	(statis	stically	(insufficient amount		(stati	stically		
test ²	signi	ficant	of data to	o show a	significan	t removal)		
	rem	oval)	significant difference)		Significant (ChioVal)			

Table 6. CM-8 and CM-11 Combined Background Statistical Analysis¹

¹ As noted earlier in this memorandum, the CM-3 performance (pre-2016/2017) cannot be reliably assessed based on the effluent sample results. For this reason, the CM-3 paired data were excluded from the statistical analysis presented in this table.

² One-tail sign test used to evaluate data. P values of \leq 0.05 are considered statistically significant.

³ Due to the high number of samples having equal influent and effluent concentrations (due to non-detects), the total number of data pairs was assumed to be four for purposes of calculating the p-value.

4.2 Lower Lot Biofilter Treatment Train

To date, samples were collected from the lower lot biofilter during 32 rain events that occurred after the construction was completed and fully functional, with samples collected at all three locations within the biofilter treatment train (influent, post-sedimentation basin, and post-biofilter) during 29 events from

2012/2013 through 2020/2021, two locations (influent and post-biofilter) for a single rain event in the 2013/2014 reporting year²⁵, and two locations (post-sedimentation basin and post-biofilter) for two events in 2018/2019. The post-biofilter samples collected in early 2014 represents a blend of filtered underdrain water and overflow. During one event in the 2014/2015 reporting year, unusually turbid water was observed in the biofilter; this may have been due to sediment-laden run-on from the Building 1436 demolition area. Table 7, Table 8, and Table 9 summarize the paired sampling data for the biofilter.



Figure 5. A photo of the biofilter on 3/13/2018

²⁵ A sample was not taken at the biofilter inlet (post-sedimentation basin) during the 2013/2014 sampling year due to the sample location being submerged and inaccessible.

For TSS, the majority of data pairs had higher influent concentrations than their paired effluent concentrations for all steps of the treatment train (influent runoff to the sedimentation basin outlet, the sedimentation basin outlet to the biofilter outlet, and influent to biofilter outlet), as shown in Table 7, Table 8, and Table 9, respectively.

The majority of data pairs also showed a decrease in dioxins concentration through all steps of the treatment train for all years. Across the system (influent runoff to the biofilter outlet), only one sample pair had effluent dioxins concentrations with higher concentrations than their paired influent sample.

For lead, the majority of samples from the influent runoff to the sedimentation basin outlet and across the system (influent runoff to biofilter outlet) exhibited a decrease in lead concentration, as shown in Table 7 and Table 9, respectively. However, for the sedimentation basin outlet to the biofilter outlet (Table 8), the majority of sample pairs showed higher effluent lead concentrations than their paired influent concentration.

Considering the entire system (influent runoff to the biofilter outlet), dioxin was the only COC to show a statistically significant (p-value ≤ 0.05) number of paired samples that decreased in concentration from the influent runoff to the biofilter outlet. There were insufficient data to show statistically significant reduction for TSS and lead.

	TSS (I	ng/L)	Dioxin	(µg/L)	Lead	(µg/L)		
	Influent	Effluent	Influent	Effluent	Influent	Effluent		
Minimum	2.7	2.5	1.0E-12	1.0E-12	0.8	0.7		
Maximum	280	110	4.7E-07	2.8E-07	20	6.6		
Average	33	23	8.7E-08	6.6E-08	2.9	2.1		
Median	18	12	5.8E-08	4.7E-08	2.0	1.7		
Standard Deviation	53	27	9.5E-08	6.9E-08	3.6	1.5		
Coefficient of Variation (COV)	1.6	1.16	1.1	1.06	1.2	0.73		
Total pairs of observations	29		29		29			
Number of influent samples having larger concentrations than effluent samples	1	9	20		2	1		
Number of effluent samples having larger concentrations than influent samples	1	0	8		(5		
Number of samples having equal influent and effluent concentrations	()		L		2		
p-value by paired nonparametric sign test ¹	0.068 (insufficient amount of data to show a significant difference)		0.068 (insufficient amount of data to show a significant difference)		0.0 (statis significant	12 tically tremoval)	0.0 (statis significant	012 tically t removal)

Table 7. Lower Lot Biofilter Performance Data – Influent Runoff to Sedimentation Basin Outlet

 1 One-tail sign test used to evaluate data. P values of \leq 0.05 are considered statistically significant.

	TSS (I	mg/L)	Dioxin	(µg/L)	Lead	(µg/L)
	Influent	Effluent	Influent	Effluent	Influent	Effluent
Minimum	2.5	1.5	1.0E-12	1.0E-12	0.7	0.5
Maximum	110	110	2.8E-07	1.5E-07	6.6	5.6
Average	23	20	6.5E-08	8.8E-09	2.1	2.1
Median	12	13	4.7E-08	2.0E-10	1.7	1.6
Standard Deviation	26	26	6.7E-08	2.8E-08	1.5	1.4
Coefficient of Variation (COV)	1.2	1.27	1.04	3.2	0.71	0.68
Total pairs of observations	31		31		31	
Number of influent samples having larger concentrations than effluent samples	1	.8	27		1	5
Number of effluent samples having larger concentrations than influent samples	1	.1	2		1	6
Number of samples having equal influent and effluent concentrations		2		2	0	
p-value by paired nonparametric sign test ¹	0.075 (insufficient amount of data to show a significant difference)		0.075 (insufficient amount of data to show a significant difference) <0.001 (statistically significant removal)		0.50 (ins amount o show a s differ	sufficient of data to ignificant rence)

Table 8. Lower Lot Biofilter Performance Data – Sedimentation Basin Outlet to Biofilter Outlet

¹One-tail sign test used to evaluate data. P values of \leq 0.05 are considered statistically significant.

	TSS (I	mg/L)	Dioxin	(µg/L)	Lead	(µg/L)	
	Influent	Effluent	Influent	Effluent	Influent	Effluent	
Minimum	2.7	1.5	1.0E-12	1.0E-12	0.8	0.5	
Maximum	280	110	4.7E-07	1.5E-07	20	5.6	
Average	33	21	9.8E-08	9.5E-09	3.0	2.2	
Median	19	13	6.2E-08	2.1E-10	2.0	1.8	
Standard Deviation	52	26	1.1E-07	3.0E-08	3.6	1.5	
Coefficient of Variation (COV)	1.6	1.22	1.2	3.1	1.2	0.67	
Total pairs of observations	30		30		30		
Number of influent samples having larger concentrations than effluent samples	1	.8	28		1	.6	
Number of effluent samples having larger concentrations than influent samples	1	2	1		1	2	
Number of samples having equal influent and effluent concentrations	(D		1		2	
p-value by paired nonparametric sign test ¹	0.18 (insufficient amount of data to show a significant difference)		0.18 (insufficient amount of data to show a significant difference) < 0.001 (statistically significant removal)		0.18 (ins amount show a s differ	sufficient of data to ignificant ence)	

Table 9. Overall Lower Lot Biofilter Performance Data – Influent Runoff to Biofilter Outlet

¹One-tail sign test used to evaluate data. P values of \leq 0.05 are considered statistically significant.

4.3 ELV Treatment BMP

To date, samples have been collected from the ELV treatment BMP during 15 events from 2013/2014 through 2019/2020. Samples were not collected during the 2020/2021 reporting year due to lack of flow. Sampling was not conducted during the 2018/2019 reporting year due to a power outage at the ELV treatment BMP associated with the Woolsey fire, which destroyed the electrical infrastructure. To prevent future power outages at the ELV treatment location, a generator was added to the ELV system as the main power source, since electrical lines were not replaced in this area to reduce the risk of future fires. Samples were collected at three locations within the ELV treatment train (influent, sedimentation tank outlet, and media tank effluent) during 11 of these events. Samples were only collected at two locations (influent and effluent) during one event, the effluent location only for one event, and the effluent and mid-point location during two events.

Extenuating circumstances relevant to this site during the February/March 2014 storm event included high flows from Helipad Road to the ELV treatment system (resulting in excess inflows to the sump), inadequate erosion controls along the earthen ELV channel (resulting in excess sediment in the sump [approximately one foot of deposited sediment in the sump and less than an inch in the sedimentation tanks]), and a power outage (resulting in the sump pump not operating during part of the storm). The February/March 2014 ELV treatment BMP effluent data are still considered representative for the analysis herein, although it is recognized that because this monitoring event was the first at the ELV, washout of fines from the media bed may have been occurring. The system has been improved to avoid these issues.

Table 10, Table 11, and Table 12 summarize the paired data for this location. The majority of data pairs from the influent to the sedimentation tank effluent showed a decrease in TSS concentrations. However, there were more effluent samples with higher TSS concentrations than their paired influent samples from the sedimentation tank effluent to the media tank effluent and from the influent to the media tank effluent. For one of the two cases where a net increase in TSS occurred during the 2013/2014 reporting year, the ELV treatment BMP was heavily loaded by sediments eroded from the denuded ELV channel prior to implementation of recent erosion control improvements.

For each step of the treatment train, the majority of sample pairs had influent dioxin concentrations higher than their paired effluent concentrations. For lead, the majority of sample pairs showed decreasing lead concentrations from the influent to the sedimentation tank effluent and influent to the media tank effluent. However, there were more sample pairs with higher media tank effluent lead concentrations when compared to their paired sedimentation basin tank effluent concentrations.

Across the system from the influent to the media tank effluent, the number of influent samples with higher concentrations than their paired effluent samples was statistically significant (p-value \leq 0.05) for dioxins and lead, while TSS showed a statistically significant number of effluent samples with higher TSS concentrations than their paired influent concentrations, based on the number of samples.

	TSS (mg/L)		Dioxin	(µg/L)	Lead	(µg/L)	
	Influent	Effluent	Influent	Effluent	Influent	Effluent	
Minimum	2.9	1.0	1.0E-12	1.0E-12	0.2	0.2	
Maximum	66	47	3.5E-07	3.6E-07	50	3.5	
Average	19	11	4.1E-08	3.3E-08	7.3	1.4	
Median	7	7	5.1E-10	2.5E-10	2.0	1.1	
Standard Deviation	22	14	1.0E-07	1.1E-07	14.6	1.05	
Coefficient of Variation (COV)	1.18	1.24	2.49	3.29	2.00	0.72	
Total pairs of observations	11		11		11		
Number of influent samples having larger	9	Ð	8			8	
Number of effluent samples having larger concentrations than influent samples	2	2	2		:	3	
Number of samples having equal influent and effluent concentrations	(0		1		0	
p-value by paired nonparametric sign test ¹	0.030 (statistically significant removal)		0.030 0.03 (statistically (statist significant removal) significant		0.11 (ins amount o show a s differ	sufficient of data to ignificant ence)	

¹One-tail sign test used to evaluate data. P values of ≤ 0.05 are considered statistically significant.

Enndent								
	TSS (I	mg/L)	Dioxin	(µg/L)	Lead	(µg/L)		
	Influent	Effluent	Influent	Effluent	Influent	Effluent		
Minimum	0.8	8	1.0E-12	1.0E-12	0.2	0.4		
Maximum	47	144	3.6E-07	1.9E-07	3.5	3.7		
Average	9	36	2.8E-08	1.5E-08	1.3	1.4		
Median	4	35	2.4E-10	1.2E-10	0.9	1.2		
Standard Deviation	13	37	1.0E-07	5.3E-08	1.01	0.97		
Coefficient of Variation (COV)	1.36	1.01	3.58	3.58	0.77	0.67		
Total pairs of observations	1	.3	13		13			
Number of influent samples having larger concentrations than effluent samples	(0	9			4		
Number of effluent samples having larger concentrations than influent samples	1	3	0		9	9		
Number of samples having equal influent and effluent concentrations	0		4		0			
p-value by paired nonparametric sign test ¹	<0.001 ² (statistically significant increase)		<0.001 ² <0.001 (statistically (statistically significant increase) significant removal)		0.13 (ins amount o show a s differ	sufficient of data to ignificant ence)		

Table 11. ELV Treatment BMP Performance Data – Sedimentation Tank Effluent to Media Tank
Effluent

¹One-tail sign test used to evaluate data. P values of \leq 0.05 are considered statistically significant.

² The number of effluent samples with higher TSS concentrations than their paired influent samples is statistically significant (statistically significant increase in concentration from sedimentation tank effluent to media tank effluent).

	1 en en a					
	TSS (mg/L)		Dioxin (µg/L)		Lead (µg/L)	
	Influent	Effluent	Influent	Effluent	Influent	Effluent
Minimum	2.9	8	1.0E-12	1.0E-12	0.2	0.4
Maximum	66	144	3.5E-07	1.9E-07	50	3.7
Average	19	36	4.8E-08	2.0E-08	7.0	1.6
Median	10	35	5.3E-09	1.3E-10	2.5	1.5
Standard Deviation	21	37	1.0E-07	5.6E-08	13.9	0.98
Coefficient of Variation (COV)	1.11	1.01	2.1	2.8	1.99	0.62
Total pairs of observations	12		12		12	
Number of influent samples having larger concentrations than effluent samples	1		10		9	
Number of effluent samples having larger concentrations than influent samples	10		1		2	
Number of samples having equal influent and effluent concentrations	1		1		1	
n value by paired popparametric sign	0.003 ²		0.003		0.019	
p-value by palled nonparametric Sign	(statis	stically	(statis	tically	(statis	tically
	significant	t increase)	significant removal)		significant removal)	

Table 12. ELV Treatment BMP Performance Data – Influent to Media Tank Effluent

¹One-tail sign test used to evaluate data. P values of \leq 0.05 are considered statistically significant.

² The number of effluent samples with higher TSS concentrations than their paired influent samples is statistically significant (statistically significant increase in concentration from influent to media tank effluent).

4.4 Detention Bioswales

Influent and effluent sample pairs were collected from the detention bioswales for the first time during the 2015/2016 reporting year²⁶. Samples were collected at three locations representing the southern detention bioswale: two influent locations (the rock crib swale outlet and runoff from the adjacent contractor laydown area) and the effluent location. Results from the two influent locations were flow-weighted to determine a representative influent concentration. The southern detention bioswale was sampled during 26 rain events during the 2015/2016 through 2020/2021 reporting years. However, the effluent was not sampled for two of these events, the influent was not sampled for another two events, and only a single influent sample was collected for two events (so the influent sample was not flow-weighted and only represented runoff from the adjacent contractor laydown area). Therefore, a total of 22 data pairs representing the southern detention bioswale performance have been collected.

The northern detention bioswale was sampled during 18 rain events between 2014/2015 and 2016/2017. However, only the effluent location was sampled for 10 of these events, resulting in eight total sample pairs. Sampling at the northern detention bioswale was discontinued after 2016/2017.

Table 13 summarizes the paired data for this location. Performance data represents both the northern and southern detention bioswales combined. For TSS, dioxins, and lead, the majority of data pairs had influent concentrations that were higher than their paired effluent concentrations. The number of

²⁶ The effluent location for the northern detention bioswale (ILBMP0007) was sampled during the 2014/2015 reporting year. However, the influent location (ILBMP0006) was not sampled until 2015/2016.

influent samples with higher concentrations than their paired effluent samples were found to be statistically significant (p-value ≤ 0.05) for all three COCs.

The southern and northern detention bioswales were analyzed together in order to assess BMPs of a similar design. However, as shown in the paired line plots, the southern detention bioswale had a greater proportion of sample pairs that showed a decrease in concentration from the influent to effluent, for all three COCs, compared to the northern detention bioswale. However, the influent concentrations at the southern bioswale were typically greater than for the northern bioswale; therefore more likely to show a decrease in concentration.

	TSS (mg/L)		Dioxin (µg/L)		Lead (µg/L)	
	Influent	Effluent	Influent	Effluent	Influent	Effluent
Minimum	0.5	1.1	1.0E-12	1.0E-12	0.50	0.50
Maximum	220	36	2.1E-05	1.9E-07	23	3.5
Average	49	10	1.2E-06	1.9E-08	4.8	1.5
Median	28	7	8.3E-08	2.1E-10	3.2	1.4
Standard Deviation	54	9.4	4.2E-06	4.6E-08	4.7	0.85
Coefficient of Variation (COV)	1.11	0.90	3.5	2.4	0.96	0.57
Total pairs of observations	30		30		30	
Number of influent samples having larger concentrations than effluent samples	24		26		23	
Number of effluent samples having larger concentrations than influent samples	6		1		6	
Number of samples having equal influent and effluent concentrations	0		3		1	
n-value by paired popparametric sign	<0.	001	<0.001		<0.001	
test ¹	(statis	tically	(statistically		(statis	tically
	significant removal)		significant removal)		significant removal)	

Table 13. Southern and Northern Detention Bioswale Combined Performance Data

 1 One-tail sign test used to evaluate data. P values of \leq 0.05 are considered statistically significant.

4.5 Boeing Admin Area Inlet Filters

The Boeing admin area inlet filters were installed in 2017 and were sampled for the first time during the 2018/2019 reporting year (paired samples were collected during one event, prior to the filter lip being sealed to prevent bypass). Paired samples were collected during two events during 2019/2020 and one event during 2020/2021. Therefore, four total sample pairs have been collected at the Boeing admin area inlet filters. Although observations regarding performance are included below, it is important to note that only four data pairs are available, and additional data are needed to evaluate performance of the Boeing admin area inlet filters.

Table 14 summarizes the paired data for this Boeing admin area inlet filters. For TSS, the majority of data pairs had influent concentrations that were higher than their paired effluent concentrations. For dioxins, more data pairs had effluent concentrations that were higher than their paired influent concentrations. There were an equal number of data pairs with effluent concentrations that were higher than their paired influent than their paired influent concentrations as data pairs with influent concentrations that were higher than their paired influent concentrations.

None of the COCs showed a statistically significant (p-value ≤ 0.05) number of paired samples that decreased in concentration from the influent runoff to the biofilter outlet, based on the number of few samples available.

	TSS (mg/L)		Dioxin (µg/L)		Lead (µg/L)	
	Influent	Effluent	Influent	Effluent	Influent	Effluent
Minimum	16	15	9.2E-08	1.5E-07	1.6	3.0
Maximum	42	31	6.3E-07	2.1E-06	5.9	5.1
Average	25	22	2.9E-07	7.2E-07	3.5	4.2
Median	22	22	2.3E-07	2.9E-07	3.3	4.4
Standard Deviation	12	8.5	2.3E-07	9.5E-07	1.9	0.95
Coefficient of Variation (COV)	0.46	0.38	0.8	1.3	0.54	0.23
Total pairs of observations	4		4		4	
Number of influent samples having larger concentrations than effluent samples	3		1		2	
Number of effluent samples having larger concentrations than influent samples	1		3		2	
Number of samples having equal influent and effluent concentrations	0		0		0	
p-value by paired nonparametric sign	0.31 (insufficient		0.31 (insufficient		0.50 (insufficient	
test ¹	show a significant		show a significant		show a significant	
	unter	encej	unter	encej	uner	encej

Table 14. Boei	ng Admin Area	Inlet Filter	Performance	Data
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¹ One-tail sign test used to evaluate data. P values of \leq 0.05 are considered statistically significant.

4.6 Statistical Analysis Summary

A summary of the statistical analyses performed on the paired data presented in this section is shown in Table 15. Based on the number of sample pairs available, a statistically significant difference indicated a decrease in concentrations from the influent to effluent locations for CM/media filter sites (excluding background sites CM-8 and CM-11) and the detention bioswales, for all three COCs. CM-8 and CM-11 background sites showed statistically significant reductions for TSS and lead, and dioxins did not exhibit a statistically significant reduction based on the data available. The lower lot biofilter (influent runoff to biofilter outlet) showed statistically significance reductions only for dioxins (while TSS and lead were not statistically significant based on the number of sample pairs available). The ELV treatment BMP (influent to media tank effluent) showed statistically significant differences for the number of influent samples with higher concentrations than their paired effluent for lead and dioxins. However, TSS at the ELV treatment BMP showed a statistically significant difference indicating higher concentrations than their paired across the system). The Boeing admin area inlet filters did not have any COCs that showed a statistically significant difference for the number of influent samples with higher concentrations than their paired effluent. However, only four sample pairs are currently available.

	TSS				Dioxir	IS	Lead		
Location	Number of Sample Pairs	p- value ¹	Statistically significant decrease observed?	Number of Sample Pairs	p- value ¹	Statistically significant decrease observed?	Number of Sample Pairs	p- value ¹	Statistically significant decrease observed?
CM/media filter non- background (CM-1, CM-9, CM-3, B-1, and Upper Lot Media Filter)	97	<0.001	Yes	90	<0.001	Yes	97	<0.001	Yes
CM-8 and CM-11	21	<0.001	Yes	11	0.31	No	10	0.011	Yes
Lower Lot Biofilter (Influent Runoff to Biofilter Outlet)	30	0.18	No	30	<0.001	Yes	30	0.18	No ²
ELV Treatment BMP (Influent to Media Tank Effluent)	12	0.003	No ³	12	0.003	Yes	12	0.019	Yes
Detention Bioswales	30	<0.001	Yes	30	<0.001	Yes	30	<0.001	Yes
Boeing Admin Area Inlet Filters	4	0.31	No	4	0.31	No	4	0.51	No

Table 15. Summary of Performance Data, 2009-2020

¹One-tail sign test used to evaluate data. P values of \leq 0.05 are considered statistically significant.

 2 Can likely be attributed to the much lower influent concentrations to the lower lot biofilter in recent years (to be discussed further).

³ The number of effluent samples with higher TSS concentrations than their paired influent samples is statistically significant (instead of the number of influent samples with higher concentrations than their paired effluent).

5. Comparison to Permit Limits

The BMPs were constructed with the SSFL to reduce COCs prior to stormwater reaching Outfall 009, which is the compliance point for the NPDES permit for the watershed draining to this location. Permit Limits do not apply to the effluent from these BMPs and they were not designed to serve that purpose. However, in this section, as a basis for evaluating effectiveness of the BMPS, we do compare the number of results greater than the Outfall 009 Permit Limits for each of the influent and effluent samples at the CMs/media filters (B-1, CM-1, CM-9, upper lot media filter, and CM-3, excluding the background CMs), the lower lot biofilter, the ELV Treatment BMP, the detention bioswales, and the Boeing admin area inlet filters is shown in Table 16, Table 17, Table 18, Table 19, and Table 20, respectively. The analyses included in Table 16 through Table 20 include all data samples analyzed, not just paired samples. Because this analysis includes samples that do not have associated paired data, the number of influent samples compared to Permit Limits may be different than the number of effluent samples compared to limits. Only influent and effluent locations for the BMPs are included in this analysis; intermediate locations are not included (e.g., sedimentation basin effluent at the ELV Treatment BMP).

It should be noted that there is no limit for TSS at Outfall 009; it is used to evaluate particulate strength or as a proxy for other constituents.

For all of the non-background CM/media filter sites analyzed, influent concentrations were more often higher than the Outfall 009 Permit Limits as compared to effluent concentrations for both lead and dioxins, as shown in Table 16. The maximum and average ratios of observed concentrations to Permit Limit, for results exceeding Permit Limits, generally show a higher ratio for influent than effluent, for both lead and dioxins, with the exception of lead at B-1 (for the average exceedance ratio). This trend of effluent ratios lower than the influent ratios suggests lead and dioxins reductions through the CMs/media filters. These results enhance the weight of evidence that the BMPs are performing effectively and reducing concentrations, especially when not enough samples are available for all of the statistical tests.

It should be noted that dioxin results for B-1 are skewed by one exceptionally high influent result of $3.6 \times 10^{-4} \,\mu$ g/L on 12/2/2014. If that result is removed, then the maximum influent ratio drops to 94 and the average becomes 17. CM-1 is skewed by one dioxin effluent result of $4.3 \times 10^{-6} \,\mu$ g/L on 3/17/2012, where the maximum effluent ratio decreases to 35 and the average drops to 7.3 if that result is removed.

вмр	Parameter	% of Samples Permit	Greater than Limits	Maximum Ratio (I Result : P	Exceedance Exceeding ermit Limit)	Average Exceedance Ratio (Exceeding Result : Permit Limit)			
		Influent	Effluent	Influent	Effluent	Influent	Effluent		
D 1	Lead	35%	8.7%	1.8	1.7	1.3	1.5		
D-1	TCDD TEQ no DNQ	85%	68%	12,868	10	773	3.9		
CN 1	Lead	31%	17%	11	7.5	3.9	3.0		
CIVI-1	TCDD TEQ no DNQ	60%	48%	3,149	155	159	15		
CM 0	Lead	41%	24%	11	6.9	4.2	2.9		
CIVI-9	TCDD TEQ no DNQ	49%	22%	56	5.2	8.5	3.2		
Upper Lot	Lead	12%	0%	1.2	N/A ¹	1.1	N/A ¹		
Media Filter	TCDD TEQ no DNQ	76%	50%	11	2.7	4.8	1.8		
CM 2	Lead	40%	0%	1.7	N/A ¹	1.5	N/A ¹		
CM-3	TCDD TEQ no DNQ	0%	0%	N/A ¹	N/A ¹	N/A ¹	N/A ¹		

Table 16. Influent and Effluent Summary as compared to the Outfall 009 Permit Limits (B-1, CM-1, CM
9, Upper Lot Media Filter, CM-3 [post 2017/2018]), 2009-2021

¹Not calculated because there were no exceedances of Permit Limits

The number of results exceeding the Permit Limits for the influent and effluent samples at the lower lot biofilter are summarized in Table 17. Influent concentrations were more often higher than the Outfall 009 Permit Limits as compared to effluent concentrations for lead (three influent vs. one effluent, out of 30 and 32 samples, respectively) and dioxins (26 influent vs. three effluent, out of 30 and 32 samples, respectively). Observation of the maximum and average ratios of observed concentrations to the Permit Limit show that a higher ratio is calculated for influent than effluent samples for lead and dioxins, suggesting reduction in both pollutants through the lower lot biofilter. One exceedance may have been due to a power outage resulting in manual pumping from the cistern to the sediment basin, which could have overloaded the biofilter. A portable generator is now on hand for the biofilter cistern pump as a backup power supply.

Table 17. Influent and Effluent Summary as Compared to the Outfall 009 Permit Limits (Lower Lot
Biofilter), 2013-2021

	% of Sam than Pe	oles Greater rmit Limits	Maximum Exceedance Ratio (Exceeding Result : Permit Limit)		Average Exceedance Ratio (Exceeding Result : Permit Limit)		
Parameter	Influent	Effluent	Influent Effluent		Influent	Effluent	
Lead	10%	3.1%	3.8	1.1	2.1	1.1	
TCDD TEQ no DNQ	87%	9.4%	17	5.2	4.0	3.3	

Similar trends are observed for the ELV treatment BMP, as shown in Table 18. There were a greater number of influent sample concentrations exceeding the Outfall 009 Permit Limits compared to effluent concentrations for lead and dioxins. Only two influent concentrations (out of 12 samples) of lead exceeded the Permit Limit (no effluent samples exceeded), while there were four influent concentrations (out of 12 samples) of dioxins that exceeded the Permit Limit and only two effluent concentrations (out of 15 samples) that exceeded the permit limit for dioxins. As observed with the CM
sites and lower lot biofilter, higher maximum and average ratios of observed concentrations to Permit Limits were calculated for influent samples compared to effluent samples. This trend also suggests reduction in lead and dioxins through the ELV treatment BMP.

	% of Samples Greater than Permit Limits		Maximum Ratio (Excee Permi	Exceedance eding Result : t Limit)	Average Exceedance Ratio (Exceeding Result : Permit Limit)	
Parameter	Influent	Effluent	Influent	Effluent	Influent	Effluent
Lead	17%	0%	9.7	N/A ¹	5.9	N/A ¹
TCDD TEQ no DNQ	33%	13%	13	6.9	4.8	4.2

Table 18. Influent and Effluent Summary as compared to the Outfall 009 Permit Limits (ELV TreatmentBMP), 2013-2020

¹Not calculated because there were no exceedances of Permit Limits

The number of results exceeding the Permit Limits for the influent and effluent samples at the detention bioswales are shown in Table 19. Influent concentrations were more often higher than the Outfall 009 Permit Limits as compared to effluent concentrations for both lead and dioxins. 12 influent concentrations (out of 32 samples) of lead exceeded the Permit Limit, while no effluent concentrations (out of 42 samples) exceeded the Permit Limit for lead. 24 influent concentrations (out of 32 samples) of dioxins exceeded the Permit Limit, and six effluent concentrations (out of 42 samples) exceeded the Permit Limit for lead. 24 influent concentrations (out of 32 samples) of dioxins exceeded the Permit Limit, and six effluent concentrations (out of 42 samples) exceeded the Permit Limit for dioxins. The maximum and average influent exceedance ratios for dioxins are greater than the effluent ratios, suggesting that dioxins are generally reduced through the detention bioswales.

Table 19. Influent and Effluent Summary as compared to the Outfall 009 Permit Limits (Detention Bioswales), 2015-2021

	% of Samples Greater than Permit Limits		Maximum Exceedance Ratio (Exceeding Result : Permit Limit)		Average Exceedance Ratio (Exceeding Result : Permit Limit)	
Parameter	Influent	Effluent	Influent	Effluent	Influent	Effluent
Lead	38%	0%	4.5	N/A ¹	1.8	N/A ¹
TCDD TEQ no DNQ	75%	14%	737	6.7	54	3.4

¹Not calculated because there were no exceedances of Permit Limits

The number of results exceeding the Permit Limits for the influent and effluent samples at the Boeing admin area inlet filters are summarized in Table 20. Only four data pairs (influent and effluent samples) are available. For lead, one out of four influent samples were above the permit Limit, and all of the effluent sample results were below the Outfall 009 Permit Limits. For dioxins, all of the influent and effluent sample were above the Permit Limit. The maximum and average ratio of observed concentrations to the Permit Limit for dioxins show a higher ratio for effluent than influent samples, suggesting an increase in concentration through the inlet filter for the available data pairs. Again, the few data available at this location prevents any statistical evaluations.

Table 20. Influent and Effluent Summary as compared to the Outfall 009 Permit Limits (Boeing AdminArea Inlet Filters) 2018-2021

Parameter	% of Samples Greater than Permit Limits		Maximum Exceedance Ratio (Exceeding Result : Permit Limit)		Average Exceedance Ratio (Exceeding Result : Permit Limit)	
	Influent	Effluent	Influent	Effluent	Influent	Effluent
Lead	25%	0%	1.1	N/A ¹	1.1	N/A ¹
TCDD TEQ no DNQ	100%	100%	22	76	11	26

¹Not calculated because there were no exceedances of Permit Limits

6. Runoff Volume Discharge Analysis

In addition to water quality performance, the lower lot biofilter is also designed to reduce the frequency of smaller storms discharging untreated runoff to the Northern Drainage and thereby discharging via Outfall 009 by retaining the storm runoff and allowing evapotranspiration to take place. It was estimated in 2017 that the average volume pumped to the biofilter has increased from 52,000 gallons per inch of rainfall to 82,000 gallons per inch of rainfall since the detention bioswales were constructed. Similarly, the estimated percent of total runoff volume treated by the lower lot biofilter (from both the 24-inch drain and the lower lot drainage areas) increased from 22% to 44% on average since the detention bioswales were constructed.

To evaluate how many storms have been prevented from discharging to the Northern Drainage this year, a binned presence/absence of discharge plot was developed as shown in Figure 6. All storms sampled since the lower lot biofilter was constructed are included (3/8/2013 to present). The storm events with discharge to the Northern Drainage (i.e., bypass of the low flow diversion weir or treated effluent from the biofilter) were identified and counted. The total number of storm events compared to the number of events where discharge occurred were then binned based on storm depth in one-inch increments. Additionally, this plot shows the percent of discharging events (i.e., number of events with discharge divided by the number of total events for that storm depth bin). As is shown in Figure 6, the lower lot biofilter successfully prevented just over half of all storms less than or equal to one inch from discharging to the Northern Drainage, but had decreasing effects for larger rains. Although the BMP will reduce runoff volumes, it is not anticipated to prevent discharge to the Northern Drainage for storms greater than 2 inches.



Figure 6. Binned Presence/Absence of Discharge at the SSFL Lower Lot Biofilter

7. Sampling Event Analysis

The Expert Panel evaluated the need for additional sampling at the BMPs in the context of the recent slow-down in site activities particularly in the Outfall 009 watershed. Following the 2016/2017 reporting year, it was decided that until site activities increase, samples would only be collected twice per year at the following BMPs: upper lot media filter, southern detention bioswale, lower lot biofilter, CM-1 (influent-west and effluent), Boeing admin area inlet filters, and the ELV Treatment BMP. The CM-1 influent-east (background) location will continue to be sampled during every storm, in order to collect more background data and because it was recently reconstructed with new media and the upstream ponding volume was increased. No further changes are proposed at this time.

8. Cumulative TSS Loading Analysis

An analysis was performed to calculate the cumulative TSS loading to each BMP thus far, based on historical storm event depths and the measured concentrations of TSS. These values were compared to the estimated sediment load that would result in highly reduced flows through the media which would cause larger volumes of bypassed flows, based on the lab column media performance study by Pitt and Clark (2010).

The estimated TSS loading to each BMP containing media and with sufficient data (ELV Treatment BMP, lower lot biofilter, B-1 media filter, CM-1, CM-9, and the upper lot media filter) was estimated for each storm event where a sample was collected (at either the influent or effluent location²⁷). Sampling was reduced at the lower lot biofilter, the ELV Treatment BMP, upper lot media filter, and CM-9 following the 2017/2018 reporting year. Therefore, historical sampling efforts and rainfall patterns were used to approximately predict the storm events that resulted in BMP discharge for storm events that were not sampled, following reduced sampling activities²⁸. TSS concentrations were estimated at these BMPs, if it was predicted that the BMP discharged but samples were not collected²⁹. The same methodology was followed for the B-1 media filter, where sample ceased following the 2015/2016 reporting year. The estimated cumulative TSS loading was determined using the following steps:

- The average annual percent capture and treatment (i.e., the percentage of incoming runoff that does not bypass the BMP) was determined using USEPA's Storm Water Management Model (SWMM) for each BMP.
- The runoff coefficient for each BMP's drainage area was determined using SWMM, simulated over the average annual year scenario.
- The total area of each BMP's drainage area was determined using available Geographic Information System (GIS) shapefiles.

²⁷ In the event that an effluent sample was collected and an influent sample was <u>not</u> collected during the same storm event, or vice-versa, the TSS concentration(s) were estimated (to be discussed) to represent the loading of TSS during this specific event.

²⁸ A logistic regression model was developed to predict if BMPs discharge during storm events (where samples were not collected, due to reduced sampling activities). Average storm intensity (in/hr), maximum storm intensity (in/hr), total rainfall depth (in), and antecedent dry period (days) were used as input variables. Model fitting was performed separately for CM-1, CM-9, ELV treatment BMP, B1 media filter, and Lower Lot Biofilter. The number of observations per test and train dataset ranged between 21 and 49, varying based on the year that the BMP became fully operational and when reduced sampling activities started. There is no model for the Upper Lot Media Filter because only data from reduced sampling years was available for this BMP. The classification accuracy (the ratio of the number of correct predictions to the total number of predictions) was 0.86, 0.93, 1.00, 0.82, and 0.75 for CM-1, CM-9, ELV treatment BMP, B1 media filter, and Lower Lot Biofilter models, respectively.

²⁹ If TSS loadings were estimated for storm events that were not sampled for a given BMP, the average of all TSS samples from the three rainy seasons preceding and following at that BMP was used to represent the influent and effluent concentrations of TSS during this specific event.

- The runoff volume treated by each BMP during each individual storm event was calculated as follows:
 - Storm event volume treated = BMP drainage area x Storm event rainfall depth x Runoff coefficient of the BMP drainage area x Average annual percent capture
- The storm event TSS loading contributed to each BMP during each individual storm event was then calculated as follows:
 - Storm event TSS loading = Storm event volume treated x Event-dependent TSS concentration retained (influent sample concentration – effluent sample concentration)
- The cumulative TSS loading since implementation of the BMP was calculated by summing the storm event TSS loading results from all storms occurring since the BMP was constructed.
- The media area of each BMP was estimated from plans³⁰, and the cumulative TSS loading per unit area of media was calculated for each BMP.

For BMPs with pretreatment (ELV Treatment BMP and lower lot biofilter), the "influent" sample used was the sample collected at the effluent of the sedimentation basin or the influent to the media. The cumulative TSS loading per media unit area to each BMP was compared to the estimated sediment load to the media until initial maintenance is needed (about 50 kg/m²) (Pitt and Clark, 2010). The percentage of cumulative sediment loading until highly reduced treatment flows for each BMP is shown in Table 21.

The estimated number of years until media replacement is needed was calculated for each BMP, assuming an average rainfall amount during the reporting year for all subsequent years, and is also shown in Table 21. This was estimated using a similar procedure outlined above based on an average rainfall year. The long-term average annual rainfall of 16.8 inches was used as the storm event depth and the average influent and effluent TSS concentrations from all sampled events were used as the TSS influent and effluent sample results, respectively. The estimated TSS loading to each BMP (per media area) during an average rainfall year and the number of average years until media replacement is needed is shown in Table 21. It should be noted that varying annual rainfall, in addition to smaller or larger storm events, will result in varying TSS loading and this serves as a rough estimate of when replacement may be expected.

Additional analyses and standing water depth and flow bypass observations were made during the 2016/2017, 2017/2018, 2018/2019, 2019/2020, and 2020/2021 reporting years related to BMP clogging and maintenance.

An analysis of flow monitoring data obtained in 2017 show that CM-9 and CM-1 began with an estimated range of hydraulic conductivities that is close to or exceeds the "average flow rate before initial clogging" of 33 inches per hour from the Media Report (Pitt and Clark, 2010). Over time, these conductivities will be substantially reduced to well below this value suggesting that maintenance may be

³⁰ For CM-1 and CM-9, it was assumed that the front half of the media mound received flow, especially during small storm events. However, ponding can occur above the media filter, especially during large storm events, and infiltrate over a larger surface area. Therefore, the media area estimate is conservative for CM-1 and CM-9.

needed to remove sediment deposited over the rainy season. Since the media mounds of the CMs are covered with backfill and gravel, it is possible that these surface materials are clogged with sediment and the actual media itself may not be the limiting factor. Therefore, the 2017 analysis shows that media may actually be clogged more than results in Table 21 indicate. Conclusions of this analysis resulted in recommendations to either replace the media or design and construct a new engineered treatment system to better handle larger fractions of the annual flows. This was done at CM-1 in 2018. Since CM-1 was reconstructed and the media was replaced in August 2018, the analysis shown in Table 21 starts in 2018/2019 for CM-1.

Maintenance observations of the BMPs performed during the 2018/2019 reporting year showed that ponding occurred during several storm events (a few inches deep in front of the weir boards) at CM-9. There were no observations of ponding during the 2019/2020 or 2020/2021 reporting years.

This analysis did not evaluate the other CMs this year. However, based on a comparison of their pervious drainage areas compared to CM-1 and CM-9, it is estimated that **CM-3 may need maintenance soon** (potentially after the next rainy season), but CM-8 and CM-11 will not require maintenance in the near future.

It is acknowledged that there are large variations in TSS loading rates, in addition to the percentage of sediment loading to the media until maintenance is needed, among the BMPs. This is a partially a function of controls being installed in the Outfall 009 watershed wherever feasible, such as relatively small CMs installed in locations where the drainage areas are large and thus the loading rates are high.

ВМР	Wet Seasons in Operation	Cumulative TSS load (kg)	Cumulative TSS load per media area (kg/m ²)	% of "sediment load to the media until maintenance is needed"	TSS load per media area in average rainfall year (kg/m ²)	Number of average years until media replacement is expected
ELV Treatment BMP	8	1.0	0.050	0.1%	0	100+
Lower Lot Biofilter	8	390	1.8	3.6%	0.64	70
B-1	10	120	6.4	13%	1.8	23
Upper Lot Media Filter	5	79	3.1	6.3%	1.3	35
CM-1 ¹	3	39	6.6	13%	2.6	16
CM-9	12	170	29	59%	3.8	5

Table 21. Percent of Cumulative Sediment Loading until Clogging

¹Restarted in 2018/2019 after BMP reconstruction and media replacement. Prior to reconstruction (which occurred prior to the 2018/2019 rainy season, in August 2018), CM-1 was estimated to have approximately 400 kg of cumulative TSS loading (which represents approximately 136% of the estimated sediment load until maintenance is needed). CM-1 had been in operation nine rainy seasons before reconstruction occurred. As shown in the table, CM-1 is anticipated to need maintenance again in 16 years, which would result in a lifespan of 19 years.

9. Paired Line Plots

The log-scale line plots presented in this section illustrate the changes in measured concentrations between influent and effluent sample pairs at each treatment BMP. Paired data were obtained from CM/media filter locations B-1, CM-1, CM-3, CM-8, CM-9, CM-11, and the upper lot media filter, the ELV treatment BMP, the lower lot biofilter, the detention bioswales, and the Boeing admin area inlet filters. Data are presented by COC in Figure 7 through Figure 61, where paired data measured during the same event are represented by two points (influent and effluent) connected by a line, and single sample results (where either an influent or effluent sample were not collected for a single event) are shown by single points without any connected line. Points and lines are shaded based on the sampling year during which they were collected, where black lines and points represent data from the most recent 2020/2021 reporting year and data from all previous reporting years are shown in gray. In addition, different symbology is used for different influent and effluent sample collection limit. The detection limit may vary slightly from year to year, but the typical detection limit is also shown as a black dotted line. The statistical analyses of the datasets are presented in Section 4.

In addition to evaluating BMP performance, the monitoring data have also been used in the site selection evaluations for consideration for enhancements to selected CMs for improved performance in areas where the effluent remains problematic. This was the case at CM-9 based on historical results, and upgradient improvements were added in 2013. Other examples of improvements include asphalt removal in the upper drainage area and filter fabric installation over the weir boards. For sites that were subject to such improvements impacting the quantity or quality of contributing runoff, separate graphs are shown for sample results that occurred before and after the improvements were made. At the B-1 media filter site, media washout was observed during initial sampling dates in the 2011/2012 reporting year. Results collected during this period were removed from the analysis. Additionally, preliminary samples were collected from the lower lot biofilter in 2012/2013 before the system was fully functional. These results were also removed from the complete analysis.

Monitoring data were first collected at the ELV treatment BMP during the 2013/2014 reporting year; since that was the first rain event that the system experienced. The monitoring data reflect media fines being washed from the system. In addition, during the February/March 2014 storm event, a plug in the storm drain under Helipad Road resulted in high flows from the Helipad Road being routed to the ELV sump and treatment system. Additionally, inadequate erosion controls along the earthen ELV channel resulted in sediment filling the sump, and a power outage resulted in the sump pump turning off. The influent-effluent pollutant concentration reduction performance of the ELV Treatment BMP is not expected to be affected by these conditions; however, the fraction of runoff volume captured from the ELV drainage area during each storm is expected to be reduced due to these factors. Although no overflow events as described previously were observed during the 2014/2015 reporting year, this plug was not removed for any storm events. Samples were not collected at the ELV treatment BMP during the 2018/2019 reporting year due to a long-term power failure associated with the Woolsey Fire, which destroyed the electrical infrastructure. To prevent future power outages at the ELV treatment location, a generator was added to the ELV system as the main power source, since electrical lines were not replaced in this area following the Woolsey Fire. A portable generator is also on hand for the biofilter cistern pump as a backup power supply.

With regards to the line plots, the BMP effectiveness during events having influent concentrations above the outfall Permit Limit is used as the performance criterion since any below the Permit Limit are already of acceptable quality and are generally considered to be at levels unlikely to be further reduced using typical stormwater controls. The data were also reviewed to document any concentration increases due to media failure or washout. As with most stormwater quality controls, the water quality percentage improvements are the most substantial when the influent concentrations are high. This is because it is difficult to further reduce low concentrations, due to equilibrium concentrations with the media, media washout, resuspension of silts, etc.

These charts are included for general visual assessment purposes only; the statistical tests in previous sections are used to make quantitative evaluations of BMP performance. It should be noted that the samples collected at the stormwater controls are all grab samples. Stormwater quality can be highly variable during storms and grab samples may represent collection times that vary throughout the storm event hydrograph. Therefore, relatively large numbers of samples for many storms are needed to represent the varying overall conditions with reasonable statistical confidence and power. The line and probability plots illustrate the influent and effluent variable concentrations.

Six CM effluent samples were collected during overflow/bypass conditions (over all reporting years) based on available field notes. These conditions are noted on the plots with red markers. No other sampling dates were noted as having overflows in the available field notes. In addition, observations of weir board overflows were collected starting in the 2011/2012 reporting year. It is unknown which prior samples, if any, were collected during overflow conditions. Sampling notes, which now more carefully track this information, have not noted any samples collected under overflow/bypass conditions since the 2011/2012 observations.

9.1 TSS Paired Line Plots



Figure 7. TSS at CM-1, pre filter fabric installation (filter fabric installed on 1/20/2012)



- Red markers indicate samples collected during weir board overflow





Note: - There are no Permit Limits designated for TSS therefore there are no Limits shown on this plot. - Red markers indicate samples collected during weir board overflow

Figure 9. TSS at CM-3³¹



Note: - There are no Permit Limits designated for TSS therefore there are no Limits shown on this plot.





Note: - There are no Permit Limits designated for TSS therefore there are no Limits shown on this plot.

Figure 11. TSS at CM-9, pre improvements (removal of A1LF asphalt [9/1/2011] and addition of CM weir board filter fabric [1/20/2012])

³¹ CM-3 was reconstructed midway through the 2019/2020 reporting year. The sampling event with weir board overflow (as shown by the red marker) occurred before CM reconstruction, and the two sampling events with increases in TSS concentration occurred following CM reconstruction and occurred when the influent TSS concentrations were very low.



Figure 12. TSS at CM-9, post improvements (removal of A1LF asphalt [9/1/2011] and addition of CM weir board filter fabric [1/20/2012])



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Figure 13. TSS at CM-11



- There are no Permit Limits designated for TSS therefore there are no Limits shown on this plot.





- There are no Permit Limits designated for TSS therefore there are no Limits shown on this plot.





- There are no Permit Limits designated for TSS therefore there are no Limits shown on this plot.

Figure 16. TSS at ELV Treatment BMP



Figure 17. TSS at Lower Lot Biofilter³²

³² A sample was not taken at the biofilter inlet (post-sedimentation basin) during the 2013/2014 sampling year due to the sample location being submerged and inaccessible. The biofilter outlet sample from the 2013/2014 reporting year reflects a mix of filtered underdrain flow and unfiltered overflow.



- There are no Permit Limits designated for TSS therefore there are no Limits shown on this plot.

Figure 18. TSS at Southern Detention Bioswale



Figure 19. TSS at Northern Detention Bioswale







Figure 21. TSS at Boeing Admin Area Inlet Filters

9.2 Dioxins Paired Line Plots



- 1E-12 ug/L is shown for ND TEQ results as this is in the range of the lowest reported TEQ results with DNQ excluded.





- Red markers indicate samples collected during weir board overflow





- Red markers indicate samples collected during weir board overflow

Figure 24. Dioxins at CM-3

³³ A leaking seal was noted at CM-1 on 3/3/2017. It is unclear if this condition was present during the 2/17/2017 sample that resulted in an exceedance of Permit Limits for dioxins. Additionally, unusually high influent concentrations were observed during some sampled events in recent reporting years. The road runoff diversion to CM-1 was constructed during 2017/2018, and sampling to characterize road runoff influent to CM-1 began in 2018/2019. Sampled events (during 2018/2019 and 2019/2020) where the road runoff location was sampled had higher influent dioxins concentrations. Therefore, the higher influent concentrations are likely due to road runoff contributions (which include several treated wood utility poles).



Note: - 1E-12 ug/L is shown for ND TEQ results as this is in the range of the lowest reported TEQ results with DNQ excluded.

Figure 25. Dioxins at CM-9, pre improvements (removal of A1LF asphalt [9/1/2011] and addition of CM weir board filter fabric [1/20/2012])



ers indicate samples collected during weir board overflow

Figure 26. Dioxins at CM-9, post improvements (removal of A1LF asphalt [9/1/2011] and addition of CM weir board filter fabric [1/20/2012])



Figure 27. Dioxins at CM-11



Figure 28. Dioxins at B-1 Media Filter (CM), pre curb cuts (curb cuts installed on 11/2/2012)



Figure 29. Dioxins at B-1 Media Filter (CM), post curb cuts (curb cuts installed on 11/2/2012)



Note: - 1E-12 ug/L is shown for ND TEQ results as this is in the range of the lowest reported TEQ results with DNQ excluded.

Figure 30. Dioxins at ELV Treatment BMP



Note: - 1E-12 ug/L is shown for ND TEQ results as this is in the range of the lowest reported TEQ results with DNQ excluded.

Figure 31. Dioxins at Lower Lot Biofilter³⁴



Note: - 1E-12 ug/L is shown for ND TEQ results as this is in the range of the lowest reported TEQ results with DNQ excluded.

Figure 32. Dioxins at Southern Detention Bioswale



- 1E-12 ug/L is shown for ND TEQ results as this is in the range of the lowest reported TEQ results with DNQ excluded.

Figure 33. Dioxins at Northern Detention Bioswale

³⁴ Effluent result from the 1/8/18 - 1/9/18 event is not consistent with past performance observed from the biofilter, therefore the performance and effluent concentrations will be evaluated during subsequent monitoring events to make sure the biofilter is performing as designed. Additionally, the effluent result from 12/6/2018 may have been due to a power outage resulting in manual pumping from the cistern to the sediment basin, which could have overloaded the biofilter.







Note: - 1E-12 ug/L is shown for ND TEQ results as this is in the range of the lowest reported TEQ results with DNQ excluded.

Figure 35. Dioxins at Boeing Admin Area Inlet Filters

9.3 Lead Paired Line Plots



Figure 36. Lead at CM-1, pre filter fabric installation (filter fabric installed on 1/20/2012)







Note: - Red markers indicate samples collected during weir board overflow

Figure 38. Lead at CM-3



Figure 39. Lead at CM-8



Figure 40. Lead at CM-9, pre improvements (removal of A1LF asphalt [9/1/2011] and addition of CM weir board filter fabric [1/20/2012])



Figure 41. Lead at CM-9, post improvements (removal of A1LF asphalt [9/1/2011] and addition of CM weir board filter fabric [1/20/2012])



Figure 42. Lead at B-1 Media Filter (CM), pre curb cuts (curb cuts installed on 11/2/2012)



Figure 43. Lead at B-1 Media Filter (CM), post curb cuts (curb cuts installed on 11/2/2012)



Figure 44. Lead at ELV Treatment BMP



Figure 45. Lead at Lower Lot Biofilter



Figure 46. Lead at Southern Detention Bioswale



Figure 47. Lead at Northern Detention Bioswale



Figure 48. Lead at Upper Lot Media Filter



Figure 49. Lead at Boeing Admin Area Inlet Filters

9.4 Copper Paired Line Plots



Figure 50. Copper at CM-1, post filter fabric installation (filter fabric installed on 1/20/2012)



Figure 51. Copper at CM-3



Figure 52. Copper at CM-9, pre improvements (removal of A1LF asphalt and addition of CM weir board filter fabric)



Figure 53. Copper at CM-9, post improvements (removal of A1LF asphalt [9/1/2011] and addition of CM weir board filter fabric [1/20/2012])















Figure 57. Copper at Lower Lot Biofilter



Figure 58. Copper at Southern Detention Bioswale³⁵



Figure 59. Copper at Northern Detention Bioswale¹⁵



Figure 60. Copper at Upper Lot Media Filter

³⁵ The Permit Limit does not apply to this location. No exceedances in Permit Limits for copper occurred at watershed 009 locations during the 2015/2016 reporting year.



Figure 61. Copper at Boeing Admin Area Inlet Filters

10. Influent v. Effluent Correlation Charts

Figure 63 through Figure 65 compare influent to effluent concentrations for the paired data presented above for CM/media filter sites (B-1, upper lot media filter, CM-3 [post 2017/2018], CM-9, and CM-1; CM-8, and CM-11 background sites are excluded). Correlation charts for the lower lot biofilter are shown in Figure 66 through Figure 68, Figure 69 through Figure 71 for the ELV treatment BMP, Figure 72 through Figure 74 for the detention bioswales, and Figure 75 through Figure 77 for the Boeing admin area inlet filters. The plots reflect the same data pairs used to represent the influent and effluent locations in the statistical analyses in the previous section. For example, the lower lot biofilter plots reflect influent runoff samples for the influent and sedimentation basin outlet samples for the effluent, while the detention bioswales plots show the influent location as the flow-weighted average of the rock crib swale outlet and runoff from the adjacent contractor laydown area. Similar to the paired line plots, points are shaded based on the sampling year during which they were collected, where black points represent data from the most recent 2020/2021 reporting year and data from all previous reporting years are shown as gray.

A least-squares regression was used to fit a line to log-transformed data (log(y) = m*log(x) + b). The resulting equation, including the slope of the lines, m, is shown in the least-squares regression equation in the upper left corner of the graph. In addition, the p-value is also shown to indicate the significance of the reported slope term. The null hypothesis is that the slope (m) is equal to 0. If the p-value is less than 0.05, the null hypothesis is rejected, which shows that the slope is non-zero and is statistically significant at the 95% confidence level. 1 minus the significant slope term also indicates the overall percentage reduction in concentrations (when multiplied by 100x). The p-value to indicate the significance of the reported y-intercept (also represented in the least-square regression equation) is also shown. If there is a significant y-intercept, the reduction varies for different influent concentrations; if the intercept is not significant, the reduction is the same irrespective of the influent concentrations.

A 1:1 line was also added to each plot. Data above the 1:1 line indicate an effluent increase in concentrations, while data below the 1:1 line indicate an effluent decrease in concentrations (or positive BMP performance). Additionally, the location where the 1:1 line intersects the best-fit line represents the irreducible concentration for each constituent (e.g. ~ 7 mg/L for TSS at CM sites). An example influent vs. effluent correlation plot, illustrating these concepts, is shown in Figure 62. Pairs where one or both results were not detected were included on these graphs with different symbols.



Figure 62. Example Influent vs. Effluent Correlation Plot

If the regression equations and associated ANOVA analyses indicate non-significant equation intercepts (p-value >0.05), the regressions were re-calculated with the intercept equal to zero, and this result is shown on the plots below (with the intercept p-value shown as N/A). This indicates that in general, the performance of the controls did not change by influent concentration (the percent reduction was constant). In some other cases, both the slope and intercept terms were not significant, and the regression is therefore also not significant. In this case, the effluent concentrations are not related to the influent concentrations, and the regression equation and p-values are not shown on the plots below.

10.1 CM/Media Filter Influent v. Effluent Correlation Charts



- Detected data pairs
- Influent not detected
 - Effluent not detected
- Both not detected
- 2009/2010 through 2019/2020
- 2020/2021
- 1:1 line
- --- Best-fit

Figure 63. Paired TSS Concentrations at CM/Media Filter Sites



- Detected data pairs
- ▽ Influent not detected
- Effluent not detected
- Both not detected
- 2009/2010 through 2019/2020
- 2020/2021
- 1:1 line
- --- Best-fit

Figure 64. Paired Dioxins Concentrations at CM/Media Filter Sites



- Detected data pairs
- ▽ Influent not detected
- Effluent not detected
- Both not detected
- 2009/2010 through 2019/2020
- 2020/2021
- 1:1 line
- --- Best-fit



10.2 Lower Lot Biofilter Influent v. Effluent Correlation Charts



Figure 66. Paired TSS Concentrations at Lower Lot Biofilter



Figure 67. Paired Dioxins Concentrations at Lower Lot Biofilter



- Detected data pairs
- v Influent not detected
- Effluent not detected
- Both not detected
- 2012/2013 through 2019/2020
- 2020/2021
- 1:1 line
- --- Best-fit





10.3 ELV Treatment BMP Influent v. Effluent Correlation Charts

- Detected data pairs
- v Influent not detected
- Effluent not detected
- Both not detected
- 2013/2014 through 2019/2020
- 1:1 line
- -- Best-fit

Figure 69. Paired TSS Concentrations at ELV Treatment BMP



• Detected data pairs

▽ Influent not detected

- Effluent not detected
- Both not detected
- 2013/2014 through 2019/2020
- 1:1 line
- -- Best-fit

Figure 70. Paired Dioxins Concentrations at ELV Treatment BMP



- Detected data pairs
- v Influent not detected
- Effluent not detected
- Both not detected
- 2013/2014 through 2019/2020
 - 1:1 line

-- Best-fit

Figure 71. Paired Lead Concentrations at ELV Treatment BMP

10.4 Detention Bioswales Influent v. Effluent Correlation Charts



Figure 72. Paired TSS Concentrations at Detention Bioswales


- Detected data pairs
- Influent not detected
- Effluent not detected
- Both not detected
- 2015/2016 through 2019/2020
- 2020/2021
 - 1:1 line

Figure 73. Paired Dioxins Concentrations at Detention Bioswales



- Detected data pairs
- Influent not detected
- Effluent not detected
- Both not detected
- 2015/2016 through 2019/2020
- 2020/2021
- 1:1 line
- -- Best-fit

Figure 74. Paired Lead Concentrations at Detention Bioswales













Figure 77. Paired Lead Concentrations at Boeing Admin Area Inlet Filters

11. Probability Plots

Probability plots for CM/media filter sites (B-1, upper lot media filter, CM-3 [post 2017/2018], CM-9, and CM-1, which excludes CM-8, and CM-11, due to the substantial flows that they receive from background areas) are shown in Figure 78 through Figure 80. Probability plots for the lower lot biofilter are shown in Figure 81 through Figure 83, and plots for the ELV treatment BMP are displayed in Figure 84 through Figure 86. Probability plots for the detention bioswales are displayed in Figure 97. These log-normal probability plots are prepared by ranking the available log-transformed data and calculating their probability of occurrence. These probability values (shown on the vertical axis) are plotted against their concurrent concentrations. While determining the plotting positions, non-detect (ND) data were assigned to the lowest positions, effectively truncating the probability plots at the fraction of non-detected samples. Therefore, only detected result positions are plotted, which leads to the correct probability of occurrences. These figures illustrate trends for influent concentrations as compared to effluent concentrations and vice versa and serve as a useful tool for predicting effluent concentrations at a given percentile.

These figures also contain some basic statistics describing the data shown on the graphs. For each influent and effluent dataset, the number of ND results is shown. The p-value resulting from an Anderson-Darling test for lognormal distributions is also shown. The Anderson-Darling test assesses if the data follows an examined distribution (p-values <0.05 indicate that the actual distribution is significantly different from log-normal distributions for these plots). The null hypothesis here is that the data comes from a lognormal distribution. If the p-value is less than 0.05, the null hypothesis is rejected, and it is concluded that the data are not lognormal distributed. The 95th percentile confidence intervals are also shown on the plots for both influent and effluent sample results. If all of the influent or effluent data points are located within the confidence interval and the p-value is greater than 0.05, one can be 95% confident that the lognormal distribution appears to fit the data fairly well, and the fitted line may be used to estimate concentrations at various percentiles.

Where influent data (blue circles) consistently fall above the effluent points (green squares), consistent water quality improvement is occurring at these areas. The vertical distance between the datasets (noting it is a log scale) also indicates the magnitude of the concentration change at these BMP types. Similar to previous plots, points are shaded based on the sampling year during which they were collected. Points that are shaded with blue or green represent data from the most recent 2020/2021 reporting year, while data from all previous reporting years are shown with blue or green outlined shapes but no fill.

The relative difference in the amount of scatter observed in these plots indicates that BMP effectiveness may vary depending on the location and constituent. These plots indicate the influent concentrations above which the BMPs are most effective (low concentrations are expected to represent concentrations unlikely to be significantly reduced by the BMP). The slope of the probability distribution also indicates the variability of the data. As an example, if the effluent slope is flatter than the influent slope, the control is reducing the variability of the effluent concentrations.





Figure 78. Log-normal Probability Plot of TSS at CM/Media Filter Locations



Figure 79. Log-normal Probability Plot of Dioxins at CM/Media Filter Locations



Figure 80. Log-normal Probability Plot of Lead at CM/Media Filter Locations

11.2 Lower Lot Biofilter Probability Plots



Figure 81. Log-normal Probability Plot of TSS at Lower Lot Biofilter



Figure 82. Log-normal Probability Plot of Dioxins at Lower Lot Biofilter



Figure 83. Log-normal Probability Plot of Lead at Lower Lot Biofilter

11.3 ELV Treatment BMP Probability Plots







Figure 85. Log-normal Probability Plot of Dioxins at ELV Treatment BMP



Figure 86. Log-normal Probability Plot of Lead at ELV Treatment BMP

11.4 Detention Bioswales Probability Plots



Figure 87. Log-normal Probability Plot of TSS at Detention Bioswales



Figure 88. Log-normal Probability Plot of Dioxins at Detention Bioswales



Figure 89. Log-normal Probability Plot of Lead at Detention Bioswales









Figure 91. Log-normal Probability Plot of Dioxins at the Boeing Admin Area Inlet Filters



Figure 92. Log-normal Probability Plot of Lead at the Boeing Admin Area Inlet Filters

12. Discussion and Observations

The following general observations were made based on an evaluation of the aforementioned data summary charts and tables.

1. Are the CMs/media filters continuing to reduce the concentrations of lead, dioxin, and TSS between the untreated influent and the treated effluent?

Yes. The CMs were originally installed as provisional (pending further evaluation) stormwater controls that could be installed in areas where existing culverts carried the stormwater below the roads. As a result, they handle a wide range of flows during a typical rain year and experience relatively short treatment residence times and the weirs overflow during average to large size storms. However, the performance monitoring results indicate that statistically significant pollutant concentration reductions are occurring for TSS, dioxins, and lead at the non-background CMs/media filters (i.e., CM-1, CM-9, B-1, and upper lot media filter) as a result of their sedimentation and media treatment unit processes. Effluent concentrations of TSS and lead were also lower than corresponding influent samples for the CM background locations (i.e., CM-8 and CM-11), with statistically significant pollutant removal observed for TSS and lead. This trend was not observed for dioxins at the CM background locations. However, a significant portion of the rain events (63%) had both influent and effluent sample results that were not detected. Monitoring results show that the CMs are reducing the concentrations of TSS, dioxins, and lead between the influent and effluent at both the non-background and background CMs (with the exception of dioxins at the background CMs).

2. Are the detention bioswales, Lower Lot Biofilter, and ELV Treatment BMPs continuing to reduce the concentrations of lead, dioxin, and TSS between the untreated influent and the treated effluent?

Generally. Cumulative performance monitoring data (as summarized by the statistical analysis tables, correlation charts, and probability plots) indicate that detention bioswales effluent concentrations were lower than corresponding influent samples for all COCs evaluated. Statistically significant pollutant removals were observed for all three COCs. Effluent concentrations were generally lower (compared to influent runoff) at the lower lot biofilter for dioxins, with statistically significant pollutant removal observed. In contrast, for lead and TSS, there were only slightly more data pairs with higher effluent results compared to data pairs with higher influent results for the biofilter (see additional discussion on question #4 of this section).

Data from the ELV Treatment BMP showed that the majority of sample pairs had lower effluent concentrations for dioxins and lead than corresponding influent samples, with statistical significance shown for both dioxins and lead. However, the majority of data pairs had higher effluent TSS concentrations than influent concentrations (with statistical significance). The ELV Treatment BMP was rebuilt recently to decrease the potential of media washout causing increased TSS in the effluent.

In addition, the number of results exceeding the Permit Limits for both the influent and effluent samples show an improvement in water quality between the untreated influent and the treated effluent, as described in the subsequent observation below.

3. Are the treatment controls continuing to aid in compliance with NPDES Permit Limits at Outfall 009?

Yes. Collectively, the treatment controls have resulted in water quality improvement and NPDES compliance at Outfall 009, where lead and dioxin compliance challenges persist. All COC-BMP combinations had fewer effluent concentration results above Permit Limits compared to the influent concentrations (with the exception of the Boeing admin area inlet filters for dioxins, which only had four influent and effluent data pairs available, and all influent and effluent results exceeded permit Limits). It is important to note that the discharge from the inlet filters flows to the lower lot biofilter for subsequent treatment. Most COC-BMP combinations also showed lower average and maximum exceedance ratios (i.e., exceeding sample concentrations divided by the Permit Limit) for effluent results compared to the influent results³⁶. These observations show that the treatment controls are improving storm water quality prior to reaching Outfall 009. For example, average influent exceedance ratios for CM-9 were 4.2 and 8.5 for lead and dioxins, respectively, while the average effluent exceedance ratios were reduced to 2.9 and 3.2 for lead and dioxins, respectively, during this same time period. This not only demonstrates that the treatment controls are reducing NPDES COC concentrations in stormwater upstream of Outfall 009, but that the treatment control drainage areas (which include paved roads) are pollutant generating source areas that, without treatment, would have worsened water quality at the downstream NPDES compliance location.

4. Is there a reason why some recent monitoring data at the lower lot biofilter have shown net increases in pollutant concentrations across the system compared to prior years?

Yes. As previously noted, dioxin reductions across the system have been consistent, as 28 out of 30 sample pairs decreased in dioxin concentrations from the influent runoff to the biofilter outlet (and one sample pair that did not result in a decrease in dioxins concentrations was from 2020/2021, when both the influent and effluent samples were non-detect). However, 18 of the 30 paired samples had higher influent concentrations than their paired effluent concentrations for TSS, and 16 of the 30 samples had larger influent concentrations for lead. It should first be noted that there are no applicable permit Limits for TSS for Outfall 009, only one effluent sample has exceeded permit Limits for lead (sample collected on 12/2/2014), and three effluent samples have exceeded permit Limits for dioxins. However, this pattern of net increases in lead concentrations (and in part, TSS concentrations) across the system can likely be attributed to the significantly lower influent concentrations to the lower lot biofilter in recent years. The B1436 detention bioswales, which were constructed in December 2014, slow and treat a portion of the drainage area which would have previously flowed to the lower lot biofilter. Significant pretreatment is being achieved by the detention bioswales, even though their primary purpose is to delay the influent runoff to the lower lot biofilter and reduce the portion of the total flow that bypasses the BMP during large storm events. As previously noted, the average volume pumped to the biofilter has increased since the detention bioswales were constructed. Similarly, the estimated percent of total runoff volume treated by the lower lot biofilter (from both the

³⁶ The only exceptions include the average exceedance ratio for lead at B-1 and dioxins for the Boeing Admin Area inlet filters (both average and maximum exceedance ratio).

24-inch drain and the lower lot drainage areas) has increased since the detention bioswales were constructed. The average influent TSS concentration to the Lower Lot biofilter for samples collected before or during December 2014 was 109 mg/L, and the average for samples collected after December 2014 was 18 mg/L. This trend of significantly lower TSS influent concentrations following construction of the detention bioswales was also observed for lead, where the average influent lead concentration before and after construction of the detention bioswales was 8.0 μ g/L and 2.0 μ g/L, respectively. The average effluent concentrations of both TSS and lead were lower in post-detention bioswale samples when compared to pre-detention bioswale samples (i.e., 41 mg/L vs. 17 mg/L for TSS and 4.0 µg/L vs. 1.8 µg/L for lead). The number of sample pairs with higher effluent concentrations than their paired influent concentrations for TSS and lead can be explained by the significant reduction in average influent concentrations to the Lower Lot biofilter since construction of the detention bioswales. It is usually not possible to reduce low TSS influent concentrations compared to high TSS influent concentrations, especially with pre-treatment that has already removed the larger particles, leaving only small particles that are difficult to remove due to sedimentation and filtering in the media. Additionally, scour or leaching of previous captured material may also be contributing to this observation.

5. Is the lower lot biofilter continuing to prevent stormwater runoff from discharging to the Northern Drainage?

Yes. Monitoring data at the lower lot biofilter were examined to determine its ability to prevent smaller storms from discharging to the Northern Drainage. The lower lot biofilter successfully prevented just over half of all storms less than or equal to one inch originating in the lower lot tributary area from discharging to the Northern Drainage, which flows to Outfall 009.

6. Has an adequate number of samples been collected such that sampling can be potentially discontinued at some locations?

Yes. Following the 2016/2017 reporting year, the Expert Panel evaluated the need for continued sampling at the BMPs. It was decided that in the context of reduced site activities (e.g., reduced construction, demolition, etc.) anticipated for the 2017/2018 and later reporting years in the Outfall 009 watershed, samples would only be collected twice per year at the following BMPs: upper lot media filter, southern detention bioswale, lower lot biofilter, CM-1 (influent-west and effluent), and the ELV Treatment BMP. Two background locations are planned to continue to be sampled during every storm, in order to collect more background data. The Panel has committed to revisiting the monitoring frequency when Outfall 009 watershed site activities increase. It should be noted that long-term monitoring is needed to examine when media clogging occurs (so maintenance can be performed when needed).

7. Is significant maintenance currently required for any of the BMPs?

No. Replacement of media at CM-9 is recommended soon, due to the observed ponding during the 2018/2019 and 2020/2021 reporting years and estimated sediment loading until maintenance is needed. Additionally, it is estimated that CM-3 may need maintenance in the near future. Recent data have shown evidence of solids export through the underdrain of the ELV treatment BMP, based on the dioxins particulate strength decreasing through the media layer. The drainage layers and filter media in the ELV Treatment BMP were rebuilt in summer

2021, and the ELV treatment BMP will continue to be investigated to better understand the recent performance. The cumulative TSS loadings to the ELV Treatment BMP, lower lot biofilter, B-1 media filter, upper lot media filter, CM-1, and CM-9 were investigated and compared to the estimated value of cumulative sediment loading to the media before maintenance is needed (Pitt and Clark, 2010). The ELV Treatment BMP, lower lot biofilter, and upper lot media filter were only 0.1%, 3.6%, and 6.3%, respectively, towards requiring maintenance, and it was estimated that maintenance due to sediment clogging would not be needed for at least 30 years, assuming average rainfall years. This long maintenance interval is due to significant pretreatment of the stormwater before the media treatment at those locations. Cumulative solids loadings at B-1 were estimated to be 13% towards lab-based thresholds of media clogging, and initial maintenance is expected to be needed in approximately 23 years. However, calculations showed that CM-1 reached the cumulative sediment loading where maintenance was needed (136%) during the 2017/2018 reporting year based on lab measurements of cumulative solids loading until media clogging. Some bypass/overflow potentially associated with media clogging at CM-1 was also observed during the 2016/2017 reporting year. Due to the estimated sediment loading and ponding observations, CM-1 was reconstructed, and the media replaced in August 2018. CM-1 was estimated to be 13% towards lab-based thresholds of media clogging (post reconstruction), and initial maintenance is expected to be needed in approximately 16 years. Cumulative solids loadings at CM-9 were estimated to be 59% towards media clogging, and initial maintenance is expected to be needed in approximately five years, assuming average rainfall years. Ponding was observed at CM-9 during several storm events during the 2018/2019 reporting year. However, ponding was not observed (at any of the CMs) during the 2019/2020 or 2020/2021 reporting years, after 72 hours following storm events. Although the cumulative TSS loading analysis did not evaluate the other CMs, based on a comparison of their pervious drainage areas compared to CM-1 and CM-9, it is estimated that CM-3 may need maintenance in the near future. It should be noted that each BMP was observed (72 hours post storm event) during three storm events during 2019/2020. The Expert Panel recommends that observations of clogging, overflow, and underdrain flows should continue to be taken at BMPs -- stage recorders may also be used -- during storms when performance samples are collected (to confirm that underdrains are functioning properly and bypass through weir boards is not occurring) as well as following storms (to confirm that extended ponding is not occurring) so that this consideration is tracked and timely maintenance can be performed when needed.

8. Is pollutant removal performance deteriorating at any BMPs?

No. Based on long-term monitoring results of all BMPs, effluent concentrations tracked the influent concentrations, with no significant differences with time. Changes in influent concentrations due to altered site conditions had the strongest impact on effluent trends, however all effluent concentrations remained low (Pitt et al 2021 and Pitt et al 2022) Based on these observations, it is not likely that chemical breakthrough occurred at any of the media treatment systems at SSFL.

13. References

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