

**City of Morro Bay and  
Cayucos Sanitary District**

**OFFSHORE MONITORING  
AND REPORTING PROGRAM**

**RESIDUAL BIOSOLIDS  
CHEMICAL ANALYSIS RESULTS**

**AUGUST 2019**



**Marine Research Specialists**  
4744 Telephone Rd Ste 3 PMB 315  
Ventura, California 93003

**Report to**  
**City of Morro Bay and**  
**Cayucos Sanitary District**

**955 Shasta Avenue**  
**Morro Bay, California 93442**  
**(805) 772-6272**

**MONITORING**  
**AND**  
**REPORTING PROGRAM**

**ANNUAL BIOSOLIDS REPORT**

**CHEMICAL ANALYSIS RESULTS**

**August 2019**

**Prepared by**

**Douglas A. Coats**

**Marine Research Specialists**

**4744 Telephone Rd Ste 3 PMB 315**  
**Ventura, California 93003**

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**September 2019**

**marine research specialists**  
4744 Telephone Rd., Suite 3 PMB 315 · Ventura, CA 93003 · (805) 644-1180

John Gunderlock  
Wastewater Treatment & Collection Systems Supervisor  
City of Morro Bay  
955 Shasta Avenue  
Morro Bay, CA 93442

18 September 2019

**Reference: Chemical Analysis Results for Biosolid Samples Collected in August 2019**

Dear Mr. Gunderlock:

Enclosed are the results of chemical analyses conducted on a representative composite of biosolid subsamples collected from the drying beds on 28 August 2019. Also included in this report are pertinent QA/QC data, including chains of custody and analyses of method blanks and spikes. All analyses were conducted following the requirements<sup>a</sup> set forth in Order Number R3-2017-0050 of NPDES discharge Permit Number CA0047881.

Based on a comparison between measured chemical concentrations in the composite sample and applicable State and Federal regulations, the biosolids amassed in 2019 are not considered hazardous waste, and are deemed suitable for land application. A summary of the analytical results is presented in Table 1. As in prior years, only a few of the more than 150 compounds analyzed in the composite sample were detected at quantifiable concentrations, and all detected chemicals had concentrations well below the applicable standards. Bulk trace-metal concentrations measured in the August-2019 samples were comparable to concentrations measured in most samples collected annually from 1999 through 2018.<sup>b</sup>

All trace-metal concentrations measured in the August-2019 sample were below Total Threshold Limit Concentrations (TTLC) that would designate them as hazardous under federal regulations.<sup>c</sup> Similarly, dry-weight concentrations for all the metals were well below the federally mandated limits, including the monthly limits for biosolids suitable for land application. One metal, copper, had a bulk wet-weight concentration that exceeded ten-times the Soluble Threshold Limit Concentration (STLC). As a result, the required waste extraction test (WET) was conducted on this compound. The test indicated that the soluble concentration of copper was only one-tenth of the applicable STLC limit that would designate the biosolids as hazardous within the State of California. Lead's bulk wet-weight concentration (17 mg/kg) was less than ten-times its STLC (50), but the laboratory performed a WET on it anyway. No quantifiable soluble concentration of lead was found.

The consistent presence of low but detectable metal concentrations within the biosolids was expected. Many of the metals occur naturally in the mineralogy of ambient sediments within the central coast region. As a result, their presence in bulk biosolid samples was anticipated because sediments enter the collection system through runoff. Some of the metals also enter the collection system through internal corrosion of household plumbing systems, which accounts for their regular presence at low concentrations within effluent samples.

Other compounds listed in Table 1 further characterize the biosolids as specified in the waste discharge requirements.

Please contact the undersigned if you have any questions regarding these results.

Sincerely,

Douglas A. Coats  
Program Manager

Enclosure (Three Report Copies)

**Table 1. Summary of Results for Biosolids Analyses**

Constituent	Units	Wet Weight				Dry Weight		
		Measured		Limit		Measured	Limit	
		Bulk <sup>d</sup>	WET <sup>e</sup>	STLC <sup>f</sup>	TTL <sup>g</sup>	Bulk	Monthly <sup>h</sup>	Ceiling <sup>i</sup>
Solids	%	81.9	— <sup>j</sup>	—	—	—	—	—
Total Dissolved Solids	ppm	—	7,200.	—	—	—	—	—
Cyanide	ppm	3.4	—	—	—	4.1	—	—
Antimony	ppm	≈2.1 <sup>k</sup>	—	15.	500.	≈2.6	—	—
Arsenic	ppm	3.1	—	5.	500.	3.8	41.	75.
Barium	ppm	190.	—	100.	10,000.	240.	—	—
Beryllium	ppm	ND <sup>l</sup>	—	0.75	75.	ND	—	—
Boron	ppm	17.	—	—	—	21.	—	—
Cadmium	ppm	1.2	—	1.	100.	1.5	39.	85.
Chromium (Total)	ppm	30.	—	560.	2,500.	37.	1,200.	3,000.
Chromium (Hexavalent)	ppm	≈0.64	ND	5.	500.	≈0.78	—	—
Cobalt	ppm	≈2.5	—	80.	8,000.	≈3.0	—	—
Copper	ppm	270.	2.5	25.	2,500.	330.	1,500.	4,300.
Lead	ppm	17.	≈0.18	5.	1,000.	21.	300.	840.
Mercury	ppm	0.85	—	0.2	20.	1.00	17.	57.
Molybdenum	ppm	9.3	—	350.	3,500.	11.	18.	75.
Nickel	ppm	22.	—	20.	2,000.	27.	420.	420.
Selenium	ppm	2.1	—	1.	100.	2.5	36.	100.
Silver	ppm	1.2	—	5.	500.	1.5	—	—
Thallium	ppm	ND	—	7.	700.	ND	—	—
Vanadium	ppm	15.	—	24.	2,400.	18.	—	—
Zinc	ppm	760.	—	250.	5,000.	920.	2,800.	7,500.
Hydrogen-Ion	pH	6.60	—	—	—	—	—	—
Phosphate	mg/kg	69,000.	—	—	—	84,000.	—	—
Ammonia	mg/kg	8,600.	—	—	—	10,000.	—	—
TKN	mg/kg	32,000.	—	—	—	39,000.	—	—
Organic Nitrogen <sup>m</sup>	mg/kg	23,400.	—	—	—	29,000.	—	—
Nitrate as NO <sub>3</sub>	mg/kg	470.	—	—	—	580.	—	—
Oil & Grease	ppm	26,000.	—	—	—	32,000.	—	—

<sup>a</sup> Although Method EPA-8240 did not explicitly test for the presence of 2-chloroethyl vinyl ether (2-CEVE), a detectable concentration of this analyte would be reported as one of the Method's Tentatively Identified Compounds (TICs). As described in the Laboratory Report's *Case Narrative*, 2-CEVE was not detected in the August-2019 composite biosolids sample.

<sup>b</sup> Marine Research Specialists (MRS). 1999 through 2018. City of Morro Bay and Cayucos Sanitary District, Residual Biosolids Chemical Analysis Results. Prepared for the City of Morro Bay and Cayucos Sanitary District, Morro Bay, CA. <http://www.morro-bay.ca.us/Archive.aspx?ADID=4607>

<sup>c</sup> U.S. Government Printing Office (USGPO). 1997b. Code of Federal Regulations. Environmental Protection. Standards for the use or disposal of Sewage Sludge, Land Application, Pollutant Limits. Chapter 40, Part 503, Subpart B. 1 July 1997 edition.

<sup>d</sup> The total wet-weight concentration (mg/kg) within a bulk biosolid sample consisting of the entire millable solid matrix rather than just the leachate.

<sup>e</sup> Waste Extraction Tests (WET) measure the soluble leachate (mg/L) or the extractable amount of a substance contained within a bulk sample of biosolids. A WET is indicated if the bulk wet-weight concentration of a contaminant in a biosolids sample exceeds ten times the STLC.

<sup>f</sup> Soluble Threshold Limit Concentrations (STLC) apply to the measured concentration in the liquid extract from a biosolid sample, as determined by a WET. Biosolids with leachate concentrations exceeding the STLC are classified as hazardous in the State of California as described in the California Code of Regulations (CCR), Title 22, Chapter 11: *Identification and Listing of Hazardous Waste*.

- 
- <sup>g</sup> Total Threshold Limit Concentrations (TTLC) apply to the total wet-weight concentration of a contaminant (mg/kg) within a bulk biosolid sample. Biosolids are designated as hazardous wastes in the State of California if measured bulk concentrations exceed the TTLC as described in the CCRs, *op. cit.*
- <sup>h</sup> Federally mandated dry-weight limits imposed on biosolids suitable for application on agricultural land apply to monthly average concentrations as defined in Table 3 of the Code of Federal Regulations (CFRs). *Environmental Protection. Standards for the use or disposal of Sewage Sludge, Land Application, Pollutant Limits*. Chapter 40, Part 503, Subpart B [40 CFR §503.13(b)(1)].
- <sup>i</sup> Federally mandated dry-weight ceiling concentrations above which biosolids are considered hazardous waste as defined in Table 1 of the CFRs, *op. cit.*
- <sup>j</sup> “—” indicates that the measurement was not required or its limit was not specified.
- <sup>k</sup> “≈” indicates the reported concentration was too low to be reliably quantified.
- <sup>l</sup> “ND” indicates that the measurement was not detected in concentrations exceeding the method detection limit.
- <sup>m</sup> The amount of nitrogen as reported by TKN excluding ammonia



Date of Report: 09/18/2019

John Gunderlock

Marine Research Specialists

4744 Telephone Rd

Ste 3-315

Suite A

Ventura, CA 93003-3238

Client Project: [none]

BCL Project: Biosolids from MBWWTP

BCL Work Order: 1928899

Invoice ID: B354959

Enclosed are the results of analyses for samples received by the laboratory on 8/28/2019. If you have any questions concerning this report, please feel free to contact me.

Revised Report: This report supercedes Report ID 1000939775

Sincerely,

Contact Person: Christina Herndon  
Client Service Rep

Authorized Signature

Certifications: CA ELAP #1186; NV #CA00014; OR ELAP #4032-001; AK UST101

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## Case Narratives

### Case Narrative for Work Order 1928899

2-CVE can only be reported as a TIC (Tentatively Identified Compound). 2-CVE was not found as a TIC for lab number 1928899.



Environmental Testing Laboratory Since 1949

*[Handwritten signature]*

Chain of Custody and Cooler Receipt Form for 1928899 Page 1 of 5

**BC LABORATORIES**

4100 Atlas Court Bakersfield, Ca. 93308  
(661) 327-4911 • FAX (661) 327-1918 • www.bclabs.com

**Chain of Custody**

\* Required Fields

19-28899

TEMP: \_\_\_\_\_

Client/Company Name * <b>City of Morro Bay</b>		Report Attention * <b>John Gunderlock</b>		Phone * #: _____ FAX * #: _____		E-mail: <b>jpgunderlock@morrobayca.gov</b>		ANALYSIS REQUESTED																																	
Address * <b>955 Shasta Avenue</b>				City * <b>Morro Bay</b>		State * <b>CA</b>		Zip * <b>93442</b>		Carbon Copies: CDHS <input type="checkbox"/> Fresno Co <input type="checkbox"/> EPA <input type="checkbox"/> Merced Co <input type="checkbox"/> Tulare Co <input type="checkbox"/> Other: _____		Moisture [EPA 160.3 or BC]	TDS, mod. STLC [EPA 160.1]	CAM 17 metals + Boron	TKN [EPA 351.2]	Ammonia as N [EPA 350.1]	Nitrate as NO3 [EPA 300.0]	Total Phosphate [EPA 365.4]	Total Cyanide [EPA 9012]	pH [EPA 9045 or 150.1]																					
Project Information: <b>2019 Biosolids Monitoring</b>				PO # _____		BCI Quote # _____		Regulatory Compliance Electronic Data Transfer: Y <input type="checkbox"/> N <input checked="" type="checkbox"/> System No. * _____																																	
How would you like your completed results sent? <input checked="" type="checkbox"/> E-Mail <input type="checkbox"/> Fax <input type="checkbox"/> EDD <input type="checkbox"/> Mail Only																																									
Sampler Name Printed / Signature <i>John Gunderlock</i>				QC Request <input type="checkbox"/> STD <input checked="" type="checkbox"/> Level II		Result Request ** Surcharge <input checked="" type="checkbox"/> STD <input type="checkbox"/> 5 Day** <input type="checkbox"/> 2 Day** <input type="checkbox"/> 1 Day**																																			
Matrix Types: RSW = Raw Surface Water CFW = Clarified Finished Water CWW = Chlorinated Waste Water BW = Bottled Water RGW = Raw Ground Water FW = Finished Water WW = Waste Water SW = Storm Water DW = Drinking Water SD = Solid																																									
Sample #	# Bottles	Sampled		Sample Description / Location *				Matrix *	Comments / Station Code																																
1	4	8/28/19	10:15	Composite Biosolids				Sludge																																	
										<table border="1"> <tr> <td>CHK BY</td> <td colspan="7">DISTRIBUTION</td> </tr> <tr> <td><i>[Signature]</i></td> <td colspan="7"><i>[Signature]</i></td> </tr> <tr> <td></td> <td colspan="7">SUB OUT</td> </tr> </table>								CHK BY	DISTRIBUTION							<i>[Signature]</i>	<i>[Signature]</i>								SUB OUT						
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Relinquished by: (Signature and Printed Name) <i>John Gunderlock</i>				Company <b>City of Morro Bay</b>		Date <b>8/28/19</b>		Time <b>13:34</b>		Received by: (Signature and Print Name) <i>Heidi Braun</i>				Company <i>Bclabs</i>																											
Relinquished by: (Signature and Printed Name) <i>Heidi Braun</i>				Company <i>Bclabs</i>		Date <b>8/28/19</b>		Time <b>2:15</b>		Received by: (Signature and Print Name)				Company																											
Received for Lab by: (Signature and Printed Name) <i>Gunderlock</i>				Date <b>8/28/19</b>		Time <b>2:15</b>		Payment Received at Delivery:																																	
Shipping Method: <b>CAO UPS GSO WALK-IN SJVC FED EX OTHER</b>				Cooling Method: <b>WET BLUE NONE</b>				Packing Material:				Date: _____ Amount: _____ Check/Cash/Card PIA # _____ Init. _____																													

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314-017-0211-10/10

Report ID: 1000940348  
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Page 4 of 55





City of Morro Bay

Chain of Custody Form (Addenda)

Page 3 of 4

Analysis and Reporting for the Biosolids Sample from the Morro Bay Wastewater Treatment Plant<sup>a</sup>

19-28899

Analysis <sup>b</sup>	Method
Level IIA QC	
Waste Extraction Tests on Copper <sup>c</sup> (CCR Title 22, Article 11)	STLC (6010)
Moisture	EPA 160.3 or BC
Total Dissolved Solids (TDS)	Modified Waste Extraction Test (STLC) EPA 160.1
<b>CAM-17 Metals and Boron<sup>d</sup></b>	
Antimony (Sb)	6010
Arsenic (As)	6010
Barium (Ba)	6010
Beryllium (Be)	6010
Boron (B)	6010
Cadmium (Cd)	6010
Total Chromium (Cr)	6010
Cobalt (Co)	6010
Copper (Cu)	6010
Lead (Pb)	6010
Mercury (Hg)	7471
Molybdenum (Mo)	6010
Nickel (Ni)	6010
Selenium (Se)	6010
Silver (Ag)	6010
Thallium (Tl)	6010
Vanadium (Va)	6010
Zinc (Zn)	6010
Total Kjeldahl Nitrogen (TKN) <sup>d</sup>	EPA 351.2
Ammonia as N <sup>d</sup>	EPA 230.1

<sup>a</sup> Treatment plant personnel are coordinating with Jerry Mason regarding the existing bottle inventory at the plant and need for additional sample containers. They will also select a suitable date to coincide with regular courier pickups in August.

<sup>b</sup> Prior to analysis, homogenize the composite sample in the laboratory to ensure uniform distribution of multiple subsamples in the sample container(s).

<sup>c</sup> Other metals may need to be WET tested depending on their bulk concentrations (e.g. lead, mercury).

<sup>d</sup> Sample results to be reported on an 'as received' and 'dry basis.'

<sup>e</sup> Report 2-CEVE non-detects in the case narrative as an absence of an associated Tentatively Identified Compound (TIC), as has been the case for biosolids reporting in the past.

<sup>f</sup> Modified-extraction, using DI water to extract not citric acid.

Page 3 of 4



City of Morro Bay

Chain of Custody Form (Addenda)

Page 4 of 4

Analysis <sup>b</sup>	Method
Nitrate as NO <sub>3</sub> <sup>d</sup>	EPA 300.0 or 353.2
Total Phosphate <sup>d</sup>	EPA 365.4
Total Cyanide <sup>d</sup>	EPA 9012
pH	EPA 9045 or 150.1
Oil and Grease	EPA 1664
Semi-volatile Organics	EPA 8270/625
Pesticides	EPA 8081 A
PCBs	EPA 8082
Volatile Organics – Low Level; report all EPA priority pollutants not reported Under other methods (including acrolein, acrylonitrile, and 2-chloroethyl vinyl ether <sup>e</sup> )	EPA 8240/624
Hexavalent Chromium (Total) <sup>d</sup>	EPA 7196
Hexavalent Chromium <sup>f</sup>	Modified Waste Extraction

19-28899

Page 4 of 4

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Marine Research Specialists  
4744 Telephone Rd  
Ste 3-315  
Suite A  
Ventura, CA 93003-3238

**Reported:** 09/18/2019 11:14  
**Project:** Biosolids from MBWWTP  
**Project Number:** [none]  
**Project Manager:** John Gunderlock

### Laboratory / Client Sample Cross Reference

Laboratory	Client Sample Information			
1928899-01	<b>COC Number:</b>	---	<b>Receive Date:</b>	08/28/2019 21:15
	<b>Project Number:</b>	---	<b>Sampling Date:</b>	08/28/2019 10:15
	<b>Sampling Location:</b>	---	<b>Sample Depth:</b>	---
	<b>Sampling Point:</b>	Composite Biosolids	<b>Lab Matrix:</b>	Solids
	<b>Sampled By:</b>	John Gunderlock	<b>Sample Type:</b>	Other

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Marine Research Specialists  
4744 Telephone Rd  
Ste 3-315  
Suite A  
Ventura, CA 93003-3238

**Reported:** 09/18/2019 11:14  
**Project:** Biosolids from MBWWTP  
**Project Number:** [none]  
**Project Manager:** John Gunderlock

### Organochlorine Pesticides (EPA Method 8081A)

BCL Sample ID:	1928899-01	Client Sample Name:	Composite Biosolids, 8/28/2019 10:15:00AM, John Gunderlock						
Constituent	Dry Basis Result	As Recvd Result	Units	As Received		Method	MB Bias	Lab Quals	Run #
				PQL	MDL				
Aldrin	ND	ND	mg/kg	0.12	0.020	EPA-8081A	ND	A10	1
alpha-BHC	ND	ND	mg/kg	0.12	0.017	EPA-8081A	ND	A10	1
beta-BHC	ND	ND	mg/kg	0.12	0.017	EPA-8081A	ND	A10	1
delta-BHC	ND	ND	mg/kg	0.12	0.012	EPA-8081A	ND	A10	1
gamma-BHC (Lindane)	ND	ND	mg/kg	0.12	0.011	EPA-8081A	ND	A10	1
Chlordane (Technical)	ND	ND	mg/kg	12	0.65	EPA-8081A	ND	A10	1
4,4'-DDD	ND	ND	mg/kg	0.12	0.023	EPA-8081A	ND	A10	1
4,4'-DDE	ND	ND	mg/kg	0.12	0.016	EPA-8081A	ND	A10	1
4,4'-DDT	ND	ND	mg/kg	0.12	0.017	EPA-8081A	ND	A10	1
Dieldrin	ND	ND	mg/kg	0.12	0.019	EPA-8081A	ND	A10	1
Endosulfan I	ND	ND	mg/kg	0.12	0.017	EPA-8081A	ND	A10	1
Endosulfan II	ND	ND	mg/kg	0.12	0.018	EPA-8081A	ND	A10	1
Endosulfan sulfate	ND	ND	mg/kg	0.12	0.015	EPA-8081A	ND	A10	1
Endrin	ND	ND	mg/kg	0.12	0.0072	EPA-8081A	ND	A10	1
Endrin aldehyde	ND	ND	mg/kg	0.12	0.020	EPA-8081A	ND	A10	1
Heptachlor	ND	ND	mg/kg	0.12	0.0099	EPA-8081A	ND	A10	1
Heptachlor epoxide	ND	ND	mg/kg	0.12	0.014	EPA-8081A	ND	A10	1
Methoxychlor	ND	ND	mg/kg	0.12	0.042	EPA-8081A	ND	A10	1
Toxaphene	ND	ND	mg/kg	12	0.48	EPA-8081A	ND	A10	1
TCMX (Surrogate)	66.1	66.1	%	20 - 130 (LCL - UCL)		EPA-8081A		A10	1
Decachlorobiphenyl (Surrogate)	94.0	94.0	%	40 - 130 (LCL - UCL)		EPA-8081A		A10	1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-8081A	09/04/19 13:00	09/05/19 10:11	HKS	GC-17	230.77	B056311

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Marine Research Specialists  
4744 Telephone Rd  
Ste 3-315  
Suite A  
Ventura, CA 93003-3238

**Reported:** 09/18/2019 11:14  
**Project:** Biosolids from MBWWTP  
**Project Number:** [none]  
**Project Manager:** John Gunderlock

### PCB Analysis (EPA Method 8082)

BCL Sample ID:	1928899-01	Client Sample Name:	Composite Biosolids, 8/28/2019 10:15:00AM, John Gunderlock						
Constituent	Dry Basis Result	As Recvd Result	Units	As Received		Method	MB Bias	Lab Quals	Run #
				PQL	MDL				
PCB-1016	ND	ND	mg/kg	1.2	0.22	EPA-8082	ND	A10	1
PCB-1221	ND	ND	mg/kg	1.2	0.37	EPA-8082	ND	A10	1
PCB-1232	ND	ND	mg/kg	1.2	0.33	EPA-8082	ND	A10	1
PCB-1242	ND	ND	mg/kg	1.2	0.22	EPA-8082	ND	A10	1
PCB-1248	ND	ND	mg/kg	1.2	0.24	EPA-8082	ND	A10	1
PCB-1254	ND	ND	mg/kg	1.2	0.53	EPA-8082	ND	A10	1
PCB-1260	ND	ND	mg/kg	1.2	0.20	EPA-8082	ND	A10	1
Total PCB's (Summation)	ND	ND	mg/kg	1.2	0.58	EPA-8082	ND	A10	1
Decachlorobiphenyl (Surrogate)	75.0	75.0	%	40 - 120 (LCL - UCL)		EPA-8082		A10	1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-8082	09/04/19 14:00	09/05/19 12:02	HKS	GC-14	115.38	B056340

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4744 Telephone Rd  
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Ventura, CA 93003-3238

Reported: 09/18/2019 11:14  
Project: Biosolids from MBWWTP  
Project Number: [none]  
Project Manager: John Gunderlock

### Volatile Organic Analysis (EPA Method 8240)

BCL Sample ID:	1928899-01	Client Sample Name:	Composite Biosolids, 8/28/2019 10:15:00AM, John Gunderlock							
Constituent	Dry Basis Result	As Recvd Result	Units	As Received		Method	MB Bias	Lab Quals	Run #	
				PQL	MDL					
Benzene	ND	ND	mg/kg	0.010	0.0026	EPA-8240	ND	A10	1	
Bromodichloromethane	ND	ND	mg/kg	0.010	0.0017	EPA-8240	ND	A10	1	
Bromoform	ND	ND	mg/kg	0.010	0.0030	EPA-8240	ND	A10	1	
Bromomethane	ND	ND	mg/kg	0.010	0.0032	EPA-8240	ND	A10	1	
Carbon tetrachloride	ND	ND	mg/kg	0.010	0.0022	EPA-8240	ND	A10	1	
Chlorobenzene	ND	ND	mg/kg	0.010	0.0026	EPA-8240	ND	A10	1	
Chloroethane	ND	ND	mg/kg	0.010	0.0028	EPA-8240	ND	A10	1	
Chloroform	ND	ND	mg/kg	0.010	0.0013	EPA-8240	ND	A10	1	
Chloromethane	ND	ND	mg/kg	0.010	0.0028	EPA-8240	ND	A10	1	
Dibromochloromethane	ND	ND	mg/kg	0.010	0.0020	EPA-8240	ND	A10	1	
1,2-Dichlorobenzene	ND	ND	mg/kg	0.010	0.0016	EPA-8240	ND	A10	1	
1,3-Dichlorobenzene	ND	ND	mg/kg	0.010	0.0028	EPA-8240	ND	A10	1	
1,4-Dichlorobenzene	ND	ND	mg/kg	0.010	0.0030	EPA-8240	ND	A10	1	
1,1-Dichloroethane	ND	ND	mg/kg	0.010	0.0028	EPA-8240	ND	A10	1	
1,2-Dichloroethane	ND	ND	mg/kg	0.010	0.0017	EPA-8240	ND	A10	1	
1,1-Dichloroethene	ND	ND	mg/kg	0.010	0.0024	EPA-8240	ND	A10	1	
trans-1,2-Dichloroethene	ND	ND	mg/kg	0.010	0.0028	EPA-8240	ND	A10	1	
1,2-Dichloropropane	ND	ND	mg/kg	0.010	0.0016	EPA-8240	ND	A10	1	
cis-1,3-Dichloropropene	ND	ND	mg/kg	0.010	0.0022	EPA-8240	ND	A10	1	
trans-1,3-Dichloropropene	ND	ND	mg/kg	0.010	0.0024	EPA-8240	ND	A10	1	
Ethylbenzene	ND	ND	mg/kg	0.010	0.0030	EPA-8240	ND	A10	1	
Methylene chloride	ND	ND	mg/kg	0.020	0.0048	EPA-8240	ND	A10	1	
Methyl t-butyl ether	ND	ND	mg/kg	0.010	0.0010	EPA-8240	ND	A10	1	
1,1,2,2-Tetrachloroethane	ND	ND	mg/kg	0.010	0.0022	EPA-8240	ND	A10	1	
Tetrachloroethene	ND	ND	mg/kg	0.010	0.0026	EPA-8240	ND	A10	1	
<b>Toluene</b>	0.0044	0.0036	<b>mg/kg</b>	<b>0.010</b>	<b>0.0024</b>	<b>EPA-8240</b>	ND	<b>J,A10</b>	1	
1,1,1-Trichloroethane	ND	ND	mg/kg	0.010	0.0022	EPA-8240	ND	A10	1	
1,1,2-Trichloroethane	ND	ND	mg/kg	0.010	0.0015	EPA-8240	ND	A10	1	
Trichloroethene	ND	ND	mg/kg	0.010	0.0022	EPA-8240	ND	A10	1	
Trichlorofluoromethane	ND	ND	mg/kg	0.010	0.0022	EPA-8240	ND	A10	1	
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	ND	mg/kg	0.010	0.0026	EPA-8240	ND	A10	1	

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**Reported:** 09/18/2019 11:14  
**Project:** Biosolids from MBWWTP  
**Project Number:** [none]  
**Project Manager:** John Gunderlock

### Volatile Organic Analysis (EPA Method 8240)

BCL Sample ID:	1928899-01	Client Sample Name:	Composite Biosolids, 8/28/2019 10:15:00AM, John Gunderlock						
Constituent	Dry Basis Result	As Recvd Result	Units	As Received		Method	MB Bias	Lab Quals	Run #
				PQL	MDL				
Vinyl chloride	ND	ND	mg/kg	0.010	0.0032	EPA-8240	ND	A10	1
<b>Total Xylenes</b>	0.018	0.015	<b>mg/kg</b>	<b>0.020</b>	<b>0.0068</b>	<b>EPA-8240</b>	ND	<b>J,A10</b>	<b>1</b>
Acrolein	ND	ND	mg/kg	0.10	0.015	EPA-8240	ND	A10	1
Acrylonitrile	ND	ND	mg/kg	0.040	0.0094	EPA-8240	ND	A10	1
1,2-Dichloroethane-d4 (Surrogate)	122	122	%	70 - 121 (LCL - UCL)		EPA-8240		A19,S09	1
Toluene-d8 (Surrogate)	84.1	84.1	%	81 - 117 (LCL - UCL)		EPA-8240			1
4-Bromofluorobenzene (Surrogate)	74.5	74.5	%	74 - 121 (LCL - UCL)		EPA-8240			1
<b>TIC: 2-Butanone</b>	0.45	0.37	<b>mg/kg</b>			<b>EPA-8240</b>		<b>A10</b>	<b>1</b>
<b>TIC: 2-Methylbutanal</b>	0.21	0.17	<b>mg/kg</b>			<b>EPA-8240</b>		<b>A10</b>	<b>1</b>
<b>TIC: 2-Methylpropanal</b>	0.16	0.13	<b>mg/kg</b>			<b>EPA-8240</b>		<b>A10</b>	<b>1</b>
<b>TIC: 2-Nonanone</b>	0.11	0.090	<b>mg/kg</b>			<b>EPA-8240</b>		<b>A10</b>	<b>1</b>
<b>TIC: 3-Methylbutanal</b>	0.42	0.35	<b>mg/kg</b>			<b>EPA-8240</b>		<b>A10</b>	<b>1</b>
<b>TIC: Acetone</b>	0.62	0.51	<b>mg/kg</b>			<b>EPA-8240</b>		<b>A10</b>	<b>1</b>
<b>TIC: Benzonitrile</b>	0.22	0.18	<b>mg/kg</b>			<b>EPA-8240</b>		<b>A10</b>	<b>1</b>
<b>TIC: Dimethyl disulfide</b>	0.28	0.23	<b>mg/kg</b>			<b>EPA-8240</b>		<b>A10</b>	<b>1</b>

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-8240	08/30/19 09:00	08/30/19 17:06	BYM	MS-V3	2	B056001

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Reported: 09/18/2019 11:14  
Project: Biosolids from MBWWTP  
Project Number: [none]  
Project Manager: John Gunderlock

### Base Neutral and Acid Extractables Organic Analysis (EPA Method 8270C)

BCL Sample ID:	1928899-01	Client Sample Name:	Composite Biosolids, 8/28/2019 10:15:00AM, John Gunderlock						
Constituent	Dry Basis Result	As Recvd Result	Units	As Received PQL	As Received MDL	Method	MB Bias	Lab Quals	Run #
Acenaphthene	ND	ND	mg/kg	17	1.1	EPA-8270C	ND	A01	1
Acenaphthylene	ND	ND	mg/kg	17	1.1	EPA-8270C	ND	A01	1
Aldrin	ND	ND	mg/kg	17	1.1	EPA-8270C	ND	A01	1
Aniline	ND	ND	mg/kg	34	1.9	EPA-8270C	ND	A01	1
Anthracene	ND	ND	mg/kg	17	1.1	EPA-8270C	ND	A01	1
Benzdine	ND	ND	mg/kg	510	1.6	EPA-8270C	ND	A01	1
Benzo[a]anthracene	ND	ND	mg/kg	17	1.3	EPA-8270C	ND	A01	1
Benzo[b]fluoranthene	ND	ND	mg/kg	17	1.1	EPA-8270C	ND	A01	1
Benzo[k]fluoranthene	ND	ND	mg/kg	17	1.4	EPA-8270C	ND	A01	1
Benzo[a]pyrene	ND	ND	mg/kg	17	1.1	EPA-8270C	ND	A01	1
Benzo[g,h,i]perylene	ND	ND	mg/kg	17	2.2	EPA-8270C	ND	A01	1
<b>Benzoic acid</b>	<b>66</b>	<b>54</b>	<b>mg/kg</b>	<b>86</b>	<b>2.4</b>	<b>EPA-8270C</b>	ND	<b>J,A01</b>	<b>1</b>
Benzyl alcohol	ND	ND	mg/kg	17	1.1	EPA-8270C	ND	A01	1
Benzyl butyl phthalate	ND	ND	mg/kg	17	1.1	EPA-8270C	ND	A01	1
alpha-BHC	ND	ND	mg/kg	17	1.1	EPA-8270C	ND	A01	1
beta-BHC	ND	ND	mg/kg	17	1.3	EPA-8270C	ND	A01	1
delta-BHC	ND	ND	mg/kg	17	1.1	EPA-8270C	ND	A01	1
gamma-BHC (Lindane)	ND	ND	mg/kg	17	1.1	EPA-8270C	ND	A01	1
bis(2-Chloroethoxy)methane	ND	ND	mg/kg	17	1.1	EPA-8270C	ND	A01	1
bis(2-Chloroethyl) ether	ND	ND	mg/kg	17	1.7	EPA-8270C	ND	A01	1
bis(2-Chloroisopropyl)ether	ND	ND	mg/kg	17	1.1	EPA-8270C	ND	A01	1
<b>bis(2-Ethylhexyl)phthalate</b>	<b>27</b>	<b>22</b>	<b>mg/kg</b>	<b>34</b>	<b>1.1</b>	<b>EPA-8270C</b>	ND	<b>J,A01</b>	<b>1</b>
4-Bromophenyl phenyl ether	ND	ND	mg/kg	17	1.1	EPA-8270C	ND	A01	1
4-Chloroaniline	ND	ND	mg/kg	17	2.6	EPA-8270C	ND	A01	1
2-Chloronaphthalene	ND	ND	mg/kg	17	1.1	EPA-8270C	ND	A01	1
4-Chlorophenyl phenyl ether	ND	ND	mg/kg	17	1.1	EPA-8270C	ND	A01	1
Chrysene	ND	ND	mg/kg	17	1.1	EPA-8270C	ND	A01	1
4,4'-DDD	ND	ND	mg/kg	17	1.1	EPA-8270C	ND	A01	1
4,4'-DDE	ND	ND	mg/kg	17	1.2	EPA-8270C	ND	A01	1
4,4'-DDT	ND	ND	mg/kg	17	1.1	EPA-8270C	ND	A01	1
Dibenzo[a,h]anthracene	ND	ND	mg/kg	17	1.1	EPA-8270C	ND	A01	1

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**Reported:** 09/18/2019 11:14  
**Project:** Biosolids from MBWWTP  
**Project Number:** [none]  
**Project Manager:** John Gunderlock

## Base Neutral and Acid Extractables Organic Analysis (EPA Method 8270C)

BCL Sample ID:	1928899-01		Client Sample Name:	Composite Biosolids, 8/28/2019 10:15:00AM, John Gunderlock					
Constituent	Dry Basis Result	As Recvd Result	Units	As Received PQL	As Received MDL	Method	MB Bias	Lab Quals	Run #
Dibenzofuran	ND	ND	mg/kg	17	1.1	EPA-8270C	ND	A01	1
1,2-Dichlorobenzene	ND	ND	mg/kg	17	1.1	EPA-8270C	ND	A01	1
1,3-Dichlorobenzene	ND	ND	mg/kg	17	1.1	EPA-8270C	ND	A01	1
1,4-Dichlorobenzene	ND	ND	mg/kg	17	1.1	EPA-8270C	ND	A01	1
3,3-Dichlorobenzidine	ND	ND	mg/kg	34	1.1	EPA-8270C	ND	A01	1
Dieldrin	ND	ND	mg/kg	17	1.3	EPA-8270C	ND	A01	1
Diethyl phthalate	ND	ND	mg/kg	17	1.1	EPA-8270C	ND	A01	1
Dimethyl phthalate	ND	ND	mg/kg	17	1.1	EPA-8270C	ND	A01	1
Di-n-butyl phthalate	ND	ND	mg/kg	17	1.1	EPA-8270C	ND	A01	1
2,4-Dinitrotoluene	ND	ND	mg/kg	17	1.5	EPA-8270C	ND	A01	1
2,6-Dinitrotoluene	ND	ND	mg/kg	17	1.1	EPA-8270C	ND	A01	1
Di-n-octyl phthalate	ND	ND	mg/kg	17	1.1	EPA-8270C	ND	A01	1
1,2-Diphenylhydrazine	ND	ND	mg/kg	17	1.1	EPA-8270C	ND	A01	1
Endosulfan I	ND	ND	mg/kg	34	1.5	EPA-8270C	ND	A01	1
Endosulfan II	ND	ND	mg/kg	34	1.5	EPA-8270C	ND	A01	1
Endosulfan sulfate	ND	ND	mg/kg	17	1.1	EPA-8270C	ND	A01	1
Endrin	ND	ND	mg/kg	34	1.5	EPA-8270C	ND	A01	1
Endrin aldehyde	ND	ND	mg/kg	86	1.2	EPA-8270C	ND	A01	1
<b>Fluoranthene</b>	3.6	2.9	<b>mg/kg</b>	<b>17</b>	<b>1.1</b>	<b>EPA-8270C</b>	ND	<b>J,A01</b>	<b>1</b>
Fluorene	ND	ND	mg/kg	17	1.1	EPA-8270C	ND	A01	1
Heptachlor	ND	ND	mg/kg	17	1.1	EPA-8270C	ND	A01	1
Heptachlor epoxide	ND	ND	mg/kg	17	2.2	EPA-8270C	ND	A01	1
Hexachlorobenzene	ND	ND	mg/kg	17	1.1	EPA-8270C	ND	A01	1
Hexachlorobutadiene	ND	ND	mg/kg	17	1.1	EPA-8270C	ND	A01	1
Hexachlorocyclopentadiene	ND	ND	mg/kg	17	2.6	EPA-8270C	ND	A01	1
Hexachloroethane	ND	ND	mg/kg	17	1.1	EPA-8270C	ND	A01	1
Indeno[1,2,3-cd]pyrene	ND	ND	mg/kg	17	1.2	EPA-8270C	ND	A01	1
Isophorone	ND	ND	mg/kg	17	1.1	EPA-8270C	ND	A01	1
2-Methylnaphthalene	ND	ND	mg/kg	17	1.1	EPA-8270C	ND	A01	1
Naphthalene	ND	ND	mg/kg	17	1.1	EPA-8270C	ND	A01	1
2-Naphthylamine	ND	ND	mg/kg	510	6.2	EPA-8270C	ND	A01	1

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**Reported:** 09/18/2019 11:14  
**Project:** Biosolids from MBWWTP  
**Project Number:** [none]  
**Project Manager:** John Gunderlock

## Base Neutral and Acid Extractables Organic Analysis (EPA Method 8270C)

BCL Sample ID: 1928899-01		Client Sample Name: Composite Biosolids, 8/28/2019 10:15:00AM, John Gunderlock							
Constituent	Dry Basis	As Recvd	Units	As Received		Method	MB Bias	Lab Quals	Run #
	Result	Result		PQL	MDL				
2-Nitroaniline	ND	ND	mg/kg	17	1.1	EPA-8270C	ND	A01	1
3-Nitroaniline	ND	ND	mg/kg	34	1.1	EPA-8270C	ND	A01	1
4-Nitroaniline	ND	ND	mg/kg	34	1.9	EPA-8270C	ND	A01	1
Nitrobenzene	ND	ND	mg/kg	17	1.1	EPA-8270C	ND	A01	1
N-Nitrosodimethylamine	ND	ND	mg/kg	17	6.8	EPA-8270C	ND	A01	1
N-Nitrosodi-N-propylamine	ND	ND	mg/kg	17	1.1	EPA-8270C	ND	A01	1
N-Nitrosodiphenylamine	ND	ND	mg/kg	17	1.1	EPA-8270C	ND	A01	1
<b>Phenanthrene</b>	1.9	1.5	<b>mg/kg</b>	<b>17</b>	<b>1.1</b>	<b>EPA-8270C</b>	ND	<b>J,A01</b>	1
<b>Pyrene</b>	3.1	2.6	<b>mg/kg</b>	<b>17</b>	<b>1.1</b>	<b>EPA-8270C</b>	ND	<b>J,A01</b>	1
1,2,4-Trichlorobenzene	ND	ND	mg/kg	17	1.1	EPA-8270C	ND	A01	1
4-Chloro-3-methylphenol	ND	ND	mg/kg	34	1.1	EPA-8270C	ND	A01	1
2-Chlorophenol	ND	ND	mg/kg	17	1.1	EPA-8270C	ND	A01	1
2,4-Dichlorophenol	ND	ND	mg/kg	17	1.1	EPA-8270C	ND	A01	1
2,4-Dimethylphenol	ND	ND	mg/kg	17	1.1	EPA-8270C	ND	A01	1
4,6-Dinitro-2-methylphenol	ND	ND	mg/kg	86	1.1	EPA-8270C	ND	A01	1
2,4-Dinitrophenol	ND	ND	mg/kg	86	1.1	EPA-8270C	ND	A01	1
2-Methylphenol	ND	ND	mg/kg	17	1.1	EPA-8270C	ND	A01	1
3- & 4-Methylphenol	ND	ND	mg/kg	34	2.4	EPA-8270C	ND	A01	1
2-Nitrophenol	ND	ND	mg/kg	17	1.1	EPA-8270C	ND	A01	1
4-Nitrophenol	ND	ND	mg/kg	34	3.1	EPA-8270C	ND	A01	1
Pentachlorophenol	ND	ND	mg/kg	34	2.9	EPA-8270C	ND	A01	1
Phenol	ND	ND	mg/kg	17	1.1	EPA-8270C	ND	A01	1
2,4,5-Trichlorophenol	ND	ND	mg/kg	34	1.9	EPA-8270C	ND	A01	1
2,4,6-Trichlorophenol	ND	ND	mg/kg	34	1.1	EPA-8270C	ND	A01	1
2-Fluorophenol (Surrogate)	66.7	66.7	%	20 - 130 (LCL - UCL)		EPA-8270C		A01	1
Phenol-d5 (Surrogate)	65.5	65.5	%	30 - 130 (LCL - UCL)		EPA-8270C		A01	1
Nitrobenzene-d5 (Surrogate)	84.6	84.6	%	30 - 130 (LCL - UCL)		EPA-8270C		A01	1
2-Fluorobiphenyl (Surrogate)	87.3	87.3	%	30 - 140 (LCL - UCL)		EPA-8270C		A01	1
2,4,6-Tribromophenol (Surrogate)	82.5	82.5	%	20 - 150 (LCL - UCL)		EPA-8270C		A01	1
p-Terphenyl-d14 (Surrogate)	83.4	83.4	%	30 - 150 (LCL - UCL)		EPA-8270C		A01	1

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**Reported:** 09/18/2019 11:14  
**Project:** Biosolids from MBWWTP  
**Project Number:** [none]  
**Project Manager:** John Gunderlock

### Base Neutral and Acid Extractables Organic Analysis (EPA Method 8270C)

<b>BCL Sample ID:</b> 1928899-01	<b>Client Sample Name:</b> Composite Biosolids, 8/28/2019 10:15:00AM, John Gunderlock							
Run #	Method	Prep Date	Run Date/Time		Analyst	Instrument	Dilution	QC Batch ID
1	EPA-8270C	09/04/19 11:00	09/06/19	12:35	MK1	MS-B1	171.18	B056202

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**Reported:** 09/18/2019 11:14  
**Project:** Biosolids from MBWWTP  
**Project Number:** [none]  
**Project Manager:** John Gunderlock

### EPA Method 1664

<b>BCL Sample ID:</b> 1928899-01	<b>Client Sample Name:</b> Composite Biosolids, 8/28/2019 10:15:00AM, John Gunderlock								
<b>Constituent</b>	<b>Dry Basis Result</b>	<b>As Recvd Result</b>	<b>Units</b>	<b>As Received</b>		<b>Method</b>	<b>MB Bias</b>	<b>Lab Quals</b>	<b>Run #</b>
Oil and Grease	32000	26000	mg/kg	<b>PQL</b> 250	<b>MDL</b> 79	EPA-1664A HEM	ND		1

Run #	Method	Prep Date	Run		Analyst	Instrument	Dilution	QC	
			Date/Time					Batch ID	
1	EPA-1664A HEM	09/03/19 09:00	09/03/19 09:00		MAM	MAN-SV	4.950	B056137	

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**Reported:** 09/18/2019 11:14  
**Project:** Biosolids from MBWWTP  
**Project Number:** [none]  
**Project Manager:** John Gunderlock

### Chemical Analysis

BCL Sample ID:	1928899-01	Client Sample Name:	Composite Biosolids, 8/28/2019 10:15:00AM, John Gunderlock						
Constituent	Dry Basis Result	As Recvd Result	Units	As Received PQL	As Received MDL	Method	MB Bias	Lab Quals	Run #
Moisture	0	18.1	%	0.05	0.05	Calc	ND		1
Total Cyanide	4.1	3.4	mg/kg	0.50	0.17	EPA-9012	ND		2
pH	6.60	6.60	pH Units	0.05	0.05	EPA-9045D		pH1:3	3
pH Measurement Temperature	22.0	22.0	C	0.1	0.1	EPA-9045D			3
Nitrate as NO3	580	470	mg/kg	4.4	1.2	EPA-300.0	ND		4
Total Kjeldahl Nitrogen	39000	32000	mg/kg	4000	960	EPA-351.2	ND	A07	5
Ammonia as N	10000	8600	mg/kg	400	130	EPA-350.1	ND	A07	6
Total Phosphate	84000	69000	mg/kg	3000	470	EPA-365.4	ND	A07	7
Solids	100	81.9	%	0.05	0.05	SM-2540G			8

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	Calc	08/30/19 10:01	09/04/19 17:01	AMM	Calc	1	BJH0408
2	EPA-9012	09/10/19 10:26	09/10/19 14:13	MC1	KONE-1	0.980	B056560
3	EPA-9045D	09/12/19 10:00	09/12/19 10:00	RT1	MANUAL	1	B056814
4	EPA-300.0	09/03/19 10:25	09/04/19 22:48	SAV	IC1	1	B055959
5	EPA-351.2	09/12/19 21:00	09/14/19 02:18	EMM	SC-1	100	B056886
6	EPA-350.1	09/11/19 09:33	09/12/19 12:05	JMH	SC-2	18.868	B056684
7	EPA-365.4	09/12/19 21:00	09/13/19 15:53	JMH	SC-1	100	B056887
8	SM-2540G	09/04/19 10:15	09/04/19 10:15	DRC	MANUAL	1	B056099

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**Reported:** 09/18/2019 11:14  
**Project:** Biosolids from MBWWTP  
**Project Number:** [none]  
**Project Manager:** John Gunderlock

### Modified WET Test (STLC)

<b>BCL Sample ID:</b> 1928899-01	<b>Client Sample Name:</b> Composite Biosolids, 8/28/2019 10:15:00AM, John Gunderlock								
<b>Constituent</b>	<b>Dry Basis Result</b>	<b>As Recvd Result</b>	<b>Units</b>	<b>As Received</b>		<b>Method</b>	<b>MB Bias</b>	<b>Lab Quals</b>	<b>Run #</b>
Hexavalent Chromium		ND	mg/L	0.20	0.070	EPA-7196	ND		1
<b>Total Dissolved Solids @ 180 C</b>		7200	mg/L	<b>500</b>	<b>250</b>	<b>EPA-160.1</b>	250		2

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-7196	09/06/19 10:13	09/06/19 10:34	MC1	KONE-1	1	B056584
2	EPA-160.1	09/06/19 09:00	09/06/19 09:00	CAD	MANUAL	50	B056207

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**Reported:** 09/18/2019 11:14  
**Project:** Biosolids from MBWWTP  
**Project Number:** [none]  
**Project Manager:** John Gunderlock

### WET Test (STLC)

<b>BCL Sample ID:</b> 1928899-01	<b>Client Sample Name:</b> Composite Biosolids, 8/28/2019 10:15:00AM, John Gunderlock
----------------------------------	---

Constituent	Dry Basis	As Recvd	Units	As Received		Method	MB Bias	Lab Quals	Run #
	Result	Result		PQL	MDL				
Copper		2.5	mg/L	0.10	0.012	EPA-6010B	ND		1
Lead		0.18	mg/L	0.50	0.16	EPA-6010B	ND	J	1

Run #	Method	Prep Date	Run		Analyst	Instrument	Dilution	QC	
			Date/Time					Batch ID	
1	EPA-6010B	09/09/19 12:30	09/09/19 14:26		JCC	PE-OP3	1	B056415	

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**Project:** Biosolids from MBWWTP  
**Project Number:** [none]  
**Project Manager:** John Gunderlock

### Total Concentrations (TTLIC)

BCL Sample ID:	1928899-01	Client Sample Name:	Composite Biosolids, 8/28/2019 10:15:00AM, John Gunderlock						
Constituent	Dry Basis Result	As Recvd Result	Units	As Received PQL	MDL	Method	MB Bias	Lab Quals	Run #
Antimony	2.6	2.1	mg/kg	10	0.66	EPA-6010B	ND	J,A07	1
Arsenic	3.8	3.1	mg/kg	2.0	0.80	EPA-6010B	ND	A07	1
Barium	240	190	mg/kg	1.0	0.36	EPA-6010B	ND	A07	1
Beryllium	ND	ND	mg/kg	1.0	0.094	EPA-6010B	ND	A07	1
Cadmium	1.5	1.2	mg/kg	1.0	0.10	EPA-6010B	ND	A07	1
Chromium	37	30	mg/kg	1.0	0.10	EPA-6010B	0.10	A07	1
Total Hexavalent Chromium	0.78	0.64	mg/kg	1.0	0.30	EPA-7199	ND	J	2
Cobalt	3.0	2.5	mg/kg	5.0	0.20	EPA-6010B	ND	J,A07	1
Copper	330	270	mg/kg	2.0	0.10	EPA-6010B	0.15	A07	1
Lead	21	17	mg/kg	5.0	0.56	EPA-6010B	ND	A07	1
Mercury	1.0	0.85	mg/kg	0.16	0.019	EPA-7471A	ND		3
Molybdenum	11	9.3	mg/kg	5.0	0.10	EPA-6010B	ND	A07	1
Nickel	27	22	mg/kg	1.0	0.30	EPA-6010B	ND	A07	1
Selenium	2.5	2.1	mg/kg	2.0	2.0	EPA-6010B	ND	A07	1
Silver	1.5	1.2	mg/kg	1.0	0.13	EPA-6010B	ND	A07	1
Thallium	ND	ND	mg/kg	10	1.3	EPA-6010B	ND	A07	1
Vanadium	18	15	mg/kg	1.0	0.22	EPA-6010B	ND	A07	1
Zinc	920	760	mg/kg	5.0	0.17	EPA-6010B	0.38	A07	1
Boron	21	17	mg/kg	10	1.0	EPA-6010B	1.8	A07	1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-6010B	09/03/19 09:30	09/06/19 11:04	JCC	PE-OP3	1.923	B056269
2	EPA-7199	09/09/19 09:15	09/11/19 13:33	SAV	IC-4	1	B056428
3	EPA-7471A	09/03/19 10:30	09/03/19 12:48	TMT	CETAC3	1.008	B055960

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**Reported:** 09/18/2019 11:14  
**Project:** Biosolids from MBWWTP  
**Project Number:** [none]  
**Project Manager:** John Gunderlock

## Organochlorine Pesticides (EPA Method 8081A)

### Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
<b>QC Batch ID: B056311</b>						
Aldrin	B056311-BLK1	ND	mg/kg	0.00050	0.000087	
alpha-BHC	B056311-BLK1	ND	mg/kg	0.00050	0.000073	
beta-BHC	B056311-BLK1	ND	mg/kg	0.00050	0.000074	
delta-BHC	B056311-BLK1	ND	mg/kg	0.00050	0.000050	
gamma-BHC (Lindane)	B056311-BLK1	ND	mg/kg	0.00050	0.000046	
Chlordane (Technical)	B056311-BLK1	ND	mg/kg	0.050	0.0028	
4,4'-DDD	B056311-BLK1	ND	mg/kg	0.00050	0.000099	
4,4'-DDE	B056311-BLK1	ND	mg/kg	0.00050	0.000071	
4,4'-DDT	B056311-BLK1	ND	mg/kg	0.00050	0.000074	
Dieldrin	B056311-BLK1	ND	mg/kg	0.00050	0.000083	
Endosulfan I	B056311-BLK1	ND	mg/kg	0.00050	0.000073	
Endosulfan II	B056311-BLK1	ND	mg/kg	0.00050	0.000079	
Endosulfan sulfate	B056311-BLK1	ND	mg/kg	0.00050	0.000064	
Endrin	B056311-BLK1	ND	mg/kg	0.00050	0.000031	
Endrin aldehyde	B056311-BLK1	ND	mg/kg	0.00050	0.000088	
Heptachlor	B056311-BLK1	ND	mg/kg	0.00050	0.000043	
Heptachlor epoxide	B056311-BLK1	ND	mg/kg	0.00050	0.000060	
Methoxychlor	B056311-BLK1	ND	mg/kg	0.00050	0.00018	
Toxaphene	B056311-BLK1	ND	mg/kg	0.050	0.0021	
<b>TCMX (Surrogate)</b>	<b>B056311-BLK1</b>	<b>85.3</b>	<b>%</b>	<b>20 - 130 (LCL - UCL)</b>		
<b>Decachlorobiphenyl (Surrogate)</b>	<b>B056311-BLK1</b>	<b>90.4</b>	<b>%</b>	<b>40 - 130 (LCL - UCL)</b>		

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**Reported:** 09/18/2019 11:14  
**Project:** Biosolids from MBWWTP  
**Project Number:** [none]  
**Project Manager:** John Gunderlock

## Organochlorine Pesticides (EPA Method 8081A)

### Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits		Lab	Quals
								Percent Recovery	RPD		
<b>QC Batch ID: B056311</b>											
Aldrin	B056311-BS1	LCS	0.0048365	0.0050676	mg/kg	95.4		70 - 130			
gamma-BHC (Lindane)	B056311-BS1	LCS	0.0045405	0.0050676	mg/kg	89.6		60 - 140			
4,4'-DDT	B056311-BS1	LCS	0.0055591	0.0050676	mg/kg	110		60 - 140			
Dieldrin	B056311-BS1	LCS	0.0048828	0.0050676	mg/kg	96.4		70 - 130			
Endrin	B056311-BS1	LCS	0.0054750	0.0050676	mg/kg	108		60 - 140			
Heptachlor	B056311-BS1	LCS	0.0050432	0.0050676	mg/kg	99.5		60 - 140			
TCMX (Surrogate)	B056311-BS1	LCS	0.0094605	0.010135	mg/kg	93.3		20 - 130			
Decachlorobiphenyl (Surrogate)	B056311-BS1	LCS	0.018702	0.020270	mg/kg	92.3		40 - 130			

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**Project Number:** [none]  
**Project Manager:** John Gunderlock

## Organochlorine Pesticides (EPA Method 8081A)

### Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Control Limits		Lab Quals
								Percent Recovery	RPD	
<b>QC Batch ID: B056311</b>		Used client sample: N								
Aldrin	MS	1927434-47	ND	0.0049186	0.0050847	mg/kg		96.7		50 - 140
	MSD	1927434-47	ND	0.0048223	0.0050676	mg/kg	2.0	95.2	30	50 - 140
gamma-BHC (Lindane)	MS	1927434-47	ND	0.0046129	0.0050847	mg/kg		90.7		50 - 140
	MSD	1927434-47	ND	0.0045311	0.0050676	mg/kg	1.8	89.4	30	50 - 140
4,4'-DDT	MS	1927434-47	ND	0.0053136	0.0050847	mg/kg		104		50 - 140
	MSD	1927434-47	ND	0.0050601	0.0050676	mg/kg	4.9	99.9	30	50 - 140
Dieldrin	MS	1927434-47	ND	0.0049288	0.0050847	mg/kg		96.9		40 - 140
	MSD	1927434-47	ND	0.0048041	0.0050676	mg/kg	2.6	94.8	30	40 - 140
Endrin	MS	1927434-47	ND	0.0053502	0.0050847	mg/kg		105		50 - 150
	MSD	1927434-47	ND	0.0051831	0.0050676	mg/kg	3.2	102	30	50 - 150
Heptachlor	MS	1927434-47	ND	0.0050736	0.0050847	mg/kg		99.8		60 - 140
	MSD	1927434-47	ND	0.0049747	0.0050676	mg/kg	2.0	98.2	30	60 - 140
TCMX (Surrogate)	MS	1927434-47	ND	0.0095502	0.010169	mg/kg		93.9		20 - 130
	MSD	1927434-47	ND	0.0094111	0.010135	mg/kg	1.5	92.9		20 - 130
Decachlorobiphenyl (Surrogate)	MS	1927434-47	ND	0.018650	0.020339	mg/kg		91.7		40 - 130
	MSD	1927434-47	ND	0.018008	0.020270	mg/kg	3.5	88.8		40 - 130

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**Reported:** 09/18/2019 11:14  
**Project:** Biosolids from MBWWTP  
**Project Number:** [none]  
**Project Manager:** John Gunderlock

### PCB Analysis (EPA Method 8082)

#### Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
<b>QC Batch ID: B056340</b>						
PCB-1016	B056340-BLK1	ND	mg/kg	0.010	0.0019	
PCB-1221	B056340-BLK1	ND	mg/kg	0.010	0.0032	
PCB-1232	B056340-BLK1	ND	mg/kg	0.010	0.0029	
PCB-1242	B056340-BLK1	ND	mg/kg	0.010	0.0019	
PCB-1248	B056340-BLK1	ND	mg/kg	0.010	0.0021	
PCB-1254	B056340-BLK1	ND	mg/kg	0.010	0.0046	
PCB-1260	B056340-BLK1	ND	mg/kg	0.010	0.0017	
Total PCB's (Summation)	B056340-BLK1	ND	mg/kg	0.010	0.0050	
<b>Decachlorobiphenyl (Surrogate)</b>	<b>B056340-BLK1</b>	<b>78.3</b>	<b>%</b>	<b>40 - 120 (LCL - UCL)</b>		

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**Project:** Biosolids from MBWWTP  
**Project Number:** [none]  
**Project Manager:** John Gunderlock

### PCB Analysis (EPA Method 8082)

#### Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits		Lab
								Percent Recovery	RPD	
<b>QC Batch ID: B056340</b>										
PCB-1016	B056340-BS1	LCS	0.070034	0.084175	mg/kg	83.2		60 - 120		
PCB-1260	B056340-BS1	LCS	0.072054	0.084175	mg/kg	85.6		60 - 120		
Decachlorobiphenyl (Surrogate)	B056340-BS1	LCS	0.015488	0.020202	mg/kg	76.7		40 - 120		

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**Project Number:** [none]  
**Project Manager:** John Gunderlock

### PCB Analysis (EPA Method 8082)

#### Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits		Lab
									RPD	Percent Recovery	
<b>QC Batch ID: B056340</b>		Used client sample: N									
PCB-1016	MS	1929016-01	ND	0.069536	0.082781	mg/kg		84.0		60 - 120	
	MSD	1929016-01	ND	0.069831	0.084746	mg/kg	0.4	82.4	30	60 - 120	
PCB-1260	MS	1929016-01	ND	0.068543	0.082781	mg/kg		82.8		60 - 120	
	MSD	1929016-01	ND	0.071525	0.084746	mg/kg	4.3	84.4	30	60 - 120	
Decachlorobiphenyl (Surrogate)	MS	1929016-01	ND	0.014901	0.019868	mg/kg		75.0		40 - 120	
	MSD	1929016-01	ND	0.015254	0.020339	mg/kg	2.3	75.0		40 - 120	

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**Project Number:** [none]  
**Project Manager:** John Gunderlock

## Volatile Organic Analysis (EPA Method 8240)

### Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
<b>QC Batch ID: B056001</b>						
Benzene	B056001-BLK1	ND	mg/kg	0.0050	0.0013	
Bromodichloromethane	B056001-BLK1	ND	mg/kg	0.0050	0.00084	
Bromoform	B056001-BLK1	ND	mg/kg	0.0050	0.0015	
Bromomethane	B056001-BLK1	ND	mg/kg	0.0050	0.0016	
Carbon tetrachloride	B056001-BLK1	ND	mg/kg	0.0050	0.0011	
Chlorobenzene	B056001-BLK1	ND	mg/kg	0.0050	0.0013	
Chloroethane	B056001-BLK1	ND	mg/kg	0.0050	0.0014	
Chloroform	B056001-BLK1	ND	mg/kg	0.0050	0.00063	
Chloromethane	B056001-BLK1	ND	mg/kg	0.0050	0.0014	
Dibromochloromethane	B056001-BLK1	ND	mg/kg	0.0050	0.00099	
1,2-Dichlorobenzene	B056001-BLK1	ND	mg/kg	0.0050	0.00081	
1,3-Dichlorobenzene	B056001-BLK1	ND	mg/kg	0.0050	0.0014	
1,4-Dichlorobenzene	B056001-BLK1	ND	mg/kg	0.0050	0.0015	
1,1-Dichloroethane	B056001-BLK1	ND	mg/kg	0.0050	0.0014	
1,2-Dichloroethane	B056001-BLK1	ND	mg/kg	0.0050	0.00085	
1,1-Dichloroethene	B056001-BLK1	ND	mg/kg	0.0050	0.0012	
trans-1,2-Dichloroethene	B056001-BLK1	ND	mg/kg	0.0050	0.0014	
1,2-Dichloropropane	B056001-BLK1	ND	mg/kg	0.0050	0.00081	
cis-1,3-Dichloropropene	B056001-BLK1	ND	mg/kg	0.0050	0.0011	
trans-1,3-Dichloropropene	B056001-BLK1	ND	mg/kg	0.0050	0.0012	
Ethylbenzene	B056001-BLK1	ND	mg/kg	0.0050	0.0015	
Methylene chloride	B056001-BLK1	ND	mg/kg	0.010	0.0024	
Methyl t-butyl ether	B056001-BLK1	ND	mg/kg	0.0050	0.00050	
1,1,2,2-Tetrachloroethane	B056001-BLK1	ND	mg/kg	0.0050	0.0011	
Tetrachloroethene	B056001-BLK1	ND	mg/kg	0.0050	0.0013	
Toluene	B056001-BLK1	ND	mg/kg	0.0050	0.0012	
1,1,1-Trichloroethane	B056001-BLK1	ND	mg/kg	0.0050	0.0011	
1,1,2-Trichloroethane	B056001-BLK1	ND	mg/kg	0.0050	0.00077	
Trichloroethene	B056001-BLK1	ND	mg/kg	0.0050	0.0011	
Trichlorofluoromethane	B056001-BLK1	ND	mg/kg	0.0050	0.0011	
1,1,2-Trichloro-1,2,2-trifluoroethane	B056001-BLK1	ND	mg/kg	0.0050	0.0013	
Vinyl chloride	B056001-BLK1	ND	mg/kg	0.0050	0.0016	
Total Xylenes	B056001-BLK1	ND	mg/kg	0.010	0.0034	

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**Project Number:** [none]  
**Project Manager:** John Gunderlock

## Volatile Organic Analysis (EPA Method 8240)

### Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
<b>QC Batch ID: B056001</b>						
Acrolein	B056001-BLK1	ND	mg/kg	0.050	0.0073	
Acrylonitrile	B056001-BLK1	ND	mg/kg	0.020	0.0047	
<b>1,2-Dichloroethane-d4 (Surrogate)</b>	<b>B056001-BLK1</b>	<b>98.7</b>	<b>%</b>	<b>70 - 121 (LCL - UCL)</b>		
<b>Toluene-d8 (Surrogate)</b>	<b>B056001-BLK1</b>	<b>99.3</b>	<b>%</b>	<b>81 - 117 (LCL - UCL)</b>		
<b>4-Bromofluorobenzene (Surrogate)</b>	<b>B056001-BLK1</b>	<b>97.7</b>	<b>%</b>	<b>74 - 121 (LCL - UCL)</b>		

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4744 Telephone Rd  
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**Reported:** 09/18/2019 11:14  
**Project:** Biosolids from MBWWTP  
**Project Number:** [none]  
**Project Manager:** John Gunderlock

## Volatile Organic Analysis (EPA Method 8240)

### Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits		Lab
								Percent Recovery	RPD	
<b>QC Batch ID: B056001</b>										
Benzene	B056001-BS1	LCS	0.13499	0.12500	mg/kg	108		70 - 130		
Bromodichloromethane	B056001-BS1	LCS	0.12969	0.12500	mg/kg	104		70 - 130		
Chlorobenzene	B056001-BS1	LCS	0.12858	0.12500	mg/kg	103		70 - 130		
Chloroethane	B056001-BS1	LCS	0.13107	0.12500	mg/kg	105		70 - 130		
1,4-Dichlorobenzene	B056001-BS1	LCS	0.12290	0.12500	mg/kg	98.3		70 - 130		
1,1-Dichloroethane	B056001-BS1	LCS	0.14059	0.12500	mg/kg	112		70 - 130		
1,1-Dichloroethene	B056001-BS1	LCS	0.11692	0.12500	mg/kg	93.5		70 - 130		
Toluene	B056001-BS1	LCS	0.12666	0.12500	mg/kg	101		70 - 130		
Trichloroethene	B056001-BS1	LCS	0.11941	0.12500	mg/kg	95.5		70 - 130		
1,2-Dichloroethane-d4 (Surrogate)	B056001-BS1	LCS	0.051800	0.050000	mg/kg	104		70 - 121		
Toluene-d8 (Surrogate)	B056001-BS1	LCS	0.050730	0.050000	mg/kg	101		81 - 117		
4-Bromofluorobenzene (Surrogate)	B056001-BS1	LCS	0.051460	0.050000	mg/kg	103		74 - 121		

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**Reported:** 09/18/2019 11:14  
**Project:** Biosolids from MBWWTP  
**Project Number:** [none]  
**Project Manager:** John Gunderlock

## Volatile Organic Analysis (EPA Method 8240)

### Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Control Limits		
								Percent Recovery	RPD	Percent Recovery
<b>QC Batch ID: B056001</b>		Used client sample: N								
Benzene	MS	1927434-50	ND	0.12203	0.12500	mg/kg		97.6		70 - 130
	MSD	1927434-50	ND	0.13622	0.12500	mg/kg	11.0	109	20	70 - 130
Bromodichloromethane	MS	1927434-50	ND	0.12341	0.12500	mg/kg		98.7		70 - 130
	MSD	1927434-50	ND	0.13263	0.12500	mg/kg	7.2	106	20	70 - 130
Chlorobenzene	MS	1927434-50	ND	0.12274	0.12500	mg/kg		98.2		70 - 130
	MSD	1927434-50	ND	0.12971	0.12500	mg/kg	5.5	104	20	70 - 130
Chloroethane	MS	1927434-50	ND	0.10782	0.12500	mg/kg		86.3		70 - 130
	MSD	1927434-50	ND	0.11554	0.12500	mg/kg	6.9	92.4	20	70 - 130
1,4-Dichlorobenzene	MS	1927434-50	ND	0.11399	0.12500	mg/kg		91.2		70 - 130
	MSD	1927434-50	ND	0.11677	0.12500	mg/kg	2.4	93.4	20	70 - 130
1,1-Dichloroethane	MS	1927434-50	ND	0.12164	0.12500	mg/kg		97.3		70 - 130
	MSD	1927434-50	ND	0.13730	0.12500	mg/kg	12.1	110	20	70 - 130
1,1-Dichloroethene	MS	1927434-50	ND	0.10434	0.12500	mg/kg		83.5		70 - 130
	MSD	1927434-50	ND	0.11112	0.12500	mg/kg	6.3	88.9	20	70 - 130
Toluene	MS	1927434-50	ND	0.11758	0.12500	mg/kg		94.1		70 - 130
	MSD	1927434-50	ND	0.12417	0.12500	mg/kg	5.5	99.3	20	70 - 130
Trichloroethene	MS	1927434-50	ND	0.11466	0.12500	mg/kg		91.7		70 - 130
	MSD	1927434-50	ND	0.11696	0.12500	mg/kg	2.0	93.6	20	70 - 130
1,2-Dichloroethane-d4 (Surrogate)	MS	1927434-50	ND	0.049520	0.050000	mg/kg		99.0		70 - 121
	MSD	1927434-50	ND	0.050690	0.050000	mg/kg	2.3	101		70 - 121
Toluene-d8 (Surrogate)	MS	1927434-50	ND	0.050520	0.050000	mg/kg		101		81 - 117
	MSD	1927434-50	ND	0.049650	0.050000	mg/kg	1.7	99.3		81 - 117
4-Bromofluorobenzene (Surrogate)	MS	1927434-50	ND	0.050470	0.050000	mg/kg		101		74 - 121
	MSD	1927434-50	ND	0.051960	0.050000	mg/kg	2.9	104		74 - 121

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**Reported:** 09/18/2019 11:14  
**Project:** Biosolids from MBWWTP  
**Project Number:** [none]  
**Project Manager:** John Gunderlock

## Base Neutral and Acid Extractables Organic Analysis (EPA Method 8270C)

### Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
<b>QC Batch ID: B056202</b>						
Acenaphthene	B056202-BLK1	ND	mg/kg	0.10	0.0067	
Acenaphthylene	B056202-BLK1	ND	mg/kg	0.10	0.0067	
Aldrin	B056202-BLK1	ND	mg/kg	0.10	0.0067	
Aniline	B056202-BLK1	ND	mg/kg	0.20	0.011	
Anthracene	B056202-BLK1	ND	mg/kg	0.10	0.0067	
Benzidine	B056202-BLK1	ND	mg/kg	3.0	0.0093	
Benzo[a]anthracene	B056202-BLK1	ND	mg/kg	0.10	0.0077	
Benzo[b]fluoranthene	B056202-BLK1	ND	mg/kg	0.10	0.0067	
Benzo[k]fluoranthene	B056202-BLK1	ND	mg/kg	0.10	0.0082	
Benzo[a]pyrene	B056202-BLK1	ND	mg/kg	0.10	0.0067	
Benzo[g,h,i]perylene	B056202-BLK1	ND	mg/kg	0.10	0.013	
Benzoic acid	B056202-BLK1	ND	mg/kg	0.50	0.014	
Benzyl alcohol	B056202-BLK1	ND	mg/kg	0.10	0.0067	
Benzyl butyl phthalate	B056202-BLK1	ND	mg/kg	0.10	0.0067	
alpha-BHC	B056202-BLK1	ND	mg/kg	0.10	0.0067	
beta-BHC	B056202-BLK1	ND	mg/kg	0.10	0.0075	
delta-BHC	B056202-BLK1	ND	mg/kg	0.10	0.0067	
gamma-BHC (Lindane)	B056202-BLK1	ND	mg/kg	0.10	0.0067	
bis(2-Chloroethoxy)methane	B056202-BLK1	ND	mg/kg	0.10	0.0067	
bis(2-Chloroethyl) ether	B056202-BLK1	ND	mg/kg	0.10	0.0097	
bis(2-Chloroisopropyl)ether	B056202-BLK1	ND	mg/kg	0.10	0.0067	
bis(2-Ethylhexyl)phthalate	B056202-BLK1	ND	mg/kg	0.20	0.0067	
4-Bromophenyl phenyl ether	B056202-BLK1	ND	mg/kg	0.10	0.0067	
4-Chloroaniline	B056202-BLK1	ND	mg/kg	0.10	0.015	
2-Chloronaphthalene	B056202-BLK1	ND	mg/kg	0.10	0.0067	
4-Chlorophenyl phenyl ether	B056202-BLK1	ND	mg/kg	0.10	0.0067	
Chrysene	B056202-BLK1	ND	mg/kg	0.10	0.0067	
4,4'-DDD	B056202-BLK1	ND	mg/kg	0.10	0.0067	
4,4'-DDE	B056202-BLK1	ND	mg/kg	0.10	0.0068	
4,4'-DDT	B056202-BLK1	ND	mg/kg	0.10	0.0067	
Dibenzo[a,h]anthracene	B056202-BLK1	ND	mg/kg	0.10	0.0067	
Dibenzofuran	B056202-BLK1	ND	mg/kg	0.10	0.0067	
1,2-Dichlorobenzene	B056202-BLK1	ND	mg/kg	0.10	0.0067	

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**Reported:** 09/18/2019 11:14  
**Project:** Biosolids from MBWWTP  
**Project Number:** [none]  
**Project Manager:** John Gunderlock

## Base Neutral and Acid Extractables Organic Analysis (EPA Method 8270C)

### Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
<b>QC Batch ID: B056202</b>						
1,3-Dichlorobenzene	B056202-BLK1	ND	mg/kg	0.10	0.0067	
1,4-Dichlorobenzene	B056202-BLK1	ND	mg/kg	0.10	0.0067	
3,3-Dichlorobenzidine	B056202-BLK1	ND	mg/kg	0.20	0.0067	
Dieldrin	B056202-BLK1	ND	mg/kg	0.10	0.0077	
Diethyl phthalate	B056202-BLK1	ND	mg/kg	0.10	0.0067	
Dimethyl phthalate	B056202-BLK1	ND	mg/kg	0.10	0.0067	
Di-n-butyl phthalate	B056202-BLK1	ND	mg/kg	0.10	0.0067	
2,4-Dinitrotoluene	B056202-BLK1	ND	mg/kg	0.10	0.0085	
2,6-Dinitrotoluene	B056202-BLK1	ND	mg/kg	0.10	0.0067	
Di-n-octyl phthalate	B056202-BLK1	ND	mg/kg	0.10	0.0067	
1,2-Diphenylhydrazine	B056202-BLK1	ND	mg/kg	0.10	0.0067	
Endosulfan I	B056202-BLK1	ND	mg/kg	0.20	0.0088	
Endosulfan II	B056202-BLK1	ND	mg/kg	0.20	0.0088	
Endosulfan sulfate	B056202-BLK1	ND	mg/kg	0.10	0.0067	
Endrin	B056202-BLK1	ND	mg/kg	0.20	0.0086	
Endrin aldehyde	B056202-BLK1	ND	mg/kg	0.50	0.0070	
Fluoranthene	B056202-BLK1	ND	mg/kg	0.10	0.0067	
Fluorene	B056202-BLK1	ND	mg/kg	0.10	0.0067	
Heptachlor	B056202-BLK1	ND	mg/kg	0.10	0.0067	
Heptachlor epoxide	B056202-BLK1	ND	mg/kg	0.10	0.013	
Hexachlorobenzene	B056202-BLK1	ND	mg/kg	0.10	0.0067	
Hexachlorobutadiene	B056202-BLK1	ND	mg/kg	0.10	0.0067	
Hexachlorocyclopentadiene	B056202-BLK1	ND	mg/kg	0.10	0.015	
Hexachloroethane	B056202-BLK1	ND	mg/kg	0.10	0.0067	
Indeno[1,2,3-cd]pyrene	B056202-BLK1	ND	mg/kg	0.10	0.0069	
Isophorone	B056202-BLK1	ND	mg/kg	0.10	0.0067	
2-Methylnaphthalene	B056202-BLK1	ND	mg/kg	0.10	0.0067	
Naphthalene	B056202-BLK1	ND	mg/kg	0.10	0.0067	
2-Naphthylamine	B056202-BLK1	ND	mg/kg	3.0	0.036	
2-Nitroaniline	B056202-BLK1	ND	mg/kg	0.10	0.0067	
3-Nitroaniline	B056202-BLK1	ND	mg/kg	0.20	0.0067	
4-Nitroaniline	B056202-BLK1	ND	mg/kg	0.20	0.011	
Nitrobenzene	B056202-BLK1	ND	mg/kg	0.10	0.0067	

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**Reported:** 09/18/2019 11:14  
**Project:** Biosolids from MBWWTP  
**Project Number:** [none]  
**Project Manager:** John Gunderlock

## Base Neutral and Acid Extractables Organic Analysis (EPA Method 8270C)

### Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
<b>QC Batch ID: B056202</b>						
N-Nitrosodimethylamine	B056202-BLK1	ND	mg/kg	0.10	0.040	
N-Nitrosodi-N-propylamine	B056202-BLK1	ND	mg/kg	0.10	0.0067	
N-Nitrosodiphenylamine	B056202-BLK1	ND	mg/kg	0.10	0.0067	
Phenanthrene	B056202-BLK1	ND	mg/kg	0.10	0.0067	
Pyrene	B056202-BLK1	ND	mg/kg	0.10	0.0067	
1,2,4-Trichlorobenzene	B056202-BLK1	ND	mg/kg	0.10	0.0067	
4-Chloro-3-methylphenol	B056202-BLK1	ND	mg/kg	0.20	0.0067	
2-Chlorophenol	B056202-BLK1	ND	mg/kg	0.10	0.0067	
2,4-Dichlorophenol	B056202-BLK1	ND	mg/kg	0.10	0.0067	
2,4-Dimethylphenol	B056202-BLK1	ND	mg/kg	0.10	0.0067	
4,6-Dinitro-2-methylphenol	B056202-BLK1	ND	mg/kg	0.50	0.0067	
2,4-Dinitrophenol	B056202-BLK1	ND	mg/kg	0.50	0.0067	
2-Methylphenol	B056202-BLK1	ND	mg/kg	0.10	0.0067	
3- & 4-Methylphenol	B056202-BLK1	ND	mg/kg	0.20	0.014	
2-Nitrophenol	B056202-BLK1	ND	mg/kg	0.10	0.0067	
4-Nitrophenol	B056202-BLK1	ND	mg/kg	0.20	0.018	
Pentachlorophenol	B056202-BLK1	ND	mg/kg	0.20	0.017	
Phenol	B056202-BLK1	ND	mg/kg	0.10	0.0067	
2,4,5-Trichlorophenol	B056202-BLK1	ND	mg/kg	0.20	0.011	
2,4,6-Trichlorophenol	B056202-BLK1	ND	mg/kg	0.20	0.0067	
<b>2-Fluorophenol (Surrogate)</b>	<b>B056202-BLK1</b>	<b>78.7</b>	<b>%</b>	<b>20 - 130 (LCL - UCL)</b>		
<b>Phenol-d5 (Surrogate)</b>	<b>B056202-BLK1</b>	<b>80.8</b>	<b>%</b>	<b>30 - 130 (LCL - UCL)</b>		
<b>Nitrobenzene-d5 (Surrogate)</b>	<b>B056202-BLK1</b>	<b>80.4</b>	<b>%</b>	<b>30 - 130 (LCL - UCL)</b>		
<b>2-Fluorobiphenyl (Surrogate)</b>	<b>B056202-BLK1</b>	<b>91.9</b>	<b>%</b>	<b>30 - 140 (LCL - UCL)</b>		
<b>2,4,6-Tribromophenol (Surrogate)</b>	<b>B056202-BLK1</b>	<b>74.5</b>	<b>%</b>	<b>20 - 150 (LCL - UCL)</b>		
<b>p-Terphenyl-d14 (Surrogate)</b>	<b>B056202-BLK1</b>	<b>81.4</b>	<b>%</b>	<b>30 - 150 (LCL - UCL)</b>		

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Reported: 09/18/2019 11:14
Project: Biosolids from MBWWTP
Project Number: [none]
Project Manager: John Gunderlock

Base Neutral and Acid Extractables Organic Analysis (EPA Method 8270C)

Quality Control Report - Laboratory Control Sample

Table with columns: Constituent, QC Sample ID, Type, Result, Spike Level, Units, Percent Recovery, RPD, Control Limits (Percent Recovery, RPD), Lab Quals. Includes a QC Batch ID: B056202 and a list of 20 chemical constituents with their respective results and recovery percentages.

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Reported: 09/18/2019 11:14
Project: Biosolids from MBWWTP
Project Number: [none]
Project Manager: John Gunderlock

Base Neutral and Acid Extractables Organic Analysis (EPA Method 8270C)

Quality Control Report - Precision & Accuracy

Table with columns: Constituent, Type, Source Sample ID, Source Result, Result, Spike Added, Units, RPD, Percent Recovery, Control Limits RPD, Control Limits Percent Recovery, Lab Quals. Includes QC Batch ID: B056202 and Used client sample: N.

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**Reported:** 09/18/2019 11:14  
**Project:** Biosolids from MBWWTP  
**Project Number:** [none]  
**Project Manager:** John Gunderlock

## Base Neutral and Acid Extractables Organic Analysis (EPA Method 8270C)

### Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits		
									RPD	Percent Recovery	Lab
<b>QC Batch ID: B056202</b>		Used client sample: N									
2-Fluorophenol (Surrogate)	MS	1927434-56	ND	0.96042	1.3289	mg/kg		72.3		20 - 130	
	MSD	1927434-56	ND	0.98459	1.3378	mg/kg	2.5	73.6		20 - 130	
Phenol-d5 (Surrogate)	MS	1927434-56	ND	0.96199	1.3289	mg/kg		72.4		30 - 130	
	MSD	1927434-56	ND	0.98229	1.3378	mg/kg	2.1	73.4		30 - 130	
Nitrobenzene-d5 (Surrogate)	MS	1927434-56	ND	0.97841	1.3289	mg/kg		73.6		30 - 130	
	MSD	1927434-56	ND	1.0003	1.3378	mg/kg	2.2	74.8		30 - 130	
2-Fluorobiphenyl (Surrogate)	MS	1927434-56	ND	1.0264	1.3289	mg/kg		77.2		30 - 140	
	MSD	1927434-56	ND	1.0560	1.3378	mg/kg	2.8	78.9		30 - 140	
2,4,6-Tribromophenol (Surrogate)	MS	1927434-56	ND	0.98030	1.3289	mg/kg		73.8		20 - 150	
	MSD	1927434-56	ND	0.96263	1.3378	mg/kg	1.8	72.0		20 - 150	
p-Terphenyl-d14 (Surrogate)	MS	1927434-56	ND	0.44912	0.66445	mg/kg		67.6		30 - 150	
	MSD	1927434-56	ND	0.47525	0.66890	mg/kg	5.7	71.0		30 - 150	

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**Reported:** 09/18/2019 11:14  
**Project:** Biosolids from MBWWTP  
**Project Number:** [none]  
**Project Manager:** John Gunderlock

### EPA Method 1664

### Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
<b>QC Batch ID: B056137</b>						
Oil and Grease	B056137-BLK1	ND	mg/kg	50	16	

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**Reported:** 09/18/2019 11:14  
**Project:** Biosolids from MBWWTP  
**Project Number:** [none]  
**Project Manager:** John Gunderlock

### EPA Method 1664

### Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits		Lab
								Percent Recovery	RPD	
<b>QC Batch ID: B056137</b>										
Oil and Grease	B056137-BS1	LCS	809.86	814.89	mg/kg	99.4		59	117	

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**Reported:** 09/18/2019 11:14  
**Project:** Biosolids from MBWWTP  
**Project Number:** [none]  
**Project Manager:** John Gunderlock

### EPA Method 1664

### Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Control Limits		
								Percent Recovery	RPD	Percent Recovery
<b>QC Batch ID: B056137</b>		Used client sample: N								
Oil and Grease	DUP	1927434-12	ND	ND		mg/kg			30	
	MS	1927434-12	ND	833.00	810.00	mg/kg		103		56 - 111
	MSD	1927434-12	ND	828.28	818.18	mg/kg	0.6	101	30	56 - 111

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4744 Telephone Rd  
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Ventura, CA 93003-3238

**Reported:** 09/18/2019 11:14  
Project: Biosolids from MBWWTP  
Project Number: [none]  
Project Manager: John Gunderlock

### Chemical Analysis

#### Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
<b>QC Batch ID: BJH0408</b>						
Moisture	BJH0408-BLK1	ND	%	0.05	0.05	
<b>QC Batch ID: B055959</b>						
Nitrate as NO3	B055959-BLK1	ND	mg/kg	4.4	1.2	
<b>QC Batch ID: B056560</b>						
Total Cyanide	B056560-BLK1	ND	mg/kg	0.50	0.17	
<b>QC Batch ID: B056684</b>						
Ammonia as N	B056684-BLK1	ND	mg/kg	20	6.7	
<b>QC Batch ID: B056886</b>						
Total Kjeldahl Nitrogen	B056886-BLK1	ND	mg/kg	40	9.6	
<b>QC Batch ID: B056887</b>						
Total Phosphate	B056887-BLK1	ND	mg/kg	30	4.7	

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**Reported:** 09/18/2019 11:14  
**Project:** Biosolids from MBWWTP  
**Project Number:** [none]  
**Project Manager:** John Gunderlock

### Chemical Analysis

#### Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits		Lab
								Percent Recovery	RPD	
<b>QC Batch ID: B055959</b>										
Nitrate as NO3	B055959-BS1	LCS	22.838	22.134	mg/kg	103		90 - 110		
<b>QC Batch ID: B056560</b>										
Total Cyanide	B056560-BS1	LCS	15.086	14.423	mg/kg	105		80 - 120		
<b>QC Batch ID: B056684</b>										
Ammonia as N	B056684-BS1	LCS	191.48	185.19	mg/kg	103		80 - 120		
<b>QC Batch ID: B056814</b>										
pH	B056814-BS1	LCS	3.9720	4.0000	pH Units	99.3		95 - 105		
<b>QC Batch ID: B056886</b>										
Total Kjeldahl Nitrogen	B056886-BS1	LCS	389.82	400.00	mg/kg	97.5		90 - 110		
<b>QC Batch ID: B056887</b>										
Total Phosphate	B056887-BS1	LCS	604.29	613.20	mg/kg	98.5		85 - 115		

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**Reported:** 09/18/2019 11:14  
**Project:** Biosolids from MBWWTP  
**Project Number:** [none]  
**Project Manager:** John Gunderlock

### Chemical Analysis

#### Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits		Lab Quals
									RPD	Percent Recovery	
<b>QC Batch ID: B055959</b>		Used client sample: N									
Nitrate as NO3	DUP	1929052-01	ND	ND		mg/kg			20		
	MS	1929052-01	ND	226.44	223.58	mg/kg		101		80 - 120	
	MSD	1929052-01	ND	225.63	223.58	mg/kg	0.4	101	20	80 - 120	
<b>QC Batch ID: B056099</b>		Used client sample: N									
Solids	DUP	1929384-01	86.700	86.220		%	0.6		20		
<b>QC Batch ID: B056560</b>		Used client sample: Y - Description: Composite Biosolids, 08/28/2019 10:15									
Total Cyanide	DUP	1928899-01	3.3609	3.2519		mg/kg	3.3		20		
	MS	1928899-01	3.3609	11.854	9.0909	mg/kg		93.4		80 - 120	
	MSD	1928899-01	3.3609	12.801	9.8039	mg/kg	7.7	96.3	20	80 - 120	
<b>QC Batch ID: B056684</b>		Used client sample: N									
Ammonia as N	DUP	1929507-01	414.12	424.20		mg/kg	2.4		20		
	MS	1929507-01	414.12	643.76	196.08	mg/kg		117		80 - 120	
	MSD	1929507-01	414.12	610.41	185.19	mg/kg	5.3	106	20	80 - 120	
<b>QC Batch ID: B056814</b>		Used client sample: N									
pH	DUP	1928886-01	7.5130	7.5180		pH Units	0.1		20		
<b>QC Batch ID: B056886</b>		Used client sample: N									
Total Kjeldahl Nitrogen	DUP	1928682-01	60.700	57.720		mg/kg	5.0		20		
	MS	1928682-01	60.700	493.28	400.00	mg/kg		108		90 - 110	
	MSD	1928682-01	60.700	500.74	400.00	mg/kg	1.5	110	20	90 - 110	
<b>QC Batch ID: B056887</b>		Used client sample: N									
Total Phosphate	DUP	1928682-01	770.60	793.41		mg/kg	2.9		20		
	MS	1928682-01	770.60	1697.9	613.20	mg/kg		151		80 - 120	Q03
	MSD	1928682-01	770.60	1695.1	613.20	mg/kg	0.2	151	20	80 - 120	Q03

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**Reported:** 09/18/2019 11:14  
**Project:** Biosolids from MBWWTP  
**Project Number:** [none]  
**Project Manager:** John Gunderlock

### Modified WET Test (STLC)

### Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
<b>QC Batch ID: B056207</b>						
Total Dissolved Solids @ 180 C	B056207-BLK1	3.3335	mg/L	6.7	3.3	J
<b>QC Batch ID: B056584</b>						
Hexavalent Chromium	B056584-BLK1	ND	mg/L	0.20	0.070	

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**Project Number:** [none]  
**Project Manager:** John Gunderlock

### Modified WET Test (STLC)

#### Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits		Lab
								Percent Recovery	RPD	
<b>QC Batch ID: B056207</b>										
Total Dissolved Solids @ 180 C	B056207-BS1	LCS	575.00	586.00	mg/L	98.1		90 - 110		
<b>QC Batch ID: B056584</b>										
Hexavalent Chromium	B056584-BS1	LCS	4.9508	5.0000	mg/L	99.0		85 - 115		

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**Reported:** 09/18/2019 11:14  
**Project:** Biosolids from MBWWTP  
**Project Number:** [none]  
**Project Manager:** John Gunderlock

### Modified WET Test (STLC)

### Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits		
									RPD	Percent Recovery	Lab
<b>QC Batch ID: B056207</b>		Used client sample: Y - Description: Composite Biosolids, 08/28/2019 10:15									
Total Dissolved Solids @ 180 C	DUP	1928899-01	7150.0	7150.0		mg/L	0		20		
<b>QC Batch ID: B056584</b>		Used client sample: Y - Description: Composite Biosolids, 08/28/2019 10:15									
Hexavalent Chromium	DUP	1928899-01	ND	ND		mg/L			20		
	MS	1928899-01	ND	4.9426	5.2632	mg/L		93.9		85 - 115	
	MSD	1928899-01	ND	5.0195	5.2632	mg/L	1.5	95.4	20	85 - 115	

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**Project Number:** [none]  
**Project Manager:** John Gunderlock

### WET Test (STLC)

#### Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
<b>QC Batch ID: B056415</b>						
Copper	B056415-BLK1	ND	mg/L	0.10	0.012	
Lead	B056415-BLK1	ND	mg/L	0.50	0.16	

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**Project:** Biosolids from MBWWTP  
**Project Number:** [none]  
**Project Manager:** John Gunderlock

### WET Test (STLC)

### Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits		Lab
								Percent Recovery	RPD	
<b>QC Batch ID: B056415</b>										
Copper	B056415-BS1	LCS	19.772	20.000	mg/L	98.9		85	115	
Lead	B056415-BS1	LCS	19.256	20.000	mg/L	96.3		85	115	

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**Reported:** 09/18/2019 11:14  
**Project:** Biosolids from MBWWTP  
**Project Number:** [none]  
**Project Manager:** John Gunderlock

### WET Test (STLC)

### Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Control Limits		Lab
								Percent Recovery	RPD	
<b>QC Batch ID: B056415</b>		Used client sample: N								
Copper	DUP	1929748-02	2.1926	2.1710		mg/L	1.0		20	
	MS	1929748-02	2.1926	23.559	20.408	mg/L		105		75 - 125
	MSD	1929748-02	2.1926	22.282	20.408	mg/L	5.6	98.4	20	75 - 125
Lead	DUP	1929748-02	ND	ND		mg/L			20	
	MS	1929748-02	ND	19.967	20.408	mg/L		97.8		75 - 125
	MSD	1929748-02	ND	19.540	20.408	mg/L	2.2	95.7	20	75 - 125

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**Project:** Biosolids from MBWWTP  
**Project Number:** [none]  
**Project Manager:** John Gunderlock

### Total Concentrations (TTLC)

#### Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
<b>QC Batch ID: B055960</b>						
Mercury	B055960-BLK1	ND	mg/kg	0.16	0.019	
<b>QC Batch ID: B056269</b>						
Antimony	B056269-BLK1	ND	mg/kg	5.0	0.33	
Arsenic	B056269-BLK1	ND	mg/kg	1.0	0.40	
Barium	B056269-BLK1	ND	mg/kg	0.50	0.18	
Beryllium	B056269-BLK1	ND	mg/kg	0.50	0.047	
Cadmium	B056269-BLK1	ND	mg/kg	0.50	0.052	
<b>Chromium</b>	<b>B056269-BLK1</b>	<b>0.054061</b>	<b>mg/kg</b>	<b>0.50</b>	<b>0.050</b>	<b>J</b>
Cobalt	B056269-BLK1	ND	mg/kg	2.5	0.098	
<b>Copper</b>	<b>B056269-BLK1</b>	<b>0.078724</b>	<b>mg/kg</b>	<b>1.0</b>	<b>0.050</b>	<b>J</b>
Lead	B056269-BLK1	ND	mg/kg	2.5	0.28	
Molybdenum	B056269-BLK1	ND	mg/kg	2.5	0.050	
Nickel	B056269-BLK1	ND	mg/kg	0.50	0.15	
Selenium	B056269-BLK1	ND	mg/kg	1.0	0.98	
Silver	B056269-BLK1	ND	mg/kg	0.50	0.067	
Thallium	B056269-BLK1	ND	mg/kg	5.0	0.64	
Vanadium	B056269-BLK1	ND	mg/kg	0.50	0.11	
<b>Zinc</b>	<b>B056269-BLK1</b>	<b>0.19717</b>	<b>mg/kg</b>	<b>2.5</b>	<b>0.087</b>	<b>J</b>
<b>Boron</b>	<b>B056269-BLK1</b>	<b>0.92283</b>	<b>mg/kg</b>	<b>5.0</b>	<b>0.50</b>	<b>J</b>
<b>QC Batch ID: B056428</b>						
Total Hexavalent Chromium	B056428-BLK1	ND	mg/kg	1.0	0.30	

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**Reported:** 09/18/2019 11:14  
**Project:** Biosolids from MBWWTP  
**Project Number:** [none]  
**Project Manager:** John Gunderlock

### Total Concentrations (TTLC)

### Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits		Lab Quals
								Percent Recovery	RPD	
<b>QC Batch ID: B055960</b>										
Mercury	B055960-BS1	LCS	0.79200	0.80000	mg/kg	99.0		80 - 120		
<b>QC Batch ID: B056269</b>										
Antimony	B056269-BS1	LCS	107.75	100.00	mg/kg	108		75 - 125		
Arsenic	B056269-BS1	LCS	19.426	20.000	mg/kg	97.1		75 - 125		
Barium	B056269-BS1	LCS	104.45	100.00	mg/kg	104		75 - 125		
Beryllium	B056269-BS1	LCS	10.062	10.000	mg/kg	101		75 - 125		
Cadmium	B056269-BS1	LCS	10.265	10.000	mg/kg	103		75 - 125		
Chromium	B056269-BS1	LCS	102.31	100.00	mg/kg	102		75 - 125		
Cobalt	B056269-BS1	LCS	102.49	100.00	mg/kg	102		75 - 125		
Copper	B056269-BS1	LCS	101.14	100.00	mg/kg	101		75 - 125		
Lead	B056269-BS1	LCS	102.45	100.00	mg/kg	102		75 - 125		
Molybdenum	B056269-BS1	LCS	97.345	100.00	mg/kg	97.3		75 - 125		
Nickel	B056269-BS1	LCS	108.01	100.00	mg/kg	108		75 - 125		
Selenium	B056269-BS1	LCS	19.555	20.000	mg/kg	97.8		75 - 125		
Silver	B056269-BS1	LCS	9.4934	10.000	mg/kg	94.9		75 - 125		
Thallium	B056269-BS1	LCS	114.41	100.00	mg/kg	114		75 - 125		
Vanadium	B056269-BS1	LCS	101.48	100.00	mg/kg	101		75 - 125		
Zinc	B056269-BS1	LCS	101.49	100.00	mg/kg	101		75 - 125		
Boron	B056269-BS1	LCS	90.651	100.00	mg/kg	90.7		75 - 125		
<b>QC Batch ID: B056428</b>										
Total Hexavalent Chromium	B056428-BS1	LCS	41.144	40.000	mg/kg	103		80 - 120		

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Reported: 09/18/2019 11:14  
Project: Biosolids from MBWWTP  
Project Number: [none]  
Project Manager: John Gunderlock

### Total Concentrations (TTLC)

### Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits		Lab Quals
									RPD	Percent Recovery	
<b>QC Batch ID: B055960</b>		Used client sample: N									
Mercury	DUP	1928886-01	ND	ND		mg/kg			20		
	MS	1928886-01	ND	0.96393	0.81967	mg/kg		118		80 - 120	
	MSD	1928886-01	ND	0.81475	0.81967	mg/kg	16.8	99.4	20	80 - 120	
<b>QC Batch ID: B056269</b>		Used client sample: N									
Antimony	DUP	1929658-01RE1	44.163	20.551		mg/kg	73.0		20		J,A02
	MS	1929658-01RE1	44.163	59.865	100.00	mg/kg		15.7		16 - 119	Q03
	MSD	1929658-01RE1	44.163	63.123	100.00	mg/kg	5.3	19.0	20	16 - 119	
Arsenic	DUP	1929658-01RE1	156.99	136.56		mg/kg	13.9		20		
	MS	1929658-01RE1	156.99	181.18	20.000	mg/kg		121		75 - 125	
	MSD	1929658-01RE1	156.99	167.57	20.000	mg/kg	7.8	52.9	20	75 - 125	A03
Barium	DUP	1929658-01RE1	104.07	84.494		mg/kg	20.8		20		Q01
	MS	1929658-01RE1	104.07	205.84	100.00	mg/kg		102		75 - 125	
	MSD	1929658-01RE1	104.07	200.56	100.00	mg/kg	2.6	96.5	20	75 - 125	
Beryllium	DUP	929658-01RE1	0.76341	0.64102		mg/kg	17.4		20		J
	MS	929658-01RE1	0.76341	10.097	10.000	mg/kg		93.3		75 - 125	
	MSD	929658-01RE1	0.76341	10.324	10.000	mg/kg	2.2	95.6	20	75 - 125	
Cadmium	DUP	929658-01RE1	0.89726	0.79044		mg/kg	12.7		20		J
	MS	929658-01RE1	0.89726	10.017	10.000	mg/kg		91.2		75 - 125	
	MSD	929658-01RE1	0.89726	10.441	10.000	mg/kg	4.1	95.4	20	75 - 125	
Chromium	DUP	929658-01RE1	14.857	13.231		mg/kg	11.6		20		
	MS	929658-01RE1	14.857	107.63	100.00	mg/kg		92.8		75 - 125	
	MSD	929658-01RE1	14.857	109.25	100.00	mg/kg	1.5	94.4	20	75 - 125	
Cobalt	DUP	929658-01RE1	5.5848	4.6686		mg/kg	17.9		20		J
	MS	929658-01RE1	5.5848	104.04	100.00	mg/kg		98.5		75 - 125	
	MSD	929658-01RE1	5.5848	107.68	100.00	mg/kg	3.4	102	20	75 - 125	
Copper	DUP	1929658-01RE1	25.057	20.041		mg/kg	22.2		20		Q01
	MS	1929658-01RE1	25.057	120.55	100.00	mg/kg		95.5		75 - 125	
	MSD	1929658-01RE1	25.057	121.85	100.00	mg/kg	1.1	96.8	20	75 - 125	
Lead	DUP	929658-01RE1	64.922	61.351		mg/kg	5.7		20		
	MS	929658-01RE1	64.922	162.27	100.00	mg/kg		97.3		75 - 125	
	MSD	929658-01RE1	64.922	167.08	100.00	mg/kg	2.9	102	20	75 - 125	
Molybdenum	DUP	1929658-01RE1	2.0976	1.0525		mg/kg	66.4		20		J,A02
	MS	1929658-01RE1	2.0976	88.940	100.00	mg/kg		86.8		75 - 125	
	MSD	1929658-01RE1	2.0976	91.721	100.00	mg/kg	3.1	89.6	20	75 - 125	
Nickel	DUP	929658-01RE1	7.8068	6.8463		mg/kg	13.1		20		
	MS	929658-01RE1	7.8068	114.00	100.00	mg/kg		106		75 - 125	
	MSD	929658-01RE1	7.8068	117.98	100.00	mg/kg	3.4	110	20	75 - 125	

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Marine Research Specialists  
4744 Telephone Rd  
Ste 3-315  
Suite A  
Ventura, CA 93003-3238

**Reported:** 09/18/2019 11:14  
**Project:** Biosolids from MBWWTP  
**Project Number:** [none]  
**Project Manager:** John Gunderlock

### Total Concentrations (TTLC)

### Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits		Lab Quals
									RPD	Percent Recovery	
<b>QC Batch ID: B056269</b>		Used client sample: N									
Selenium	DUP	1929658-01RE1	ND	ND		mg/kg			20		
	MS	1929658-01RE1	ND	10.852	20.000	mg/kg		54.3		75 - 125	Q03
	MSD	1929658-01RE1	ND	13.191	20.000	mg/kg	19.5	66.0	20	75 - 125	Q03
Silver	DUP	929658-01RE1	ND	ND		mg/kg			20		
	MS	929658-01RE1	ND	8.3113	10.000	mg/kg		83.1		75 - 125	
	MSD	929658-01RE1	ND	8.5446	10.000	mg/kg	2.8	85.4	20	75 - 125	
Thallium	DUP	929658-01RE1	ND	ND		mg/kg			20		
	MS	929658-01RE1	ND	101.11	100.00	mg/kg		101		75 - 125	
	MSD	929658-01RE1	ND	104.87	100.00	mg/kg	3.7	105	20	75 - 125	
Vanadium	DUP	929658-01RE1	28.581	26.114		mg/kg	9.0		20		
	MS	929658-01RE1	28.581	122.76	100.00	mg/kg		94.2		75 - 125	
	MSD	929658-01RE1	28.581	123.69	100.00	mg/kg	0.8	95.1	20	75 - 125	
Zinc	DUP	929658-01RE1	187.25	181.82		mg/kg	2.9		20		
	MS	929658-01RE1	187.25	280.18	100.00	mg/kg		92.9		75 - 125	
	MSD	929658-01RE1	187.25	281.01	100.00	mg/kg	0.3	93.8	20	75 - 125	
Boron	DUP	1929658-01RE1	10.295	6.9500		mg/kg	38.8		20		J,A02
	MS	1929658-01RE1	10.295	61.252	100.00	mg/kg		51.0		75 - 125	Q03
	MSD	1929658-01RE1	10.295	57.920	100.00	mg/kg	5.6	47.6	20	75 - 125	Q03
<b>QC Batch ID: B056428</b>		Used client sample: N									
Total Hexavalent Chromium	DUP	1929336-01	1.1500	1.0600		mg/kg	8.1		20		
	MS	1929336-01	1.1500	39.462	40.000	mg/kg		95.8		75 - 125	
	MSD	1929336-01	1.1500	39.908	40.000	mg/kg	1.1	96.9	20	75 - 125	

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**Reported:** 09/18/2019 11:14  
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**Project Number:** [none]  
**Project Manager:** John Gunderlock

**Notes And Definitions**

- J Estimated Value (CLP Flag)
- MDL Method Detection Limit
- ND Analyte Not Detected
- PQL Practical Quantitation Limit
- A01 Detection and quantitation limits are raised due to sample dilution.
- A02 The difference between duplicate readings is less than the quantitation limit.
- A03 The sample concentration was more than 4 times the spike level.
- A07 Detection and quantitation limits were raised due to sample dilution caused by high analyte concentration or matrix interference.
- A10 Detection and quantitation limits were raised due to matrix interference.
- A19 Surrogate is high due to matrix interference. Interferences verified through second extraction/analysis.
- pH1:3 pH result reported on a 1:3 dilution of sample
- Q01 Sample precision is not within the control limits.
- Q03 Matrix spike recovery(s) was(were) not within the control limits.
- S09 The surrogate recovery for this compound was not within the control limits.

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