City of Morro Bay and
Cayucos Sanitary District

OFFSHORE MONITORING AND REPORTING PROGRAM

RESIDUAL BIOSOLIDS CHEMICAL ANALYSIS RESULTS

AUGUST 2017

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 2017

Prepared by

Douglas A. Coats

Marine Research Specialists

4744 Telephone Rd Ste 3 PMB 315
Ventura, California 93003

Telephone: (805) 644-1180
E-mail: Marine@Rain.org

September 2017

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

11 September 2017

Reference: Chemical Analysis Results for Biosolid Samples Collected in August 2017

Dear Mr. Gunderlock:

Enclosed are the results of chemical analyses conducted on a representative composite of biosolid subsamples collected from the drying beds on 23 August 2017. 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[a] set forth in Order Number R3-2008-0065 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 2017 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-2017 samples were somewhat lower than concentrations measured in most samples collected annually from 1999 through 2016.[b]

All trace-metal concentrations measured in the August-2017 sample were below Total Threshold Limit Concentrations (TTLC) that would designate them as hazardous under federal regulations.[c] 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. None of metals had bulk wet-weight concentrations that exceeded ten-times the applicable Soluble Threshold Limit Concentration (STLC). As a result, waste extraction tests (WET) were not needed for any of the metals because their soluble concentrations were projected to be lower than the STLC limit that would designate the biosolids as hazardous within the State of California. Nevertheless, a copper WET test was conducted because its bulk concentration has occasionally exceeded 10-fold of its STLC. However, as with all the WET tests in prior years, the 2.9 mg/L soluble copper concentration found in the August 2017 biosolids sample was only a fraction of the 25-mg/L STLC limit, again confirming that the biosolids are not be considered hazardous waste.

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. There is no clearly identifiable reason for the lower metal concentrations measured within the August-2017 biosolids samples as compared to those measured historically within biosolids samples.

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

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

Sincerely,

Douglas A. Coats Vice President MARINE RESEARCH SPECIALISTS 2017.09.10 11:00:08 -07'00'

Douglas A. Coats
Program Manager

Enclosure (Three Report Copies)

Table 1. Summary of Results for Biosolids Analyses

		Wet Weight				Dry Weight		
		Measured		Limit		Measured	Limit	
Constituent	**Units**	**Bulk** [d]	**WET** [e]	**STLC** [f]	**TTLC** [g]	**Bulk**	**Monthly** [h]	**Ceiling** [i]
Solids	%	84.4	— [j]	—	—	—	—	—
Total Dissolved Solids	ppm	—	3,100.	—	—	—	—	—
Cyanide	ppm	2.0	—	—	—	2.4	—	—
Antimony	ppm	≈1.3 [k]	—	15.	500.	≈1.5	—	—
Arsenic	ppm	1.4	—	5.	500.	1.7	41.	75.
Barium	ppm	210.	—	100.	10,000.	250.	—	—
Beryllium	ppm	≈0.13	—	0.75	75.	≈0.16	—	—
Boron	ppm	10.	—	—	—	12.	—	—
Cadmium	ppm	0.97	—	1.	100.	1.2	39.	85.
Chromium (Total)	ppm	27.	—	560.	2,500.	32.	1,200.	3,000.
Chromium (Hexavalent)	ppm	≈2.8	ND [l]	5.	500.	≈3.3	—	—
Cobalt	ppm	≈2.3	—	80.	8,000.	≈2.7	—	—
Copper	ppm	160.	2.9	25.	2,500.	190.	1,500.	4,300.
Lead	ppm	12.	—	5.	1,000.	15.	300.	840.
Mercury	ppm	0.33	—	0.2	20.	0.39	17.	57.
Molybdenum	ppm	7.5	—	350.	3,500.	8.9	18.	75.
Nickel	ppm	17.	—	20.	2,000.	20.	420.	420.
Selenium	ppm	4.0	—	1.	100.	4.8	36.	100.
Silver	ppm	1.0	—	5.	500.	1.2	—	—
Thallium	ppm	ND	—	7.	700.	ND	—	—
Vanadium	ppm	13.	—	24.	2,400.	15.	—	—
Zinc	ppm	460.	—	250.	5,000.	540.	2,800.	7,500.
Hydrogen-Ion	pH	6.48	—	—	—	—	—	—
Phosphate	mg/kg	44,000.	—	—	—	52,000.	—	—
Ammonia	mg/kg	2,800.	—	—	—	3,300.	—	—
TKN	mg/kg	14,000.	—	—	—	16,000.	—	—
Organic Nitrogen [m]	mg/kg	11,200.	—	—	—	12,700.	—	—
Nitrate as NO_3	mg/kg	1,400.	—	—	—	1,600.	—	—
Oil & Grease	ppm	16,000.	—	—	—	20,000.	—	—

[a] 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-2017 composite biosolids sample.

[b] Marine Research Specialists (MRS). 1999 through 2016. 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?AMID=64

[c] 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.

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

[e] 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.

[f] 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*.

[g] 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.*

[h] 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)].

[i] Federally mandated dry-weight ceiling concentrations above which biosolids are considered hazardous waste as defined in Table 1 of the CFRs, *op. cit.*

[j] "—" indicates that the measurement was not required or its limit was not specified.

[k] "≈" indicates the reported concentration was too low to be reliably quantified.

[l] "ND" indicates that the measurement was not detected in concentrations exceeding the method detection limit.

[m] The amount of nitrogen as reported by TKN excluding ammonia

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Date of Report: 09/08/2017

Doug Coats

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: 1723647
Invoice ID: B278528

Enclosed are the results of analyses for samples received by the laboratory on 8/23/2017. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Contact Person: Misty Orton
Client Service Rep

Authorized Signature

Table of Contents

Case Narratives

Case Narrative for Work Order 1723647

2- CEVE can only be reported as a TIC (Tentatively Identified Compound). 2-CEVE was not found as a TIC for lab #1723647

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949.

Chain of Custody Form

Report To: Client: Marine Research Specialists	Project #:
Attn: Douglas A Coats	Project Name: MBCSD Biosolids 2017
Street Address: 4744 TELEPHONE RD STE 3 PMB 315	Global ID #:
City, State, Zip: Ventura, CA 93003	Sampler(s): John Gunckel [illegible] / Steve A.
Phone: 805.218.3662	
Email Address: Marine@Rain.org	
Work Order#	17-23647

Analysis Requested

Comments:
Page 1 of 4

Please see attached PDF beginning on Page 3 for full explanations/details of individual analyses.

Are there any tests with holding times less than or equal to 48 hours? ☐ Yes ☒ No

Sample #	Description	Date Sampled	Time Sampled	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	Soil	Sludge	Drinking Water	Ground Water	Waste Water	Other	Notes
1	BC1 Composite Biosolids	8/23/17	1030	X	X	X	X	X	X	X	X	X		X					

CHK BY [illegible] DISTRIBUTION [illegible] SUB-OUT ☐

Billing ☒ Same as above

Client:
Address:
City: State: Zip:
Attn:
PO#:

EDF Required? ☐ Yes ☒ No

Send Copy to State of CA? ☐ Yes ☒ No

Sample Disposal: ☐ Return to Client ☒ Disposal by lab ☐ Archive Months______

Special Reporting: ☒ QC ☐ EDF ☐ Raw Data

Relinquished By	Date	Time	Received By	Date	Time
1. [illegible signature]	23 Aug 17	1245	[illegible signature]	8-23-17	1245
2. [illegible signature]	8-23-17	2040	2. Gurjot Pam [illegible]	8-23-17	2040
3.			3.		

BC Laboratories, Inc. – 4100 Atlas Court Bakersfield, Ca. 93308 661.327-4911 Fax: 661.327-1918

Page 1 of 4

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949.

Chain of Custody Form

Report To: Client: Marine Research Specialists	Project #:
Attn: Douglas A Coats	Project Name: MBCSD Biosolids 2017
Street Address: 4744 TELEPHONE RD STE 3 PMB 315	Global ID #:
City, State, Zip: Ventura, CA 93003	Sampler(s): John Gruderlock / Steve A.
Phone: 805.218.3662	
Email Address: Marine@Rain.org	
Work Order#	17-23647

Analysis Requested

Sample #	Description	Date Sampled	Time Sampled	Oil and Grease, EPA 1664	Semi-vol organics, EPA 8270	Pesticides/PCBs, EPA 8082	Volatile organics, EPA 8240	Total Hex Chrom, EPA 7196	Hex Chrom, mod. STLC 7196	WET tests*** on Cu		Sample Matrix: Soil	Sludge	Drinking Water	Ground water	Waste Water	Other		Notes
– 1	BC1 Composite Biosolids	8/23/17	1030	X	X	X	X	X	X	X			X						***STLC EPA 6010, but see Footnote c on Page 3!
	(continued from Page 1)																		

Comments:
Page 2 of 4

Please see attached PDF beginning on Page 3 for full explanations/details of individual analyses.

Are there any tests with holding times less than or equal to 48 hours? ☐ Yes ☒ No

Billing ☒ Same as above

Client:
Address:
City: State Zip
Attn:
PO#:

EDF Required? ☐ Yes ☒ No

Send Copy to State of CA? ☐ Yes ☒ No

Sample Disposal ☐ Return to Client ☒ Disposal by lab ☐ Archive Months

Special Reporting ☒ QC ☐ EDF ☐ Raw Data

	1. Relinquished By	Date	Time	1. Relinquished By	Date	Time
		23Aug17	12:45		8-23-17	1248
	2. Relinquished By	Date	Time	2. Relinquished By	Date	Time
		8-23-17	2040		8-23-17	2040
	3. Relinquished By	Date	Time	3. Relinquished By	Date	Time

BC Laboratories, Inc. – 4100 Atlas Court Bakersfield, Ca. 93308 661.327-4911 Fax: 661.327-1918

Page 2 of 4

BC Laboratories, Inc. Chain of Custody Form (Addenda) 17-23647 Page 3 of 4

Analysis and Reporting for the Biosolids Sample from the Morro Bay Wastewater Treatment Plant to be collected in August 2017[a]

Analysis[b]	Method
Level IIA QC	
Waste Extraction Tests on copper[c] **(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
CAM-17 Metals and Boron[d]:	
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)[d]	EPA 351.2

[a] Treatment plant personnel are coordinating with Jerry Mason regarding the existing bottle inventory at the plant and the need for additional sample containers. They will also a suitable sampling date to coincide with regular courier pickups in August. Please provide preliminary (pre-QC) results in BC LabNet as soon as they become available.

[b] Prior to analysis, homogenize the composite sample in the laboratory to ensure uniform distribution of multiple subsamples in the sample container(s)

[c] Other metals may need to be WET tested depending on their bulk concentrations (e.g. lead, mercury). Questions regarding the need for additional WET tests based on the preliminary bulk-chemistry analysis of metals can be directed to Doug Coats 805.218.3662.

[d] Sample results to be reported on an '*as received*' and '*dry basis*.'

[e] Historically, 2-CEVE non-detects have been reported in the case narrative as the absence of an associated Tentatively Identified Compound (TIC). Please do the same for this year's report.

[f] Modified-extraction, using DI water to extract not citric acid

17-23647

BC Laboratories, Inc. Chain of Custody Form (Addenda) Page 4 of 4

Analysis[b]	Method
Ammonia as N[d]	EPA 350.1
Nitrate as NO_3[d]	EPA 300.0 or 353.2
Total Phosphate[d]	EPA 365.4
Total Cyanide[d]	EPA 9012
pH	EPA 9045 or 150.1
Oil and Grease	EPA 1664
Semi-volatile Organics	EPA 8270/625
Pesticides and 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**[e])	EPA 8240/624
Hexavalent Chromium (Total)[d]	EPA 7196
Hexavalent Chromium[f]	Modified Waste Extraction Test (STLC) EPA 7196

Chain of Custody and Cooler Receipt Form for 1723647 Page 5 of 5

BC LABORATORIES INC. COOLER RECEIPT FORM Page 1 Of 1

Submission #: 17-23647

SHIPPING INFORMATION	SHIPPING CONTAINER	FREE LIQUID
Fed Ex ☐ UPS ☐ Ontrac ☐ Hand Delivery ☐	Ice Chest ☒ None ☐ Box ☐	YES ☐ NO ☐
BC Lab Field Service ☒ Other ☐ (Specify)_____	Other ☐ (Specify)_____	W / S

Refrigerant: Ice ☑ Blue Ice ☐ None ☐ Other ☐ Comments:

Custody Seals Ice Chest ☐ Intact? Yes ☐ No ☐ Containers ☐ Intact? Yes ☐ No ☐ None ☑ Comments:

All samples received? Yes ☑ No ☐ All samples containers intact? Yes ☑ No ☐ Description(s) match COC? Yes ☑ No ☐

COC Received ☑ YES ☐ NO

Emissivity: 0.95 Container: Glass Thermometer ID: 208 Date/Time 6/23/17 2040

Temperature: (A) 0.0 °C / (C) -0.1 °C Analyst Init RMR

SAMPLE CONTAINERS	SAMPLE NUMBERS 1	2	3	4	5	6	7	8	9	10
QT PE UNPRES										
4oz / 8oz / 16oz PE UNPRES										
2oz Cr^{+6}										
QT INORGANIC CHEMICAL METALS										
INORGANIC CHEMICAL METALS 4oz / 8oz / 16oz										
PT CYANIDE										
PT NITROGEN FORMS										
PT TOTAL SULFIDE										
2oz. NITRATE / NITRITE										
PT TOTAL ORGANIC CARBON										
PT CHEMICAL OXYGEN DEMAND										
PtA PHENOLICS										
40ml VOA VIAL TRAVEL BLANK										
40ml VOA VIAL										
QT EPA 1664										
PT ODOR										
RADIOLOGICAL										
BACTERIOLOGICAL										
40 ml VOA VIAL- 504										
QT EPA 508/608/8080										
QT EPA 515.1/8150										
QT EPA 525										
QT EPA 525 TRAVEL BLANK										
40ml EPA 547										
40ml EPA 531.1										
8oz EPA 548										
QT EPA 549										
QT EPA 8015M										
QT EPA 8270										
8oz / 16oz / 32oz AMBER										
8oz / 16oz / 32oz JAR	ABC1)									
SOIL SLEEVE										
PCB VIAL										
PLASTIC BAG										
TEDLAR BAG										
FERROUS IRON										
ENCORE										
SMART KIT										
SUMMA CANISTER										

Comments:

Sample Numbering Completed By: RMR Date/Time: 6/23/17 2026

A = Actual / C = Corrected

Rev 21 05/23/2016

{S:\WPDocs\WordPerfect\LAB_DOCS\FORMS\SAMREC rev 20}

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

Reported: 09/08/2017 9:20
Project: Biosolids from MBWWTP
Project Number: [none]
Project Manager: Doug Coats

Laboratory / Client Sample Cross Reference

Laboratory	Client Sample Information			
1723647-01	**COC Number:**	---	**Receive Date:**	08/23/2017 20:40
	Project Number:	---	**Sampling Date:**	08/23/2017 10:30
	Sampling Location:	---	**Sample Depth:**	---
	Sampling Point:	BC1 Composite Biosolids	**Lab Matrix:**	Solids
	Sampled By:	---	**Sample Type:**	Sludge

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

Reported: 09/08/2017 9:20
Project: Biosolids from MBWWTP
Project Number: [none]
Project Manager: Doug Coats

Organochlorine Pesticides and PCB's (EPA Method 8080)

BCL Sample ID: 1723647-01 | **Client Sample Name:** BC1 Composite Biosolids, 8/23/2017 10:30:00AM

Constituent	Dry Basis Result	As Recvd Result	Units	As Received PQL	As Received MDL	Method	MB Bias	Lab Quals	Run #
Aldrin	ND	ND	mg/kg	0.00096	0.000065	EPA-8080	ND		1
alpha-BHC	ND	ND	mg/kg	0.00096	0.00025	EPA-8080	ND		1
beta-BHC	ND	ND	mg/kg	0.00096	0.00029	EPA-8080	ND		1
delta-BHC	ND	ND	mg/kg	0.00096	0.000090	EPA-8080	ND		1
gamma-BHC (Lindane)	ND	ND	mg/kg	0.00096	0.00016	EPA-8080	ND		1
Chlordane (Technical)	ND	ND	mg/kg	0.096	0.0033	EPA-8080	ND		1
4,4'-DDD	ND	ND	mg/kg	0.00096	0.00040	EPA-8080	ND		1
4,4'-DDE	ND	ND	mg/kg	0.00096	0.000038	EPA-8080	ND		1
4,4'-DDT	ND	ND	mg/kg	0.00096	0.00018	EPA-8080	ND		1
Dieldrin	ND	ND	mg/kg	0.00096	0.00015	EPA-8080	ND		1
Endosulfan I	ND	ND	mg/kg	0.00096	0.000042	EPA-8080	ND		1
Endosulfan II	ND	ND	mg/kg	0.00096	0.00027	EPA-8080	ND		1
Endosulfan sulfate	ND	ND	mg/kg	0.00096	0.00065	EPA-8080	ND		1
Endrin	ND	ND	mg/kg	0.00096	0.00018	EPA-8080	ND		1
Endrin aldehyde	ND	ND	mg/kg	0.00096	0.00044	EPA-8080	ND		1
Heptachlor	ND	ND	mg/kg	0.00096	0.000069	EPA-8080	ND		1
Heptachlor epoxide	ND	ND	mg/kg	0.00096	0.000033	EPA-8080	ND		1
Methoxychlor	ND	ND	mg/kg	0.00096	0.00040	EPA-8080	ND		1
Toxaphene	ND	ND	mg/kg	0.096	0.018	EPA-8080	ND		1
PCB-1016	ND	ND	mg/kg	0.019	0.0075	EPA-8080	ND		1
PCB-1221	ND	ND	mg/kg	0.019	0.014	EPA-8080	ND		1
PCB-1232	ND	ND	mg/kg	0.019	0.014	EPA-8080	ND		1
PCB-1242	ND	ND	mg/kg	0.019	0.0081	EPA-8080	ND		1
PCB-1248	ND	ND	mg/kg	0.019	0.013	EPA-8080	ND		1
PCB-1254	ND	ND	mg/kg	0.019	0.0062	EPA-8080	ND		1
PCB-1260	ND	ND	mg/kg	0.019	0.0056	EPA-8080	ND		1
Total PCB's (Summation)	ND	ND	mg/kg	0.019	0.0096	EPA-8080	ND		1
TCMX (Surrogate)	86.4	86.4	%	20 - 130 (LCL - UCL)		EPA-8080			1
Decachlorobiphenyl (Surrogate)	91.1	91.1	%	40 - 130 (LCL - UCL)		EPA-8080			1

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

Reported: 09/08/2017 9:20
Project: Biosolids from MBWWTP
Project Number: [none]
Project Manager: Doug Coats

Organochlorine Pesticides and PCB's (EPA Method 8080)

BCL Sample ID: 1723647-01 | **Client Sample Name:** BC1 Composite Biosolids, 8/23/2017 10:30:00AM

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-8080	08/26/17	08/28/17 16:01	HKS	GC-17	1.923	B[H3086

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

Reported: 09/08/2017 9:20
Project: Biosolids from MBWWTP
Project Number: [none]
Project Manager: Doug Coats

PCB Analysis (EPA Method 8082)

BCL Sample ID: 1723647-01 | **Client Sample Name:** BC1 Composite Biosolids, 8/23/2017 10:30:00AM

Constituent	Dry Basis Result	As Recvd Result	Units	As Received PQL	As Received MDL	Method	MB Bias	Lab Quals	Run #
PCB-1016	ND	ND	mg/kg	0.010	0.0039	EPA-8082	ND		1
PCB-1221	ND	ND	mg/kg	0.010	0.0072	EPA-8082	ND		1
PCB-1232	ND	ND	mg/kg	0.010	0.0074	EPA-8082	ND		1
PCB-1242	ND	ND	mg/kg	0.010	0.0042	EPA-8082	ND		1
PCB-1248	ND	ND	mg/kg	0.010	0.0070	EPA-8082	ND		1
PCB-1254	ND	ND	mg/kg	0.010	0.0032	EPA-8082	ND		1
PCB-1260	ND	ND	mg/kg	0.010	0.0029	EPA-8082	ND		1
Total PCB's (Summation)	ND	ND	mg/kg	0.010	0.0050	EPA-8082	ND		1
Decachlorobiphenyl (Surrogate)	56.7	56.7	%	40 - 120 (LCL - UCL)		EPA-8082			1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-8082	08/25/17	08/29/17 21:13	HKS	GC-15	1	B[H2942

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

Reported: 09/08/2017 9:20
Project: Biosolids from MBWWTP
Project Number: [none]
Project Manager: Doug Coats

Volatile Organic Analysis (EPA Method 8240)

BCL Sample ID: 1723647-01 | **Client Sample Name:** BC1 Composite Biosolids, 8/23/2017 10:30:00AM

Constituent	Dry Basis Result	As Recvd Result	Units	As Received PQL	As Received MDL	Method	MB Bias	Lab Quals	Run #
Benzene	ND	ND	mg/kg	0.0050	0.0013	EPA-8240	ND		1
Bromodichloromethane	ND	ND	mg/kg	0.0050	0.00084	EPA-8240	ND		1
Bromoform	ND	ND	mg/kg	0.0050	0.0015	EPA-8240	ND		1
Bromomethane	ND	ND	mg/kg	0.0050	0.0016	EPA-8240	ND		1
Carbon tetrachloride	ND	ND	mg/kg	0.0050	0.0011	EPA-8240	ND		1
Chlorobenzene	ND	ND	mg/kg	0.0050	0.0013	EPA-8240	ND		1
Chloroethane	ND	ND	mg/kg	0.0050	0.0014	EPA-8240	ND		1
Chloroform	ND	ND	mg/kg	0.0050	0.00063	EPA-8240	ND		1
Chloromethane	ND	ND	mg/kg	0.0050	0.0014	EPA-8240	ND		1
Dibromochloromethane	ND	ND	mg/kg	0.0050	0.00099	EPA-8240	ND		1
1,2-Dichlorobenzene	ND	ND	mg/kg	0.0050	0.00081	EPA-8240	ND		1
1,3-Dichlorobenzene	ND	ND	mg/kg	0.0050	0.0014	EPA-8240	ND		1
1,4-Dichlorobenzene	ND	ND	mg/kg	0.0050	0.0015	EPA-8240	ND		1
1,1-Dichloroethane	ND	ND	mg/kg	0.0050	0.0014	EPA-8240	ND		1
1,2-Dichloroethane	ND	ND	mg/kg	0.0050	0.00085	EPA-8240	ND		1
1,1-Dichloroethene	ND	ND	mg/kg	0.0050	0.0012	EPA-8240	ND		1
trans-1,2-Dichloroethene	ND	ND	mg/kg	0.0050	0.0014	EPA-8240	ND		1
1,2-Dichloropropane	ND	ND	mg/kg	0.0050	0.00081	EPA-8240	ND		1
cis-1,3-Dichloropropene	ND	ND	mg/kg	0.0050	0.0011	EPA-8240	ND		1
trans-1,3-Dichloropropene	ND	ND	mg/kg	0.0050	0.0012	EPA-8240	ND		1
Ethylbenzene	ND	ND	mg/kg	0.0050	0.0015	EPA-8240	ND		1
Methylene chloride	ND	ND	mg/kg	0.010	0.0024	EPA-8240	ND		1
Methyl t-butyl ether	ND	ND	mg/kg	0.0050	0.00050	EPA-8240	ND		1
1,1,2,2-Tetrachloroethane	ND	ND	mg/kg	0.0050	0.0011	EPA-8240	ND		1
Tetrachloroethene	ND	ND	mg/kg	0.0050	0.0013	EPA-8240	ND		1
Toluene	ND	ND	mg/kg	0.0050	0.0012	EPA-8240	ND		1
1,1,1-Trichloroethane	ND	ND	mg/kg	0.0050	0.0011	EPA-8240	ND		1
1,1,2-Trichloroethane	ND	ND	mg/kg	0.0050	0.00077	EPA-8240	ND		1
Trichloroethene	ND	ND	mg/kg	0.0050	0.0011	EPA-8240	ND		1
Trichlorofluoromethane	ND	ND	mg/kg	0.0050	0.0011	EPA-8240	ND		1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	ND	mg/kg	0.0050	0.0013	EPA-8240	ND		1

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

Reported: 09/08/2017 9:20
Project: Biosolids from MBWWTP
Project Number: [none]
Project Manager: Doug Coats

Volatile Organic Analysis (EPA Method 8240)

BCL Sample ID: 1723647-01 | **Client Sample Name:** BC1 Composite Biosolids, 8/23/2017 10:30:00AM

Constituent	Dry Basis Result	As Recvd Result	Units	As Received PQL	As Received MDL	Method	MB Bias	Lab Quals	Run #
Vinyl chloride	ND	ND	mg/kg	0.0050	0.0016	EPA-8240	ND		1
Total Xylenes	ND	ND	mg/kg	0.010	0.0034	EPA-8240	ND		1
Acrolein	ND	ND	mg/kg	0.050	0.0073	EPA-8240	ND		1
Acrylonitrile	ND	ND	mg/kg	0.020	0.0047	EPA-8240	ND		1
1,2-Dichloroethane-d4 (Surrogate)	118	118	%	70 - 121 (LCL - UCL)		EPA-8240			1
Toluene-d8 (Surrogate)	97.2	97.2	%	81 - 117 (LCL - UCL)		EPA-8240			1
4-Bromofluorobenzene (Surrogate)	94.4	94.4	%	74 - 121 (LCL - UCL)		EPA-8240			1
TIC: Dimethyl disulfide	0.018	0.015	**mg/kg**			**EPA-8240**			1
TIC: Ethylene oxide	1.4	1.2	**mg/kg**			**EPA-8240**			1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-8240	08/25/17	08/25/17 15:58	ADC	MS-V2	1	B[H2511

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

Reported: 09/08/2017 9:20
Project: Biosolids from MBWWTP
Project Number: [none]
Project Manager: Doug Coats

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

BCL Sample ID: 1723647-01 | **Client Sample Name:** BC1 Composite Biosolids, 8/23/2017 10:30:00AM

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	25	2.3	EPA-8270C	ND	A01	1
Acenaphthylene	ND	ND	mg/kg	25	4.5	EPA-8270C	ND	A01	1
Aldrin	ND	ND	mg/kg	25	4.0	EPA-8270C	ND	A01	1
Aniline	ND	ND	mg/kg	50	4.0	EPA-8270C	ND	A01	1
Anthracene	ND	ND	mg/kg	25	12	EPA-8270C	ND	A01	1
Benzidine	ND	ND	mg/kg	740	14	EPA-8270C	ND	A01	1
Benzo[a]anthracene	ND	ND	mg/kg	25	10	EPA-8270C	ND	A01	1
Benzo[b]fluoranthene	ND	ND	mg/kg	25	2.3	EPA-8270C	ND	A01	1
Benzo[k]fluoranthene	ND	ND	mg/kg	25	4.2	EPA-8270C	ND	A01	1
Benzo[a]pyrene	ND	ND	mg/kg	25	6.4	EPA-8270C	ND	A01	1
Benzo[g,h,i]perylene	ND	ND	mg/kg	25	2.7	EPA-8270C	ND	A01	1
Benzoic acid	ND	ND	mg/kg	120	14	EPA-8270C	ND	A01	1
Benzyl alcohol	ND	ND	mg/kg	25	1.8	EPA-8270C	ND	A01	1
Benzyl butyl phthalate	ND	ND	mg/kg	25	8.2	EPA-8270C	ND	A01	1
alpha-BHC	ND	ND	mg/kg	25	8.7	EPA-8270C	ND	A01	1
beta-BHC	ND	ND	mg/kg	25	9.9	EPA-8270C	ND	A01	1
delta-BHC	ND	ND	mg/kg	25	4.5	EPA-8270C	ND	A01	1
gamma-BHC (Lindane)	ND	ND	mg/kg	25	6.2	EPA-8270C	ND	A01	1
bis(2-Chloroethoxy)methane	ND	ND	mg/kg	25	11	EPA-8270C	ND	A01	1
bis(2-Chloroethyl) ether	ND	ND	mg/kg	25	6.4	EPA-8270C	ND	A01	1
bis(2-Chloroisopropyl)ether	ND	ND	mg/kg	25	3.7	EPA-8270C	ND	A01	1
bis(2-Ethylhexyl)phthalate	ND	ND	mg/kg	50	7.9	EPA-8270C	ND	A01	1
4-Bromophenyl phenyl ether	ND	ND	mg/kg	25	6.4	EPA-8270C	ND	A01	1
4-Chloroaniline	ND	ND	mg/kg	25	3.7	EPA-8270C	ND	A01	1
2-Chloronaphthalene	ND	ND	mg/kg	25	3.0	EPA-8270C	ND	A01	1
4-Chlorophenyl phenyl ether	ND	ND	mg/kg	25	2.7	EPA-8270C	ND	A01	1
Chrysene	ND	ND	mg/kg	25	4.0	EPA-8270C	ND	A01	1
4,4'-DDD	ND	ND	mg/kg	25	7.9	EPA-8270C	ND	A01	1
4,4'-DDE	ND	ND	mg/kg	25	8.2	EPA-8270C	ND	A01	1
4,4'-DDT	ND	ND	mg/kg	25	13	EPA-8270C	ND	A01	1
Dibenzo[a,h]anthracene	ND	ND	mg/kg	25	4.7	EPA-8270C	ND	A01	1

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

Reported: 09/08/2017 9:20
Project: Biosolids from MBWWTP
Project Number: [none]
Project Manager: Doug Coats

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

BCL Sample ID: 1723647-01 | **Client Sample Name:** BC1 Composite Biosolids, 8/23/2017 10:30:00AM

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	25	3.2	EPA-8270C	ND	A01	1
1,2-Dichlorobenzene	ND	ND	mg/kg	25	2.1	EPA-8270C	ND	A01	1
1,3-Dichlorobenzene	ND	ND	mg/kg	25	3.0	EPA-8270C	ND	A01	1
1,4-Dichlorobenzene	ND	ND	mg/kg	25	4.5	EPA-8270C	ND	A01	1
3,3-Dichlorobenzidine	ND	ND	mg/kg	50	5.9	EPA-8270C	ND	A01	1
Dieldrin	ND	ND	mg/kg	25	7.7	EPA-8270C	ND	A01	1
Diethyl phthalate	ND	ND	mg/kg	25	1.8	EPA-8270C	ND	A01	1
Dimethyl phthalate	ND	ND	mg/kg	25	2.3	EPA-8270C	ND	A01	1
Di-n-butyl phthalate	ND	ND	mg/kg	25	4.7	EPA-8270C	ND	A01	1
2,4-Dinitrotoluene	ND	ND	mg/kg	25	7.4	EPA-8270C	ND	A01	1
2,6-Dinitrotoluene	ND	ND	mg/kg	25	4.0	EPA-8270C	ND	A01	1
Di-n-octyl phthalate	ND	ND	mg/kg	25	3.2	EPA-8270C	ND	A01	1
1,2-Diphenylhydrazine	ND	ND	mg/kg	25	4.0	EPA-8270C	ND	A01	1
Endosulfan I	ND	ND	mg/kg	50	15	EPA-8270C	ND	A01	1
Endosulfan II	ND	ND	mg/kg	50	15	EPA-8270C	ND	A01	1
Endosulfan sulfate	ND	ND	mg/kg	25	14	EPA-8270C	ND	A01	1
Endrin	ND	ND	mg/kg	50	13	EPA-8270C	ND	A01	1
Endrin aldehyde	ND	ND	mg/kg	120	11	EPA-8270C	ND	A01	1
Fluoranthene	ND	ND	mg/kg	25	2.7	EPA-8270C	ND	A01	1
Fluorene	ND	ND	mg/kg	25	3.2	EPA-8270C	ND	A01	1
Heptachlor	ND	ND	mg/kg	25	5.9	EPA-8270C	ND	A01	1
Heptachlor epoxide	ND	ND	mg/kg	25	16	EPA-8270C	ND	A01	1
Hexachlorobenzene	ND	ND	mg/kg	25	3.0	EPA-8270C	ND	A01	1
Hexachlorobutadiene	ND	ND	mg/kg	25	5.0	EPA-8270C	ND	A01	1
Hexachlorocyclopentadiene	ND	ND	mg/kg	25	7.2	EPA-8270C	ND	A01	1
Hexachloroethane	ND	ND	mg/kg	25	7.9	EPA-8270C	ND	A01	1
Indeno[1,2,3-cd]pyrene	ND	ND	mg/kg	25	3.2	EPA-8270C	ND	A01	1
Isophorone	ND	ND	mg/kg	25	2.5	EPA-8270C	ND	A01	1
2-Methylnaphthalene	ND	ND	mg/kg	25	2.0	EPA-8270C	ND	A01	1
Naphthalene	ND	ND	mg/kg	25	2.1	EPA-8270C	ND	A01	1
2-Naphthylamine	ND	ND	mg/kg	740	9.7	EPA-8270C	ND	A01	1

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

Reported: 09/08/2017 9:20
Project: Biosolids from MBWWTP
Project Number: [none]
Project Manager: Doug Coats

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

BCL Sample ID: 1723647-01 | **Client Sample Name:** BC1 Composite Biosolids, 8/23/2017 10:30:00AM

Constituent	Dry Basis Result	As Recvd Result	Units	As Received PQL	As Received MDL	Method	MB Bias	Lab Quals	Run #
2-Nitroaniline	ND	ND	mg/kg	25	6.7	EPA-8270C	ND	A01	1
3-Nitroaniline	ND	ND	mg/kg	50	9.2	EPA-8270C	ND	A01	1
4-Nitroaniline	ND	ND	mg/kg	50	9.2	EPA-8270C	ND	A01	1
Nitrobenzene	ND	ND	mg/kg	25	2.4	EPA-8270C	ND	A01	1
N-Nitrosodimethylamine	ND	ND	mg/kg	25	19	EPA-8270C	ND	A01	1
N-Nitrosodi-N-propylamine	ND	ND	mg/kg	25	3.2	EPA-8270C	ND	A01	1
N-Nitrosodiphenylamine	ND	ND	mg/kg	25	4.5	EPA-8270C	ND	A01	1
Phenanthrene	ND	ND	mg/kg	25	8.4	EPA-8270C	ND	A01	1
Pyrene	ND	ND	mg/kg	25	6.7	EPA-8270C	ND	A01	1
1,2,4-Trichlorobenzene	ND	ND	mg/kg	25	4.0	EPA-8270C	ND	A01	1
4-Chloro-3-methylphenol	ND	ND	mg/kg	50	4.2	EPA-8270C	ND	A01	1
2-Chlorophenol	ND	ND	mg/kg	25	3.7	EPA-8270C	ND	A01	1
2,4-Dichlorophenol	ND	ND	mg/kg	25	5.2	EPA-8270C	ND	A01	1
2,4-Dimethylphenol	ND	ND	mg/kg	25	4.7	EPA-8270C	ND	A01	1
4,6-Dinitro-2-methylphenol	ND	ND	mg/kg	120	7.4	EPA-8270C	ND	A01	1
2,4-Dinitrophenol	ND	ND	mg/kg	120	45	EPA-8270C	ND	A01	1
2-Methylphenol	ND	ND	mg/kg	25	2.1	EPA-8270C	ND	A01	1
3- & 4-Methylphenol	ND	ND	mg/kg	50	8.4	EPA-8270C	ND	A01	1
2-Nitrophenol	ND	ND	mg/kg	25	6.2	EPA-8270C	ND	A01	1
4-Nitrophenol	ND	ND	mg/kg	50	8.4	EPA-8270C	ND	A01	1
Pentachlorophenol	ND	ND	mg/kg	50	7.7	EPA-8270C	ND	A01	1
Phenol	ND	ND	mg/kg	25	3.7	EPA-8270C	ND	A01	1
2,4,5-Trichlorophenol	ND	ND	mg/kg	50	4.2	EPA-8270C	ND	A01	1
2,4,6-Trichlorophenol	ND	ND	mg/kg	50	6.9	EPA-8270C	ND	A01	1
2-Fluorophenol (Surrogate)	40.3	40.3	%	20 - 130 (LCL - UCL)		EPA-8270C		A01	1
Phenol-d5 (Surrogate)	40.1	40.1	%	30 - 130 (LCL - UCL)		EPA-8270C		A01	1
Nitrobenzene-d5 (Surrogate)	35.1	35.1	%	30 - 130 (LCL - UCL)		EPA-8270C		A01	1
2-Fluorobiphenyl (Surrogate)	74.0	74.0	%	30 - 140 (LCL - UCL)		EPA-8270C		A01	1
2,4,6-Tribromophenol (Surrogate)	42.8	42.8	%	20 - 150 (LCL - UCL)		EPA-8270C		A01	1
p-Terphenyl-d14 (Surrogate)	48.5	48.5	%	30 - 150 (LCL - UCL)		EPA-8270C		A01	1

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

Reported: 09/08/2017 9:20
Project: Biosolids from MBWWTP
Project Number: [none]
Project Manager: Doug Coats

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

BCL Sample ID:	1723647-01	**Client Sample Name:**	BC1 Composite Biosolids, 8/23/2017 10:30:00AM

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-8270C	08/25/17	08/28/17 21:05	MK1	MS-B1	247.50	B[H2832

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

Reported: 09/08/2017 9:20
Project: Biosolids from MBWWTP
Project Number: [none]
Project Manager: Doug Coats

EPA Method 1664

BCL Sample ID: 1723647-01 | **Client Sample Name:** BC1 Composite Biosolids, 8/23/2017 10:30:00AM

Constituent	Dry Basis Result	As Recvd Result	Units	As Received PQL	As Received MDL	Method	MB Bias	Lab Quals	Run #
Oil and Grease	20000	16000	**mg/kg**	**2300**	**950**	**EPA-1664A HEM**	ND		1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-1664A HEM	09/01/17	09/01/17 10:00	MAM	MAN-SV	45.455	B[I0092

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

Reported: 09/08/2017 9:20
Project: Biosolids from MBWWTP
Project Number: [none]
Project Manager: Doug Coats

Chemical Analysis

BCL Sample ID: 1723647-01 | **Client Sample Name:** BC1 Composite Biosolids, 8/23/2017 10:30:00AM

Constituent	Dry Basis Result	As Recvd Result	Units	As Received PQL	As Received MDL	Method	MB Bias	Lab Quals	Run #
Moisture	0	15.6	**%**	**0.05**	**0.05**	**Calc**	ND		1
Total Cyanide	2.4	2.0	**mg/kg**	**0.50**	**0.28**	**EPA-9012**	ND		2
pH	6.48	6.48	**pH Units**	**0.05**	**0.05**	**EPA-9045D**		**pH1:1**	3
pH Measurement Temperature	24.8	24.8	**C**	**0.1**	**0.1**	**EPA-9045D**			3
Nitrate as NO3	1600	1400	**mg/kg**	**22**	**6.0**	**EPA-300.0**	ND	**A07**	4
Total Kjeldahl Nitrogen	16000	14000	**mg/kg**	**800**	**320**	**EPA-351.2**	ND	**A07**	5
Ammonia as N	3300	2800	**mg/kg**	**200**	**100**	**EPA-350.1**	ND	**A07**	6
Total Phosphate	52000	44000	**mg/kg**	**3000**	**1900**	**EPA-365.4**	ND	**A07**	7
Solids	100	84.4	**%**	**0.05**	**0.05**	**SM-2540G**			8

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	Calc	08/24/17	08/30/17 20:01	AMM	Calc	1	B[H2538
2	EPA-9012	08/28/17	08/28/17 14:48	RCC	KONE-1	0.943	B[F2187
3	EPA-9045D	08/25/17	08/25/17 14:45	DIW	PH10	1	B[H2736
4	EPA-300.0	08/29/17	08/29/17 17:23	EMW	IC8	5	B[H2870
5	EPA-351.2	08/28/17	08/29/17 13:56	JMH	SC-1	20	B[H2751
6	EPA-350.1	08/25/17	08/28/17 09:13	JMH	SC-1	18.519	B[H2565
7	EPA-365.4	08/28/17	08/29/17 16:12	JMH	SC-1	100	B[H2764
8	SM-2540G	08/29/17	08/29/17 23:45	DRC	MANUAL	1	B[H3104

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

Reported: 09/08/2017 9:20
Project: Biosolids from MBWWTP
Project Number: [none]
Project Manager: Doug Coats

Modified WET Test (STLC)

BCL Sample ID: 1723647-01 | **Client Sample Name:** BC1 Composite Biosolids, 8/23/2017 10:30:00AM

Constituent	Dry Basis Result	As Recvd Result	Units	As Received PQL	As Received MDL	Method	MB Bias	Lab Quals	Run #
Hexavalent Chromium		ND	mg/L	0.20	0.070	EPA-7196	ND		1
Total Dissolved Solids @ 180 C		3100	**mg/L**	**200**	**200**	**EPA-160.1**	ND		2

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-7196	08/28/17	08/28/17 09:41	RCC	KONE-1	1	B[H2794
2	EPA-160.1	08/28/17	08/28/17 11:30	CAD	MANUAL	20	B[H2787

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

Reported: 09/08/2017 9:20
Project: Biosolids from MBWWTP
Project Number: [none]
Project Manager: Doug Coats

WET Test (STLC)

BCL Sample ID: 1723647-01 | **Client Sample Name:** BC1 Composite Biosolids, 8/23/2017 10:30:00AM

Constituent	Dry Basis Result	As Recvd Result	Units	As Received PQL	As Received MDL	Method	MB Bias	Lab Quals	Run #
Copper		2.9	**mg/L**	**0.10**	**0.012**	**EPA-6010B**	0.014		1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-6010B	08/27/17	08/28/17 21:01	JCC	PE-OP3	1	B[H2833

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

Reported: 09/08/2017 9:20
Project: Biosolids from MBWWTP
Project Number: [none]
Project Manager: Doug Coats

Total Concentrations (TTLC)

BCL Sample ID: 1723647-01 | **Client Sample Name:** BC1 Composite Biosolids, 8/23/2017 10:30:00AM

Constituent	Dry Basis Result	As Recvd Result	Units	As Received PQL	As Received MDL	Method	MB Bias	Lab Quals	Run #
Antimony	1.5	1.3	**mg/kg**	**5.0**	**0.33**	**EPA-6010B**	0.51	**J**	1
Arsenic	1.7	1.4	**mg/kg**	**1.0**	**0.40**	**EPA-6010B**	ND		1
Barium	250	210	**mg/kg**	**0.50**	**0.18**	**EPA-6010B**	ND		1
Beryllium	0.16	0.13	**mg/kg**	**0.50**	**0.047**	**EPA-6010B**	ND	**J**	1
Cadmium	1.2	0.97	**mg/kg**	**0.50**	**0.052**	**EPA-6010B**	ND		1
Chromium	32	27	**mg/kg**	**0.50**	**0.050**	**EPA-6010B**	ND		1
Total Hexavalent Chromium	3.3	2.8	mg/kg	5.0	1.5	EPA-7199	1.9	J,A07	2
Cobalt	2.7	2.3	**mg/kg**	**2.5**	**0.098**	**EPA-6010B**	ND	**J**	1
Copper	190	160	**mg/kg**	**1.0**	**0.050**	**EPA-6010B**	0.064		1
Lead	15	12	**mg/kg**	**2.5**	**0.28**	**EPA-6010B**	ND		1
Mercury	0.39	0.33	**mg/kg**	**0.16**	**0.019**	**EPA-7471A**	ND		3
Molybdenum	8.9	7.5	**mg/kg**	**2.5**	**0.050**	**EPA-6010B**	0.095		1
Nickel	20	17	**mg/kg**	**0.50**	**0.15**	**EPA-6010B**	ND		1
Selenium	4.8	4.0	**mg/kg**	**1.0**	**0.98**	**EPA-6010B**	ND		1
Silver	1.2	1.0	**mg/kg**	**0.50**	**0.067**	**EPA-6010B**	ND		1
Thallium	ND	ND	mg/kg	5.0	0.64	EPA-6010B	ND		1
Vanadium	15	13	**mg/kg**	**0.50**	**0.11**	**EPA-6010B**	ND		1
Zinc	540	460	**mg/kg**	**2.5**	**0.087**	**EPA-6010B**	0.20		1
Boron	12	10	**mg/kg**	**5.0**	**0.50**	**EPA-6010B**	ND		1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-6010B	09/01/17	09/01/17 19:18	JRG	PE-OP2	0.952	B[I0100
2	EPA-7199	09/05/17	09/05/17 19:08	EMW	IC-4	5	B[I0141
3	EPA-7471A	08/28/17	08/30/17 12:26	MEV	CETAC2	0.992	B[H2825

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

Reported: 09/08/2017 9:20
Project: Biosolids from MBWWTP
Project Number: [none]
Project Manager: Doug Coats

Organochlorine Pesticides and PCB's (EPA Method 8080)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: B[H3086						
Aldrin	B[H3086-BLK1	ND	mg/kg	0.00050	0.000034	
alpha-BHC	B[H3086-BLK1	ND	mg/kg	0.00050	0.00013	
beta-BHC	B[H3086-BLK1	ND	mg/kg	0.00050	0.00015	
delta-BHC	B[H3086-BLK1	ND	mg/kg	0.00050	0.000047	
gamma-BHC (Lindane)	B[H3086-BLK1	ND	mg/kg	0.00050	0.000082	
Chlordane (Technical)	B[H3086-BLK1	ND	mg/kg	0.050	0.0017	
4,4'-DDD	B[H3086-BLK1	ND	mg/kg	0.00050	0.00021	
4,4'-DDE	B[H3086-BLK1	ND	mg/kg	0.00050	0.000020	
4,4'-DDT	B[H3086-BLK1	ND	mg/kg	0.00050	0.000093	
Dieldrin	B[H3086-BLK1	ND	mg/kg	0.00050	0.000079	
Endosulfan I	B[H3086-BLK1	ND	mg/kg	0.00050	0.000022	
Endosulfan II	B[H3086-BLK1	ND	mg/kg	0.00050	0.00014	
Endosulfan sulfate	B[H3086-BLK1	ND	mg/kg	0.00050	0.00034	
Endrin	B[H3086-BLK1	ND	mg/kg	0.00050	0.000091	
Endrin aldehyde	B[H3086-BLK1	ND	mg/kg	0.00050	0.00023	
Heptachlor	B[H3086-BLK1	ND	mg/kg	0.00050	0.000036	
Heptachlor epoxide	B[H3086-BLK1	ND	mg/kg	0.00050	0.000017	
Methoxychlor	B[H3086-BLK1	ND	mg/kg	0.00050	0.00021	
Toxaphene	B[H3086-BLK1	ND	mg/kg	0.050	0.0094	
PCB-1016	B[H3086-BLK1	ND	mg/kg	0.010	0.0039	
PCB-1221	B[H3086-BLK1	ND	mg/kg	0.010	0.0072	
PCB-1232	B[H3086-BLK1	ND	mg/kg	0.010	0.0074	
PCB-1242	B[H3086-BLK1	ND	mg/kg	0.010	0.0042	
PCB-1248	B[H3086-BLK1	ND	mg/kg	0.010	0.0070	
PCB-1254	B[H3086-BLK1	ND	mg/kg	0.010	0.0032	
PCB-1260	B[H3086-BLK1	ND	mg/kg	0.010	0.0029	
Total PCB's (Summation)	B[H3086-BLK1	ND	mg/kg	0.010	0.0050	
TCMX (Surrogate)	**B[H3086-BLK1**	**86.9**	%	**20 - 130 (LCL - UCL)**		
Decachlorobiphenyl (Surrogate)	**B[H3086-BLK1**	**91.2**	%	**40 - 130 (LCL - UCL)**		

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

Reported: 09/08/2017 9:20
Project: Biosolids from MBWWTP
Project Number: [none]
Project Manager: Doug Coats

Organochlorine Pesticides and PCB's (EPA Method 8080)

Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits Percent Recovery	Control Limits RPD	Lab Quals
QC Batch ID: B[H3086										
Aldrin	B[H3086-BS1	LCS	0.0043787	0.0049834	mg/kg	87.9		70 - 130		
gamma-BHC (Lindane)	B[H3086-BS1	LCS	0.0045731	0.0049834	mg/kg	91.8		60 - 140		
4,4'-DDT	B[H3086-BS1	LCS	0.0040485	0.0049834	mg/kg	81.2		60 - 140		
Dieldrin	B[H3086-BS1	LCS	0.0043070	0.0049834	mg/kg	86.4		70 - 130		
Endrin	B[H3086-BS1	LCS	0.0045262	0.0049834	mg/kg	90.8		60 - 140		
Heptachlor	B[H3086-BS1	LCS	0.0045199	0.0049834	mg/kg	90.7		60 - 140		
TCMX (Surrogate)	B[H3086-BS1	LCS	0.0097694	0.0099668	mg/kg	98.0		20 - 130		
Decachlorobiphenyl (Surrogate)	B[H3086-BS1	LCS	0.016588	0.019934	mg/kg	83.2		40 - 130		

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

Reported: 09/08/2017 9:20
Project: Biosolids from MBWWTP
Project Number: [none]
Project Manager: Doug Coats

Organochlorine Pesticides and PCB's (EPA Method 8080)

Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits RPD	Control Limits Percent Recovery	Lab Quals
QC Batch ID: B[H3086	Used client sample: N										
Aldrin	MS	1722106-77	ND	0.0044430	0.0050000	mg/kg		88.9		50 - 140	
	MSD	1722106-77	ND	0.0047125	0.0050847	mg/kg	5.9	92.7	30	50 - 140	
gamma-BHC (Lindane)	MS	1722106-77	ND	0.0047063	0.0050000	mg/kg		94.1		50 - 140	
	MSD	1722106-77	ND	0.0048312	0.0050847	mg/kg	2.6	95.0	30	50 - 140	
4,4'-DDT	MS	1722106-77	ND	0.0043123	0.0050000	mg/kg		86.2		50 - 140	
	MSD	1722106-77	ND	0.0045380	0.0050847	mg/kg	5.1	89.2	30	50 - 140	
Dieldrin	MS	1722106-77	ND	0.0044190	0.0050000	mg/kg		88.4		40 - 140	
	MSD	1722106-77	ND	0.0046234	0.0050847	mg/kg	4.5	90.9	30	40 - 140	
Endrin	MS	1722106-77	ND	0.0046997	0.0050000	mg/kg		94.0		50 - 150	
	MSD	1722106-77	ND	0.0048597	0.0050847	mg/kg	3.3	95.6	30	50 - 150	
Heptachlor	MS	1722106-77	ND	0.0045950	0.0050000	mg/kg		91.9		60 - 140	
	MSD	1722106-77	ND	0.0048444	0.0050847	mg/kg	5.3	95.3	30	60 - 140	
TCMX (Surrogate)	MS	1722106-77	ND	0.010123	0.010000	mg/kg		101		20 - 130	
	MSD	1722106-77	ND	0.010504	0.010169	mg/kg	3.7	103		20 - 130	
Decachlorobiphenyl (Surrogate)	MS	1722106-77	ND	0.018074	0.020000	mg/kg		90.4		40 - 130	
	MSD	1722106-77	ND	0.017620	0.020339	mg/kg	2.5	86.6		40 - 130	

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

Reported: 09/08/2017 9:20
Project: Biosolids from MBWWTP
Project Number: [none]
Project Manager: Doug Coats

PCB Analysis (EPA Method 8082)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: B[H2942						
PCB-1016	B[H2942-BLK1	ND	mg/kg	0.010	0.0039	
PCB-1221	B[H2942-BLK1	ND	mg/kg	0.010	0.0072	
PCB-1232	B[H2942-BLK1	ND	mg/kg	0.010	0.0074	
PCB-1242	B[H2942-BLK1	ND	mg/kg	0.010	0.0042	
PCB-1248	B[H2942-BLK1	ND	mg/kg	0.010	0.0070	
PCB-1254	B[H2942-BLK1	ND	mg/kg	0.010	0.0032	
PCB-1260	B[H2942-BLK1	ND	mg/kg	0.010	0.0029	
Total PCB's (Summation)	B[H2942-BLK1	ND	mg/kg	0.010	0.0050	
Decachlorobiphenyl (Surrogate)	**B[H2942-BLK1**	**91.7**	%	**40 - 120 (LCL - UCL)**		

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

Reported: 09/08/2017 9:20
Project: Biosolids from MBWWTP
Project Number: [none]
Project Manager: Doug Coats

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 Percent Recovery	Control Limits RPD	Lab Quals
QC Batch ID: B[H2942										
PCB-1016	B[H2942-BS1	LCS	0.066000	0.083333	mg/kg	79.2		60 - 120		
PCB-1260	B[H2942-BS1	LCS	0.060000	0.083333	mg/kg	72.0		60 - 120		
Decachlorobiphenyl (Surrogate)	B[H2942-BS1	LCS	0.016667	0.020000	mg/kg	83.3		40 - 120		

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

Reported: 09/08/2017 9:20
Project: Biosolids from MBWWTP
Project Number: [none]
Project Manager: Doug Coats

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 RPD	Control Limits Percent Recovery	Lab Quals
QC Batch ID: B[H2942	Used client sample: N										
PCB-1016	MS	1722106-77	ND	0.070333	0.083333	mg/kg		84.4		60 - 120	
	MSD	1722106-77	ND	0.067667	0.083333	mg/kg	3.9	81.2	30	60 - 120	
PCB-1260	MS	1722106-77	ND	0.065667	0.083333	mg/kg		78.8		60 - 120	
	MSD	1722106-77	ND	0.061333	0.083333	mg/kg	6.8	73.6	30	60 - 120	
Decachlorobiphenyl (Surrogate)	MS	1722106-77	ND	0.017667	0.020000	mg/kg		88.3		40 - 120	
	MSD	1722106-77	ND	0.018333	0.020000	mg/kg	3.7	91.7		40 - 120	

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

Reported: 09/08/2017 9:20
Project: Biosolids from MBWWTP
Project Number: [none]
Project Manager: Doug Coats

Volatile Organic Analysis (EPA Method 8240)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: B[H2511						
Benzene	B[H2511-BLK1	ND	mg/kg	0.0050	0.0013	
Bromodichloromethane	B[H2511-BLK1	ND	mg/kg	0.0050	0.00084	
Bromoform	B[H2511-BLK1	ND	mg/kg	0.0050	0.0015	
Bromomethane	B[H2511-BLK1	ND	mg/kg	0.0050	0.0016	
Carbon tetrachloride	B[H2511-BLK1	ND	mg/kg	0.0050	0.0011	
Chlorobenzene	B[H2511-BLK1	ND	mg/kg	0.0050	0.0013	
Chloroethane	B[H2511-BLK1	ND	mg/kg	0.0050	0.0014	
Chloroform	B[H2511-BLK1	ND	mg/kg	0.0050	0.00063	
Chloromethane	B[H2511-BLK1	ND	mg/kg	0.0050	0.0014	
Dibromochloromethane	B[H2511-BLK1	ND	mg/kg	0.0050	0.00099	
1,2-Dichlorobenzene	B[H2511-BLK1	ND	mg/kg	0.0050	0.00081	
1,3-Dichlorobenzene	B[H2511-BLK1	ND	mg/kg	0.0050	0.0014	
1,4-Dichlorobenzene	B[H2511-BLK1	ND	mg/kg	0.0050	0.0015	
1,1-Dichloroethane	B[H2511-BLK1	ND	mg/kg	0.0050	0.0014	
1,2-Dichloroethane	B[H2511-BLK1	ND	mg/kg	0.0050	0.00085	
1,1-Dichloroethene	B[H2511-BLK1	ND	mg/kg	0.0050	0.0012	
trans-1,2-Dichloroethene	B[H2511-BLK1	ND	mg/kg	0.0050	0.0014	
1,2-Dichloropropane	B[H2511-BLK1	ND	mg/kg	0.0050	0.00081	
cis-1,3-Dichloropropene	B[H2511-BLK1	ND	mg/kg	0.0050	0.0011	
trans-1,3-Dichloropropene	B[H2511-BLK1	ND	mg/kg	0.0050	0.0012	
Ethylbenzene	B[H2511-BLK1	ND	mg/kg	0.0050	0.0015	
Methylene chloride	B[H2511-BLK1	ND	mg/kg	0.010	0.0024	
Methyl t-butyl ether	B[H2511-BLK1	ND	mg/kg	0.0050	0.00050	
1,1,2,2-Tetrachloroethane	B[H2511-BLK1	ND	mg/kg	0.0050	0.0011	
Tetrachloroethene	B[H2511-BLK1	ND	mg/kg	0.0050	0.0013	
Toluene	B[H2511-BLK1	ND	mg/kg	0.0050	0.0012	
1,1,1-Trichloroethane	B[H2511-BLK1	ND	mg/kg	0.0050	0.0011	
1,1,2-Trichloroethane	B[H2511-BLK1	ND	mg/kg	0.0050	0.00077	
Trichloroethene	B[H2511-BLK1	ND	mg/kg	0.0050	0.0011	
Trichlorofluoromethane	B[H2511-BLK1	ND	mg/kg	0.0050	0.0011	
1,1,2-Trichloro-1,2,2-trifluoroethane	B[H2511-BLK1	ND	mg/kg	0.0050	0.0013	
Vinyl chloride	B[H2511-BLK1	ND	mg/kg	0.0050	0.0016	
Total Xylenes	B[H2511-BLK1	ND	mg/kg	0.010	0.0034	

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

Reported: 09/08/2017 9:20
Project: Biosolids from MBWWTP
Project Number: [none]
Project Manager: Doug Coats

Volatile Organic Analysis (EPA Method 8240)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: B[H2511						
Acrolein	B[H2511-BLK1	ND	mg/kg	0.050	0.0073	
Acrylonitrile	B[H2511-BLK1	ND	mg/kg	0.020	0.0047	
1,2-Dichloroethane-d4 (Surrogate)	**B[H2511-BLK1**	**103**	%	**70 - 121 (LCL - UCL)**		
Toluene-d8 (Surrogate)	**B[H2511-BLK1**	**103**	%	**81 - 117 (LCL - UCL)**		
4-Bromofluorobenzene (Surrogate)	**B[H2511-BLK1**	**104**	%	**74 - 121 (LCL - UCL)**		

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

Reported: 09/08/2017 9:20
Project: Biosolids from MBWWTP
Project Number: [none]
Project Manager: Doug Coats

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 Percent Recovery	Control Limits RPD	Lab Quals
QC Batch ID: B[H2511										
Benzene	B[H2511-BS1	LCS	0.11047	0.12500	mg/kg	88.4		70 - 130		
Bromodichloromethane	B[H2511-BS1	LCS	0.13223	0.12500	mg/kg	106		70 - 130		
Chlorobenzene	B[H2511-BS1	LCS	0.11686	0.12500	mg/kg	93.5		70 - 130		
Chloroethane	B[H2511-BS1	LCS	0.12297	0.12500	mg/kg	98.4		70 - 130		
1,4-Dichlorobenzene	B[H2511-BS1	LCS	0.11598	0.12500	mg/kg	92.8		70 - 130		
1,1-Dichloroethane	B[H2511-BS1	LCS	0.12150	0.12500	mg/kg	97.2		70 - 130		
1,1-Dichloroethene	B[H2511-BS1	LCS	0.12207	0.12500	mg/kg	97.7		70 - 130		
Toluene	B[H2511-BS1	LCS	0.12382	0.12500	mg/kg	99.1		70 - 130		
Trichloroethene	B[H2511-BS1	LCS	0.12480	0.12500	mg/kg	99.8		70 - 130		
1,2-Dichloroethane-d4 (Surrogate)	B[H2511-BS1	LCS	0.051250	0.050000	mg/kg	102		70 - 121		
Toluene-d8 (Surrogate)	B[H2511-BS1	LCS	0.050010	0.050000	mg/kg	100		81 - 117		
4-Bromofluorobenzene (Surrogate)	B[H2511-BS1	LCS	0.045410	0.050000	mg/kg	90.8		74 - 121		

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

Reported: 09/08/2017 9:20
Project: Biosolids from MBWWTP
Project Number: [none]
Project Manager: Doug Coats

Volatile Organic Analysis (EPA Method 8240)

Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits RPD	Control Limits Percent Recovery	Lab Quals
QC Batch ID: B[H2511	Used client sample: N										
Benzene	MS	1722106-51	ND	0.10290	0.12500	mg/kg		82.3		70 - 130	
	MSD	1722106-51	ND	0.11203	0.12500	mg/kg	8.5	89.6	20	70 - 130	
Bromodichloromethane	MS	1722106-51	ND	0.12422	0.12500	mg/kg		99.4		70 - 130	
	MSD	1722106-51	ND	0.12566	0.12500	mg/kg	1.2	101	20	70 - 130	
Chlorobenzene	MS	1722106-51	ND	0.11151	0.12500	mg/kg		89.2		70 - 130	
	MSD	1722106-51	ND	0.11762	0.12500	mg/kg	5.3	94.1	20	70 - 130	
Chloroethane	MS	1722106-51	ND	0.10819	0.12500	mg/kg		86.6		70 - 130	
	MSD	1722106-51	ND	0.12201	0.12500	mg/kg	12.0	97.6	20	70 - 130	
1,4-Dichlorobenzene	MS	1722106-51	ND	0.10858	0.12500	mg/kg		86.9		70 - 130	
	MSD	1722106-51	ND	0.11833	0.12500	mg/kg	8.6	94.7	20	70 - 130	
1,1-Dichloroethane	MS	1722106-51	ND	0.10686	0.12500	mg/kg		85.5		70 - 130	
	MSD	1722106-51	ND	0.11890	0.12500	mg/kg	10.7	95.1	20	70 - 130	
1,1-Dichloroethene	MS	1722106-51	ND	0.10975	0.12500	mg/kg		87.8		70 - 130	
	MSD	1722106-51	ND	0.12587	0.12500	mg/kg	13.7	101	20	70 - 130	
Toluene	MS	1722106-51	ND	0.12063	0.12500	mg/kg		96.5		70 - 130	
	MSD	1722106-51	ND	0.12207	0.12500	mg/kg	1.2	97.7	20	70 - 130	
Trichloroethene	MS	1722106-51	ND	0.12242	0.12500	mg/kg		97.9		70 - 130	
	MSD	1722106-51	ND	0.12319	0.12500	mg/kg	0.6	98.6	20	70 - 130	
1,2-Dichloroethane-d4 (Surrogate)	MS	1722106-51	ND	0.050480	0.050000	mg/kg		101		70 - 121	
	MSD	1722106-51	ND	0.050630	0.050000	mg/kg	0.3	101		70 - 121	
Toluene-d8 (Surrogate)	MS	1722106-51	ND	0.052420	0.050000	mg/kg		105		81 - 117	
	MSD	1722106-51	ND	0.048810	0.050000	mg/kg	7.1	97.6		81 - 117	
4-Bromofluorobenzene (Surrogate)	MS	1722106-51	ND	0.050930	0.050000	mg/kg		102		74 - 121	
	MSD	1722106-51	ND	0.050740	0.050000	mg/kg	0.4	101		74 - 121	

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

Reported: 09/08/2017 9:20
Project: Biosolids from MBWWTP
Project Number: [none]
Project Manager: Doug Coats

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
QC Batch ID: B[H2832						
Acenaphthene	B[H2832-BLK1	ND	mg/kg	0.10	0.0092	
Acenaphthylene	B[H2832-BLK1	ND	mg/kg	0.10	0.018	
Aldrin	B[H2832-BLK1	ND	mg/kg	0.10	0.016	
Aniline	B[H2832-BLK1	ND	mg/kg	0.20	0.016	
Anthracene	B[H2832-BLK1	ND	mg/kg	0.10	0.050	
Benzidine	B[H2832-BLK1	ND	mg/kg	3.0	0.058	
Benzo[a]anthracene	B[H2832-BLK1	ND	mg/kg	0.10	0.041	
Benzo[b]fluoranthene	B[H2832-BLK1	ND	mg/kg	0.10	0.0094	
Benzo[k]fluoranthene	B[H2832-BLK1	ND	mg/kg	0.10	0.017	
Benzo[a]pyrene	B[H2832-BLK1	ND	mg/kg	0.10	0.026	
Benzo[g,h,i]perylene	B[H2832-BLK1	ND	mg/kg	0.10	0.011	
Benzoic acid	B[H2832-BLK1	ND	mg/kg	0.50	0.057	
Benzyl alcohol	B[H2832-BLK1	ND	mg/kg	0.10	0.0073	
Benzyl butyl phthalate	B[H2832-BLK1	ND	mg/kg	0.10	0.033	
alpha-BHC	B[H2832-BLK1	ND	mg/kg	0.10	0.035	
beta-BHC	B[H2832-BLK1	ND	mg/kg	0.10	0.040	
delta-BHC	B[H2832-BLK1	ND	mg/kg	0.10	0.018	
gamma-BHC (Lindane)	B[H2832-BLK1	ND	mg/kg	0.10	0.025	
bis(2-Chloroethoxy)methane	B[H2832-BLK1	ND	mg/kg	0.10	0.045	
bis(2-Chloroethyl) ether	B[H2832-BLK1	ND	mg/kg	0.10	0.026	
bis(2-Chloroisopropyl)ether	B[H2832-BLK1	ND	mg/kg	0.10	0.015	
bis(2-Ethylhexyl)phthalate	B[H2832-BLK1	ND	mg/kg	0.20	0.032	
4-Bromophenyl phenyl ether	B[H2832-BLK1	ND	mg/kg	0.10	0.026	
4-Chloroaniline	B[H2832-BLK1	ND	mg/kg	0.10	0.015	
2-Chloronaphthalene	B[H2832-BLK1	ND	mg/kg	0.10	0.012	
4-Chlorophenyl phenyl ether	B[H2832-BLK1	ND	mg/kg	0.10	0.011	
Chrysene	B[H2832-BLK1	ND	mg/kg	0.10	0.016	
4,4'-DDD	B[H2832-BLK1	ND	mg/kg	0.10	0.032	
4,4'-DDE	B[H2832-BLK1	ND	mg/kg	0.10	0.033	
4,4'-DDT	B[H2832-BLK1	ND	mg/kg	0.10	0.052	
Dibenzo[a,h]anthracene	B[H2832-BLK1	ND	mg/kg	0.10	0.019	
Dibenzofuran	B[H2832-BLK1	ND	mg/kg	0.10	0.013	
1,2-Dichlorobenzene	B[H2832-BLK1	ND	mg/kg	0.10	0.0084	

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

Reported: 09/08/2017 9:20
Project: Biosolids from MBWWTP
Project Number: [none]
Project Manager: Doug Coats

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
QC Batch ID: B[H2832						
1,3-Dichlorobenzene	B[H2832-BLK1	ND	mg/kg	0.10	0.012	
1,4-Dichlorobenzene	B[H2832-BLK1	ND	mg/kg	0.10	0.018	
3,3-Dichlorobenzidine	B[H2832-BLK1	ND	mg/kg	0.20	0.024	
Dieldrin	B[H2832-BLK1	ND	mg/kg	0.10	0.031	
Diethyl phthalate	B[H2832-BLK1	ND	mg/kg	0.10	0.0073	
Dimethyl phthalate	B[H2832-BLK1	ND	mg/kg	0.10	0.0091	
Di-n-butyl phthalate	B[H2832-BLK1	ND	mg/kg	0.10	0.019	
2,4-Dinitrotoluene	B[H2832-BLK1	ND	mg/kg	0.10	0.030	
2,6-Dinitrotoluene	B[H2832-BLK1	ND	mg/kg	0.10	0.016	
Di-n-octyl phthalate	B[H2832-BLK1	ND	mg/kg	0.10	0.013	
1,2-Diphenylhydrazine	B[H2832-BLK1	ND	mg/kg	0.10	0.016	
Endosulfan I	B[H2832-BLK1	ND	mg/kg	0.20	0.062	
Endosulfan II	B[H2832-BLK1	ND	mg/kg	0.20	0.062	
Endosulfan sulfate	B[H2832-BLK1	ND	mg/kg	0.10	0.056	
Endrin	B[H2832-BLK1	ND	mg/kg	0.20	0.053	
Endrin aldehyde	B[H2832-BLK1	ND	mg/kg	0.50	0.044	
Fluoranthene	B[H2832-BLK1	ND	mg/kg	0.10	0.011	
Fluorene	B[H2832-BLK1	ND	mg/kg	0.10	0.013	
Heptachlor	B[H2832-BLK1	ND	mg/kg	0.10	0.024	
Heptachlor epoxide	B[H2832-BLK1	ND	mg/kg	0.10	0.065	
Hexachlorobenzene	B[H2832-BLK1	ND	mg/kg	0.10	0.012	
Hexachlorobutadiene	B[H2832-BLK1	ND	mg/kg	0.10	0.020	
Hexachlorocyclopentadiene	B[H2832-BLK1	ND	mg/kg	0.10	0.029	
Hexachloroethane	B[H2832-BLK1	ND	mg/kg	0.10	0.032	
Indeno[1,2,3-cd]pyrene	B[H2832-BLK1	ND	mg/kg	0.10	0.013	
Isophorone	B[H2832-BLK1	ND	mg/kg	0.10	0.0099	
2-Methylnaphthalene	B[H2832-BLK1	ND	mg/kg	0.10	0.0082	
Naphthalene	B[H2832-BLK1	ND	mg/kg	0.10	0.0085	
2-Naphthylamine	B[H2832-BLK1	ND	mg/kg	3.0	0.039	
2-Nitroaniline	B[H2832-BLK1	ND	mg/kg	0.10	0.027	
3-Nitroaniline	B[H2832-BLK1	ND	mg/kg	0.20	0.037	
4-Nitroaniline	B[H2832-BLK1	ND	mg/kg	0.20	0.037	
Nitrobenzene	B[H2832-BLK1	ND	mg/kg	0.10	0.0098	

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

Reported: 09/08/2017 9:20
Project: Biosolids from MBWWTP
Project Number: [none]
Project Manager: Doug Coats

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
QC Batch ID: B[H2832						
N-Nitrosodimethylamine	B[H2832-BLK1	ND	mg/kg	0.10	0.077	
N-Nitrosodi-N-propylamine	B[H2832-BLK1	ND	mg/kg	0.10	0.013	
N-Nitrosodiphenylamine	B[H2832-BLK1	ND	mg/kg	0.10	0.018	
Phenanthrene	B[H2832-BLK1	ND	mg/kg	0.10	0.034	
Pyrene	B[H2832-BLK1	ND	mg/kg	0.10	0.027	
1,2,4-Trichlorobenzene	B[H2832-BLK1	ND	mg/kg	0.10	0.016	
4-Chloro-3-methylphenol	B[H2832-BLK1	ND	mg/kg	0.20	0.017	
2-Chlorophenol	B[H2832-BLK1	ND	mg/kg	0.10	0.015	
2,4-Dichlorophenol	B[H2832-BLK1	ND	mg/kg	0.10	0.021	
2,4-Dimethylphenol	B[H2832-BLK1	ND	mg/kg	0.10	0.019	
4,6-Dinitro-2-methylphenol	B[H2832-BLK1	ND	mg/kg	0.50	0.030	
2,4-Dinitrophenol	B[H2832-BLK1	ND	mg/kg	0.50	0.18	
2-Methylphenol	B[H2832-BLK1	ND	mg/kg	0.10	0.0086	
3- & 4-Methylphenol	B[H2832-BLK1	ND	mg/kg	0.20	0.034	
2-Nitrophenol	B[H2832-BLK1	ND	mg/kg	0.10	0.025	
4-Nitrophenol	B[H2832-BLK1	ND	mg/kg	0.20	0.034	
Pentachlorophenol	B[H2832-BLK1	ND	mg/kg	0.20	0.031	
Phenol	B[H2832-BLK1	ND	mg/kg	0.10	0.015	
2,4,5-Trichlorophenol	B[H2832-BLK1	ND	mg/kg	0.20	0.017	
2,4,6-Trichlorophenol	B[H2832-BLK1	ND	mg/kg	0.20	0.028	
2-Fluorophenol (Surrogate)	**B[H2832-BLK1**	**56.8**	%	**20 - 130 (LCL - UCL)**		
Phenol-d5 (Surrogate)	**B[H2832-BLK1**	**61.2**	%	**30 - 130 (LCL - UCL)**		
Nitrobenzene-d5 (Surrogate)	**B[H2832-BLK1**	**53.1**	%	**30 - 130 (LCL - UCL)**		
2-Fluorobiphenyl (Surrogate)	**B[H2832-BLK1**	**85.8**	%	**30 - 140 (LCL - UCL)**		
2,4,6-Tribromophenol (Surrogate)	**B[H2832-BLK1**	**43.5**	%	**20 - 150 (LCL - UCL)**		
p-Terphenyl-d14 (Surrogate)	**B[H2832-BLK1**	**58.1**	%	**30 - 150 (LCL - UCL)**		

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

Reported: 09/08/2017 9:20
Project: Biosolids from MBWWTP
Project Number: [none]
Project Manager: Doug Coats

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

Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits Percent Recovery	Control Limits RPD	Lab Quals
QC Batch ID: B[H2832										
Acenaphthene	B[H2832-BS1	LCS	1.1957	1.6556	mg/kg	72.2		50 - 130		
1,4-Dichlorobenzene	B[H2832-BS1	LCS	1.3692	1.6556	mg/kg	82.7		50 - 130		
2,4-Dinitrotoluene	B[H2832-BS1	LCS	1.4821	1.6556	mg/kg	89.5		50 - 130		
Hexachlorobenzene	B[H2832-BS1	LCS	1.4113	1.3245	mg/kg	107		40 - 130		
Hexachlorobutadiene	B[H2832-BS1	LCS	1.1358	1.6556	mg/kg	68.6		50 - 130		
Hexachloroethane	B[H2832-BS1	LCS	1.1460	1.6556	mg/kg	69.2		50 - 130		
Nitrobenzene	B[H2832-BS1	LCS	1.3788	1.6556	mg/kg	83.3		50 - 130		
N-Nitrosodi-N-propylamine	B[H2832-BS1	LCS	1.2252	1.6556	mg/kg	74.0		40 - 120		
Pyrene	B[H2832-BS1	LCS	1.3967	1.6556	mg/kg	84.4		40 - 150		
1,2,4-Trichlorobenzene	B[H2832-BS1	LCS	1.3593	1.6556	mg/kg	82.1		50 - 120		
4-Chloro-3-methylphenol	B[H2832-BS1	LCS	1.1371	1.6556	mg/kg	68.7		50 - 130		
2-Chlorophenol	B[H2832-BS1	LCS	1.3361	1.6556	mg/kg	80.7		50 - 130		
2-Methylphenol	B[H2832-BS1	LCS	1.2169	1.6556	mg/kg	73.5		50 - 130		
3- & 4-Methylphenol	B[H2832-BS1	LCS	2.3364	3.3113	mg/kg	70.6		50 - 130		
4-Nitrophenol	B[H2832-BS1	LCS	1.1934	1.6556	mg/kg	72.1		30 - 130		
Pentachlorophenol	B[H2832-BS1	LCS	0.68576	1.3245	mg/kg	51.8		20 - 130		
Phenol	B[H2832-BS1	LCS	1.2560	1.6556	mg/kg	75.9		40 - 120		
2,4,6-Trichlorophenol	B[H2832-BS1	LCS	1.0748	1.6556	mg/kg	64.9		50 - 130		
2-Fluorophenol (Surrogate)	B[H2832-BS1	LCS	0.78344	1.3245	mg/kg	59.1		20 - 130		
Phenol-d5 (Surrogate)	B[H2832-BS1	LCS	0.79603	1.3245	mg/kg	60.1		30 - 130		
Nitrobenzene-d5 (Surrogate)	B[H2832-BS1	LCS	0.70397	1.3245	mg/kg	53.1		30 - 130		
2-Fluorobiphenyl (Surrogate)	B[H2832-BS1	LCS	1.0675	1.3245	mg/kg	80.6		30 - 140		
2,4,6-Tribromophenol (Surrogate)	B[H2832-BS1	LCS	0.66490	1.3245	mg/kg	50.2		20 - 150		
p-Terphenyl-d14 (Surrogate)	B[H2832-BS1	LCS	0.40960	0.66225	mg/kg	61.8		30 - 150		

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

Reported: 09/08/2017 9:20
Project: Biosolids from MBWWTP
Project Number: [none]
Project Manager: Doug Coats

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	Control Limits Percent Recovery	Lab Quals
QC Batch ID: B[H2832	Used client sample: N										
Acenaphthene	MS	1722106-18	ND	1.1683	1.6502	mg/kg		70.8		30 - 140	
	MSD	1722106-18	ND	1.2232	1.6722	mg/kg	4.6	73.1	30	30 - 140	
1,4-Dichlorobenzene	MS	1722106-18	ND	1.2614	1.6502	mg/kg		76.4		50 - 130	
	MSD	1722106-18	ND	1.3766	1.6722	mg/kg	8.7	82.3	30	50 - 130	
2,4-Dinitrotoluene	MS	1722106-18	ND	1.5050	1.6502	mg/kg		91.2		50 - 130	
	MSD	1722106-18	ND	1.5034	1.6722	mg/kg	0.1	89.9	30	50 - 130	
Hexachlorobenzene	MS	1722106-18	ND	1.3594	1.3201	mg/kg		103		50 - 130	
	MSD	1722106-18	ND	1.4906	1.3378	mg/kg	9.2	111	30	50 - 130	
Hexachlorobutadiene	MS	1722106-18	ND	1.1158	1.6502	mg/kg		67.6		50 - 130	
	MSD	1722106-18	ND	1.2078	1.6722	mg/kg	7.9	72.2	30	50 - 130	
Hexachloroethane	MS	1722106-18	ND	1.1231	1.6502	mg/kg		68.1		50 - 130	
	MSD	1722106-18	ND	1.2180	1.6722	mg/kg	8.1	72.8	30	50 - 130	
Nitrobenzene	MS	1722106-18	ND	1.3617	1.6502	mg/kg		82.5		30 - 120	
	MSD	1722106-18	ND	1.4625	1.6722	mg/kg	7.1	87.5	30	30 - 120	
N-Nitrosodi-N-propylamine	MS	1722106-18	ND	1.2271	1.6502	mg/kg		74.4		20 - 130	
	MSD	1722106-18	ND	1.3009	1.6722	mg/kg	5.8	77.8	30	20 - 130	
Pyrene	MS	1722106-18	ND	1.2881	1.6502	mg/kg		78.1		40 - 140	
	MSD	1722106-18	ND	1.3425	1.6722	mg/kg	4.1	80.3	30	40 - 140	
1,2,4-Trichlorobenzene	MS	1722106-18	ND	1.3386	1.6502	mg/kg		81.1		50 - 130	
	MSD	1722106-18	ND	1.4244	1.6722	mg/kg	6.2	85.2	30	50 - 130	
4-Chloro-3-methylphenol	MS	1722106-18	ND	1.3409	1.6502	mg/kg		81.3		50 - 130	
	MSD	1722106-18	ND	1.4349	1.6722	mg/kg	6.8	85.8	30	50 - 130	
2-Chlorophenol	MS	1722106-18	ND	1.2954	1.6502	mg/kg		78.5		50 - 130	
	MSD	1722106-18	ND	1.3451	1.6722	mg/kg	3.8	80.4	30	50 - 130	
2-Methylphenol	MS	1722106-18	ND	1.2073	1.6502	mg/kg		73.2		50 - 130	
	MSD	1722106-18	ND	1.2419	1.6722	mg/kg	2.8	74.3	30	50 - 130	
3- & 4-Methylphenol	MS	1722106-18	ND	2.2347	3.3003	mg/kg		67.7		50 - 130	
	MSD	1722106-18	ND	2.3366	3.3445	mg/kg	4.5	69.9	30	50 - 130	
4-Nitrophenol	MS	1722106-18	ND	1.0264	1.6502	mg/kg		62.2		30 - 140	
	MSD	1722106-18	ND	1.1599	1.6722	mg/kg	12.2	69.4	30	30 - 140	
Pentachlorophenol	MS	1722106-18	ND	0.66898	1.3201	mg/kg		50.7		30 - 130	
	MSD	1722106-18	ND	0.65585	1.3378	mg/kg	2.0	49.0	30	30 - 130	
Phenol	MS	1722106-18	ND	1.2053	1.6502	mg/kg		73.0		40 - 150	
	MSD	1722106-18	ND	1.2511	1.6722	mg/kg	3.7	74.8	30	40 - 150	
2,4,6-Trichlorophenol	MS	1722106-18	ND	1.0835	1.6502	mg/kg		65.7		50 - 130	
	MSD	1722106-18	ND	1.1314	1.6722	mg/kg	4.3	67.7	30	50 - 130	

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

Reported: 09/08/2017 9:20
Project: Biosolids from MBWWTP
Project Number: [none]
Project Manager: Doug Coats

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	Control Limits Percent Recovery	Lab Quals
QC Batch ID: B[H2832	Used client sample: N										
2-Fluorophenol (Surrogate)	MS	1722106-18	ND	0.75776	1.3201	mg/kg		57.4		20 - 130	
	MSD	1722106-18	ND	0.80727	1.3378	mg/kg	6.3	60.3		20 - 130	
Phenol-d5 (Surrogate)	MS	1722106-18	ND	0.77129	1.3201	mg/kg		58.4		30 - 130	
	MSD	1722106-18	ND	0.79940	1.3378	mg/kg	3.6	59.8		30 - 130	
Nitrobenzene-d5 (Surrogate)	MS	1722106-18	ND	0.70462	1.3201	mg/kg		53.4		30 - 130	
	MSD	1722106-18	ND	0.73058	1.3378	mg/kg	3.6	54.6		30 - 130	
2-Fluorobiphenyl (Surrogate)	MS	1722106-18	ND	1.0406	1.3201	mg/kg		78.8		30 - 140	
	MSD	1722106-18	ND	1.1032	1.3378	mg/kg	5.8	82.5		30 - 140	
2,4,6-Tribromophenol (Surrogate)	MS	1722106-18	ND	0.66205	1.3201	mg/kg		50.2		20 - 150	
	MSD	1722106-18	ND	0.68534	1.3378	mg/kg	3.5	51.2		20 - 150	
p-Terphenyl-d14 (Surrogate)	MS	1722106-18	ND	0.38845	0.66007	mg/kg		58.8		30 - 150	
	MSD	1722106-18	ND	0.40577	0.66890	mg/kg	4.4	60.7		30 - 150	

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

Reported: 09/08/2017 9:20
Project: Biosolids from MBWWTP
Project Number: [none]
Project Manager: Doug Coats

EPA Method 1664

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: B[I0092						
Oil and Grease	B[I0092-BLK1	ND	mg/kg	50	21	

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

Reported: 09/08/2017 9:20
Project: Biosolids from MBWWTP
Project Number: [none]
Project Manager: Doug Coats

EPA Method 1664

Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits Percent Recovery	Control Limits RPD	Lab Quals
QC Batch ID: B[I0092										
Oil and Grease	B[I0092-BS1	LCS	828.71	796.04	mg/kg	104		59 - 117		

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

Reported: 09/08/2017 9:20
Project: Biosolids from MBWWTP
Project Number: [none]
Project Manager: Doug Coats

EPA Method 1664

Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits RPD	Control Limits Percent Recovery	Lab Quals
QC Batch ID: B[I0092	Used client sample: N										
Oil and Grease	DUP	1722106-11	ND	ND		mg/kg			30		
	MS	1722106-11	ND	832.34	802.40	mg/kg		104		56 - 111	
	MSD	1722106-11	ND	803.57	797.62	mg/kg	3.5	101	30	56 - 111	

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

Reported: 09/08/2017 9:20
Project: Biosolids from MBWWTP
Project Number: [none]
Project Manager: Doug Coats

Chemical Analysis

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: B[F2187						
Total Cyanide	B[F2187-BLK1	ND	mg/kg	0.50	0.28	
QC Batch ID: B[H2538						
Moisture	B[H2538-BLK1	ND	%	0.05	0.05	
QC Batch ID: B[H2565						
Ammonia as N	B[H2565-BLK1	ND	mg/kg	10	5.0	
QC Batch ID: B[H2751						
Total Kjeldahl Nitrogen	B[H2751-BLK1	ND	mg/kg	40	16	
QC Batch ID: B[H2764						
Total Phosphate	B[H2764-BLK1	ND	mg/kg	30	19	
QC Batch ID: B[H2870						
Nitrate as NO3	B[H2870-BLK1	ND	mg/kg	4.4	1.2	

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

Reported: 09/08/2017 9:20
Project: Biosolids from MBWWTP
Project Number: [none]
Project Manager: Doug Coats

Chemical Analysis

Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits Percent Recovery	Control Limits RPD	Lab Quals
QC Batch ID: B[F2187										
Total Cyanide	B[F2187-BS1	LCS	13.554	14.151	mg/kg	95.8		80 - 120		
QC Batch ID: B[H2565										
Ammonia as N	B[H2565-BS1	LCS	96.096	96.154	mg/kg	99.9		80 - 120		
QC Batch ID: B[H2736										
pH	B[H2736-BS1	LCS	4.0040	4.0000	pH Units	100		95 - 105		
QC Batch ID: B[H2751										
Total Kjeldahl Nitrogen	B[H2751-BS1	LCS	413.52	400.00	mg/kg	103		90 - 110		
QC Batch ID: B[H2764										
Total Phosphate	B[H2764-BS1	LCS	698.60	613.20	mg/kg	114		85 - 115		
QC Batch ID: B[H2870										
Nitrate as NO3	B[H2870-BS1	LCS	22.931	22.134	mg/kg	104		90 - 110		

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

Reported: 09/08/2017 9:20
Project: Biosolids from MBWWTP
Project Number: [none]
Project Manager: Doug Coats

Chemical Analysis

Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits RPD	Control Limits Percent Recovery	Lab Quals
QC Batch ID: B[F2187	Used client sample: N										
Total Cyanide	DUP	**1723565-01**	**1.1436**	**1.1085**		**mg/kg**	**3.1**		**20**		
	MS	**1723565-01**	**1.1436**	**8.3929**	**9.2593**	**mg/kg**		**78.3**		**80 - 120**	**Q03**
	MSD	**1723565-01**	**1.1436**	**9.4813**	**9.6154**	**mg/kg**	**12.2**	**86.7**	**20**	**80 - 120**	
QC Batch ID: B[H2565	Used client sample: N										
Ammonia as N	DUP	**1723616-01**	**2282.8**	**2232.0**		**mg/kg**	**2.3**		**20**		
	MS	**1723616-01**	**2282.8**	**2411.5**	**96.154**	**mg/kg**		**134**		**80 - 120**	**A03**
	MSD	**1723616-01**	**2282.8**	**2389.6**	**94.340**	**mg/kg**	**0.9**	**113**	**20**	**80 - 120**	
QC Batch ID: B[H2736	Used client sample: N										
pH	DUP	1723565-01	6.6910	6.6920		pH Units	0.0		20		
QC Batch ID: B[H2751	Used client sample: N										
Total Kjeldahl Nitrogen	DUP	**1723645-01**	**26402**	**25906**		**mg/kg**	**1.9**		**20**		
	MS	**1723645-01**	**26402**	**26484**	**400.00**	**mg/kg**		**20.5**		**90 - 110**	**A03**
	MSD	**1723645-01**	**26402**	**27638**	**400.00**	**mg/kg**	**4.3**	**309**	**20**	**90 - 110**	**A03**
QC Batch ID: B[H2764	Used client sample: N										
Total Phosphate	DUP	**1723645-01**	**66383**	**67236**		**mg/kg**	**1.3**		**20**		
	MS	**1723645-01**	**66383**	**65923**	**613.20**	**mg/kg**		**-75.0**		**80 - 120**	**A03**
	MSD	**1723645-01**	**66383**	**67659**	**613.20**	**mg/kg**	**2.6**	**208**	**20**	**80 - 120**	**A03**
QC Batch ID: B[H2870	Used client sample: N										
Nitrate as NO3	DUP	1723616-01	9.1192	8.6765		mg/kg	5.0		20		
	MS	1723616-01	9.1192	235.60	223.58	mg/kg		101		80 - 120	
	MSD	1723616-01	9.1192	234.93	223.58	mg/kg	0.3	101	20	80 - 120	
QC Batch ID: B[H3104	Used client sample: Y - Description: BC1 Composite Biosolids, 08/23/2017 10:30										
Solids	DUP	1723647-01	84.360	82.460		%	2.3		20		

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

Reported: 09/08/2017 9:20
Project: Biosolids from MBWWTP
Project Number: [none]
Project Manager: Doug Coats

Modified WET Test (STLC)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: B[H2787						
Total Dissolved Solids @ 180 C	B[H2787-BLK1	ND	mg/L	6.7	6.7	
QC Batch ID: B[H2794						
Hexavalent Chromium	B[H2794-BLK1	ND	mg/L	0.20	0.070	

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

Reported: 09/08/2017 9:20
Project: Biosolids from MBWWTP
Project Number: [none]
Project Manager: Doug Coats

Modified WET Test (STLC)

Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits Percent Recovery	Control Limits RPD	Lab Quals
QC Batch ID: B[H2787										
Total Dissolved Solids @ 180 C	B[H2787-BS1	LCS	580.00	586.00	mg/L	99.0		90 - 110		
QC Batch ID: B[H2794										
Hexavalent Chromium	B[H2794-BS1	LCS	5.0206	5.0000	mg/L	100		85 - 115		

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

Reported: 09/08/2017 9:20
Project: Biosolids from MBWWTP
Project Number: [none]
Project Manager: Doug Coats

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	Control Limits Percent Recovery	Lab Quals
QC Batch ID: B[H2787	Used client sample: Y - Description: BC1 Composite Biosolids, 08/23/2017 10:30										
Total Dissolved Solids @ 180 C	DUP	1723647-01	3120.0	3220.0		mg/L	3.2		20		
QC Batch ID: B[H2794	Used client sample: Y - Description: BC1 Composite Biosolids, 08/23/2017 10:30										
Hexavalent Chromium	DUP	1723647-01	ND	ND		mg/L			20		
	MS	1723647-01	ND	5.2213	5.2632	mg/L		99.2		85 - 115	
	MSD	1723647-01	ND	5.1633	5.2632	mg/L	1.1	98.1	20	85 - 115	

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

Reported: 09/08/2017 9:20
Project: Biosolids from MBWWTP
Project Number: [none]
Project Manager: Doug Coats

WET Test (STLC)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: B[H2833						
Copper	B[H2833-BLK1	0.014175	mg/L	0.10	0.012	J

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

Reported: 09/08/2017 9:20
Project: Biosolids from MBWWTP
Project Number: [none]
Project Manager: Doug Coats

WET Test (STLC)

Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits Percent Recovery	Control Limits RPD	Lab Quals
QC Batch ID: B[H2833										
Copper	B[H2833-BS1	LCS	21.437	20.000	mg/L	107		85 - 115		

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

Reported: 09/08/2017 9:20
Project: Biosolids from MBWWTP
Project Number: [none]
Project Manager: Doug Coats

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	Control Limits Percent Recovery	Lab Quals
QC Batch ID: B[H2833	Used client sample: N										
Copper	DUP	**1722568-01**	**0.058982**	**0.042187**		**mg/L**	**33.2**		**20**		**J,A02**
	MS	**1722568-01**	**0.058982**	**21.420**	**20.408**	**mg/L**		**105**		**75 - 125**	
	MSD	**1722568-01**	**0.058982**	**21.468**	**20.408**	**mg/L**	**0.2**	**105**	**20**	**75 - 125**	

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

Reported: 09/08/2017 9:20
Project: Biosolids from MBWWTP
Project Number: [none]
Project Manager: Doug Coats

Total Concentrations (TTLC)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: B[H2825						
Mercury	B[H2825-BLK1	ND	mg/kg	0.16	0.019	
QC Batch ID: B[I0100						
Antimony	**B[I0100-BLK1**	**0.53696**	**mg/kg**	**5.0**	**0.33**	**J**
Arsenic	B[I0100-BLK1	ND	mg/kg	1.0	0.40	
Barium	B[I0100-BLK1	ND	mg/kg	0.50	0.18	
Beryllium	B[I0100-BLK1	ND	mg/kg	0.50	0.047	
Cadmium	B[I0100-BLK1	ND	mg/kg	0.50	0.052	
Chromium	B[I0100-BLK1	ND	mg/kg	0.50	0.050	
Cobalt	B[I0100-BLK1	ND	mg/kg	2.5	0.098	
Copper	**B[I0100-BLK1**	**0.067297**	**mg/kg**	**1.0**	**0.050**	**J**
Lead	B[I0100-BLK1	ND	mg/kg	2.5	0.28	
Molybdenum	**B[I0100-BLK1**	**0.099319**	**mg/kg**	**2.5**	**0.050**	**J**
Nickel	B[I0100-BLK1	ND	mg/kg	0.50	0.15	
Selenium	B[I0100-BLK1	ND	mg/kg	1.0	0.98	
Silver	B[I0100-BLK1	ND	mg/kg	0.50	0.067	
Thallium	B[I0100-BLK1	ND	mg/kg	5.0	0.64	
Vanadium	B[I0100-BLK1	ND	mg/kg	0.50	0.11	
Zinc	**B[I0100-BLK1**	**0.21115**	**mg/kg**	**2.5**	**0.087**	**J**
Boron	B[I0100-BLK1	ND	mg/kg	5.0	0.50	
QC Batch ID: B[I0141						
Total Hexavalent Chromium	**B[I0141-BLK1**	**0.38000**	**mg/kg**	**1.0**	**0.30**	**J**

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

Reported: 09/08/2017 9:20
Project: Biosolids from MBWWTP
Project Number: [none]
Project Manager: Doug Coats

Total Concentrations (TTLC)

Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits Percent Recovery	Control Limits RPD	Lab Quals
QC Batch ID: B[H2825										
Mercury	B[H2825-BS1	LCS	0.82192	0.80000	mg/kg	103		80 - 120		
QC Batch ID: B[I0100										
Antimony	B[I0100-BS1	LCS	99.413	100.00	mg/kg	99.4		75 - 125		
Arsenic	B[I0100-BS1	LCS	9.7739	10.000	mg/kg	97.7		75 - 125		
Barium	B[I0100-BS1	LCS	100.69	100.00	mg/kg	101		75 - 125		
Beryllium	B[I0100-BS1	LCS	10.346	10.000	mg/kg	103		75 - 125		
Cadmium	B[I0100-BS1	LCS	9.9250	10.000	mg/kg	99.2		75 - 125		
Chromium	B[I0100-BS1	LCS	102.98	100.00	mg/kg	103		75 - 125		
Cobalt	B[I0100-BS1	LCS	104.46	100.00	mg/kg	104		75 - 125		
Copper	B[I0100-BS1	LCS	99.109	100.00	mg/kg	99.1		75 - 125		
Lead	B[I0100-BS1	LCS	105.30	100.00	mg/kg	105		75 - 125		
Molybdenum	B[I0100-BS1	LCS	102.64	100.00	mg/kg	103		75 - 125		
Nickel	B[I0100-BS1	LCS	105.57	100.00	mg/kg	106		75 - 125		
Selenium	B[I0100-BS1	LCS	9.4165	10.000	mg/kg	94.2		75 - 125		
Silver	B[I0100-BS1	LCS	9.0988	10.000	mg/kg	91.0		75 - 125		
Thallium	B[I0100-BS1	LCS	106.18	100.00	mg/kg	106		75 - 125		
Vanadium	B[I0100-BS1	LCS	101.99	100.00	mg/kg	102		75 - 125		
Zinc	B[I0100-BS1	LCS	101.80	100.00	mg/kg	102		75 - 125		
Boron	B[I0100-BS1	LCS	95.736	100.00	mg/kg	95.7		75 - 125		
QC Batch ID: B[I0141										
Total Hexavalent Chromium	B[I0141-BS1	LCS	42.846	40.000	mg/kg	107		80 - 120		

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

Reported: 09/08/2017 9:20
Project: Biosolids from MBWWTP
Project Number: [none]
Project Manager: Doug Coats

Total Concentrations (TTLC)

Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits RPD	Control Limits Percent Recovery	Lab Quals
QC Batch ID: B[H2825	Used client sample: N										
Mercury	DUP	**1723680-01**	**0.020000**	**0.031639**		**mg/kg**	**45.1**		**20**		**J,A02**
	MS	**1723680-01**	**0.020000**	**0.78607**	**0.81967**	**mg/kg**		**93.5**		**80 - 120**	
	MSD	**1723680-01**	**0.020000**	**0.83033**	**0.81967**	**mg/kg**	**5.5**	**98.9**	**20**	**80 - 120**	
QC Batch ID: B[I0100	Used client sample: N										
Antimony	DUP	1724362-03	ND	ND		mg/kg			20		
	MS	1724362-03	ND	31.042	100.00	mg/kg		31.0		16 - 119	
	MSD	1724362-03	ND	32.258	100.00	mg/kg	3.8	32.3	20	16 - 119	
Arsenic	DUP	**1724362-03**	**6.1940**	**9.3823**		**mg/kg**	**40.9**		**20**		**Q01**
	MS	**1724362-03**	**6.1940**	**17.322**	**10.000**	**mg/kg**		**111**		**75 - 125**	
	MSD	**1724362-03**	**6.1940**	**16.708**	**10.000**	**mg/kg**	**3.6**	**105**	**20**	**75 - 125**	
Barium	DUP	1724362-03	100.54	110.24		mg/kg	9.2		20		
	MS	1724362-03	100.54	190.14	100.00	mg/kg		89.6		75 - 125	
	MSD	1724362-03	100.54	189.84	100.00	mg/kg	0.2	89.3	20	75 - 125	
Beryllium	DUP	1724362-03	0.29367	0.31507		mg/kg	7.0		20		J
	MS	1724362-03	0.29367	9.5615	10.000	mg/kg		92.7		75 - 125	
	MSD	1724362-03	0.29367	9.6022	10.000	mg/kg	0.4	93.1	20	75 - 125	
Cadmium	DUP	1724362-03	0.054790	ND		mg/kg			20		
	MS	1724362-03	0.054790	9.2357	10.000	mg/kg		91.8		75 - 125	
	MSD	1724362-03	0.054790	8.9488	10.000	mg/kg	3.2	88.9	20	75 - 125	
Chromium	DUP	1724362-03	10.719	11.855		mg/kg	10.1		20		
	MS	1724362-03	10.719	99.423	100.00	mg/kg		88.7		75 - 125	
	MSD	1724362-03	10.719	100.01	100.00	mg/kg	0.6	89.3	20	75 - 125	
Cobalt	DUP	1724362-03	3.1311	3.4430		mg/kg	9.5		20		
	MS	1724362-03	3.1311	90.893	100.00	mg/kg		87.8		75 - 125	
	MSD	1724362-03	3.1311	88.281	100.00	mg/kg	2.9	85.1	20	75 - 125	
Copper	DUP	1724362-03	5.3698	5.5672		mg/kg	3.6		20		
	MS	1724362-03	5.3698	95.396	100.00	mg/kg		90.0		75 - 125	
	MSD	1724362-03	5.3698	96.335	100.00	mg/kg	1.0	91.0	20	75 - 125	
Lead	DUP	1724362-03	2.2592	2.7446		mg/kg	19.4		20		
	MS	1724362-03	2.2592	90.889	100.00	mg/kg		88.6		75 - 125	
	MSD	1724362-03	2.2592	88.375	100.00	mg/kg	2.8	86.1	20	75 - 125	
Molybdenum	DUP	**1724362-03**	**1.8872**	**1.4612**		**mg/kg**	**25.4**		**20**		**J,A02**
	MS	**1724362-03**	**1.8872**	**89.416**	**100.00**	**mg/kg**		**87.5**		**75 - 125**	
	MSD	**1724362-03**	**1.8872**	**86.731**	**100.00**	**mg/kg**	**3.0**	**84.8**	**20**	**75 - 125**	
Nickel	DUP	1724362-03	5.6797	6.0684		mg/kg	6.6		20		
	MS	1724362-03	5.6797	94.818	100.00	mg/kg		89.1		75 - 125	
	MSD	1724362-03	5.6797	92.453	100.00	mg/kg	2.5	86.8	20	75 - 125	

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

Reported: 09/08/2017 9:20
Project: Biosolids from MBWWTP
Project Number: [none]
Project Manager: Doug Coats

Total Concentrations (TTLC)

Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits RPD	Control Limits Percent Recovery	Lab Quals
QC Batch ID: B[I0100	Used client sample: N										
Selenium	DUP	**1724362-03**	**3.4306**	**2.1204**		**mg/kg**	**47.2**		**20**		**Q01**
	MS	**1724362-03**	**3.4306**	**10.305**	**10.000**	**mg/kg**		**68.7**		**75 - 125**	**Q03**
	MSD	**1724362-03**	**3.4306**	**11.147**	**10.000**	**mg/kg**	**7.9**	**77.2**	**20**	**75 - 125**	
Silver	DUP	1724362-03	ND	ND		mg/kg			20		
	MS	1724362-03	ND	8.5273	10.000	mg/kg		85.3		75 - 125	
	MSD	1724362-03	ND	8.6279	10.000	mg/kg	1.2	86.3	20	75 - 125	
Thallium	DUP	1724362-03	1.6925	1.5227		mg/kg	10.6		20		J
	MS	1724362-03	1.6925	88.529	100.00	mg/kg		86.8		75 - 125	
	MSD	1724362-03	1.6925	86.071	100.00	mg/kg	2.8	84.4	20	75 - 125	
Vanadium	DUP	1724362-03	22.381	24.087		mg/kg	7.3		20		
	MS	1724362-03	22.381	113.20	100.00	mg/kg		90.8		75 - 125	
	MSD	1724362-03	22.381	113.16	100.00	mg/kg	0.0	90.8	20	75 - 125	
Zinc	DUP	1724362-03	28.819	29.703		mg/kg	3.0		20		
	MS	1724362-03	28.819	115.94	100.00	mg/kg		87.1		75 - 125	
	MSD	1724362-03	28.819	112.39	100.00	mg/kg	3.1	83.6	20	75 - 125	
Boron	DUP	1724362-03	8.5357	8.7507		mg/kg	2.5		20		
	MS	1724362-03	8.5357	91.883	100.00	mg/kg		83.3		75 - 125	
	MSD	1724362-03	8.5357	92.590	100.00	mg/kg	0.8	84.1	20	75 - 125	
QC Batch ID: B[I0141	Used client sample: Y - Description: BC1 Composite Biosolids, 08/23/2017 10:30										
Total Hexavalent Chromium	DUP	1723647-01	2.8000	2.8000		mg/kg	0		20		J
	MS	1723647-01	2.8000	166.99	200.00	mg/kg		82.1		75 - 125	
	MSD	1723647-01	2.8000	167.92	200.00	mg/kg	0.6	82.6	20	75 - 125	

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

Reported: 09/08/2017 9:20
Project: Biosolids from MBWWTP
Project Number: [none]
Project Manager: Doug Coats

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 is 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.
pH1:1	pH result reported on a 1:1 dilution of sample
Q01	Sample precision is not within the control limits.
Q03	Matrix spike recovery(s) is(are) not within the control limits.