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Del Mar Analytical

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May 12, 2005

MWH- Pasadena / Boeing
300 North Lake Avenue, Suite 1200
Pasadena , CA 91101

Attention: Bronwyn Kelly

Project: Boeing Outfall sampling for Quarter 1, 2005
Sampled: 1/9/05 – 3/30/05

Dear Ms. Kelly:

During an evaluation of the Oil & Grease data by AMEC, there was a discrepancy noted in the data reported. Attached is a table with revised oil and grease results. The revision incorporates method blank corrections that were inadvertently omitted during the original data processing. The laboratory is initiating a full investigation of this issue and will provide a formal corrective action at a later date.

If you have any questions or require further assistance, please do not hesitate to contact me at (949) 261-1022, extension 215.

Sincerely yours,

DEL MAR ANALYTICAL

Michele Harper
Project Manager

Dave Dawes
QA Manager

Enclosure

MWH/Boeing Oil Grease Revisions

batch	wrk	sample	Date Sampled	Outfall	result	raw	volume	Original	blank mg	Revised	Permit Level	Evaluation of Original	Evaluaition of Revised
5A12061	IOA0454	01	1/9/2005	017	11.9048	0.0125	1050	11.9	1.6	10	10	Exceedance	Hit
5A12061	IOA0456	01	1/9/2005	015	11.0476	0.0116	1050	11	1.6	9.5	10	Exceedance	Hit
5A12061	IOA0458	01	1/10/2005	006	2.9524	0.0031	1050	3	1.6	1.4	15	J	J
5A12061	IOA0460	01	1/10/2005	004	7.767	0.008	1030	7.8	1.6	6.2	15	Hit	Hit
5A12061	IOA0464	01	1/10/2005	005	6.9608	0.0071	1020	7	1.6	5.4	15	Hit	Hit
5A12061	IOA0466	01	1/10/2005	003	7.6238	0.0077	1010	7.6	1.6	6	15	Hit	Hit
5A12061	IOA0550	01	1/11/2005	002	7.8846	0.0082	1040	7.9	1.6	6.3	10	Hit	Hit
5A12061	IOA0551	01	1/11/2005	001	4.2718	0.0044	1030	4.3	1.6	2.7	10	J	J
5A13065	IOA0549	01	1/11/2005	011-grab	15.2381	0.016	1050	15.2	1.2	14	NA	Hit	Hit
5A13065	IOA0552	01	1/11/2005	018	18.6408	0.0192	1030	18.6	1.2	17	NA	Hit	Hit
5A13065	IOA0553	01	1/11/2005	008	13.3663	0.0135	1010	13.4	1.2	12	15	Hit	Hit
5A13065	IOA0554	01	1/11/2005	009	16.7308	0.0174	1040	16.7	1.2	16	15	Exceedance	Exceedance
5A13065	IOA0555	01	1/11/2005	010	8.4466	0.0087	1030	8.4	1.2	7.3	15	Hit	Hit
5A13065	IOA0556	01	1/11/2005	007	10.4854	0.0108	1030	10.5	1.2	9.3	15	Hit	Hit
5A13065	IOA0567	01	1/12/2005	011-comp	42.8431	0.0437	1020	42.8	1.2	42	NA	Hit	Hit
5A19067	IOA0997	01	1/18/2005	001	1.5686	0.0016	1020	1.6	1.3	0.3	10	J	ND
5A19067	IOA0999	01	1/18/2005	002	2.4272	0.0025	1030	2.4	1.3	1.2	10	J	J
5C09091	IOC0449	01	3/4/2005	003	1.1538	0.0012	1040	1.2	1.7	-0.5	15	J	ND
5C09091	IOC0450	01	3/4/2005	004	1.0476	0.0011	1050	1	1.7	-0.6	15	J	ND
5C09091	IOC0451	01	3/4/2005	005	2.6415	0.0028	1060	2.6	1.7	1	15	J	J
5C09091	IOC0452	01	3/4/2005	006	0.9615	0.001	1040	1	1.7	-0.7	15	J	ND
5C09091	IOC0453	01	3/4/2005	007	1.2264	0.0013	1060	1.2	1.7	-0.4	15	J	ND
5C09091	IOC0454	01	3/4/2005	008	1.4563	0.0015	1030	1.5	1.7	-0.2	15	J	ND
5C09091	IOC0625	01	3/7/2005	012	1.619	0.0017	1050	1.6	1.7	0	NA	J	ND
5C14065	IOC0995	01	3/11/2005	002	1.4423	0.0015	1040	1.4	1.6	-0.1	10	J	ND
5C14065	IOC0996	01	3/11/2005	011	1.1538	0.0012	1040	1.2	1.6	-0.4	NA	J	ND
5C31087	IOC2360	01	3/30/2005	012	5.8095	0.0061	1050	5.8	1.1	4.8	NA	Hit	J

Created 5/12/05

APPENDIX G

Section 1

January Outfall 001

AMEC Data Validation Reports

Del Mar Analytical Laboratory Reports

CONTRACT COMPLIANCE SCREENING FORM FOR HARDCOPY DATA

AMEC Earth & Environmental
550 South Wadsworth Boulevard
Suite 500
Lakewood, CO 80226

Package ID T711DF20
Task Order 313150010
SDG No. Multiple
No. of Analyses 15

Laboratory Alta
Reviewer K. Shadowlight
Analysis/Method Dioxins

Date: February 11, 2005
Reviewer's Signature K Shadowlight

ACTION ITEMS[a]	
1. **Case Narrative Deficiencies**	
2. **Out of Scope Analyses**	
3. **Analyses Not Conducted**	
4. **Missing Hardcopy Deliverables**	
5. **Incorrect Hardcopy Deliverables**	
6. **Deviations from Analysis Protocol, e.g.,**	Qualifications were assigned for the following:
Holding Times	* Method blank contamination
GC/MS Tune/Inst. Performance	* EMPCs
Calibration	* Detects below the lower method calibration level
Method blanks	
Surrogates	
Matrix Spike/Dup LCS	
Field QC	
Internal Standard Performance	
Compound Identification and Quantitation	
System Performance	
COMMENTS[b]	Rev. 1

[a] Subcontracted analytical laboratory is not meeting contract and/or method requirements.
[b] Differences in protocol have been adopted by the laboratory but no action against the laboratory is required.

DATA VALIDATION REPORT

NPDES
Monitoring

ANALYSIS: DIOXINS/FURANS

SAMPLE DELIVERY GROUPS: Multiple SDGs

Prepared by

AMEC—Denver Operations
550 South Wadsworth Boulevard, Suite 500
Lakewood, Colorado 80226

1. INTRODUCTION

Task Order Title:	NPDES Monitoring
Contract Task Order #:	313150010
Sample Delivery Group #:	Multiple
Project Manager:	B. McIlvaine
Matrix:	Water
Analysis:	Dioxins/Furans
QC Level:	Level IV
No. of Samples:	15
No. of Reanalyses/Dilutions:	0
Reviewer:	K. Shadowlight
Date of Review:	February 11, 2005

The samples listed in Table 1 were validated based on the guidelines outlined in the *AMEC Data Validation Procedure for Dioxins and Furans (DVP-19, Rev. 1), EPA Method 1613, and the National National Functional Guidelines For Chlorinated Dioxin/Furan Data Review* (8/02). Any deviations from these procedures and guidelines are documented herein. Qualifiers were applied in cases where the data did not meet the required QC criteria or where special consideration by the data user is required. Data qualifiers were placed on Form Is with the associated qualification codes. Analytes that were rejected for any reason are denoted on the Form I as having only the "R" data qualifier and associated qualification code(s) denoting the reason for rejection. Any additional problems with the data that may have resulted in an estimated value were not denoted by a qualification code since the data had already been rejected.

Table 1. Sample Identification

Client ID	Laboratory ID (Del Mar)	Laboratory ID (Pace)	Matrix	COC Method
Outfall 003	IOA0026-01	105648001	water	1613
Outfall 004	IOA0027-01	105646001	water	1613
Outfall 005	IOA0028-01	105645001	water	1613
Outfall 007	IOA0108-01	105774001	water	1613
Outfall 008	IOA0109-01	105775001	water	1613
Outfall 009	IOA0110-01	105770001	water	1613
Outfall 010	IOA0111-01	105758001	water	1613
Outfall 001	IOA0112-01	105778001	water	1613
Outfall 002	IOA0119-01	105772001	water	1613
Outfall 018	IOA0122-01	105779001	water	1613
Outfall 011	IOA0131-01	105773001	water	1613
Outfall 006	IOA0458-01	106048001	water	1613
Outfall 004	IOA0460-01	106050001	water	1613
Outfall 005	IOA0464-01	106052001	water	1613
Outfall 003	IOA0466-01	106051001	water	1613

2. DATA VALIDATION FINDINGS

2.1 SAMPLE MANAGEMENT

Following are findings associated with sample management:

2.1.1 Sample Preservation, Handling, and Transport

All of the samples in these SDGs were received at Del Mar Analytical within the temperature limits of 4°C ±2°C. Several of the samples in these SDGs were received at Pace Analytical Services below the temperature limits of 4°C ±2°C; however, as none of the samples were noted to have been damaged, no qualifications were required. The samples were received in good condition at both laboratories. No qualifications were required.

2.1.2 Chain of Custody

The COC and transfer COC were signed by the appropriate field and laboratory personnel, and accounted for the analyses presented in these SDGs. As the samples were couriered directly to the laboratory (Del Mar Analytical), custody seals were not required. There was no information regarding custody seals upon receipt at Pace. No qualifications were required.

2.1.3 Holding Times

The samples were extracted and analyzed within a year of collection. No qualifications were required.

2.2 INSTRUMENT PERFORMANCE

Following are findings associated with instrument performance:

2.2.1 GC Column Performance

A column performance standard was combined with the daily calibration verification and analyzed at the beginning of each analytical sequence. The GC column performance was acceptable with the chromatographic separation of 2,3,7,8-TCDD and other TCDD isomers resolved with a valley of ≤25%. No qualifications were required.

2.2.2 Mass Spectrometer Performance

The mass spectrometer performance could not be evaluated as the laboratory did not provide selected ion current profiles for the lock-mass ions. No qualifications were required.

2.3 CALIBRATION

2.3.1 Initial Calibration

There was one initial calibration, analyzed 11/29/04 on Instrument 10MSHR05. The calibration consisted of five concentration level standards (CS1 through CS5) analyzed to verify instrument linearity. The initial calibration was acceptable with %RSDs ≤20% for the 15 native compounds (calibration by isotope dilution) and ≤35% for the 2 native and all labeled compounds (calibration by internal standard). The relative retention times and ion abundance ratios were within the QC limits listed in Method 1613 for all standards. A representative number of %RSDs were verified from the raw data, and no calculation or transcription errors were noted. No qualifications were required.

2.3.2 Continuing Calibration

Calibration verification (VER) consisted of a mid-level standard (CS3) analyzed at the beginning of each analytical sequence. The VER was acceptable with the concentrations within the acceptance criteria listed in the Table 6 of the EPA Method 1613. The ion abundance ratios and relative retention times were within the method QC limits. A representative number of %Ds were verified from the raw data, and no calculation or transcription errors were noted. No qualifications were required.

2.4 BLANKS

One method blank (Blank-6202) was extracted and analyzed with the samples in these SDGs. Target compounds 1,2,3,4,6,7,8-HpCDD, total HpCDD, OCDF, and OCDD were reported in the method blank. Any detects for the aforementioned target compounds reported at concentrations <5x the concentrations reported in the method blank were qualified as estimated nondetects "UJ," at the levels of interference in the samples of these SDGs. A review of the method blank raw data and chromatograms indicated no false negatives or false positives. No further qualifications were required.

2.5 BLANK SPIKES AND LABORATORY CONTROL SAMPLES

One LCS/LCSD pair (LCS-6203/LCSD-6204) was extracted and analyzed with the samples in these SDGs. All recoveries were within the acceptance criteria listed in Table 6 of the Method 1613. There were no QC limits established for RPDs. The reported RPDs were within ±20%. No qualifications were required.

2.6 MATRIX SPIKE/MATRIX SPIKE DUPLICATE

MS/MSD analyses were not performed in these SDGs. Evaluation of method accuracy and precision was based on the LCS/LCSD results. No qualifications were required.

2.7 FIELD QC SAMPLES

Following are findings associated with field QC:

2.7.1 Field Blanks and Equipment Rinsates

The samples in these SDGs had no associated field QC samples. No qualifications were required.

2.7.2 Field Duplicates

No field duplicate samples were identified for these SDGs.

2.8 INTERNAL STANDARDS

The labeled standard recoveries were within the acceptance criteria listed in Table 7 of Method 1613. No qualifications were required.

2.9 COMPOUND IDENTIFICATION

The laboratory analyzed for polychlorinated dioxins/furans by EPA Method 1613. The compound identifications were verified from the raw data and no false negatives or positives were noted. No qualifications were required.

2.10 COMPOUND QUANTIFICATION AND REPORTED DETECTION LIMITS

Compound quantitation was verified from the raw data. The laboratory calculated and reported compound-specific detection limits. Any detects below the lower method calibration limit (MCL) were qualified as estimated, "J." Any reported EMPC was qualified as an estimated nondetect, "UJ." No further qualifications were required.

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 1613B Analysis Results

Client - Del Mar Analytical

Client's Sample ID	IOA0112-01		
Lab Sample ID	105778001		
Filename	F50127B_14		
Injected By	MRO		
Total Amount Extracted	1040 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	01/04/2005
ICAL Date	11/29/2004	Received	01/06/2005
CCal Filename(s)	F50127A_13	Extracted	01/24/2005
Method Blank ID	BLANK-6202	Analyzed	01/28/2005 07:52

Native Isomers	Conc pg/L	EMPC pg/L	LOD pg/L		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	1.00		2,3,7,8-TCDF-13C	2.00	65
Total TCDF	1.60	-----	1.00	J	2,3,7,8-TCDD-13C	2.00	81
					1,2,3,7,8-PeCDF-13C	2.00	103
2,3,7,8-TCDD	ND	-----	1.00		2,3,4,7,8-PeCDF-13C	2.00	99
Total TCDD	ND	-----	1.00		1,2,3,7,8-PeCDD-13C	2.00	120
					1,2,3,4,7,8-HxCDF-13C	2.00	72
1,2,3,7,8-PeCDF	ND	-----	0.57		1,2,3,6,7,8-HxCDF-13C	2.00	84
2,3,4,7,8-PeCDF	ND	-----	0.42		2,3,4,6,7,8-HxCDF-13C	2.00	79
Total PeCDF	0.70	-----	0.49	J	1,2,3,7,8,9-HxCDF-13C	2.00	77
					1,2,3,4,7,8-HxCDD-13C	2.00	67
1,2,3,7,8-PeCDD	ND	-----	0.60		1,2,3,6,7,8-HxCDD-13C	2.00	90
Total PeCDD	ND	-----	0.60		1,2,3,4,6,7,8-HpCDF-13C	2.00	76
					1,2,3,4,7,8,9-HpCDF-13C	2.00	67
1,2,3,4,7,8-HxCDF	0.96	-----	0.46	J	1,2,3,4,6,7,8-HpCDD-13C	2.00	90
1,2,3,6,7,8-HxCDF	ND	-----	0.40		OCDD-13C	4.00	75
2,3,4,6,7,8-HxCDF	ND	-----	0.59				
1,2,3,7,8,9-HxCDF	ND	-----	0.39		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	0.96	-----	0.46	J	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	0.71		2,3,7,8-TCDD-37Cl4	0.20	80
1,2,3,6,7,8-HxCDD	ND	-----	0.69				
1,2,3,7,8,9-HxCDD	ND	-----	0.72				
Total HxCDD	ND	-----	0.71				
1,2,3,4,6,7,8-HpCDF	-----	1.9	0.82	I			
1,2,3,4,7,8,9-HpCDF	ND	-----	0.68				
Total HpCDF	2.10	-----	0.75	J			
1,2,3,4,6,7,8-HpCDD	13.00	-----	0.82	BJ			
Total HpCDD	24.00	-----	0.82	J			
OCDF	11.00	-----	0.78	BJ			
OCDD	140.00	-----	1.00	B			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection. Totals are averages of individual isomer LODs.
D = Result obtained from analysis of diluted sample
B = Less than 10 times higher than method blank level
P = Recovery outside of method 1613 control limits
J = Concentration detected is below the calibration range
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No....105778

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
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CONTRACT COMPLIANCE SCREENING FORM FOR HARDCOPY DATA

AMEC Earth & Environmental
550 South Wadsworth Boulevard
Suite 500
Lakewood, CO 80226

Laboratory: Del Mar
Reviewer: M. Pokorny
Analysis/Method: Volatiles

Package ID: T711VO39
Task Order: 313150010
SDG No.: IOA0112 / IOA0119
No. of Analyses: 4

Date: February 1, 2005
Reviewer's Signature:

ACTION ITEMS[a]	
1. **Case Narrative Deficiencies**	
2. **Out of Scope Analyses**	
3. **Analyses Not Conducted**	
4. **Missing Hardcopy Deliverables**	
5. **Incorrect Hardcopy Deliverables**	
6. **Deviations from Analysis Protocol, e.g.,**	Qualification required for a detect below the reporting limit.
Holding Times	
GC/MS Tune/Inst. Perform	
Calibrations	
Blanks	
Surrogates	
Matrix Spike/Dup LCS	
Field QC	
Internal Standard Performance	
Compound Identification and Quantitation	
System Performance	
COMMENTS[b]	

[a] Subcontracted analytical laboratory is not meeting contract and/or method requirements.
[b] Differences in protocol have been adopted by the laboratory but no action against the laboratory is required.

DATA VALIDATION REPORT

NPDES Monitoring

ANALYSIS: VOLATILES

SAMPLE DELIVERY GROUP: IOA0112, IOA0119

Prepared by

AMEC Denver Operations
550 South Wadsworth Boulevard, Suite 500
Lakewood, Colorado 80226

1. INTRODUCTION

Task Order Title:	NPDES Monitoring
Contract Task Order #:	313150010
SDG#:	IOA0112, IOA0119
Project Manager:	B. McIlvaine
Matrix:	Water
Analysis:	Volatiles
QC Level:	Level IV
No. of Samples:	4
No. of Reanalyses/Dilutions:	0
Reviewer:	M. Pokorny
Date of Review:	February 1, 2005

The samples listed in Table 1 were validated based on the guidelines outlined in the *AMEC Data Validation Procedure for Levels C and D Volatile Organics (DVP-2, Rev. 2), EPA Method 624*, and the *National Functional Guidelines For Organic Data Review* (2/94). Any deviations from these procedures are documented herein. Qualifiers were applied in cases where the data did not meet the required QC criteria or where special consideration by the data user is required. Data qualifiers were placed on Form Is with the associated qualification codes. Analytes that were rejected for any reason are denoted on the summary forms as having only the "R" data qualifier and associated qualification code(s) denoting the reason for rejection. Any additional problems with the data that may have resulted in an estimated value were not denoted by a qualification code since the data had already been rejected.

Table 1. Sample identification

Client ID	EPA ID	Lab No.	Matrix	Method
Outfall 001	Outfall 001	IOA0112-01	water	624
Trip Blank	Trip Blank	IOA0112-02	water	624
Outfall 002	Outfall 002	IOA0119-01	water	624
Trip Blank	Trip Blank	IOA0119-02	water	624

2. DATA VALIDATION FINDINGS

2.1 SAMPLE MANAGEMENT

The following are findings associated with sample management:

2.1.1 Sample Preservation, Handling, and Transport

The samples in these SDGs were received at the laboratory within the temperature limits of 4°C ± 2°C. According to the COCs, the samples were received intact, without headspace, and in good condition. No qualifications were required.

2.1.2 Chain of Custody

The COCs were signed by field and laboratory personnel and accounted for the analyses presented in these SDGs. As the samples were couriered to the laboratory, custody seals are not required. No qualifications were required.

2.1.3 Holding Times

The samples were analyzed within 14 days of collection. No qualifications were required.

2.2 GC/MS TUNING

The ion abundance windows shown on the quantitation report were consistent with those specified in the EPA Method 624. All ion abundances were within the established windows and were therefore acceptable. The samples and associated QC were analyzed within 12 hours of the BFB injection times. The Form Vs were verified from the raw data and no discrepancies between the summary forms and the raw data were noted. No qualifications were required.

2.3 CALIBRATION

One initial calibration, dated 11/10/04, was associated with these SDGs. The average RRFs were ≥0.05 and the %RSDs were ≤35% for the target compounds listed on the sample summary forms. One continuing calibration, dated 01/05/05, was associated with these SDGs. The RRFs for all target compounds were ≥0.05 and the %Ds were ≤20%. A representative number of %RSDs and average RRFs from the initial calibration, and %Ds and RRFs from the continuing calibration were recalculated from the raw data, and no calculation or transcription errors were found. No qualifications were required.

2.4 BLANKS

One water method blank (5A05017-BLK1) was associated with these SDGs. There were no detects for the target compounds listed on the summary form. The method blank raw data showed no evidence of false negatives. No qualifications were required.

2.5 BLANK SPIKES AND LABORATORY CONTROL SAMPLES

One water blank spike (5A05017-BS1) was associated with these SDGs. All spike recoveries were within the laboratory-established QC limits. A representative number of recoveries were recalculated from the raw data and no calculation or transcription errors were found. No qualifications were required.

2.6 SURROGATE RECOVERY

The surrogates were within the QC limits of 80-120%. A representative number of surrogate recoveries were recalculated from the raw data and no calculation or transcription errors were found. No qualifications were required.

2.7 MATRIX SPIKE/MATRIX SPIKE DUPLICATE

MS/MSD analyses were not performed for these SDGs. No qualifications were required.

2.8 FIELD QC SAMPLES

Field QC samples were evaluated, and if necessary, qualified based on method blanks and other laboratory QC results affecting the usability of the field QC data. Any remaining detects were used to evaluate the associated site sample. Following are findings associated with field QC samples:

2.8.1 Trip Blanks

Samples Trip Blank (IOA0112-02) and Trip Blank (IOA0119-02) were the trip blanks associated with the site sample of these SDGs. There were no target compounds detected in the trip blanks. No qualifications were required.

2.8.2 Field Blanks and Equipment Rinsates

There were no other field QC samples associated with these SDGs. No qualifications were required.

2.8.3 Field Duplicates

There were no field duplicate samples associated with these SDGs.

2.9 INTERNAL STANDARDS PERFORMANCE

Internal standard area counts and retention times for these SDGs were within the control limits established by the continuing calibration standards, of +100%/-50% for internal standard areas and ±0.50 minutes for retention times. A representative number of internal standard areas and retention times were verified from the raw data, and no calculation or transcription errors were noted. No qualifications were required.

2.10 COMPOUND IDENTIFICATION

Target compound identification was verified at a Level IV data validation. The laboratory analyzed for a subset of volatile target compounds by EPA Method 624. Chromatograms, retention times, and spectra for the samples and QC were examined and no target compound identification problems were noted. No qualifications were required.

2.11 COMPOUND QUANTIFICATION AND REPORTED DETECTION LIMITS

Compound quantification is verified at a Level IV data validation. The reporting limits were supported by the lowest concentrations of the initial calibration standards and by MDL study. Compound quantitation was verified by recalculating any sample detect, and/or a representative number of blank spike and surrogate recoveries from the raw data. No calculation or transcription errors were noted. Target compounds detected below the reporting limit were qualified as estimated, "J," by the laboratory. No further qualifications were required.

2.12 TENTATIVELY IDENTIFIED COMPOUNDS

The laboratory did not provide TICs for these SDGs. No qualifications were required.

2.13 SYSTEM PERFORMANCE

A review of the chromatograms and other raw data showed no identifiable problems with system performance. No qualifications were required.

Del Mar Analytical

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MWH-Pasadena,Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 001
Report Number: IOA0112

Sampled: 01/04/05
Received: 01/04/05

DRAFT: PURGEABLES BY GC/MS (EPA 624)

Analyte	Method	Batch	MDL	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers	REV QUAL	QUAL CODE
Sample ID: IOA0112-01 (DRAFT: Outfall 001 - Water)							Sampled: 01/04/05				
Reporting Units: ug/l											
Benzene	EPA 624	5A05017	0.28	2.0	ND	1	01/05/05	01/05/05	U		
Carbon tetrachloride	EPA 624	5A05017	0.28	5.0	ND	1	01/05/05	01/05/05			
Chloroform	EPA 624	5A05017	0.33	2.0	ND	1	01/05/05	01/05/05			
1,1-Dichloroethane	EPA 624	5A05017	0.27	2.0	ND	1	01/05/05	01/05/05			
1,2-Dichloroethane	EPA 624	5A05017	0.28	2.0	ND	1	01/05/05	01/05/05			
1,1-Dichloroethene	EPA 624	5A05017	0.32	3.0	ND	1	01/05/05	01/05/05			
Ethylbenzene	EPA 624	5A05017	0.25	2.0	ND	1	01/05/05	01/05/05			
Tetrachloroethene	EPA 624	5A05017	0.32	2.0	ND	1	01/05/05	01/05/05			
Toluene	EPA 624	5A05017	0.36	2.0	ND	1	01/05/05	01/05/05			
1,1,1-Trichloroethane	EPA 624	5A05017	0.30	2.0	ND	1	01/05/05	01/05/05			
1,1,2-Trichloroethane	EPA 624	5A05017	0.30	2.0	ND	1	01/05/05	01/05/05			
Trichloroethene	EPA 624	5A05017	0.26	5.0	ND	1	01/05/05	01/05/05			
Trichlorofluoromethane	EPA 624	5A05017	0.34	5.0	ND	1	01/05/05	01/05/05			
Vinyl chloride	EPA 624	5A05017	0.26	5.0	ND	1	01/05/05	01/05/05			
Xylenes, Total	EPA 624	5A05017	0.52	4.0	ND	1	01/05/05	01/05/05			
Surrogate: Dibromofluoromethane (80-120%)					*100 %*						
Surrogate: Toluene-d8 (80-120%)					*99 %*						
Surrogate: 4-Bromofluorobenzene (80-120%)					*98 %*						
Sample ID: IOA0112-02 (DRAFT: Trip Blank - Water)							Sampled: 01/04/05				
Reporting Units: ug/l											
Benzene	EPA 624	5A05017	0.28	2.0	ND	1	01/05/05	01/05/05	U		
Carbon tetrachloride	EPA 624	5A05017	0.28	5.0	ND	1	01/05/05	01/05/05			
Chloroform	EPA 624	5A05017	0.33	2.0	ND	1	01/05/05	01/05/05			
1,1-Dichloroethane	EPA 624	5A05017	0.27	2.0	ND	1	01/05/05	01/05/05			
1,2-Dichloroethane	EPA 624	5A05017	0.28	2.0	ND	1	01/05/05	01/05/05			
1,1-Dichloroethene	EPA 624	5A05017	0.32	3.0	ND	1	01/05/05	01/05/05			
Ethylbenzene	EPA 624	5A05017	0.25	2.0	ND	1	01/05/05	01/05/05			
Tetrachloroethene	EPA 624	5A05017	0.32	2.0	ND	1	01/05/05	01/05/05			
Toluene	EPA 624	5A05017	0.36	2.0	ND	1	01/05/05	01/05/05			
1,1,1-Trichloroethane	EPA 624	5A05017	0.30	2.0	ND	1	01/05/05	01/05/05			
1,1,2-Trichloroethane	EPA 624	5A05017	0.30	2.0	ND	1	01/05/05	01/05/05			
Trichloroethene	EPA 624	5A05017	0.26	5.0	ND	1	01/05/05	01/05/05			
Trichlorofluoromethane	EPA 624	5A05017	0.34	5.0	ND	1	01/05/05	01/05/05			
Vinyl chloride	EPA 624	5A05017	0.26	5.0	ND	1	01/05/05	01/05/05			
Xylenes, Total	EPA 624	5A05017	0.52	4.0	ND	1	01/05/05	01/05/05			
Surrogate: Dibromofluoromethane (80-120%)					*100 %*						
Surrogate: Toluene-d8 (80-120%)					*99 %*						
Surrogate: 4-Bromofluorobenzene (80-120%)					*98 %*						

AMEC VALIDATED

DRAFT REPORT
DRAFT REPORT
DATA SUBJECT TO CHANGE

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LEVEL II

CONTRACT COMPLIANCE SCREENING FORM FOR HARDCOPY DATA

AMEC Earth & Environmental
550 South Wadsworth Boulevard
Suite 500
Lakewood, CO 80226

Laboratory Del Mar
Reviewer P. Meeks
Analysis/Method General Minerals

Package ID T711WC54
Task Order 313150010
SDG No. IOA0112, 0119
No. of Analyses 2

Date: 02/01/05
Reviewer's Signature P. Meeks

ACTION ITEMS[a]	
1. **Case Narrative Deficiencies**	
2. **Out of Scope Analyses**	
3. **Analyses Not Conducted**	
4. **Missing Hardcopy Deliverables**	
5. **Incorrect Hardcopy Deliverables**	
6. **Deviations from Analysis Protocol, e.g.,**	
Holding Times	
GC/MS Tune/Inst. Performance	
Calibrations	
Blanks	
Surrogates	
Matrix Spike/Dup LCS	
Field QC	
Internal Standard Performance	
Compound Identification and Quantitation	
System Performance	

COMMENTS[b]	Acceptable as reviewed.

[a] Subcontracted analytical laboratory is not meeting contract and/or method requirements.
[b] Differences in protocol have been adopted by the laboratory but, no action against the laboratory is required.

DATA VALIDATION REPORT

NPDES Monitoring

ANALYSIS: GENERAL MINERALS

SAMPLE DELIVERY GROUP: IOA0112 & IOA0119

Prepared by

AMEC—Denver Operations
550 South Wadsworth Boulevard, Suite 500
Lakewood, Colorado 80226

1. INTRODUCTION

Task Order Title:	NPDES Monitoring
Contract Task Order #:	313150010
Sample Delivery Group #:	IOA0112, IOA0119
Project Manager:	B. McIlvaine
Matrix:	Water
Analysis:	General Minerals
QC Level:	Level IV
No. of Samples:	2
Reviewer:	P. Meeks
Date of Review:	February 01, 2005

The sample listed in Table 1 was validated based on the guidelines outlined in the AMEC *Data Validation Procedures* SOP DVP-6, Rev. 2, *USEPA Methods for Chemical Analysis of Water and Wastes Method 425.1, 350.2, 180.1, and 120.1, Standard Methods for the Examination of Water and Wastewater Method SM5540-C,* and validation guidelines outlined in the USEPA *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (2/94).* Any deviations from these procedures and guidelines are documented herein. Qualifiers were applied in cases where the data did not meet the required QC criteria or where special consideration by the data user is required. Data qualifiers were placed on Form Is with the associated qualification codes. Analytes that were rejected for any reason are denoted on the Form I as having only the "R" data qualifier and associated qualification code(s) denoting the reason for rejection. Any additional problems with the data that may have resulted in an estimated value were not denoted by a qualification code since the data had already been rejected.

Table 1. Sample identification

Client ID	EPA ID	Laboratory ID	Matrix	COC Method
Outfall 001	Outfall 001	IOA0112-01	water	General Minerals
Outfall 002	Outfall 002	IOA0119-01	water	General Minerals

2. DATA VALIDATION FINDINGS

2.1 SAMPLE MANAGEMENT

Following are findings associated with sample management:

2.1.1 Sample Preservation, Handling, and Transport

The samples in these SDGs were received at the laboratory within the temperature limits of 4°C ± 2°C. No preservation problems were noted by the laboratory. No qualifications were required.

2.1.2 Chain of Custody

The COCs were signed and dated by field and laboratory personnel and accounted for the samples and analyses presented. No sample qualifications were required.

2.1.3 Holding Times

The holding times were assessed by comparing the dates of collection with the dates of analyses. The 28-day analytical holding time for ammonia and specific conductance, and the 48-hour turbidity and surfactant holding times were met. No qualifications were required.

2.2 CALIBRATION

For the applicable analyses, the initial calibration correlation coefficients were ≥ 0.995. All ICV and continuing calibration information was acceptable with recoveries within the control limits of 90-110%. For the titration method, ammonia, no information regarding the standardization of the titrant was provided; however, as the LCS recovery for ammonia was within the CCV control limits, and no qualifications were required. No qualifications were required.

2.3 BLANKS

The method blank and CCB results reported on the summary forms and in the raw data for blank analyses associated with the samples were nondetects at the reporting limit. No further qualifications were required.

2.4 BLANK SPIKES AND LABORATORY CONTROL SAMPLES

The ammonia and MBAS laboratory control sample recoveries were within the laboratory-established control limits. The LCS is not applicable to turbidity or specific conductance. No qualifications were required.

2.5 SURROGATES RECOVERY

Surrogate recovery is not applicable to the analyses presented in these SDGs.

2.6 LABORATORY DUPLICATES

No MS/MSD or duplicate analyses were performed in association with the samples in these SDGs; therefore, no assessment was made with respect to this criterion.

2.7 MATRIX SPIKE/MATRIX SPIKE DUPLICATE

No MS/MSD analyses were performed in association with the samples in these SDGs; therefore, no assessment was made with respect to this criterion.

2.8 FURNACE ATOMIC ABSORPTION QC

Furnace atomic absorption was not utilized for the analysis of these samples; therefore, furnace atomic absorption QC is not applicable.

2.9 ICP SERIAL DILUTION

ICP serial dilution is not applicable to the analyses presented in this data validation report.

2.10 SAMPLE RESULT VERIFICATION

A Level IV review was performed for the samples in this data package. Calculations were verified, and the sample results reported on the Form Is were verified against the raw data. No transcription errors or calculations errors were noted. MBAS for Outfall 001 and Outfall 002 was reported from 100× dilutions as the samples had formed emulsions. No qualifications were required.

2.11 FIELD QC SAMPLES

Field QC samples are evaluated, and if necessary, qualified based only on laboratory blanks. Any remaining detects are used to evaluate the associated samples. The following are findings associated with field QC samples:

2.11.1 Field Blanks and Equipment Rinsates

The samples in these SDGs had no associated field QC samples. No qualifications were required.

2.11.2 Field Duplicates

There were no field duplicate pairs associated with these SDGs.

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 001

Report Number: IOA0112

Sampled: 01/04/05
Received: 01/04/05

DRAFT: INORGANICS

Analyte	Method	Batch	MDL	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers	Rev Qual	Qual Code
Sample ID: IOA0112-01 (DRAFT: Outfall 001 - Water)					**Sampled: 01/04/05**						
Reporting Units: mg/l											
Ammonia-N (Distilled)	EPA 350.2	5A05067	0.30	0.50	ND	1	01/05/05	01/05/05	U		
Surfactants (MBAS)	SM5540-C	5A04104	4.4	10	ND	100	01/04/05	01/04/05	U	RL-1	
Sample ID: IOA0112-01 (DRAFT: Outfall 001 - Water)					**Sampled: 01/04/05**						
Reporting Units: NTU											
Turbidity	EPA 180.1	5A05079	0.040	1.0	**20**	1	01/05/05	01/05/05			
Sample ID: IOA0112-01 (DRAFT: Outfall 001 - Water)					**Sampled: 01/04/05**						
Reporting Units: umhos/cm											
Specific Conductance	EPA 120.1	5A06081	1.0	1.0	**130**	1	01/06/05	01/06/05			

PM 2/1/05

AMEC VALIDATED
LEVEL IV

DRAFT REPORT
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DATA SUBJECT TO CHANGE

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LABORATORY REPORT

Prepared For: MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project: Routine Outfall 001

Sampled: 01/04/05
Received: 01/04/05
Issued: 02/21/05 11:58

NELAP #01108CA California ELAP#1197 CSDLAC #10117

The results listed within this Laboratory Report pertain only to the samples tested in the laboratory. The analyses contained in this report were performed in accordance with the applicable certifications as noted. All soil samples are reported on a wet weight basis unless otherwise noted in the report. This Laboratory Report is confidential and is intended for the sole use of Del Mar Analytical and its client. This report shall not be reproduced, except in full, without written permission from Del Mar Analytical. The Chain(s) of Custody, 3 pages, are included and are an integral part of this report.
This entire report was reviewed and approved for release.

SAMPLE CROSS REFERENCE

SUBCONTRACTED: Refer to the last page for specific subcontract laboratory information included in this report.

LABORATORY ID	CLIENT ID	MATRIX
IOA0112-01	Outfall 001	Water
IOA0112-02	Trip Blank	Water

Reviewed By:

Michele Harper

Del Mar Analytical, Irvine
Michele Harper
Project Manager

Del Mar Analytical

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 001
Report Number: IOA0112

Sampled: 01/04/05
Received: 01/04/05

PURGEABLES BY GC/MS (EPA 624)

Analyte	Method	Batch	MDL Limit	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA0112-01 (Outfall 001 - Water)					**Sampled: 01/04/05**				
Reporting Units: ug/l									
Benzene	EPA 624	5A05017	0.28	2.0	ND	1	01/05/05	01/05/05	
Carbon tetrachloride	EPA 624	5A05017	0.28	5.0	ND	1	01/05/05	01/05/05	
Chloroform	EPA 624	5A05017	0.33	2.0	ND	1	01/05/05	01/05/05	
1,1-Dichloroethane	EPA 624	5A05017	0.27	2.0	ND	1	01/05/05	01/05/05	
1,2-Dichloroethane	EPA 624	5A05017	0.28	2.0	ND	1	01/05/05	01/05/05	
1,1-Dichloroethene	EPA 624	5A05017	0.32	3.0	ND	1	01/05/05	01/05/05	
Ethylbenzene	EPA 624	5A05017	0.25	2.0	ND	1	01/05/05	01/05/05	
Tetrachloroethene	EPA 624	5A05017	0.32	2.0	ND	1	01/05/05	01/05/05	
Toluene	EPA 624	5A05017	0.36	2.0	ND	1	01/05/05	01/05/05	
1,1,1-Trichloroethane	EPA 624	5A05017	0.30	2.0	ND	1	01/05/05	01/05/05	
1,1,2-Trichloroethane	EPA 624	5A05017	0.30	2.0	ND	1	01/05/05	01/05/05	
Trichloroethene	EPA 624	5A05017	0.26	5.0	ND	1	01/05/05	01/05/05	
Trichlorofluoromethane	EPA 624	5A05017	0.34	5.0	ND	1	01/05/05	01/05/05	
Vinyl chloride	EPA 624	5A05017	0.26	5.0	ND	1	01/05/05	01/05/05	
Xylenes, Total	EPA 624	5A05017	0.52	4.0	ND	1	01/05/05	01/05/05	
Surrogate: Dibromofluoromethane (80-120%)					*100 %*				
Surrogate: Toluene-d8 (80-120%)					*99 %*				
Surrogate: 4-Bromofluorobenzene (80-120%)					*98 %*				
Sample ID: IOA0112-02 (Trip Blank - Water)					**Sampled: 01/04/05**				
Reporting Units: ug/l									
Benzene	EPA 624	5A05017	0.28	2.0	ND	1	01/05/05	01/05/05	
Carbon tetrachloride	EPA 624	5A05017	0.28	5.0	ND	1	01/05/05	01/05/05	
Chloroform	EPA 624	5A05017	0.33	2.0	ND	1	01/05/05	01/05/05	
1,1-Dichloroethane	EPA 624	5A05017	0.27	2.0	ND	1	01/05/05	01/05/05	
1,2-Dichloroethane	EPA 624	5A05017	0.28	2.0	ND	1	01/05/05	01/05/05	
1,1-Dichloroethene	EPA 624	5A05017	0.32	3.0	ND	1	01/05/05	01/05/05	
Ethylbenzene	EPA 624	5A05017	0.25	2.0	ND	1	01/05/05	01/05/05	
Tetrachloroethene	EPA 624	5A05017	0.32	2.0	ND	1	01/05/05	01/05/05	
Toluene	EPA 624	5A05017	0.36	2.0	ND	1	01/05/05	01/05/05	
1,1,1-Trichloroethane	EPA 624	5A05017	0.30	2.0	ND	1	01/05/05	01/05/05	
1,1,2-Trichloroethane	EPA 624	5A05017	0.30	2.0	ND	1	01/05/05	01/05/05	
Trichloroethene	EPA 624	5A05017	0.26	5.0	ND	1	01/05/05	01/05/05	
Trichlorofluoromethane	EPA 624	5A05017	0.34	5.0	ND	1	01/05/05	01/05/05	
Vinyl chloride	EPA 624	5A05017	0.26	5.0	ND	1	01/05/05	01/05/05	
Xylenes, Total	EPA 624	5A05017	0.52	4.0	ND	1	01/05/05	01/05/05	
Surrogate: Dibromofluoromethane (80-120%)					*100 %*				
Surrogate: Toluene-d8 (80-120%)					*99 %*				
Surrogate: 4-Bromofluorobenzene (80-120%)					*98 %*				

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 001
Report Number: IOA0112

Sampled: 01/04/05
Received: 01/04/05

ACID & BASE/NEUTRALS BY GC/MS (EPA 625)

Analyte	Method	Batch	MDL Limit	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA0112-01 (Outfall 001 - Water)					**Sampled: 01/04/05**				
Reporting Units: ug/l									
Bis(2-ethylhexyl)phthalate	EPA 625	5A05039	1.1	5.0	ND	0.962	01/05/05	01/14/05	
2,4-Dinitrotoluene	EPA 625	5A05039	0.23	9.0	ND	0.962	01/05/05	01/14/05	
N-Nitrosodimethylamine	EPA 625	5A05039	0.22	8.0	ND	0.962	01/05/05	01/14/05	
Pentachlorophenol	EPA 625	5A05039	0.78	8.0	ND	0.962	01/05/05	01/14/05	
2,4,6-Trichlorophenol	EPA 625	5A05039	0.10	6.0	ND	0.962	01/05/05	01/14/05	
Surrogate: 2-Fluorophenol (35-120%)					*72 %*				
Surrogate: Phenol-d6 (45-120%)					*80 %*				
Surrogate: 2,4,6-Tribromophenol (50-125%)					*89 %*				
Surrogate: Nitrobenzene-d5 (45-120%)					*76 %*				
Surrogate: 2-Fluorobiphenyl (45-120%)					*77 %*				
Surrogate: Terphenyl-d14 (45-135%)					*81 %*				

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 001
Report Number: IOA0112

Sampled: 01/04/05
Received: 01/04/05

ORGANOCHLORINE PESTICIDES (EPA 608)

Analyte	Method	Batch	MDL Limit	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA0112-01 (Outfall 001 - Water) - cont.					**Sampled: 01/04/05**				
Reporting Units: ug/l									
alpha-BHC	EPA 608	5A05041	0.00049	0.010	ND	0.952	01/05/05	01/05/05	
Surrogate: Decachlorobiphenyl (45-120%)					*78 %*				
Surrogate: Tetrachloro-m-xylene (35-120%)					*61 %*				

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
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Attention: Bronwyn Kelly

Project ID: Routine Outfall 001

Report Number: IOA0112

Sampled: 01/04/05
Received: 01/04/05

METALS

Analyte	Method	Batch	MDL Limit	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA0112-01 (Outfall 001 - Water) - cont.					**Sampled: 01/04/05**				
Reporting Units: ug/l									
Copper	EPA 200.8	5A04091	0.49	2.0	**3.7**	1	01/04/05	01/05/05	
Lead	EPA 200.8	5A04091	0.13	1.0	**0.74**	1	01/04/05	01/05/05	J
Mercury	EPA 245.1	5A05061	0.063	0.20	**0.15**	1	01/05/05	01/05/05	J

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 001
Report Number: IOA0112

Sampled: 01/04/05
Received: 01/04/05

INORGANICS

Analyte	Method	Batch	MDL Limit	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA0112-01 (Outfall 001 - Water) - cont.					**Sampled: 01/04/05**				
Reporting Units: mg/l									
Ammonia-N (Distilled)	EPA 350.2	5A05067	0.30	0.50	ND	1	01/05/05	01/05/05	
Biochemical Oxygen Demand	EPA 405.1	5A05054	0.59	2.0	**0.90**	1	01/05/05	01/10/05	J
Chloride	EPA 300.0	5A04042	0.26	0.50	**5.8**	1	01/04/05	01/04/05	
Nitrate/Nitrite-N	EPA 300.0	5A04042	0.072	0.26	**2.2**	1	01/04/05	01/04/05	
Oil & Grease	EPA 413.1	5A05068	0.94	5.0	**5.2**	1	01/05/05	01/05/05	
Sulfate	EPA 300.0	5A04042	0.18	0.50	**9.2**	1	01/04/05	01/04/05	
Surfactants (MBAS)	SM5540-C	5A04104	4.4	10	ND	100	01/04/05	01/04/05	RL-1
Total Dissolved Solids	SM2540C	5A05076	10	10	**120**	1	01/05/05	01/05/05	
Total Suspended Solids	EPA 160.2	5A07077	10	10	ND	1	01/07/05	01/07/05	
Sample ID: IOA0112-01 (Outfall 001 - Water)					**Sampled: 01/04/05**				
Reporting Units: ml/l/hr									
Total Settleable Solids	EPA 160.5	5A05055	0.10	0.10	ND	1	01/05/05	01/05/05	
Sample ID: IOA0112-01 (Outfall 001 - Water)					**Sampled: 01/04/05**				
Reporting Units: NTU									
Turbidity	EPA 180.1	5A05079	0.040	1.0	**20**	1	01/05/05	01/05/05	
Sample ID: IOA0112-01 (Outfall 001 - Water)					**Sampled: 01/04/05**				
Reporting Units: ug/l									
Total Cyanide	EPA 335.2	5A05078	2.2	5.0	ND	1	01/05/05	01/05/05	
Perchlorate	EPA 314.0	5A05056	0.80	4.0	ND	1	01/05/05	01/05/05	
Sample ID: IOA0112-01 (Outfall 001 - Water)					**Sampled: 01/04/05**				
Reporting Units: umhos/cm									
Specific Conductance	EPA 120.1	5A06081	1.0	1.0	**130**	1	01/06/05	01/06/05	

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Project ID: Routine Outfall 001

Report Number: IOA0112

Sampled: 01/04/05
Received: 01/04/05

SHORT HOLD TIME DETAIL REPORT

	Hold Time (in days)	Date/Time Sampled	Date/Time Received	Date/Time Extracted	Date/Time Analyzed
Sample ID: Outfall 001 (IOA0112-01) - Water					
EPA 160.5	2	01/04/2005 11:30	01/04/2005 18:30	01/05/2005 09:28	01/05/2005 10:40
EPA 180.1	2	01/04/2005 11:30	01/04/2005 18:30	01/05/2005 14:00	01/05/2005 15:00
EPA 300.0	2	01/04/2005 11:30	01/04/2005 18:30	01/04/2005 19:00	01/04/2005 20:54
EPA 405.1	2	01/04/2005 11:30	01/04/2005 18:30	01/05/2005 13:20	01/10/2005 16:00
SM5540-C	2	01/04/2005 11:30	01/04/2005 18:30	01/04/2005 21:33	01/04/2005 22:04

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Project ID: Routine Outfall 001

Report Number: IOA0112

Sampled: 01/04/05
Received: 01/04/05

METHOD BLANK/QC DATA

PURGEABLES BY GC/MS (EPA 624)

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A05017 Extracted: 01/05/05											
Blank Analyzed: 01/05/2005 (5A05017-BLK1)											
Benzene	ND	2.0	0.28	ug/l							
Carbon tetrachloride	ND	5.0	0.28	ug/l							
Chloroform	ND	2.0	0.33	ug/l							
1,1-Dichloroethane	ND	2.0	0.27	ug/l							
1,2-Dichloroethane	ND	2.0	0.28	ug/l							
1,1-Dichloroethene	ND	3.0	0.32	ug/l							
Ethylbenzene	ND	2.0	0.25	ug/l							
Tetrachloroethene	ND	2.0	0.32	ug/l							
Toluene	ND	2.0	0.36	ug/l							
1,1,1-Trichloroethane	ND	2.0	0.30	ug/l							
1,1,2-Trichloroethane	ND	2.0	0.30	ug/l							
Trichloroethene	ND	5.0	0.26	ug/l							
Trichlorofluoromethane	ND	5.0	0.34	ug/l							
Vinyl chloride	ND	5.0	0.26	ug/l							
Xylenes, Total	ND	4.0	0.52	ug/l							
Surrogate: Dibromofluoromethane	*25.2*			*ug/l*	*25.0*		*101*	*80-120*			
Surrogate: Toluene-d8	*25.2*			*ug/l*	*25.0*		*101*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*24.3*			*ug/l*	*25.0*		*97*	*80-120*			
LCS Analyzed: 01/05/2005 (5A05017-BS1)											
Benzene	21.5	2.0	0.28	ug/l	25.0		86	70-120			
Carbon tetrachloride	29.0	5.0	0.28	ug/l	25.0		116	70-140			
Chloroform	25.3	2.0	0.33	ug/l	25.0		101	75-130			
1,1-Dichloroethane	21.9	2.0	0.27	ug/l	25.0		88	70-135			
1,2-Dichloroethane	27.6	2.0	0.28	ug/l	25.0		110	60-150			
1,1-Dichloroethene	21.4	3.0	0.32	ug/l	25.0		86	75-135			
Ethylbenzene	23.6	2.0	0.25	ug/l	25.0		94	80-120			
Tetrachloroethene	24.6	2.0	0.32	ug/l	25.0		98	75-125			
Toluene	23.4	2.0	0.36	ug/l	25.0		94	75-120			
1,1,1-Trichloroethane	27.2	2.0	0.30	ug/l	25.0		109	75-140			
1,1,2-Trichloroethane	23.4	2.0	0.30	ug/l	25.0		94	70-125			
Trichloroethene	24.1	5.0	0.26	ug/l	25.0		96	80-120			
Trichlorofluoromethane	27.7	5.0	0.34	ug/l	25.0		111	65-145			
Vinyl chloride	23.2	5.0	0.26	ug/l	25.0		93	50-130			
Surrogate: Dibromofluoromethane	*25.5*			*ug/l*	*25.0*		*102*	*80-120*			
Surrogate: Toluene-d8	*25.7*			*ug/l*	*25.0*		*103*	*80-120*			

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 001

Report Number: IOA0112

Sampled: 01/04/05
Received: 01/04/05

METHOD BLANK/QC DATA

PURGEABLES BY GC/MS (EPA 624)

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A05017 Extracted: 01/05/05											
LCS Analyzed: 01/05/2005 (5A05017-BS1)											
Surrogate: 4-Bromofluorobenzene	*25.3*			*ug/l*	*25.0*		*101*	*80-120*			
Matrix Spike Analyzed: 01/05/2005 (5A05017-MS1)						**Source: IOA0112-01**					
Benzene	21.0	2.0	0.28	ug/l	25.0	ND	84	70-120			
Carbon tetrachloride	28.8	5.0	0.28	ug/l	25.0	ND	115	70-145			
Chloroform	24.7	2.0	0.33	ug/l	25.0	ND	99	70-135			
1,1-Dichloroethane	21.2	2.0	0.27	ug/l	25.0	ND	85	65-135			
1,2-Dichloroethane	27.2	2.0	0.28	ug/l	25.0	ND	109	60-150			
1,1-Dichloroethene	21.1	3.0	0.32	ug/l	25.0	ND	84	65-140			
Ethylbenzene	23.3	2.0	0.25	ug/l	25.0	ND	93	70-130			
Tetrachloroethene	24.5	2.0	0.32	ug/l	25.0	ND	98	70-130			
Toluene	23.2	2.0	0.36	ug/l	25.0	ND	93	70-120			
1,1,1-Trichloroethane	26.8	2.0	0.30	ug/l	25.0	ND	107	75-140			
1,1,2-Trichloroethane	21.9	2.0	0.30	ug/l	25.0	ND	88	60-135			
Trichloroethene	23.3	5.0	0.26	ug/l	25.0	ND	93	70-125			
Trichlorofluoromethane	27.1	5.0	0.34	ug/l	25.0	ND	108	55-145			
Vinyl chloride	21.8	5.0	0.26	ug/l	25.0	ND	87	40-135			
Surrogate: Dibromofluoromethane	*25.5*			*ug/l*	*25.0*		*102*	*80-120*			
Surrogate: Toluene-d8	*25.7*			*ug/l*	*25.0*		*103*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*25.5*			*ug/l*	*25.0*		*102*	*80-120*			
Matrix Spike Dup Analyzed: 01/05/2005 (5A05017-MSD1)						**Source: IOA0112-01**					
Benzene	22.3	2.0	0.28	ug/l	25.0	ND	89	70-120	6	20	
Carbon tetrachloride	30.1	5.0	0.28	ug/l	25.0	ND	120	70-145	4	25	
Chloroform	25.6	2.0	0.33	ug/l	25.0	ND	102	70-135	4	20	
1,1-Dichloroethane	22.4	2.0	0.27	ug/l	25.0	ND	90	65-135	6	20	
1,2-Dichloroethane	28.1	2.0	0.28	ug/l	25.0	ND	112	60-150	3	20	
1,1-Dichloroethene	22.3	3.0	0.32	ug/l	25.0	ND	89	65-140	6	20	
Ethylbenzene	24.3	2.0	0.25	ug/l	25.0	ND	97	70-130	4	20	
Tetrachloroethene	25.3	2.0	0.32	ug/l	25.0	ND	101	70-130	3	20	
Toluene	24.5	2.0	0.36	ug/l	25.0	ND	98	70-120	5	20	
1,1,1-Trichloroethane	27.5	2.0	0.30	ug/l	25.0	ND	110	75-140	3	20	
1,1,2-Trichloroethane	23.5	2.0	0.30	ug/l	25.0	ND	94	60-135	7	25	
Trichloroethene	24.3	5.0	0.26	ug/l	25.0	ND	97	70-125	4	20	
Trichlorofluoromethane	27.8	5.0	0.34	ug/l	25.0	ND	111	55-145	3	25	
Vinyl chloride	23.3	5.0	0.26	ug/l	25.0	ND	93	40-135	7	30	

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Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 001
Report Number: IOA0112

Sampled: 01/04/05
Received: 01/04/05

METHOD BLANK/QC DATA

PURGEABLES BY GC/MS (EPA 624)

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A05017 Extracted: 01/05/05											
Matrix Spike Dup Analyzed: 01/05/2005 (5A05017-MSD1)						**Source: IOA0112-01**					
Surrogate: Dibromofluoromethane	*25.5*			*ug/l*	*25.0*		*102*	*80-120*			
Surrogate: Toluene-d8	*25.7*			*ug/l*	*25.0*		*103*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*25.5*			*ug/l*	*25.0*		*102*	*80-120*			

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Project ID: Routine Outfall 001

Report Number: IOA0112

Sampled: 01/04/05
Received: 01/04/05

METHOD BLANK/QC DATA

ACID & BASE/NEUTRALS BY GC/MS (EPA 625)

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A05039 Extracted: 01/05/05											
Blank Analyzed: 01/13/2005 (5A05039-BLK1)											
Bis(2-ethylhexyl)phthalate	ND	5.0	1.1	ug/l							
2,4-Dinitrotoluene	ND	9.0	0.23	ug/l							
N-Nitrosodimethylamine	ND	8.0	0.22	ug/l							
Pentachlorophenol	ND	8.0	0.78	ug/l							
2,4,6-Trichlorophenol	ND	6.0	0.10	ug/l							
Surrogate: 2-Fluorophenol	*15.2*			*ug/l*	*20.0*		*76*	*35-120*			
Surrogate: Phenol-d6	*15.8*			*ug/l*	*20.0*		*79*	*45-120*			
Surrogate: 2,4,6-Tribromophenol	*16.1*			*ug/l*	*20.0*		*80*	*50-125*			
Surrogate: Nitrobenzene-d5	*7.68*			*ug/l*	*10.0*		*77*	*45-120*			
Surrogate: 2-Fluorobiphenyl	*7.72*			*ug/l*	*10.0*		*77*	*45-120*			
Surrogate: Terphenyl-d14	*8.24*			*ug/l*	*10.0*		*82*	*45-135*			
LCS Analyzed: 01/13/2005 (5A05039-BS1)											**M-NR1**
Bis(2-ethylhexyl)phthalate	9.64	5.0	1.1	ug/l	10.0		96	65-125			
2,4-Dinitrotoluene	9.12	9.0	0.23	ug/l	10.0		91	60-140			
N-Nitrosodimethylamine	8.98	8.0	0.22	ug/l	10.0		90	40-120			
Pentachlorophenol	8.90	8.0	0.78	ug/l	10.0		89	50-125			
2,4,6-Trichlorophenol	9.40	6.0	0.10	ug/l	10.0		94	60-120			
Surrogate: 2-Fluorophenol	*14.2*			*ug/l*	*20.0*		*71*	*35-120*			
Surrogate: Phenol-d6	*15.6*			*ug/l*	*20.0*		*78*	*45-120*			
Surrogate: 2,4,6-Tribromophenol	*16.0*			*ug/l*	*20.0*		*80*	*50-125*			
Surrogate: Nitrobenzene-d5	*7.74*			*ug/l*	*10.0*		*77*	*45-120*			
Surrogate: 2-Fluorobiphenyl	*7.48*			*ug/l*	*10.0*		*75*	*45-120*			
Surrogate: Terphenyl-d14	*7.84*			*ug/l*	*10.0*		*78*	*45-135*			
LCS Dup Analyzed: 01/13/2005 (5A05039-BSD1)											
Bis(2-ethylhexyl)phthalate	10.7	5.0	1.1	ug/l	10.0		107	65-125	10	20	
2,4-Dinitrotoluene	10.3	9.0	0.23	ug/l	10.0		103	60-140	12	20	
N-Nitrosodimethylamine	10.6	8.0	0.22	ug/l	10.0		106	40-120	17	20	
Pentachlorophenol	10.0	8.0	0.78	ug/l	10.0		100	50-125	12	25	
2,4,6-Trichlorophenol	10.9	6.0	0.10	ug/l	10.0		109	60-120	15	20	
Surrogate: 2-Fluorophenol	*16.5*			*ug/l*	*20.0*		*82*	*35-120*			
Surrogate: Phenol-d6	*17.4*			*ug/l*	*20.0*		*87*	*45-120*			
Surrogate: 2,4,6-Tribromophenol	*17.8*			*ug/l*	*20.0*		*89*	*50-125*			
Surrogate: Nitrobenzene-d5	*8.50*			*ug/l*	*10.0*		*85*	*45-120*			
Surrogate: 2-Fluorobiphenyl	*8.54*			*ug/l*	*10.0*		*85*	*45-120*			

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Attention: Bronwyn Kelly

Project ID: Routine Outfall 001
Report Number: IOA0112

Sampled: 01/04/05
Received: 01/04/05

METHOD BLANK/QC DATA

ACID & BASE/NEUTRALS BY GC/MS (EPA 625)

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A05039 Extracted: 01/05/05											
LCS Dup Analyzed: 01/13/2005 (5A05039-BSD1)											
Surrogate: Terphenyl-d14	*8.36*			*ug/l*	*10.0*		*84*	*45-135*			

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 001
Report Number: IOA0112

Sampled: 01/04/05
Received: 01/04/05

METHOD BLANK/QC DATA

ORGANOCHLORINE PESTICIDES (EPA 608)

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A05041 Extracted: 01/05/05											
Blank Analyzed: 01/05/2005 (5A05041-BLK1)											
alpha-BHC	ND	0.010	0.00049	ug/l							
Surrogate: Decachlorobiphenyl	*0.437*			*ug/l*	*0.500*		*87*	*45-120*			
Surrogate: Tetrachloro-m-xylene	*0.374*			*ug/l*	*0.500*		*75*	*35-120*			
LCS Analyzed: 01/05/2005 (5A05041-BS1)											**M-NR1**
alpha-BHC	0.463	0.010	0.00049	ug/l	0.500		93	45-115			
Surrogate: Decachlorobiphenyl	*0.459*			*ug/l*	*0.500*		*92*	*45-120*			
Surrogate: Tetrachloro-m-xylene	*0.368*			*ug/l*	*0.500*		*74*	*35-120*			
LCS Dup Analyzed: 01/05/2005 (5A05041-BSD1)											
alpha-BHC	0.425	0.010	0.00049	ug/l	0.500		85	45-115	9	30	
Surrogate: Decachlorobiphenyl	*0.456*			*ug/l*	*0.500*		*91*	*45-120*			
Surrogate: Tetrachloro-m-xylene	*0.331*			*ug/l*	*0.500*		*66*	*35-120*			

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METALS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A04091 Extracted: 01/04/05											
Blank Analyzed: 01/05/2005 (5A04091-BLK1)											
Copper	ND	2.0	0.49	ug/l							
Lead	ND	1.0	0.13	ug/l							
LCS Analyzed: 01/05/2005 (5A04091-BS1)											
Copper	79.1	2.0	0.49	ug/l	80.0		99	85-115			
Lead	80.9	1.0	0.13	ug/l	80.0		101	85-115			
Matrix Spike Analyzed: 01/05/2005 (5A04091-MS1)						**Source: IOA0069-02**					
Copper	73.3	2.0	0.49	ug/l	80.0	1.7	90	70-130			
Lead	76.2	1.0	0.13	ug/l	80.0	0.31	95	70-130			
Matrix Spike Dup Analyzed: 01/05/2005 (5A04091-MSD1)						**Source: IOA0069-02**					
Copper	70.3	2.0	0.49	ug/l	80.0	1.7	86	70-130	4	20	
Lead	67.6	1.0	0.13	ug/l	80.0	0.31	84	70-130	12	20	
Batch: 5A05061 Extracted: 01/05/05											
Blank Analyzed: 01/05/2005 (5A05061-BLK1)											
Mercury	ND	0.20	0.063	ug/l							
LCS Analyzed: 01/05/2005 (5A05061-BS1)											
Mercury	8.18	0.20	0.063	ug/l	8.00		102	85-115			
Matrix Spike Analyzed: 01/05/2005 (5A05061-MS1)						**Source: IOA0084-01**					
Mercury	7.81	0.20	0.063	ug/l	8.00	0.086	97	70-130			
Matrix Spike Dup Analyzed: 01/05/2005 (5A05061-MSD1)						**Source: IOA0084-01**					
Mercury	7.89	0.20	0.063	ug/l	8.00	0.086	98	70-130	1	20	

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INORGANICS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A04042 Extracted: 01/04/05											
Blank Analyzed: 01/04/2005 (5A04042-BLK1)											
Chloride	ND	0.50	0.26	mg/l							
Nitrate/Nitrite-N	ND	0.26	0.072	mg/l							
Sulfate	ND	0.50	0.18	mg/l							
LCS Analyzed: 01/04/2005 (5A04042-BS1)											
Chloride	4.97	0.50	0.26	mg/l	5.00		99	90-110			
Sulfate	9.93	0.50	0.18	mg/l	10.0		99	90-110			
Matrix Spike Analyzed: 01/04/2005 (5A04042-MS1)						**Source: IOA0049-01**					
Chloride	5.60	0.50	0.26	mg/l	5.00	0.51	102	80-120			
Sulfate	10.4	0.50	0.18	mg/l	10.0	0.63	98	80-120			
Matrix Spike Dup Analyzed: 01/04/2005 (5A04042-MSD1)						**Source: IOA0049-01**					
Chloride	5.72	0.50	0.26	mg/l	5.00	0.51	104	80-120	2	20	
Sulfate	10.6	0.50	0.18	mg/l	10.0	0.63	100	80-120	2	20	
Batch: 5A04104 Extracted: 01/04/05											
Blank Analyzed: 01/04/2005 (5A04104-BLK1)											
Surfactants (MBAS)	ND	0.10	0.044	mg/l							
LCS Analyzed: 01/04/2005 (5A04104-BS1)											
Surfactants (MBAS)	0.236	0.10	0.044	mg/l	0.250		94	90-110			
Matrix Spike Analyzed: 01/04/2005 (5A04104-MS1)						**Source: IOA0069-02**					
Surfactants (MBAS)	0.199	0.10	0.044	mg/l	0.250	ND	80	50-125			

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INORGANICS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A04104 Extracted: 01/04/05											
Matrix Spike Dup Analyzed: 01/04/2005 (5A04104-MSD1)						**Source: IOA0069-02**					
Surfactants (MBAS)	0.172	0.10	0.044	mg/l	0.250	ND	69	50-125	15	20	
Batch: 5A05054 Extracted: 01/05/05											
Blank Analyzed: 01/10/2005 (5A05054-BLK1)											
Biochemical Oxygen Demand	ND	2.0	0.59	mg/l							
LCS Analyzed: 01/10/2005 (5A05054-BS1)											
Biochemical Oxygen Demand	208	100	30	mg/l	198		105	85-115			
LCS Dup Analyzed: 01/10/2005 (5A05054-BSD1)											
Biochemical Oxygen Demand	200	100	30	mg/l	198		101	85-115	4	20	
Batch: 5A05056 Extracted: 01/05/05											
Blank Analyzed: 01/05/2005 (5A05056-BLK1)											
Perchlorate	ND	4.0	0.80	ug/l							
LCS Analyzed: 01/05/2005 (5A05056-BS1)											
Perchlorate	51.0	4.0	0.80	ug/l	50.0		102	85-115			
Matrix Spike Analyzed: 01/08/2005 (5A05056-MS1)						**Source: IOA0118-01**					
Perchlorate	59.2	4.0	0.80	ug/l	50.0	3.7	111	80-120			
Matrix Spike Dup Analyzed: 01/05/2005 (5A05056-MSD1)						**Source: IOA0118-01**					
Perchlorate	58.0	4.0	0.80	ug/l	50.0	3.7	109	80-120	2	20	

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INORGANICS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A05067 Extracted: 01/05/05											
Blank Analyzed: 01/05/2005 (5A05067-BLK1)											
Ammonia-N (Distilled)	ND	0.50	0.30	mg/l							
LCS Analyzed: 01/05/2005 (5A05067-BS1)											
Ammonia-N (Distilled)	10.1	0.50	0.30	mg/l	10.0		101	80-115			
Matrix Spike Analyzed: 01/05/2005 (5A05067-MS1)						**Source: IOA0060-03**					
Ammonia-N (Distilled)	10.4	0.50	0.30	mg/l	10.0	0.56	98	70-120			
Matrix Spike Dup Analyzed: 01/05/2005 (5A05067-MSD1)						**Source: IOA0060-03**					
Ammonia-N (Distilled)	10.1	0.50	0.30	mg/l	10.0	0.56	95	70-120	3	15	
Batch: 5A05068 Extracted: 01/05/05											
Blank Analyzed: 01/05/2005 (5A05068-BLK1)											
Oil & Grease	ND	5.0	0.94	mg/l							
LCS Analyzed: 01/05/2005 (5A05068-BS1)											**M-NR1**
Oil & Grease	20.1	5.0	0.94	mg/l	20.0		100	65-120			
LCS Dup Analyzed: 01/05/2005 (5A05068-BSD1)											
Oil & Grease	21.1	5.0	0.94	mg/l	20.0		106	65-120	5	20	
Batch: 5A05076 Extracted: 01/05/05											
Blank Analyzed: 01/05/2005 (5A05076-BLK1)											
Total Dissolved Solids	ND	10	10	mg/l							

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INORGANICS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A05076 Extracted: 01/05/05											
LCS Analyzed: 01/05/2005 (5A05076-BS1)											
Total Dissolved Solids	1080	20	20	mg/l	1000		108	90-110			
Duplicate Analyzed: 01/05/2005 (5A05076-DUP1)						**Source: IOA0066-03**					
Total Dissolved Solids	230	10	10	mg/l		230			0	10	
Batch: 5A05078 Extracted: 01/05/05											
Blank Analyzed: 01/05/2005 (5A05078-BLK1)											
Total Cyanide	ND	5.0	2.2	ug/l							
LCS Analyzed: 01/05/2005 (5A05078-BS1)											
Total Cyanide	191	5.0	2.2	ug/l	200		96	90-110			
Matrix Spike Analyzed: 01/05/2005 (5A05078-MS1)						**Source: IOA0112-01**					
Total Cyanide	153	5.0	2.2	ug/l	200	ND	76	70-115			
Matrix Spike Dup Analyzed: 01/05/2005 (5A05078-MSD1)						**Source: IOA0112-01**					
Total Cyanide	157	5.0	2.2	ug/l	200	ND	78	70-115	3	15	
Batch: 5A05079 Extracted: 01/05/05											
Blank Analyzed: 01/05/2005 (5A05079-BLK1)											
Turbidity	ND	1.0	0.040	NTU							
Duplicate Analyzed: 01/05/2005 (5A05079-DUP1)						**Source: IOA0069-02**					
Turbidity	0.0900	1.0	0.040	NTU		0.10			11	20	J

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Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A06081 Extracted: 01/06/05											
Duplicate Analyzed: 01/06/2005 (5A06081-DUP1)						**Source: IOA0117-11**					
Specific Conductance	865	1.0	1.0	umhos/cm		880			2	5	
Batch: 5A07077 Extracted: 01/07/05											
Blank Analyzed: 01/07/2005 (5A07077-BLK1)											
Total Suspended Solids	ND	10	10	mg/l							
LCS Analyzed: 01/07/2005 (5A07077-BS1)											
Total Suspended Solids	989	10	10	mg/l	1000		99	85-115			
Duplicate Analyzed: 01/07/2005 (5A07077-DUP1)						**Source: IOA0210-01**					
Total Suspended Solids	ND	10	10	mg/l		ND				10	

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Compliance Check

The results obtained from the analytical testing of this data set were checked against compliance limits received from the client. Any results at or above the compliance limits appear in bold on this page.

LabNumber	Analysis	Analyte	Units	Result	MRL	Compliance Limit
IOA0112-01	413.1 Oil and Grease	Oil & Grease	mg/l	5.20	5.0	10.00
IOA0112-01	608-Pest Boeing 001/002 Q (LL)	alpha-BHC	ug/l	0	0.010	0.0100
IOA0112-01	624-Boeing 001/002 Q (Fr113+X)	1,1-Dichloroethene	ug/l	0	3.0	3.20
IOA0112-01	624-Boeing 001/002 Q (Fr113+X)	Trichloroethene	ug/l	0	5.0	5.00
IOA0112-01	625-Boeing 001/002 Q-LL	2,4,6-Trichlorophenol	ug/l	0	6.0	6.50
IOA0112-01	625-Boeing 001/002 Q-LL	2,4-Dinitrotoluene	ug/l	0	9.0	9.10
IOA0112-01	625-Boeing 001/002 Q-LL	Bis(2-ethylhexyl)phthalate	ug/l	0.27	5.0	4.00
IOA0112-01	625-Boeing 001/002 Q-LL	N-Nitrosodimethylamine	ug/l	0	8.0	8.10
IOA0112-01	625-Boeing 001/002 Q-LL	Pentachlorophenol	ug/l	0	8.0	8.20
IOA0112-01	BOD	Biochemical Oxygen Demand	mg/l	0.90	2.0	20
IOA0112-01	Chloride - 300.0	Chloride	mg/l	5.80	0.50	150
IOA0112-01	Copper-200.8	Copper	ug/l	3.70	2.0	7.10
IOA0112-01	Cyanide-335.2 5ppb	Total Cyanide	ug/l	-3	5.0	4.30
IOA0112-01	Lead-200.8	Lead	ug/l	0.74	1.0	2.60
IOA0112-01	**MBAS - SM5540-C**	**Surfactants (MBAS)**	**mg/l**	**2.60**	**10**	**0.50**
IOA0112-01	Mercury - 245.1	Mercury	ug/l	0.15	0.20	0.20
IOA0112-01	Nitrogen, NO3+NO2 -N	Nitrate/Nitrite-N	mg/l	2.20	0.26	8.00
IOA0112-01	Perchlorate 314.0	Perchlorate	ug/l	0	4.0	6.00
IOA0112-01	Sulfate-300.0	Sulfate	mg/l	9.20	0.50	300
IOA0112-01	TDS - SM 2540C	Total Dissolved Solids	mg/l	120	10	950
IOA0112-02	624-Boeing 001/002 Q (Fr113+X)	1,1-Dichloroethene	ug/l	0	3.0	3.20
IOA0112-02	624-Boeing 001/002 Q (Fr113+X)	Trichloroethene	ug/l	0	5.0	5.00

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DATA QUALIFIERS AND DEFINITIONS

J	Estimated value. Analyte detected at a level less than the Reporting Limit (RL) and greater than or equal to the Method Detection Limit (MDL). The user of this data should be aware that this data is of unknown quality.
M-NR1	There was no MS/MSD analyzed with this batch due to insufficient sample volume. See Blank Spike/Blank Spike Duplicate.
RL-1	Reporting limit raised due to sample matrix effects.
ND	Analyte NOT DETECTED at or above the reporting limit or MDL, if MDL is specified.
RPD	Relative Percent Difference

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2520 E. Sunset Rd. #3, Las Vegas, NV 89120 (702) 798-3620 FAX (702) 798-3621

MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 001

Report Number: IOA0112

Sampled: 01/04/05
Received: 01/04/05

Certification Summary

Del Mar Analytical, Irvine

Method	Matrix	Nelac	California
EPA 120.1	Water	X	X
EPA 160.2	Water	X	X
EPA 160.5	Water	X	X
EPA 180.1	Water	X	X
EPA 200.8	Water	X	X
EPA 245.1	Water	X	X
EPA 300.0	Water	X	X
EPA 314.0	Water	X	X
EPA 335.2	Water	X	X
EPA 350.2	Water	X	X
EPA 405.1	Water	X	X
EPA 413.1	Water	X	X
EPA 608	Water	X	X
EPA 624	Water	X	X
EPA 625	Water	X	X
SM2540C	Water	X	X
SM5540-C	Water	X	X

Nevada and NELAP provide analyte specific accreditations. Analyte specific information for Del Mar Analytical may be obtained by contacting the laboratory or visiting our website at www.dmalabs.com.

Subcontracted Laboratories

Pace Analytical, MN- SUB

1700 Elm Street, Ste 200 - Minneapolis, MN 55414

Analysis Performed: 1613-Dioxin-HR
Samples: IOA0112-01

Analysis Performed: EDD + Level 4
Samples: IOA0112-01

Del Mar Analytical, Irvine
Michele Harper
Project Manager

The results pertain only to the samples tested in the laboratory. This report shall not be reproduced, except in full, without written permission from Del Mar Analytical.

10A0112

Del Mar Analytical Version 5 8/12/04 — CHAIN OF CUSTODY FORM

Client Name/Address:
MWH-Pasadena
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101

Project Manager: Bronwyn Kelly

Sampler: Barroso

Project:
Boeing-SSFL NPDES
Quarterly Outfall 001

Phone Number:
(626) 568-6691
Fax Number:
(626) 568-6515

ANALYSIS REQUIRED

Sample Description	Sample Matrix	Container Type	# of Cont.	Sampling Date/Time	Preservative	Bottle * #	Total Recoverable Metals: Cu, Pb, Hg,	Settleable Solids	VOCs 624 + xylenes + Freon 113	TCDD (and all congeners)	Oil & Grease (EPA 413.1)	Cyanide (total recoverable)	BOD5(20 degrees C)	Surfactants (MBAS)	Cl-, SO4, NO3+NO2-N, Perchlorate	Turbidity, TDS, TSS, Conductivity	Ammonia-N	Alpha BHC (608)	2,4,6 Trichlorophenol, 2,4 Dinitrotoluene, Bis(2-ethylhexyl)phthalate, NDMA, pentachlorophenol (EPA 625)		Comments
Outfall 001	W	Poly-1L	1	1-4-05 11:50	HNO3	1A	X														24 TAT
Outfall 001-Dup	W	Poly-1L	1		HNO3	1B	X														24 TAT
Outfall 001	W	Poly-1L	1		None	2		X													
Outfall 001	W	VOAs	3		HCl	3A,3B,3C			X												
Outfall 001	W	1L Amber	2		None	4A,4B				X											
Outfall 001	W	1L Amber	2		HCl	5A, 5B					X										24 TAT
Outfall 001	W	Poly-500 ml	1		NaOH	6						X									24 TAT
Outfall 001	W	Poly-1L	1		None	7							X								
Outfall 001	W	Poly-500 ml	2		None	8A,8B								X							
Outfall 001	W	Poly-500 ml	2		None	9A,9B									X						
Outfall 001	W	Poly-500 ml	2		None	10A, 10B										X					
Outfall 001	W	Poly-500 ml	1		H2SO4	11											X				
Outfall 001	W	1L Amber	2		None	12A, 12B												X			
Outfall 001	W	1L Amber	2		None	13A, 13B									DRP				X		
Trip Blank	W	VOAs	3		HCl	14A, 14B, 14C			X												

Field readings:
Temp = 50.° F
pH= 6.8

Relinquished By	Date/Time:	Received By	Date/Time:
Tom S. Barroso	1-4-05 1520	BD Keech	1/4/05 1520
BD Keech	1/4/05 1830	[signature]	1/4/05 1830
Relinquished By	Date/Time:	Received By	Date/Time:

Turn around Time: (check)
24 Hours _____ 5 Days _____
48 Hours _____ 10 Days _____
72 Hours _____ Normal _____
Perchlorate Only 72 Hours _____
Metals Only 72 Hours _____
Sample Integrity: (Check)
Intact X On Ice Y 5°C

10A0112

Del Mar Analytical Version 5 8/12/04 CHAIN OF CUSTODY FORM

Client Name/Address:

MWH-Pasadena
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101

Project Manager: Bronwyn Kelly

Sampler: Barroso

Project:
Boeing-SSFL NPDES
~~Quarterly~~ Outfall 001
Routine 1-4-05

Phone Number:
(626) 568-6691
Fax Number:
(626) 568-6515

ANALYSIS REQUIRED

Sample Description	Sample Matrix	Container Type	# of Cont.	Sampling Date/Time	Preservative	Bottle * #	Total Reoverable Metals: Cu, Pb, Hg,	Settleable Solids	VOCs 624 + xylenes + ~~Freon 113~~ 1,4-DCB	TCDD (and all congeners)	Oil & Grease (EPA 413.1)	Cyanide (total recoverable)	BOD5(20 degrees C)	Surfactants (MBAS)	Cl-, SO4, NO3+NO2-N, Perchlorate	Turbidity,TDS, TSS, Conductivity	Ammonia-N	Alpha BHC (608)	2,4,6 Trichlorophenol; 2,4 Dinitrotoluene, Bis(2-ethylhexyl)phthalate, NDMA, pentachlorophenol (EPA 625)		Comments
Outfall 001	W	Poly-1L	1	1-4-05 11:30	HNO3	1A	X														24 TAT
Outfall 001-Dup	W	Poly-1L	1		HNO3	1B	X														24 TAT
Outfall 001	W	Poly-1L	1		None	2		X													
Outfall 001	W	VOAs	3		HCl	3A,3B,3C			X												
Outfall 001	W	1L Amber	2		None	4A,4B				X											
Outfall 001	W	1L Amber	2		HCl	5A, 5B					X										24 TAT
Outfall 001	W	Poly-500 ml	1		NaOH	6						X									24 TAT
Outfall 001	W	Poly-1L	1		None	7							X								
Outfall 001	W	Poly-500 ml	2		None	8A,8B								X							
Outfall 001	W	Poly-500 ml	2		None	9A,9B									X						
Outfall 001	W	Poly-500 ml	2		None	10A, 10B										X					
Outfall 001	W	Poly-500 ml	1		H2SO4	11											X				
Outfall 001	W	1L Amber	2		None	12A, 12B												X			
Outfall 001	W	1L Amber	2		None	13A, 13B									DRP				X		
Trip Blank	W	VOAs	3		HCl	14A, 14B, 14C			X												

Field readings:
Temp = 50.° F
pH= 6.8

Relinquished By: Tina E. Barroso Date/Time: 1-4-05 1520
Received By: BD Leech Date/Time: 1/4/05 1520

Relinquished By: BD Leech Date/Time: 1/4/05 1830
Received By: [signature] Date/Time: 1/4/05 1830

Relinquished By: Date/Time:
Received By: Date/Time:

Turn around Time: (check)
24 Hours _____ 5 Days _____
48 Hours _____ 10 Days _____
72 Hours _____ Normal _____
Perchlorate Only 72 Hours _____
Metals Only 72 Hours _____
Sample Integrity: (Check)
Intact X On Ice: Y 5°C

Del Mar Analytical

2852 Alton Ave., Irvine CA 92606 (949) 261-1022 FAX (949) 261-1228
1014 E. Cooley Dr., Suite A, Colton, CA 92324 (909) 370-4667 FAX (949) 370-1046
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2520 E. Sunset Rd. #3, Las Vegas, NV 89120 (702) 798-3620 FAX (702) 798-3621

February 3, 2005

MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, Ca.91101

Attention: Bronwyn Kelly

Project: Routine Outfall 001
Sampled: 01/04/05
Del Mar Analytical Number: IOA0112

Dear Ms. Kelly:

Pace Analytical performed Method 1613B analysis for the project referenced above. Please use the following cross-reference table when reviewing your results.

MWH ID	DEL MAR ID	Pace ID
Outfall 001	IOA0112-01	105778001

Attached is the original report from the subcontract laboratory. If you have any questions or require further assistance, please do not hesitate to contact me.

Sincerely yours,
DEL MAR ANALYTICAL

Michele Harper
Project Manager

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Pace Analytical™

Method 1613B Analysis Results

Client - Del Mar Analytical

Client's Sample ID	IOA0112-01		
Lab Sample ID	105778001		
Filename	F50127B_14		
Injected By	MRO		
Total Amount Extracted	1040 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	01/04/2005
ICAL Date	11/29/2004	Received	01/06/2005
CCal Filename(s)	F50127A_13	Extracted	01/24/2005
Method Blank ID	BLANK-6202	Analyzed	01/28/2005 07:52

Native Isomers	Conc pg/L	EMPC pg/L	LOD pg/L		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	1.00		2,3,7,8-TCDF-13C	2.00	65
Total TCDF	1.60	-----	1.00	J	2,3,7,8-TCDD-13C	2.00	81
					1,2,3,7,8-PeCDF-13C	2.00	103
2,3,7,8-TCDD	ND	-----	1.00		2,3,4,7,8-PeCDF-13C	2.00	99
Total TCDD	ND	-----	1.00		1,2,3,7,8-PeCDD-13C	2.00	120
					1,2,3,4,7,8-HxCDF-13C	2.00	72
1,2,3,7,8-PeCDF	ND	-----	0.57		1,2,3,6,7,8-HxCDF-13C	2.00	84
2,3,4,7,8-PeCDF	ND	-----	0.42		2,3,4,6,7,8-HxCDF-13C	2.00	79
Total PeCDF	0.70	-----	0.49	J	1,2,3,7,8,9-HxCDF-13C	2.00	77
					1,2,3,4,7,8-HxCDD-13C	2.00	67
1,2,3,7,8-PeCDD	ND	-----	0.60		1,2,3,6,7,8-HxCDD-13C	2.00	90
Total PeCDD	ND	-----	0.60		1,2,3,4,6,7,8-HpCDF-13C	2.00	76
					1,2,3,4,7,8,9-HpCDF-13C	2.00	67
1,2,3,4,7,8-HxCDF	0.96	-----	0.46	J	1,2,3,4,6,7,8-HpCDD-13C	2.00	90
1,2,3,6,7,8-HxCDF	ND	-----	0.40		OCDD-13C	4.00	75
2,3,4,6,7,8-HxCDF	ND	-----	0.59				
1,2,3,7,8,9-HxCDF	ND	-----	0.39		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	0.96	-----	0.46	J	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	0.71		2,3,7,8-TCDD-37Cl4	0.20	80
1,2,3,6,7,8-HxCDD	ND	-----	0.69				
1,2,3,7,8,9-HxCDD	ND	-----	0.72				
Total HxCDD	ND	-----	0.71				
1,2,3,4,6,7,8-HpCDF	-----	1.9	0.82	I			
1,2,3,4,7,8,9-HpCDF	ND	-----	0.68				
Total HpCDF	2.10	-----	0.75	J			
1,2,3,4,6,7,8-HpCDD	13.00	-----	0.82	BJ			
Total HpCDD	24.00	-----	0.82	J			
OCDF	11.00	-----	0.78	BJ			
OCDD	140.00	-----	1.00	B			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection. Totals are averages of individual isomer LODs.
D = Result obtained from analysis of diluted sample
B = Less than 10 times higher than method blank level
P = Recovery outside of method 1613 control limits
J = Concentration detected is below the calibration range
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....105778

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Pace Analytical™

Method 1613B Blank Analysis Results

Client - Del Mar Analytical

Lab Sample ID	BLANK-6202	Matrix	Water
Filename	F50127A_06	Dilution	NA
Total Amount Extracted	982 mL	Extracted	01/24/2005
ICAL Date	11/29/2004	Analyzed	01/27/2005 14:13
CCal Filename(s)	F50127A_02	Injected By	MRO

Native Isomers	Conc pg/L	EMPC pg/L	LOD pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	4.7	2,3,7,8-TCDF-13C	2.00	33
Total TCDF	ND	-----	-----	2,3,7,8-TCDD-13C	2.00	45
				1,2,3,7,8-PeCDF-13C	2.00	68
2,3,7,8-TCDD	ND	-----	5.1	2,3,4,7,8-PeCDF-13C	2.00	70
Total TCDD	ND	-----	-----	1,2,3,7,8-PeCDD-13C	2.00	81
				1,2,3,4,7,8-HxCDF-13C	2.00	75
1,2,3,7,8-PeCDF	ND	-----	2.2	1,2,3,6,7,8-HxCDF-13C	2.00	95
2,3,4,7,8-PeCDF	ND	-----	1.5	2,3,4,6,7,8-HxCDF-13C	2.00	98
Total PeCDF	ND	-----	-----	1,2,3,7,8,9-HxCDF-13C	2.00	85
				1,2,3,4,7,8-HxCDD-13C	2.00	78
1,2,3,7,8-PeCDD	ND	-----	1.6	1,2,3,6,7,8-HxCDD-13C	2.00	94
Total PeCDD	ND	-----	-----	1,2,3,4,6,7,8-HpCDF-13C	2.00	85
				1,2,3,4,7,8,9-HpCDF-13C	2.00	78
1,2,3,4,7,8-HxCDF	ND	-----	1.6	1,2,3,4,6,7,8-HpCDD-13C	2.00	99
1,2,3,6,7,8-HxCDF	ND	-----	1.4	OCDD-13C	4.00	97
2,3,4,6,7,8-HxCDF	ND	-----	1.1			
1,2,3,7,8,9-HxCDF	ND	-----	1.6	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	-----	-----	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	1.6	2,3,7,8-TCDD-37Cl4	0.20	40
1,2,3,6,7,8-HxCDD	ND	-----	1.2			
1,2,3,7,8,9-HxCDD	ND	-----	1.7			
Total HxCDD	ND	-----	-----			
1,2,3,4,6,7,8-HpCDF	ND	-----	1.5			
1,2,3,4,7,8,9-HpCDF	ND	-----	1.4			
Total HpCDF	ND	-----	-----			
1,2,3,4,6,7,8-HpCDD	1.9	-----	1.3 J			
Total HpCDD	1.9	-----	----- J			
OCDF	8.3	-----	1.9 J			
OCDD	26.0	-----	2.3 J			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection. Totals are averages of individual isomer LODs.
A = Limit of Detection based on signal to noise
P = Recovery outside of method 1613 control limits
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....105645

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Pace Analytical™

Method 1613B Laboratory Control Spike Results

Client - Del Mar Analytical

Lab Sample ID	LCS-6203		
Filename	F50127A_03	Matrix	Water
Total Amount Extracted	1030 mL	Dilution	NA
ICAL Date	11/29/2004	Extracted	01/24/2005
CCal Filename	F50127A_02	Analyzed	01/27/2005 11:44
Method Blank ID	BLANK-6202	Injected By	MRO

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDF	10	10.2	7.5	15.8	102
2,3,7,8-TCDD	10	9.0	6.7	15.8	90
1,2,3,7,8-PeCDF	50	50.1	40.0	67.0	100
2,3,4,7,8-PeCDF	50	48.4	34.0	80.0	97
1,2,3,7,8-PeCDD	50	43.4	35.0	71.0	87
1,2,3,4,7,8-HxCDF	50	44.8	36.0	67.0	90
1,2,3,6,7,8-HxCDF	50	48.0	42.0	65.0	96
2,3,4,6,7,8-HxCDF	50	48.6	35.0	78.0	97
1,2,3,7,8,9-HxCDF	50	46.4	39.0	65.0	93
1,2,3,4,7,8-HxCDD	50	50.0	35.0	82.0	100
1,2,3,6,7,8-HxCDD	50	51.7	38.0	67.0	103
1,2,3,7,8,9-HxCDD	50	48.5	32.0	81.0	97
1,2,3,4,6,7,8-HpCDF	50	51.4	41.0	61.0	103
1,2,3,4,7,8,9-HpCDF	50	52.3	39.0	69.0	105
1,2,3,4,6,7,8-HpCDD	50	43.4	35.0	70.0	87
OCDF	100	89.5	63.0	170.0	90
OCDD	100	96.9	78.0	144.0	97
2,3,7,8-TCDD-37Cl4	10	6.2	3.1	19.1	62
2,3,7,8-TCDF-13C	100	49.8	22.0	152.0	50
2,3,7,8-TCDD-13C	100	65.8	20.0	175.0	66
1,2,3,7,8-PeCDF-13C	100	75.7	21.0	192.0	76
2,3,4,7,8-PeCDF-13C	100	76.9	13.0	328.0	77
1,2,3,7,8-PeCDD-13C	100	93.4	21.0	227.0	93
1,2,3,4,7,8-HxCDF-13C	100	78.9	19.0	202.0	79
1,2,3,6,7,8-HxCDF-13C	100	89.8	21.0	159.0	90
2,3,4,6,7,8-HxCDF-13C	100	88.2	22.0	176.0	88
1,2,3,7,8,9-HxCDF-13C	100	81.5	17.0	205.0	81
1,2,3,4,7,8-HxCDD-13C	100	82.2	21.0	193.0	82
1,2,3,6,7,8-HxCDD-13C	100	95.2	25.0	163.0	95
1,2,3,4,6,7,8-HpCDF-13C	100	86.3	21.0	158.0	86
1,2,3,4,7,8,9-HpCDF-13C	100	75.6	20.0	186.0	76
1,2,3,4,6,7,8-HpCDD-13C	100	102.9	26.0	166.0	103
OCDD-13C	200	195.1	26.0	397.0	98

Cs = Concentration Spiked (ng/mL)
Cr = Concentration Recovered (ng/mL)
Rec. = Recovery (Expressed as Percent)
Control Limit Reference: Method 1613, Table 6, 10/94 Revision
X = Background subtracted value
P = Recovery outside of control limits
Nn = Value obtained from additional analysis
* = See Discussion

Report No.....105645

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 1613B Laboratory Control Spike Results

Client - Del Mar Analytical

Lab Sample ID	LCSD-6204		
Filename	F50127A_04	Matrix	Water
Total Amount Extracted	1000 mL	Dilution	NA
ICAL Date	11/29/2004	Extracted	01/24/2005
CCal Filename	F50127A_02	Analyzed	01/27/2005 12:32
Method Blank ID	BLANK-6202	Injected By	MRO

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDF	10	9.9	7.5	15.8	99
2,3,7,8-TCDD	10	8.8	6.7	15.8	88
1,2,3,7,8-PeCDF	50	49.8	40.0	67.0	100
2,3,4,7,8-PeCDF	50	47.6	34.0	80.0	95
1,2,3,7,8-PeCDD	50	41.4	35.0	71.0	83
1,2,3,4,7,8-HxCDF	50	46.6	36.0	67.0	93
1,2,3,6,7,8-HxCDF	50	44.0	42.0	65.0	88
2,3,4,6,7,8-HxCDF	50	47.2	35.0	78.0	94
1,2,3,7,8,9-HxCDF	50	44.8	39.0	65.0	90
1,2,3,4,7,8-HxCDD	50	46.5	35.0	82.0	93
1,2,3,6,7,8-HxCDD	50	48.9	38.0	67.0	98
1,2,3,7,8,9-HxCDD	50	46.7	32.0	81.0	93
1,2,3,4,6,7,8-HpCDF	50	48.7	41.0	61.0	97
1,2,3,4,7,8,9-HpCDF	50	49.9	39.0	69.0	100
1,2,3,4,6,7,8-HpCDD	50	42.7	35.0	70.0	85
OCDF	100	84.8	63.0	170.0	85
OCDD	100	92.5	78.0	144.0	92
2,3,7,8-TCDD-37Cl4	10	7.5	3.1	19.1	75
2,3,7,8-TCDF-13C	100	65.7	22.0	152.0	66
2,3,7,8-TCDD-13C	100	83.8	20.0	175.0	84
1,2,3,7,8-PeCDF-13C	100	84.9	21.0	192.0	85
2,3,4,7,8-PeCDF-13C	100	85.6	13.0	328.0	86
1,2,3,7,8-PeCDD-13C	100	105.3	21.0	227.0	105
1,2,3,4,7,8-HxCDF-13C	100	82.6	19.0	202.0	83
1,2,3,6,7,8-HxCDF-13C	100	96.7	21.0	159.0	97
2,3,4,6,7,8-HxCDF-13C	100	92.3	22.0	176.0	92
1,2,3,7,8,9-HxCDF-13C	100	84.5	17.0	205.0	84
1,2,3,4,7,8-HxCDD-13C	100	81.9	21.0	193.0	82
1,2,3,6,7,8-HxCDD-13C	100	102.0	25.0	163.0	102
1,2,3,4,6,7,8-HpCDF-13C	100	90.1	21.0	158.0	90
1,2,3,4,7,8,9-HpCDF-13C	100	78.6	20.0	186.0	79
1,2,3,4,6,7,8-HpCDD-13C	100	106.1	26.0	166.0	106
OCDD-13C	200	196.4	26.0	397.0	98

Cs = Concentration Spiked (ng/mL)
Cr = Concentration Recovered (ng/mL)
Rec. = Recovery (Expressed as Percent)
Control Limit Reference: Method 1613, Table 6, 10/94 Revision
X = Background subtracted value
P = Recovery outside of control limits
Nn = Value obtained from additional analysis
* = See Discussion

Report No.....105645

REPORT OF LABORATORY ANALYSIS

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SPIKE RECOVERY RELATIVE PERCENT DIFFERENCE (RPD) RESULTS

Client..... Del Mar Analytical

SPIKE 1 ID..... LCS-6203
SPIKE 1 Filename..... F50127A_03
SPIKE 2 ID..... LCSD-6204
SPIKE 2 Filename..... F50127A_04

COMPOUND	SPIKE 1 REC,%	SPIKE 2 REC,%	RPD,%
2378-TCDF	102	99	3.0
2378-TCDD	90	88	2.2
12378-PeCDF	100	100	0.0
23478-PeCDF	97	95	2.1
12378-PeCDD	87	83	4.7
123478-HxCDF	90	93	3.3
123678-HxCDF	96	88	8.7
234678-HxCDF	97	94	3.1
123789-HxCDF	93	90	3.3
123478-HxCDD	100	93	7.3
123678-HxCDD	103	98	5.0
123789-HxCDD	97	93	4.2
1234678-HpCDF	103	97	6.0
1234789-HpCDF	105	100	4.9
1234678-HpCDD	87	85	2.3
OCDF	90	85	5.7
OCDD	97	92	5.3

REC = Percent Recovered
RPD = The difference between the two values divided by the average.
NA = Not Applicable

Report No.....105645

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TABLE 1. 2,3,7,8-TCDD Equivalency Factors (TEFs) for the Polychlorinated Dibenzo-p-dioxins and Dibenzofurans

Number	Compound(s)	TEF
1	2,3,7,8-TCDD	1.00
2	1,2,3,7,8-PeCDD	0.50
3	1,2,3,6,7,8-HxCDD	0.1
4	1,2,3,7,8,9-HxCDD	0.1
5	1,2,3,4,7,8-HxCDD	0.1
6	1,2,3,4,6,7,8-HpCDD	0.01
7	OCDD	0.001
8	* Total - TCDD	0.0
9	* Total - PeCDD	0.0
10	* Total - HxCDD	0.0
11	* Total - HpCDD	0.0
12	2,3,7,8-TCDF	0.10
13	1,2,3,7,8-PeCDF	0.05
14	2,3,4,7,8-PeCDF	0.5
15	1,2,3,6,7,8-HxCDF	0.1
16	1,2,3,7,8,9-HxCDF	0.1
17	1,2,3,4,7,8-HxCDF	0.1
18	2,3,4,6,7,8-HxCDF	0.1
19	1,2,3,4,6,7,8-HpCDF	0.01
20	1,2,3,4,7,8,9-HpCDF	0.01
21	OCDF	0.001
22	* Total - TCDF	0.0
23	* Total - PeCDF	0.0
24	* Total - HxCDF	0.0
25	* Total - HpCDF	0.0

*Excluding the 2,3,7,8-substituted congeners.

Reference: 1989 ITEFs

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2520 E. Sunset Rd., Suite #3, Las Vegas, NV 89120 Ph (702) 798-3620 Fax (702) 798-3621

SUBCONTRACT ORDER - PROJECT # IOA0112 105778

SENDING LABORATORY:

Del Mar Analytical, Irvine
17461 Derian Avenue. Suite 100
Irvine, CA 92614
Phone: (949) 261-1022
Fax: (949) 261-1228
Project Manager: Michele Harper

RECEIVING LABORATORY:

Pace Analytical, MN- SUB
1700 Elm Street, Ste 200
Minneapolis, MN 55414
Phone :(612) 607-1700
Fax: (612) 607-6444

Standard TAT is requested unless specific due date is requested => Due Date:_____ Initials:_____

Analysis	Expiration	Comments
Sample ID: IOA0112-01 Water	**Sampled: 01/04/05 11:30**	**Instant Nofication** 105778001
1613-Dioxin-HR	01/11/05 11:30	J flags, 17 congeners, no TEQ, sub to Pace-MN

Containers Supplied:
1 L Amber (IOA0112-01G)
1 L Amber (IOA0112-01H)

SAMPLE INTEGRITY:

All containers intact: ☐ Yes ☐ No Sample labels/COC agree: ☐ Yes ☐ No Samples Received On Ice:: ☒ Yes ☐ No
Custody Seals Present: ☐ Yes ☐ No Samples Preserved Properly: ☐ Yes ☐ No Samples Received at (temp): 0

Released By	Date	Time	Received By	Date	Time
	1-05-05	1700	Bright Flenn	1/6/05	9:25

CONTRACT COMPLIANCE SCREENING FORM FOR HARDCOPY DATA

AMEC Earth & Environmental
550 South Wadsworth Boulevard
Suite 500
Lakewood, CO 80226

Package ID T711DF22
Task Order 313150010
SDG No. Multiple
No. of Analyses 9

Laboratory Pace
Reviewer K. Shadowlight
Analysis/Method Dioxins

Date: February 18, 2005
Reviewer's Signature K Shadowlight

ACTION ITEMS[a]	
1. **Case Narrative Deficiencies**	
2. **Out of Scope Analyses**	
3. **Analyses Not Conducted**	
4. **Missing Hardcopy Deliverables**	
5. **Incorrect Hardcopy Deliverables**	
6. **Deviations from Analysis Protocol, e.g.,**	Qualifications were assigned for the following:
Holding Times	* Method blank contamination
GC/MS Tune/Inst. Performance	* EMPCs
Calibration	* Detects below the lower method calibration level
Method blanks	
Surrogates	
Matrix Spike/Dup LCS	
Field QC	
Internal Standard Performance	
Compound Identification and Quantitation	
System Performance	
COMMENTS[b]	

[a] Subcontracted analytical laboratory is not meeting contract and/or method requirements.
[b] Differences in protocol have been adopted by the laboratory but no action against the laboratory is required.

DATA VALIDATION REPORT

NPDES
Monitoring

ANALYSIS: DIOXINS/FURANS

SAMPLE DELIVERY GROUPS: Multiple SDGs

Prepared by

AMEC—Denver Operations
550 South Wadsworth Boulevard, Suite 500
Lakewood, Colorado 80226

1. INTRODUCTION

Task Order Title:	NPDES Monitoring
Contract Task Order #:	313150010
Sample Delivery Group #:	Multiple
Project Manager:	B. McIlvaine
Matrix:	Water
Analysis:	Dioxins/Furans
QC Level:	Level IV
No. of Samples:	9
No. of Reanalyses/Dilutions:	0
Reviewer:	K. Shadowlight
Date of Review:	February 18, 2005

The samples listed in Table 1 were validated based on the guidelines outlined in the *AMEC Data Validation Procedure for Dioxins and Furans (DVP-19, Rev. 1), EPA Method 1613, and the National National Functional Guidelines For Chlorinated Dioxin/Furan Data Review* (8/02). Any deviations from these procedures and guidelines are documented herein. Qualifiers were applied in cases where the data did not meet the required QC criteria or where special consideration by the data user is required. Data qualifiers were placed on Form Is with the associated qualification codes. Analytes that were rejected for any reason are denoted on the Form I as having only the "R" data qualifier and associated qualification code(s) denoting the reason for rejection. Any additional problems with the data that may have resulted in an estimated value were not denoted by a qualification code since the data had already been rejected.

Table 1. Sample Identification

Client ID	Laboratory ID (Del Mar)	Laboratory ID (Pace)	Matrix	COC Method
Outfall 001	IOA0551-01	106124001	water	1613
Outfall 002	IOA0550-01	106130001	water	1613
Outfall 007	IOA0556-01	106128001	water	1613
Outfall 008	IOA0553-01	106126001	water	1613
Outfall 009	IOA0554-01	106131001	water	1613
Outfall 010	IOA0555-01	106127001	water	1613
Outfall 011	IOA0549-01	106132001	water	1613
Outfall 011	IOA0567-01	106135001	water	1613
Outfall 018	IOA0552-01	106125001	water	1613

2. DATA VALIDATION FINDINGS

2.1 SAMPLE MANAGEMENT

Following are findings associated with sample management:

2.1.1 Sample Preservation, Handling, and Transport

The samples in these SDGs were received at Del Mar Analytical within the temperature limits of 4°C ±2°C. The samples were subcontracted to Pace Analytical for the dioxin/furan analyses. The samples in these SDGs were received at Pace Analytical Services within the temperature limits of 4°C ±2°C. The samples were received in good condition at both laboratories. No qualifications were required.

2.1.2 Chain of Custody

The COCs and transfer COCs were signed by the appropriate field and laboratory personnel. The samples and analyses were accounted for on both the original COCs and transfer COCs. As the samples were couriered directly to the laboratory (Del Mar Analytical), custody seals were not required. There was no information regarding custody seals upon receipt at Pace. No qualifications were required.

2.1.3 Holding Times

The samples were extracted and analyzed within a year of collection. No qualifications were required.

2.2 INSTRUMENT PERFORMANCE

Following are findings associated with instrument performance:

2.2.1 GC Column Performance

A column performance standard was combined with the daily calibration verification and analyzed at the beginning of each analytical sequence. The GC column performance was acceptable with the chromatographic separation of 2,3,7,8-TCDD and other TCDD isomers resolved with a valley of ≤25%. No qualifications were required.

2.2.2 Mass Spectrometer Performance

The mass spectrometer performance could not be evaluated as the laboratory did not provide selected ion current profiles for the lock-mass ions. No qualifications were required.

2.3 CALIBRATION

2.3.1 Initial Calibration

There was one initial calibration, analyzed 11/29/04 on Instrument 10MSHR05. The calibration consisted of five concentration level standards (CS1 through CS5) analyzed to verify instrument linearity. The initial calibration was acceptable with %RSDs ≤20% for the 15 native compounds (calibration by isotope dilution) and ≤35% for the 2 native and all labeled compounds (calibration by internal standard). The relative retention times and ion abundance ratios were within the QC limits listed in Method 1613 for all standards. A representative number of %RSDs were verified from the raw data, and no calculation or transcription errors were noted. No qualifications were required.

2.3.2 Continuing Calibration

Calibration verification (VER) consisted of a mid-level standard (CS3) analyzed at the beginning of each analytical sequence. The VER was acceptable with the concentrations within the acceptance criteria listed in the Table 6 of the EPA Method 1613. The ion abundance ratios and relative retention times were within the method QC limits. A representative number of %Ds were verified from the raw data, and no calculation or transcription errors were noted. No qualifications were required.

2.4 BLANKS

One method blank (Blank-6220) was extracted and analyzed with the samples in these SDGs. Target compounds total HpCDF, 1,2,3,4,6,7,8-HpCDF, total HpCDF, OCDF, and OCDD were reported in the method blank. Any detects for the aforementioned target compounds reported at concentrations <5× the concentrations reported in the method blank were qualified as estimated nondetects "UJ," at the levels of interference in the samples of these SDGs. A review of the method blank raw data and chromatograms indicated no false negatives or false positives. No further qualifications were required.

2.5 BLANK SPIKES AND LABORATORY CONTROL SAMPLES

One LCS/LCSD pair (LCS-6221/LCSD-6222) was extracted and analyzed with the samples in these SDGs. All recoveries were within the acceptance criteria listed in Table 6 of the Method 1613. There are no method QC limits established for RPDs. The reported RPDs were within ±20%. No qualifications were required.

2.6 MATRIX SPIKE/MATRIX SPIKE DUPLICATE

MS/MSD analyses were not performed in these SDGs. Evaluation of method accuracy and precision was based on the LCS/LCSD results. No qualifications were required.

2.7 FIELD QC SAMPLES

Following are findings associated with field QC:

2.7.1 Field Blanks and Equipment Rinsates

The samples in these SDGs had no associated field QC samples. No qualifications were required.

2.7.2 Field Duplicates

No field duplicate samples were identified for these SDGs.

2.8 INTERNAL STANDARDS

The labeled standard recoveries were within the acceptance criteria listed in Table 7 of Method 1613. No qualifications were required.

2.9 COMPOUND IDENTIFICATION

The laboratory analyzed for polychlorinated dioxins/furans by EPA Method 1613. The compound identifications were verified from the raw data and no false negatives or positives were noted. No qualifications were required.

2.10 COMPOUND QUANTIFICATION AND REPORTED DETECTION LIMITS

Compound quantitation was verified from the raw data. The laboratory calculated and reported compound-specific detection limits. Any detects below the lower method calibration limit (MCL) were qualified as estimated, "J." Any reported EMPC was qualified as an estimated nondetect, "UJ." No further qualifications were required.

Pace Analytical™

Pace Analytical Services, Inc.
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Method 1613B Analysis Results

Client - Del Mar Analytical

Client's Sample ID	IOA0551-01 outfall 001		
Lab Sample ID	106124001		
Filename	F50129B_07		
Injected By	BAL		
Total Amount Extracted	1050 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	01/11/2005
ICAL Date	11/29/2004	Received	01/13/2005
CCal Filename(s)	F50129B_02	Extracted	01/28/2005
Method Blank ID	BLANK-6220	Analyzed	01/30/2005 00:39

Native Isomers	Conc pg/L	EMPC pg/L	LOD pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	1.30	2,3,7,8-TCDF-13C	2.00	63
Total TCDF	ND	-----	1.30	2,3,7,8-TCDD-13C	2.00	79
				1,2,3,7,8-PeCDF-13C	2.00	67
2,3,7,8-TCDD	ND	-----	1.20	2,3,4,7,8-PeCDF-13C	2.00	70
Total TCDD	ND	-----	1.20	1,2,3,7,8-PeCDD-13C	2.00	84
				1,2,3,4,7,8-HxCDF-13C	2.00	72
1,2,3,7,8-PeCDF	ND	-----	1.60	1,2,3,6,7,8-HxCDF-13C	2.00	83
2,3,4,7,8-PeCDF	ND	-----	0.86	2,3,4,6,7,8-HxCDF-13C	2.00	79
Total PeCDF	ND	-----	1.20	1,2,3,7,8,9-HxCDF-13C	2.00	74
				1,2,3,4,7,8-HxCDD-13C	2.00	67
1,2,3,7,8-PeCDD	ND	-----	0.73	1,2,3,6,7,8-HxCDD-13C	2.00	89
Total PeCDD	ND	-----	0.73	1,2,3,4,6,7,8-HpCDF-13C	2.00	78
				1,2,3,4,7,8,9-HpCDF-13C	2.00	65
1,2,3,4,7,8-HxCDF	ND	-----	1.00	1,2,3,4,6,7,8-HpCDD-13C	2.00	84
1,2,3,6,7,8-HxCDF	ND	-----	1.40	OCDD-13C	4.00	71
2,3,4,6,7,8-HxCDF	ND	-----	0.87			
1,2,3,7,8,9-HxCDF	ND	-----	0.75	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	-----	1.00	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	1.10	2,3,7,8-TCDD-37Cl4	0.20	78
1,2,3,6,7,8-HxCDD	ND	-----	0.87			
1,2,3,7,8,9-HxCDD	ND	-----	1.10			
Total HxCDD	ND	-----	1.00			
1,2,3,4,6,7,8-HpCDF	ND	-----	1.10			
1,2,3,4,7,8,9-HpCDF	ND	-----	1.70			
Total HpCDF	ND	-----	1.40			
1,2,3,4,6,7,8-HpCDD	5.8	-----	1.20 BJ			
Total HpCDD	12.0	-----	1.20 BJ			
OCDF	7.1	-----	1.70 BJ			
OCDD	56.0	-----	1.90 J			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection. Totals are averages of individual isomer LODs.
D = Result obtained from analysis of diluted sample
B = Less than 10 times higher than method blank level
P = Recovery outside of method 1613 control limits
J = Concentration detected is below the calibration range
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....106124

AMEC VALIDATED
LEVEL IV

REPORT OF LABORATORY ANALYSIS

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CONTRACT COMPLIANCE SCREENING FORM FOR HARDCOPY DATA

AMEC Earth & Environmental
550 South Wadsworth Boulevard
Suite 500
Lakewood, CO 80226

Laboratory Del Mar
Reviewer M. Pokorny
Analysis/Method Volatiles

Package ID T711VO41
Task Order 313150010
SDG No. IOA0550, IOA0551
No. of Analyses 4

Date: February 9, 2005
Reviewer's Signature

ACTION ITEMS[a]	
1. **Case Narrative Deficiencies**	
2. **Out of Scope Analyses**	
3. **Analyses Not Conducted**	
4. **Missing Hardcopy Deliverables**	
5. **Incorrect Hardcopy Deliverables**	
6. **Deviations from Analysis Protocol, e.g.,**	Qualification required for a detect below the reporting limit.
Holding Times	
GC/MS Tune/Inst. Perform	
Calibrations	
Blanks	
Surrogates	
Matrix Spike/Dup LCS	
Field QC	
Internal Standard Performance	
Compound Identification and Quantitation	
System Performance	
COMMENTS[b]	

[a] Subcontracted analytical laboratory is not meeting contract and/or method requirements.
[b] Differences in protocol have been adopted by the laboratory but no action against the laboratory is required.

DATA VALIDATION REPORT

NPDES Monitoring

ANALYSIS: VOLATILES

SAMPLE DELIVERY GROUP: IOA0550, IOA0551

Prepared by

AMEC Denver Operations
550 South Wadsworth Boulevard, Suite 500
Lakewood, Colorado 80226

1. INTRODUCTION

Task Order Title:	NPDES Monitoring
Contract Task Order #:	313150010
SDG#:	IOA0550, IOA0551
Project Manager:	B. McIlvaine
Matrix:	Water
Analysis:	Volatiles
QC Level:	Level IV
No. of Samples:	4
No. of Reanalyses/Dilutions:	0
Reviewer:	M. Pokorny
Date of Review:	February 9, 2005

The samples listed in Table 1 were validated based on the guidelines outlined in the *AMEC Data Validation Procedure for Levels C and D Volatile Organics (DVP-2, Rev. 2), EPA Method 624,* and the *National Functional Guidelines For Organic Data Review* (2/94). Any deviations from these procedures are documented herein. Qualifiers were applied in cases where the data did not meet the required QC criteria or where special consideration by the data user is required. Data qualifiers were placed on Form Is with the associated qualification codes. Analytes that were rejected for any reason are denoted on the summary forms as having only the "R" data qualifier and associated qualification code(s) denoting the reason for rejection. Any additional problems with the data that may have resulted in an estimated value were not denoted by a qualification code since the data had already been rejected.

Table 1. Sample identification

Client ID	EPA ID	Lab No.	Matrix	Method
Outfall 002	Outfall 002	IOA0550-01	water	624
Trip Blank	Trip Blank	IOA0550-02	water	624
Outfall 001	Outfall 001	IOA0551-01	water	624
Trip Blank	Trip Blank	IOA0551-02	water	624

2. DATA VALIDATION FINDINGS

2.1 SAMPLE MANAGEMENT

The following are findings associated with sample management:

2.1.1 Sample Preservation, Handling, and Transport

The samples in these SDGs were received at the laboratory within the temperature limits of 4°C ± 2°C. According to the COCs, the samples were received intact, without headspace, and in good condition. No qualifications were required.

2.1.2 Chain of Custody

The COCs were signed by field and laboratory personnel and accounted for the analyses presented in these SDGs. As the samples were couriered to the laboratory, custody seals are not required. No qualifications were required.

2.1.3 Holding Times

The samples were analyzed within 14 days of collection. No qualifications were required.

2.2 GC/MS TUNING

The ion abundance windows shown on the quantitation report were consistent with those specified in the EPA Method 624. All ion abundances were within the established windows and were therefore acceptable. The samples and associated QC were analyzed within 12 hours of the BFB injection times. The Form Vs were verified from the raw data and no discrepancies between the summary forms and the raw data were noted. No qualifications were required.

2.3 CALIBRATION

Three initial calibrations, dated 11/10/04, 12/13/04, and 01/04/05, were associated with these SDGs. The average RRFs were ≥0.05 and the %RSDs were ≤35% for the target compounds listed on the sample summary forms. Three continuing calibrations were associated with these SDGs. The RRFs for all target compounds were ≥0.05 and the %Ds were ≤20%. A representative number of %RSDs and average RRFs from the initial calibration, and %Ds and RRFs from the continuing calibration were recalculated from the raw data, and no calculation or transcription errors were found. No qualifications were required.

2.4 BLANKS

Three water method blanks (5A12001-BLK1, 5A12003-BLK1, 5A12008-BLK1) were associated with these SDGs. There were no detects for the target compounds listed on the summary forms. The method blank raw data showed no evidence of false negatives. No qualifications were required.

2.5 BLANK SPIKES AND LABORATORY CONTROL SAMPLES

Three water blank spikes (5A12001-BS1, 5A12003-BS1, 5A12008-BS1) were associated with these SDGs. All spike recoveries were within the laboratory-established QC limits. A representative number of recoveries were recalculated from the raw data and no calculation or transcription errors were found. No qualifications were required.

2.6 SURROGATE RECOVERY

The surrogates were within the QC limits of 80-120%. A representative number of surrogate recoveries were recalculated from the raw data and no calculation or transcription errors were found. No qualifications were required.

2.7 MATRIX SPIKE/MATRIX SPIKE DUPLICATE

MS/MSD analyses were not performed for these SDGs. Evaluation of method accuracy was based on LCS results. No qualifications were required.

2.8 FIELD QC SAMPLES

Field QC samples were evaluated, and if necessary, qualified based on method blanks and other laboratory QC results affecting the usability of the field QC data. Any remaining detects were used to evaluate the associated site sample. Following are findings associated with field QC samples:

2.8.1 Trip Blanks

Samples Trip Blank (IOA0550-02) and Trip Blank (IOA0551-02) were the trip blanks associated with the site samples of these SDGs. There were no target compounds detected in the trip blanks. No qualifications were required.

2.8.2 Field Blanks and Equipment Rinsates

There were no other field QC samples associated with these SDGs. No qualifications were required.

2.8.3 Field Duplicates

There were no field duplicate samples associated with these SDGs.

2.9 INTERNAL STANDARDS PERFORMANCE

Internal standard area counts and retention times for these SDGs were within the control limits established by the continuing calibration standards, of +100%/-50% for internal standard areas and ±0.50 minutes for retention times. A representative number of internal standard areas and retention times were verified from the raw data, and no calculation or transcription errors were noted. No qualifications were required.

2.10 COMPOUND IDENTIFICATION

Target compound identification was verified at a Level IV data validation. The laboratory analyzed for a subset of volatile target compounds by EPA Method 624. Chromatograms, retention times, and spectra for the samples and QC were examined and no target compound identification problems were noted. No qualifications were required.

2.11 COMPOUND QUANTIFICATION AND REPORTED DETECTION LIMITS

Compound quantification is verified at a Level IV data validation. The reporting limits were supported by the lowest concentrations of the initial calibration standards and by MDL study. Compound quantitation was verified by recalculating any sample detect, and/or a representative number of blank spike and surrogate recoveries from the raw data. No calculation or transcription errors were noted. Target compounds detected below the reporting limit were qualified as estimated, "J," by the laboratory. No further qualifications were required.

2.12 TENTATIVELY IDENTIFIED COMPOUNDS

The laboratory did not provide TICs for these SDGs. No qualifications were required.

2.13 SYSTEM PERFORMANCE

A review of the chromatograms and other raw data showed no identifiable problems with system performance. No qualifications were required.

Del Mar Analytical

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 001

Report Number: IOA0551

Sampled: 01/11/05
Received: 01/11/05

DRAFT: PURGEABLES BY GC/MS (EPA 624)

Analyte	Method	Batch	MDL	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers REV QUAL	Data Qualifiers QUAL
Sample ID: IOA0551-01 (DRAFT: Outfall 001 - Water)										
Reporting Units: ug/l										
Benzene	EPA 624	5A12008	0.28	2.0	ND	1	01/12/05	01/12/05	U	
Carbon tetrachloride	EPA 624	5A12008	0.28	5.0	ND	1	01/12/05	01/12/05		
Chloroform	EPA 624	5A12008	0.33	2.0	ND	1	01/12/05	01/12/05		
1,1-Dichloroethane	EPA 624	5A12008	0.27	2.0	ND	1	01/12/05	01/12/05		
1,2-Dichloroethane	EPA 624	5A12008	0.28	2.0	ND	1	01/12/05	01/12/05		
1,1-Dichloroethene	EPA 624	5A12008	0.32	3.0	ND	1	01/12/05	01/12/05		
Ethylbenzene	EPA 624	5A12008	0.25	2.0	ND	1	01/12/05	01/12/05		
Tetrachloroethene	EPA 624	5A12008	0.32	2.0	ND	1	01/12/05	01/12/05		
Toluene	EPA 624	5A12008	0.36	2.0	ND	1	01/12/05	01/12/05		
1,1,1-Trichloroethane	EPA 624	5A12008	0.30	2.0	ND	1	01/12/05	01/12/05		
1,1,2-Trichloroethane	EPA 624	5A12008	0.30	2.0	ND	1	01/12/05	01/12/05		
Trichloroethene	EPA 624	5A12008	0.26	5.0	ND	1	01/12/05	01/12/05		
Trichlorofluoromethane	EPA 624	5A12008	0.34	5.0	ND	1	01/12/05	01/12/05		
Vinyl chloride	EPA 624	5A12008	0.26	5.0	ND	1	01/12/05	01/12/05		
Xylenes, Total	EPA 624	5A12008	0.52	4.0	ND	1	01/12/05	01/12/05		
Surrogate: Dibromofluoromethane (80-120%)					*100 %*					
Surrogate: Toluene-d8 (80-120%)					*101 %*					
Surrogate: 4-Bromofluorobenzene (80-120%)					*98 %*					
Sample ID: IOA0551-02 (DRAFT: Trip Blanks - Water)										
Reporting Units: ug/l										
Benzene	EPA 624	5A12008	0.28	2.0	ND	1	01/12/05	01/12/05	U	
Carbon tetrachloride	EPA 624	5A12008	0.28	5.0	ND	1	01/12/05	01/12/05		
Chloroform	EPA 624	5A12008	0.33	2.0	ND	1	01/12/05	01/12/05		
1,1-Dichloroethane	EPA 624	5A12008	0.27	2.0	ND	1	01/12/05	01/12/05		
1,2-Dichloroethane	EPA 624	5A12008	0.28	2.0	ND	1	01/12/05	01/12/05		
1,1-Dichloroethene	EPA 624	5A12008	0.32	3.0	ND	1	01/12/05	01/12/05		
Ethylbenzene	EPA 624	5A12008	0.25	2.0	ND	1	01/12/05	01/12/05		
Tetrachloroethene	EPA 624	5A12008	0.32	2.0	ND	1	01/12/05	01/12/05		
Toluene	EPA 624	5A12008	0.36	2.0	ND	1	01/12/05	01/12/05		
1,1,1-Trichloroethane	EPA 624	5A12008	0.30	2.0	ND	1	01/12/05	01/12/05		
1,1,2-Trichloroethane	EPA 624	5A12008	0.30	2.0	ND	1	01/12/05	01/12/05		
Trichloroethene	EPA 624	5A12008	0.26	5.0	ND	1	01/12/05	01/12/05		
Trichlorofluoromethane	EPA 624	5A12008	0.34	5.0	ND	1	01/12/05	01/12/05		
Vinyl chloride	EPA 624	5A12008	0.26	5.0	ND	1	01/12/05	01/12/05		
Xylenes, Total	EPA 624	5A12008	0.52	4.0	ND	1	01/12/05	01/12/05		
Surrogate: Dibromofluoromethane (80-120%)					*98 %*					
Surrogate: Toluene-d8 (80-120%)					*98 %*					
Surrogate: 4-Bromofluorobenzene (80-120%)					*97 %*					

AMEC VALIDATION

DRAFT REPORT
DRAFT REPORT
DATA SUBJECT TO CHANGE

LEVEL IV

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CONTRACT COMPLIANCE SCREENING FORM FOR HARDCOPY DATA

AMEC Earth & Environmental
550 South Wadsworth Boulevard
Suite 500
Lakewood, CO 80226

Laboratory Del Mar
Reviewer P. Meeks
Analysis/Method General Minerals

Package ID T711WC57
Task Order 313150010
SDG No. IOA0550, 0551
No. of Analyses 2

Date: 02/09/05
Reviewer's Signature P. Meeks

ACTION ITEMS[a]	
1. **Case Narrative Deficiencies**	
2. **Out of Scope Analyses**	
3. **Analyses Not Conducted**	
4. **Missing Hardcopy Deliverables**	
5. **Incorrect Hardcopy Deliverables**	
6. **Deviations from Analysis Protocol, e.g.,**	
Holding Times	
GC/MS Tune/Inst. Performance	
Calibrations	
Blanks	
Surrogates	
Matrix Spike/Dup LCS	
Field QC	
Internal Standard Performance	
Compound Identification and Quantitation	
System Performance	

COMMENTS[b]	Acceptable as reviewed.

[a] Subcontracted analytical laboratory is not meeting contract and/or method requirements.

[b] Differences in protocol have been adopted by the laboratory but no action against the laboratory is required.

DATA VALIDATION REPORT

NPDES Monitoring

ANALYSIS: GENERAL MINERALS

SAMPLE DELIVERY GROUPS: IOA0550 & IOA0551

Prepared by

AMEC—Denver Operations
550 South Wadsworth Boulevard, Suite 500
Lakewood, Colorado 80226

1. INTRODUCTION

Task Order Title:	NPDES Monitoring
Contract Task Order #:	313150010
Sample Delivery Group #:	IOA0550 & IOA0551
Project Manager:	B. McIlvaine
Matrix:	Water
Analysis:	General Minerals
QC Level:	Level IV
No. of Samples:	2
Reviewer:	P. Meeks
Date of Review:	February 09, 2005

The sample listed in Table 1 was validated based on the guidelines outlined in the AMEC *Data Validation Procedures* SOP DVP-6, Rev. 2, *USEPA Methods for Chemical Analysis of Water and Wastes Method 350.2, 180.1, and 120.1,* and validation guidelines outlined in the USEPA *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (2/94).* Any deviations from these procedures and guidelines are documented herein. Qualifiers were applied in cases where the data did not meet the required QC criteria or where special consideration by the data user is required. Data qualifiers were placed on Form Is with the associated qualification codes. Analytes that were rejected for any reason are denoted on the Form I as having only the "R" data qualifier and associated qualification code(s) denoting the reason for rejection. Any additional problems with the data that may have resulted in an estimated value were not denoted by a qualification code since the data had already been rejected.

Table 1. Sample identification

Client ID	EPA ID	Laboratory ID	Matrix	COC Method
Outfall 002	Outfall 002	IOA0550-01	water	General Minerals
Outfall 001	Outfall 001	IOA0551-01	water	General Minerals

2. DATA VALIDATION FINDINGS

2.1 SAMPLE MANAGEMENT

Following are findings associated with sample management:

2.1.1 Sample Preservation, Handling, and Transport

The samples in these SDGs were received at the laboratory within the temperature limits of 4°C ± 2°C. No preservation problems were noted by the laboratory. No qualifications were required.

2.1.2 Chain of Custody

The COCs were signed and dated by field and laboratory personnel and accounted for the samples and analyses presented. No sample qualifications were required.

2.1.3 Holding Times

The holding times were assessed by comparing the date of collection with the dates of analyses. The 28-day analytical holding time for ammonia and specific conductance, and the 48-hour holding time for turbidity were met, and no qualifications were required.

2.2 CALIBRATION

For the applicable analyses, the initial calibration correlation coefficients were ≥0.995. All ICV and continuing calibration information was acceptable with recoveries within the control limits of 90-110%. For the titration method, ammonia, no information regarding the standardization of the titrant was provided; however, as the LCS recovery for ammonia was within the CCV control limits, no qualifications were required. No qualifications were required.

2.3 BLANKS

The method blank and CCB results reported on the summary forms and in the raw data for blank analyses associated with the samples were nondetects at the reporting limit. No further qualifications were required.

2.4 BLANK SPIKES AND LABORATORY CONTROL SAMPLES

For the applicable methods, the laboratory control sample recoveries were within the laboratory-established control limits. The LCS is not applicable to turbidity or specific conductance. No qualifications were required.

2.5 SURROGATES RECOVERY

Surrogate recovery is not applicable to the analyses presented in these SDGs.

2.6 LABORATORY DUPLICATES

No MS/MSD or duplicate analyses were performed in association with the samples in these SDGs; therefore, no assessment was made with respect to this criterion.

2.7 MATRIX SPIKE/MATRIX SPIKE DUPLICATE

No MS/MSD analyses were performed in association with the samples in these SDGs; therefore, no assessment was made with respect to this criterion.

2.8 FURNACE ATOMIC ABSORPTION QC

Furnace atomic absorption was not utilized for the analysis of these samples; therefore, furnace atomic absorption QC is not applicable.

2.9 ICP SERIAL DILUTION

ICP serial dilution is not applicable to the analyses presented in this data validation report.

2.10 SAMPLE RESULT VERIFICATION

A Level IV review was performed for the samples in this data package. Calculations were verified, and the sample results reported on the Form Is were verified against the raw data. No qualifications were required.

2.11 FIELD QC SAMPLES

Field QC samples are evaluated, and if necessary, qualified based only on laboratory blanks. Any remaining detects are used to evaluate the associated samples. The following are findings associated with field QC samples:

2.11.1 Field Blanks and Equipment Rinsates

The samples in these SDGs had no associated field QC samples. No qualifications were required.

2.11.2 Field Duplicates

There were no field duplicate pairs associated with these SDGs.

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 001

Report Number: IOA0551

Sampled: 01/11/05
Received: 01/11/05

DRAFT: INORGANICS

Analyte	Method	Batch	MDL	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Rev Qual	Qual Code
Sample ID: IOA0551-01 (DRAFT: Outfall 001 - Water)										
Reporting Units: mg/l										
Ammonia-N (Distilled)	EPA 350.2	5A13063	0.30	0.50	ND	1	01/13/05	01/13/05	U	
Sample ID: IOA0551-01 (DRAFT: Outfall 001 - Water)										
Reporting Units: NTU										
Turbidity	EPA 180.1	5A12058	0.040	1.0	23	1	01/12/05	01/12/05		
Sample ID: IOA0551-01 (DRAFT: Outfall 001 - Water)										
Reporting Units: umhos/cm										
Specific Conductance	EPA 120.1	5A13060	1.0	1.0	99	1	01/13/05	01/13/05		

AMEC VALIDATED

LEVEL IV

DRAFT REPORT
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LABORATORY REPORT

Prepared For: MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project: Routine Outfall 001

Sampled: 01/11/05
Received: 01/11/05
Revised: 03/04/05 09:36

NELAP #01108CA California ELAP#1197 CSDLAC #10117

The results listed within this Laboratory Report pertain only to the samples tested in the laboratory. The analyses contained in this report were performed in accordance with the applicable certifications as noted. All soil samples are reported on a wet weight basis unless otherwise noted in the report. This Laboratory Report is confidential and is intended for the sole use of Del Mar Analytical and its client. This report shall not be reproduced, except in full, without written permission from Del Mar Analytical. The Chain of Custody, 1 page, is included and is an integral part of this report.

This entire report was reviewed and approved for release.

CASE NARRATIVE

SAMPLE RECEIPT:	Samples were received intact, at 2°C, on ice and with chain of custody documentation.
HOLDING TIMES:	All samples were analyzed within prescribed holding times and/or in accordance with the Del Mar Analytical Sample Acceptance Policy unless otherwise noted in the report.
PRESERVATION:	Samples requiring preservation were verified prior to sample analysis.
QA/QC CRITERIA:	All analyses met method criteria, except as noted in the report with data qualifiers.
COMMENTS:	Results that fall between the MDL and RL are 'J' flagged.
SUBCONTRACTED:	Refer to the last page for specific subcontract laboratory information included in this report.
ADDITIONAL INFORMATION:	The report was revised to correct the compound list reported for EPA 624.

LABORATORY ID	CLIENT ID	MATRIX
IOA0551-01	Outfall 001	Water
IOA0551-02	Trip Blanks	Water

Reviewed By:

Michele Harper

Del Mar Analytical, Irvine
Michele Harper
Project Manager

Del Mar Analytical

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 001
Report Number: IOA0551

Sampled: 01/11/05
Received: 01/11/05

PURGEABLES BY GC/MS (EPA 624)

Analyte	Method	Batch	MDL Limit	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA0551-01 (Outfall 001 - Water)									
Reporting Units: ug/l									
Benzene	EPA 624	5A12008	0.28	2.0	ND	1	01/12/05	01/12/05	
Carbon tetrachloride	EPA 624	5A12008	0.28	5.0	ND	1	01/12/05	01/12/05	
Chloroform	EPA 624	5A12008	0.33	2.0	ND	1	01/12/05	01/12/05	
1,1-Dichloroethane	EPA 624	5A12008	0.27	2.0	ND	1	01/12/05	01/12/05	
1,2-Dichloroethane	EPA 624	5A12008	0.28	2.0	ND	1	01/12/05	01/12/05	
1,1-Dichloroethene	EPA 624	5A12008	0.32	3.0	ND	1	01/12/05	01/12/05	
Ethylbenzene	EPA 624	5A12008	0.25	2.0	ND	1	01/12/05	01/12/05	
Tetrachloroethene	EPA 624	5A12008	0.32	2.0	ND	1	01/12/05	01/12/05	
Toluene	EPA 624	5A12008	0.36	2.0	ND	1	01/12/05	01/12/05	
1,1,1-Trichloroethane	EPA 624	5A12008	0.30	2.0	ND	1	01/12/05	01/12/05	
1,1,2-Trichloroethane	EPA 624	5A12008	0.30	2.0	ND	1	01/12/05	01/12/05	
Trichloroethene	EPA 624	5A12008	0.26	5.0	ND	1	01/12/05	01/12/05	
Trichlorofluoromethane	EPA 624	5A12008	0.34	5.0	ND	1	01/12/05	01/12/05	
Vinyl chloride	EPA 624	5A12008	0.26	5.0	ND	1	01/12/05	01/12/05	
Xylenes, Total	EPA 624	5A12008	0.52	4.0	ND	1	01/12/05	01/12/05	
Surrogate: Dibromofluoromethane (80-120%)					*100 %*				
Surrogate: Toluene-d8 (80-120%)					*101 %*				
Surrogate: 4-Bromofluorobenzene (80-120%)					*98 %*				
Sample ID: IOA0551-02 (Trip Blanks - Water)									
Reporting Units: ug/l									
Benzene	EPA 624	5A12008	0.28	2.0	ND	1	01/12/05	01/12/05	
Carbon tetrachloride	EPA 624	5A12008	0.28	5.0	ND	1	01/12/05	01/12/05	
Chloroform	EPA 624	5A12008	0.33	2.0	ND	1	01/12/05	01/12/05	
1,1-Dichloroethane	EPA 624	5A12008	0.27	2.0	ND	1	01/12/05	01/12/05	
1,2-Dichloroethane	EPA 624	5A12008	0.28	2.0	ND	1	01/12/05	01/12/05	
1,1-Dichloroethene	EPA 624	5A12008	0.32	3.0	ND	1	01/12/05	01/12/05	
Ethylbenzene	EPA 624	5A12008	0.25	2.0	ND	1	01/12/05	01/12/05	
Tetrachloroethene	EPA 624	5A12008	0.32	2.0	ND	1	01/12/05	01/12/05	
Toluene	EPA 624	5A12008	0.36	2.0	ND	1	01/12/05	01/12/05	
1,1,1-Trichloroethane	EPA 624	5A12008	0.30	2.0	ND	1	01/12/05	01/12/05	
1,1,2-Trichloroethane	EPA 624	5A12008	0.30	2.0	ND	1	01/12/05	01/12/05	
Trichloroethene	EPA 624	5A12008	0.26	5.0	ND	1	01/12/05	01/12/05	
Trichlorofluoromethane	EPA 624	5A12008	0.34	5.0	ND	1	01/12/05	01/12/05	
Vinyl chloride	EPA 624	5A12008	0.26	5.0	ND	1	01/12/05	01/12/05	
Xylenes, Total	EPA 624	5A12008	0.52	4.0	ND	1	01/12/05	01/12/05	
Surrogate: Dibromofluoromethane (80-120%)					*98 %*				
Surrogate: Toluene-d8 (80-120%)					*98 %*				
Surrogate: 4-Bromofluorobenzene (80-120%)					*97 %*				

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 001

Report Number: IOA0551

Sampled: 01/11/05
Received: 01/11/05

ACID & BASE/NEUTRALS BY GC/MS (EPA 625)

Analyte	Method	Batch	MDL Limit	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA0551-01 (Outfall 001 - Water)									
Reporting Units: ug/l									
Bis(2-ethylhexyl)phthalate	EPA 625	5A12027	1.1	5.0	**1.3**	0.971	01/12/05	01/17/05	J
2,4-Dinitrotoluene	EPA 625	5A12027	0.23	9.0	ND	0.971	01/12/05	01/17/05	
N-Nitrosodimethylamine	EPA 625	5A12027	0.22	8.0	ND	0.971	01/12/05	01/17/05	
Pentachlorophenol	EPA 625	5A12027	0.78	8.0	ND	0.971	01/12/05	01/17/05	
2,4,6-Trichlorophenol	EPA 625	5A12027	0.10	6.0	ND	0.971	01/12/05	01/17/05	
Surrogate: 2-Fluorophenol (35-120%)					*69 %*				
Surrogate: Phenol-d6 (45-120%)					*72 %*				
Surrogate: 2,4,6-Tribromophenol (50-125%)					*75 %*				
Surrogate: Nitrobenzene-d5 (45-120%)					*69 %*				
Surrogate: 2-Fluorobiphenyl (45-120%)					*77 %*				
Surrogate: Terphenyl-d14 (45-135%)					*78 %*				

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 001

Report Number: IOA0551

Sampled: 01/11/05
Received: 01/11/05

ORGANOCHLORINE PESTICIDES (EPA 608)

Analyte	Method	Batch	MDL Limit	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA0551-01 (Outfall 001 - Water) - cont.									
Reporting Units: ug/l									
alpha-BHC	EPA 608	5A13049	0.00049	0.010	ND	0.943	01/13/05	01/14/05	
Surrogate: Decachlorobiphenyl (45-120%)					*87 %*				
Surrogate: Tetrachloro-m-xylene (35-120%)					*64 %*				

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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MWH-Pasadena/Boeing
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Attention: Bronwyn Kelly

Project ID: Routine Outfall 001
Report Number: IOA0551

Sampled: 01/11/05
Received: 01/11/05

METALS

Analyte	Method	Batch	MDL Limit	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA0551-01 (Outfall 001 - Water) - cont.									
Reporting Units: ug/l									
Copper	EPA 200.8	5A11106	0.49	2.0	**3.3**	1	01/11/05	01/12/05	
Lead	EPA 200.8	5A11106	0.13	1.0	**1.1**	1	01/11/05	01/12/05	
Mercury	EPA 245.1	5A12047	0.063	0.20	**0.17**	1	01/12/05	01/12/05	J

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 001
Report Number: IOA0551

Sampled: 01/11/05
Received: 01/11/05

INORGANICS

Analyte	Method	Batch	MDL Limit	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA0551-01 (Outfall 001 - Water) - cont.									
Reporting Units: mg/l									
Ammonia-N (Distilled)	EPA 350.2	5A13063	0.30	0.50	ND	1	01/13/05	01/13/05	
Biochemical Oxygen Demand	EPA 405.1	5A12041	0.59	2.0	**1.2**	1	01/12/05	01/17/05	J
Chloride	EPA 300.0	5A11041	0.26	0.50	**4.2**	1	01/11/05	01/11/05	
Nitrate/Nitrite-N	EPA 300.0	5A11041	0.072	0.26	**0.96**	1	01/11/05	01/11/05	
Oil & Grease	EPA 413.1	5A12061	0.94	5.0	**4.3**	1	01/12/05	01/12/05	B, J
Sulfate	EPA 300.0	5A11041	0.18	0.50	**6.8**	1	01/11/05	01/11/05	
Surfactants (MBAS)	SM5540-C	5A12059	0.044	0.10	ND	1	01/12/05	01/12/05	
Total Dissolved Solids	SM2540C	5A13089	10	10	**110**	1	01/13/05	01/13/05	
Total Suspended Solids	EPA 160.2	5A14084	10	10	**10**	1	01/14/05	01/14/05	
Sample ID: IOA0551-01 (Outfall 001 - Water)									
Reporting Units: ml/l/hr									
Total Settleable Solids	EPA 160.5	5A12043	0.10	0.10	ND	1	01/12/05	01/12/05	
Sample ID: IOA0551-01 (Outfall 001 - Water)									
Reporting Units: NTU									
Turbidity	EPA 180.1	5A12058	0.040	1.0	**23**	1	01/12/05	01/12/05	
Sample ID: IOA0551-01 (Outfall 001 - Water)									
Reporting Units: ug/l									
Total Cyanide	EPA 335.2	5A11108	2.2	5.0	ND	1	01/11/05	01/11/05	
Perchlorate	EPA 314.0	5A13051	0.80	4.0	ND	1	01/13/05	01/13/05	
Sample ID: IOA0551-01 (Outfall 001 - Water)									
Reporting Units: umhos/cm									
Specific Conductance	EPA 120.1	5A13060	1.0	1.0	**99**	1	01/13/05	01/13/05	

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Report Number: IOA0551

Sampled: 01/11/05
Received: 01/11/05

SHORT HOLD TIME DETAIL REPORT

	Hold Time (in days)	Date/Time Sampled	Date/Time Received	Date/Time Extracted	Date/Time Analyzed
Sample ID: Outfall 001 (IOA0551-01) - Water					
EPA 160.5	2	01/11/2005 10:04	01/11/2005 18:50	01/12/2005 09:30	01/12/2005 12:30
EPA 180.1	2	01/11/2005 10:04	01/11/2005 18:50	01/12/2005 11:30	01/12/2005 12:30
EPA 300.0	2	01/11/2005 10:04	01/11/2005 18:50	01/11/2005 21:00	01/11/2005 21:30
EPA 405.1	2	01/11/2005 10:04	01/11/2005 18:50	01/12/2005 11:00	01/17/2005 16:00
SM5540-C	2	01/11/2005 10:04	01/11/2005 18:50	01/12/2005 13:06	01/12/2005 20:16

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Report Number: IOA0551

Sampled: 01/11/05
Received: 01/11/05

METHOD BLANK/QC DATA

PURGEABLES BY GC/MS (EPA 624)

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A12008 Extracted: 01/12/05											
Blank Analyzed: 01/12/2005 (5A12008-BLK1)											
Benzene	ND	2.0	0.28	ug/l							
Carbon tetrachloride	ND	5.0	0.28	ug/l							
Chloroform	ND	2.0	0.33	ug/l							
1,1-Dichloroethane	ND	2.0	0.27	ug/l							
1,2-Dichloroethane	ND	2.0	0.28	ug/l							
1,1-Dichloroethene	ND	3.0	0.32	ug/l							
Ethylbenzene	ND	2.0	0.25	ug/l							
Tetrachloroethene	ND	2.0	0.32	ug/l							
Toluene	ND	2.0	0.36	ug/l							
1,1,1-Trichloroethane	ND	2.0	0.30	ug/l							
1,1,2-Trichloroethane	ND	2.0	0.30	ug/l							
Trichloroethene	ND	5.0	0.26	ug/l							
Trichlorofluoromethane	ND	5.0	0.34	ug/l							
Vinyl chloride	ND	5.0	0.26	ug/l							
Xylenes, Total	ND	4.0	0.52	ug/l							
Surrogate: Dibromofluoromethane	*24.6*			*ug/l*	*25.0*		*98*	*80-120*			
Surrogate: Toluene-d8	*25.1*			*ug/l*	*25.0*		*100*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*24.8*			*ug/l*	*25.0*		*99*	*80-120*			
LCS Analyzed: 01/12/2005 (5A12008-BS1)											
Benzene	23.0	2.0	0.28	ug/l	25.0		92	70-120			
Carbon tetrachloride	29.2	5.0	0.28	ug/l	25.0		117	70-140			
Chloroform	24.5	2.0	0.33	ug/l	25.0		98	75-130			
1,1-Dichloroethane	23.8	2.0	0.27	ug/l	25.0		95	70-135			
1,2-Dichloroethane	26.9	2.0	0.28	ug/l	25.0		108	60-150			
1,1-Dichloroethene	24.2	3.0	0.32	ug/l	25.0		97	75-135			
Ethylbenzene	26.5	2.0	0.25	ug/l	25.0		106	80-120			
Tetrachloroethene	27.2	2.0	0.32	ug/l	25.0		109	75-125			
Toluene	24.2	2.0	0.36	ug/l	25.0		97	75-120			
1,1,1-Trichloroethane	28.0	2.0	0.30	ug/l	25.0		112	75-140			
1,1,2-Trichloroethane	24.9	2.0	0.30	ug/l	25.0		100	70-125			
Trichloroethene	25.9	5.0	0.26	ug/l	25.0		104	80-120			
Trichlorofluoromethane	28.6	5.0	0.34	ug/l	25.0		114	65-145			
Vinyl chloride	22.0	5.0	0.26	ug/l	25.0		88	50-130			
Surrogate: Dibromofluoromethane	*23.9*			*ug/l*	*25.0*		*96*	*80-120*			
Surrogate: Toluene-d8	*24.9*			*ug/l*	*25.0*		*100*	*80-120*			

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 001

Report Number: IOA0551

Sampled: 01/11/05
Received: 01/11/05

METHOD BLANK/QC DATA

PURGEABLES BY GC/MS (EPA 624)

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A12008 Extracted: 01/12/05											
LCS Analyzed: 01/12/2005 (5A12008-BS1)											
Surrogate: 4-Bromofluorobenzene	*25.2*			*ug/l*	*25.0*		*101*	*80-120*			
Matrix Spike Analyzed: 01/12/2005 (5A12008-MS1)						**Source: IOA0549-01**					
Benzene	26.0	2.0	0.28	ug/l	25.0	ND	104	70-120			
Carbon tetrachloride	32.8	5.0	0.28	ug/l	25.0	ND	131	70-145			
Chloroform	28.4	2.0	0.33	ug/l	25.0	ND	114	70-135			
1,1-Dichloroethane	27.8	2.0	0.27	ug/l	25.0	ND	111	65-135			
1,2-Dichloroethane	30.3	2.0	0.28	ug/l	25.0	ND	121	60-150			
1,1-Dichloroethene	28.1	3.0	0.32	ug/l	25.0	ND	112	65-140			
Ethylbenzene	29.7	2.0	0.25	ug/l	25.0	ND	119	70-130			
Tetrachloroethene	30.4	2.0	0.32	ug/l	25.0	ND	122	70-130			
Toluene	27.6	2.0	0.36	ug/l	25.0	ND	110	70-120			
1,1,1-Trichloroethane	32.6	2.0	0.30	ug/l	25.0	ND	130	75-140			
1,1,2-Trichloroethane	27.8	2.0	0.30	ug/l	25.0	ND	111	60-135			
Trichloroethene	28.9	5.0	0.26	ug/l	25.0	ND	116	70-125			
Trichlorofluoromethane	33.3	5.0	0.34	ug/l	25.0	ND	133	55-145			
Vinyl chloride	26.1	5.0	0.26	ug/l	25.0	ND	104	40-135			
Surrogate: Dibromofluoromethane	*24.7*			*ug/l*	*25.0*		*99*	*80-120*			
Surrogate: Toluene-d8	*25.0*			*ug/l*	*25.0*		*100*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*25.3*			*ug/l*	*25.0*		*101*	*80-120*			
Matrix Spike Dup Analyzed: 01/12/2005 (5A12008-MSD1)						**Source: IOA0549-01**					
Benzene	22.7	2.0	0.28	ug/l	25.0	ND	91	70-120	14	20	
Carbon tetrachloride	28.3	5.0	0.28	ug/l	25.0	ND	113	70-145	15	25	
Chloroform	24.5	2.0	0.33	ug/l	25.0	ND	98	70-135	15	20	
1,1-Dichloroethane	23.8	2.0	0.27	ug/l	25.0	ND	95	65-135	16	20	
1,2-Dichloroethane	25.8	2.0	0.28	ug/l	25.0	ND	103	60-150	16	20	
1,1-Dichloroethene	24.4	3.0	0.32	ug/l	25.0	ND	98	65-140	14	20	
Ethylbenzene	26.2	2.0	0.25	ug/l	25.0	ND	105	70-130	13	20	
Tetrachloroethene	26.8	2.0	0.32	ug/l	25.0	ND	107	70-130	13	20	
Toluene	24.0	2.0	0.36	ug/l	25.0	ND	96	70-120	14	20	
1,1,1-Trichloroethane	27.9	2.0	0.30	ug/l	25.0	ND	112	75-140	16	20	
1,1,2-Trichloroethane	23.6	2.0	0.30	ug/l	25.0	ND	94	60-135	16	25	
Trichloroethene	25.0	5.0	0.26	ug/l	25.0	ND	100	70-125	14	20	
Trichlorofluoromethane	28.6	5.0	0.34	ug/l	25.0	ND	114	55-145	15	25	
Vinyl chloride	23.4	5.0	0.26	ug/l	25.0	ND	94	40-135	11	30	

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Attention: Bronwyn Kelly

Project ID: Routine Outfall 001

Report Number: IOA0551

Sampled: 01/11/05
Received: 01/11/05

METHOD BLANK/QC DATA

PURGEABLES BY GC/MS (EPA 624)

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A12008 Extracted: 01/12/05											
Matrix Spike Dup Analyzed: 01/12/2005 (5A12008-MSD1)						**Source: IOA0549-01**					
Surrogate: Dibromofluoromethane	*24.3*			*ug/l*	*25.0*		*97*	*80-120*			
Surrogate: Toluene-d8	*24.8*			*ug/l*	*25.0*		*99*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*25.3*			*ug/l*	*25.0*		*101*	*80-120*			

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Report Number: IOA0551

Sampled: 01/11/05
Received: 01/11/05

METHOD BLANK/QC DATA

ACID & BASE/NEUTRALS BY GC/MS (EPA 625)

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A12027 Extracted: 01/12/05											
Blank Analyzed: 01/17/2005 (5A12027-BLK1)											
Bis(2-ethylhexyl)phthalate	ND	5.0	1.1	ug/l							
2,4-Dinitrotoluene	ND	9.0	0.23	ug/l							
N-Nitrosodimethylamine	ND	8.0	0.22	ug/l							
Pentachlorophenol	ND	8.0	0.78	ug/l							
2,4,6-Trichlorophenol	ND	6.0	0.10	ug/l							
Surrogate: 2-Fluorophenol	*14.2*			*ug/l*	*20.0*		*71*	*35-120*			
Surrogate: Phenol-d6	*14.7*			*ug/l*	*20.0*		*74*	*45-120*			
Surrogate: 2,4,6-Tribromophenol	*14.3*			*ug/l*	*20.0*		*72*	*50-125*			
Surrogate: Nitrobenzene-d5	*6.84*			*ug/l*	*10.0*		*68*	*45-120*			
Surrogate: 2-Fluorobiphenyl	*7.60*			*ug/l*	*10.0*		*76*	*45-120*			
Surrogate: Terphenyl-d14	*8.12*			*ug/l*	*10.0*		*81*	*45-135*			
LCS Analyzed: 01/17/2005 (5A12027-BS1)											**M-NR1**
Bis(2-ethylhexyl)phthalate	8.56	5.0	1.1	ug/l	10.0		86	65-125			
2,4-Dinitrotoluene	7.36	9.0	0.23	ug/l	10.0		74	60-140			*J*
N-Nitrosodimethylamine	7.68	8.0	0.22	ug/l	10.0		77	40-120			*J*
Pentachlorophenol	8.04	8.0	0.78	ug/l	10.0		80	50-125			
2,4,6-Trichlorophenol	8.64	6.0	0.10	ug/l	10.0		86	60-120			
Surrogate: 2-Fluorophenol	*14.5*			*ug/l*	*20.0*		*72*	*35-120*			
Surrogate: Phenol-d6	*14.5*			*ug/l*	*20.0*		*72*	*45-120*			
Surrogate: 2,4,6-Tribromophenol	*14.7*			*ug/l*	*20.0*		*74*	*50-125*			
Surrogate: Nitrobenzene-d5	*7.14*			*ug/l*	*10.0*		*71*	*45-120*			
Surrogate: 2-Fluorobiphenyl	*7.80*			*ug/l*	*10.0*		*78*	*45-120*			
Surrogate: Terphenyl-d14	*8.56*			*ug/l*	*10.0*		*86*	*45-135*			
LCS Dup Analyzed: 01/17/2005 (5A12027-BSD1)											
Bis(2-ethylhexyl)phthalate	8.24	5.0	1.1	ug/l	10.0		82	65-125	4	20	
2,4-Dinitrotoluene	7.48	9.0	0.23	ug/l	10.0		75	60-140	2	20	*J*
N-Nitrosodimethylamine	7.20	8.0	0.22	ug/l	10.0		72	40-120	6	20	*J*
Pentachlorophenol	7.68	8.0	0.78	ug/l	10.0		77	50-125	5	25	*J*
2,4,6-Trichlorophenol	8.76	6.0	0.10	ug/l	10.0		88	60-120	1	20	
Surrogate: 2-Fluorophenol	*14.3*			*ug/l*	*20.0*		*72*	*35-120*			
Surrogate: Phenol-d6	*14.5*			*ug/l*	*20.0*		*72*	*45-120*			
Surrogate: 2,4,6-Tribromophenol	*15.0*			*ug/l*	*20.0*		*75*	*50-125*			
Surrogate: Nitrobenzene-d5	*7.38*			*ug/l*	*10.0*		*74*	*45-120*			
Surrogate: 2-Fluorobiphenyl	*7.66*			*ug/l*	*10.0*		*77*	*45-120*			

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Project ID: Routine Outfall 001

Report Number: IOA0551

Sampled: 01/11/05
Received: 01/11/05

METHOD BLANK/QC DATA

ACID & BASE/NEUTRALS BY GC/MS (EPA 625)

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A12027 Extracted: 01/12/05											
LCS Dup Analyzed: 01/17/2005 (5A12027-BSD1)											
Surrogate: Terphenyl-d14	*9.00*			*ug/l*	*10.0*		*90*	*45-135*			

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 001

Report Number: IOA0551

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Received: 01/11/05

METHOD BLANK/QC DATA

ORGANOCHLORINE PESTICIDES (EPA 608)

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A13049 Extracted: 01/13/05											
Blank Analyzed: 01/14/2005 (5A13049-BLK1)											
alpha-BHC	ND	0.010	0.00049	ug/l							
Surrogate: Decachlorobiphenyl	*0.456*			*ug/l*	*0.500*		*91*	*45-120*			
Surrogate: Tetrachloro-m-xylene	*0.349*			*ug/l*	*0.500*		*70*	*35-120*			
LCS Analyzed: 01/14/2005 (5A13049-BS1)											**M-NR1**
alpha-BHC	0.427	0.010	0.00049	ug/l	0.500		85	45-115			
Surrogate: Decachlorobiphenyl	*0.432*			*ug/l*	*0.500*		*86*	*45-120*			
Surrogate: Tetrachloro-m-xylene	*0.347*			*ug/l*	*0.500*		*69*	*35-120*			
LCS Dup Analyzed: 01/14/2005 (5A13049-BSD1)											
alpha-BHC	0.433	0.010	0.00049	ug/l	0.500		87	45-115	1	30	
Surrogate: Decachlorobiphenyl	*0.407*			*ug/l*	*0.500*		*81*	*45-120*			
Surrogate: Tetrachloro-m-xylene	*0.364*			*ug/l*	*0.500*		*73*	*35-120*			

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METALS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A11106 Extracted: 01/11/05											
Blank Analyzed: 01/12/2005 (5A11106-BLK1)											
Copper	ND	2.0	0.49	ug/l							
Lead	ND	1.0	0.13	ug/l							
LCS Analyzed: 01/12/2005 (5A11106-BS1)											
Copper	82.0	2.0	0.49	ug/l	80.0		102	85-115			
Lead	81.6	1.0	0.13	ug/l	80.0		102	85-115			
Matrix Spike Analyzed: 01/12/2005 (5A11106-MS1)						**Source: IOA0550-01**					
Copper	79.0	2.0	0.49	ug/l	80.0	4.0	94	70-130			
Lead	75.8	1.0	0.13	ug/l	80.0	0.68	94	70-130			
Matrix Spike Dup Analyzed: 01/12/2005 (5A11106-MSD1)						**Source: IOA0550-01**					
Copper	84.7	2.0	0.49	ug/l	80.0	4.0	101	70-130	7	20	
Lead	82.0	1.0	0.13	ug/l	80.0	0.68	102	70-130	8	20	
Batch: 5A12047 Extracted: 01/12/05											
Blank Analyzed: 01/12/2005 (5A12047-BLK1)											
Mercury	ND	0.20	0.063	ug/l							
LCS Analyzed: 01/12/2005 (5A12047-BS1)											
Mercury	8.12	0.20	0.063	ug/l	8.00		102	85-115			
Matrix Spike Analyzed: 01/12/2005 (5A12047-MS1)						**Source: IOA0483-01**					
Mercury	8.00	0.20	0.063	ug/l	8.00	ND	100	70-130			
Matrix Spike Dup Analyzed: 01/12/2005 (5A12047-MSD1)						**Source: IOA0483-01**					
Mercury	8.26	0.20	0.063	ug/l	8.00	ND	103	70-130	3	20	

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INORGANICS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A11041 Extracted: 01/11/05											
Blank Analyzed: 01/11/2005 (5A11041-BLK1)											
Chloride	ND	0.50	0.26	mg/l							
Nitrate/Nitrite-N	ND	0.26	0.072	mg/l							
Sulfate	ND	0.50	0.18	mg/l							
LCS Analyzed: 01/11/2005 (5A11041-BS1)											
Chloride	5.00	0.50	0.26	mg/l	5.00		100	90-110			
Sulfate	10.8	0.50	0.18	mg/l	10.0		108	90-110			
Matrix Spike Analyzed: 01/11/2005 (5A11041-MS1)						**Source: IOA0551-01**					
Chloride	8.89	0.50	0.26	mg/l	5.00	4.2	94	80-120			
Sulfate	17.1	0.50	0.18	mg/l	10.0	6.8	103	80-120			
Matrix Spike Dup Analyzed: 01/11/2005 (5A11041-MSD1)						**Source: IOA0551-01**					
Chloride	9.11	0.50	0.26	mg/l	5.00	4.2	98	80-120	2	20	
Sulfate	17.2	0.50	0.18	mg/l	10.0	6.8	104	80-120	1	20	
Batch: 5A11108 Extracted: 01/11/05											
Blank Analyzed: 01/11/2005 (5A11108-BLK1)											
Total Cyanide	ND	5.0	2.2	ug/l							
LCS Analyzed: 01/11/2005 (5A11108-BS1)											
Total Cyanide	184	5.0	2.2	ug/l	200		92	90-110			
Matrix Spike Analyzed: 01/11/2005 (5A11108-MS1)						**Source: IOA0214-01**					
Total Cyanide	171	5.0	2.2	ug/l	200	ND	86	70-115			

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INORGANICS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A11108 Extracted: 01/11/05											
Matrix Spike Dup Analyzed: 01/11/2005 (5A11108-MSD1)						**Source: IOA0214-01**					
Total Cyanide	169	5.0	2.2	ug/l	200	ND	84	70-115	1	15	
Batch: 5A12041 Extracted: 01/12/05											
Blank Analyzed: 01/17/2005 (5A12041-BLK1)											
Biochemical Oxygen Demand	ND	2.0	0.59	mg/l							
LCS Analyzed: 01/17/2005 (5A12041-BS1)											
Biochemical Oxygen Demand	208	100	30	mg/l	198		105	85-115			
LCS Dup Analyzed: 01/17/2005 (5A12041-BSD1)											
Biochemical Oxygen Demand	212	100	30	mg/l	198		107	85-115	2	20	
Batch: 5A12058 Extracted: 01/12/05											
Blank Analyzed: 01/12/2005 (5A12058-BLK1)											
Turbidity	ND	1.0	0.040	NTU							
Duplicate Analyzed: 01/12/2005 (5A12058-DUP1)						**Source: IOA0541-01**					
Turbidity	0.260	1.0	0.040	NTU		0.23			12	20	J
Batch: 5A12059 Extracted: 01/12/05											
Blank Analyzed: 01/12/2005 (5A12059-BLK1)											
Surfactants (MBAS)	ND	0.10	0.044	mg/l							

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Batch: 5A12059 Extracted: 01/12/05											
LCS Analyzed: 01/12/2005 (5A12059-BS1)											
Surfactants (MBAS)	0.248	0.10	0.044	mg/l	0.250		99	90-110			
Matrix Spike Analyzed: 01/12/2005 (5A12059-MS1)						**Source: IOA0578-01**					
Surfactants (MBAS)	0.191	0.10	0.044	mg/l	0.250	0.052	56	50-125			
Matrix Spike Dup Analyzed: 01/12/2005 (5A12059-MSD1)						**Source: IOA0578-01**					
Surfactants (MBAS)	0.193	0.10	0.044	mg/l	0.250	0.052	56	50-125	1	20	
Batch: 5A12061 Extracted: 01/12/05											
Blank Analyzed: 01/12/2005 (5A12061-BLK1)											
Oil & Grease	1.60	5.0	0.94	mg/l							*J*
LCS Analyzed: 01/12/2005 (5A12061-BS1)											**M-NR1**
Oil & Grease	21.2	5.0	0.94	mg/l	20.0		106	65-120			
LCS Dup Analyzed: 01/12/2005 (5A12061-BSD1)											
Oil & Grease	20.8	5.0	0.94	mg/l	20.0		104	65-120	2	20	
Batch: 5A13051 Extracted: 01/13/05											
Blank Analyzed: 01/13/2005 (5A13051-BLK1)											
Perchlorate	ND	4.0	0.80	ug/l							
LCS Analyzed: 01/13/2005 (5A13051-BS1)											
Perchlorate	50.0	4.0	0.80	ug/l	50.0		100	85-115			

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Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A13051 Extracted: 01/13/05											
Matrix Spike Analyzed: 01/13/2005 (5A13051-MS1)						**Source: IOA0417-02**					
Perchlorate	49.6	4.0	0.80	ug/l	50.0	0.93	97	80-120			
Matrix Spike Dup Analyzed: 01/13/2005 (5A13051-MSD1)						**Source: IOA0417-02**					
Perchlorate	50.7	4.0	0.80	ug/l	50.0	0.93	100	80-120	2	20	
Batch: 5A13060 Extracted: 01/13/05											
Duplicate Analyzed: 01/13/2005 (5A13060-DUP1)						**Source: IOA0552-01**					
Specific Conductance	164	1.0	1.0	umhos/cm		160			2	5	
Batch: 5A13063 Extracted: 01/13/05											
Blank Analyzed: 01/13/2005 (5A13063-BLK1)											
Ammonia-N (Distilled)	ND	0.50	0.30	mg/l							
LCS Analyzed: 01/13/2005 (5A13063-BS1)											
Ammonia-N (Distilled)	9.80	0.50	0.30	mg/l	10.0		98	80-115			
Matrix Spike Analyzed: 01/13/2005 (5A13063-MS1)						**Source: IOA0632-01**					
Ammonia-N (Distilled)	11.5	0.50	0.30	mg/l	10.0	0.56	109	70-120			
Matrix Spike Dup Analyzed: 01/13/2005 (5A13063-MSD1)						**Source: IOA0632-01**					
Ammonia-N (Distilled)	11.2	0.50	0.30	mg/l	10.0	0.56	106	70-120	3	15	
Batch: 5A13089 Extracted: 01/13/05											
Blank Analyzed: 01/13/2005 (5A13089-BLK1)											
Total Dissolved Solids	ND	10	10	mg/l							

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Batch: 5A13089 Extracted: 01/13/05											
LCS Analyzed: 01/13/2005 (5A13089-BS1)											
Total Dissolved Solids	994	10	10	mg/l	1000		99	90-110			
Duplicate Analyzed: 01/13/2005 (5A13089-DUP1)						**Source: IOA0549-01**					
Total Dissolved Solids	92.0	10	10	mg/l		88			4	10	
Batch: 5A14084 Extracted: 01/14/05											
Blank Analyzed: 01/14/2005 (5A14084-BLK1)											
Total Suspended Solids	ND	10	10	mg/l							
LCS Analyzed: 01/14/2005 (5A14084-BS1)											
Total Suspended Solids	949	10	10	mg/l	1000		95	85-115			
Duplicate Analyzed: 01/14/2005 (5A14084-DUP1)						**Source: IOA0607-01**					
Total Suspended Solids	ND	10	10	mg/l		ND				10	

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Compliance Check

The results obtained from the analytical testing of this data set were checked against compliance limits received from the client. Any results at or above the compliance limits appear in bold on this page.

LabNumber	Analysis	Analyte	Units	Result	MRL	Compliance Limit
IOA0551-01	413.1 Oil and Grease	Oil & Grease	mg/l	4.30	5.0	10.00
IOA0551-01	608-Pest Boeing 001/002 Q (LL)	alpha-BHC	ug/l	0	0.010	0.0100
IOA0551-01	624-Boeing 001/002 Q (Fr113+X)	1,1-Dichloroethene	ug/l	0	3.0	3.20
IOA0551-01	624-Boeing 001/002 Q (Fr113+X)	Trichloroethene	ug/l	0	5.0	5.00
IOA0551-01	625-Boeing 001/002 Q-LL	2,4,6-Trichlorophenol	ug/l	0	6.0	6.50
IOA0551-01	625-Boeing 001/002 Q-LL	2,4-Dinitrotoluene	ug/l	0	9.0	9.10
IOA0551-01	625-Boeing 001/002 Q-LL	Bis(2-ethylhexyl)phthalate	ug/l	1.30	5.0	4.00
IOA0551-01	625-Boeing 001/002 Q-LL	N-Nitrosodimethylamine	ug/l	0	8.0	8.10
IOA0551-01	625-Boeing 001/002 Q-LL	Pentachlorophenol	ug/l	0	8.0	8.20
IOA0551-01	BOD	Biochemical Oxygen Demand	mg/l	1.20	2.0	20
IOA0551-01	Chloride - 300.0	Chloride	mg/l	4.20	0.50	150
IOA0551-01	Copper-200.8	Copper	ug/l	3.30	2.0	7.10
IOA0551-01	Cyanide-335.2 5ppb	Total Cyanide	ug/l	-4	5.0	4.30
IOA0551-01	Lead-200.8	Lead	ug/l	1.10	1.0	2.60
IOA0551-01	MBAS - SM5540-C	Surfactants (MBAS)	mg/l	0.031	0.10	0.50
IOA0551-01	Mercury - 245.1	Mercury	ug/l	0.17	0.20	0.20
IOA0551-01	Nitrogen, NO3+NO2 -N	Nitrate/Nitrite-N	mg/l	0.96	0.26	8.00
IOA0551-01	Perchlorate 314.0	Perchlorate	ug/l	0	4.0	6.00
IOA0551-01	Sulfate-300.0	Sulfate	mg/l	6.80	0.50	300
IOA0551-01	TDS - SM 2540C	Total Dissolved Solids	mg/l	110	10	950
IOA0551-02	624-Boeing 001/002 Q (Fr113+X)	1,1-Dichloroethene	ug/l	0	3.0	3.20
IOA0551-02	624-Boeing 001/002 Q (Fr113+X)	Trichloroethene	ug/l	0	5.0	5.00

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DATA QUALIFIERS AND DEFINITIONS

B	Analyte was detected in the associated Method Blank.
J	Estimated value. Analyte detected at a level less than the Reporting Limit (RL) and greater than or equal to the Method Detection Limit (MDL). The user of this data should be aware that this data is of unknown quality.
M-NR1	There was no MS/MSD analyzed with this batch due to insufficient sample volume. See Blank Spike/Blank Spike Duplicate.
ND	Analyte NOT DETECTED at or above the reporting limit or MDL, if MDL is specified.
RPD	Relative Percent Difference

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2520 E. Sunset Rd. #3, Las Vegas, NV 89120 (702) 798-3620 FAX (702) 798-3621

MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 001

Report Number: IOA0551

Sampled: 01/11/05
Received: 01/11/05

Certification Summary

Del Mar Analytical, Irvine

Method	Matrix	Nelac	California
EPA 120.1	Water	X	X
EPA 160.2	Water	X	X
EPA 160.5	Water	X	X
EPA 180.1	Water	X	X
EPA 200.8	Water	X	X
EPA 245.1	Water	X	X
EPA 300.0	Water	X	X
EPA 314.0	Water	X	X
EPA 335.2	Water	X	X
EPA 350.2	Water	X	X
EPA 405.1	Water	X	X
EPA 413.1	Water	X	X
EPA 608	Water	X	X
EPA 624	Water	X	X
EPA 625	Water	X	X
SM2540C	Water	X	X
SM5540-C	Water	X	X

Nevada and NELAP provide analyte specific accreditations. Analyte specific information for Del Mar Analytical may be obtained by contacting the laboratory or visiting our website at www.dmalabs.com.

Subcontracted Laboratories

Pace Analytical, MN- SUB
1700 Elm Street, Ste 200 - Minneapolis, MN 55414

Analysis Performed: 1613-Dioxin-HR
Samples: IOA0551-01

Analysis Performed: EDD + Level 4
Samples: IOA0551-01

Del Mar Analytical, Irvine
Michele Harper
Project Manager

The results pertain only to the samples tested in the laboratory. This report shall not be reproduced, except in full, without written permission from Del Mar Analytical.

IOA0551

Del Mar Analytical Version 5 8/12/04 CHAIN OF CUSTODY FORM

Client Name/Address:	Project:
MWH-Pasadena 300 North Lake Avenue, Suite 1200 Pasadena, CA 91101	Boeing-SSFL NPDES **Routine Outfall 001**
Project Manager: Bronwyn Kelly Sampler: R. BAÑAGA	Phone Number: (626) 568-6691 Fax Number: (626) 568-6515

Sample Description	Sample Matrix	Container Type	# of Cont.	Sampling Date/Time	Preservative	Bottle #	Total Recoverable Metals: Cu, Pb, Hg,	Settleable Solids	VOCs 624 + xylenes	TCDD (and all congeners)	Oil & Grease (EPA 413.1)	Cyanide (total recoverable)	BOD5(20 degrees C)	Surfactants (MBAS)	Cl-, SO4, NO3+NO2-N, Perchlorate	Turbidity,TDS, TSS, Conductivity	Ammonia-N	Alpha BHC (608)	2,4,6 Trichlorophenol, 2,4 Dinitrotoluene, Bis(2-ethylhexyl)phthalate, NDMA, pentachlorophenol (EPA 625)		Comments
Outfall 001	W	Poly-1L	1	1-11-05 10:04	HNO3	1A	X														24 TAT
Outfall 001-Dup	W	Poly-1L	1		HNO3	1B	X														24 TAT
Outfall 001	W	Poly-1L	1		None	2		X													
Outfall 001	W	VOAs	3		HCl	3A, 3B, 3C			X												
Outfall 001	W	1L Amber	2		None	4A, 4B				X											
Outfall 001	W	1L Amber	2		HCl	5A, 5B					X										24 TAT
Outfall 001	W	Poly-500 ml	1		NaOH	6						X									24 TAT
Outfall 001	W	Poly-1L	1		None	7							X								
Outfall 001	W	Poly-500 ml	2		None	8A, 8B								X							
Outfall 001	W	Poly-500 ml	2		None	9A, 9B									X						
Outfall 001	W	Poly-500 ml	2		None	10A, 10B										X					
Outfall 001	W	Poly-500 ml	1		H2SO4	11											X				
Outfall 001	W	1L Amber	2		None	12A, 12B												X			
Outfall 001	W	1L Amber	2	1-11-05 10:04	None	13A, 13B													X		
Trip Blank	W	VOAs	3		HCl	14A, 14B, 14C,			X												

ANALYSIS REQUIRED

Field readings: 6
Temp = 55.8
pH= 6.99

Relinquished By	Date/Time:	Received By	Date/Time:
[signature]	1-11-05 1435	[signature]	1-11-05 1435
[signature]	1-11-05 1850	[signature]	1/11/05 1850

Turn around Time: (check)
24 Hours ____ 5 Days ____
48 Hours ____ 10 Days ____
72 Hours ____ Normal X
Perchlorate Only 72 Hours ____
Metals Only 72 Hours ____
Sample Integrity: (Check)
Intact X On Ice: X 2°C

Del Mar Analytical

2852 Alton Ave., Irvine CA 92606 (949) 261-1022 FAX (949) 261-1228
1014 E. Cooley Dr., Suite A, Colton, CA 92324 (909) 370-4667 FAX (949) 370-1046
9484 Chesapeake Dr., Suite 805, San Diego, CA 92123 (858) 505-8596 FAX (858) 505-9689
9830 South 51st St., Suite B-120, Phoenix, AZ 85044 (480) 785-0043 FAX (480) 785-0851
2520 E. Sunset Rd. #3, Las Vegas, NV 89120 (702) 798-3620 FAX (702) 798-3621

February 25, 2005

MWH-Pasadena/Boeing
300 North Lake Avenue
Pasadena, Ca. 91101

Attention: Bronwyn Kelly

Project: Routine Outfall 001
Sampled: 01/11/05
Del Mar Analytical Number: IOA0551

Dear Ms. Kelly:

Pace Analytical performed Method 1613B analysis for the project referenced above. Please use the following cross-reference table when reviewing your results.

MWH ID	DEL MAR ID	Pace ID
Outfall 001	IOA0551-01	106124001

Attached is the original report from the subcontract laboratory. If you have any questions or require further assistance, please do not hesitate to contact me.

Sincerely yours,
DEL MAR ANALYTICAL

Michele Harper
Project Manager

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Pace Analytical™

Method 1613B Analysis Results

Client - Del Mar Analytical

Client's Sample ID	IOA0551-01		
Lab Sample ID	106124001		
Filename	F50129B_07		
Injected By	BAL		
Total Amount Extracted	1050 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	01/11/2005
ICAL Date	11/29/2004	Received	01/13/2005
CCal Filename(s)	F50129B_02	Extracted	01/28/2005
Method Blank ID	BLANK-6220	Analyzed	01/30/2005 00:39

Native Isomers	Conc pg/L	EMPC pg/L	LOD pg/L		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	1.30		2,3,7,8-TCDF-13C	2.00	63
Total TCDF	ND	-----	1.30		2,3,7,8-TCDD-13C	2.00	79
					1,2,3,7,8-PeCDF-13C	2.00	67
2,3,7,8-TCDD	ND	-----	1.20		2,3,4,7,8-PeCDF-13C	2.00	70
Total TCDD	ND	-----	1.20		1,2,3,7,8-PeCDD-13C	2.00	84
					1,2,3,4,7,8-HxCDF-13C	2.00	72
1,2,3,7,8-PeCDF	ND	-----	1.60		1,2,3,6,7,8-HxCDF-13C	2.00	83
2,3,4,7,8-PeCDF	ND	-----	0.86		2,3,4,6,7,8-HxCDF-13C	2.00	79
Total PeCDF	ND	-----	1.20		1,2,3,7,8,9-HxCDF-13C	2.00	74
					1,2,3,4,7,8-HxCDD-13C	2.00	67
1,2,3,7,8-PeCDD	ND	-----	0.73		1,2,3,6,7,8-HxCDD-13C	2.00	89
Total PeCDD	ND	-----	0.73		1,2,3,4,6,7,8-HpCDF-13C	2.00	78
					1,2,3,4,7,8,9-HpCDF-13C	2.00	65
1,2,3,4,7,8-HxCDF	ND	-----	1.00		1,2,3,4,6,7,8-HpCDD-13C	2.00	84
1,2,3,6,7,8-HxCDF	ND	-----	1.40		OCDD-13C	4.00	71
2,3,4,6,7,8-HxCDF	ND	-----	0.87				
1,2,3,7,8,9-HxCDF	ND	-----	0.75		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	-----	1.00		1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	1.10		2,3,7,8-TCDD-37Cl4	0.20	78
1,2,3,6,7,8-HxCDD	ND	-----	0.87				
1,2,3,7,8,9-HxCDD	ND	-----	1.10				
Total HxCDD	ND	-----	1.00				
1,2,3,4,6,7,8-HpCDF	ND	-----	1.10				
1,2,3,4,7,8,9-HpCDF	ND	-----	1.70				
Total HpCDF	ND	-----	1.40				
1,2,3,4,6,7,8-HpCDD	5.8	-----	1.20	BJ			
Total HpCDD	12.0	-----	1.20	BJ			
OCDF	7.1	-----	1.70	BJ			
OCDD	56.0	-----	1.90	J			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection. Totals are averages of individual isomer LODs.
D = Result obtained from analysis of diluted sample
B = Less than 10 times higher than method blank level
P = Recovery outside of method 1613 control limits
J = Concentration detected is below the calibration range
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....106124

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 1613B Blank Analysis Results

Client - Del Mar Analytical

Lab Sample ID	BLANK-6220	Matrix	Water
Filename	F50129B_06	Dilution	NA
Total Amount Extracted	1020 mL	Extracted	01/28/2005
ICAL Date	11/29/2004	Analyzed	01/29/2005 23:49
CCal Filename(s)	F50129B_02	Injected By	BAL

Native Isomers	Conc pg/L	EMPC pg/L	PRL pg/L		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	1.20		2,3,7,8-TCDF-13C	2.00	58
Total TCDF	ND	-----	-----		2,3,7,8-TCDD-13C	2.00	75
					1,2,3,7,8-PeCDF-13C	2.00	65
2,3,7,8-TCDD	ND	-----	1.20		2,3,4,7,8-PeCDF-13C	2.00	67
Total TCDD	ND	-----	-----		1,2,3,7,8-PeCDD-13C	2.00	80
					1,2,3,4,7,8-HxCDF-13C	2.00	70
1,2,3,7,8-PeCDF	ND	-----	1.50		1,2,3,6,7,8-HxCDF-13C	2.00	82
2,3,4,7,8-PeCDF	ND	-----	1.20		2,3,4,6,7,8-HxCDF-13C	2.00	77
Total PeCDF	ND	-----	-----		1,2,3,7,8,9-HxCDF-13C	2.00	72
					1,2,3,4,7,8-HxCDD-13C	2.00	66
1,2,3,7,8-PeCDD	ND	-----	1.60		1,2,3,6,7,8-HxCDD-13C	2.00	88
Total PeCDD	ND	-----	-----		1,2,3,4,6,7,8-HpCDF-13C	2.00	73
					1,2,3,4,7,8,9-HpCDF-13C	2.00	63
1,2,3,4,7,8-HxCDF	ND	-----	0.75		1,2,3,4,6,7,8-HpCDD-13C	2.00	80
1,2,3,6,7,8-HxCDF	ND	-----	0.86		OCDD-13C	4.00	68
2,3,4,6,7,8-HxCDF	ND	-----	1.10				
1,2,3,7,8,9-HxCDF	ND	-----	1.20		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	-----	-----		1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	1.10		2,3,7,8-TCDD-37Cl4	0.20	73
1,2,3,6,7,8-HxCDD	ND	-----	0.99				
1,2,3,7,8,9-HxCDD	ND	-----	1.00				
Total HxCDD	ND	-----	-----				
1,2,3,4,6,7,8-HpCDF	ND	-----	2.10				
1,2,3,4,7,8,9-HpCDF	ND	-----	1.90				
Total HpCDF	2.2	-----	-----	J			
1,2,3,4,6,7,8-HpCDD	2.4	-----	1.40	J			
Total HpCDD	2.4	-----	-----	J			
OCDF	5.2	-----	1.80	J			
OCDD	5.6	-----	2.90	J			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
PRL = Pace Analytical Reporting Limit
A = Limit of Detection based on signal to noise
P = Recovery outside of method 1613 control limits
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
J = Value below calibration range
* = See Discussion

Report No.....106124

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 1613B Laboratory Control Spike Results

Client - Del Mar Analytical

Lab Sample ID	LCS-6221		
Filename	F50129B_03	Matrix	Water
Total Amount Extracted	1040 mL	Dilution	NA
ICAL Date	11/29/2004	Extracted	01/28/2005
CCal Filename	F50129B_02	Analyzed	01/29/2005 21:22
Method Blank ID	BLANK-6220	Injected By	BAL

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDF	10	9.9	7.5	15.8	99
2,3,7,8-TCDD	10	8.6	6.7	15.8	86
1,2,3,7,8-PeCDF	50	50.5	40.0	67.0	101
2,3,4,7,8-PeCDF	50	48.2	34.0	80.0	96
1,2,3,7,8-PeCDD	50	43.3	35.0	71.0	87
1,2,3,4,7,8-HxCDF	50	45.6	36.0	67.0	91
1,2,3,6,7,8-HxCDF	50	48.7	42.0	65.0	97
2,3,4,6,7,8-HxCDF	50	49.1	35.0	78.0	98
1,2,3,7,8,9-HxCDF	50	46.5	39.0	65.0	93
1,2,3,4,7,8-HxCDD	50	49.9	35.0	82.0	100
1,2,3,6,7,8-HxCDD	50	51.3	38.0	67.0	103
1,2,3,7,8,9-HxCDD	50	50.1	32.0	81.0	100
1,2,3,4,6,7,8-HpCDF	50	50.3	41.0	61.0	101
1,2,3,4,7,8,9-HpCDF	50	53.3	39.0	69.0	107
1,2,3,4,6,7,8-HpCDD	50	45.4	35.0	70.0	91
OCDF	100	95.6	63.0	170.0	96
OCDD	100	97.1	78.0	144.0	97
2,3,7,8-TCDD-37Cl4	10	6.9	3.1	19.1	69
2,3,7,8-TCDF-13C	100	51.5	22.0	152.0	52
2,3,7,8-TCDD-13C	100	67.8	20.0	175.0	68
1,2,3,7,8-PeCDF-13C	100	61.4	21.0	192.0	61
2,3,4,7,8-PeCDF-13C	100	65.9	13.0	328.0	66
1,2,3,7,8-PeCDD-13C	100	77.8	21.0	227.0	78
1,2,3,4,7,8-HxCDF-13C	100	70.2	19.0	202.0	70
1,2,3,6,7,8-HxCDF-13C	100	78.0	21.0	159.0	78
2,3,4,6,7,8-HxCDF-13C	100	74.1	22.0	176.0	74
1,2,3,7,8,9-HxCDF-13C	100	70.4	17.0	205.0	70
1,2,3,4,7,8-HxCDD-13C	100	69.0	21.0	193.0	69
1,2,3,6,7,8-HxCDD-13C	100	82.8	25.0	163.0	83
1,2,3,4,6,7,8-HpCDF-13C	100	72.1	21.0	158.0	72
1,2,3,4,7,8,9-HpCDF-13C	100	62.4	20.0	186.0	62
1,2,3,4,6,7,8-HpCDD-13C	100	80.1	26.0	166.0	80
OCDD-13C	200	135.6	26.0	397.0	68

Cs = Concentration Spiked (ng/mL)
Cr = Concentration Recovered (ng/mL)
Rec. = Recovery (Expressed as Percent)
Control Limit Reference: Method 1613, Table 6, 10/94 Revision
X = Background subtracted value
P = Recovery outside of control limits
Nn = Value obtained from additional analysis
* = See Discussion

Report No.....106124

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 1613B Laboratory Control Spike Results

Client - Del Mar Analytical

Lab Sample ID	LCSD-6222		
Filename	F50129B_04	Matrix	Water
Total Amount Extracted	1040 mL	Dilution	NA
ICAL Date	11/29/2004	Extracted	01/28/2005
CCal Filename	F50129B_02	Analyzed	01/29/2005 22:09
Method Blank ID	BLANK-6220	Injected By	BAL

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDF	10	10.6	7.5	15.8	106
2,3,7,8-TCDD	10	9.4	6.7	15.8	94
1,2,3,7,8-PeCDF	50	53.2	40.0	67.0	106
2,3,4,7,8-PeCDF	50	50.7	34.0	80.0	101
1,2,3,7,8-PeCDD	50	46.0	35.0	71.0	92
1,2,3,4,7,8-HxCDF	50	47.6	36.0	67.0	95
1,2,3,6,7,8-HxCDF	50	50.9	42.0	65.0	102
2,3,4,6,7,8-HxCDF	50	50.9	35.0	78.0	102
1,2,3,7,8,9-HxCDF	50	49.0	39.0	65.0	98
1,2,3,4,7,8-HxCDD	50	52.4	35.0	82.0	105
1,2,3,6,7,8-HxCDD	50	54.2	38.0	67.0	108
1,2,3,7,8,9-HxCDD	50	52.5	32.0	81.0	105
1,2,3,4,6,7,8-HpCDF	50	55.0	41.0	61.0	110
1,2,3,4,7,8,9-HpCDF	50	55.7	39.0	69.0	111
1,2,3,4,6,7,8-HpCDD	50	48.0	35.0	70.0	96
OCDF	100	100.6	63.0	170.0	101
OCDD	100	101.9	78.0	144.0	102
2,3,7,8-TCDD-37Cl4	10	8.7	3.1	19.1	87
2,3,7,8-TCDF-13C	100	70.4	22.0	152.0	70
2,3,7,8-TCDD-13C	100	88.6	20.0	175.0	89
1,2,3,7,8-PeCDF-13C	100	73.6	21.0	192.0	74
2,3,4,7,8-PeCDF-13C	100	79.0	13.0	328.0	79
1,2,3,7,8-PeCDD-13C	100	95.5	21.0	227.0	96
1,2,3,4,7,8-HxCDF-13C	100	84.8	19.0	202.0	85
1,2,3,6,7,8-HxCDF-13C	100	89.5	21.0	159.0	90
2,3,4,6,7,8-HxCDF-13C	100	87.2	22.0	176.0	87
1,2,3,7,8,9-HxCDF-13C	100	82.1	17.0	205.0	82
1,2,3,4,7,8-HxCDD-13C	100	80.1	21.0	193.0	80
1,2,3,6,7,8-HxCDD-13C	100	97.0	25.0	163.0	97
1,2,3,4,6,7,8-HpCDF-13C	100	84.4	21.0	158.0	84
1,2,3,4,7,8,9-HpCDF-13C	100	71.7	20.0	186.0	72
1,2,3,4,6,7,8-HpCDD-13C	100	92.4	26.0	166.0	92
OCDD-13C	200	159.2	26.0	397.0	80

Cs = Concentration Spiked (ng/mL)
Cr = Concentration Recovered (ng/mL)
Rec. = Recovery (Expressed as Percent)
Control Limit Reference: Method 1613, Table 6, 10/94 Revision
X = Background subtracted value
P = Recovery outside of control limits
Nn = Value obtained from additional analysis
* = See Discussion

Report No.....106124

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Pace Analytical Services, Inc.
1700 Elm Street
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444

SPIKE RECOVERY RELATIVE PERCENT DIFFERENCE (RPD) RESULTS

Client..... Del Mar Analytical

SPIKE 1 ID..... LCS-6221
SPIKE 1 Filename..... F50129B_03
SPIKE 2 ID..... LCSD-6222
SPIKE 2 Filename..... F50129B_04

COMPOUND	SPIKE 1 REC,%	SPIKE 2 REC,%	RPD,%
2378-TCDF	99	106	6.8
2378-TCDD	86	94	8.9
12378-PeCDF	101	106	4.8
23478-PeCDF	96	101	5.1
12378-PeCDD	87	92	5.6
123478-HxCDF	91	95	4.3
123678-HxCDF	97	102	5.0
234678-HxCDF	98	102	4.0
123789-HxCDF	93	98	5.2
123478-HxCDD	100	105	4.9
123678-HxCDD	103	108	4.7
123789-HxCDD	100	105	4.9
1234678-HpCDF	101	110	8.5
1234789-HpCDF	107	111	3.7
1234678-HpCDD	91	96	5.3
OCDF	96	101	5.1
OCDD	97	102	5.0

REC = Percent Recovered
RPD = The difference between the two values divided by the average.
NA = Not Applicable

Report No..... 106124, 106125, 106126
106127, 106128, 106130
106131, 106132, 106135

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Pace Analytical Services, Inc.
1700 Elm Street
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TABLE 1. 2,3,7,8-TCDD Equivalency Factors (TEFs) for the Polychlorinated Dibenzo-p-dioxins and Dibenzofurans

Number	Compound(s)	TEF
1	2,3,7,8-TCDD	1.00
2	1,2,3,7,8-PeCDD	0.50
3	1,2,3,6,7,8-HxCDD	0.1
4	1,2,3,7,8,9-HxCDD	0.1
5	1,2,3,4,7,8-HxCDD	0.1
6	1,2,3,4,6,7,8-HpCDD	0.01
7	OCDD	0.001
8	* Total - TCDD	0.0
9	* Total - PeCDD	0.0
10	* Total - HxCDD	0.0
11	* Total - HpCDD	0.0
12	2,3,7,8-TCDF	0.10
13	1,2,3,7,8-PeCDF	0.05
14	2,3,4,7,8-PeCDF	0.5
15	1,2,3,6,7,8-HxCDF	0.1
16	1,2,3,7,8,9-HxCDF	0.1
17	1,2,3,4,7,8-HxCDF	0.1
18	2,3,4,6,7,8-HxCDF	0.1
19	1,2,3,4,6,7,8-HpCDF	0.01
20	1,2,3,4,7,8,9-HpCDF	0.01
21	OCDF	0.001
22	* Total - TCDF	0.0
23	* Total - PeCDF	0.0
24	* Total - HxCDF	0.0
25	* Total - HpCDF	0.0

*Excluding the 2,3,7,8-substituted congeners.

Reference: 1989 ITEFs

REPORT OF LABORATORY ANALYSIS

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ACCREDITED IN ACCORDANCE WITH nelac

Del Mar Analytical

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SUBCONTRACT ORDER - PROJECT # IOA0551 106124

SENDING LABORATORY:	RECEIVING LABORATORY:
Del Mar Analytical, Irvine 17461 Derian Avenue. Suite 100 Irvine, CA 92614 Phone: (949) 261-1022 Fax: (949) 261-1228 Project Manager: Michele Harper	Pace Analytical, MN- SUB 1700 Elm Street, Ste 200 Minneapolis, MN 55414 Phone :(612) 607-1700 Fax: (612) 607-6444

Standard TAT is requested unless specific due date is requested => Due Date:_____ Initials:_____

Analysis	Expiration	Comments
Sample ID: IOA0551-01 Water	**Sampled: 01/11/05 10:04**	**Instant Nofication** 106124001
1613-Dioxin-HR	01/18/05 10:04	J flags, 17 congeners, no TEQ, sub to Pace-MN
EDD + Level 4	02/08/05 10:04	Excel EDD email to pm,Include Std logs for Lvl IV

Containers Supplied:
1 L Amber (IOA0551-01G)
1 L Amber (IOA0551-01H)

SAMPLE INTEGRITY:

All containers intact: ☐ Yes ☐ No Sample labels/COC agree: ☐ Yes ☐ No Samples Received On Ice:: ☐ Yes ☐ No
Custody Seals Present: ☐ Yes ☐ No Samples Preserved Properly: ☐ Yes ☐ No Samples Received at (temp): 3.0°C

Released By	Date	Time	Received By	Date	Time
[signature]	1/12/05		[signature] Pace	1.13.05	09:45
Released By	Date	Time	Received By	Date	Time

CONTRACT COMPLIANCE SCREENING FORM FOR HARDCOPY DATA

AMEC Earth & Environmental
550 South Wadsworth Boulevard
Suite 500
Lakewood, CO 80226

Package ID T711DF24
Task Order 313150010
SDG No. Multiple
No. of Analyses 7

Laboratory Pace
Reviewer K. Shadowlight
Analysis/Method Dioxins

Date: February 18, 2005
Reviewer's Signature K Shadowlight

ACTION ITEMS[a]	
1. **Case Narrative Deficiencies**	
2. **Out of Scope Analyses**	
3. **Analyses Not Conducted**	
4. **Missing Hardcopy Deliverables**	
5. **Incorrect Hardcopy Deliverables**	
6. **Deviations from Analysis Protocol, e.g.,**	Qualifications were assigned for the following:
Holding Times	* Method blank contamination
GC/MS Tune/Inst. Performance	* EMPCs
Calibration	* Detects below the lower method calibration level
Method blanks	
Surrogates	
Matrix Spike/Dup LCS	
Field QC	
Internal Standard Performance	
Compound Identification and Quantitation	
System Performance	
COMMENTS[b]	

[a] Subcontracted analytical laboratory is not meeting contract and/or method requirements.
[b] Differences in protocol have been adopted by the laboratory but no action against the laboratory is required.

DATA VALIDATION REPORT

NPDES
Monitoring

ANALYSIS: DIOXINS/FURANS

SAMPLE DELIVERY GROUPS: Multiple SDGs

Prepared by

AMEC—Denver Operations
550 South Wadsworth Boulevard, Suite 500
Lakewood, Colorado 80226

1. INTRODUCTION

Task Order Title:	NPDES Monitoring
Contract Task Order #:	313150010
Sample Delivery Group #:	Multiple
Project Manager:	B. McIlvaine
Matrix:	Water
Analysis:	Dioxins/Furans
QC Level:	Level IV
No. of Samples:	7
No. of Reanalyses/Dilutions:	0
Reviewer:	K. Shadowlight
Date of Review:	February 21, 2005

The samples listed in Table 1 were validated based on the guidelines outlined in the *AMEC Data Validation Procedure for Dioxins and Furans (DVP-19, Rev. 1), EPA Method 1613, and the National National Functional Guidelines For Chlorinated Dioxin/Furan Data Review* (8/02). Any deviations from these procedures and guidelines are documented herein. Qualifiers were applied in cases where the data did not meet the required QC criteria or where special consideration by the data user is required. Data qualifiers were placed on Form Is with the associated qualification codes. Analytes that were rejected for any reason are denoted on the Form I as having only the "R" data qualifier and associated qualification code(s) denoting the reason for rejection. Any additional problems with the data that may have resulted in an estimated value were not denoted by a qualification code since the data had already been rejected.

Table 1. Sample Identification

Client ID	Laboratory ID (Del Mar)	Laboratory ID (Pace)	Matrix	COC Method
Outfall 001	IOA0997-01	106475001	water	1613
Outfall 001	IOA1551-01	106840001	water	1613
Outfall 002	IOA0999-01	106478001	water	1613
Outfall 002	IOA1553-01	106871001	water	1613
Outfall 003	IOA1556-01	106869001	water	1613
Outfall 008	IOA1555-01	10687001	water	1613
Outfall 009	IOA1554-01	106842001	water	1613

2. DATA VALIDATION FINDINGS

2.1 SAMPLE MANAGEMENT

Following are findings associated with sample management:

2.1.1 Sample Preservation, Handling, and Transport

The samples in these SDGs were received at Del Mar Analytical within the temperature limits of 4°C ±2°C. The samples were subcontracted to Pace Analytical for the dioxin/furan analyses. The samples in these SDGs were received at Pace Analytical Services below the temperature limits of 4°C ± 2°C, at 1.8°C; however, as the samples were not noted to have been frozen or damaged, no qualifications were required. No qualifications were required.

2.1.2 Chain of Custody

The COCs and transfer COCs were signed by the appropriate field and laboratory personnel. The samples and analyses were accounted for on both the original COCs and transfer COCs. As the samples were couriered directly to the laboratory (Del Mar Analytical), custody seals were not required. There was no information regarding custody seals upon receipt at Pace. No qualifications were required.

2.1.3 Holding Times

The samples were extracted and analyzed within a year of collection. No qualifications were required.

2.2 INSTRUMENT PERFORMANCE

Following are findings associated with instrument performance:

2.2.1 GC Column Performance

A column performance standard was combined with the daily calibration verification and analyzed at the beginning of each analytical sequence. The GC column performance was acceptable with the chromatographic separation of 2,3,7,8-TCDD and other TCDD isomers resolved with a valley of ≤25%. No qualifications were required.

2.2.2 Mass Spectrometer Performance

The mass spectrometer performance could not be evaluated as the laboratory did not provide selected ion current profiles for the lock-mass ions. No qualifications were required.

2.3 CALIBRATION

2.3.1 Initial Calibration

There were two initial calibrations, analyzed 11/29/04 on instrument 10MSHR05 and 01/26/05 on instrument 10MSHR06. The calibrations consisted of five concentration level standards (CS1 through CS5) analyzed to verify instrument linearity. The initial calibrations were acceptable with %RSDs ≤20% for the 15 native compounds (calibration by isotope dilution) and ≤35% for the 2 native and all labeled compounds (calibration by internal standard). The relative retention times and ion abundance ratios were within the QC limits listed in Method 1613 for all standards. A representative number of %RSDs were verified from the raw data, and no calculation or transcription errors were noted. No qualifications were required.

2.3.2 Continuing Calibration

Calibration verification (VER) consisted of a mid-level standard (CS3) analyzed at the beginning of each analytical sequence. The VER was acceptable with the concentrations within the acceptance criteria listed in the Table 6 of the EPA Method 1613. The ion abundance ratios and relative retention times were within the method QC limits. A representative number of %Ds were verified from the raw data, and no calculation or transcription errors were noted. No qualifications were required.

2.4 BLANKS

One method blank (Blank-6241) was extracted and analyzed with the samples in these SDGs. Target compounds 1,2,3,6,7,8-HxCDF, total HxCDF, total HpCDF, 1,2,3,4,6,7,8-HpCDD, total HpCDD, and OCDF were reported in the method blank. Any detects for the aforementioned target compounds reported at concentrations <5× the concentrations reported in the method blank were qualified as estimated nondetects "UJ," at the levels of interference in the samples of these SDGs. The detect for total TCDF was qualified as estimated, "J," in sample Outfall 002 (IOA0999-01), as a portion of the total concentration was attributed to method blank contamination. Target compounds 1,2,3,4,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, and OCDD were reported as EMPCs in the method blank. A review of the method blank raw data and chromatograms indicated no false negatives or false positives. No further qualifications were required.

2.5 BLANK SPIKES AND LABORATORY CONTROL SAMPLES

One LCS/LCSD pair (LCS-6242/LCSD-6243) was extracted and analyzed with the samples in these SDGs. All recoveries were within the acceptance criteria listed in Table 6 of the Method 1613. There are no method QC limits established for RPDs. The reported RPDs were within ±20%. No qualifications were required.

2.6 MATRIX SPIKE/MATRIX SPIKE DUPLICATE

MS/MSD analyses were not performed in these SDGs. Evaluation of method accuracy and precision was based on the LCS/LCSD results. No qualifications were required.

2.7 FIELD QC SAMPLES

Following are findings associated with field QC:

2.7.1 Field Blanks and Equipment Rinsates

The samples in these SDGs had no associated field QC samples. No qualifications were required.

2.7.2 Field Duplicates

No field duplicate samples were identified for these SDGs.

2.8 INTERNAL STANDARDS

The labeled standard recoveries were within the acceptance criteria listed in Table 7 of Method 1613. No qualifications were required.

2.9 COMPOUND IDENTIFICATION

The laboratory analyzed for polychlorinated dioxins/furans by EPA Method 1613. The compound identifications were verified from the raw data and no false negatives or positives were noted. No qualifications were required.

2.10 COMPOUND QUANTIFICATION AND REPORTED DETECTION LIMITS

Compound quantitation was verified from the raw data. The laboratory calculated and reported compound-specific detection limits. Any detects below the lower method calibration limit (MCL) were qualified as estimated, "J." Any reported EMPC was qualified as an estimated nondetect, "UJ." No further qualifications were required.

Pace Analytical™

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Method 1613B Analysis Results

Client - Del Mar Analytical

Client's Sample ID	IOA0997-01		
Lab Sample ID	106475001		
Filename	U50203A_07		
Injected By	SMT		
Total Amount Extracted	1040 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	01/18/2005
ICAL Date	01/26/2005	Received	01/20/2005
CCal Filename(s)	U50202B_12	Extracted	01/31/2005
Method Blank ID	BLANK-6241	Analyzed	02/03/2005 10:43

Native Isomers	Conc pg/L	EMPC pg/L	LOD pg/L		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	0.61		2,3,7,8-TCDF-13C	2.00	102
Total TCDF	0.95	-----	0.61	BJ	2,3,7,8-TCDD-13C	2.00	99
					1,2,3,7,8-PeCDF-13C	2.00	109
2,3,7,8-TCDD	ND	-----	0.86		2,3,4,7,8-PeCDF-13C	2.00	116
Total TCDD	ND	-----	0.86		1,2,3,7,8-PeCDD-13C	2.00	128
					1,2,3,4,7,8-HxCDF-13C	2.00	102
1,2,3,7,8-PeCDF	ND	-----	0.29		1,2,3,6,7,8-HxCDF-13C	2.00	92
2,3,4,7,8-PeCDF	-----	0.33	0.21	I	2,3,4,6,7,8-HxCDF-13C	2.00	93
Total PeCDF	ND	-----	0.25		1,2,3,7,8,9-HxCDF-13C	2.00	102
					1,2,3,4,7,8-HxCDD-13C	2.00	101
1,2,3,7,8-PeCDD	ND	-----	0.72		1,2,3,6,7,8-HxCDD-13C	2.00	82
Total PeCDD	ND	-----	0.72		1,2,3,4,6,7,8-HpCDF-13C	2.00	90
					1,2,3,4,7,8,9-HpCDF-13C	2.00	84
1,2,3,4,7,8-HxCDF	-----	0.78	0.21	I	1,2,3,4,6,7,8-HpCDD-13C	2.00	91
1,2,3,6,7,8-HxCDF	-----	0.46	0.16	I	OCDD-13C	4.00	95
2,3,4,6,7,8-HxCDF	0.49	-----	0.20	J			
1,2,3,7,8,9-HxCDF	0.35	-----	0.24	J	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	0.85	-----	0.21	BJ	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	0.33		2,3,7,8-TCDD-37Cl4	0.20	91
1,2,3,6,7,8-HxCDD	ND	-----	0.31				
1,2,3,7,8,9-HxCDD	ND	-----	0.35				
Total HxCDD	ND	-----	0.33				
1,2,3,4,6,7,8-HpCDF	-----	1.30	0.62	I			
1,2,3,4,7,8,9-HpCDF	ND	-----	0.66				
Total HpCDF	5.20	-----	0.64	BJ			
1,2,3,4,6,7,8-HpCDD	3.00	-----	1.00	J			
Total HpCDD	3.00	-----	1.00	J			
OCDF	7.60	-----	0.93	BJ			
OCDD	18.00	-----	0.58	J			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection. Totals are averages of individual isomer LODs.
D = Result obtained from analysis of diluted sample
B = Less than 10 times higher than method blank level
P = Recovery outside of method 1613 control limits
J = Concentration detected is below the calibration range
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....106475

REPORT OF LABORATORY ANALYSIS

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NELAC VALIDATED LEVEL IV

CONTRACT COMPLIANCE SCREENING FORM FOR HARDCOPY DATA

AMEC Earth & Environmental
550 South Wadsworth Boulevard
Suite 500
Lakewood, CO 80226

Laboratory Del Mar Analytical
Reviewer K. Okonzak
Analysis/Method Metals

Package ID T711MT32
Task Order 313150010
SDG No. IOA0997
No. of Analyses 1

Date: 3/01/05
Reviewer's Signature

ACTION ITEMS[a]	
1. **Case Narrative Deficiencies**	
2. **Out of Scope Analyses**	
3. **Analyses Not Conducted**	
4. **Missing Hardcopy Deliverables**	
5. **Incorrect Hardcopy Deliverables**	
6. **Deviations from Analysis Protocol, e.g.,**	Qualifications applied for:
	The mercury reanalysis of sample Outfall 001 was rejected in favor of the original mercury analysis performed for this sample.
Holding Times	
GC/MS Tune/Inst. Perform	
Calibrations	
Blanks	
Surrogates	
Matrix Spike/Dup LCS	
Field QC	
Internal Standard Performance	
Compound Identification and Quantitation	
System Performance	

COMMENTS[b]	

[a] Subcontracted analytical laboratory is not meeting contract and/or method requirements.
[b] Differences in protocol have been adopted by the laboratory but no action against the laboratory is required.

Data Qualifier Reference Table

Qualifier	Organics	Inorganics
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.	The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.	The associated value is an estimated quantity.
N	The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification."	Not applicable.
NJ	The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.	Not applicable.
UJ	The analyte was not deemed above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.	The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.
R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and to meet quality control criteria. The presence or absence of the analyte cannot be verified.	The data are unusable. (Note: Analyte may or may not be present).

Qualification Code Reference Table

Qualifier	Organics	Inorganics
H	Holding times were exceeded.	Holding times were exceeded.
S	Surrogate recovery was outside QC limits.	The sequence or number of standards used for the calibration was incorrect
C	Calibration %RSD or %D were noncompliant.	Correlation coefficient is <0.995.
R	Calibration RRF was <0.05.	%R for calibration is not within control limits.
B	Presumed contamination from preparation (method) blank.	Presumed contamination from preparation (method) or calibration blank.
L	Laboratory Blank Spike/Blank Spike Duplicate %R was not within control limits.	Laboratory Control Sample %R was not within control limits.
Q	MS/MSD recovery was poor or RPD high.	MS recovery was poor.
E	Not applicable.	Duplicates showed poor agreement.
I	Internal standard performance was unsatisfactory.	ICP ICS results were unsatisfactory.
A	Not applicable.	ICP Serial Dilution %D were not within control limits.
M	Tuning (BFB or DFTPP) was noncompliant.	Not applicable.
T	Presumed contamination from trip blank.	Not applicable.
+	False positive – reported compound was not present. Not applicable.	
-	False negative – compound was present but not reported.	Not applicable.
F	Presumed contamination from FB, or ER.	Presumed contamination from FB or ER.
S	Reported result or other information was incorrect.	Reported result or other information was incorrect.
?	TIC identity or reported retention time has been changed.	Not applicable.
D	The analysis with this flag should not be used because another more technically sound analysis is available.	The analysis with this flag should not be used because another more technically sound analysis is available.
P	Instrument performance for pesticides was poor.	Post Digestion Spike recovery was not within control limits.
DNQ	The compound was detected between the MDL and the RL and, by definition, is considered an estimated value.	The compound was detected between the MDL and the RL and, by definition, is considered an estimated value.

*#	Unusual problems found with the data that have been described in Section 2.#, "Data Validation Findings." The number following the asterisk (*) will indicate the subsection where a description of the problem can be found (eg. *1 would indicate a sample was not within temperature limits).	Unusual problems found with the data that have been described in Section 2.#, "Data Validation Findings." The number following the asterisk (*) will indicate the subsection where a description of the problem can be found (eg. *1 would indicate a sample was not within temperature limits).

DATA VALIDATION REPORT

NPDES
Monitoring

ANALYSIS: METALS

SAMPLE DELIVERY GROUP: IOA0997

Prepared by

AMEC—Denver Operations
550 South Wadsworth Boulevard, Suite 500
Lakewood, Colorado 80226

1. INTRODUCTION

Task Order Title:	NPDES Monitoring
Contract Task Order #:	313150010
SDG#:	IOA0997
Project Manager:	B. McIlvaine
Matrix:	Water
Analysis:	Metals
QC Level:	Level IV
No. of Samples:	1
No. of Reanalyses/Dilutions:	1
Reviewer:	K. Okonzak
Date of Review:	March 1, 2005

The samples listed in Table 1 were validated based on the guidelines outlined in the *AMEC Data Validation Procedure for Levels III and IV ICP-MS Metals, (DVP-5-A, Rev.0), AMEC Data Validation Procedure for Levels III and IV ICP Metals* (DVP-5, Rev. 0), SW-846 *Method 7471A for Mercury (Manual Cold-Vapor Technique)*, and validation guidelines outlined in the USEPA CLP *National Functional Guidelines for Inorganic Data Review* (2/94). Any deviations from these procedures and guidelines are documented herein. Qualifiers were applied in cases where the data did not meet the required QC criteria or where special consideration by the data user is required. Data qualifiers were placed on Form Is with the associated qualification codes. Analytes that were rejected for any reason are denoted on the Form I as having only the "R" data qualifier and associated qualification code(s) denoting the reason for rejection. Any additional problems with the data that may have resulted in an estimated value were not denoted by a qualification code since the data had already been rejected.

Table 1. Sample identification

Client ID	EPA ID	Laboratory ID	Matrix	COC Method
Outfall 001	Outfall 001	IOA0997-01	water	ILM04
Outfall 001 RE1	Outfall 001 RE1	IOA0997-01RE1	water	ILM04

2. DATA VALIDATION FINDINGS

2.1 SAMPLE MANAGEMENT

Following are findings associated with sample management:

2.1.1 Sample Preservation, Handling, and Transport

The sample in this SDG was received at the laboratory within the temperature limits of 4°C ±2°C. No sample preservation, handling, or transport problems were noted, and no qualifications were necessary.

2.1.2 Chain of Custody

The COC was signed and dated by field and laboratory personnel. Mercury in Outfall 001 was reanalyzed and reported as Outfall 001RE1. To differentiate between the original analysis and the reanalysis, the reviewer appended the ID of the reanalysis with an "RE1" suffix. No sample qualifications were required.

2.1.3 Holding Times

The date of collection recorded on the COC and the dates of analysis recorded in the raw data, documented that the sample analysis was performed within the specified holding times of 28 days for mercury. No qualifications were assigned.

2.2 ICP-MS TUNING

The ICP-MS tuning is not applicable to the mercury analysis.

2.3 CALIBRATION

The ICV and CCV results showed acceptable recoveries, 80-120% for mercury. The mercury reporting limit check standard was recovered within the AMEC control limits of 70-130%. No qualifications were required.

2.4 BLANKS

The calibration and method blanks associated with the sample in this SDG were nondetected for mercury at the laboratory MDL; therefore, no sample qualifications were required due to the blanks.

2.5 ICP INTERFERENCE CHECK SAMPLE (ICS A/AB)

ICP interference check samples are not applicable to the mercury analysis.

2.6 BLANK SPIKES AND LABORATORY CONTROL SAMPLES

The mercury LCS samples were identified as 5A20051-BS1 and 5A21065-BS1. The LCS results on the summary form and in the raw data were within the laboratory-established mercury control limits of 85-115%. No qualifications were required.

2.7 LABORATORY DUPLICATES

No MS/MSD or duplicate analyses were performed in association with the sample in this SDG; therefore, no assessment was made with respect to this criterion.

2.8 MATRIX SPIKE

No MS/MSD analyses were performed in association with the sample in this SDG; therefore, no assessment was made with respect to this criterion.

2.9 FURNACE ATOMIC ABSORPTION QC

Furnace atomic absorption was not utilized for the analysis of the sample; therefore, furnace atomic absorption QC is not applicable.

2.10 ICP/MS SERIAL DILUTION

No serial dilution analysis was performed in association with the sample in this data package; therefore, no assessment was made with respect to this criterion.

2.11 INTERNAL STANDARDS PERFORMANCE

The ICP-MS internal standard recoveries are not applicable to the mercury analysis.

2.12 SAMPLE RESULT VERIFICATION

A Level IV review was performed for the sample in this data package. Calculations were verified, and the sample results reported on the Form I were verified against the raw data. No transcription errors or calculation errors were noted. Outfall 001 was reanalyzed for mercury and reported as Outfall 001 RE1. As the original and reanalysis results were similar, the reanalysis, Outfall 001 RE1, was rejected, "R," in favor of the original result, Outfall 001. No further qualifications were required.

2.13 FIELD QC SAMPLES

Field QC samples are evaluated, and if necessary, qualified based only on laboratory blanks. Any remaining detects are used to evaluate the associated samples.

2.13.1 Field Blanks and Equipment Rinsates

The sample in this SDG had no associated field QC samples. No qualifications were required.

2.13.2 Field Duplicates

There were no field duplicate analyses performed in association with the site sample reported in this data package.

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 001

Report Number: IOA0997

Sampled: 01/18/05
Received: 01/19/05

DRAFT: METALS

Analyte	Method	Batch	MDL	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Review Qual	Data Qual Code
Sample ID: IOA0997-01 (DRAFT: Outfall 001 - Water)										
Reporting Units: ug/l										
Mercury	EPA 245.1	5A20051	0.063	0.20	**0.26**	1	01/20/05	01/20/05		
Sample ID: IOA0997-01RE1 (DRAFT: Outfall 001 - Water)										
Reporting Units: ug/l										
Mercury	EPA 245.1	5A21065	0.063	0.20	**0.25**	1	01/21/05	01/21/05	R	D

RE1

AMEC VALIDATED

Level IV

3/2/05

DRAFT REPORT
DRAFT REPORT
DATA SUBJECT TO CHANGE

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CONTRACT COMPLIANCE SCREENING FORM FOR HARDCOPY DATA

AMEC Earth & Environmental
550 South Wadsworth Boulevard
Suite 500
Lakewood, CO 80226

Laboratory Del Mar
Reviewer M. Pokorny
Analysis/Method Volatiles

Package ID T711VO47
Task Order 313150010
SDG No. IOA0997
No. of Analyses 2

Date: February 23, 2005
Reviewer's Signature M. Pokorny

ACTION ITEMS[a]	
1. **Case Narrative Deficiencies**	
2. **Out of Scope Analyses**	
3. **Analyses Not Conducted**	
4. **Missing Hardcopy Deliverables**	
5. **Incorrect Hardcopy Deliverables**	
6. **Deviations from Analysis Protocol, e.g.,**	
Holding Times	
GC/MS Tune/Inst. Perform	
Calibrations	
Blanks	
Surrogates	
Matrix Spike/Dup LCS	
Field QC	
Internal Standard Performance	
Compound Identification and Quantitation	
System Performance	
COMMENTS[b]	Acceptable as reviewed.

[a] Subcontracted analytical laboratory is not meeting contract and/or method requirements.
[b] Differences in protocol have been adopted by the laboratory but no action against the laboratory is required.

DATA VALIDATION REPORT

NPDES Monitoring

ANALYSIS: VOLATILES

SAMPLE DELIVERY GROUP: IOA0997

Prepared by

AMEC Denver Operations
550 South Wadsworth Boulevard, Suite 500
Lakewood, Colorado 80226

1. INTRODUCTION

Task Order Title:	NPDES Monitoring
Contract Task Order #:	313150010
SDG#:	IOA0997
Project Manager:	B. McIlvaine
Matrix:	Water
Analysis:	Volatiles
QC Level:	Level IV
No. of Samples:	2
No. of Reanalyses/Dilutions:	0
Reviewer:	M. Pokorny
Date of Review:	February 23, 2005

The samples listed in Table 1 were validated based on the guidelines outlined in the *AMEC Data Validation Procedure for Levels C and D Volatile Organics (DVP-2, Rev. 2), EPA Method 624*, and the *National Functional Guidelines For Organic Data Review* (2/94). Any deviations from these procedures are documented herein. Qualifiers were applied in cases where the data did not meet the required QC criteria or where special consideration by the data user is required. Data qualifiers were placed on Form Is with the associated qualification codes. Analytes that were rejected for any reason are denoted on the summary forms as having only the "R" data qualifier and associated qualification code(s) denoting the reason for rejection. Any additional problems with the data that may have resulted in an estimated value were not denoted by a qualification code since the data had already been rejected.

Table 1. Sample identification

Client ID	EPA ID	Lab No.	Matrix	Method
Outfall 001	Outfall 001	IOA0997-01	water	624
Trip Blank	Trip Blank	IOA0997-02	water	624

2. DATA VALIDATION FINDINGS

2.1 SAMPLE MANAGEMENT

The following are findings associated with sample management:

2.1.1 Sample Preservation, Handling, and Transport

The samples in this SDG were received at the laboratory within the temperature limits of 4°C ± 2°C. According to the COC, the samples were received intact, without headspace, and in good condition. No qualifications were required.

2.1.2 Chain of Custody

The COC was signed by field and laboratory personnel and accounted for the analyses presented in this SDG. As the samples were couriered directly to the laboratory, custody seals are not required. No qualifications were required.

2.1.3 Holding Times

The samples were analyzed within 14 days of collection. No qualifications were required.

2.2 GC/MS TUNING

The ion abundance windows shown on the quantitation report were consistent with those specified in the EPA Method 624. All ion abundances were within the established windows and were therefore acceptable. The samples and associated QC were analyzed within 12 hours of the BFB injection times. The Form Vs were verified from the raw data and no discrepancies between the summary forms and the raw data were noted. No qualifications were required.

2.3 CALIBRATION

One initial calibration, dated 11/16/04, was associated with this SDG. The average RRFs were ≥0.05 and the %RSDs were ≤35% for the target compounds listed on the sample summary forms. One continuing calibration, dated 01/23/05, was associated with this SDG. The RRFs for all target compounds were ≥0.05 and the %Ds were ≤20%. A representative number of %RSDs and average RRFs from the initial calibrations, and %Ds and RRFs from the continuing calibrations were recalculated from the raw data, and no calculation or transcription errors were found. No qualifications were required.

2.4 BLANKS

One water method blank (5A23003-BLK1) was associated with this SDG. There were no detects for the target compounds listed on the summary forms. The method blank raw data showed no evidence of false negatives. No qualifications were required.

2.5 BLANK SPIKES AND LABORATORY CONTROL SAMPLES

One water blank spike (5A23003-BS1) was associated with this SDG. All spike recoveries were within the laboratory-established QC limits. A representative number of recoveries were recalculated from the raw data and no calculation or transcription errors were found. No qualifications were required.

2.6 SURROGATE RECOVERY

The surrogates were within the QC limits of 80-120%. A representative number of surrogate recoveries were recalculated from the raw data and no calculation or transcription errors were found. No qualifications were required.

2.7 MATRIX SPIKE/MATRIX SPIKE DUPLICATE

An MS/MSD analyses was not performed with this SDG. Evaluation of method accuracy was based on the LCS results. No qualifications were required.

2.8 FIELD QC SAMPLES

Field QC samples were evaluated, and if necessary, qualified based on method blanks and other laboratory QC results affecting the usability of the field QC data. Any remaining detects were used to evaluate the associated site sample. Following are findings associated with field QC samples:

2.8.1 Trip Blanks

Sample Trip Blank (IOA0997-02) was the trip blank associated with the site sample of this SDG. No target compounds were detected in the trip blank. No qualifications were required.

2.8.2 Field Blanks and Equipment Rinsates

There were no other field QC samples associated with this SDG. No qualifications were required.

2.8.3 Field Duplicates

There were no field duplicate samples associated with this SDG.

2.9 INTERNAL STANDARDS PERFORMANCE

Internal standard area counts and retention times for this SDG were within the control limits established by the continuing calibration standards, of +100%/-50% for internal standard areas and ±0.50 minutes for retention times. A representative number of internal standard areas and retention times were verified from the raw data, and no calculation or transcription errors were noted. No qualifications were required.

2.10 COMPOUND IDENTIFICATION

Target compound identification was verified at a Level IV data validation. The laboratory analyzed for a subset of volatile target compounds by EPA Method 624. Chromatograms, retention times, and spectra for the samples and QC were examined and no target compound identification problems were noted. No qualifications were required.

2.11 COMPOUND QUANTIFICATION AND REPORTED DETECTION LIMITS

Compound quantification is verified at a Level IV data validation. The reporting limits were supported by the lowest concentrations of the initial calibration standards and by MDL study. Compound quantitation was verified by recalculating any sample detect, and/or a representative number of blank spike and surrogate recoveries from the raw data. No calculation or transcription errors were noted. No qualifications were required.

2.12 TENTATIVELY IDENTIFIED COMPOUNDS

The laboratory did not analyzed for TICs for the samples of this SDG. No qualifications were required.

2.13 SYSTEM PERFORMANCE

A review of the chromatograms and other raw data showed no identifiable problems with system performance. No qualifications were required.

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 001

Report Number: IOA0997

Sampled: 01/18/05
Received: 01/19/05

DRAFT: PURGEABLES BY GC/MS (EPA 624)

Analyte	Method	Batch	MDL	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA0997-01 (DRAFT: Outfall 001 - Water)									REV QUAL / QUAL CODE
Reporting Units: ug/l									
Benzene	EPA 624	5A23003	0.28	2.0	ND	1	01/23/05	01/23/05	U
Carbon tetrachloride	EPA 624	5A23003	0.28	5.0	ND	1	01/23/05	01/23/05	
Chloroform	EPA 624	5A23003	0.33	2.0	ND	1	01/23/05	01/23/05	
1,1-Dichloroethane	EPA 624	5A23003	0.27	2.0	ND	1	01/23/05	01/23/05	
1,2-Dichloroethane	EPA 624	5A23003	0.28	2.0	ND	1	01/23/05	01/23/05	
1,1-Dichloroethene	EPA 624	5A23003	0.32	3.0	ND	1	01/23/05	01/23/05	
Ethylbenzene	EPA 624	5A23003	0.25	2.0	ND	1	01/23/05	01/23/05	
Tetrachloroethene	EPA 624	5A23003	0.32	2.0	ND	1	01/23/05	01/23/05	
Toluene	EPA 624	5A23003	0.36	2.0	ND	1	01/23/05	01/23/05	
1,1,1-Trichloroethane	EPA 624	5A23003	0.30	2.0	ND	1	01/23/05	01/23/05	
1,1,2-Trichloroethane	EPA 624	5A23003	0.30	2.0	ND	1	01/23/05	01/23/05	
Trichloroethene	EPA 624	5A23003	0.26	5.0	ND	1	01/23/05	01/23/05	
Trichlorofluoromethane	EPA 624	5A23003	0.34	5.0	ND	1	01/23/05	01/23/05	
Vinyl chloride	EPA 624	5A23003	0.26	5.0	ND	1	01/23/05	01/23/05	
Xylenes, Total	EPA 624	5A23003	0.52	4.0	ND	1	01/23/05	01/23/05	
Surrogate: Dibromofluoromethane (80-120%)					*98 %*				
Surrogate: Toluene-d8 (80-120%)					*90 %*				
Surrogate: 4-Bromofluorobenzene (80-120%)					*82 %*				
Sample ID: IOA0997-02 (DRAFT: Trip Blank - Water)									
Reporting Units: ug/l									
Benzene	EPA 624	5A23003	0.28	2.0	ND	1	01/23/05	01/23/05	U
Carbon tetrachloride	EPA 624	5A23003	0.28	5.0	ND	1	01/23/05	01/23/05	
Chloroform	EPA 624	5A23003	0.33	2.0	ND	1	01/23/05	01/23/05	
1,1-Dichloroethane	EPA 624	5A23003	0.27	2.0	ND	1	01/23/05	01/23/05	
1,2-Dichloroethane	EPA 624	5A23003	0.28	2.0	ND	1	01/23/05	01/23/05	
1,1-Dichloroethene	EPA 624	5A23003	0.32	3.0	ND	1	01/23/05	01/23/05	
Ethylbenzene	EPA 624	5A23003	0.25	2.0	ND	1	01/23/05	01/23/05	
Tetrachloroethene	EPA 624	5A23003	0.32	2.0	ND	1	01/23/05	01/23/05	
Toluene	EPA 624	5A23003	0.36	2.0	ND	1	01/23/05	01/23/05	
1,1,1-Trichloroethane	EPA 624	5A23003	0.30	2.0	ND	1	01/23/05	01/23/05	
1,1,2-Trichloroethane	EPA 624	5A23003	0.30	2.0	ND	1	01/23/05	01/23/05	
Trichloroethene	EPA 624	5A23003	0.26	5.0	ND	1	01/23/05	01/23/05	
Trichlorofluoromethane	EPA 624	5A23003	0.34	5.0	ND	1	01/23/05	01/23/05	
Vinyl chloride	EPA 624	5A23003	0.26	5.0	ND	1	01/23/05	01/23/05	
Xylenes, Total	EPA 624	5A23003	0.52	4.0	ND	1	01/23/05	01/23/05	
Surrogate: Dibromofluoromethane (80-120%)					*96 %*				
Surrogate: Toluene-d8 (80-120%)					*90 %*				
Surrogate: 4-Bromofluorobenzene (80-120%)					*84 %*				

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DRAFT REPORT
DRAFT REPORT
DATA SUBJECT TO CHANGE

LEVEL IV

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CONTRACT COMPLIANCE SCREENING FORM FOR HARDCOPY DATA

AMEC Earth & Environmental
550 South Wadsworth Boulevard
Suite 500
Lakewood, CO 80226

Laboratory Del Mar
Reviewer P. Meeks
Analysis/Method General Minerals

Package ID T711WC64
Task Order 313150010
SDG No. IOA0997
No. of Analyses 1

Date: 02/23/05
Reviewer's Signature P. Meeks

ACTION ITEMS[a]	
1. **Case Narrative Deficiencies**	
2. **Out of Scope Analyses**	
3. **Analyses Not Conducted**	
4. **Missing Hardcopy Deliverables**	
5. **Incorrect Hardcopy Deliverables**	
6. **Deviations from Analysis Protocol, e.g.,**	
Holding Times	
GC/MS Tune/Inst. Performance	
Calibrations	
Blanks	
Surrogates	
Matrix Spike/Dup LCS	
Field QC	
Internal Standard Performance	
Compound Identification and Quantitation	
System Performance	

COMMENTS[b]	Acceptable as reviewed.

[a] Subcontracted analytical laboratory is not meeting contract and/or method requirements.
[b] Differences in protocol have been adopted by the laboratory but no action against the laboratory is required.

DATA VALIDATION REPORT

NPDES Monitoring

ANALYSIS: GENERAL MINERALS

SAMPLE DELIVERY GROUP: IOA0997

Prepared by

AMEC—Denver Operations
550 South Wadsworth Boulevard, Suite 500
Lakewood, Colorado 80226

1. INTRODUCTION

Task Order Title:	NPDES Monitoring
Contract Task Order #:	313150010
Sample Delivery Group #:	IOA0997
Project Manager:	B. McIlvaine
Matrix:	Water
Analysis:	General Minerals
QC Level:	Level IV
No. of Samples:	1
Reviewer:	P. Meeks
Date of Review:	February 23, 2005

The sample listed in Table 1 was validated based on the guidelines outlined in the AMEC *Data Validation Procedures* SOP DVP-6, Rev. 2, *USEPA Methods for Chemical Analysis of Water and Wastes Method 350.2, 180.1, and 120.1,* and validation guidelines outlined in the USEPA *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (2/94).* Any deviations from these procedures and guidelines are documented herein. Qualifiers were applied in cases where the data did not meet the required QC criteria or where special consideration by the data user is required. Data qualifiers were placed on Form Is with the associated qualification codes. Analytes that were rejected for any reason are denoted on the Form I as having only the "R" data qualifier and associated qualification code(s) denoting the reason for rejection. Any additional problems with the data that may have resulted in an estimated value were not denoted by a qualification code since the data had already been rejected.

Table 1. Sample identification

Client ID	EPA ID	Laboratory ID	Matrix	COC Method
Outfall 001	Outfall 001	IOA0997-01	water	General Minerals

2. DATA VALIDATION FINDINGS

2.1 SAMPLE MANAGEMENT

Following are findings associated with sample management:

2.1.1 Sample Preservation, Handling, and Transport

The sample in this SDG was received at the laboratory within the temperature limits of 4°C ± 2°C. No preservation problems were noted by the laboratory. No qualifications were required.

2.1.2 Chain of Custody

The COC was signed and dated by field and laboratory personnel and accounted for the sample and analyses presented in this SDG. No sample qualifications were required.

2.1.3 Holding Times

The holding time was assessed by comparing the date of collection with the dates of analyses. The 28-day analytical holding time for ammonia and specific conductance, and the 48-hour analytical holding time for turbidity were met, and no qualifications were required.

2.2 CALIBRATION

For turbidity, the initial calibration correlation coefficient was ≥0.995 and the continuing calibration information was acceptable with %Rs within the control limits of 90-110%. The appropriate check standards were analyzed for conductivity, with acceptable results. For the titration method, ammonia, no information regarding the standardization of the titrant was provided; however, as the LCS recovery for ammonia was within the CCV control limits, and no qualifications were required. No qualifications were required.

2.3 BLANKS

Turbidity was reported in the method blank, but not at sufficient concentration to qualify the site sample. The remaining method blank and CCB results reported on the summary forms and in the raw data for blank analyses associated with the samples were nondetects at the reporting limit. Blank analyses are not applicable to the specific conductance method. No qualifications were required.

2.4 BLANK SPIKES AND LABORATORY CONTROL SAMPLES

The ammonia laboratory control sample recovery was within the laboratory-established control limits of 80-115%. The LCS is not applicable to turbidity or specific conductance. No qualifications were required.

2.5 SURROGATES RECOVERY

Surrogate recovery is not applicable to the analyses presented in this SDG.

2.6 LABORATORY DUPLICATES

No duplicate analysis or MS/MSD analyses were performed for the sample in this SDG; therefore, no assessment was made with respect to this criterion.

2.7 MATRIX SPIKE/MATRIX SPIKE DUPLICATE

No MS/MSD analyses were performed in association with the sample in this SDG; therefore, no assessment was made with respect to this criterion. Method accuracy was evaluated based on LCS results.

2.8 FURNACE ATOMIC ABSORPTION QC

Furnace atomic absorption was not utilized for the analysis of this sample; therefore, furnace atomic absorption QC is not applicable.

2.9 ICP SERIAL DILUTION

ICP serial dilution is not applicable to the analyses presented in this data validation report.

2.10 SAMPLE RESULT VERIFICATION

A Level IV review was performed for the sample in this data package. Calculations were verified, and the sample results reported on the Form I were verified against the raw data. No transcription errors or calculations errors were noted. No qualifications were required.

2.11 FIELD QC SAMPLES

Field QC samples are evaluated, and if necessary, qualified based only on laboratory blanks. Any remaining detects are used to evaluate the associated samples. The following are findings associated with field QC samples:

2.11.1 Field Blanks and Equipment Rinsates

The sample in this SDG had no associated field QC samples. No qualifications were required.

2.11.2 Field Duplicates

There were no field duplicate pairs associated with this SDG.

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 001

Report Number: IOA0997

Sampled: 01/18/05
Received: 01/19/05

DRAFT: INORGANICS

Analyte	Method	Batch	MDL	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers (Rev Qual)	(Qual Code)
Sample ID: IOA0997-01 (DRAFT: Outfall 001 - Water) - cont.										
Reporting Units: mg/l										
Ammonia-N (Distilled)	EPA 350.2	5A20065	0.30	0.50	ND	1	01/20/05	01/20/05	U	
Sample ID: IOA0997-01 (DRAFT: Outfall 001 - Water)										
Reporting Units: NTU										
Turbidity	EPA 180.1	5A19080	0.040	1.0	2.5	1	01/19/05	01/19/05		
Sample ID: IOA0997-01 (DRAFT: Outfall 001 - Water)										
Reporting Units: umhos/cm										
Specific Conductance	EPA 120.1	5A19072	1.0	1.0	220	1	01/19/05	01/19/05		

AMEC VALIDATED
LEVEL IV

DRAFT REPORT
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DATA SUBJECT TO CHANGE

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LABORATORY REPORT

Prepared For: MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project: Routine Outfall 001

Sampled: 01/18/05
Received: 01/19/05
Issued: 03/07/05 08:58

NELAP #01108CA California ELAP#1197 CSDLAC #10117

The results listed within this Laboratory Report pertain only to the samples tested in the laboratory. The analyses contained in this report were performed in accordance with the applicable certifications as noted. All soil samples are reported on a wet weight basis unless otherwise noted in the report. This Laboratory Report is confidential and is intended for the sole use of Del Mar Analytical and its client. This report shall not be reproduced, except in full, without written permission from Del Mar Analytical. The Chain of Custody, 1 page, is included and is an integral part of this report.

This entire report was reviewed and approved for release.

SAMPLE CROSS REFERENCE

SUBCONTRACTED: Refer to the last page for specific subcontract laboratory information included in this report.

LABORATORY ID	CLIENT ID	MATRIX
IOA0997-01	Outfall 001	Water
IOA0997-02	Trip Blank	Water

Reviewed By:

Michele Harper

Del Mar Analytical, Irvine
Michele Harper
Project Manager

Del Mar Analytical

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 001

Report Number: IOA0997

Sampled: 01/18/05
Received: 01/19/05

PURGEABLES BY GC/MS (EPA 624)

Analyte	Method	Batch	MDL Limit	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA0997-01 (Outfall 001 - Water)									
Reporting Units: ug/l									
Benzene	EPA 624	5A23003	0.28	2.0	ND	1	01/23/05	01/23/05	
Carbon tetrachloride	EPA 624	5A23003	0.28	5.0	ND	1	01/23/05	01/23/05	
Chloroform	EPA 624	5A23003	0.33	2.0	ND	1	01/23/05	01/23/05	
1,1-Dichloroethane	EPA 624	5A23003	0.27	2.0	ND	1	01/23/05	01/23/05	
1,2-Dichloroethane	EPA 624	5A23003	0.28	2.0	ND	1	01/23/05	01/23/05	
1,1-Dichloroethene	EPA 624	5A23003	0.32	3.0	ND	1	01/23/05	01/23/05	
Ethylbenzene	EPA 624	5A23003	0.25	2.0	ND	1	01/23/05	01/23/05	
Tetrachloroethene	EPA 624	5A23003	0.32	2.0	ND	1	01/23/05	01/23/05	
Toluene	EPA 624	5A23003	0.36	2.0	ND	1	01/23/05	01/23/05	
1,1,1-Trichloroethane	EPA 624	5A23003	0.30	2.0	ND	1	01/23/05	01/23/05	
1,1,2-Trichloroethane	EPA 624	5A23003	0.30	2.0	ND	1	01/23/05	01/23/05	
Trichloroethene	EPA 624	5A23003	0.26	5.0	ND	1	01/23/05	01/23/05	
Trichlorofluoromethane	EPA 624	5A23003	0.34	5.0	ND	1	01/23/05	01/23/05	
Vinyl chloride	EPA 624	5A23003	0.26	5.0	ND	1	01/23/05	01/23/05	
Xylenes, Total	EPA 624	5A23003	0.52	4.0	ND	1	01/23/05	01/23/05	
Surrogate: Dibromofluoromethane (80-120%)					*98 %*				
Surrogate: Toluene-d8 (80-120%)					*90 %*				
Surrogate: 4-Bromofluorobenzene (80-120%)					*82 %*				
Sample ID: IOA0997-02 (Trip Blank - Water)									
Reporting Units: ug/l									
Benzene	EPA 624	5A23003	0.28	2.0	ND	1	01/23/05	01/23/05	
Carbon tetrachloride	EPA 624	5A23003	0.28	5.0	ND	1	01/23/05	01/23/05	
Chloroform	EPA 624	5A23003	0.33	2.0	ND	1	01/23/05	01/23/05	
1,1-Dichloroethane	EPA 624	5A23003	0.27	2.0	ND	1	01/23/05	01/23/05	
1,2-Dichloroethane	EPA 624	5A23003	0.28	2.0	ND	1	01/23/05	01/23/05	
1,1-Dichloroethene	EPA 624	5A23003	0.32	3.0	ND	1	01/23/05	01/23/05	
Ethylbenzene	EPA 624	5A23003	0.25	2.0	ND	1	01/23/05	01/23/05	
Tetrachloroethene	EPA 624	5A23003	0.32	2.0	ND	1	01/23/05	01/23/05	
Toluene	EPA 624	5A23003	0.36	2.0	ND	1	01/23/05	01/23/05	
1,1,1-Trichloroethane	EPA 624	5A23003	0.30	2.0	ND	1	01/23/05	01/23/05	
1,1,2-Trichloroethane	EPA 624	5A23003	0.30	2.0	ND	1	01/23/05	01/23/05	
Trichloroethene	EPA 624	5A23003	0.26	5.0	ND	1	01/23/05	01/23/05	
Trichlorofluoromethane	EPA 624	5A23003	0.34	5.0	ND	1	01/23/05	01/23/05	
Vinyl chloride	EPA 624	5A23003	0.26	5.0	ND	1	01/23/05	01/23/05	
Xylenes, Total	EPA 624	5A23003	0.52	4.0	ND	1	01/23/05	01/23/05	
Surrogate: Dibromofluoromethane (80-120%)					*96 %*				
Surrogate: Toluene-d8 (80-120%)					*90 %*				
Surrogate: 4-Bromofluorobenzene (80-120%)					*84 %*				

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Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 001

Report Number: IOA0997

Sampled: 01/18/05
Received: 01/19/05

ACID & BASE/NEUTRALS BY GC/MS (EPA 625)

Analyte	Method	Batch	MDL Limit	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA0997-01 (Outfall 001 - Water)									
Reporting Units: ug/l									
Bis(2-ethylhexyl)phthalate	EPA 625	5A20039	1.1	5.0	ND	0.98	01/20/05	01/26/05	
2,4-Dinitrotoluene	EPA 625	5A20039	0.23	9.0	ND	0.98	01/20/05	01/26/05	
N-Nitrosodimethylamine	EPA 625	5A20039	0.22	8.0	ND	0.98	01/20/05	01/26/05	
Pentachlorophenol	EPA 625	5A20039	0.78	8.0	ND	0.98	01/20/05	01/26/05	
2,4,6-Trichlorophenol	EPA 625	5A20039	0.10	6.0	ND	0.98	01/20/05	01/26/05	
Surrogate: 2-Fluorophenol (35-120%)					*71 %*				
Surrogate: Phenol-d6 (45-120%)					*58 %*				
Surrogate: 2,4,6-Tribromophenol (50-125%)					*84 %*				
Surrogate: Nitrobenzene-d5 (45-120%)					*74 %*				
Surrogate: 2-Fluorobiphenyl (45-120%)					*87 %*				
Surrogate: Terphenyl-d14 (45-135%)					*83 %*				

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Project ID: Routine Outfall 001

Report Number: IOA0997

Sampled: 01/18/05
Received: 01/19/05

ORGANOCHLORINE PESTICIDES (EPA 608)

Analyte	Method	Batch	MDL Limit	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA0997-01 (Outfall 001 - Water) - cont.									
Reporting Units: ug/l									
alpha-BHC	EPA 608	5A20040	0.00049	0.010	ND	0.971	01/20/05	01/20/05	
Surrogate: Decachlorobiphenyl (45-120%)					*95 %*				
Surrogate: Tetrachloro-m-xylene (35-120%)					*87 %*				

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Received: 01/19/05

METALS

Analyte	Method	Batch	MDL Limit	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA0997-01 (Outfall 001 - Water) - cont.									
Reporting Units: ug/l									
Copper	EPA 200.8	5A19083	0.49	2.0	**2.7**	1	01/19/05	01/19/05	
Lead	EPA 200.8	5A19083	0.13	1.0	**0.32**	1	01/19/05	01/19/05	J
Mercury	EPA 245.1	5A20051	0.063	0.20	**0.26**	1	01/20/05	01/20/05	
Sample ID: IOA0997-01RE1 (Outfall 001 - Water)									
Reporting Units: ug/l									
Mercury	EPA 245.1	5A21065	0.063	0.20	**0.25**	1	01/21/05	01/21/05	

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Sampled: 01/18/05
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INORGANICS

Analyte	Method	Batch	MDL Limit	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA0997-01 (Outfall 001 - Water) - cont.									
Reporting Units: mg/l									
Ammonia-N (Distilled)	EPA 350.2	5A20065	0.30	0.50	ND	1	01/20/05	01/20/05	
Biochemical Oxygen Demand	EPA 405.1	5A19046	0.59	2.0	ND	1	01/19/05	01/24/05	
Chloride	EPA 300.0	5A19040	0.26	0.50	**13**	1	01/19/05	01/19/05	
Nitrate/Nitrite-N	EPA 300.0	5A19040	0.072	0.26	**0.77**	1	01/19/05	01/19/05	
Oil & Grease	EPA 413.1	5A19067	0.94	5.0	**1.6**	1	01/19/05	01/19/05	B, J
Sulfate	EPA 300.0	5A19040	0.18	0.50	**24**	1	01/19/05	01/19/05	
Surfactants (MBAS)	SM5540-C	5A19095	0.044	0.10	ND	1	01/19/05	01/19/05	
Total Dissolved Solids	SM2540C	5A19098	10	10	**150**	1	01/19/05	01/19/05	
Total Suspended Solids	EPA 160.2	5A19090	10	10	ND	1	01/19/05	01/19/05	
Sample ID: IOA0997-01 (Outfall 001 - Water)									
Reporting Units: ml/l/hr									
Total Settleable Solids	EPA 160.5	5A19047	0.10	0.10	ND	1	01/19/05	01/19/05	
Sample ID: IOA0997-01 (Outfall 001 - Water)									
Reporting Units: NTU									
Turbidity	EPA 180.1	5A19080	0.040	1.0	**2.5**	1	01/19/05	01/19/05	
Sample ID: IOA0997-01 (Outfall 001 - Water)									
Reporting Units: ug/l									
Total Cyanide	EPA 335.2	5A19096	2.2	5.0	ND	1	01/19/05	01/19/05	
Perchlorate	EPA 314.0	5A19048	0.80	4.0	ND	1	01/19/05	01/20/05	
Sample ID: IOA0997-01 (Outfall 001 - Water)									
Reporting Units: umhos/cm									
Specific Conductance	EPA 120.1	5A19072	1.0	1.0	**220**	1	01/19/05	01/19/05	

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Report Number: IOA0997

Sampled: 01/18/05
Received: 01/19/05

SHORT HOLD TIME DETAIL REPORT

	Hold Time (in days)	Date/Time Sampled	Date/Time Received	Date/Time Extracted	Date/Time Analyzed
Sample ID: Outfall 001 (IOA0997-01) - Water					
EPA 160.5	2	01/18/2005 11:45	01/19/2005 12:00	01/19/2005 14:30	01/19/2005 16:00
EPA 180.1	2	01/18/2005 11:45	01/19/2005 12:00	01/19/2005 14:15	01/19/2005 15:15
EPA 300.0	2	01/18/2005 11:45	01/19/2005 12:00	01/19/2005 14:30	01/19/2005 15:56
EPA 405.1	2	01/18/2005 11:45	01/19/2005 12:00	01/19/2005 15:00	01/24/2005 17:00
SM5540-C	2	01/18/2005 11:45	01/19/2005 12:00	01/19/2005 18:22	01/19/2005 21:46

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Sampled: 01/18/05
Received: 01/19/05

METHOD BLANK/QC DATA

PURGEABLES BY GC/MS (EPA 624)

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A23003 Extracted: 01/23/05											
Blank Analyzed: 01/23/2005 (5A23003-BLK1)											
Benzene	ND	2.0	0.28	ug/l							
Carbon tetrachloride	ND	5.0	0.28	ug/l							
Chloroform	ND	2.0	0.33	ug/l							
1,1-Dichloroethane	ND	2.0	0.27	ug/l							
1,2-Dichloroethane	ND	2.0	0.28	ug/l							
1,1-Dichloroethene	ND	3.0	0.32	ug/l							
Ethylbenzene	ND	2.0	0.25	ug/l							
Tetrachloroethene	ND	2.0	0.32	ug/l							
Toluene	ND	2.0	0.36	ug/l							
1,1,1-Trichloroethane	ND	2.0	0.30	ug/l							
1,1,2-Trichloroethane	ND	2.0	0.30	ug/l							
Trichloroethene	ND	5.0	0.26	ug/l							
Trichlorofluoromethane	ND	5.0	0.34	ug/l							
Vinyl chloride	ND	5.0	0.26	ug/l							
Xylenes, Total	ND	4.0	0.52	ug/l							
Surrogate: Dibromofluoromethane	*23.5*			*ug/l*	*25.0*		*94*	*80-120*			
Surrogate: Toluene-d8	*22.5*			*ug/l*	*25.0*		*90*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*20.9*			*ug/l*	*25.0*		*84*	*80-120*			
LCS Analyzed: 01/23/2005 (5A23003-BS1)											
Benzene	23.7	2.0	0.28	ug/l	25.0		95	70-120			
Carbon tetrachloride	27.6	5.0	0.28	ug/l	25.0		110	70-140			
Chloroform	24.4	2.0	0.33	ug/l	25.0		98	75-130			
1,1-Dichloroethane	24.0	2.0	0.27	ug/l	25.0		96	70-135			
1,2-Dichloroethane	24.7	2.0	0.28	ug/l	25.0		99	60-150			
1,1-Dichloroethene	25.2	3.0	0.32	ug/l	25.0		101	75-135			
Ethylbenzene	22.8	2.0	0.25	ug/l	25.0		91	80-120			
Tetrachloroethene	21.8	2.0	0.32	ug/l	25.0		87	75-125			
Toluene	24.1	2.0	0.36	ug/l	25.0		96	75-120			
1,1,1-Trichloroethane	24.8	2.0	0.30	ug/l	25.0		99	75-140			
1,1,2-Trichloroethane	25.4	2.0	0.30	ug/l	25.0		102	70-125			
Trichloroethene	25.9	5.0	0.26	ug/l	25.0		104	80-120			
Trichlorofluoromethane	27.5	5.0	0.34	ug/l	25.0		110	65-145			
Vinyl chloride	23.3	5.0	0.26	ug/l	25.0		93	50-130			
Surrogate: Dibromofluoromethane	*23.4*			*ug/l*	*25.0*		*94*	*80-120*			
Surrogate: Toluene-d8	*23.2*			*ug/l*	*25.0*		*93*	*80-120*			

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Attention: Bronwyn Kelly

Project ID: Routine Outfall 001

Report Number: IOA0997

Sampled: 01/18/05
Received: 01/19/05

METHOD BLANK/QC DATA

PURGEABLES BY GC/MS (EPA 624)

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A23003 Extracted: 01/23/05											
LCS Analyzed: 01/23/2005 (5A23003-BS1)											
Surrogate: 4-Bromofluorobenzene	*22.8*			*ug/l*	*25.0*		*91*	*80-120*			
Matrix Spike Analyzed: 01/23/2005 (5A23003-MS1)						**Source: IOA1188-02**					
Benzene	22.9	2.0	0.28	ug/l	25.0	0.56	89	70-120			
Carbon tetrachloride	25.7	5.0	0.28	ug/l	25.0	ND	103	70-145			
Chloroform	23.2	2.0	0.33	ug/l	25.0	ND	93	70-135			
1,1-Dichloroethane	22.7	2.0	0.27	ug/l	25.0	ND	91	65-135			
1,2-Dichloroethane	22.9	2.0	0.28	ug/l	25.0	ND	92	60-150			
1,1-Dichloroethene	23.4	3.0	0.32	ug/l	25.0	ND	94	65-140			
Ethylbenzene	29.5	2.0	0.25	ug/l	25.0	8.4	84	70-130			
Tetrachloroethene	20.4	2.0	0.32	ug/l	25.0	ND	82	70-130			
Toluene	22.7	2.0	0.36	ug/l	25.0	ND	91	70-120			
1,1,1-Trichloroethane	23.3	2.0	0.30	ug/l	25.0	ND	93	75-140			
1,1,2-Trichloroethane	23.8	2.0	0.30	ug/l	25.0	ND	95	60-135			
Trichloroethene	23.8	5.0	0.26	ug/l	25.0	ND	95	70-125			
Trichlorofluoromethane	24.7	5.0	0.34	ug/l	25.0	ND	99	55-145			
Vinyl chloride	20.8	5.0	0.26	ug/l	25.0	ND	83	40-135			
Surrogate: Dibromofluoromethane	*23.7*			*ug/l*	*25.0*		*95*	*80-120*			
Surrogate: Toluene-d8	*22.9*			*ug/l*	*25.0*		*92*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*22.5*			*ug/l*	*25.0*		*90*	*80-120*			
Matrix Spike Dup Analyzed: 01/23/2005 (5A23003-MSD1)						**Source: IOA1188-02**					
Benzene	24.0	2.0	0.28	ug/l	25.0	0.56	94	70-120	5	20	
Carbon tetrachloride	27.6	5.0	0.28	ug/l	25.0	ND	110	70-145	7	25	
Chloroform	24.7	2.0	0.33	ug/l	25.0	ND	99	70-135	6	20	
1,1-Dichloroethane	24.0	2.0	0.27	ug/l	25.0	ND	96	65-135	6	20	
1,2-Dichloroethane	25.7	2.0	0.28	ug/l	25.0	ND	103	60-150	12	20	
1,1-Dichloroethene	24.6	3.0	0.32	ug/l	25.0	ND	98	65-140	5	20	
Ethylbenzene	31.1	2.0	0.25	ug/l	25.0	8.4	91	70-130	5	20	
Tetrachloroethene	22.1	2.0	0.32	ug/l	25.0	ND	88	70-130	8	20	
Toluene	24.1	2.0	0.36	ug/l	25.0	ND	96	70-120	6	20	
1,1,1-Trichloroethane	24.9	2.0	0.30	ug/l	25.0	ND	100	75-140	7	20	
1,1,2-Trichloroethane	27.3	2.0	0.30	ug/l	25.0	ND	109	60-135	14	25	
Trichloroethene	25.4	5.0	0.26	ug/l	25.0	ND	102	70-125	7	20	
Trichlorofluoromethane	27.2	5.0	0.34	ug/l	25.0	ND	109	55-145	10	25	
Vinyl chloride	22.0	5.0	0.26	ug/l	25.0	ND	88	40-135	6	30	

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Report Number: IOA0997

Sampled: 01/18/05
Received: 01/19/05

METHOD BLANK/QC DATA

PURGEABLES BY GC/MS (EPA 624)

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A23003 Extracted: 01/23/05											
Matrix Spike Dup Analyzed: 01/23/2005 (5A23003-MSD1)						**Source: IOA1188-02**					
Surrogate: Dibromofluoromethane	*24.1*			*ug/l*	*25.0*		*96*	*80-120*			
Surrogate: Toluene-d8	*22.9*			*ug/l*	*25.0*		*92*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*23.1*			*ug/l*	*25.0*		*92*	*80-120*			

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 001

Report Number: IOA0997

Sampled: 01/18/05
Received: 01/19/05

METHOD BLANK/QC DATA

ACID & BASE/NEUTRALS BY GC/MS (EPA 625)

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A20039 Extracted: 01/20/05											
Blank Analyzed: 01/26/2005 (5A20039-BLK1)											
Bis(2-ethylhexyl)phthalate	ND	5.0	1.1	ug/l							
2,4-Dinitrotoluene	ND	9.0	0.23	ug/l							
N-Nitrosodimethylamine	ND	8.0	0.22	ug/l							
Pentachlorophenol	ND	8.0	0.78	ug/l							
2,4,6-Trichlorophenol	ND	6.0	0.10	ug/l							
Surrogate: 2-Fluorophenol	*15.1*			*ug/l*	*20.0*		*76*	*35-120*			
Surrogate: Phenol-d6	*14.4*			*ug/l*	*20.0*		*72*	*45-120*			
Surrogate: 2,4,6-Tribromophenol	*15.1*			*ug/l*	*20.0*		*76*	*50-125*			
Surrogate: Nitrobenzene-d5	*7.28*			*ug/l*	*10.0*		*73*	*45-120*			
Surrogate: 2-Fluorobiphenyl	*8.50*			*ug/l*	*10.0*		*85*	*45-120*			
Surrogate: Terphenyl-d14	*8.50*			*ug/l*	*10.0*		*85*	*45-135*			
LCS Analyzed: 01/26/2005 (5A20039-BS1)											
Bis(2-ethylhexyl)phthalate	10.2	5.0	1.1	ug/l	10.0		102	65-125			
2,4-Dinitrotoluene	8.14	9.0	0.23	ug/l	10.0		81	60-140			*J*
N-Nitrosodimethylamine	6.68	8.0	0.22	ug/l	10.0		67	40-120			*J*
Pentachlorophenol	9.14	8.0	0.78	ug/l	10.0		91	50-125			
2,4,6-Trichlorophenol	9.08	6.0	0.10	ug/l	10.0		91	60-120			
Surrogate: 2-Fluorophenol	*13.4*			*ug/l*	*20.0*		*67*	*35-120*			
Surrogate: Phenol-d6	*13.8*			*ug/l*	*20.0*		*69*	*45-120*			
Surrogate: 2,4,6-Tribromophenol	*15.7*			*ug/l*	*20.0*		*78*	*50-125*			
Surrogate: Nitrobenzene-d5	*7.20*			*ug/l*	*10.0*		*72*	*45-120*			
Surrogate: 2-Fluorobiphenyl	*8.12*			*ug/l*	*10.0*		*81*	*45-120*			
Surrogate: Terphenyl-d14	*8.08*			*ug/l*	*10.0*		*81*	*45-135*			
LCS Dup Analyzed: 01/26/2005 (5A20039-BSD1)											**M-NR1**
Bis(2-ethylhexyl)phthalate	10.6	5.0	1.1	ug/l	10.0		106	65-125	4	20	
2,4-Dinitrotoluene	8.66	9.0	0.23	ug/l	10.0		87	60-140	6	20	*J*
N-Nitrosodimethylamine	7.02	8.0	0.22	ug/l	10.0		70	40-120	5	20	*J*
Pentachlorophenol	9.20	8.0	0.78	ug/l	10.0		92	50-125	1	25	
2,4,6-Trichlorophenol	9.58	6.0	0.10	ug/l	10.0		96	60-120	5	20	
Surrogate: 2-Fluorophenol	*14.2*			*ug/l*	*20.0*		*71*	*35-120*			
Surrogate: Phenol-d6	*14.6*			*ug/l*	*20.0*		*73*	*45-120*			
Surrogate: 2,4,6-Tribromophenol	*15.7*			*ug/l*	*20.0*		*78*	*50-125*			
Surrogate: Nitrobenzene-d5	*7.42*			*ug/l*	*10.0*		*74*	*45-120*			
Surrogate: 2-Fluorobiphenyl	*8.08*			*ug/l*	*10.0*		*81*	*45-120*			

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ACID & BASE/NEUTRALS BY GC/MS (EPA 625)

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A20039 Extracted: 01/20/05											
LCS Dup Analyzed: 01/26/2005 (5A20039-BSD1)											**M-NR1**
Surrogate: Terphenyl-d14	*8.18*			*ug/l*	*10.0*		*82*	*45-135*			

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ORGANOCHLORINE PESTICIDES (EPA 608)

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A20040 Extracted: 01/20/05											
Blank Analyzed: 01/20/2005 (5A20040-BLK1)											
alpha-BHC	ND	0.010	0.00049	ug/l							
Surrogate: Decachlorobiphenyl	*0.446*			*ug/l*	*0.500*		*89*	*45-120*			
Surrogate: Tetrachloro-m-xylene	*0.303*			*ug/l*	*0.500*		*61*	*35-120*			
LCS Analyzed: 01/20/2005 (5A20040-BS1)											**M-NR1**
alpha-BHC	0.476	0.010	0.00049	ug/l	0.500		95	45-115			
Surrogate: Decachlorobiphenyl	*0.498*			*ug/l*	*0.500*		*100*	*45-120*			
Surrogate: Tetrachloro-m-xylene	*0.392*			*ug/l*	*0.500*		*78*	*35-120*			
LCS Dup Analyzed: 01/20/2005 (5A20040-BSD1)											
alpha-BHC	0.449	0.010	0.00049	ug/l	0.500		90	45-115	6	30	
Surrogate: Decachlorobiphenyl	*0.469*			*ug/l*	*0.500*		*94*	*45-120*			
Surrogate: Tetrachloro-m-xylene	*0.364*			*ug/l*	*0.500*		*73*	*35-120*			

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METALS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A19083 Extracted: 01/19/05											
Blank Analyzed: 01/19/2005 (5A19083-BLK1)											
Copper	ND	2.0	0.49	ug/l							
Lead	ND	1.0	0.13	ug/l							
LCS Analyzed: 01/19/2005 (5A19083-BS1)											
Copper	78.6	2.0	0.49	ug/l	80.0		98	85-115			
Lead	78.1	1.0	0.13	ug/l	80.0		98	85-115			
Matrix Spike Analyzed: 01/19/2005 (5A19083-MS1)						**Source: IOA0999-01**					
Copper	77.0	2.0	0.49	ug/l	80.0	3.6	92	70-130			
Lead	75.6	1.0	0.13	ug/l	80.0	0.22	94	70-130			
Matrix Spike Dup Analyzed: 01/19/2005 (5A19083-MSD1)						**Source: IOA0999-01**					
Copper	78.9	2.0	0.49	ug/l	80.0	3.6	94	70-130	2	20	
Lead	77.3	1.0	0.13	ug/l	80.0	0.22	96	70-130	2	20	
Batch: 5A20051 Extracted: 01/20/05											
Blank Analyzed: 01/20/2005 (5A20051-BLK1)											
Mercury	ND	0.20	0.063	ug/l							
LCS Analyzed: 01/20/2005 (5A20051-BS1)											
Mercury	8.31	0.20	0.063	ug/l	8.00		104	85-115			
Matrix Spike Analyzed: 01/20/2005 (5A20051-MS1)						**Source: IOA1004-02**					
Mercury	8.49	0.20	0.063	ug/l	8.00	0.15	104	70-130			
Matrix Spike Dup Analyzed: 01/20/2005 (5A20051-MSD1)						**Source: IOA1004-02**					
Mercury	8.38	0.20	0.063	ug/l	8.00	0.15	103	70-130	1	20	

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METALS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A21065 Extracted: 01/21/05											
Blank Analyzed: 01/21/2005 (5A21065-BLK1)											
Mercury	ND	0.20	0.063	ug/l							
LCS Analyzed: 01/21/2005 (5A21065-BS1)											
Mercury	7.92	0.20	0.063	ug/l	8.00		99	85-115			
Matrix Spike Analyzed: 01/21/2005 (5A21065-MS1)						**Source: IOA1185-01**					
Mercury	7.25	0.20	0.063	ug/l	8.00	ND	91	70-130			
Matrix Spike Dup Analyzed: 01/21/2005 (5A21065-MSD1)						**Source: IOA1185-01**					
Mercury	7.19	0.20	0.063	ug/l	8.00	ND	90	70-130	1	20	

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INORGANICS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A19040 Extracted: 01/19/05											
Blank Analyzed: 01/19/2005 (5A19040-BLK1)											
Chloride	ND	0.50	0.26	mg/l							
Nitrate/Nitrite-N	ND	0.26	0.072	mg/l							
Sulfate	ND	0.50	0.18	mg/l							
LCS Analyzed: 01/19/2005 (5A19040-BS1)											
Chloride	4.68	0.50	0.26	mg/l	5.00		94	90-110			*M-3*
Sulfate	9.91	0.50	0.18	mg/l	10.0		99	90-110			*M-3*
Batch: 5A19046 Extracted: 01/19/05											
Blank Analyzed: 01/24/2005 (5A19046-BLK1)											
Biochemical Oxygen Demand	ND	100	30	mg/l							
LCS Analyzed: 01/24/2005 (5A19046-BS1)											
Biochemical Oxygen Demand	201	100	30	mg/l	198		102	85-115			
LCS Dup Analyzed: 01/24/2005 (5A19046-BSD1)											
Biochemical Oxygen Demand	203	100	30	mg/l	198		103	85-115	1	20	
Batch: 5A19048 Extracted: 01/19/05											
Blank Analyzed: 01/19/2005 (5A19048-BLK1)											
Perchlorate	ND	4.0	0.80	ug/l							
LCS Analyzed: 01/19/2005 (5A19048-BS1)											
Perchlorate	50.6	4.0	0.80	ug/l	50.0		101	85-115			*M-3*

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INORGANICS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A19067 Extracted: 01/19/05											
Blank Analyzed: 01/19/2005 (5A19067-BLK1)											
Oil & Grease	1.30	5.0	0.94	mg/l							*J*
LCS Analyzed: 01/19/2005 (5A19067-BS1)											**M-NR1**
Oil & Grease	18.1	5.0	0.94	mg/l	20.0		90	65-120			
LCS Dup Analyzed: 01/19/2005 (5A19067-BSD1)											
Oil & Grease	20.8	5.0	0.94	mg/l	20.0		104	65-120	14	20	
Batch: 5A19072 Extracted: 01/19/05											
Duplicate Analyzed: 01/19/2005 (5A19072-DUP1)						**Source: IOA0950-04**					
Specific Conductance	825	1.0	1.0	umhos/cm		830			1	5	
Batch: 5A19080 Extracted: 01/19/05											
Blank Analyzed: 01/19/2005 (5A19080-BLK1)											
Turbidity	0.0400	1.0	0.040	NTU							*J*
Duplicate Analyzed: 01/19/2005 (5A19080-DUP1)						**Source: IOA0945-01**					
Turbidity	0.130	1.0	0.040	NTU		0.15			14	20	*J*
Batch: 5A19090 Extracted: 01/19/05											
Blank Analyzed: 01/19/2005 (5A19090-BLK1)											
Total Suspended Solids	ND	10	10	mg/l							

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Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A19090 Extracted: 01/19/05											
LCS Analyzed: 01/19/2005 (5A19090-BS1)											
Total Suspended Solids	971	10	10	mg/l	1000		97	85-115			
Duplicate Analyzed: 01/19/2005 (5A19090-DUP1)						**Source: IOA0988-01**					
Total Suspended Solids	ND	10	10	mg/l		ND				10	
Batch: 5A19095 Extracted: 01/19/05											
Blank Analyzed: 01/19/2005 (5A19095-BLK1)											
Surfactants (MBAS)	ND	0.10	0.044	mg/l							
LCS Analyzed: 01/19/2005 (5A19095-BS1)											
Surfactants (MBAS)	0.248	0.10	0.044	mg/l	0.250		99	90-110			
Matrix Spike Analyzed: 01/19/2005 (5A19095-MS1)						**Source: IOA0999-01**					
Surfactants (MBAS)	0.268	0.10	0.044	mg/l	0.250	0.060	83	50-125			
Matrix Spike Dup Analyzed: 01/19/2005 (5A19095-MSD1)						**Source: IOA0999-01**					
Surfactants (MBAS)	0.283	0.10	0.044	mg/l	0.250	0.060	89	50-125	5	20	
Batch: 5A19096 Extracted: 01/19/05											
Blank Analyzed: 01/19/2005 (5A19096-BLK1)											
Total Cyanide	ND	5.0	2.2	ug/l							
LCS Analyzed: 01/19/2005 (5A19096-BS1)											
Total Cyanide	187	5.0	2.2	ug/l	200		94	90-110			

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Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A19096 Extracted: 01/19/05											
Matrix Spike Analyzed: 01/19/2005 (5A19096-MS1)						**Source: IOA0999-01**					
Total Cyanide	92.8	5.0	2.2	ug/l	200	ND	46	70-115			*M2*
Matrix Spike Dup Analyzed: 01/19/2005 (5A19096-MSD1)						**Source: IOA0999-01**					
Total Cyanide	80.1	5.0	2.2	ug/l	200	ND	40	70-115	15	15	*M2*
Batch: 5A19098 Extracted: 01/19/05											
Blank Analyzed: 01/19/2005 (5A19098-BLK1)											
Total Dissolved Solids	ND	10	10	mg/l							
LCS Analyzed: 01/19/2005 (5A19098-BS1)											
Total Dissolved Solids	986	10	10	mg/l	1000		99	90-110			
Duplicate Analyzed: 01/19/2005 (5A19098-DUP1)						**Source: IOA0952-01**					
Total Dissolved Solids	493	10	10	mg/l		490			1	10	
Batch: 5A20065 Extracted: 01/20/05											
Blank Analyzed: 01/20/2005 (5A20065-BLK1)											
Ammonia-N (Distilled)	ND	0.50	0.30	mg/l							
LCS Analyzed: 01/20/2005 (5A20065-BS1)											
Ammonia-N (Distilled)	9.80	0.50	0.30	mg/l	10.0		98	80-115			
Matrix Spike Analyzed: 01/20/2005 (5A20065-MS1)						**Source: IOA0999-01**					
Ammonia-N (Distilled)	9.52	0.50	0.30	mg/l	10.0	ND	95	70-120			

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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2520 E. Sunset Rd. #3, Las Vegas, NV 89120 (702) 798-3620 FAX (702) 798-3621

MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 001

Report Number: IOA0997

Sampled: 01/18/05
Received: 01/19/05

METHOD BLANK/QC DATA

INORGANICS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A20065 Extracted: 01/20/05											
Matrix Spike Dup Analyzed: 01/20/2005 (5A20065-MSD1)						**Source: IOA0999-01**					
Ammonia-N (Distilled)	9.80	0.50	0.30	mg/l	10.0	ND	98	70-120	3	15	

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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Sampled: 01/18/05
Received: 01/19/05

Compliance Check

The results obtained from the analytical testing of this data set were checked against compliance limits received from the client. Any results at or above the compliance limits appear in bold on this page.

LabNumber	Analysis	Analyte	Units	Result	MRL	Compliance Limit
IOA0997-01	413.1 Oil and Grease	Oil & Grease	mg/l	1.60	5.0	10.00
IOA0997-01	608-Pest Boeing 001/002 Q (LL)	alpha-BHC	ug/l	0	0.010	0.0100
IOA0997-01	624-Boeing 001/002 Q (Fr113+X)	1,1-Dichloroethene	ug/l	0	3.0	3.20
IOA0997-01	624-Boeing 001/002 Q (Fr113+X)	Trichloroethene	ug/l	0	5.0	5.00
IOA0997-01	625-Boeing 001/002 Q-LL	2,4,6-Trichlorophenol	ug/l	0	6.0	6.50
IOA0997-01	625-Boeing 001/002 Q-LL	2,4-Dinitrotoluene	ug/l	0	9.0	9.10
IOA0997-01	625-Boeing 001/002 Q-LL	Bis(2-ethylhexyl)phthalate	ug/l	0.63	5.0	4.00
IOA0997-01	625-Boeing 001/002 Q-LL	N-Nitrosodimethylamine	ug/l	0	8.0	8.10
IOA0997-01	625-Boeing 001/002 Q-LL	Pentachlorophenol	ug/l	0	8.0	8.20
IOA0997-01	BOD	Biochemical Oxygen Demand	mg/l	0.55	2.0	20
IOA0997-01	Chloride - 300.0	Chloride	mg/l	13	0.50	150
IOA0997-01	Copper-200.8	Copper	ug/l	2.70	2.0	7.10
IOA0997-01	Cyanide-335.2 5ppb	Total Cyanide	ug/l	0.13	5.0	4.30
IOA0997-01	Lead-200.8	Lead	ug/l	0.32	1.0	2.60
IOA0997-01	MBAS - SM5540-C	Surfactants (MBAS)	mg/l	0	0.10	0.50
IOA0997-01	**Mercury - 245.1**	**Mercury**	**ug/l**	**0.26**	**0.20**	**0.20**
IOA0997-01	Nitrogen, NO3+NO2 -N	Nitrate/Nitrite-N	mg/l	0.77	0.26	8.00
IOA0997-01	Perchlorate 314.0	Perchlorate	ug/l	0	4.0	6.00
IOA0997-01	Sulfate-300.0	Sulfate	mg/l	24	0.50	300
IOA0997-01	TDS - SM 2540C	Total Dissolved Solids	mg/l	150	10	950
IOA0997-01RE1	**Mercury - 245.1**	**Mercury**	**ug/l**	**0.25**	**0.20**	**0.20**
IOA0997-02	624-Boeing 001/002 Q (Fr113+X)	1,1-Dichloroethene	ug/l	0	3.0	3.20
IOA0997-02	624-Boeing 001/002 Q (Fr113+X)	Trichloroethene	ug/l	0	5.0	5.00

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 001
Report Number: IOA0997

Sampled: 01/18/05
Received: 01/19/05

DATA QUALIFIERS AND DEFINITIONS

B	Analyte was detected in the associated Method Blank.
J	Estimated value. Analyte detected at a level less than the Reporting Limit (RL) and greater than or equal to the Method Detection Limit (MDL). The user of this data should be aware that this data is of unknown quality.
M2	The MS and/or MSD were below the acceptance limits due to sample matrix interference. See Blank Spike (LCS).
M-3	Results exceeded the linear range in the MS/MSD and therefore are not available for reporting. The batch was accepted based on acceptable recovery in the Blank Spike (LCS).
M-NR1	There was no MS/MSD analyzed with this batch due to insufficient sample volume. See Blank Spike/Blank Spike Duplicate.
ND	Analyte NOT DETECTED at or above the reporting limit or MDL, if MDL is specified.
RPD	Relative Percent Difference

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
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Attention: Bronwyn Kelly

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Sampled: 01/18/05
Received: 01/19/05

Certification Summary

Del Mar Analytical, Irvine

Method	Matrix	Nelac	California
EPA 120.1	Water	X	X
EPA 160.2	Water	X	X
EPA 160.5	Water	X	X
EPA 180.1	Water	X	X
EPA 200.8	Water	X	X
EPA 245.1	Water	X	X
EPA 300.0	Water	X	X
EPA 314.0	Water	X	X
EPA 335.2	Water	X	X
EPA 350.2	Water	X	X
EPA 405.1	Water	X	X
EPA 413.1	Water	X	X
EPA 608	Water	X	X
EPA 624	Water	X	X
EPA 625	Water	X	X
SM2540C	Water	X	X
SM5540-C	Water	X	X

Nevada and NELAP provide analyte specific accreditations. Analyte specific information for Del Mar Analytical may be obtained by contacting the laboratory or visiting our website at www.dmalabs.com.

Subcontracted Laboratories

Pace Analytical, MN- SUB

1700 Elm Street, Ste 200 - Minneapolis, MN 55414

Analysis Performed: 1613-Dioxin-HR
Samples: IOA0997-01

Analysis Performed: EDD + Level 4
Samples: IOA0997-01

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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:40 1DA0997

Del Mar Analytical Version 5 8/12/04 CHAIN OF CUSTODY FORM

Client Name/Address:	Project:
MWH-Pasadena 300 North Lake Avenue, Suite 1200 Pasadena, CA 91101	Boeing-SSFL NPDES **Routine Outfall 001**
Project Manager: Bronwyn Kelly Sampler: Pollock	Phone Number: (626) 568-6691 Fax Number: (626) 568-6515

Sample Description	Sample Matrix	Container Type	# of Cont.	Sampling Date/Time	Preservative	Bottle * #	Total Recoverable Metals: Cu, Pb, Hg,	Settleable Solids	VOCs 624 + xylenes	TCDD (and all congeners)	Oil & Grease (EPA 413.1)	Cyanide (total recoverable)	BOD5(20 degrees C)	Surfactants (MBAS)	Cl-, SO4, NO3+NO2-N, Perchlorate	Turbidity,TDS, TSS, Conductivity	Ammonia-N	Alpha BHC (608)	2,4,6 Trichlorophenol, 2,4 Dinitrotoluene, Bis(2-ethylhexyl)phthalate, NDMA, pentachlorophenol (EPA 625)		Comments
Outfall 001	W	Poly-1L	1	1-5-05 11:45	HNO3	1A	X														24 TAT
Outfall 001-Dup	W	Poly-1L	1		HNO3	1B	X														24 TAT
Outfall 001	W	Poly-1L	1		None	2		X													
Outfall 001	W	VOAs	3		HCl	3A, 3B, 3C			X												
Outfall 001	W	1L Amber	2		None	4A, 4B				X											
Outfall 001	W	1L Amber	2		HCl	5A, 5B					X										24 TAT
Outfall 001	W	Poly-500 ml	1		NaOH	6						X									24 TAT
Outfall 001	W	Poly-1L	1		None	7							X								
Outfall 001	W	Poly-500 ml	2		None	8A, 8B								X							
Outfall 001	W	Poly-500 ml	2		None	9A, 9B									X						
Outfall 001	W	Poly-500 ml	2		None	10A, 10B										X					
Outfall 001	W	Poly-500 ml	1		H2SO4	11											X				
Outfall 001	W	1L Amber	2		None	12A, 12B												X			
Outfall 001	W	1L Amber	2		None	13A, 13B													X		
Trip Blank	W	VOAs	3		HCl	14A, 14B, 14C,			X												

ANALYSIS REQUIRED

Field readings:
Temp = 55.2
pH= 7.6

Relinquished By	Date/Time:	Received By	Date/Time:
	1/9/05 0945		1/9/05 0945
Relinquished By	Date/Time:	Received By	Date/Time:
	1/9/05 1200		
Relinquished By	Date/Time:	Received By	Date/Time:
			1/19/05 12:00

Turn around Time: (check)
24 Hours _____ 5 Days _____
48 Hours _____ 10 Days _____
72 Hours _____ Normal _____
Perchlorate Only 72 Hours _____
Metals Only 72 Hours _____
Sample Integrity: (Check)
Intact X On Ice: 4° C.

Del Mar Analytical

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February 25, 2005

MWH-Pasadena/Boeing
300 North Lake Avenue
Pasadena, Ca. 91101

Attention: Bronwyn Kelly

Project: Routine Outfall 001
Sampled: 01/18/05
Del Mar Analytical Number: IOA0997

Dear Ms. Kelly:

Pace Analytical performed Method 1613B analysis for the project referenced above. Please use the following cross-reference table when reviewing your results.

MWH ID	DEL MAR ID	Pace ID
Outfall 001	IOA0997-01	106475001

Attached is the original report from the subcontract laboratory. If you have any questions or require further assistance, please do not hesitate to contact me.

Sincerely yours,
DEL MAR ANALYTICAL

Michele Harper
Project Manager

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Pace Analytical™

Method 1613B Analysis Results

Client - Del Mar Analytical

Client's Sample ID	IOA0997-01		
Lab Sample ID	106475001		
Filename	U50203A_07		
Injected By	SMT		
Total Amount Extracted	1040 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	01/18/2005
ICAL Date	01/26/2005	Received	01/20/2005
CCal Filename(s)	U50202B_12	Extracted	01/31/2005
Method Blank ID	BLANK-6241	Analyzed	02/03/2005 10:43

Native Isomers	Conc pg/L	EMPC pg/L	LOD pg/L		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	0.61		2,3,7,8-TCDF-13C	2.00	102
Total TCDF	0.95	-----	0.61	BJ	2,3,7,8-TCDD-13C	2.00	99
					1,2,3,7,8-PeCDF-13C	2.00	109
2,3,7,8-TCDD	ND	-----	0.86		2,3,4,7,8-PeCDF-13C	2.00	116
Total TCDD	ND	-----	0.86		1,2,3,7,8-PeCDD-13C	2.00	128
					1,2,3,4,7,8-HxCDF-13C	2.00	102
1,2,3,7,8-PeCDF	ND	-----	0.29		1,2,3,6,7,8-HxCDF-13C	2.00	92
2,3,4,7,8-PeCDF	-----	0.33	0.21	I	2,3,4,6,7,8-HxCDF-13C	2.00	93
Total PeCDF	ND	-----	0.25		1,2,3,7,8,9-HxCDF-13C	2.00	102
					1,2,3,4,7,8-HxCDD-13C	2.00	101
1,2,3,7,8-PeCDD	ND	-----	0.72		1,2,3,6,7,8-HxCDD-13C	2.00	82
Total PeCDD	ND	-----	0.72		1,2,3,4,6,7,8-HpCDF-13C	2.00	90
					1,2,3,4,7,8,9-HpCDF-13C	2.00	84
1,2,3,4,7,8-HxCDF	-----	0.78	0.21	I	1,2,3,4,6,7,8-HpCDD-13C	2.00	91
1,2,3,6,7,8-HxCDF	-----	0.46	0.16	I	OCDD-13C	4.00	95
2,3,4,6,7,8-HxCDF	0.49	-----	0.20	J			
1,2,3,7,8,9-HxCDF	0.35	-----	0.24	J	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	0.85	-----	0.21	BJ	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	0.33		2,3,7,8-TCDD-37Cl4	0.20	91
1,2,3,6,7,8-HxCDD	ND	-----	0.31				
1,2,3,7,8,9-HxCDD	ND	-----	0.35				
Total HxCDD	ND	-----	0.33				
1,2,3,4,6,7,8-HpCDF	-----	1.30	0.62	I			
1,2,3,4,7,8,9-HpCDF	ND	-----	0.66				
Total HpCDF	5.20	-----	0.64	BJ			
1,2,3,4,6,7,8-HpCDD	3.00	-----	1.00	J			
Total HpCDD	3.00	-----	1.00	J			
OCDF	7.60	-----	0.93	BJ			
OCDD	18.00	-----	0.58	J			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection. Totals are averages of individual isomer LODs.
D = Result obtained from analysis of diluted sample
B = Less than 10 times higher than method blank level
P = Recovery outside of method 1613 control limits
J = Concentration detected is below the calibration range
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....106475

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Pace Analytical™

Method 1613B Blank Analysis Results

Client - Del Mar Analytical

Lab Sample ID	BLANK-6241	Matrix	Water
Filename	U50202B_06	Dilution	NA
Total Amount Extracted	1040 mL	Extracted	01/31/2005
ICAL Date	01/26/2005	Analyzed	02/02/2005 23:46
CCal Filename(s)	U50202B_01	Injected By	SMT

Native Isomers	Conc pg/L	EMPC pg/L	LOD pg/L		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	0.59		2,3,7,8-TCDF-13C	2.00	86
Total TCDF	1.10	-----	-----	J	2,3,7,8-TCDD-13C	2.00	86
					1,2,3,7,8-PeCDF-13C	2.00	92
2,3,7,8-TCDD	ND	-----	1.30		2,3,4,7,8-PeCDF-13C	2.00	98
Total TCDD	ND	-----	-----		1,2,3,7,8-PeCDD-13C	2.00	105
					1,2,3,4,7,8-HxCDF-13C	2.00	83
1,2,3,7,8-PeCDF	-----	0.73	0.53	I	1,2,3,6,7,8-HxCDF-13C	2.00	76
2,3,4,7,8-PeCDF	ND	-----	0.63		2,3,4,6,7,8-HxCDF-13C	2.00	79
Total PeCDF	ND	-----	-----		1,2,3,7,8,9-HxCDF-13C	2.00	82
					1,2,3,4,7,8-HxCDD-13C	2.00	82
1,2,3,7,8-PeCDD	ND	-----	1.10		1,2,3,6,7,8-HxCDD-13C	2.00	66
Total PeCDD	ND	-----	-----		1,2,3,4,6,7,8-HpCDF-13C	2.00	75
					1,2,3,4,7,8,9-HpCDF-13C	2.00	69
1,2,3,4,7,8-HxCDF	-----	1.30	0.26	E	1,2,3,4,6,7,8-HpCDD-13C	2.00	77
1,2,3,6,7,8-HxCDF	-----	0.75	0.29	E	OCDD-13C	4.00	79
2,3,4,6,7,8-HxCDF	-----	0.71	0.31	I			
1,2,3,7,8,9-HxCDF	-----	1.00	0.41	E	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	0.34	-----	-----	J	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	1.10		2,3,7,8-TCDD-37Cl4	0.20	89
1,2,3,6,7,8-HxCDD	ND	-----	0.69				
1,2,3,7,8,9-HxCDD	ND	-----	0.95				
Total HxCDD	ND	-----	-----				
1,2,3,4,6,7,8-HpCDF	1.20	-----	0.71	J			
1,2,3,4,7,8,9-HpCDF	ND	-----	0.99				
Total HpCDF	4.30	-----	-----	J			
1,2,3,4,6,7,8-HpCDD	-----	1.60	0.86	I			
Total HpCDD	ND	-----	-----				
OCDF	6.50	-----	1.20	J			
OCDD	-----	8.30	0.74	I			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection. Totals are averages of individual isomer LODs.
A = Limit of Detection based on signal to noise
P = Recovery outside of method 1613 control limits
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....106475

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 1613B Laboratory Control Spike Results

Client - Del Mar Analytical

Lab Sample ID	LCS-6242		
Filename	U50202B_02	Matrix	Water
Total Amount Extracted	1040 mL	Dilution	NA
ICAL Date	01/26/2005	Extracted	01/31/2005
CCal Filename	U50202B_01	Analyzed	02/02/2005 20:28
Method Blank ID	BLANK-6241	Injected By	SMT

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDF	10	8.8	7.5	15.8	88
2,3,7,8-TCDD	10	8.6	6.7	15.8	86
1,2,3,7,8-PeCDF	50	43.6	40.0	67.0	87
2,3,4,7,8-PeCDF	50	42.3	34.0	80.0	85
1,2,3,7,8-PeCDD	50	38.0	35.0	71.0	76
1,2,3,4,7,8-HxCDF	50	39.1	36.0	67.0	78
1,2,3,6,7,8-HxCDF	50	42.0	42.0	65.0	84
2,3,4,6,7,8-HxCDF	50	40.4	35.0	78.0	81
1,2,3,7,8,9-HxCDF	50	39.6	39.0	65.0	79
1,2,3,4,7,8-HxCDD	50	43.2	35.0	82.0	86
1,2,3,6,7,8-HxCDD	50	42.9	38.0	67.0	86
1,2,3,7,8,9-HxCDD	50	45.4	32.0	81.0	91
1,2,3,4,6,7,8-HpCDF	50	44.2	41.0	61.0	88
1,2,3,4,7,8,9-HpCDF	50	46.8	39.0	69.0	94
1,2,3,4,6,7,8-HpCDD	50	41.4	35.0	70.0	83
OCDF	100	79.6	63.0	170.0	80
OCDD	100	85.8	78.0	144.0	86
2,3,7,8-TCDD-37Cl4	10	7.8	3.1	19.1	78
2,3,7,8-TCDF-13C	100	85.1	22.0	152.0	85
2,3,7,8-TCDD-13C	100	80.0	20.0	175.0	80
1,2,3,7,8-PeCDF-13C	100	90.8	21.0	192.0	91
2,3,4,7,8-PeCDF-13C	100	94.3	13.0	328.0	94
1,2,3,7,8-PeCDD-13C	100	102.1	21.0	227.0	102
1,2,3,4,7,8-HxCDF-13C	100	81.8	19.0	202.0	82
1,2,3,6,7,8-HxCDF-13C	100	78.8	21.0	159.0	79
2,3,4,6,7,8-HxCDF-13C	100	83.3	22.0	176.0	83
1,2,3,7,8,9-HxCDF-13C	100	85.0	17.0	205.0	85
1,2,3,4,7,8-HxCDD-13C	100	83.5	21.0	193.0	83
1,2,3,6,7,8-HxCDD-13C	100	71.7	25.0	163.0	72
1,2,3,4,6,7,8-HpCDF-13C	100	76.4	21.0	158.0	76
1,2,3,4,7,8,9-HpCDF-13C	100	67.0	20.0	186.0	67
1,2,3,4,6,7,8-HpCDD-13C	100	73.0	26.0	166.0	73
OCDD-13C	200	148.7	26.0	397.0	74

Cs = Concentration Spiked (ng/mL)
Cr = Concentration Recovered (ng/mL)
Rec. = Recovery (Expressed as Percent)
Control Limit Reference: Method 1613, Table 6, 10/94 Revision
X = Background subtracted value
P = Recovery outside of control limits
Nn = Value obtained from additional analysis
* = See Discussion

Report No.....106475

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 1613B Laboratory Control Spike Results

Client - Del Mar Analytical

Lab Sample ID	LCSD-6243		
Filename	U50202B_03	Matrix	Water
Total Amount Extracted	1030 mL	Dilution	NA
ICAL Date	01/26/2005	Extracted	01/31/2005
CCal Filename	U50202B_01	Analyzed	02/02/2005 21:15
Method Blank ID	BLANK-6241	Injected By	SMT

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDF	10	9.7	7.5	15.8	97
2,3,7,8-TCDD	10	9.4	6.7	15.8	94
1,2,3,7,8-PeCDF	50	46.8	40.0	67.0	94
2,3,4,7,8-PeCDF	50	44.6	34.0	80.0	89
1,2,3,7,8-PeCDD	50	40.7	35.0	71.0	81
1,2,3,4,7,8-HxCDF	50	41.3	36.0	67.0	83
1,2,3,6,7,8-HxCDF	50	44.5	42.0	65.0	89
2,3,4,6,7,8-HxCDF	50	43.6	35.0	78.0	87
1,2,3,7,8,9-HxCDF	50	42.2	39.0	65.0	84
1,2,3,4,7,8-HxCDD	50	49.1	35.0	82.0	98
1,2,3,6,7,8-HxCDD	50	45.6	38.0	67.0	91
1,2,3,7,8,9-HxCDD	50	51.3	32.0	81.0	103
1,2,3,4,6,7,8-HpCDF	50	47.5	41.0	61.0	95
1,2,3,4,7,8,9-HpCDF	50	50.1	39.0	69.0	100
1,2,3,4,6,7,8-HpCDD	50	44.5	35.0	70.0	89
OCDF	100	89.7	63.0	170.0	90
OCDD	100	91.5	78.0	144.0	92
2,3,7,8-TCDD-37Cl4	10	9.3	3.1	19.1	93
2,3,7,8-TCDF-13C	100	100.2	22.0	152.0	100
2,3,7,8-TCDD-13C	100	97.2	20.0	175.0	97
1,2,3,7,8-PeCDF-13C	100	109.5	21.0	192.0	109
2,3,4,7,8-PeCDF-13C	100	114.8	13.0	328.0	115
1,2,3,7,8-PeCDD-13C	100	124.2	21.0	227.0	124
1,2,3,4,7,8-HxCDF-13C	100	93.9	19.0	202.0	94
1,2,3,6,7,8-HxCDF-13C	100	88.8	21.0	159.0	89
2,3,4,6,7,8-HxCDF-13C	100	89.8	22.0	176.0	90
1,2,3,7,8,9-HxCDF-13C	100	96.4	17.0	205.0	96
1,2,3,4,7,8-HxCDD-13C	100	86.2	21.0	193.0	86
1,2,3,6,7,8-HxCDD-13C	100	80.0	25.0	163.0	80
1,2,3,4,6,7,8-HpCDF-13C	100	85.0	21.0	158.0	85
1,2,3,4,7,8,9-HpCDF-13C	100	80.0	20.0	186.0	80
1,2,3,4,6,7,8-HpCDD-13C	100	81.7	26.0	166.0	82
OCDD-13C	200	177.3	26.0	397.0	89

Cs = Concentration Spiked (ng/mL)
Cr = Concentration Recovered (ng/mL)
Rec. = Recovery (Expressed as Percent)
Control Limit Reference: Method 1613, Table 6, 10/94 Revision
X = Background subtracted value
P = Recovery outside of control limits
Nn = Value obtained from additional analysis
* = See Discussion

Report No.....106475

REPORT OF LABORATORY ANALYSIS

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www.pacelabs.com

Pace Analytical Services, Inc.
1700 Elm Street
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444

SPIKE RECOVERY RELATIVE PERCENT DIFFERENCE (RPD) RESULTS

Client..... Del Mar Analytical

SPIKE 1 ID..... LCS-6242
SPIKE 1 Filename..... U50202B_02
SPIKE 2 ID..... LCSD-6243
SPIKE 2 Filename..... U50202B_03

COMPOUND	SPIKE 1 REC,%	SPIKE 2 REC,%	RPD,%
2378-TCDF	88	97	9.7
2378-TCDD	86	94	8.9
12378-PeCDF	87	94	7.7
23478-PeCDF	85	89	4.6
12378-PeCDD	76	81	6.4
123478-HxCDF	78	83	6.2
123678-HxCDF	84	89	5.8
234678-HxCDF	81	87	7.1
123789-HxCDF	79	84	6.1
123478-HxCDD	86	98	13.0
123678-HxCDD	86	91	5.6
123789-HxCDD	91	103	12.4
1234678-HpCDF	88	95	7.7
1234789-HpCDF	94	100	6.2
1234678-HpCDD	83	89	7.0
OCDF	80	90	11.8
OCDD	86	92	6.7

REC = Percent Recovered
RPD = The difference between the two values divided by the average.
NA = Not Applicable

Report No..... 106475

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Pace Analytical Services, Inc.
1700 Elm Street
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444

TABLE 1. 2,3,7,8-TCDD Equivalency Factors (TEFs) for the Polychlorinated Dibenzo-p-dioxins and Dibenzofurans

Number	Compound(s)	TEF
1	2,3,7,8-TCDD	1.00
2	1,2,3,7,8-PeCDD	0.50
3	1,2,3,6,7,8-HxCDD	0.1
4	1,2,3,7,8,9-HxCDD	0.1
5	1,2,3,4,7,8-HxCDD	0.1
6	1,2,3,4,6,7,8-HpCDD	0.01
7	OCDD	0.001
8	* Total - TCDD	0.0
9	* Total - PeCDD	0.0
10	* Total - HxCDD	0.0
11	* Total - HpCDD	0.0
12	2,3,7,8-TCDF	0.10
13	1,2,3,7,8-PeCDF	0.05
14	2,3,4,7,8-PeCDF	0.5
15	1,2,3,6,7,8-HxCDF	0.1
16	1,2,3,7,8,9-HxCDF	0.1
17	1,2,3,4,7,8-HxCDF	0.1
18	2,3,4,6,7,8-HxCDF	0.1
19	1,2,3,4,6,7,8-HpCDF	0.01
20	1,2,3,4,7,8,9-HpCDF	0.01
21	OCDF	0.001
22	* Total - TCDF	0.0
23	* Total - PeCDF	0.0
24	* Total - HxCDF	0.0
25	* Total - HpCDF	0.0

*Excluding the 2,3,7,8-substituted congeners.

Reference: 1989 ITEFs

REPORT OF LABORATORY ANALYSIS

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Del Mar Analytical

17461 Derian Ave. Suite 100, Irvine, CA 92614 Ph (949) 261-1022 Fax (949) 261-1228
1014 E. Cooley Dr., Suite A, Colton, CA 92324 Ph (909) 370-4667 Fax (909) 370-1046
9484 Chesapeake Drive, Suite 805, San Diego, CA 92123 Ph (619) 505-9596 Fax (619) 505-9689
9830 South 51st Street, Suite B-120, Phoenix, AZ 85044 Ph (480) 785-0043 Fax (480) 785-0851
2520 E. Sunset Rd., Suite #3, Las Vegas, NV 89120 Ph (702) 798-3620 Fax (702) 798-3621

SUBCONTRACT ORDER - PROJECT # IOA0997

106475

SENDING LABORATORY:	RECEIVING LABORATORY:
Del Mar Analytical, Irvine 17461 Derian Avenue. Suite 100 Irvine, CA 92614 Phone: (949) 261-1022 Fax: (949) 261-1228 Project Manager: Michele Harper	Pace Analytical, MN- SUB 1700 Elm Street, Ste 200 Minneapolis, MN 55414 Phone :(612) 607-1700 Fax: (612) 607-6444

Standard TAT is requested unless specific due date is requested => Due Date:_____ Initials:_____

Analysis	Expiration	Comments
Sample ID: IOA0997-01 Water	**Sampled: 01/18/05 11:45**	106475001
1613-Dioxin-HR	01/25/05 11:45	J flags, 17 congeners, no TEQ, sub to Pace-MN
EDD + Level 4	02/15/05 11:45	Excel EDD email to pm,Include Std logs for Lvl IV

Containers Supplied:
1 L Amber (IOA0997-01G)
1 L Amber (IOA0997-01H)

SAMPLE INTEGRITY:

All containers intact: ☐ Yes ☐ No Sample labels/COC agree: ☐ Yes ☐ No Samples Received On Ice:: ☐ Yes ☐ No
Custody Seals Present: ☐ Yes ☐ No Samples Preserved Properly: ☐ Yes ☐ No Samples Received at (temp): 4.6°C

Released By	Date	Time	Received By	Date	Time
	1-19-05	1700		1.20.05	09:20

Del Mar Analytical

17461Derian Ave., Suite 100, Irvine, CA 92614 (949) 261-1022 FAX (949) 260-3297
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2520 E. Sunset Rd. #3, Las Vegas, NV 89120 (702) 798-3620 FAX (702) 798-3621

LABORATORY REPORT

Prepared For: MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project: Routine Outfall 001

Sampled: 01/21/05
Received: 01/21/05
Issued: 01/25/05 14:24

NELAP #01108CA CA ELAP #1197 CSDLAC #10117

The results listed within this Laboratory Report pertain only to the samples tested in the laboratory. The analyses contained in this report were performed in accordance with the applicable certifications as noted. All soil samples are reported on a wet weight basis unless otherwise noted in the report. This Laboratory Report is confidential and is intended for the sole use of Del Mar Analytical and its client. This report shall not be reproduced, except in full, without written permission from Del Mar Analytical. The Chain of Custody, 1 page, is included and is an integral part of this report.

This entire report was reviewed and approved for release.

SAMPLE CROSS REFERENCE

LABORATORY ID	CLIENT ID	MATRIX
IOA1336-01	Outfall 001	Water

Reviewed By:

Michele Harper

Del Mar Analytical, Irvine
Michele Harper
Project Manager

Del Mar Analytical

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 001

Report Number: IOA1336

Sampled: 01/21/05
Received: 01/21/05

METALS

Analyte	Method	Batch	MDL Limit	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA1336-01 (Outfall 001 - Water)									
Reporting Units: ug/l									
Mercury	EPA 245.1	5A24044	0.063	0.20	ND	1	01/24/05	01/24/05	

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 001

Report Number: IOA1336

Sampled: 01/21/05
Received: 01/21/05

METHOD BLANK/QC DATA

METALS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A24044 Extracted: 01/24/05											
Blank Analyzed: 01/24/2005 (5A24044-BLK1)											
Mercury	ND	0.20	0.063	ug/l							
LCS Analyzed: 01/24/2005 (5A24044-BS1)											
Mercury	8.57	0.20	0.063	ug/l	8.00		107	85-115			
Matrix Spike Analyzed: 01/24/2005 (5A24044-MS1)						**Source: IOA1305-06**					
Mercury	8.28	0.20	0.063	ug/l	8.00	ND	104	70-130			
Matrix Spike Dup Analyzed: 01/24/2005 (5A24044-MSD1)						**Source: IOA1305-06**					
Mercury	8.45	0.20	0.063	ug/l	8.00	ND	106	70-130	2	20	

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
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Attention: Bronwyn Kelly

Project ID: Routine Outfall 001

Report Number: IOA1336

Sampled: 01/21/05
Received: 01/21/05

Compliance Check

The results obtained from the analytical testing of this data set were checked against compliance limits received from the client. Any results at or above the compliance limits appear in bold on this page.

LabNumber	Analysis	Analyte	Units	Result	MRL	Compliance Limit
IOA1336-01	Mercury - 245.1	Mercury	ug/l	0.0020	0.20	0.20

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 001

Report Number: IOA1336

Sampled: 01/21/05
Received: 01/21/05

DATA QUALIFIERS AND DEFINITIONS

ND Analyte NOT DETECTED at or above the reporting limit or MDL, if MDL is specified.

RPD Relative Percent Difference

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 001

Report Number: IOA1336

Sampled: 01/21/05
Received: 01/21/05

Certification Summary

Del Mar Analytical, Irvine

Method	Matrix	NELAP	CA
EPA 245.1	Water	X	X

NV and NELAP provide analyte specific accreditations. Analyte specific information for Del Mar Analytical may be obtained by contacting the laboratory or visiting our website at www.dmalabs.com.

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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SSFL ANALYTICAL — CHAIN OF CUSTODY FORM

205

Project: SSFL OUTFALL

Project Manager/Phone Number: KELLY 818-586-5431

Sampler: POLLOCK

ANALYSIS REQUIRED

Boeing Log#	Sample Description	Sample Matrix	Container Type	# of Containers	Sampling Date/Time	Preservation	MERCURY			Sampler's ID#
	OUTFALL #2	W	PLASTIC	1	1-21-05 15:35	HNO3	✓			1 L poly
	OUTFALL #1	W	"	1	" 15:50	"	✓			"

10A1336

Relinquished By	Date/Time:	Received By	Date/Time:
[signature]	1-21-05 15:59	[signature]	1/21/05 15:59
[signature]	1/21/05 1900	[signature]	1-21-05 19:00
Relinquished By	Date/Time:	Received By	Date/Time:

Turnaround Time: (check)
Same Day _____ 72 Hours _____
24 Hours _____ 5 days _____
48 hours _____ normal _____

Sample Integrity: (Check)
Intact X On Ice: 3 D

CONTRACT COMPLIANCE SCREENING FORM FOR HARDCOPY DATA

AMEC Earth & Environmental
550 South Wadsworth Boulevard
Suite 500
Lakewood, CO 80226

Package ID T711DF24
Task Order 313150010
SDG No. Multiple
No. of Analyses 7

Laboratory Pace
Reviewer K. Shadowlight
Analysis/Method Dioxins

Date: February 18, 2005
Reviewer's Signature K Shadowlight

ACTION ITEMS[a]	
1. **Case Narrative Deficiencies**	
2. **Out of Scope Analyses**	
3. **Analyses Not Conducted**	
4. **Missing Hardcopy Deliverables**	
5. **Incorrect Hardcopy Deliverables**	
6. **Deviations from Analysis Protocol, e.g.,**	Qualifications were assigned for the following:
Holding Times	* Method blank contamination
GC/MS Tune/Inst. Performance	* EMPCs
Calibration	* Detects below the lower method calibration level
Method blanks	
Surrogates	
Matrix Spike/Dup LCS	
Field QC	
Internal Standard Performance	
Compound Identification and Quantitation	
System Performance	
COMMENTS[b]	

[a] Subcontracted analytical laboratory is not meeting contract and/or method requirements.
[b] Differences in protocol have been adopted by the laboratory but no action against the laboratory is required.

DATA VALIDATION REPORT

NPDES
Monitoring

ANALYSIS: DIOXINS/FURANS

SAMPLE DELIVERY GROUPS: Multiple SDGs

Prepared by

AMEC—Denver Operations
550 South Wadsworth Boulevard, Suite 500
Lakewood, Colorado 80226

1. INTRODUCTION

Task Order Title:	NPDES Monitoring
Contract Task Order #:	313150010
Sample Delivery Group #:	Multiple
Project Manager:	B. McIlvaine
Matrix:	Water
Analysis:	Dioxins/Furans
QC Level:	Level IV
No. of Samples:	7
No. of Reanalyses/Dilutions:	0
Reviewer:	K. Shadowlight
Date of Review:	February 21, 2005

The samples listed in Table 1 were validated based on the guidelines outlined in the *AMEC Data Validation Procedure for Dioxins and Furans (DVP-19, Rev. 1), EPA Method 1613, and the National National Functional Guidelines For Chlorinated Dioxin/Furan Data Review* (8/02). Any deviations from these procedures and guidelines are documented herein. Qualifiers were applied in cases where the data did not meet the required QC criteria or where special consideration by the data user is required. Data qualifiers were placed on Form Is with the associated qualification codes. Analytes that were rejected for any reason are denoted on the Form I as having only the "R" data qualifier and associated qualification code(s) denoting the reason for rejection. Any additional problems with the data that may have resulted in an estimated value were not denoted by a qualification code since the data had already been rejected.

Table 1. Sample Identification

Client ID	Laboratory ID (Del Mar)	Laboratory ID (Pace)	Matrix	COC Method
Outfall 001	IOA0997-01	106475001	water	1613
Outfall 001	IOA1551-01	106840001	water	1613
Outfall 002	IOA0999-01	106478001	water	1613
Outfall 002	IOA1553-01	106871001	water	1613
Outfall 003	IOA1556-01	106869001	water	1613
Outfall 008	IOA1555-01	10687001	water	1613
Outfall 009	IOA1554-01	106842001	water	1613

2. DATA VALIDATION FINDINGS

2.1 SAMPLE MANAGEMENT

Following are findings associated with sample management:

2.1.1 Sample Preservation, Handling, and Transport

The samples in these SDGs were received at Del Mar Analytical within the temperature limits of 4°C ±2°C. The samples were subcontracted to Pace Analytical for the dioxin/furan analyses. The samples in these SDGs were received at Pace Analytical Services below the temperature limits of 4°C ± 2°C, at 1.8°C; however, as the samples were not noted to have been frozen or damaged, no qualifications were required. No qualifications were required.

2.1.2 Chain of Custody

The COCs and transfer COCs were signed by the appropriate field and laboratory personnel. The samples and analyses were accounted for on both the original COCs and transfer COCs. As the samples were couriered directly to the laboratory (Del Mar Analytical), custody seals were not required. There was no information regarding custody seals upon receipt at Pace. No qualifications were required.

2.1.3 Holding Times

The samples were extracted and analyzed within a year of collection. No qualifications were required.

2.2 INSTRUMENT PERFORMANCE

Following are findings associated with instrument performance:

2.2.1 GC Column Performance

A column performance standard was combined with the daily calibration verification and analyzed at the beginning of each analytical sequence. The GC column performance was acceptable with the chromatographic separation of 2,3,7,8-TCDD and other TCDD isomers resolved with a valley of ≤25%. No qualifications were required.

2.2.2 Mass Spectrometer Performance

The mass spectrometer performance could not be evaluated as the laboratory did not provide selected ion current profiles for the lock-mass ions. No qualifications were required.

2.3 CALIBRATION

2.3.1 Initial Calibration

There were two initial calibrations, analyzed 11/29/04 on instrument 10MSHR05 and 01/26/05 on instrument 10MSHR06. The calibrations consisted of five concentration level standards (CS1 through CS5) analyzed to verify instrument linearity. The initial calibrations were acceptable with %RSDs ≤20% for the 15 native compounds (calibration by isotope dilution) and ≤35% for the 2 native and all labeled compounds (calibration by internal standard). The relative retention times and ion abundance ratios were within the QC limits listed in Method 1613 for all standards. A representative number of %RSDs were verified from the raw data, and no calculation or transcription errors were noted. No qualifications were required.

2.3.2 Continuing Calibration

Calibration verification (VER) consisted of a mid-level standard (CS3) analyzed at the beginning of each analytical sequence. The VER was acceptable with the concentrations within the acceptance criteria listed in the Table 6 of the EPA Method 1613. The ion abundance ratios and relative retention times were within the method QC limits. A representative number of %Ds were verified from the raw data, and no calculation or transcription errors were noted. No qualifications were required.

2.4 BLANKS

One method blank (Blank-6241) was extracted and analyzed with the samples in these SDGs. Target compounds 1,2,3,6,7,8-HxCDF, total HxCDF, total HpCDF, 1,2,3,4,6,7,8-HpCDD, total HpCDD, and OCDF were reported in the method blank. Any detects for the aforementioned target compounds reported at concentrations <5× the concentrations reported in the method blank were qualified as estimated nondetects "UJ," at the levels of interference in the samples of these SDGs. The detect for total TCDF was qualified as estimated, "J," in sample Outfall 002 (IOA0999-01), as a portion of the total concentration was attributed to method blank contamination. Target compounds 1,2,3,4,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, and OCDD were reported as EMPCs in the method blank. A review of the method blank raw data and chromatograms indicated no false negatives or false positives. No further qualifications were required.

2.5 BLANK SPIKES AND LABORATORY CONTROL SAMPLES

One LCS/LCSD pair (LCS-6242/LCSD-6243) was extracted and analyzed with the samples in these SDGs. All recoveries were within the acceptance criteria listed in Table 6 of the Method 1613. There are no method QC limits established for RPDs. The reported RPDs were within ±20%. No qualifications were required.

2.6 MATRIX SPIKE/MATRIX SPIKE DUPLICATE

MS/MSD analyses were not performed in these SDGs. Evaluation of method accuracy and precision was based on the LCS/LCSD results. No qualifications were required.

2.7 FIELD QC SAMPLES

Following are findings associated with field QC:

2.7.1 Field Blanks and Equipment Rinsates

The samples in these SDGs had no associated field QC samples. No qualifications were required.

2.7.2 Field Duplicates

No field duplicate samples were identified for these SDGs.

2.8 INTERNAL STANDARDS

The labeled standard recoveries were within the acceptance criteria listed in Table 7 of Method 1613. No qualifications were required.

2.9 COMPOUND IDENTIFICATION

The laboratory analyzed for polychlorinated dioxins/furans by EPA Method 1613. The compound identifications were verified from the raw data and no false negatives or positives were noted. No qualifications were required.

2.10 COMPOUND QUANTIFICATION AND REPORTED DETECTION LIMITS

Compound quantitation was verified from the raw data. The laboratory calculated and reported compound-specific detection limits. Any detects below the lower method calibration limit (MCL) were qualified as estimated, "J." Any reported EMPC was qualified as an estimated nondetect, "UJ." No further qualifications were required.

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 1613B Analysis Results

Client - Del Mar Analytical

Client's Sample ID	IOA0997-01		
Lab Sample ID	106475001		
Filename	U50203A_07		
Injected By	SMT		
Total Amount Extracted	1040 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	01/18/2005
ICAL Date	01/26/2005	Received	01/20/2005
CCal Filename(s)	U50202B_12	Extracted	01/31/2005
Method Blank ID	BLANK-6241	Analyzed	02/03/2005 10:43

Native Isomers	Conc pg/L	EMPC pg/L	LOD pg/L		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	0.61		2,3,7,8-TCDF-13C	2.00	102
Total TCDF	0.95	-----	0.61	BJ	2,3,7,8-TCDD-13C	2.00	99
					1,2,3,7,8-PeCDF-13C	2.00	109
2,3,7,8-TCDD	ND	-----	0.86		2,3,4,7,8-PeCDF-13C	2.00	116
Total TCDD	ND	-----	0.86		1,2,3,7,8-PeCDD-13C	2.00	128
					1,2,3,4,7,8-HxCDF-13C	2.00	102
1,2,3,7,8-PeCDF	ND	-----	0.29		1,2,3,6,7,8-HxCDF-13C	2.00	92
2,3,4,7,8-PeCDF	-----	0.33	0.21	I	2,3,4,6,7,8-HxCDF-13C	2.00	93
Total PeCDF	ND	-----	0.25		1,2,3,7,8,9-HxCDF-13C	2.00	102
					1,2,3,4,7,8-HxCDD-13C	2.00	101
1,2,3,7,8-PeCDD	ND	-----	0.72		1,2,3,6,7,8-HxCDD-13C	2.00	82
Total PeCDD	ND	-----	0.72		1,2,3,4,6,7,8-HpCDF-13C	2.00	90
					1,2,3,4,7,8,9-HpCDF-13C	2.00	84
1,2,3,4,7,8-HxCDF	-----	0.78	0.21	I	1,2,3,4,6,7,8-HpCDD-13C	2.00	91
1,2,3,6,7,8-HxCDF	-----	0.46	0.16	I	OCDD-13C	4.00	95
2,3,4,6,7,8-HxCDF	0.49	-----	0.20	J			
1,2,3,7,8,9-HxCDF	0.35	-----	0.24	J	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	0.85	-----	0.21	BJ	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	0.33		2,3,7,8-TCDD-37Cl4	0.20	91
1,2,3,6,7,8-HxCDD	ND	-----	0.31				
1,2,3,7,8,9-HxCDD	ND	-----	0.35				
Total HxCDD	ND	-----	0.33				
1,2,3,4,6,7,8-HpCDF	-----	1.30	0.62	I			
1,2,3,4,7,8,9-HpCDF	ND	-----	0.66				
Total HpCDF	5.20	-----	0.64	BJ			
1,2,3,4,6,7,8-HpCDD	3.00	-----	1.00	J			
Total HpCDD	3.00	-----	1.00	J			
OCDF	7.60	-----	0.93	BJ			
OCDD	18.00	-----	0.58	J			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection. Totals are averages of individual isomer LODs.
D = Result obtained from analysis of diluted sample
B = Less than 10 times higher than method blank level
P = Recovery outside of method 1613 control limits
J = Concentration detected is below the calibration range
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....106475

REPORT OF LABORATORY ANALYSIS

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AIHEC VALIDATED LEVEL IV

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 1613B Analysis Results

Client - Del Mar Analytical

Client's Sample ID	IOA1551-01		
Lab Sample ID	106840001		
Filename	F50204A_03		
Injected By	MRO		
Total Amount Extracted	1030 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	01/26/2005
ICAL Date	11/29/2004	Received	01/28/2005
CCal Filename(s)	F50203A_20	Extracted	01/31/2005
Method Blank ID	BLANK-6241	Analyzed	02/04/2005 11:38

Native Isomers	Conc pg/L	EMPC pg/L	LOD pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	1.90	2,3,7,8-TCDF-13C	2.00	61
Total TCDF	ND	-----	1.90	2,3,7,8-TCDD-13C	2.00	66
				1,2,3,7,8-PeCDF-13C	2.00	67
2,3,7,8-TCDD	ND	-----	2.30	2,3,4,7,8-PeCDF-13C	2.00	81
Total TCDD	ND	-----	2.30	1,2,3,7,8-PeCDD-13C	2.00	83
				1,2,3,4,7,8-HxCDF-13C	2.00	66
1,2,3,7,8-PeCDF	ND	-----	1.80	1,2,3,6,7,8-HxCDF-13C	2.00	76
2,3,4,7,8-PeCDF	ND	-----	1.30	2,3,4,6,7,8-HxCDF-13C	2.00	70
Total PeCDF	ND	-----	1.50	1,2,3,7,8,9-HxCDF-13C	2.00	70
				1,2,3,4,7,8-HxCDD-13C	2.00	68
1,2,3,7,8-PeCDD	ND	-----	1.50	1,2,3,6,7,8-HxCDD-13C	2.00	68
Total PeCDD	ND	-----	1.50	1,2,3,4,6,7,8-HpCDF-13C	2.00	61
				1,2,3,4,7,8,9-HpCDF-13C	2.00	61
1,2,3,4,7,8-HxCDF	-----	1.5	1.40 I	1,2,3,4,6,7,8-HpCDD-13C	2.00	72
1,2,3,6,7,8-HxCDF	ND	-----	1.30	OCDD-13C	4.00	72
2,3,4,6,7,8-HxCDF	ND	-----	0.86			
1,2,3,7,8,9-HxCDF	ND	-----	0.96	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	-----	1.10	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	1.50			
1,2,3,6,7,8-HxCDD	ND	-----	1.60	2,3,7,8-TCDD-37Cl4	0.20	63
1,2,3,7,8,9-HxCDD	ND	-----	1.30			
Total HxCDD	ND	-----	1.40			
1,2,3,4,6,7,8-HpCDF	6.6	-----	1.50 BJ			
1,2,3,4,7,8,9-HpCDF	ND	-----	1.60			
Total HpCDF	45.0	-----	1.60 J			
1,2,3,4,6,7,8-HpCDD	9.1	-----	2.00 J			
Total HpCDD	13.0	-----	2.00 J			
OCDF	50.0	-----	1.20 BJ			
OCDD	45.0	-----	2.50 J			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection. Totals are averages of individual isomer LODs.
D = Result obtained from analysis of diluted sample
B = Less than 10 times higher than method blank level
P = Recovery outside of method 1613 control limits
J = Concentration detected is below the calibration range
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....106840

REPORT OF LABORATORY ANALYSIS

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CONTRACT COMPLIANCE SCREENING FORM FOR HARDCOPY DATA

AMEC Earth & Environmental
550 South Wadsworth Boulevard
Suite 500
Lakewood, CO 80226

Laboratory Del Mar
Reviewer M. Pokorny
Analysis/Method Volatiles

Package ID T711VO52
Task Order 313150010
SDG No. IOA1551, 1553
No. of Analyses 4

Date: March 7, 2005
Reviewer's Signature M. Pokorny

ACTION ITEMS[a]	
1. **Case Narrative Deficiencies**	
2. **Out of Scope Analyses**	
3. **Analyses Not Conducted**	
4. **Missing Hardcopy Deliverables**	
5. **Incorrect Hardcopy Deliverables**	
6. **Deviations from Analysis Protocol, e.g.,**	Qualifications were required for calibration outliers.
Holding Times	
GC/MS Tune/Inst. Perform	
Calibrations	
Blanks	
Surrogates	
Matrix Spike/Dup LCS	
Field QC	
Internal Standard Performance	
Compound Identification and Quantitation	
System Performance	
COMMENTS[b]	

[a] Subcontracted analytical laboratory is not meeting contract and/or method requirements.
[b] Differences in protocol have been adopted by the laboratory but no action against the laboratory is required.

DATA VALIDATION REPORT

NPDES Monitoring

ANALYSIS: VOLATILES

SAMPLE DELIVERY GROUPs: IOA1551, IOA1553

Prepared by

AMEC Denver Operations
550 South Wadsworth Boulevard, Suite 500
Lakewood, Colorado 80226

1. INTRODUCTION

Task Order Title:	NPDES Monitoring
Contract Task Order #:	313150010
SDG#:	IOA1551, IOA1553
Project Manager:	B. McIlvaine
Matrix:	Water
Analysis:	Volatiles
QC Level:	Level IV
No. of Samples:	4
No. of Reanalyses/Dilutions:	0
Reviewer:	M. Pokorny
Date of Review:	March 7, 2005

The samples listed in Table 1 were validated based on the guidelines outlined in the *AMEC Data Validation Procedure for Levels C and D Volatile Organics (DVP-2, Rev. 2), EPA Method 624*, and the *National Functional Guidelines For Organic Data Review* (2/94). Any deviations from these procedures are documented herein. Qualifiers were applied in cases where the data did not meet the required QC criteria or where special consideration by the data user is required. Data qualifiers were placed on Form Is with the associated qualification codes. Analytes that were rejected for any reason are denoted on the summary forms as having only the "R" data qualifier and associated qualification code(s) denoting the reason for rejection. Any additional problems with the data that may have resulted in an estimated value were not denoted by a qualification code since the data had already been rejected.

Table 1. Sample identification

Client ID	EPA ID	Lab No.	Matrix	Method
Outfall 001	Outfall 001	IOA1551-01	water	624
TRIP BLANK	TRIP BLANK	IOA1551-02	water	624
Outfall 002	Outfall 002	IOA1553-01	water	624
TRIP BLANK	TRIP BLANK	IOA1553-02	water	624

2. DATA VALIDATION FINDINGS

2.1 SAMPLE MANAGEMENT

The following are findings associated with sample management:

2.1.1 Sample Preservation, Handling, and Transport

The samples in these SDGs were received at the laboratory within the temperature limits of 4°C ± 2°C. According to the COCs, the samples were received intact, without headspace, and in good condition. No qualifications were required.

2.1.2 Chain of Custody

The COCs were signed by field and laboratory personnel and accounted for the analyses presented in these SDGs. As the samples were couriered to the laboratory, custody seals are not required. No qualifications were required.

2.1.3 Holding Times

The samples were analyzed within 14 days of collection. No qualifications were required.

2.2 GC/MS TUNING

The ion abundance windows shown on the quantitation report were consistent with those specified in the EPA Method 624. All ion abundances were within the established windows and were therefore acceptable. The samples and associated QC were analyzed within 12 hours of the BFB injection times. The Form Vs were verified from the raw data and no discrepancies between the summary forms and the raw data were noted. No qualifications were required.

2.3 CALIBRATION

Two initial calibrations, dated 01/05/05 and 01/26/05, were associated with these SDGs. The average RRFs were ≥0.05 and the %RSDs were ≤35% for the target compounds listed on the sample summary forms for both initial calibrations. Two continuing calibrations, dated 01/31/05 and 02/01/05, were associated with this SDG. The RRFs for all target compounds were ≥0.05 and the %Ds were ≤20% except for the %Ds for 1,2-dichloroethane and 1,1,2-trichloroethane in the continuing calibration dated 01/31/05. 1,2-Dichloroethane and 1,1,2-trichloroethane were qualified as estimated nondetects, "UJ," in both of the site samples of these SDGs. A representative number of %RSDs and average RRFs from the initial calibration, and %Ds and RRFs from the continuing calibration were recalculated from the raw data, and no calculation or transcription errors were found. No further qualifications were required.

2.4 BLANKS

Two water method blanks (5A31022-BLK1 and 5B01008-BLK1) were associated with these SDGs. No target compounds were reported in the method blanks. The method blank raw data showed no evidence of false negatives. No qualifications were required.

2.5 BLANK SPIKES AND LABORATORY CONTROL SAMPLES

Two water blank spikes (5A31022-BS1 and 5B01008-BS1) were associated with these SDGs. All spike recoveries were within the laboratory-established QC limits. A representative number of recoveries were recalculated from the raw data and no calculation or transcription errors were found. No qualifications were required.

2.6 SURROGATE RECOVERY

The surrogates were within the QC limits of 80-120%. A representative number of surrogate recoveries were recalculated from the raw data and no calculation or transcription errors were found. No qualifications were required.

2.7 MATRIX SPIKE/MATRIX SPIKE DUPLICATE

Samples Outfall 001 and TRIP BLANK (IOA1553-02) were analyzed as the MS/MSDs performed with these SDGs; however, as sample TRIP BLANK was identified as a field QC sample the MS/MSD was not evaluated for that sample. All percent recoveries and RPDs were within the QC limits. No qualifications were required.

2.8 FIELD QC SAMPLES

Field QC samples were evaluated, and if necessary, qualified based on method blanks and other laboratory QC results affecting the usability of the field QC data. Any remaining detects were used to evaluate the associated site sample. Following are findings associated with field QC samples:

2.8.1 Trip Blanks

Samples TRIP BLANK (IOA1551-02) and TRIP BLANK (IOA1553-02) were the trip blanks associated with these SDGs. No target compounds were reported in the trip blanks. No qualifications were required.

2.8.2 Field Blanks and Equipment Rinsates

There were no field QC samples associated with this SDG. No qualifications were required.

2.8.3 Field Duplicates

There were no field duplicate samples associated with this SDG.

2.9 INTERNAL STANDARDS PERFORMANCE

Internal standard area counts and retention times for these SDGs were within the control limits established by the continuing calibration standards, of +100%/-50% for internal standard areas and ±0.50 minutes for retention times. A representative number of internal standard areas and retention times were verified from the raw data, and no calculation or transcription errors were noted. No qualifications were required.

2.10 COMPOUND IDENTIFICATION

Target compound identification was verified at a Level IV data validation. The laboratory analyzed for a subset of volatile target compounds by EPA Method 624. Chromatograms, retention times, and spectra for the sample and QC were examined and no target compound identification problems were noted. No qualifications were required.

2.11 COMPOUND QUANTIFICATION AND REPORTED DETECTION LIMITS

Compound quantification is verified at a Level IV data validation. The reporting limits were supported by the lowest concentrations of the initial calibration standards and by the MDL study. Compound quantitation was verified by recalculating sample detects, and/or a representative number of blank spike and surrogate recoveries from the raw data. No calculation or transcription errors were noted. No qualifications were required.

2.12 TENTATIVELY IDENTIFIED COMPOUNDS

The laboratory did not provide TICs for these SDGs. No qualifications were required.

2.13 SYSTEM PERFORMANCE

A review of the chromatograms and other raw data showed no identifiable problems with system performance. No qualifications were required.

Del Mar Analytical

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9484 Chesapeake Dr., Suite 805, San Diego, CA 92123 (858) 505-8596 FAX (858) 505-8689
9830 South 51st St., Suite B-120, Phoenix, AZ 85044 (480) 785-0043 FAX (480) 785-0851
2520 E. Sunset Rd. #3, Las Vegas, NV 89120 (702) 798-3620 FAX (702) 798-3621

MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 001

Report Number: IOA1551

Sampled: 01/26/05
Received: 01/26/05

DRAFT: PURGEABLES BY GC/MS (EPA 624)

Analyte	Method	Batch	MDL	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers	REV QUAL	QUA COD
Sample ID: IOA1551-01 (DRAFT: Outfall 001 - Water)											
Reporting Units: ug/l											
Benzene	EPA 624	5A31022	0.28	2.0	ND	1	01/31/05	01/31/05		U	
Trichlorotrifluoroethane (Freon 113)	EPA 624	5A31022	1.2	5.0	ND	1	01/31/05	01/31/05			
Carbon tetrachloride	EPA 624	5A31022	0.28	5.0	ND	1	01/31/05	01/31/05			
Chloroform	EPA 624	5A31022	0.33	2.0	ND	1	01/31/05	01/31/05			
1,1-Dichloroethane	EPA 624	5A31022	0.27	2.0	ND	1	01/31/05	01/31/05			
1,2-Dichloroethane	EPA 624	5A31022	0.28	2.0	ND	1	01/31/05	01/31/05			
1,1-Dichloroethene	EPA 624	5A31022	0.32	3.0	ND	1	01/31/05	01/31/05		U	C
Ethylbenzene	EPA 624	5A31022	0.25	2.0	ND	1	01/31/05	01/31/05		U	
Tetrachloroethene	EPA 624	5A31022	0.32	2.0	ND	1	01/31/05	01/31/05			
Toluene	EPA 624	5A31022	0.36	2.0	ND	1	01/31/05	01/31/05			
1,1,1-Trichloroethane	EPA 624	5A31022	0.30	2.0	ND	1	01/31/05	01/31/05			
1,1,2-Trichloroethane	EPA 624	5A31022	0.30	2.0	ND	1	01/31/05	01/31/05			
Trichloroethene	EPA 624	5A31022	0.26	5.0	ND	1	01/31/05	01/31/05		U	C
Trichlorofluoromethane	EPA 624	5A31022	0.34	5.0	ND	1	01/31/05	01/31/05		U	
Vinyl chloride	EPA 624	5A31022	0.26	5.0	ND	1	01/31/05	01/31/05			
Xylenes, Total	EPA 624	5A31022	0.52	4.0	ND	1	01/31/05	01/31/05			
Surrogate: Dibromofluoromethane (80-120%)					97 %						
Surrogate: Toluene-d8 (80-120%)					95 %						
Surrogate: 4-Bromofluorobenzene (80-120%)					95 %						
Sample ID: IOA1551-02 (DRAFT: Trip Blank - Water)											
Reporting Units: ug/l											
Benzene	EPA 624	5A31022	0.28	2.0	ND	1	01/31/05	01/31/05		U	
Carbon tetrachloride	EPA 624	5A31022	0.28	5.0	ND	1	01/31/05	01/31/05			
Chloroform	EPA 624	5A31022	0.33	2.0	ND	1	01/31/05	01/31/05			
1,1-Dichloroethane	EPA 624	5A31022	0.27	2.0	ND	1	01/31/05	01/31/05			
1,2-Dichloroethane	EPA 624	5A31022	0.28	2.0	ND	1	01/31/05	01/31/05			
1,1-Dichloroethene	EPA 624	5A31022	0.32	3.0	ND	1	01/31/05	01/31/05			
Ethylbenzene	EPA 624	5A31022	0.25	2.0	ND	1	01/31/05	01/31/05			
Tetrachloroethene	EPA 624	5A31022	0.32	2.0	ND	1	01/31/05	01/31/05			
Toluene	EPA 624	5A31022	0.36	2.0	ND	1	01/31/05	01/31/05			
1,1,1-Trichloroethane	EPA 624	5A31022	0.30	2.0	ND	1	01/31/05	01/31/05			
1,1,2-Trichloroethane	EPA 624	5A31022	0.30	2.0	ND	1	01/31/05	01/31/05			
Trichloroethene	EPA 624	5A31022	0.26	5.0	ND	1	01/31/05	01/31/05			
Trichlorofluoromethane	EPA 624	5A31022	0.34	5.0	ND	1	01/31/05	01/31/05			
Vinyl chloride	EPA 624	5A31022	0.26	5.0	ND	1	01/31/05	01/31/05			
Xylenes, Total	EPA 624	5A31022	0.52	4.0	ND	1	01/31/05	01/31/05			
Surrogate: Dibromofluoromethane (80-120%)					99 %						
Surrogate: Toluene-d8 (80-120%)					95 %						
Surrogate: 4-Bromofluorobenzene (80-120%)					95 %						

DRAFT REPORT
DRAFT REPORT
DATA SUBJECT TO CHANGE

USEC VALIDATED

LEVEL IV

CONTRACT COMPLIANCE SCREENING FORM FOR HARDCOPY DATA

AMEC Earth & Environmental
550 South Wadsworth Boulevard
Suite 500
Lakewood, CO 80226

Laboratory Del Mar Analytical
Reviewer L. Jarusewic
Analysis/Method General Minerals

Package ID T711WC69
Task Order 313150010
SDG No. IOA1551 &IOA1553
No. of Analyses 2

Date: 03/07/05
Reviewer's Signature

ACTION ITEMS[a]	
1. **Case Narrative Deficiencies**	
2. **Out of Scope Analyses**	
3. **Analyses Not Conducted**	
4. **Missing Hardcopy Deliverables**	
5. **Incorrect Hardcopy Deliverables**	
6. **Deviations from Analysis Protocol, e.g.,**	
Holding Times	
GC/MS Tune/Inst. Performance	
Calibrations	
Blanks	
Surrogates	
Matrix Spike/Dup LCS	
Field QC	
Internal Standard Performance	
Compound Identification and Quantitation	
System Performance	
COMMENTS[b]	Acceptable as reviewed.

[a] Subcontracted analytical laboratory is not meeting contract and/or method requirements.
[b] Differences in protocol have been adopted by the laboratory but no action against the laboratory is required.

DATA VALIDATION REPORT

NPDES Monitoring

ANALYSIS: GENERAL MINERALS

SAMPLE DELIVERY GROUPS: IOA1551 & IOA1553

Prepared by

AMEC—Denver Operations
550 South Wadsworth Boulevard, Suite 500
Lakewood, Colorado 80226

1. INTRODUCTION

Task Order Title:	NPDES Monitoring
Contract Task Order #:	313150010
Sample Delivery Group #:	IOA1551 & IOA1553
Project Manager:	B. McIlvaine
Matrix:	Water
Analysis:	General Minerals
QC Level:	Level IV
No. of Samples:	2
Reviewer:	L. Jarusewic
Date of Review:	March 7, 2005

The sample listed in Table 1 was validated based on the guidelines outlined in the AMEC *Data Validation Procedures* SOP DVP-6, Rev. 2, *USEPA Methods for Chemical Analysis of Water and Wastes Method 350.2 and 120.1,* and validation guidelines outlined in the USEPA *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (2/94).* Any deviations from these procedures and guidelines are documented herein. Qualifiers were applied in cases where the data did not meet the required QC criteria or where special consideration by the data user is required. Data qualifiers were placed on Form Is with the associated qualification codes. Analytes that were rejected for any reason are denoted on the Form I as having only the "R" data qualifier and associated qualification code(s) denoting the reason for rejection. Any additional problems with the data that may have resulted in an estimated value were not denoted by a qualification code since the data had already been rejected.

Table 1. Sample identification

Client ID	EPA ID	Laboratory ID	Matrix	COC Method
Outfall 001	Outfall 001	IOA1551-01	water	General Minerals
Outfall 002	Outfall 002	IOA1553-01	water	General Minerals

2. DATA VALIDATION FINDINGS

2.1 SAMPLE MANAGEMENT

Following are findings associated with sample management:

2.1.1 Sample Preservation, Handling, and Transport

The samples in these SDGs were received at the laboratory within the temperature limits of 4°C ± 2°C. No preservation problems were noted by the laboratory. No qualifications were required.

2.1.2 Chain of Custody

The COCs were signed and dated by field and laboratory personnel, and accounted for the samples and analyses presented in these SDGs. No qualifications were required.

2.1.3 Holding Times

The holding times were assessed by comparing the dates of collection with the dates of analyses. The 28-day analytical holding time for ammonia and conductivity and the 48-hour holding time for turbidity were met. No qualifications were required.

2.2 CALIBRATION

For the turbidity analysis, the initial calibration correlation coefficient was ≥ 0.995. The specific conductance and turbidity ICV and continuing calibration information was acceptable with %Rs within the control limits of 90-110%. For the ammonia titration method, no information regarding the standardization of the titrant was provided; however, as the LCS recovery was within the CCV control limits, no qualifications were required.

2.3 BLANKS

The method blank and CCB results reported on the summary forms and in the raw data for blank analyses associated with the samples were nondetects at the reporting limit. No qualifications were required.

2.4 BLANK SPIKES AND LABORATORY CONTROL SAMPLES

The ammonia laboratory control sample recovery was within the laboratory-established control limits. The LCS is not applicable to turbidity and specific conductance. No qualifications were required.

2.5 SURROGATES RECOVERY

Surrogate recovery is not applicable to the analyses presented in these SDGs.

2.6 LABORATORY DUPLICATES

No MS/MSD or duplicate analyses were performed in association with the samples in these SDGs; therefore, no assessment was made with respect to this criterion.

2.7 MATRIX SPIKE/MATRIX SPIKE DUPLICATE

No MS/MSD analyses were performed in association with the samples in these SDGs; therefore, no assessment was made with respect to this criterion. Method accuracy was evaluated based on LCS results.

2.8 FURNACE ATOMIC ABSORPTION QC

Furnace atomic absorption was not utilized for the analysis of these samples; therefore, furnace atomic absorption QC is not applicable.

2.9 ICP SERIAL DILUTION

ICP serial dilution is not applicable to the analyses presented in this data validation report.

2.10 SAMPLE RESULT VERIFICATION

A Level IV review was performed for the samples in this data package. Calculations were verified, and the sample results reported on the Form Is were verified against the raw data. No transcription errors or calculations errors were noted. No qualifications were required.

2.11 FIELD QC SAMPLES

Field QC samples are evaluated, and if necessary, qualified based only on laboratory blanks. Any remaining detects are used to evaluate the associated samples. The following are findings associated with field QC samples:

2.11.1 Field Blanks and Equipment Rinsates

The samples in these SDGs had no associated field QC samples. No qualifications were required.

2.11.2 Field Duplicates

There were no field duplicate pairs associated with these SDGs.

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 001

Report Number: 10A1551

Sampled: 01/26/05
Received: 01/26/05

DRAFT: INORGANICS

Analyte	Method	Batch	MDL	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: 10A1551-01 (DRAFT: Outfall 001 - Water)									
Reporting Units: mg/l									
Ammonia-N (Distilled)	EPA 350.2	5A28077	0.30	0.50	ND	1	01/28/05	01/28/05	U
Sample ID: 10A1551-01 (DRAFT: Outfall 001 - Water)									
Reporting Units: NTU									
Turbidity	EPA 180.1	5A27057	0.040	1.0	1.2	1	01/27/05	01/27/05	
Sample ID: 10A1551-01 (DRAFT: Outfall 001 - Water)									
Reporting Units: umhos/cm									
Specific Conductance	EPA 120.1	5A28087	1.0	1.0	260	1	01/28/05	01/28/05	

REV QUAL | QUAL COD

AMEC VALIDATED

LEVEL IV

DRAFT REPORT
DRAFT REPORT
DATA SUBJECT TO CHANGE

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LABORATORY REPORT

Prepared For: MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project: Routine Outfall 001

Sampled: 01/26/05
Received: 01/26/05
Issued: 03/19/05 18:12

NELAP #01108CA California ELAP#1197 CSDLAC #10117

The results listed within this Laboratory Report pertain only to the samples tested in the laboratory. The analyses contained in this report were performed in accordance with the applicable certifications as noted. All soil samples are reported on a wet weight basis unless otherwise noted in the report. This Laboratory Report is confidential and is intended for the sole use of Del Mar Analytical and its client. This report shall not be reproduced, except in full, without written permission from Del Mar Analytical. The Chain of Custody, 1 page, is included and is an integral part of this report.

This entire report was reviewed and approved for release.

SAMPLE CROSS REFERENCE

SUBCONTRACTED: Refer to the last page for specific subcontract laboratory information included in this report.

LABORATORY ID	CLIENT ID	MATRIX
IOA1551-01	Outfall 001	Water
IOA1551-02	Trip Blank	Water

Reviewed By:

Michele Harper

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 001

Report Number: IOA1551

Sampled: 01/26/05
Received: 01/26/05

PURGEABLES BY GC/MS (EPA 624)

Analyte	Method	Batch	MDL Limit	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA1551-01 (Outfall 001 - Water)									
Reporting Units: ug/l									
Benzene	EPA 624	5A31022	0.28	2.0	ND	1	01/31/05	01/31/05	
Trichlorotrifluoroethane (Freon 113)	EPA 624	5A31022	1.2	5.0	ND	1	01/31/05	01/31/05	
Carbon tetrachloride	EPA 624	5A31022	0.28	5.0	ND	1	01/31/05	01/31/05	
Chloroform	EPA 624	5A31022	0.33	2.0	ND	1	01/31/05	01/31/05	
1,1-Dichloroethane	EPA 624	5A31022	0.27	2.0	ND	1	01/31/05	01/31/05	
1,2-Dichloroethane	EPA 624	5A31022	0.28	2.0	ND	1	01/31/05	01/31/05	
1,1-Dichloroethene	EPA 624	5A31022	0.32	3.0	ND	1	01/31/05	01/31/05	
Ethylbenzene	EPA 624	5A31022	0.25	2.0	ND	1	01/31/05	01/31/05	
Tetrachloroethene	EPA 624	5A31022	0.32	2.0	ND	1	01/31/05	01/31/05	
Toluene	EPA 624	5A31022	0.36	2.0	ND	1	01/31/05	01/31/05	
1,1,1-Trichloroethane	EPA 624	5A31022	0.30	2.0	ND	1	01/31/05	01/31/05	
1,1,2-Trichloroethane	EPA 624	5A31022	0.30	2.0	ND	1	01/31/05	01/31/05	
Trichloroethene	EPA 624	5A31022	0.26	5.0	ND	1	01/31/05	01/31/05	
Trichlorofluoromethane	EPA 624	5A31022	0.34	5.0	ND	1	01/31/05	01/31/05	
Vinyl chloride	EPA 624	5A31022	0.26	5.0	ND	1	01/31/05	01/31/05	
Xylenes, Total	EPA 624	5A31022	0.52	4.0	ND	1	01/31/05	01/31/05	
Surrogate: Dibromofluoromethane (80-120%)					*97 %*				
Surrogate: Toluene-d8 (80-120%)					*95 %*				
Surrogate: 4-Bromofluorobenzene (80-120%)					*95 %*				
Sample ID: IOA1551-02 (Trip Blank - Water)									
Reporting Units: ug/l									
Benzene	EPA 624	5A31022	0.28	2.0	ND	1	01/31/05	01/31/05	
Carbon tetrachloride	EPA 624	5A31022	0.28	5.0	ND	1	01/31/05	01/31/05	
Chloroform	EPA 624	5A31022	0.33	2.0	ND	1	01/31/05	01/31/05	
1,1-Dichloroethane	EPA 624	5A31022	0.27	2.0	ND	1	01/31/05	01/31/05	
1,2-Dichloroethane	EPA 624	5A31022	0.28	2.0	ND	1	01/31/05	01/31/05	
1,1-Dichloroethene	EPA 624	5A31022	0.32	3.0	ND	1	01/31/05	01/31/05	
Ethylbenzene	EPA 624	5A31022	0.25	2.0	ND	1	01/31/05	01/31/05	
Tetrachloroethene	EPA 624	5A31022	0.32	2.0	ND	1	01/31/05	01/31/05	
Toluene	EPA 624	5A31022	0.36	2.0	ND	1	01/31/05	01/31/05	
1,1,1-Trichloroethane	EPA 624	5A31022	0.30	2.0	ND	1	01/31/05	01/31/05	
1,1,2-Trichloroethane	EPA 624	5A31022	0.30	2.0	ND	1	01/31/05	01/31/05	
Trichloroethene	EPA 624	5A31022	0.26	5.0	ND	1	01/31/05	01/31/05	
Trichlorofluoromethane	EPA 624	5A31022	0.34	5.0	ND	1	01/31/05	01/31/05	
Vinyl chloride	EPA 624	5A31022	0.26	5.0	ND	1	01/31/05	01/31/05	
Xylenes, Total	EPA 624	5A31022	0.52	4.0	ND	1	01/31/05	01/31/05	
Surrogate: Dibromofluoromethane (80-120%)					*99 %*				
Surrogate: Toluene-d8 (80-120%)					*95 %*				
Surrogate: 4-Bromofluorobenzene (80-120%)					*94 %*				

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 001

Report Number: IOA1551

Sampled: 01/26/05
Received: 01/26/05

ACID & BASE/NEUTRALS BY GC/MS (EPA 625)

Analyte	Method	Batch	MDL Limit	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA1551-01 (Outfall 001 - Water)									
Reporting Units: ug/l									
Bis(2-ethylhexyl)phthalate	EPA 625	5A27040	1.1	5.0	ND	0.952	01/27/05	01/31/05	
2,4-Dinitrotoluene	EPA 625	5A27040	0.23	9.0	ND	0.952	01/27/05	01/31/05	
N-Nitrosodimethylamine	EPA 625	5A27040	0.22	8.0	ND	0.952	01/27/05	01/31/05	
Pentachlorophenol	EPA 625	5A27040	0.78	8.0	ND	0.952	01/27/05	01/31/05	
2,4,6-Trichlorophenol	EPA 625	5A27040	0.10	6.0	ND	0.952	01/27/05	01/31/05	
Surrogate: 2-Fluorophenol (35-120%)					*64 %*				
Surrogate: Phenol-d6 (45-120%)					*64 %*				
Surrogate: 2,4,6-Tribromophenol (50-125%)					*75 %*				
Surrogate: Nitrobenzene-d5 (45-120%)					*60 %*				
Surrogate: 2-Fluorobiphenyl (45-120%)					*68 %*				
Surrogate: Terphenyl-d14 (45-135%)					*72 %*				

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Michele Harper
Project Manager

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Attention: Bronwyn Kelly

Project ID: Routine Outfall 001

Report Number: IOA1551

Sampled: 01/26/05
Received: 01/26/05

ORGANOCHLORINE PESTICIDES (EPA 608)

Analyte	Method	Batch	MDL Limit	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA1551-01 (Outfall 001 - Water) - cont.									
Reporting Units: ug/l									
alpha-BHC	EPA 608	5B01037	0.00049	0.010	ND	0.952	02/01/05	02/01/05	
Surrogate: Decachlorobiphenyl (45-120%)					*88 %*				
Surrogate: Tetrachloro-m-xylene (35-120%)					*83 %*				

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 001
Report Number: IOA1551

Sampled: 01/26/05
Received: 01/26/05

METALS

Analyte	Method	Batch	MDL Limit	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA1551-01 (Outfall 001 - Water) - cont.									
Reporting Units: ug/l									
Copper	EPA 200.8	5A26113	0.49	2.0	**1.7**	1	01/26/05	01/26/05	J
Lead	EPA 200.8	5A26113	0.13	1.0	ND	1	01/26/05	01/26/05	
Mercury	EPA 245.1	5A27047	0.063	0.20	**0.13**	1	01/27/05	01/27/05	J

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Michele Harper
Project Manager

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Attention: Bronwyn Kelly

Project ID: Routine Outfall 001

Report Number: IOA1551

Sampled: 01/26/05
Received: 01/26/05

INORGANICS

Analyte	Method	Batch	MDL Limit	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA1551-01 (Outfall 001 - Water) - cont.									
Reporting Units: mg/l									
Ammonia-N (Distilled)	EPA 350.2	5A28077	0.30	0.50	ND	1	01/28/05	01/28/05	
Biochemical Oxygen Demand	EPA 405.1	5A27049	0.59	2.0	**0.75**	1	01/27/05	02/01/05	J
Chloride	EPA 300.0	5A26051	0.26	0.50	**19**	1	01/26/05	01/26/05	
Nitrate/Nitrite-N	EPA 300.0	5A26051	0.072	0.26	**0.38**	1	01/26/05	01/26/05	
Oil & Grease	EPA 413.1	5A26077	0.94	5.0	ND	1	01/26/05	01/26/05	
Sulfate	EPA 300.0	5A26051	0.18	0.50	**28**	1	01/26/05	01/26/05	
Surfactants (MBAS)	SM5540-C	5A26108	0.044	0.10	**0.081**	1	01/26/05	01/26/05	J
Total Dissolved Solids	SM2540C	5A28091	10	10	**140**	1	01/28/05	01/28/05	
Total Suspended Solids	EPA 160.2	5A27101	10	10	ND	1	01/27/05	01/27/05	
Sample ID: IOA1551-01 (Outfall 001 - Water)									
Reporting Units: ml/l/hr									
Total Settleable Solids	EPA 160.5	5A27060	0.10	0.10	ND	1	01/27/05	01/27/05	
Sample ID: IOA1551-01 (Outfall 001 - Water)									
Reporting Units: NTU									
Turbidity	EPA 180.1	5A27057	0.040	1.0	**1.2**	1	01/27/05	01/27/05	
Sample ID: IOA1551-01 (Outfall 001 - Water)									
Reporting Units: ug/l									
Total Cyanide	EPA 335.2	5A26117	2.2	5.0	ND	1	01/26/05	01/26/05	
Perchlorate	EPA 314.0	5A30022	0.80	4.0	ND	1	01/30/05	01/30/05	
Sample ID: IOA1551-01 (Outfall 001 - Water)									
Reporting Units: umhos/cm									
Specific Conductance	EPA 120.1	5A28087	1.0	1.0	**260**	1	01/28/05	01/28/05	

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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Attention: Bronwyn Kelly

Project ID: Routine Outfall 001

Report Number: IOA1551

Sampled: 01/26/05
Received: 01/26/05

SHORT HOLD TIME DETAIL REPORT

	Hold Time (in days)	Date/Time Sampled	Date/Time Received	Date/Time Extracted	Date/Time Analyzed
Sample ID: Outfall 001 (IOA1551-01) - Water					
EPA 160.5	2	01/26/2005 11:45	01/26/2005 17:05	01/27/2005 09:56	01/27/2005 11:00
EPA 180.1	2	01/26/2005 11:45	01/26/2005 17:05	01/27/2005 08:00	01/27/2005 13:30
EPA 300.0	2	01/26/2005 11:45	01/26/2005 17:05	01/26/2005 19:00	01/26/2005 19:38
EPA 405.1	2	01/26/2005 11:45	01/26/2005 17:05	01/27/2005 09:21	02/01/2005 15:08
SM5540-C	2	01/26/2005 11:45	01/26/2005 17:05	01/26/2005 19:20	01/26/2005 23:01

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Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 001

Report Number: IOA1551

Sampled: 01/26/05
Received: 01/26/05

METHOD BLANK/QC DATA

PURGEABLES BY GC/MS (EPA 624)

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A31022 Extracted: 01/31/05											
Blank Analyzed: 01/31/2005 (5A31022-BLK1)											
Benzene	ND	2.0	0.28	ug/l							
Carbon tetrachloride	ND	5.0	0.28	ug/l							
Chloroform	ND	2.0	0.33	ug/l							
1,1-Dichloroethane	ND	2.0	0.27	ug/l							
1,2-Dichloroethane	ND	2.0	0.28	ug/l							
1,1-Dichloroethene	ND	3.0	0.32	ug/l							
Ethylbenzene	ND	2.0	0.25	ug/l							
Tetrachloroethene	ND	2.0	0.32	ug/l							
Toluene	ND	2.0	0.36	ug/l							
1,1,1-Trichloroethane	ND	2.0	0.30	ug/l							
1,1,2-Trichloroethane	ND	2.0	0.30	ug/l							
Trichloroethene	ND	5.0	0.26	ug/l							
Trichlorofluoromethane	ND	5.0	0.34	ug/l							
Vinyl chloride	ND	5.0	0.26	ug/l							
Xylenes, Total	ND	4.0	0.52	ug/l							
Surrogate: Dibromofluoromethane	*24.4*			*ug/l*	*25.0*		*98*	*80-120*			
Surrogate: Toluene-d8	*24.1*			*ug/l*	*25.0*		*96*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*23.3*			*ug/l*	*25.0*		*93*	*80-120*			
LCS Analyzed: 01/31/2005 (5A31022-BS1)											
Benzene	21.2	2.0	0.28	ug/l	25.0		85	70-120			
Carbon tetrachloride	25.2	5.0	0.28	ug/l	25.0		101	70-140			
Chloroform	22.4	2.0	0.33	ug/l	25.0		90	75-130			
1,1-Dichloroethane	21.9	2.0	0.27	ug/l	25.0		88	70-135			
1,2-Dichloroethane	22.4	2.0	0.28	ug/l	25.0		90	60-150			
1,1-Dichloroethene	21.1	3.0	0.32	ug/l	25.0		84	75-135			
Ethylbenzene	23.6	2.0	0.25	ug/l	25.0		94	80-120			
Tetrachloroethene	23.4	2.0	0.32	ug/l	25.0		94	75-125			
Toluene	23.0	2.0	0.36	ug/l	25.0		92	75-120			
1,1,1-Trichloroethane	24.6	2.0	0.30	ug/l	25.0		98	75-140			
1,1,2-Trichloroethane	23.4	2.0	0.30	ug/l	25.0		94	70-125			
Trichloroethene	23.9	5.0	0.26	ug/l	25.0		96	80-120			
Trichlorofluoromethane	22.1	5.0	0.34	ug/l	25.0		88	65-145			
Vinyl chloride	21.1	5.0	0.26	ug/l	25.0		84	50-130			
Surrogate: Dibromofluoromethane	*24.6*			*ug/l*	*25.0*		*98*	*80-120*			
Surrogate: Toluene-d8	*24.6*			*ug/l*	*25.0*		*98*	*80-120*			

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 001

Report Number: IOA1551

Sampled: 01/26/05
Received: 01/26/05

METHOD BLANK/QC DATA

PURGEABLES BY GC/MS (EPA 624)

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A31022 Extracted: 01/31/05											
LCS Analyzed: 01/31/2005 (5A31022-BS1)											
Surrogate: 4-Bromofluorobenzene	*23.8*			*ug/l*	*25.0*		*95*	*80-120*			
Matrix Spike Analyzed: 01/31/2005 (5A31022-MS1)						**Source: IOA1551-01**					
Benzene	23.3	2.0	0.28	ug/l	25.0	ND	93	70-120			
Carbon tetrachloride	28.0	5.0	0.28	ug/l	25.0	ND	112	70-145			
Chloroform	24.8	2.0	0.33	ug/l	25.0	ND	99	70-135			
1,1-Dichloroethane	24.0	2.0	0.27	ug/l	25.0	ND	96	65-135			
1,2-Dichloroethane	23.8	2.0	0.28	ug/l	25.0	ND	95	60-150			
1,1-Dichloroethene	23.7	3.0	0.32	ug/l	25.0	ND	95	65-140			
Ethylbenzene	25.6	2.0	0.25	ug/l	25.0	ND	102	70-130			
Tetrachloroethene	25.7	2.0	0.32	ug/l	25.0	ND	103	70-130			
Toluene	25.0	2.0	0.36	ug/l	25.0	ND	100	70-120			
1,1,1-Trichloroethane	26.7	2.0	0.30	ug/l	25.0	ND	107	75-140			
1,1,2-Trichloroethane	24.1	2.0	0.30	ug/l	25.0	ND	96	60-135			
Trichloroethene	26.3	5.0	0.26	ug/l	25.0	ND	105	70-125			
Trichlorofluoromethane	24.0	5.0	0.34	ug/l	25.0	ND	96	55-145			
Vinyl chloride	22.0	5.0	0.26	ug/l	25.0	ND	88	40-135			
Surrogate: Dibromofluoromethane	*24.8*			*ug/l*	*25.0*		*99*	*80-120*			
Surrogate: Toluene-d8	*24.4*			*ug/l*	*25.0*		*98*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*23.4*			*ug/l*	*25.0*		*94*	*80-120*			
Matrix Spike Dup Analyzed: 01/31/2005 (5A31022-MSD1)						**Source: IOA1551-01**					
Benzene	22.2	2.0	0.28	ug/l	25.0	ND	89	70-120	5	20	
Carbon tetrachloride	26.8	5.0	0.28	ug/l	25.0	ND	107	70-145	4	25	
Chloroform	23.7	2.0	0.33	ug/l	25.0	ND	95	70-135	5	20	
1,1-Dichloroethane	23.0	2.0	0.27	ug/l	25.0	ND	92	65-135	4	20	
1,2-Dichloroethane	22.1	2.0	0.28	ug/l	25.0	ND	88	60-150	7	20	
1,1-Dichloroethene	22.1	3.0	0.32	ug/l	25.0	ND	88	65-140	7	20	
Ethylbenzene	25.0	2.0	0.25	ug/l	25.0	ND	100	70-130	2	20	
Tetrachloroethene	25.1	2.0	0.32	ug/l	25.0	ND	100	70-130	2	20	
Toluene	23.4	2.0	0.36	ug/l	25.0	ND	94	70-120	7	20	
1,1,1-Trichloroethane	25.9	2.0	0.30	ug/l	25.0	ND	104	75-140	3	20	
1,1,2-Trichloroethane	22.2	2.0	0.30	ug/l	25.0	ND	89	60-135	8	25	
Trichloroethene	25.2	5.0	0.26	ug/l	25.0	ND	101	70-125	4	20	
Trichlorofluoromethane	23.2	5.0	0.34	ug/l	25.0	ND	93	55-145	3	25	
Vinyl chloride	21.5	5.0	0.26	ug/l	25.0	ND	86	40-135	2	30	

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Attention: Bronwyn Kelly

Project ID: Routine Outfall 001

Report Number: IOA1551

Sampled: 01/26/05
Received: 01/26/05

METHOD BLANK/QC DATA

PURGEABLES BY GC/MS (EPA 624)

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A31022 Extracted: 01/31/05											
Matrix Spike Dup Analyzed: 01/31/2005 (5A31022-MSD1)						**Source: IOA1551-01**					
Surrogate: Dibromofluoromethane	*24.5*			*ug/l*	*25.0*		*98*	*80-120*			
Surrogate: Toluene-d8	*24.1*			*ug/l*	*25.0*		*96*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*23.9*			*ug/l*	*25.0*		*96*	*80-120*			

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METHOD BLANK/QC DATA

ACID & BASE/NEUTRALS BY GC/MS (EPA 625)

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A27040 Extracted: 01/27/05											
Blank Analyzed: 01/31/2005 (5A27040-BLK1)											
Bis(2-ethylhexyl)phthalate	ND	5.0	1.1	ug/l							
2,4-Dinitrotoluene	ND	9.0	0.23	ug/l							
N-Nitrosodimethylamine	ND	8.0	0.22	ug/l							
Pentachlorophenol	ND	8.0	0.78	ug/l							
2,4,6-Trichlorophenol	ND	6.0	0.10	ug/l							
Surrogate: 2-Fluorophenol	*13.2*			*ug/l*	*20.0*		*66*	*35-120*			
Surrogate: Phenol-d6	*13.5*			*ug/l*	*20.0*		*68*	*45-120*			
Surrogate: 2,4,6-Tribromophenol	*12.9*			*ug/l*	*20.0*		*64*	*50-125*			
Surrogate: Nitrobenzene-d5	*7.58*			*ug/l*	*10.0*		*76*	*45-120*			
Surrogate: 2-Fluorobiphenyl	*8.04*			*ug/l*	*10.0*		*80*	*45-120*			
Surrogate: Terphenyl-d14	*7.46*			*ug/l*	*10.0*		*75*	*45-135*			
LCS Analyzed: 01/31/2005 (5A27040-BS1)											**M-NR1**
Bis(2-ethylhexyl)phthalate	8.12	5.0	1.1	ug/l	10.0		81	65-125			
2,4-Dinitrotoluene	7.52	9.0	0.23	ug/l	10.0		75	60-140			*J*
N-Nitrosodimethylamine	7.80	8.0	0.22	ug/l	10.0		78	40-120			*J*
Pentachlorophenol	8.72	8.0	0.78	ug/l	10.0		87	50-125			
2,4,6-Trichlorophenol	9.04	6.0	0.10	ug/l	10.0		90	60-120			
Surrogate: 2-Fluorophenol	*15.6*			*ug/l*	*20.0*		*78*	*35-120*			
Surrogate: Phenol-d6	*15.4*			*ug/l*	*20.0*		*77*	*45-120*			
Surrogate: 2,4,6-Tribromophenol	*15.6*			*ug/l*	*20.0*		*78*	*50-125*			
Surrogate: Nitrobenzene-d5	*7.68*			*ug/l*	*10.0*		*77*	*45-120*			
Surrogate: 2-Fluorobiphenyl	*8.02*			*ug/l*	*10.0*		*80*	*45-120*			
Surrogate: Terphenyl-d14	*7.56*			*ug/l*	*10.0*		*76*	*45-135*			
LCS Dup Analyzed: 01/31/2005 (5A27040-BSD1)											
Bis(2-ethylhexyl)phthalate	8.34	5.0	1.1	ug/l	10.0		83	65-125	3	20	
2,4-Dinitrotoluene	7.52	9.0	0.23	ug/l	10.0		75	60-140	0	20	*J*
N-Nitrosodimethylamine	8.20	8.0	0.22	ug/l	10.0		82	40-120	5	20	
Pentachlorophenol	9.00	8.0	0.78	ug/l	10.0		90	50-125	3	25	
2,4,6-Trichlorophenol	8.38	6.0	0.10	ug/l	10.0		84	60-120	8	20	
Surrogate: 2-Fluorophenol	*13.7*			*ug/l*	*20.0*		*68*	*35-120*			
Surrogate: Phenol-d6	*13.7*			*ug/l*	*20.0*		*68*	*45-120*			
Surrogate: 2,4,6-Tribromophenol	*16.1*			*ug/l*	*20.0*		*80*	*50-125*			
Surrogate: Nitrobenzene-d5	*6.84*			*ug/l*	*10.0*		*68*	*45-120*			
Surrogate: 2-Fluorobiphenyl	*7.34*			*ug/l*	*10.0*		*73*	*45-120*			

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Sampled: 01/26/05
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METHOD BLANK/QC DATA

ACID & BASE/NEUTRALS BY GC/MS (EPA 625)

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A27040 Extracted: 01/27/05											
LCS Dup Analyzed: 01/31/2005 (5A27040-BSD1)											
Surrogate: Terphenyl-d14	*7.70*			*ug/l*	*10.0*		*77*	*45-135*			

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METHOD BLANK/QC DATA

ORGANOCHLORINE PESTICIDES (EPA 608)

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5B01037 Extracted: 02/01/05											
Blank Analyzed: 02/01/2005 (5B01037-BLK1)											
alpha-BHC	ND	0.010	0.00049	ug/l							
Surrogate: Decachlorobiphenyl	*0.380*			*ug/l*	*0.500*		*76*	*45-120*			
Surrogate: Tetrachloro-m-xylene	*0.256*			*ug/l*	*0.500*		*51*	*35-120*			
LCS Analyzed: 02/01/2005 (5B01037-BS1)											**M-NR1**
alpha-BHC	0.434	0.010	0.00049	ug/l	0.500		87	45-115			
Surrogate: Decachlorobiphenyl	*0.460*			*ug/l*	*0.500*		*92*	*45-120*			
Surrogate: Tetrachloro-m-xylene	*0.361*			*ug/l*	*0.500*		*72*	*35-120*			
LCS Dup Analyzed: 02/01/2005 (5B01037-BSD1)											
alpha-BHC	0.349	0.010	0.00049	ug/l	0.500		70	45-115	22	30	
Surrogate: Decachlorobiphenyl	*0.358*			*ug/l*	*0.500*		*72*	*45-120*			
Surrogate: Tetrachloro-m-xylene	*0.280*			*ug/l*	*0.500*		*56*	*35-120*			

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METHOD BLANK/QC DATA

METALS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A26113 Extracted: 01/26/05											
Blank Analyzed: 01/26/2005 (5A26113-BLK1)											
Copper	ND	2.0	0.49	ug/l							
Lead	ND	1.0	0.13	ug/l							
LCS Analyzed: 01/26/2005 (5A26113-BS1)											
Copper	78.1	2.0	0.49	ug/l	80.0		98	85-115			
Lead	77.0	1.0	0.13	ug/l	80.0		96	85-115			
Matrix Spike Analyzed: 01/26/2005 (5A26113-MS1)						**Source: IOA1551-01**					
Copper	80.6	2.0	0.49	ug/l	80.0	1.7	99	70-130			
Lead	77.4	1.0	0.13	ug/l	80.0	ND	97	70-130			
Matrix Spike Dup Analyzed: 01/26/2005 (5A26113-MSD1)						**Source: IOA1551-01**					
Copper	81.2	2.0	0.49	ug/l	80.0	1.7	99	70-130	1	20	
Lead	77.1	1.0	0.13	ug/l	80.0	ND	96	70-130	0	20	
Batch: 5A27047 Extracted: 01/27/05											
Blank Analyzed: 01/27/2005 (5A27047-BLK1)											
Mercury	ND	0.20	0.063	ug/l							
LCS Analyzed: 01/27/2005 (5A27047-BS1)											
Mercury	8.51	0.20	0.063	ug/l	8.00		106	85-115			
Matrix Spike Analyzed: 01/27/2005 (5A27047-MS1)						**Source: IOA1551-01**					
Mercury	8.65	0.20	0.063	ug/l	8.00	0.13	106	70-130			
Matrix Spike Dup Analyzed: 01/27/2005 (5A27047-MSD1)						**Source: IOA1551-01**					
Mercury	8.48	0.20	0.063	ug/l	8.00	0.13	104	70-130	2	20	

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 001

Report Number: IOA1551

Sampled: 01/26/05
Received: 01/26/05

METHOD BLANK/QC DATA

INORGANICS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A26051 Extracted: 01/26/05											
Blank Analyzed: 01/26/2005 (5A26051-BLK1)											
Chloride	ND	0.50	0.26	mg/l							
Nitrate/Nitrite-N	ND	0.26	0.072	mg/l							
Sulfate	ND	0.50	0.18	mg/l							
LCS Analyzed: 01/26/2005 (5A26051-BS1)											
Chloride	4.65	0.50	0.26	mg/l	5.00		93	90-110			
Sulfate	9.60	0.50	0.18	mg/l	10.0		96	90-110			
Matrix Spike Analyzed: 01/26/2005 (5A26051-MS1)						**Source: IOA1551-01**					
Chloride	23.7	0.50	0.26	mg/l	5.00	19	94	80-120			
Sulfate	37.9	0.50	0.18	mg/l	10.0	28	99	80-120			
Matrix Spike Dup Analyzed: 01/26/2005 (5A26051-MSD1)						**Source: IOA1551-01**					
Chloride	23.4	0.50	0.26	mg/l	5.00	19	88	80-120	1	20	
Sulfate	38.1	0.50	0.18	mg/l	10.0	28	101	80-120	1	20	
Batch: 5A26077 Extracted: 01/26/05											
Blank Analyzed: 01/26/2005 (5A26077-BLK1)											
Oil & Grease	ND	5.0	0.94	mg/l							
LCS Analyzed: 01/26/2005 (5A26077-BS1)											**M-NR1**
Oil & Grease	18.6	5.0	0.94	mg/l	20.0		93	65-120			
LCS Dup Analyzed: 01/26/2005 (5A26077-BSD1)											
Oil & Grease	18.5	5.0	0.94	mg/l	20.0		92	65-120	1	20	

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 001

Report Number: IOA1551

Sampled: 01/26/05
Received: 01/26/05

METHOD BLANK/QC DATA

INORGANICS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A26108 Extracted: 01/26/05											
Blank Analyzed: 01/26/2005 (5A26108-BLK1)											
Surfactants (MBAS)	ND	0.10	0.044	mg/l							
LCS Analyzed: 01/26/2005 (5A26108-BS1)											
Surfactants (MBAS)	0.255	0.10	0.044	mg/l	0.250		102	90-110			
Matrix Spike Analyzed: 01/26/2005 (5A26108-MS1)						**Source: IOA1558-02**					
Surfactants (MBAS)	0.240	0.10	0.044	mg/l	0.250	ND	96	50-125			
Matrix Spike Dup Analyzed: 01/26/2005 (5A26108-MSD1)						**Source: IOA1558-02**					
Surfactants (MBAS)	0.257	0.10	0.044	mg/l	0.250	ND	103	50-125	7	20	
Batch: 5A26117 Extracted: 01/26/05											
Blank Analyzed: 01/26/2005 (5A26117-BLK1)											
Total Cyanide	ND	5.0	2.2	ug/l							
LCS Analyzed: 01/26/2005 (5A26117-BS1)											
Total Cyanide	196	5.0	2.2	ug/l	200		98	90-110			
Matrix Spike Analyzed: 01/26/2005 (5A26117-MS1)						**Source: IOA1551-01**					
Total Cyanide	198	5.0	2.2	ug/l	200	ND	99	70-115			
Matrix Spike Dup Analyzed: 01/26/2005 (5A26117-MSD1)						**Source: IOA1551-01**					
Total Cyanide	184	5.0	2.2	ug/l	200	ND	92	70-115	7	15	
Batch: 5A27049 Extracted: 01/27/05											
Blank Analyzed: 02/01/2005 (5A27049-BLK1)											
Biochemical Oxygen Demand	ND	2.0	0.59	mg/l							

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 001

Report Number: IOA1551

Sampled: 01/26/05
Received: 01/26/05

METHOD BLANK/QC DATA

INORGANICS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A27049 Extracted: 01/27/05											
LCS Analyzed: 02/01/2005 (5A27049-BS1)											
Biochemical Oxygen Demand	206	100	30	mg/l	198		104	85-115			
LCS Dup Analyzed: 02/01/2005 (5A27049-BSD1)											
Biochemical Oxygen Demand	204	100	30	mg/l	198		103	85-115	1	20	
Batch: 5A27057 Extracted: 01/27/05											
Blank Analyzed: 01/27/2005 (5A27057-BLK1)											
Turbidity	ND	1.0	0.040	NTU							
Duplicate Analyzed: 01/27/2005 (5A27057-DUP1)						**Source: IOA1457-01**					
Turbidity	10.2	1.0	0.040	NTU		10			2	20	
Batch: 5A27101 Extracted: 01/27/05											
Blank Analyzed: 01/27/2005 (5A27101-BLK1)											
Total Suspended Solids	ND	10	10	mg/l							
LCS Analyzed: 01/27/2005 (5A27101-BS1)											
Total Suspended Solids	977	10	10	mg/l	1000		98	85-115			
Duplicate Analyzed: 01/27/2005 (5A27101-DUP1)						**Source: IOA1542-02**					
Total Suspended Solids	ND	10	10	mg/l		ND				10	
Batch: 5A28077 Extracted: 01/28/05											
Blank Analyzed: 01/28/2005 (5A28077-BLK1)											
Ammonia-N (Distilled)	ND	0.50	0.30	mg/l							

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Sampled: 01/26/05
Received: 01/26/05

METHOD BLANK/QC DATA

INORGANICS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A28077 Extracted: 01/28/05											
LCS Analyzed: 01/28/2005 (5A28077-BS1)											
Ammonia-N (Distilled)	10.1	0.50	0.30	mg/l	10.0		101	80-115			
Matrix Spike Analyzed: 01/28/2005 (5A28077-MS1)						**Source: IOA1520-01**					
Ammonia-N (Distilled)	9.24	0.50	0.30	mg/l	10.0	ND	92	70-120			
Matrix Spike Dup Analyzed: 01/28/2005 (5A28077-MSD1)						**Source: IOA1520-01**					
Ammonia-N (Distilled)	9.80	0.50	0.30	mg/l	10.0	ND	98	70-120	6	15	
Batch: 5A28087 Extracted: 01/28/05											
Duplicate Analyzed: 01/28/2005 (5A28087-DUP1)						**Source: IOA1740-01**					
Specific Conductance	136	1.0	1.0	umhos/cm		130			5	5	
Batch: 5A28091 Extracted: 01/28/05											
Blank Analyzed: 01/28/2005 (5A28091-BLK1)											
Total Dissolved Solids	ND	10	10	mg/l							
LCS Analyzed: 01/28/2005 (5A28091-BS1)											
Total Dissolved Solids	908	10	10	mg/l	1000		91	90-110			
Duplicate Analyzed: 01/28/2005 (5A28091-DUP1)						**Source: IOA1548-02**					
Total Dissolved Solids	586	10	10	mg/l		590			1	10	
Batch: 5A30022 Extracted: 01/30/05											
Blank Analyzed: 01/30/2005 (5A30022-BLK1)											
Perchlorate	ND	4.0	0.80	ug/l							

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Attention: Bronwyn Kelly

Project ID: Routine Outfall 001

Report Number: IOA1551

Sampled: 01/26/05
Received: 01/26/05

METHOD BLANK/QC DATA

INORGANICS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A30022 Extracted: 01/30/05											
LCS Analyzed: 01/30/2005 (5A30022-BS1)											
Perchlorate	54.1	4.0	0.80	ug/l	50.0		108	85-115			
Matrix Spike Analyzed: 01/30/2005 (5A30022-MS1)						**Source: IOA1744-02**					
Perchlorate	58.9	4.0	0.80	ug/l	50.0	0.87	116	80-120			
Matrix Spike Dup Analyzed: 01/30/2005 (5A30022-MSD1)						**Source: IOA1744-02**					
Perchlorate	54.3	4.0	0.80	ug/l	50.0	0.87	107	80-120	8	20	

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Sampled: 01/26/05
Received: 01/26/05

Compliance Check

The results obtained from the analytical testing of this data set were checked against compliance limits received from the client. Any results at or above the compliance limits appear in bold on this page.

LabNumber	Analysis	Analyte	Units	Result	MRL	Compliance Limit
IOA1551-01	413.1 Oil and Grease	Oil & Grease	mg/l	0.29	5.0	10.00
IOA1551-01	608-Pest Boeing 001/002 Q (LL)	alpha-BHC	ug/l	0	0.010	0.0100
IOA1551-01	624-Boeing 001/002 Q (Fr113+X)	1,1-Dichloroethene	ug/l	0	3.0	3.20
IOA1551-01	624-Boeing 001/002 Q (Fr113+X)	Trichloroethene	ug/l	0	5.0	5.00
IOA1551-01	625-Boeing 001/002 Q-LL	2,4,6-Trichlorophenol	ug/l	0	6.0	6.50
IOA1551-01	625-Boeing 001/002 Q-LL	2,4-Dinitrotoluene	ug/l	0	9.0	9.10
IOA1551-01	625-Boeing 001/002 Q-LL	Bis(2-ethylhexyl)phthalate	ug/l	0.34	5.0	4.00
IOA1551-01	625-Boeing 001/002 Q-LL	N-Nitrosodimethylamine	ug/l	0	8.0	8.10
IOA1551-01	625-Boeing 001/002 Q-LL	Pentachlorophenol	ug/l	0	8.0	8.20
IOA1551-01	BOD	Biochemical Oxygen Demand	mg/l	0.75	2.0	20
IOA1551-01	Chloride - 300.0	Chloride	mg/l	19	0.50	150
IOA1551-01	Copper-200.8	Copper	ug/l	1.70	2.0	7.10
IOA1551-01	Cyanide-335.2 5ppb	Total Cyanide	ug/l	-5	5.0	4.30
IOA1551-01	Lead-200.8	Lead	ug/l	0.063	1.0	2.60
IOA1551-01	MBAS - SM5540-C	Surfactants (MBAS)	mg/l	0.081	0.10	0.50
IOA1551-01	Mercury - 245.1	Mercury	ug/l	0.13	0.20	0.20
IOA1551-01	Nitrogen, NO3+NO2 -N	Nitrate/Nitrite-N	mg/l	0.38	0.26	8.00
IOA1551-01	Perchlorate 314.0	Perchlorate	ug/l	0	4.0	6.00
IOA1551-01	Sulfate-300.0	Sulfate	mg/l	28	0.50	300
IOA1551-01	TDS - SM 2540C	Total Dissolved Solids	mg/l	140	10	950
IOA1551-02	624-Boeing 001/002 Q (Fr113+X)	1,1-Dichloroethene	ug/l	0	3.0	3.20
IOA1551-02	624-Boeing 001/002 Q (Fr113+X)	Trichloroethene	ug/l	0	5.0	5.00

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Report Number: IOA1551

Sampled: 01/26/05
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DATA QUALIFIERS AND DEFINITIONS

J	Estimated value. Analyte detected at a level less than the Reporting Limit (RL) and greater than or equal to the Method Detection Limit (MDL). The user of this data should be aware that this data is of unknown quality.
M-NR1	There was no MS/MSD analyzed with this batch due to insufficient sample volume. See Blank Spike/Blank Spike Duplicate.
ND	Analyte NOT DETECTED at or above the reporting limit or MDL, if MDL is specified.
RPD	Relative Percent Difference

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Michele Harper
Project Manager

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Sampled: 01/26/05
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Certification Summary

Del Mar Analytical, Irvine

Method	Matrix	Nelac	California
EPA 120.1	Water	X	X
EPA 160.2	Water	X	X
EPA 160.5	Water	X	X
EPA 180.1	Water	X	X
EPA 200.8	Water	X	X
EPA 245.1	Water	X	X
EPA 300.0	Water	X	X
EPA 314.0	Water	X	X
EPA 335.2	Water	X	X
EPA 350.2	Water	X	X
EPA 405.1	Water	X	X
EPA 413.1	Water	X	X
EPA 608	Water	X	X
EPA 624	Water	X	X
EPA 625	Water	X	X
SM2540C	Water	X	X
SM5540-C	Water	X	X

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Subcontracted Laboratories

Pace Analytical, MN- SUB

1700 Elm Street, Ste 200 - Minneapolis, MN 55414

Analysis Performed: 1613-Dioxin-HR
Samples: IOA1551-01

Analysis Performed: EDD + Level 4
Samples: IOA1551-01

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Project Manager

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Del Mar Analytical Version 5 8/12/04 CHAIN OF CUSTODY FORM

Client Name/Address:
MWH-Pasadena
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101

Project Manager: Bronwyn Kelly

Sampler: Rick Banagu

Project:
Boeing-SSFL NPDES
Routine Outfall 001

Phone Number:
(626) 568-6691
Fax Number:
(626) 568-6515

ANALYSIS REQUIRED 1OA/1551

Sample Description	Sample Matrix	Container Type	# of Cont.	Sampling Date/Time	Preservative	Bottle * #	Total Reoverable Metals: Cu, Pb, Hg, .	Settleable Solids .	VOCs 624 + xylenes .	TCDD (and all congeners)	Oil & Grease (EPA 413.1)	Cyanide (total recoverable)	BOD5(20 degrees C)	Surfactants (MBAS) .	Cl-, SO4, NO3+NO2-N, Perchlorate	Turbidity, TDS, TSS, Conductivity	Ammonia-N	Alpha BHC (608)	2,4,6 Trichlorophenol, 2,4 Dinitrotoluene, Bis(2-ethylhexyl)phthalate, NDMA, pentachlorophenol (EPA 625)		Comments
Outfall 001	W	Poly-1L	1	1-26-05 11:43	HNO3	1A	X														24 TAT
Outfall 001-Dup	W	Poly-1L	1		HNO3	1B	X														24 TAT
Outfall 001	W	Poly-1L	1		None	2		X													
Outfall 001	W	VOAs	3		HCl	3A, 3B, 3C			X												
Outfall 001	W	1L Amber	2		None	4A, 4B				X											
Outfall 001	W	1L Amber	2		HCl	5A, 5B					X										24 TAT
Outfall 001	W	Poly-500 ml	1		NaOH	6						X									24 TAT
Outfall 001	W	Poly-1L	1		None	7							X								
Outfall 001	W	Poly-500 ml	2		None	8A, 8B								X							
Outfall 001	W	Poly-500 ml	2		None	9A, 9B									X						
Outfall 001	W	Poly-500 ml	2		None	10A, 10B										X					
Outfall 001	W	Poly-500 ml	1		H2SO4	11											X				
Outfall 001	W	1L Amber	2		None	12A, 12B												X			
Outfall 001	W	1L Amber	2	1-26-05 11:43	None	13A, 13B													X		
Trip Blank	W	VOAs	3		HCl	14A, 14B, 14C,			X												

Field readings:
Temp = 57.7
pH= 7.09

Relinquished By	Date/Time:	Received By	Date/Time:
[signature]	1-26-05 1410	[signature]	1/26/05 1410
[signature]	1/26/05 1705	[signature]	1/26/05 1705
Relinquished By	Date/Time:	Received By	Date/Time:

Turn around Time: (check)
24 Hours _____ 5 Days _____
48 Hours _____ 10 Days _____
72 Hours _____ Normal ✓

Perchlorate Only 72 Hours _____

Metals Only 72 Hours _____

Sample Integrity: (Check)
Intact ✓ On Ice: ✓ 3°C

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March 10, 2005

MWH-Pasadena/Boeing
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Attention: Bronwyn Kelly

Project: Routine Outfall 001
Sampled: 01/26/05
Del Mar Analytical Number: IOA1551

Dear Ms. Kelly:

Pace Analytical performed Method 1613B analysis for the project referenced above. Please use the following cross-reference table when reviewing your results.

MWH ID	DEL MAR ID	Pace ID
Outfall 001	IOA1551-01	106840001

Attached is the original report from the subcontract laboratory. If you have any questions or require further assistance, please do not hesitate to contact me.

Sincerely yours,
DEL MAR ANALYTICAL

Michele Harper
Project Manager

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Pace Analytical™

Method 1613B Analysis Results

Client - Del Mar Analytical

Client's Sample ID	IOA1551-01		
Lab Sample ID	106840001		
Filename	F50204A_03		
Injected By	MRO		
Total Amount Extracted	1030 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	01/26/2005
ICAL Date	11/29/2004	Received	01/28/2005
CCal Filename(s)	F50203A_20	Extracted	01/31/2005
Method Blank ID	BLANK-6241	Analyzed	02/04/2005 11:38

Native Isomers	Conc pg/L	EMPC pg/L	LOD pg/L		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	1.90		2,3,7,8-TCDF-13C	2.00	61
Total TCDF	ND	-----	1.90		2,3,7,8-TCDD-13C	2.00	66
					1,2,3,7,8-PeCDF-13C	2.00	67
2,3,7,8-TCDD	ND	-----	2.30		2,3,4,7,8-PeCDF-13C	2.00	81
Total TCDD	ND	-----	2.30		1,2,3,7,8-PeCDD-13C	2.00	83
					1,2,3,4,7,8-HxCDF-13C	2.00	66
1,2,3,7,8-PeCDF	ND	-----	1.80		1,2,3,6,7,8-HxCDF-13C	2.00	76
2,3,4,7,8-PeCDF	ND	-----	1.30		2,3,4,6,7,8-HxCDF-13C	2.00	70
Total PeCDF	ND	-----	1.50		1,2,3,7,8,9-HxCDF-13C	2.00	70
					1,2,3,4,7,8-HxCDD-13C	2.00	68
1,2,3,7,8-PeCDD	ND	-----	1.50		1,2,3,6,7,8-HxCDD-13C	2.00	68
Total PeCDD	ND	-----	1.50		1,2,3,4,6,7,8-HpCDF-13C	2.00	61
					1,2,3,4,7,8,9-HpCDF-13C	2.00	61
1,2,3,4,7,8-HxCDF	-----	1.5	1.40	I	1,2,3,4,6,7,8-HpCDD-13C	2.00	72
1,2,3,6,7,8-HxCDF	ND	-----	1.30		OCDD-13C	4.00	72
2,3,4,6,7,8-HxCDF	ND	-----	0.86				
1,2,3,7,8,9-HxCDF	ND	-----	0.96		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	-----	1.10		1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	1.50		2,3,7,8-TCDD-37Cl4	0.20	63
1,2,3,6,7,8-HxCDD	ND	-----	1.60				
1,2,3,7,8,9-HxCDD	ND	-----	1.30				
Total HxCDD	ND	-----	1.40				
1,2,3,4,6,7,8-HpCDF	6.6	-----	1.50	BJ			
1,2,3,4,7,8,9-HpCDF	ND	-----	1.60				
Total HpCDF	45.0	-----	1.60	J			
1,2,3,4,6,7,8-HpCDD	9.1	-----	2.00	J			
Total HpCDD	13.0	-----	2.00	J			
OCDF	50.0	-----	1.20	BJ			
OCDD	45.0	-----	2.50	J			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection. Totals are averages of individual isomer LODs.
D = Result obtained from analysis of diluted sample
B = Less than 10 times higher than method blank level
P = Recovery outside of method 1613 control limits
J = Concentration detected is below the calibration range
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....106840

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Pace Analytical™

Method 1613B Blank Analysis Results

Client - Del Mar Analytical

Lab Sample ID	BLANK-6241	Matrix	Water
Filename	U50202B_06	Dilution	NA
Total Amount Extracted	1040 mL	Extracted	01/31/2005
ICAL Date	01/26/2005	Analyzed	02/02/2005 23:46
CCal Filename(s)	U50202B_01	Injected By	SMT

Native Isomers	Conc pg/L	EMPC pg/L	LOD pg/L		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	0.59		2,3,7,8-TCDF-13C	2.00	86
Total TCDF	1.10	-----	-----	J	2,3,7,8-TCDD-13C	2.00	86
					1,2,3,7,8-PeCDF-13C	2.00	92
2,3,7,8-TCDD	ND	-----	1.30		2,3,4,7,8-PeCDF-13C	2.00	98
Total TCDD	ND	-----	-----		1,2,3,7,8-PeCDD-13C	2.00	105
					1,2,3,4,7,8-HxCDF-13C	2.00	83
1,2,3,7,8-PeCDF	-----	0.73	0.53	I	1,2,3,6,7,8-HxCDF-13C	2.00	76
2,3,4,7,8-PeCDF	ND	-----	0.63		2,3,4,6,7,8-HxCDF-13C	2.00	79
Total PeCDF	ND	-----	-----		1,2,3,7,8,9-HxCDF-13C	2.00	82
					1,2,3,4,7,8-HxCDD-13C	2.00	82
1,2,3,7,8-PeCDD	ND	-----	1.10		1,2,3,6,7,8-HxCDD-13C	2.00	66
Total PeCDD	ND	-----	-----		1,2,3,4,6,7,8-HpCDF-13C	2.00	75
					1,2,3,4,7,8,9-HpCDF-13C	2.00	69
1,2,3,4,7,8-HxCDF	-----	1.30	0.26	E	1,2,3,4,6,7,8-HpCDD-13C	2.00	77
1,2,3,6,7,8-HxCDF	-----	0.75	0.29	E	OCDD-13C	4.00	79
2,3,4,6,7,8-HxCDF	-----	0.71	0.31	I			
1,2,3,7,8,9-HxCDF	-----	1.00	0.41	E	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	0.34	-----	-----	J	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	1.10		2,3,7,8-TCDD-37Cl4	0.20	89
1,2,3,6,7,8-HxCDD	ND	-----	0.69				
1,2,3,7,8,9-HxCDD	ND	-----	0.95				
Total HxCDD	ND	-----	-----				
1,2,3,4,6,7,8-HpCDF	1.20	-----	0.71	J			
1,2,3,4,7,8,9-HpCDF	ND	-----	0.99				
Total HpCDF	4.30	-----	-----	J			
1,2,3,4,6,7,8-HpCDD	-----	1.60	0.86	I			
Total HpCDD	ND	-----	-----				
OCDF	6.50	-----	1.20	J			
OCDD	-----	8.30	0.74	I			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection. Totals are averages of individual isomer LODs.
A = Limit of Detection based on signal to noise
P = Recovery outside of method 1613 control limits
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....106475

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

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Method 1613B Laboratory Control Spike Results

Client - Del Mar Analytical

Lab Sample ID	LCS-6242		
Filename	U50202B_02	Matrix	Water
Total Amount Extracted	1040 mL	Dilution	NA
ICAL Date	01/26/2005	Extracted	01/31/2005
CCal Filename	U50202B_01	Analyzed	02/02/2005 20:28
Method Blank ID	BLANK-6241	Injected By	SMT

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDF	10	8.8	7.5	15.8	88
2,3,7,8-TCDD	10	8.6	6.7	15.8	86
1,2,3,7,8-PeCDF	50	43.6	40.0	67.0	87
2,3,4,7,8-PeCDF	50	42.3	34.0	80.0	85
1,2,3,7,8-PeCDD	50	38.0	35.0	71.0	76
1,2,3,4,7,8-HxCDF	50	39.1	36.0	67.0	78
1,2,3,6,7,8-HxCDF	50	42.0	42.0	65.0	84
2,3,4,6,7,8-HxCDF	50	40.4	35.0	78.0	81
1,2,3,7,8,9-HxCDF	50	39.6	39.0	65.0	79
1,2,3,4,7,8-HxCDD	50	43.2	35.0	82.0	86
1,2,3,6,7,8-HxCDD	50	42.9	38.0	67.0	86
1,2,3,7,8,9-HxCDD	50	45.4	32.0	81.0	91
1,2,3,4,6,7,8-HpCDF	50	44.2	41.0	61.0	88
1,2,3,4,7,8,9-HpCDF	50	46.8	39.0	69.0	94
1,2,3,4,6,7,8-HpCDD	50	41.4	35.0	70.0	83
OCDF	100	79.6	63.0	170.0	80
OCDD	100	85.8	78.0	144.0	86
2,3,7,8-TCDD-37Cl4	10	7.8	3.1	19.1	78
2,3,7,8-TCDF-13C	100	85.1	22.0	152.0	85
2,3,7,8-TCDD-13C	100	80.0	20.0	175.0	80
1,2,3,7,8-PeCDF-13C	100	90.8	21.0	192.0	91
2,3,4,7,8-PeCDF-13C	100	94.3	13.0	328.0	94
1,2,3,7,8-PeCDD-13C	100	102.1	21.0	227.0	102
1,2,3,4,7,8-HxCDF-13C	100	81.8	19.0	202.0	82
1,2,3,6,7,8-HxCDF-13C	100	78.8	21.0	159.0	79
2,3,4,6,7,8-HxCDF-13C	100	83.3	22.0	176.0	83
1,2,3,7,8,9-HxCDF-13C	100	85.0	17.0	205.0	85
1,2,3,4,7,8-HxCDD-13C	100	83.5	21.0	193.0	83
1,2,3,6,7,8-HxCDD-13C	100	71.7	25.0	163.0	72
1,2,3,4,6,7,8-HpCDF-13C	100	76.4	21.0	158.0	76
1,2,3,4,7,8,9-HpCDF-13C	100	67.0	20.0	186.0	67
1,2,3,4,6,7,8-HpCDD-13C	100	73.0	26.0	166.0	73
OCDD-13C	200	148.7	26.0	397.0	74

Cs = Concentration Spiked (ng/mL)
Cr = Concentration Recovered (ng/mL)
Rec. = Recovery (Expressed as Percent)
Control Limit Reference: Method 1613, Table 6, 10/94 Revision
X = Background subtracted value
P = Recovery outside of control limits
Nn = Value obtained from additional analysis
* = See Discussion

Report No.....106475

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Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 1613B Laboratory Control Spike Results

Client - Del Mar Analytical

Lab Sample ID	LCSD-6243		
Filename	U50202B_03	Matrix	Water
Total Amount Extracted	1030 mL	Dilution	NA
ICAL Date	01/26/2005	Extracted	01/31/2005
CCal Filename	U50202B_01	Analyzed	02/02/2005 21:15
Method Blank ID	BLANK-6241	Injected By	SMT

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDF	10	9.7	7.5	15.8	97
2,3,7,8-TCDD	10	9.4	6.7	15.8	94
1,2,3,7,8-PeCDF	50	46.8	40.0	67.0	94
2,3,4,7,8-PeCDF	50	44.6	34.0	80.0	89
1,2,3,7,8-PeCDD	50	40.7	35.0	71.0	81
1,2,3,4,7,8-HxCDF	50	41.3	36.0	67.0	83
1,2,3,6,7,8-HxCDF	50	44.5	42.0	65.0	89
2,3,4,6,7,8-HxCDF	50	43.6	35.0	78.0	87
1,2,3,7,8,9-HxCDF	50	42.2	39.0	65.0	84
1,2,3,4,7,8-HxCDD	50	49.1	35.0	82.0	98
1,2,3,6,7,8-HxCDD	50	45.6	38.0	67.0	91
1,2,3,7,8,9-HxCDD	50	51.3	32.0	81.0	103
1,2,3,4,6,7,8-HpCDF	50	47.5	41.0	61.0	95
1,2,3,4,7,8,9-HpCDF	50	50.1	39.0	69.0	100
1,2,3,4,6,7,8-HpCDD	50	44.5	35.0	70.0	89
OCDF	100	89.7	63.0	170.0	90
OCDD	100	91.5	78.0	144.0	92
2,3,7,8-TCDD-37Cl4	10	9.3	3.1	19.1	93
2,3,7,8-TCDF-13C	100	100.2	22.0	152.0	100
2,3,7,8-TCDD-13C	100	97.2	20.0	175.0	97
1,2,3,7,8-PeCDF-13C	100	109.5	21.0	192.0	109
2,3,4,7,8-PeCDF-13C	100	114.8	13.0	328.0	115
1,2,3,7,8-PeCDD-13C	100	124.2	21.0	227.0	124
1,2,3,4,7,8-HxCDF-13C	100	93.9	19.0	202.0	94
1,2,3,6,7,8-HxCDF-13C	100	88.8	21.0	159.0	89
2,3,4,6,7,8-HxCDF-13C	100	89.8	22.0	176.0	90
1,2,3,7,8,9-HxCDF-13C	100	96.4	17.0	205.0	96
1,2,3,4,7,8-HxCDD-13C	100	86.2	21.0	193.0	86
1,2,3,6,7,8-HxCDD-13C	100	80.0	25.0	163.0	80
1,2,3,4,6,7,8-HpCDF-13C	100	85.0	21.0	158.0	85
1,2,3,4,7,8,9-HpCDF-13C	100	80.0	20.0	186.0	80
1,2,3,4,6,7,8-HpCDD-13C	100	81.7	26.0	166.0	82
OCDD-13C	200	177.3	26.0	397.0	89

Cs = Concentration Spiked (ng/mL)
Cr = Concentration Recovered (ng/mL)
Rec. = Recovery (Expressed as Percent)
Control Limit Reference: Method 1613, Table 6, 10/94 Revision
X = Background subtracted value
P = Recovery outside of control limits
Nn = Value obtained from additional analysis
* = See Discussion

Report No.....106475

REPORT OF LABORATORY ANALYSIS

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SPIKE RECOVERY RELATIVE PERCENT DIFFERENCE (RPD) RESULTS

Client..... Del Mar Analytical

SPIKE 1 ID..... LCS-6242
SPIKE 1 Filename..... U50202B_02
SPIKE 2 ID..... LCSD-6243
SPIKE 2 Filename..... U50202B_03

COMPOUND	SPIKE 1 REC,%	SPIKE 2 REC,%	RPD,%
2378-TCDF	88	97	9.7
2378-TCDD	86	94	8.9
12378-PeCDF	87	94	7.7
23478-PeCDF	85	89	4.6
12378-PeCDD	76	81	6.4
123478-HxCDF	78	83	6.2
123678-HxCDF	84	89	5.8
234678-HxCDF	81	87	7.1
123789-HxCDF	79	84	6.1
123478-HxCDD	86	98	13.0
123678-HxCDD	86	91	5.6
123789-HxCDD	91	103	12.4
1234678-HpCDF	88	95	7.7
1234789-HpCDF	94	100	6.2
1234678-HpCDD	83	89	7.0
OCDF	80	90	11.8
OCDD	86	92	6.7

REC = Percent Recovered
RPD = The difference between the two values divided by the average.
NA = Not Applicable

Report No..... 106475

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TABLE 1. 2,3,7,8-TCDD Equivalency Factors (TEFs) for the Polychlorinated Dibenzo-p-dioxins and Dibenzofurans

Number	Compound(s)	TEF
1	2,3,7,8-TCDD	1.00
2	1,2,3,7,8-PeCDD	0.50
3	1,2,3,6,7,8-HxCDD	0.1
4	1,2,3,7,8,9-HxCDD	0.1
5	1,2,3,4,7,8-HxCDD	0.1
6	1,2,3,4,6,7,8-HpCDD	0.01
7	OCDD	0.001
8	* Total - TCDD	0.0
9	* Total - PeCDD	0.0
10	* Total - HxCDD	0.0
11	* Total - HpCDD	0.0
12	2,3,7,8-TCDF	0.10
13	1,2,3,7,8-PeCDF	0.05
14	2,3,4,7,8-PeCDF	0.5
15	1,2,3,6,7,8-HxCDF	0.1
16	1,2,3,7,8,9-HxCDF	0.1
17	1,2,3,4,7,8-HxCDF	0.1
18	2,3,4,6,7,8-HxCDF	0.1
19	1,2,3,4,6,7,8-HpCDF	0.01
20	1,2,3,4,7,8,9-HpCDF	0.01
21	OCDF	0.001
22	* Total - TCDF	0.0
23	* Total - PeCDF	0.0
24	* Total - HxCDF	0.0
25	* Total - HpCDF	0.0

*Excluding the 2,3,7,8-substituted congeners.

Reference: 1989 ITEFs

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Del Mar Analytical

17461 Derian Ave, Suite 100, Irvine, CA 92614 Ph (949) 261-1022 Fax (949) 261-1228
1014 E. Cooley Dr., Suite A, Colton, CA 92324 Ph (909) 370-4667 Fax (909) 370-1046
9484 Chesapeake Drive, Suite 805, San Diego, CA 92123 Ph (619) 505-9596 Fax (619) 505-9689
9830 South 51st Street, Suite B-120, Phoenix, AZ 85044 Ph (480) 785-0043 Fax (480) 785-0851
2520 E. Sunset Rd., Suite #3, Las Vegas, NV 89120 Ph (702) 798-3620 Fax (702) 798-3621

SUBCONTRACT ORDER - PROJECT # IOA1551

SENDING LABORATORY:

Del Mar Analytical, Irvine
17461 Derian Avenue. Suite 100
Irvine, CA 92614
Phone: (949) 261-1022
Fax: (949) 261-1228
Project Manager: Michele Harper

RECEIVING LABORATORY:

Pace Analytical, MN- SUB
1700 Elm Street, Ste 200
Minneapolis, MN 55414
Phone :(612) 607-1700
Fax: (612) 607-6444

Standard TAT is requested unless specific due date is requested => Due Date:_____ Initials:_____

Analysis	Expiration	Comments
Sample ID: IOA1551-01 Water	**Sampled: 01/26/05 11:45**	**"Instant Nofication"**
1613-Dioxin-HR	02/02/05 11:45	J flags, 17 congeners, no TEQ, sub to Pace-MN
EDD + Level 4	02/23/05 11:45	Excel EDD email to pm,Include Std logs for Lvl IV

Containers Supplied:
1 L Amber (IOA1551-01G)
1 L Amber (IOA1551-01H)

SAMPLE INTEGRITY:

All containers intact: ☐ Yes ☐ No Sample labels/COC agree: ☐ Yes ☐ No Samples Received On Ice:: ☒ Yes ☐ No
Custody Seals Present: ☐ Yes ☐ No Samples Preserved Properly: ☐ Yes ☐ No Samples Received at (temp): 1.3°C

Released By	Date	Time	Received By	Date	Time
	1-27-05	1700		1/28/05	1015

APPENDIX G

Section 2

January Outfall 002

AMEC Data Validation Reports

Del Mar Analytical Laboratory Reports

CONTRACT COMPLIANCE SCREENING FORM FOR HARDCOPY DATA

AMEC Earth & Environmental
550 South Wadsworth Boulevard
Suite 500
Lakewood, CO 80226

Laboratory Alta
Reviewer K. Shadowlight
Analysis/Method Dioxins

Package ID T711DF20
Task Order 313150010
SDG No. Multiple
No. of Analyses 15

Date: February 11, 2005
Reviewer's Signature K Shadowlight

ACTION ITEMS[a]	
1. **Case Narrative Deficiencies**	
2. **Out of Scope Analyses**	
3. **Analyses Not Conducted**	
4. **Missing Hardcopy Deliverables**	
5. **Incorrect Hardcopy Deliverables**	
6. **Deviations from Analysis Protocol, e.g.,**	Qualifications were assigned for the following:
Holding Times	* Method blank contamination
GC/MS Tune/Inst. Performance	* EMPCs
Calibration	* Detects below the lower method calibration level
Method blanks	
Surrogates	
Matrix Spike/Dup LCS	
Field QC	
Internal Standard Performance	
Compound Identification and Quantitation	
System Performance	
COMMENTS[b]	Rev. 1

[a] Subcontracted analytical laboratory is not meeting contract and/or method requirements.
[b] Differences in protocol have been adopted by the laboratory but no action against the laboratory is required.

DATA VALIDATION REPORT

NPDES
Monitoring

ANALYSIS: DIOXINS/FURANS

SAMPLE DELIVERY GROUPS: Multiple SDGs

Prepared by

AMEC—Denver Operations
550 South Wadsworth Boulevard, Suite 500
Lakewood, Colorado 80226

1. INTRODUCTION

Task Order Title:	NPDES Monitoring
Contract Task Order #:	313150010
Sample Delivery Group #:	Multiple
Project Manager:	B. McIlvaine
Matrix:	Water
Analysis:	Dioxins/Furans
QC Level:	Level IV
No. of Samples:	15
No. of Reanalyses/Dilutions:	0
Reviewer:	K. Shadowlight
Date of Review:	February 11, 2005

The samples listed in Table 1 were validated based on the guidelines outlined in the *AMEC Data Validation Procedure for Dioxins and Furans (DVP-19, Rev. 1), EPA Method 1613, and the National National Functional Guidelines For Chlorinated Dioxin/Furan Data Review* (8/02). Any deviations from these procedures and guidelines are documented herein. Qualifiers were applied in cases where the data did not meet the required QC criteria or where special consideration by the data user is required. Data qualifiers were placed on Form Is with the associated qualification codes. Analytes that were rejected for any reason are denoted on the Form I as having only the "R" data qualifier and associated qualification code(s) denoting the reason for rejection. Any additional problems with the data that may have resulted in an estimated value were not denoted by a qualification code since the data had already been rejected.

Table 1. Sample Identification

Client ID	Laboratory ID (Del Mar)	Laboratory ID (Pace)	Matrix	COC Method
Outfall 003	IOA0026-01	105648001	water	1613
Outfall 004	IOA0027-01	105646001	water	1613
Outfall 005	IOA0028-01	105645001	water	1613
Outfall 007	IOA0108-01	105774001	water	1613
Outfall 008	IOA0109-01	105775001	water	1613
Outfall 009	IOA0110-01	105770001	water	1613
Outfall 010	IOA0111-01	105758001	water	1613
Outfall 001	IOA0112-01	105778001	water	1613
Outfall 002	IOA0119-01	105772001	water	1613
Outfall 018	IOA0122-01	105779001	water	1613
Outfall 011	IOA0131-01	105773001	water	1613
Outfall 006	IOA0458-01	106048001	water	1613
Outfall 004	IOA0460-01	106050001	water	1613
Outfall 005	IOA0464-01	106052001	water	1613
Outfall 003	IOA0466-01	106051001	water	1613

2. DATA VALIDATION FINDINGS

2.1 SAMPLE MANAGEMENT

Following are findings associated with sample management:

2.1.1 Sample Preservation, Handling, and Transport

All of the samples in these SDGs were received at Del Mar Analytical within the temperature limits of 4°C ±2°C. Several of the samples in these SDGs were received at Pace Analytical Services below the temperature limits of 4°C ±2°C; however, as none of the samples were noted to have been damaged, no qualifications were required. The samples were received in good condition at both laboratories. No qualifications were required.

2.1.2 Chain of Custody

The COC and transfer COC were signed by the appropriate field and laboratory personnel, and accounted for the analyses presented in these SDGs. As the samples were couriered directly to the laboratory (Del Mar Analytical), custody seals were not required. There was no information regarding custody seals upon receipt at Pace. No qualifications were required.

2.1.3 Holding Times

The samples were extracted and analyzed within a year of collection. No qualifications were required.

2.2 INSTRUMENT PERFORMANCE

Following are findings associated with instrument performance:

2.2.1 GC Column Performance

A column performance standard was combined with the daily calibration verification and analyzed at the beginning of each analytical sequence. The GC column performance was acceptable with the chromatographic separation of 2,3,7,8-TCDD and other TCDD isomers resolved with a valley of ≤25%. No qualifications were required.

2.2.2 Mass Spectrometer Performance

The mass spectrometer performance could not be evaluated as the laboratory did not provide selected ion current profiles for the lock-mass ions. No qualifications were required.

2.3 CALIBRATION

2.3.1 Initial Calibration

There was one initial calibration, analyzed 11/29/04 on Instrument 10MSHR05. The calibration consisted of five concentration level standards (CS1 through CS5) analyzed to verify instrument linearity. The initial calibration was acceptable with %RSDs ≤20% for the 15 native compounds (calibration by isotope dilution) and ≤35% for the 2 native and all labeled compounds (calibration by internal standard). The relative retention times and ion abundance ratios were within the QC limits listed in Method 1613 for all standards. A representative number of %RSDs were verified from the raw data, and no calculation or transcription errors were noted. No qualifications were required.

2.3.2 Continuing Calibration

Calibration verification (VER) consisted of a mid-level standard (CS3) analyzed at the beginning of each analytical sequence. The VER was acceptable with the concentrations within the acceptance criteria listed in the Table 6 of the EPA Method 1613. The ion abundance ratios and relative retention times were within the method QC limits. A representative number of %Ds were verified from the raw data, and no calculation or transcription errors were noted. No qualifications were required.

2.4 BLANKS

One method blank (Blank-6202) was extracted and analyzed with the samples in these SDGs. Target compounds 1,2,3,4,6,7,8-HpCDD, total HpCDD, OCDF, and OCDD were reported in the method blank. Any detects for the aforementioned target compounds reported at concentrations <5x the concentrations reported in the method blank were qualified as estimated nondetects "UJ," at the levels of interference in the samples of these SDGs. A review of the method blank raw data and chromatograms indicated no false negatives or false positives. No further qualifications were required.

2.5 BLANK SPIKES AND LABORATORY CONTROL SAMPLES

One LCS/LCSD pair (LCS-6203/LCSD-6204) was extracted and analyzed with the samples in these SDGs. All recoveries were within the acceptance criteria listed in Table 6 of the Method 1613. There were no QC limits established for RPDs. The reported RPDs were within ±20%. No qualifications were required.

2.6 MATRIX SPIKE/MATRIX SPIKE DUPLICATE

MS/MSD analyses were not performed in these SDGs. Evaluation of method accuracy and precision was based on the LCS/LCSD results. No qualifications were required.

2.7 FIELD QC SAMPLES

Following are findings associated with field QC:

2.7.1 Field Blanks and Equipment Rinsates

The samples in these SDGs had no associated field QC samples. No qualifications were required.

2.7.2 Field Duplicates

No field duplicate samples were identified for these SDGs.

2.8 INTERNAL STANDARDS

The labeled standard recoveries were within the acceptance criteria listed in Table 7 of Method 1613. No qualifications were required.

2.9 COMPOUND IDENTIFICATION

The laboratory analyzed for polychlorinated dioxins/furans by EPA Method 1613. The compound identifications were verified from the raw data and no false negatives or positives were noted. No qualifications were required.

2.10 COMPOUND QUANTIFICATION AND REPORTED DETECTION LIMITS

Compound quantitation was verified from the raw data. The laboratory calculated and reported compound-specific detection limits. Any detects below the lower method calibration limit (MCL) were qualified as estimated, "J." Any reported EMPC was qualified as an estimated nondetect, "UJ." No further qualifications were required.

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 1613B Analysis Results

Client - Del Mar Analytical

Client's Sample ID	IOA0119-01		
Lab Sample ID	105772001		
Filename	F50127A_11		
Injected By	MRO		
Total Amount Extracted	1040 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	01/04/2005
ICAL Date	11/29/2004	Received	01/06/2005
CCal Filename(s)	F50127A_02	Extracted	01/24/2005
Method Blank ID	BLANK-6202	Analyzed	01/27/2005 18:24

Native Isomers	Conc pg/L	EMPC pg/L	LOD pg/L		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	1.60		2,3,7,8-TCDF-13C	2.00	58
Total TCDF	2.5	-----	1.60	J	2,3,7,8-TCDD-13C	2.00	69
					1,2,3,7,8-PeCDF-13C	2.00	81
2,3,7,8-TCDD	ND	-----	2.00		2,3,4,7,8-PeCDF-13C	2.00	83
Total TCDD	ND	-----	2.00		1,2,3,7,8-PeCDD-13C	2.00	97
					1,2,3,4,7,8-HxCDF-13C	2.00	76
1,2,3,7,8-PeCDF	ND	-----	1.20		1,2,3,6,7,8-HxCDF-13C	2.00	92
2,3,4,7,8-PeCDF	ND	-----	0.85		2,3,4,6,7,8-HxCDF-13C	2.00	93
Total PeCDF	ND	-----	1.00		1,2,3,7,8,9-HxCDF-13C	2.00	82
					1,2,3,4,7,8-HxCDD-13C	2.00	74
1,2,3,7,8-PeCDD	ND	-----	1.40		1,2,3,6,7,8-HxCDD-13C	2.00	89
Total PeCDD	ND	-----	1.40		1,2,3,4,6,7,8-HpCDF-13C	2.00	86
					1,2,3,4,7,8,9-HpCDF-13C	2.00	78
1,2,3,4,7,8-HxCDF	ND	-----	1.50		1,2,3,4,6,7,8-HpCDD-13C	2.00	101
1,2,3,6,7,8-HxCDF	ND	-----	1.40		OCDD-13C	4.00	99
2,3,4,6,7,8-HxCDF	ND	-----	0.80				
1,2,3,7,8,9-HxCDF	ND	-----	0.59		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	-----	1.10		1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	1.30		2,3,7,8-TCDD-37Cl4	0.20	63
1,2,3,6,7,8-HxCDD	ND	-----	1.20				
1,2,3,7,8,9-HxCDD	ND	-----	1.30				
Total HxCDD	ND	-----	1.30				
1,2,3,4,6,7,8-HpCDF	2.3	-----	0.96	J			
1,2,3,4,7,8,9-HpCDF	ND	-----	0.95				
Total HpCDF	2.3	-----	0.95	J			
1,2,3,4,6,7,8-HpCDD	7.6	-----	1.20	BJ			
Total HpCDD	16.0	-----	1.20	BJ			
OCDF	9.4	-----	1.10	BJ			
OCDD	65.0	-----	2.30	BJ			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection. Totals are averages of individual isomer LODs.
D = Result obtained from analysis of diluted sample
B = Less than 10 times higher than method blank level
P = Recovery outside of method 1613 control limits
J = Concentration detected is below the calibration range
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....105772

REPORT OF LABORATORY ANALYSIS

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CONTRACT COMPLIANCE SCREENING FORM FOR HARDCOPY DATA

AMEC Earth & Environmental
550 South Wadsworth Boulevard
Suite 500
Lakewood, CO 80226

Laboratory Del Mar
Reviewer M. Pokorny
Analysis/Method Volatiles

Package ID T711VO39
Task Order 313150010
SDG No. IOA0112 / IOA0119
No. of Analyses 4

Date: February 1, 2005
Reviewer's Signature

ACTION ITEMS[a]	
1. **Case Narrative Deficiencies**	
2. **Out of Scope Analyses**	
3. **Analyses Not Conducted**	
4. **Missing Hardcopy Deliverables**	
5. **Incorrect Hardcopy Deliverables**	
6. **Deviations from Analysis Protocol, e.g.,**	Qualification required for a detect below the reporting limit.
Holding Times	
GC/MS Tune/Inst. Perform	
Calibrations	
Blanks	
Surrogates	
Matrix Spike/Dup LCS	
Field QC	
Internal Standard Performance	
Compound Identification and Quantitation	
System Performance	

COMMENTS[b]	

[a] Subcontracted analytical laboratory is not meeting contract and/or method requirements.
[b] Differences in protocol have been adopted by the laboratory but no action against the laboratory is required.

DATA VALIDATION REPORT

NPDES Monitoring

ANALYSIS: VOLATILES

SAMPLE DELIVERY GROUP: IOA0112, IOA0119

Prepared by

AMEC Denver Operations
550 South Wadsworth Boulevard, Suite 500
Lakewood, Colorado 80226

1. INTRODUCTION

Task Order Title:	NPDES Monitoring
Contract Task Order #:	313150010
SDG#:	IOA0112, IOA0119
Project Manager:	B. McIlvaine
Matrix:	Water
Analysis:	Volatiles
QC Level:	Level IV
No. of Samples:	4
No. of Reanalyses/Dilutions:	0
Reviewer:	M. Pokorny
Date of Review:	February 1, 2005

The samples listed in Table 1 were validated based on the guidelines outlined in the *AMEC Data Validation Procedure for Levels C and D Volatile Organics (DVP-2, Rev. 2), EPA Method 624,* and the *National Functional Guidelines For Organic Data Review* (2/94). Any deviations from these procedures are documented herein. Qualifiers were applied in cases where the data did not meet the required QC criteria or where special consideration by the data user is required. Data qualifiers were placed on Form Is with the associated qualification codes. Analytes that were rejected for any reason are denoted on the summary forms as having only the "R" data qualifier and associated qualification code(s) denoting the reason for rejection. Any additional problems with the data that may have resulted in an estimated value were not denoted by a qualification code since the data had already been rejected.

Table 1. Sample identification

Client ID	EPA ID	Lab No.	Matrix	Method
Outfall 001	Outfall 001	IOA0112-01	water	624
Trip Blank	Trip Blank	IOA0112-02	water	624
Outfall 002	Outfall 002	IOA0119-01	water	624
Trip Blank	Trip Blank	IOA0119-02	water	624

2. DATA VALIDATION FINDINGS

2.1 SAMPLE MANAGEMENT

The following are findings associated with sample management:

2.1.1 Sample Preservation, Handling, and Transport

The samples in these SDGs were received at the laboratory within the temperature limits of 4°C ± 2°C. According to the COCs, the samples were received intact, without headspace, and in good condition. No qualifications were required.

2.1.2 Chain of Custody

The COCs were signed by field and laboratory personnel and accounted for the analyses presented in these SDGs. As the samples were couriered to the laboratory, custody seals are not required. No qualifications were required.

2.1.3 Holding Times

The samples were analyzed within 14 days of collection. No qualifications were required.

2.2 GC/MS TUNING

The ion abundance windows shown on the quantitation report were consistent with those specified in the EPA Method 624. All ion abundances were within the established windows and were therefore acceptable. The samples and associated QC were analyzed within 12 hours of the BFB injection times. The Form Vs were verified from the raw data and no discrepancies between the summary forms and the raw data were noted. No qualifications were required.

2.3 CALIBRATION

One initial calibration, dated 11/10/04, was associated with these SDGs. The average RRFs were ≥0.05 and the %RSDs were ≤35% for the target compounds listed on the sample summary forms. One continuing calibration, dated 01/05/05, was associated with these SDGs. The RRFs for all target compounds were ≥0.05 and the %Ds were ≤20%. A representative number of %RSDs and average RRFs from the initial calibration, and %Ds and RRFs from the continuing calibration were recalculated from the raw data, and no calculation or transcription errors were found. No qualifications were required.

2.4 BLANKS

One water method blank (5A05017-BLK1) was associated with these SDGs. There were no detects for the target compounds listed on the summary form. The method blank raw data showed no evidence of false negatives. No qualifications were required.

2.5 BLANK SPIKES AND LABORATORY CONTROL SAMPLES

One water blank spike (5A05017-BS1) was associated with these SDGs. All spike recoveries were within the laboratory-established QC limits. A representative number of recoveries were recalculated from the raw data and no calculation or transcription errors were found. No qualifications were required.

2.6 SURROGATE RECOVERY

The surrogates were within the QC limits of 80-120%. A representative number of surrogate recoveries were recalculated from the raw data and no calculation or transcription errors were found. No qualifications were required.

2.7 MATRIX SPIKE/MATRIX SPIKE DUPLICATE

MS/MSD analyses were not performed for these SDGs. No qualifications were required.

2.8 FIELD QC SAMPLES

Field QC samples were evaluated, and if necessary, qualified based on method blanks and other laboratory QC results affecting the usability of the field QC data. Any remaining detects were used to evaluate the associated site sample. Following are findings associated with field QC samples:

2.8.1 Trip Blanks

Samples Trip Blank (IOA0112-02) and Trip Blank (IOA0119-02) were the trip blanks associated with the site sample of these SDGs. There were no target compounds detected in the trip blanks. No qualifications were required.

2.8.2 Field Blanks and Equipment Rinsates

There were no other field QC samples associated with these SDGs. No qualifications were required.

2.8.3 Field Duplicates

There were no field duplicate samples associated with these SDGs.

2.9 INTERNAL STANDARDS PERFORMANCE

Internal standard area counts and retention times for these SDGs were within the control limits established by the continuing calibration standards, of +100%/-50% for internal standard areas and ±0.50 minutes for retention times. A representative number of internal standard areas and retention times were verified from the raw data, and no calculation or transcription errors were noted. No qualifications were required.

2.10 COMPOUND IDENTIFICATION

Target compound identification was verified at a Level IV data validation. The laboratory analyzed for a subset of volatile target compounds by EPA Method 624. Chromatograms, retention times, and spectra for the samples and QC were examined and no target compound identification problems were noted. No qualifications were required.

2.11 COMPOUND QUANTIFICATION AND REPORTED DETECTION LIMITS

Compound quantification is verified at a Level IV data validation. The reporting limits were supported by the lowest concentrations of the initial calibration standards and by MDL study. Compound quantitation was verified by recalculating any sample detect, and/or a representative number of blank spike and surrogate recoveries from the raw data. No calculation or transcription errors were noted. Target compounds detected below the reporting limit were qualified as estimated, "J," by the laboratory. No further qualifications were required.

2.12 TENTATIVELY IDENTIFIED COMPOUNDS

The laboratory did not provide TICs for these SDGs. No qualifications were required.

2.13 SYSTEM PERFORMANCE

A review of the chromatograms and other raw data showed no identifiable problems with system performance. No qualifications were required.

Del Mar Analytical

17461 Derian Ave., Suite 100, Irvine, CA 92614 (949) 261-1022 FAX (949) 260-3297
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2520 E. Sunset Rd. #3, Las Vegas NV 89120 (702) 798-3620 FAX (702) 798-3621

MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 002

Report Number: IOA0119

Sampled: 01/04/05
Received: 01/04/05

DRAFT: PURGEABLES BY GC/MS (EPA 624)

Analyte	Method	Batch	MDL	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers	REV QUAL	QUAL CODE
Sample ID: IOA0119-01 (DRAFT: Outfall 002 - Water)						Sampled: 01/04/05					
Reporting Units: ug/l											
Benzene	EPA 624	5A05017	0.28	2.0	ND	1	01/05/05	01/05/05		U	
Carbon tetrachloride	EPA 624	5A05017	0.28	5.0	ND	1	01/05/05	01/05/05			
Chloroform	EPA 624	5A05017	0.33	2.0	ND	1	01/05/05	01/05/05			
1,1-Dichloroethane	EPA 624	5A05017	0.27	2.0	ND	1	01/05/05	01/05/05			
1,2-Dichloroethane	EPA 624	5A05017	0.28	2.0	ND	1	01/05/05	01/05/05			
1,1-Dichloroethene	EPA 624	5A05017	0.32	3.0	ND	1	01/05/05	01/05/05			
Ethylbenzene	EPA 624	5A05017	0.25	2.0	ND	1	01/05/05	01/05/05			
Tetrachloroethene	EPA 624	5A05017	0.32	2.0	ND	1	01/05/05	01/05/05			
Toluene	EPA 624	5A05017	0.36	2.0	ND	1	01/05/05	01/05/05			
1,1,1-Trichloroethane	EPA 624	5A05017	0.30	2.0	ND	1	01/05/05	01/05/05			
1,1,2-Trichloroethane	EPA 624	5A05017	0.30	2.0	ND	1	01/05/05	01/05/05			
Trichloroethene	EPA 624	5A05017	0.26	5.0	1.0	1	01/05/05	01/05/05	J	J	DNQ
Trichlorofluoromethane	EPA 624	5A05017	0.34	5.0	ND	1	01/05/05	01/05/05		U	
Vinyl chloride	EPA 624	5A05017	0.26	5.0	ND	1	01/05/05	01/05/05		U	
Xylenes, Total	EPA 624	5A05017	0.52	4.0	ND	1	01/05/05	01/05/05		U	
Surrogate: Dibromofluoromethane (80-120%)					*98 %*						
Surrogate: Toluene-d8 (80-120%)					*101 %*						
Surrogate: 4-Bromofluorobenzene (80-120%)					*97 %*						
Sample ID: IOA0119-02 (DRAFT: Trip Blank - Water)						Sampled: 01/04/05					
Reporting Units: ug/l											
Benzene	EPA 624	5A05017	0.28	2.0	ND	1	01/05/05	01/05/05		U	
Carbon tetrachloride	EPA 624	5A05017	0.28	5.0	ND	1	01/05/05	01/05/05			
Chloroform	EPA 624	5A05017	0.33	2.0	ND	1	01/05/05	01/05/05			
1,1-Dichloroethane	EPA 624	5A05017	0.27	2.0	ND	1	01/05/05	01/05/05			
1,2-Dichloroethane	EPA 624	5A05017	0.28	2.0	ND	1	01/05/05	01/05/05			
1,1-Dichloroethene	EPA 624	5A05017	0.32	3.0	ND	1	01/05/05	01/05/05			
Ethylbenzene	EPA 624	5A05017	0.25	2.0	ND	1	01/05/05	01/05/05			
Tetrachloroethene	EPA 624	5A05017	0.32	2.0	ND	1	01/05/05	01/05/05			
Toluene	EPA 624	5A05017	0.36	2.0	ND	1	01/05/05	01/05/05			
1,1,1-Trichloroethane	EPA 624	5A05017	0.30	2.0	ND	1	01/05/05	01/05/05			
1,1,2-Trichloroethane	EPA 624	5A05017	0.30	2.0	ND	1	01/05/05	01/05/05			
Trichloroethene	EPA 624	5A05017	0.26	5.0	ND	1	01/05/05	01/05/05			
Trichlorofluoromethane	EPA 624	5A05017	0.34	5.0	ND	1	01/05/05	01/05/05			
Vinyl chloride	EPA 624	5A05017	0.26	5.0	ND	1	01/05/05	01/05/05			
Xylenes, Total	EPA 624	5A05017	0.52	4.0	ND	1	01/05/05	01/05/05			
Surrogate: Dibromofluoromethane (80-120%)					*101 %*						
Surrogate: Toluene-d8 (80-120%)					*100 %*						
Surrogate: 4-Bromofluorobenzene (80-120%)					*98 %*						

AMEC VALIDATED

LEVEL IV

DRAFT REPORT
DRAFT REPORT
DATA SUBJECT TO CHANGE

The results set forth only to the samples tested in the Laboratory. This report shall not be reproduced except in full, without written permission from Del Mar Analytical.

CONTRACT COMPLIANCE SCREENING FORM FOR HARDCOPY DATA

AMEC Earth & Environmental
550 South Wadsworth Boulevard
Suite 500
Lakewood, CO 80226

Laboratory Del Mar
Reviewer P. Meeks
Analysis/Method General Minerals

Package ID T711WC54
Task Order 313150010
SDG No. IOA0112, 0119
No. of Analyses 2

Date: 02/01/05
Reviewer's Signature P. Meeks

ACTION ITEMS[a]	
1. **Case Narrative Deficiencies**	
2. **Out of Scope Analyses**	
3. **Analyses Not Conducted**	
4. **Missing Hardcopy Deliverables**	
5. **Incorrect Hardcopy Deliverables**	
6. **Deviations from Analysis Protocol, e.g.,**	
Holding Times	
GC/MS Tune/Inst. Performance	
Calibrations	
Blanks	
Surrogates	
Matrix Spike/Dup LCS	
Field QC	
Internal Standard Performance	
Compound Identification and Quantitation	
System Performance	
COMMENTS[b]	Acceptable as reviewed.

[a] Subcontracted analytical laboratory is not meeting contract and/or method requirements.
[b] Differences in protocol have been adopted by the laboratory but no action against the laboratory is required.

DATA VALIDATION REPORT

NPDES Monitoring

ANALYSIS: GENERAL MINERALS

SAMPLE DELIVERY GROUP: IOA0112 & IOA0119

Prepared by

AMEC—Denver Operations
550 South Wadsworth Boulevard, Suite 500
Lakewood, Colorado 80226

1. INTRODUCTION

Task Order Title:	NPDES Monitoring
Contract Task Order #:	313150010
Sample Delivery Group #:	IOA0112, IOA0119
Project Manager:	B. McIlvaine
Matrix:	Water
Analysis:	General Minerals
QC Level:	Level IV
No. of Samples:	2
Reviewer:	P. Meeks
Date of Review:	February 01, 2005

The sample listed in Table 1 was validated based on the guidelines outlined in the AMEC *Data Validation Procedures* SOP DVP-6, Rev. 2, *USEPA Methods for Chemical Analysis of Water and Wastes Method 425.1, 350.2, 180.1, and 120.1, Standard Methods for the Examination of Water and Wastewater Method SM5540-C,* and validation guidelines outlined in the USEPA *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (2/94).* Any deviations from these procedures and guidelines are documented herein. Qualifiers were applied in cases where the data did not meet the required QC criteria or where special consideration by the data user is required. Data qualifiers were placed on Form Is with the associated qualification codes. Analytes that were rejected for any reason are denoted on the Form I as having only the "R" data qualifier and associated qualification code(s) denoting the reason for rejection. Any additional problems with the data that may have resulted in an estimated value were not denoted by a qualification code since the data had already been rejected.

Table 1. Sample identification

Client ID	EPA ID	Laboratory ID	Matrix	COC Method
Outfall 001	Outfall 001	IOA0112-01	water	General Minerals
Outfall 002	Outfall 002	IOA0119-01	water	General Minerals

2. DATA VALIDATION FINDINGS

2.1 SAMPLE MANAGEMENT

Following are findings associated with sample management:

2.1.1 Sample Preservation, Handling, and Transport

The samples in these SDGs were received at the laboratory within the temperature limits of 4°C ± 2°C. No preservation problems were noted by the laboratory. No qualifications were required.

2.1.2 Chain of Custody

The COCs were signed and dated by field and laboratory personnel and accounted for the samples and analyses presented. No sample qualifications were required.

2.1.3 Holding Times

The holding times were assessed by comparing the dates of collection with the dates of analyses. The 28-day analytical holding time for ammonia and specific conductance, and the 48-hour turbidity and surfactant holding times were met. No qualifications were required.

2.2 CALIBRATION

For the applicable analyses, the initial calibration correlation coefficients were ≥ 0.995. All ICV and continuing calibration information was acceptable with recoveries within the control limits of 90-110%. For the titration method, ammonia, no information regarding the standardization of the titrant was provided; however, as the LCS recovery for ammonia was within the CCV control limits, and no qualifications were required. No qualifications were required.

2.3 BLANKS

The method blank and CCB results reported on the summary forms and in the raw data for blank analyses associated with the samples were nondetects at the reporting limit. No further qualifications were required.

2.4 BLANK SPIKES AND LABORATORY CONTROL SAMPLES

The ammonia and MBAS laboratory control sample recoveries were within the laboratory-established control limits. The LCS is not applicable to turbidity or specific conductance. No qualifications were required.

2.5 SURROGATES RECOVERY

Surrogate recovery is not applicable to the analyses presented in these SDGs.

2.6 LABORATORY DUPLICATES

No MS/MSD or duplicate analyses were performed in association with the samples in these SDGs; therefore, no assessment was made with respect to this criterion.

2.7 MATRIX SPIKE/MATRIX SPIKE DUPLICATE

No MS/MSD analyses were performed in association with the samples in these SDGs; therefore, no assessment was made with respect to this criterion.

2.8 FURNACE ATOMIC ABSORPTION QC

Furnace atomic absorption was not utilized for the analysis of these samples; therefore, furnace atomic absorption QC is not applicable.

2.9 ICP SERIAL DILUTION

ICP serial dilution is not applicable to the analyses presented in this data validation report.

2.10 SAMPLE RESULT VERIFICATION

A Level IV review was performed for the samples in this data package. Calculations were verified, and the sample results reported on the Form Is were verified against the raw data. No transcription errors or calculations errors were noted. MBAS for Outfall 001 and Outfall 002 was reported from 100× dilutions as the samples had formed emulsions. No qualifications were required.

2.11 FIELD QC SAMPLES

Field QC samples are evaluated, and if necessary, qualified based only on laboratory blanks. Any remaining detects are used to evaluate the associated samples. The following are findings associated with field QC samples:

2.11.1 Field Blanks and Equipment Rinsates

The samples in these SDGs had no associated field QC samples. No qualifications were required.

2.11.2 Field Duplicates

There were no field duplicate pairs associated with these SDGs.

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 002

Report Number: IOA0119

Sampled: 01/04/05
Received: 01/04/05

DRAFT: INORGANICS

Analyte	Method	Batch	MDL	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers (Rev Qual / Qual Code)
Sample ID: IOA0119-01 (DRAFT: Outfall 002 - Water)					**Sampled: 01/04/05**				
Reporting Units: mg/l									
Ammonia-N (Distilled)	EPA 350.2	5A05067	0.30	0.50	ND	1	01/05/05	01/05/05	U
Surfactants (MBAS)	SM5540-C	5A04104	4.4	10	ND	100	01/04/05	01/04/05	U ~~R1~~ 1
Sample ID: IOA0119-01 (DRAFT: Outfall 002 - Water)					**Sampled: 01/04/05**				
Reporting Units: NTU									
Turbidity	EPA 180.1	5A05079	0.040	1.0	**9.8**	1	01/05/05	01/05/05	
Sample ID: IOA0119-01 (DRAFT: Outfall 002 - Water)					**Sampled: 01/04/05**				
Reporting Units: umhos/cm									
Specific Conductance	EPA 120.1	5A06081	1.0	1.0	**250**	1	01/06/05	01/06/05	

pm 2/1/05

AMEC VALIDATED

LEVEL IV

DRAFT REPORT
DRAFT REPORT
DATA SUBJECT TO CHANGE

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LABORATORY REPORT

Prepared For: MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project: Routine Outfall 002

Sampled: 01/04/05
Received: 01/04/05
Issued: 02/21/05 12:03

NELAP #01108CA California ELAP#1197 CSDLAC #10117

The results listed within this Laboratory Report pertain only to the samples tested in the laboratory. The analyses contained in this report were performed in accordance with the applicable certifications as noted. All soil samples are reported on a wet weight basis unless otherwise noted in the report. This Laboratory Report is confidential and is intended for the sole use of Del Mar Analytical and its client. This report shall not be reproduced, except in full, without written permission from Del Mar Analytical. The Chain(s) of Custody, 4 pages, are included and are an integral part of this report.
This entire report was reviewed and approved for release.

SAMPLE CROSS REFERENCE

SUBCONTRACTED: Refer to the last page for specific subcontract laboratory information included in this report.

LABORATORY ID	CLIENT ID	MATRIX
IOA0119-01	Outfall 002	Water
IOA0119-02	Trip Blank	Water

Reviewed By:

Michele Harper

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 002

Report Number: IOA0119

Sampled: 01/04/05
Received: 01/04/05

PURGEABLES BY GC/MS (EPA 624)

Analyte	Method	Batch	MDL Limit	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA0119-01 (Outfall 002 - Water)					**Sampled: 01/04/05**				
Reporting Units: ug/l									
Benzene	EPA 624	5A05017	0.28	2.0	ND	1	01/05/05	01/05/05	
Carbon tetrachloride	EPA 624	5A05017	0.28	5.0	ND	1	01/05/05	01/05/05	
Chloroform	EPA 624	5A05017	0.33	2.0	ND	1	01/05/05	01/05/05	
1,1-Dichloroethane	EPA 624	5A05017	0.27	2.0	ND	1	01/05/05	01/05/05	
1,2-Dichloroethane	EPA 624	5A05017	0.28	2.0	ND	1	01/05/05	01/05/05	
1,1-Dichloroethene	EPA 624	5A05017	0.32	3.0	ND	1	01/05/05	01/05/05	
Ethylbenzene	EPA 624	5A05017	0.25	2.0	ND	1	01/05/05	01/05/05	
Tetrachloroethene	EPA 624	5A05017	0.32	2.0	ND	1	01/05/05	01/05/05	
Toluene	EPA 624	5A05017	0.36	2.0	ND	1	01/05/05	01/05/05	
1,1,1-Trichloroethane	EPA 624	5A05017	0.30	2.0	ND	1	01/05/05	01/05/05	
1,1,2-Trichloroethane	EPA 624	5A05017	0.30	2.0	ND	1	01/05/05	01/05/05	
Trichloroethene	EPA 624	5A05017	0.26	5.0	**1.0**	1	01/05/05	01/05/05	J
Trichlorofluoromethane	EPA 624	5A05017	0.34	5.0	ND	1	01/05/05	01/05/05	
Vinyl chloride	EPA 624	5A05017	0.26	5.0	ND	1	01/05/05	01/05/05	
Xylenes, Total	EPA 624	5A05017	0.52	4.0	ND	1	01/05/05	01/05/05	
Surrogate: Dibromofluoromethane (80-120%)					*98 %*				
Surrogate: Toluene-d8 (80-120%)					*101 %*				
Surrogate: 4-Bromofluorobenzene (80-120%)					*97 %*				
Sample ID: IOA0119-02 (Trip Blank - Water)					**Sampled: 01/04/05**				
Reporting Units: ug/l									
Benzene	EPA 624	5A05017	0.28	2.0	ND	1	01/05/05	01/05/05	
Carbon tetrachloride	EPA 624	5A05017	0.28	5.0	ND	1	01/05/05	01/05/05	
Chloroform	EPA 624	5A05017	0.33	2.0	ND	1	01/05/05	01/05/05	
1,1-Dichloroethane	EPA 624	5A05017	0.27	2.0	ND	1	01/05/05	01/05/05	
1,2-Dichloroethane	EPA 624	5A05017	0.28	2.0	ND	1	01/05/05	01/05/05	
1,1-Dichloroethene	EPA 624	5A05017	0.32	3.0	ND	1	01/05/05	01/05/05	
Ethylbenzene	EPA 624	5A05017	0.25	2.0	ND	1	01/05/05	01/05/05	
Tetrachloroethene	EPA 624	5A05017	0.32	2.0	ND	1	01/05/05	01/05/05	
Toluene	EPA 624	5A05017	0.36	2.0	ND	1	01/05/05	01/05/05	
1,1,1-Trichloroethane	EPA 624	5A05017	0.30	2.0	ND	1	01/05/05	01/05/05	
1,1,2-Trichloroethane	EPA 624	5A05017	0.30	2.0	ND	1	01/05/05	01/05/05	
Trichloroethene	EPA 624	5A05017	0.26	5.0	ND	1	01/05/05	01/05/05	
Trichlorofluoromethane	EPA 624	5A05017	0.34	5.0	ND	1	01/05/05	01/05/05	
Vinyl chloride	EPA 624	5A05017	0.26	5.0	ND	1	01/05/05	01/05/05	
Xylenes, Total	EPA 624	5A05017	0.52	4.0	ND	1	01/05/05	01/05/05	
Surrogate: Dibromofluoromethane (80-120%)					*101 %*				
Surrogate: Toluene-d8 (80-120%)					*100 %*				
Surrogate: 4-Bromofluorobenzene (80-120%)					*98 %*				

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 002

Report Number: IOA0119

Sampled: 01/04/05
Received: 01/04/05

ACID & BASE/NEUTRALS BY GC/MS (EPA 625)

Analyte	Method	Batch	MDL Limit	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA0119-01 (Outfall 002 - Water)					**Sampled: 01/04/05**				
Reporting Units: ug/l									
Bis(2-ethylhexyl)phthalate	EPA 625	5A05039	1.1	5.0	ND	0.971	01/05/05	01/14/05	
2,4-Dinitrotoluene	EPA 625	5A05039	0.23	9.0	ND	0.971	01/05/05	01/14/05	
N-Nitrosodimethylamine	EPA 625	5A05039	0.22	8.0	ND	0.971	01/05/05	01/14/05	
Pentachlorophenol	EPA 625	5A05039	0.78	8.0	ND	0.971	01/05/05	01/14/05	
2,4,6-Trichlorophenol	EPA 625	5A05039	0.10	6.0	ND	0.971	01/05/05	01/14/05	
Surrogate: 2-Fluorophenol (35-120%)					*74 %*				
Surrogate: Phenol-d6 (45-120%)					*81 %*				
Surrogate: 2,4,6-Tribromophenol (50-125%)					*88 %*				
Surrogate: Nitrobenzene-d5 (45-120%)					*77 %*				
Surrogate: 2-Fluorobiphenyl (45-120%)					*78 %*				
Surrogate: Terphenyl-d14 (45-135%)					*81 %*				

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 002

Report Number: IOA0119

Sampled: 01/04/05
Received: 01/04/05

ORGANOCHLORINE PESTICIDES (EPA 608)

Analyte	Method	Batch	MDL Limit	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA0119-01 (Outfall 002 - Water) - cont.					**Sampled: 01/04/05**				
Reporting Units: ug/l									
alpha-BHC	EPA 608	5A05041	0.00049	0.010	ND	0.962	01/05/05	01/05/05	
Surrogate: Decachlorobiphenyl (45-120%)					*148 %*				*Z2*
Surrogate: Tetrachloro-m-xylene (35-120%)					*103 %*				

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 002
Report Number: IOA0119

Sampled: 01/04/05
Received: 01/04/05

METALS

Analyte	Method	Batch	MDL	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA0119-01 (Outfall 002 - Water) - cont.					**Sampled: 01/04/05**				
Reporting Units: ug/l									
Copper	EPA 200.8	5A04091	0.49	2.0	**3.5**	1	01/04/05	01/05/05	
Lead	EPA 200.8	5A04091	0.13	1.0	**1.2**	1	01/04/05	01/05/05	
Mercury	EPA 245.1	5A05061	0.063	0.20	**0.16**	1	01/05/05	01/05/05	J

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MWH-Pasadena/Boeing
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Attention: Bronwyn Kelly

Project ID: Routine Outfall 002
Report Number: IOA0119

Sampled: 01/04/05
Received: 01/04/05

INORGANICS

Analyte	Method	Batch	MDL	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA0119-01 (Outfall 002 - Water) - cont.					**Sampled: 01/04/05**				
Reporting Units: mg/l									
Ammonia-N (Distilled)	EPA 350.2	5A05067	0.30	0.50	ND	1	01/05/05	01/05/05	
Biochemical Oxygen Demand	EPA 405.1	5A05054	0.59	2.0	**1.3**	1	01/05/05	01/10/05	J
Chloride	EPA 300.0	5A04042	0.26	0.50	**12**	1	01/04/05	01/04/05	
Nitrate/Nitrite-N	EPA 300.0	5A04042	0.072	0.26	**1.7**	1	01/04/05	01/04/05	
Oil & Grease	EPA 413.1	5A05068	0.94	5.0	ND	1	01/05/05	01/05/05	
Sulfate	EPA 300.0	5A04042	0.18	0.50	**43**	1	01/04/05	01/04/05	
Surfactants (MBAS)	SM5540-C	5A04104	4.4	10	ND	100	01/04/05	01/04/05	RL-1
Total Dissolved Solids	SM2540C	5A06082	10	10	**200**	1	01/06/05	01/06/05	
Total Suspended Solids	EPA 160.2	5A07077	10	10	ND	1	01/07/05	01/07/05	
Sample ID: IOA0119-01 (Outfall 002 - Water)					**Sampled: 01/04/05**				
Reporting Units: ml/l/hr									
Total Settleable Solids	EPA 160.5	5A05055	0.10	0.10	ND	1	01/05/05	01/05/05	
Sample ID: IOA0119-01 (Outfall 002 - Water)					**Sampled: 01/04/05**				
Reporting Units: NTU									
Turbidity	EPA 180.1	5A05079	0.040	1.0	**9.8**	1	01/05/05	01/05/05	
Sample ID: IOA0119-01 (Outfall 002 - Water)					**Sampled: 01/04/05**				
Reporting Units: ug/l									
Total Cyanide	EPA 335.2	5A05078	2.2	5.0	ND	1	01/05/05	01/05/05	
Perchlorate	EPA 314.0	5A06055	0.80	4.0	ND	1	01/06/05	01/06/05	
Sample ID: IOA0119-01 (Outfall 002 - Water)					**Sampled: 01/04/05**				
Reporting Units: umhos/cm									
Specific Conductance	EPA 120.1	5A06081	1.0	1.0	**250**	1	01/06/05	01/06/05	

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Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 002

Report Number: IOA0119

Sampled: 01/04/05
Received: 01/04/05

SHORT HOLD TIME DETAIL REPORT

	Hold Time (in days)	Date/Time Sampled	Date/Time Received	Date/Time Extracted	Date/Time Analyzed
Sample ID: Outfall 002 (IOA0119-01) - Water					
EPA 160.5	2	01/04/2005 11:18	01/04/2005 18:30	01/05/2005 09:28	01/05/2005 10:40
EPA 180.1	2	01/04/2005 11:18	01/04/2005 18:30	01/05/2005 14:00	01/05/2005 15:00
EPA 300.0	2	01/04/2005 11:18	01/04/2005 18:30	01/04/2005 22:30	01/04/2005 23:07
EPA 405.1	2	01/04/2005 11:18	01/04/2005 18:30	01/05/2005 14:00	01/10/2005 19:00
SM5540-C	2	01/04/2005 11:18	01/04/2005 18:30	01/04/2005 21:33	01/04/2005 22:04

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Attention: Bronwyn Kelly

Project ID: Routine Outfall 002

Report Number: IOA0119

Sampled: 01/04/05
Received: 01/04/05

METHOD BLANK/QC DATA

PURGEABLES BY GC/MS (EPA 624)

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A05017 Extracted: 01/05/05											
Blank Analyzed: 01/05/2005 (5A05017-BLK1)											
Benzene	ND	2.0	0.28	ug/l							
Carbon tetrachloride	ND	5.0	0.28	ug/l							
Chloroform	ND	2.0	0.33	ug/l							
1,1-Dichloroethane	ND	2.0	0.27	ug/l							
1,2-Dichloroethane	ND	2.0	0.28	ug/l							
1,1-Dichloroethene	ND	3.0	0.32	ug/l							
Ethylbenzene	ND	2.0	0.25	ug/l							
Tetrachloroethene	ND	2.0	0.32	ug/l							
Toluene	ND	2.0	0.36	ug/l							
1,1,1-Trichloroethane	ND	2.0	0.30	ug/l							
1,1,2-Trichloroethane	ND	2.0	0.30	ug/l							
Trichloroethene	ND	5.0	0.26	ug/l							
Trichlorofluoromethane	ND	5.0	0.34	ug/l							
Vinyl chloride	ND	5.0	0.26	ug/l							
Xylenes, Total	ND	4.0	0.52	ug/l							
Surrogate: Dibromofluoromethane	*25.2*			*ug/l*	*25.0*		*101*	*80-120*			
Surrogate: Toluene-d8	*25.2*			*ug/l*	*25.0*		*101*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*24.3*			*ug/l*	*25.0*		*97*	*80-120*			
LCS Analyzed: 01/05/2005 (5A05017-BS1)											
Benzene	21.5	2.0	0.28	ug/l	25.0		86	70-120			
Carbon tetrachloride	29.0	5.0	0.28	ug/l	25.0		116	70-140			
Chloroform	25.3	2.0	0.33	ug/l	25.0		101	75-130			
1,1-Dichloroethane	21.9	2.0	0.27	ug/l	25.0		88	70-135			
1,2-Dichloroethane	27.6	2.0	0.28	ug/l	25.0		110	60-150			
1,1-Dichloroethene	21.4	3.0	0.32	ug/l	25.0		86	75-135			
Ethylbenzene	23.6	2.0	0.25	ug/l	25.0		94	80-120			
Tetrachloroethene	24.6	2.0	0.32	ug/l	25.0		98	75-125			
Toluene	23.4	2.0	0.36	ug/l	25.0		94	75-120			
1,1,1-Trichloroethane	27.2	2.0	0.30	ug/l	25.0		109	75-140			
1,1,2-Trichloroethane	23.4	2.0	0.30	ug/l	25.0		94	70-125			
Trichloroethene	24.1	5.0	0.26	ug/l	25.0		96	80-120			
Trichlorofluoromethane	27.7	5.0	0.34	ug/l	25.0		111	65-145			
Vinyl chloride	23.2	5.0	0.26	ug/l	25.0		93	50-130			
Surrogate: Dibromofluoromethane	*25.5*			*ug/l*	*25.0*		*102*	*80-120*			
Surrogate: Toluene-d8	*25.7*			*ug/l*	*25.0*		*103*	*80-120*			

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 002

Report Number: IOA0119

Sampled: 01/04/05
Received: 01/04/05

METHOD BLANK/QC DATA

PURGEABLES BY GC/MS (EPA 624)

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A05017 Extracted: 01/05/05											
LCS Analyzed: 01/05/2005 (5A05017-BS1)											
Surrogate: 4-Bromofluorobenzene	*25.3*			*ug/l*	*25.0*		*101*	*80-120*			
Matrix Spike Analyzed: 01/05/2005 (5A05017-MS1)						**Source: IOA0112-01**					
Benzene	21.0	2.0	0.28	ug/l	25.0	ND	84	70-120			
Carbon tetrachloride	28.8	5.0	0.28	ug/l	25.0	ND	115	70-145			
Chloroform	24.7	2.0	0.33	ug/l	25.0	ND	99	70-135			
1,1-Dichloroethane	21.2	2.0	0.27	ug/l	25.0	ND	85	65-135			
1,2-Dichloroethane	27.2	2.0	0.28	ug/l	25.0	ND	109	60-150			
1,1-Dichloroethene	21.1	3.0	0.32	ug/l	25.0	ND	84	65-140			
Ethylbenzene	23.3	2.0	0.25	ug/l	25.0	ND	93	70-130			
Tetrachloroethene	24.5	2.0	0.32	ug/l	25.0	ND	98	70-130			
Toluene	23.2	2.0	0.36	ug/l	25.0	ND	93	70-120			
1,1,1-Trichloroethane	26.8	2.0	0.30	ug/l	25.0	ND	107	75-140			
1,1,2-Trichloroethane	21.9	2.0	0.30	ug/l	25.0	ND	88	60-135			
Trichloroethene	23.3	5.0	0.26	ug/l	25.0	ND	93	70-125			
Trichlorofluoromethane	27.1	5.0	0.34	ug/l	25.0	ND	108	55-145			
Vinyl chloride	21.8	5.0	0.26	ug/l	25.0	ND	87	40-135			
Surrogate: Dibromofluoromethane	*25.5*			*ug/l*	*25.0*		*102*	*80-120*			
Surrogate: Toluene-d8	*25.7*			*ug/l*	*25.0*		*103*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*25.5*			*ug/l*	*25.0*		*102*	*80-120*			
Matrix Spike Dup Analyzed: 01/05/2005 (5A05017-MSD1)						**Source: IOA0112-01**					
Benzene	22.3	2.0	0.28	ug/l	25.0	ND	89	70-120	6	20	
Carbon tetrachloride	30.1	5.0	0.28	ug/l	25.0	ND	120	70-145	4	25	
Chloroform	25.6	2.0	0.33	ug/l	25.0	ND	102	70-135	4	20	
1,1-Dichloroethane	22.4	2.0	0.27	ug/l	25.0	ND	90	65-135	6	20	
1,2-Dichloroethane	28.1	2.0	0.28	ug/l	25.0	ND	112	60-150	3	20	
1,1-Dichloroethene	22.3	3.0	0.32	ug/l	25.0	ND	89	65-140	6	20	
Ethylbenzene	24.3	2.0	0.25	ug/l	25.0	ND	97	70-130	4	20	
Tetrachloroethene	25.3	2.0	0.32	ug/l	25.0	ND	101	70-130	3	20	
Toluene	24.5	2.0	0.36	ug/l	25.0	ND	98	70-120	5	20	
1,1,1-Trichloroethane	27.5	2.0	0.30	ug/l	25.0	ND	110	75-140	3	20	
1,1,2-Trichloroethane	23.5	2.0	0.30	ug/l	25.0	ND	94	60-135	7	25	
Trichloroethene	24.3	5.0	0.26	ug/l	25.0	ND	97	70-125	4	20	
Trichlorofluoromethane	27.8	5.0	0.34	ug/l	25.0	ND	111	55-145	3	25	
Vinyl chloride	23.3	5.0	0.26	ug/l	25.0	ND	93	40-135	7	30	

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Attention: Bronwyn Kelly

Project ID: Routine Outfall 002

Report Number: IOA0119

Sampled: 01/04/05
Received: 01/04/05

METHOD BLANK/QC DATA

PURGEABLES BY GC/MS (EPA 624)

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A05017 Extracted: 01/05/05											
Matrix Spike Dup Analyzed: 01/05/2005 (5A05017-MSD1)						**Source: IOA0112-01**					
Surrogate: Dibromofluoromethane	*25.5*			*ug/l*	*25.0*		*102*	*80-120*			
Surrogate: Toluene-d8	*25.7*			*ug/l*	*25.0*		*103*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*25.5*			*ug/l*	*25.0*		*102*	*80-120*			

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METHOD BLANK/QC DATA

ACID & BASE/NEUTRALS BY GC/MS (EPA 625)

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A05039 Extracted: 01/05/05											
Blank Analyzed: 01/13/2005 (5A05039-BLK1)											
Bis(2-ethylhexyl)phthalate	ND	5.0	1.1	ug/l							
2,4-Dinitrotoluene	ND	9.0	0.23	ug/l							
N-Nitrosodimethylamine	ND	8.0	0.22	ug/l							
Pentachlorophenol	ND	8.0	0.78	ug/l							
2,4,6-Trichlorophenol	ND	6.0	0.10	ug/l							
Surrogate: 2-Fluorophenol	*15.2*			*ug/l*	*20.0*		*76*	*35-120*			
Surrogate: Phenol-d6	*15.8*			*ug/l*	*20.0*		*79*	*45-120*			
Surrogate: 2,4,6-Tribromophenol	*16.1*			*ug/l*	*20.0*		*80*	*50-125*			
Surrogate: Nitrobenzene-d5	*7.68*			*ug/l*	*10.0*		*77*	*45-120*			
Surrogate: 2-Fluorobiphenyl	*7.72*			*ug/l*	*10.0*		*77*	*45-120*			
Surrogate: Terphenyl-d14	*8.24*			*ug/l*	*10.0*		*82*	*45-135*			
LCS Analyzed: 01/13/2005 (5A05039-BS1)											**M-NR1**
Bis(2-ethylhexyl)phthalate	9.64	5.0	1.1	ug/l	10.0		96	65-125			
2,4-Dinitrotoluene	9.12	9.0	0.23	ug/l	10.0		91	60-140			
N-Nitrosodimethylamine	8.98	8.0	0.22	ug/l	10.0		90	40-120			
Pentachlorophenol	8.90	8.0	0.78	ug/l	10.0		89	50-125			
2,4,6-Trichlorophenol	9.40	6.0	0.10	ug/l	10.0		94	60-120			
Surrogate: 2-Fluorophenol	*14.2*			*ug/l*	*20.0*		*71*	*35-120*			
Surrogate: Phenol-d6	*15.6*			*ug/l*	*20.0*		*78*	*45-120*			
Surrogate: 2,4,6-Tribromophenol	*16.0*			*ug/l*	*20.0*		*80*	*50-125*			
Surrogate: Nitrobenzene-d5	*7.74*			*ug/l*	*10.0*		*77*	*45-120*			
Surrogate: 2-Fluorobiphenyl	*7.48*			*ug/l*	*10.0*		*75*	*45-120*			
Surrogate: Terphenyl-d14	*7.84*			*ug/l*	*10.0*		*78*	*45-135*			
LCS Dup Analyzed: 01/13/2005 (5A05039-BSD1)											
Bis(2-ethylhexyl)phthalate	10.7	5.0	1.1	ug/l	10.0		107	65-125	10	20	
2,4-Dinitrotoluene	10.3	9.0	0.23	ug/l	10.0		103	60-140	12	20	
N-Nitrosodimethylamine	10.6	8.0	0.22	ug/l	10.0		106	40-120	17	20	
Pentachlorophenol	10.0	8.0	0.78	ug/l	10.0		100	50-125	12	25	
2,4,6-Trichlorophenol	10.9	6.0	0.10	ug/l	10.0		109	60-120	15	20	
Surrogate: 2-Fluorophenol	*16.5*			*ug/l*	*20.0*		*82*	*35-120*			
Surrogate: Phenol-d6	*17.4*			*ug/l*	*20.0*		*87*	*45-120*			
Surrogate: 2,4,6-Tribromophenol	*17.8*			*ug/l*	*20.0*		*89*	*50-125*			
Surrogate: Nitrobenzene-d5	*8.50*			*ug/l*	*10.0*		*85*	*45-120*			
Surrogate: 2-Fluorobiphenyl	*8.54*			*ug/l*	*10.0*		*85*	*45-120*			

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MWH-Pasadena/Boeing
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Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 002

Report Number: IOA0119

Sampled: 01/04/05
Received: 01/04/05

METHOD BLANK/QC DATA

ACID & BASE/NEUTRALS BY GC/MS (EPA 625)

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A05039 Extracted: 01/05/05											
LCS Dup Analyzed: 01/13/2005 (5A05039-BSD1)											
Surrogate: Terphenyl-d14	*8.36*			*ug/l*	*10.0*		*84*	*45-135*			

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METHOD BLANK/QC DATA

ORGANOCHLORINE PESTICIDES (EPA 608)

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A05041 Extracted: 01/05/05											
Blank Analyzed: 01/05/2005 (5A05041-BLK1)											
alpha-BHC	ND	0.010	0.00049	ug/l							
Surrogate: Decachlorobiphenyl	*0.437*			*ug/l*	*0.500*		*87*	*45-120*			
Surrogate: Tetrachloro-m-xylene	*0.374*			*ug/l*	*0.500*		*75*	*35-120*			
LCS Analyzed: 01/05/2005 (5A05041-BS1)											**M-NR1**
alpha-BHC	0.463	0.010	0.00049	ug/l	0.500		93	45-115			
Surrogate: Decachlorobiphenyl	*0.459*			*ug/l*	*0.500*		*92*	*45-120*			
Surrogate: Tetrachloro-m-xylene	*0.368*			*ug/l*	*0.500*		*74*	*35-120*			
LCS Dup Analyzed: 01/05/2005 (5A05041-BSD1)											
alpha-BHC	0.425	0.010	0.00049	ug/l	0.500		85	45-115	9	30	
Surrogate: Decachlorobiphenyl	*0.456*			*ug/l*	*0.500*		*91*	*45-120*			
Surrogate: Tetrachloro-m-xylene	*0.331*			*ug/l*	*0.500*		*66*	*35-120*			

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METHOD BLANK/QC DATA

METALS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A04091 Extracted: 01/04/05											
Blank Analyzed: 01/05/2005 (5A04091-BLK1)											
Copper	ND	2.0	0.49	ug/l							
Lead	ND	1.0	0.13	ug/l							
LCS Analyzed: 01/05/2005 (5A04091-BS1)											
Copper	79.1	2.0	0.49	ug/l	80.0		99	85-115			
Lead	80.9	1.0	0.13	ug/l	80.0		101	85-115			
Matrix Spike Analyzed: 01/05/2005 (5A04091-MS1)						**Source: IOA0069-02**					
Copper	73.3	2.0	0.49	ug/l	80.0	1.7	90	70-130			
Lead	76.2	1.0	0.13	ug/l	80.0	0.31	95	70-130			
Matrix Spike Dup Analyzed: 01/05/2005 (5A04091-MSD1)						**Source: IOA0069-02**					
Copper	70.3	2.0	0.49	ug/l	80.0	1.7	86	70-130	4	20	
Lead	67.6	1.0	0.13	ug/l	80.0	0.31	84	70-130	12	20	
Batch: 5A05061 Extracted: 01/05/05											
Blank Analyzed: 01/05/2005 (5A05061-BLK1)											
Mercury	ND	0.20	0.063	ug/l							
LCS Analyzed: 01/05/2005 (5A05061-BS1)											
Mercury	8.18	0.20	0.063	ug/l	8.00		102	85-115			
Matrix Spike Analyzed: 01/05/2005 (5A05061-MS1)						**Source: IOA0084-01**					
Mercury	7.81	0.20	0.063	ug/l	8.00	0.086	97	70-130			
Matrix Spike Dup Analyzed: 01/05/2005 (5A05061-MSD1)						**Source: IOA0084-01**					
Mercury	7.89	0.20	0.063	ug/l	8.00	0.086	98	70-130	1	20	

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METHOD BLANK/QC DATA

INORGANICS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A04042 Extracted: 01/04/05											
Blank Analyzed: 01/04/2005 (5A04042-BLK1)											
Chloride	ND	0.50	0.26	mg/l							
Nitrate/Nitrite-N	ND	0.26	0.072	mg/l							
Sulfate	ND	0.50	0.18	mg/l							
LCS Analyzed: 01/04/2005 (5A04042-BS1)											
Chloride	4.97	0.50	0.26	mg/l	5.00		99	90-110			
Sulfate	9.93	0.50	0.18	mg/l	10.0		99	90-110			
Matrix Spike Analyzed: 01/04/2005 (5A04042-MS1)						**Source: IOA0049-01**					
Chloride	5.60	0.50	0.26	mg/l	5.00	0.51	102	80-120			
Sulfate	10.4	0.50	0.18	mg/l	10.0	0.63	98	80-120			
Matrix Spike Dup Analyzed: 01/04/2005 (5A04042-MSD1)						**Source: IOA0049-01**					
Chloride	5.72	0.50	0.26	mg/l	5.00	0.51	104	80-120	2	20	
Sulfate	10.6	0.50	0.18	mg/l	10.0	0.63	100	80-120	2	20	
Batch: 5A04104 Extracted: 01/04/05											
Blank Analyzed: 01/04/2005 (5A04104-BLK1)											
Surfactants (MBAS)	ND	0.10	0.044	mg/l							
LCS Analyzed: 01/04/2005 (5A04104-BS1)											
Surfactants (MBAS)	0.236	0.10	0.044	mg/l	0.250		94	90-110			
Matrix Spike Analyzed: 01/04/2005 (5A04104-MS1)						**Source: IOA0069-02**					
Surfactants (MBAS)	0.199	0.10	0.044	mg/l	0.250	ND	80	50-125			

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Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 002

Report Number: IOA0119

Sampled: 01/04/05
Received: 01/04/05

METHOD BLANK/QC DATA

INORGANICS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A04104 Extracted: 01/04/05											
Matrix Spike Dup Analyzed: 01/04/2005 (5A04104-MSD1)						**Source: IOA0069-02**					
Surfactants (MBAS)	0.172	0.10	0.044	mg/l	0.250	ND	69	50-125	15	20	
Batch: 5A05054 Extracted: 01/05/05											
Blank Analyzed: 01/10/2005 (5A05054-BLK1)											
Biochemical Oxygen Demand	ND	2.0	0.59	mg/l							
LCS Analyzed: 01/10/2005 (5A05054-BS1)											
Biochemical Oxygen Demand	208	100	30	mg/l	198		105	85-115			
LCS Dup Analyzed: 01/10/2005 (5A05054-BSD1)											
Biochemical Oxygen Demand	200	100	30	mg/l	198		101	85-115	4	20	
Batch: 5A05067 Extracted: 01/05/05											
Blank Analyzed: 01/05/2005 (5A05067-BLK1)											
Ammonia-N (Distilled)	ND	0.50	0.30	mg/l							
LCS Analyzed: 01/05/2005 (5A05067-BS1)											
Ammonia-N (Distilled)	10.1	0.50	0.30	mg/l	10.0		101	80-115			
Matrix Spike Analyzed: 01/05/2005 (5A05067-MS1)						**Source: IOA0060-03**					
Ammonia-N (Distilled)	10.4	0.50	0.30	mg/l	10.0	0.56	98	70-120			
Matrix Spike Dup Analyzed: 01/05/2005 (5A05067-MSD1)						**Source: IOA0060-03**					
Ammonia-N (Distilled)	10.1	0.50	0.30	mg/l	10.0	0.56	95	70-120	3	15	

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Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 002

Report Number: IOA0119

Sampled: 01/04/05
Received: 01/04/05

METHOD BLANK/QC DATA

INORGANICS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A05068 Extracted: 01/05/05											
Blank Analyzed: 01/05/2005 (5A05068-BLK1)											
Oil & Grease	ND	5.0	0.94	mg/l							
LCS Analyzed: 01/05/2005 (5A05068-BS1)											**M-NR1**
Oil & Grease	20.1	5.0	0.94	mg/l	20.0		100	65-120			
LCS Dup Analyzed: 01/05/2005 (5A05068-BSD1)											
Oil & Grease	21.1	5.0	0.94	mg/l	20.0		106	65-120	5	20	
Batch: 5A05078 Extracted: 01/05/05											
Blank Analyzed: 01/05/2005 (5A05078-BLK1)											
Total Cyanide	ND	5.0	2.2	ug/l							
LCS Analyzed: 01/05/2005 (5A05078-BS1)											
Total Cyanide	191	5.0	2.2	ug/l	200		96	90-110			
Matrix Spike Analyzed: 01/05/2005 (5A05078-MS1)						**Source: IOA0112-01**					
Total Cyanide	153	5.0	2.2	ug/l	200	ND	76	70-115			
Matrix Spike Dup Analyzed: 01/05/2005 (5A05078-MSD1)						**Source: IOA0112-01**					
Total Cyanide	157	5.0	2.2	ug/l	200	ND	78	70-115	3	15	
Batch: 5A05079 Extracted: 01/05/05											
Blank Analyzed: 01/05/2005 (5A05079-BLK1)											
Turbidity	ND	1.0	0.040	NTU							

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 002
Report Number: IOA0119

Sampled: 01/04/05
Received: 01/04/05

METHOD BLANK/QC DATA

INORGANICS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A05079 Extracted: 01/05/05											
Duplicate Analyzed: 01/05/2005 (5A05079-DUP1)						**Source: IOA0069-02**					
Turbidity	0.0900	1.0	0.040	NTU		0.10			11	20	J
Batch: 5A06055 Extracted: 01/06/05											
Blank Analyzed: 01/06/2005 (5A06055-BLK1)											
Perchlorate	ND	4.0	0.80	ug/l							
LCS Analyzed: 01/06/2005 (5A06055-BS1)											
Perchlorate	51.3	4.0	0.80	ug/l	50.0		103	85-115			
Matrix Spike Analyzed: 01/06/2005 (5A06055-MS1)						**Source: IOA0122-01**					
Perchlorate	54.1	4.0	0.80	ug/l	50.0	5.8	97	80-120			
Matrix Spike Dup Analyzed: 01/06/2005 (5A06055-MSD1)						**Source: IOA0122-01**					
Perchlorate	53.2	4.0	0.80	ug/l	50.0	5.8	95	80-120	2	20	
Batch: 5A06081 Extracted: 01/06/05											
Duplicate Analyzed: 01/06/2005 (5A06081-DUP1)						**Source: IOA0117-11**					
Specific Conductance	865	1.0	1.0	umhos/cm		880			2	5	
Batch: 5A06082 Extracted: 01/06/05											
Blank Analyzed: 01/06/2005 (5A06082-BLK1)											
Total Dissolved Solids	ND	10	10	mg/l							

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 002

Report Number: IOA0119

Sampled: 01/04/05
Received: 01/04/05

METHOD BLANK/QC DATA

INORGANICS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A06082 Extracted: 01/06/05											
LCS Analyzed: 01/06/2005 (5A06082-BS1)											
Total Dissolved Solids	904	10	10	mg/l	1000		90	90-110			
Duplicate Analyzed: 01/06/2005 (5A06082-DUP1)						**Source: IOA0119-01**					
Total Dissolved Solids	198	10	10	mg/l		200			1	10	
Batch: 5A07077 Extracted: 01/07/05											
Blank Analyzed: 01/07/2005 (5A07077-BLK1)											
Total Suspended Solids	ND	10	10	mg/l							
LCS Analyzed: 01/07/2005 (5A07077-BS1)											
Total Suspended Solids	989	10	10	mg/l	1000		99	85-115			
Duplicate Analyzed: 01/07/2005 (5A07077-DUP1)						**Source: IOA0210-01**					
Total Suspended Solids	ND	10	10	mg/l		ND				10	

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 002

Report Number: IOA0119

Sampled: 01/04/05
Received: 01/04/05

Compliance Check

The results obtained from the analytical testing of this data set were checked against compliance limits received from the client. Any results at or above the compliance limits appear in bold on this page.

LabNumber	Analysis	Analyte	Units	Result	MRL	Compliance Limit
IOA0119-01	413.1 Oil and Grease	Oil & Grease	mg/l	0.20	5.0	10.00
IOA0119-01	608-Pest Boeing 001/002 Q (LL)	alpha-BHC	ug/l	0	0.010	0.0100
IOA0119-01	624-Boeing 001/002 Q (Fr113+X)	1,1-Dichloroethene	ug/l	0	3.0	3.20
IOA0119-01	624-Boeing 001/002 Q (Fr113+X)	Trichloroethene	ug/l	1.00	5.0	5.00
IOA0119-01	625-Boeing 001/002 Q-LL	2,4,6-Trichlorophenol	ug/l	0	6.0	6.50
IOA0119-01	625-Boeing 001/002 Q-LL	2,4-Dinitrotoluene	ug/l	0	9.0	9.10
IOA0119-01	625-Boeing 001/002 Q-LL	Bis(2-ethylhexyl)phthalate	ug/l	0.39	5.0	4.00
IOA0119-01	625-Boeing 001/002 Q-LL	N-Nitrosodimethylamine	ug/l	0	8.0	8.10
IOA0119-01	625-Boeing 001/002 Q-LL	Pentachlorophenol	ug/l	0	8.0	8.20
IOA0119-01	BOD	Biochemical Oxygen Demand	mg/l	1.30	2.0	20
IOA0119-01	Chloride - 300.0	Chloride	mg/l	12	0.50	150
IOA0119-01	Copper-200.8	Copper	ug/l	3.50	2.0	7.10
IOA0119-01	Cyanide-335.2 5ppb	Total Cyanide	ug/l	-3	5.0	4.30
IOA0119-01	Lead-200.8	Lead	ug/l	1.20	1.0	2.60
IOA0119-01	**MBAS - SM5540-C**	**Surfactants (MBAS)**	**mg/l**	**1.70**	**10**	**0.50**
IOA0119-01	Mercury - 245.1	Mercury	ug/l	0.16	0.20	0.20
IOA0119-01	Nitrogen, NO3+NO2 -N	Nitrate/Nitrite-N	mg/l	1.70	0.26	8.00
IOA0119-01	Perchlorate 314.0	Perchlorate	ug/l	0	4.0	6.00
IOA0119-01	Sulfate-300.0	Sulfate	mg/l	43	0.50	300
IOA0119-01	TDS - SM 2540C	Total Dissolved Solids	mg/l	200	10	950
IOA0119-02	624-Boeing 001/002 Q (Fr113+X)	1,1-Dichloroethene	ug/l	0	3.0	3.20
IOA0119-02	624-Boeing 001/002 Q (Fr113+X)	Trichloroethene	ug/l	0	5.0	5.00

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 002

Report Number: IOA0119

Sampled: 01/04/05
Received: 01/04/05

DATA QUALIFIERS AND DEFINITIONS

J	Estimated value. Analyte detected at a level less than the Reporting Limit (RL) and greater than or equal to the Method Detection Limit (MDL). The user of this data should be aware that this data is of unknown quality.
M-NR1	There was no MS/MSD analyzed with this batch due to insufficient sample volume. See Blank Spike/Blank Spike Duplicate.
RL-1	Reporting limit raised due to sample matrix effects.
Z2	Surrogate recovery was above the acceptance limits. Data not impacted.
ND	Analyte NOT DETECTED at or above the reporting limit or MDL, if MDL is specified.
RPD	Relative Percent Difference

Del Mar Analytical, Irvine
Michele Harper
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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 002

Report Number: IOA0119

Sampled: 01/04/05
Received: 01/04/05

Certification Summary

Del Mar Analytical, Irvine

Method	Matrix	Nelac	California
EPA 120.1	Water	X	X
EPA 160.2	Water	X	X
EPA 160.5	Water	X	X
EPA 180.1	Water	X	X
EPA 200.8	Water	X	X
EPA 245.1	Water	X	X
EPA 300.0	Water	X	X
EPA 314.0	Water	X	X
EPA 335.2	Water	X	X
EPA 350.2	Water	X	X
EPA 405.1	Water	X	X
EPA 413.1	Water	X	X
EPA 608	Water	X	X
EPA 624	Water	X	X
EPA 625	Water	X	X
SM2540C	Water	X	X
SM5540-C	Water	X	X

Nevada and NELAP provide analyte specific accreditations. Analyte specific information for Del Mar Analytical may be obtained by contacting the laboratory or visiting our website at www.dmalabs.com.

Subcontracted Laboratories

Pace Analytical, MN- SUB

1700 Elm Street, Ste 200 - Minneapolis, MN 55414

Analysis Performed: 1613-Dioxin-HR
Samples: IOA0119-01

Analysis Performed: EDD + Level 4
Samples: IOA0119-01

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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IQA0119

Del Mar Analytical Version 5 8/12/04 CHAIN OF CUSTODY FORM

Client Name/Address:

MWH-Pasadena
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101

Project:
Boeing-SSFL NPDES
Quarterly Outfall 002

Project Manager: Bronwyn Kelly

Sampler: Pollock

Phone Number:
(626) 568-6691
Fax Number:
(626) 568-6515

Field readings:
Temp = 50.0
pH= 7.1

Sample Description	Sample Matrix	Container Type	# of Cont.	Sampling Date/Time	Preservative	Bottle * #	Total Reoverable Metals: Cu, Pb, Hg,	Settleable Solids	VOCs 624 + xylenes + Freon 113	TCDD (and all congeners)	Oil & Grease (EPA 413.1)	Cyanide (total recoverable)	BOD5(20 degrees C)	Surfactants (MBAS)	Cl-, SO4, NO3+NO2-N, Perchlorate	Turbidity,TDS, TSS, Conductivity	Ammonia-N	Alpha BHC (608)	2,4,6 Trichlorophenol, 2,4 Dinitrotoluene, Bis(2-ethylhexyl)phthalate, NDMA, pentachlorophenol (EPA 625)		Comments
Outfall 002	W	Poly-1 liter	1	1-4-05 1118	HNO3	1A	X														
Outfall 002-Dup	W	Poly-1 liter	1		HNO3	1B	X														24 TAT
Outfall 002	W	Poly-1 liter	1		None	2		X													24 TAT
Outfall 002	W	VOAs	3		HCl	3A,3B,3C			X												
Outfall 002	W	Glass-Amber	2		None	4A,4B				X											
Outfall 002	W	1L Amber	2		HCl	5A, 5B					X										
Outfall 002	W	Poly-500 ml	1		NaOH	6						X									24 TAT
Outfall 002	W	Poly-1 liter	1		None	7							X								24 TAT
Outfall 002	W	Poly-500 ml	2		None	8A,8B								X							
Outfall 002	W	Poly-500 ml	2		None	9A,9B									X						
Outfall 002	W	Poly-500 ml	2		None	10A, 10B										X					
Outfall 002	W	Poly-500 ml	1		H2SO4	11											X				
Outfall 002	W	1L Amber	2		None	12A, 12B												X			
Outfall 002	W	1L Amber	2		None	13A, 13B													X		
Trip Blank	W	VOAs	3		HCl	14A, 14B, 14C			X												

Relinquished By: Date/Time: 1-4-05 1520

Received By: Date/Time: 1/4/05 1520

Relinquished By: Date/Time: 1/4/05 1830

Received By: Date/Time: 1/4/05 1830

Relinquished By: Date/Time:

Received By: Date/Time:

Turnaround Time: (check)
Same Day ____ 72 Hours ____
24 Hours ____ 5 days ____
48 hours ____ normal ____
Perchlorate Only 72 Hours ____
Metals Only 72 Hours ____
Sample Integrity: (Check)
Intact ____ On Ice: + 5°C

IDA0119

Del Mar Analytical Version 5 8/12/04 CHAIN OF CUSTODY FORM

Client Name/Address:

MWH-Pasadena
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101

Project Manager: Bronwyn Kelly

Sampler: Pollock

Project:
Boeing-SSFL NPDES
~~Quarterly~~ Outfall 002
Rach C MH 1/3/05

Phone Number:
(626) 568-6691
Fax Number:
(626) 568-6515

ANALYSIS REQUIRED

	Sample Description	Sample Matrix	Container Type	# of Cont.	Sampling Date/Time	Preservative	Bottle * #	Total Reoverable Metals: Cu, Pb, Hg,	Settleable Solids	VOCs 624 + xylenes + ~~Freon 113~~ MH 1/31/05	TCDD (and all congeners)	Oil & Grease (EPA 413.1)	Cyanide (total recoverable)	BOD5(20 degrees C)	Surfactants (MBAS)	Cl-, SO4, NO3+NO2-N, Perchlorate	Turbidity,TDS, TSS, Conductivity	Ammonia-N	Alpha BHC (608)	2,4,6 Trichlorophenol, 2,4 Dinitrotoluene, Bis(2-ethylhexyl)phthalate, NDMA, pentachlorophenol (EPA 625)		Comments
5	Outfall 002	W	Poly-1 liter	1	1/4-05 1118	HNO3	1A	X														24 TAT
6	Outfall 002-Dup	W	Poly-1 liter	1		HNO3	1B	X														24 TAT
7	Outfall 002	W	Poly-1 liter	1		None	2		X													
8	Outfall 002	W	VOAs	3		HCl	3A,3B,3C			X												
9	Outfall 002	W	Glass-Amber	2		None	4A,4B				X											
10	Outfall 002	W	1L Amber	2		HCl	5A, 5B					X										24 TAT
	Outfall 002	W	Poly-500 ml	1		NaOH	6						X									24 TAT
11	Outfall 002	W	Poly-1 liter	1		None	7							X								
12	Outfall 002	W	Poly-500 ml	2		None	8A,8B								X							
13	Outfall 002	W	Poly-500 ml	2		None	9A,9B									X						
14	Outfall 002	W	Poly-500 ml	2		None	10A, 10B										X					
15	Outfall 002	W	Poly-500 ml	1		H2SO4	11											X				
16	Outfall 002	W	1L Amber	2		None	12A, 12B												X			
17	Outfall 002	W	1L Amber	2		None	13A, 13B													X		
18	Trip Blank	W	VOAs	3		HCl	14A, 14B, 14C			X												

Field readings:
Temp = 50.0
pH= 7.1

Relinquished By: [signature] Date/Time: 1-4-05 1520
Received By: BD Date/Time: 1/4/05 1520

Relinquished By: BD Date/Time: 1/4/05 1830
Received By: [signature] Date/Time: 1/4/05 1830

Relinquished By: Date/Time:
Received By: Date/Time:

Turnaround Time: (check)
Same Day ____ 72 Hours ____
24 Hours ____ 5 days ____
48 hours ____ normal ____
Perchlorate Only 72 Hours ____
Metals Only 72 Hours ____

Sample Integrity: (Check)
Intact X On Ice: + 5°C

Del Mar Analytical

2852 Alton Ave., Irvine CA 92606 (949) 261-1022 FAX (949) 261-1228
1014 E. Cooley Dr., Suite A, Colton, CA 92324 (909) 370-4667 FAX (949) 370-1046
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9830 South 51st St., Suite B-120, Phoenix, AZ 85044 (480) 785-0043 FAX (480) 785-0851
2520 E. Sunset Rd. #3, Las Vegas, NV 89120 (702) 798-3620 FAX (702) 798-3621

February 3, 2005

MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, Ca.91101

Attention: Bronwyn Kelly

Project: Routine Outfall 002
Sampled: 01/04/05
Del Mar Analytical Number: IOA0119

Dear Ms. Kelly:

Pace Analytical performed Method 1613B analysis for the project referenced above. Please use the following cross-reference table when reviewing your results.

MWH ID	DEL MAR ID	Pace ID
Outfall 002	IOA0119-01	105772001

Attached is the original report from the subcontract laboratory. If you have any questions or require further assistance, please do not hesitate to contact me.

Sincerely yours,
DEL MAR ANALYTICAL

Michele Harper
Project Manager

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Pace Analytical™

Method 1613B Analysis Results

Client - Del Mar Analytical

Client's Sample ID	IOA0119-01		
Lab Sample ID	105772001		
Filename	F50127A_11		
Injected By	MRO		
Total Amount Extracted	1040 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	01/04/2005
ICAL Date	11/29/2004	Received	01/06/2005
CCal Filename(s)	F50127A_02	Extracted	01/24/2005
Method Blank ID	BLANK-6202	Analyzed	01/27/2005 18:24

Native Isomers	Conc pg/L	EMPC pg/L	LOD pg/L		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	1.60		2,3,7,8-TCDF-13C	2.00	58
Total TCDF	2.5	-----	1.60	J	2,3,7,8-TCDD-13C	2.00	69
					1,2,3,7,8-PeCDF-13C	2.00	81
2,3,7,8-TCDD	ND	-----	2.00		2,3,4,7,8-PeCDF-13C	2.00	83
Total TCDD	ND	-----	2.00		1,2,3,7,8-PeCDD-13C	2.00	97
					1,2,3,4,7,8-HxCDF-13C	2.00	76
1,2,3,7,8-PeCDF	ND	-----	1.20		1,2,3,6,7,8-HxCDF-13C	2.00	92
2,3,4,7,8-PeCDF	ND	-----	0.85		2,3,4,6,7,8-HxCDF-13C	2.00	93
Total PeCDF	ND	-----	1.00		1,2,3,7,8,9-HxCDF-13C	2.00	82
					1,2,3,4,7,8-HxCDD-13C	2.00	74
1,2,3,7,8-PeCDD	ND	-----	1.40		1,2,3,6,7,8-HxCDD-13C	2.00	89
Total PeCDD	ND	-----	1.40		1,2,3,4,6,7,8-HpCDF-13C	2.00	86
					1,2,3,4,7,8,9-HpCDF-13C	2.00	78
1,2,3,4,7,8-HxCDF	ND	-----	1.50		1,2,3,4,6,7,8-HpCDD-13C	2.00	101
1,2,3,6,7,8-HxCDF	ND	-----	1.40		OCDD-13C	4.00	99
2,3,4,6,7,8-HxCDF	ND	-----	0.80				
1,2,3,7,8,9-HxCDF	ND	-----	0.59		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	-----	1.10		1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	1.30		2,3,7,8-TCDD-37Cl4	0.20	63
1,2,3,6,7,8-HxCDD	ND	-----	1.20				
1,2,3,7,8,9-HxCDD	ND	-----	1.30				
Total HxCDD	ND	-----	1.30				
1,2,3,4,6,7,8-HpCDF	2.3	-----	0.96	J			
1,2,3,4,7,8,9-HpCDF	ND	-----	0.95				
Total HpCDF	2.3	-----	0.95	J			
1,2,3,4,6,7,8-HpCDD	7.6	-----	1.20	BJ			
Total HpCDD	16.0	-----	1.20	BJ			
OCDF	9.4	-----	1.10	BJ			
OCDD	65.0	-----	2.30	BJ			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection. Totals are averages of individual isomer LODs.
D = Result obtained from analysis of diluted sample
B = Less than 10 times higher than method blank level
P = Recovery outside of method 1613 control limits
J = Concentration detected is below the calibration range
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....105772

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Pace Analytical™

Method 1613B Blank Analysis Results

Client - Del Mar Analytical

Lab Sample ID	BLANK-6202	Matrix	Water
Filename	F50127A_06	Dilution	NA
Total Amount Extracted	982 mL	Extracted	01/24/2005
ICAL Date	11/29/2004	Analyzed	01/27/2005 14:13
CCal Filename(s)	F50127A_02	Injected By	MRO

Native Isomers	Conc pg/L	EMPC pg/L	LOD pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	4.7	2,3,7,8-TCDF-13C	2.00	33
Total TCDF	ND	-----	-----	2,3,7,8-TCDD-13C	2.00	45
				1,2,3,7,8-PeCDF-13C	2.00	68
2,3,7,8-TCDD	ND	-----	5.1	2,3,4,7,8-PeCDF-13C	2.00	70
Total TCDD	ND	-----	-----	1,2,3,7,8-PeCDD-13C	2.00	81
				1,2,3,4,7,8-HxCDF-13C	2.00	75
1,2,3,7,8-PeCDF	ND	-----	2.2	1,2,3,6,7,8-HxCDF-13C	2.00	95
2,3,4,7,8-PeCDF	ND	-----	1.5	2,3,4,6,7,8-HxCDF-13C	2.00	98
Total PeCDF	ND	-----	-----	1,2,3,7,8,9-HxCDF-13C	2.00	85
				1,2,3,4,7,8-HxCDD-13C	2.00	78
1,2,3,7,8-PeCDD	ND	-----	1.6	1,2,3,6,7,8-HxCDD-13C	2.00	94
Total PeCDD	ND	-----	-----	1,2,3,4,6,7,8-HpCDF-13C	2.00	85
				1,2,3,4,7,8,9-HpCDF-13C	2.00	78
1,2,3,4,7,8-HxCDF	ND	-----	1.6	1,2,3,4,6,7,8-HpCDD-13C	2.00	99
1,2,3,6,7,8-HxCDF	ND	-----	1.4	OCDD-13C	4.00	97
2,3,4,6,7,8-HxCDF	ND	-----	1.1			
1,2,3,7,8,9-HxCDF	ND	-----	1.6	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	-----	-----	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	1.6	2,3,7,8-TCDD-37Cl4	0.20	40
1,2,3,6,7,8-HxCDD	ND	-----	1.2			
1,2,3,7,8,9-HxCDD	ND	-----	1.7			
Total HxCDD	ND	-----	-----			
1,2,3,4,6,7,8-HpCDF	ND	-----	1.5			
1,2,3,4,7,8,9-HpCDF	ND	-----	1.4			
Total HpCDF	ND	-----	-----			
1,2,3,4,6,7,8-HpCDD	1.9	-----	1.3 J			
Total HpCDD	1.9	-----	----- J			
OCDF	8.3	-----	1.9 J			
OCDD	26.0	-----	2.3 J			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection. Totals are averages of individual isomer LODs.
A = Limit of Detection based on signal to noise
P = Recovery outside of method 1613 control limits
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....105645

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Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Pace Analytical™

Method 1613B Laboratory Control Spike Results

Client - Del Mar Analytical

Lab Sample ID	LCS-6203		
Filename	F50127A_03	Matrix	Water
Total Amount Extracted	1030 mL	Dilution	NA
ICAL Date	11/29/2004	Extracted	01/24/2005
CCal Filename	F50127A_02	Analyzed	01/27/2005 11:44
Method Blank ID	BLANK-6202	Injected By	MRO

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDF	10	10.2	7.5	15.8	102
2,3,7,8-TCDD	10	9.0	6.7	15.8	90
1,2,3,7,8-PeCDF	50	50.1	40.0	67.0	100
2,3,4,7,8-PeCDF	50	48.4	34.0	80.0	97
1,2,3,7,8-PeCDD	50	43.4	35.0	71.0	87
1,2,3,4,7,8-HxCDF	50	44.8	36.0	67.0	90
1,2,3,6,7,8-HxCDF	50	48.0	42.0	65.0	96
2,3,4,6,7,8-HxCDF	50	48.6	35.0	78.0	97
1,2,3,7,8,9-HxCDF	50	46.4	39.0	65.0	93
1,2,3,4,7,8-HxCDD	50	50.0	35.0	82.0	100
1,2,3,6,7,8-HxCDD	50	51.7	38.0	67.0	103
1,2,3,7,8,9-HxCDD	50	48.5	32.0	81.0	97
1,2,3,4,6,7,8-HpCDF	50	51.4	41.0	61.0	103
1,2,3,4,7,8,9-HpCDF	50	52.3	39.0	69.0	105
1,2,3,4,6,7,8-HpCDD	50	43.4	35.0	70.0	87
OCDF	100	89.5	63.0	170.0	90
OCDD	100	96.9	78.0	144.0	97
2,3,7,8-TCDD-37Cl4	10	6.2	3.1	19.1	62
2,3,7,8-TCDF-13C	100	49.8	22.0	152.0	50
2,3,7,8-TCDD-13C	100	65.8	20.0	175.0	66
1,2,3,7,8-PeCDF-13C	100	75.7	21.0	192.0	76
2,3,4,7,8-PeCDF-13C	100	76.9	13.0	328.0	77
1,2,3,7,8-PeCDD-13C	100	93.4	21.0	227.0	93
1,2,3,4,7,8-HxCDF-13C	100	78.9	19.0	202.0	79
1,2,3,6,7,8-HxCDF-13C	100	89.8	21.0	159.0	90
2,3,4,6,7,8-HxCDF-13C	100	88.2	22.0	176.0	88
1,2,3,7,8,9-HxCDF-13C	100	81.5	17.0	205.0	81
1,2,3,4,7,8-HxCDD-13C	100	82.2	21.0	193.0	82
1,2,3,6,7,8-HxCDD-13C	100	95.2	25.0	163.0	95
1,2,3,4,6,7,8-HpCDF-13C	100	86.3	21.0	158.0	86
1,2,3,4,7,8,9-HpCDF-13C	100	75.6	20.0	186.0	76
1,2,3,4,6,7,8-HpCDD-13C	100	102.9	26.0	166.0	103
OCDD-13C	200	195.1	26.0	397.0	98

Cs = Concentration Spiked (ng/mL)
Cr = Concentration Recovered (ng/mL)
Rec. = Recovery (Expressed as Percent)
Control Limit Reference: Method 1613, Table 6, 10/94 Revision
X = Background subtracted value
P = Recovery outside of control limits
Nn = Value obtained from additional analysis
* = See Discussion

Report No.....105645

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Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 1613B Laboratory Control Spike Results

Client - Del Mar Analytical

Lab Sample ID	LCSD-6204		
Filename	F50127A_04	Matrix	Water
Total Amount Extracted	1000 mL	Dilution	NA
ICAL Date	11/29/2004	Extracted	01/24/2005
CCal Filename	F50127A_02	Analyzed	01/27/2005 12:32
Method Blank ID	BLANK-6202	Injected By	MRO

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDF	10	9.9	7.5	15.8	99
2,3,7,8-TCDD	10	8.8	6.7	15.8	88
1,2,3,7,8-PeCDF	50	49.8	40.0	67.0	100
2,3,4,7,8-PeCDF	50	47.6	34.0	80.0	95
1,2,3,7,8-PeCDD	50	41.4	35.0	71.0	83
1,2,3,4,7,8-HxCDF	50	46.6	36.0	67.0	93
1,2,3,6,7,8-HxCDF	50	44.0	42.0	65.0	88
2,3,4,6,7,8-HxCDF	50	47.2	35.0	78.0	94
1,2,3,7,8,9-HxCDF	50	44.8	39.0	65.0	90
1,2,3,4,7,8-HxCDD	50	46.5	35.0	82.0	93
1,2,3,6,7,8-HxCDD	50	48.9	38.0	67.0	98
1,2,3,7,8,9-HxCDD	50	46.7	32.0	81.0	93
1,2,3,4,6,7,8-HpCDF	50	48.7	41.0	61.0	97
1,2,3,4,7,8,9-HpCDF	50	49.9	39.0	69.0	100
1,2,3,4,6,7,8-HpCDD	50	42.7	35.0	70.0	85
OCDF	100	84.8	63.0	170.0	85
OCDD	100	92.5	78.0	144.0	92
2,3,7,8-TCDD-37Cl4	10	7.5	3.1	19.1	75
2,3,7,8-TCDF-13C	100	65.7	22.0	152.0	66
2,3,7,8-TCDD-13C	100	83.8	20.0	175.0	84
1,2,3,7,8-PeCDF-13C	100	84.9	21.0	192.0	85
2,3,4,7,8-PeCDF-13C	100	85.6	13.0	328.0	86
1,2,3,7,8-PeCDD-13C	100	105.3	21.0	227.0	105
1,2,3,4,7,8-HxCDF-13C	100	82.6	19.0	202.0	83
1,2,3,6,7,8-HxCDF-13C	100	96.7	21.0	159.0	97
2,3,4,6,7,8-HxCDF-13C	100	92.3	22.0	176.0	92
1,2,3,7,8,9-HxCDF-13C	100	84.5	17.0	205.0	84
1,2,3,4,7,8-HxCDD-13C	100	81.9	21.0	193.0	82
1,2,3,6,7,8-HxCDD-13C	100	102.0	25.0	163.0	102
1,2,3,4,6,7,8-HpCDF-13C	100	90.1	21.0	158.0	90
1,2,3,4,7,8,9-HpCDF-13C	100	78.6	20.0	186.0	79
1,2,3,4,6,7,8-HpCDD-13C	100	106.1	26.0	166.0	106
OCDD-13C	200	196.4	26.0	397.0	98

Cs = Concentration Spiked (ng/mL)
Cr = Concentration Recovered (ng/mL)
Rec. = Recovery (Expressed as Percent)
Control Limit Reference: Method 1613, Table 6, 10/94 Revision
X = Background subtracted value
P = Recovery outside of control limits
Nn = Value obtained from additional analysis
* = See Discussion

Report No.....105645

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Minneapolis, MN 55414
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Fax: 612.607.6444

SPIKE RECOVERY RELATIVE PERCENT DIFFERENCE (RPD) RESULTS

Client..... Del Mar Analytical

SPIKE 1 ID..... LCS-6203
SPIKE 1 Filename..... F50127A_03
SPIKE 2 ID..... LCSD-6204
SPIKE 2 Filename..... F50127A_04

COMPOUND	SPIKE 1 REC,%	SPIKE 2 REC,%	RPD,%
2378-TCDF	102	99	3.0
2378-TCDD	90	88	2.2
12378-PeCDF	100	100	0.0
23478-PeCDF	97	95	2.1
12378-PeCDD	87	83	4.7
123478-HxCDF	90	93	3.3
123678-HxCDF	96	88	8.7
234678-HxCDF	97	94	3.1
123789-HxCDF	93	90	3.3
123478-HxCDD	100	93	7.3
123678-HxCDD	103	98	5.0
123789-HxCDD	97	93	4.2
1234678-HpCDF	103	97	6.0
1234789-HpCDF	105	100	4.9
1234678-HpCDD	87	85	2.3
OCDF	90	85	5.7
OCDD	97	92	5.3

REC = Percent Recovered
RPD = The difference between the two values divided by the average.
NA = Not Applicable

Report No.....105645

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TABLE 1. 2,3,7,8-TCDD Equivalency Factors (TEFs) for the Polychlorinated Dibenzo-p-dioxins and Dibenzofurans

Number	Compound(s)	TEF
1	2,3,7,8-TCDD	1.00
2	1,2,3,7,8-PeCDD	0.50
3	1,2,3,6,7,8-HxCDD	0.1
4	1,2,3,7,8,9-HxCDD	0.1
5	1,2,3,4,7,8-HxCDD	0.1
6	1,2,3,4,6,7,8-HpCDD	0.01
7	OCDD	0.001
8	* Total - TCDD	0.0
9	* Total - PeCDD	0.0
10	* Total - HxCDD	0.0
11	* Total - HpCDD	0.0
12	2,3,7,8-TCDF	0.10
13	1,2,3,7,8-PeCDF	0.05
14	2,3,4,7,8-PeCDF	0.5
15	1,2,3,6,7,8-HxCDF	0.1
16	1,2,3,7,8,9-HxCDF	0.1
17	1,2,3,4,7,8-HxCDF	0.1
18	2,3,4,6,7,8-HxCDF	0.1
19	1,2,3,4,6,7,8-HpCDF	0.01
20	1,2,3,4,7,8,9-HpCDF	0.01
21	OCDF	0.001
22	* Total - TCDF	0.0
23	* Total - PeCDF	0.0
24	* Total - HxCDF	0.0
25	* Total - HpCDF	0.0

*Excluding the 2,3,7,8-substituted congeners.

Reference: 1989 ITEFs

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Del Mar Analytical

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9484 Chesapeake Drive, Suite 805, San Diego, CA 92123 Ph (619) 505-9596 Fax (619) 505-9689
9830 South 51st Street, Suite B-120, Phoenix, AZ 85044 Ph (480) 785-0043 Fax (480) 785-0851
2520 E. Sunset Rd., Suite #3, Las Vegas, NV 89120 Ph (702) 798-3620 Fax (702) 798-3621

SUBCONTRACT ORDER - PROJECT # IOA0119

105772

SENDING LABORATORY:

Del Mar Analytical, Irvine
17461 Derian Avenue. Suite 100
Irvine, CA 92614
Phone: (949) 261-1022
Fax: (949) 261-1228
Project Manager: Michele Harper

RECEIVING LABORATORY:

Pace Analytical, MN- SUB
1700 Elm Street, Ste 200
Minneapolis, MN 55414
Phone :(612) 607-1700
Fax: (612) 607-6444

Standard TAT is requested unless specific due date is requested => Due Date:_____ **Initials:**_____

Analysis	Expiration	Comments
Sample ID: IOA0119-01 Water	**Sampled: 01/04/05 11:18**	**Instant Nofication**
1613-Dioxin-HR	01/11/05 11:18	J flags, 17 congeners, no TEQ, sub to Pace-MN

105772001

Containers Supplied:
1 L Amber (IOA0119-01G)
1 L Amber (IOA0119-01H)

SAMPLE INTEGRITY:

All containers intact: ☐ Yes ☐ No
Custody Seals Present: ☐ Yes ☐ No
Sample labels/COC agree: ☐ Yes ☐ No
Samples Preserved Properly: ☐ Yes ☐ No
Samples Received On Ice:: ☒ Yes ☐ No
Samples Received at (temp): 0.0

	Date	Time		Date	Time
Released By	1-5-05	1700	Bright Flew	1/6/05	9:25
Released By			Received By		

Page 1 of 1

CONTRACT COMPLIANCE SCREENING FORM FOR HARDCOPY DATA

AMEC Earth & Environmental
550 South Wadsworth Boulevard
Suite 500
Lakewood, CO 80226

Package ID T711DF22
Task Order 313150010
SDG No. Multiple
No. of Analyses 9

Laboratory Pace
Reviewer K. Shadowlight
Analysis/Method Dioxins

Date: February 18, 2005
Reviewer's Signature K Shadowlight

ACTION ITEMS[a]	
1. **Case Narrative Deficiencies**	
2. **Out of Scope Analyses**	
3. **Analyses Not Conducted**	
4. **Missing Hardcopy Deliverables**	
5. **Incorrect Hardcopy Deliverables**	
6. **Deviations from Analysis Protocol, e.g.,**	Qualifications were assigned for the following:
Holding Times	* Method blank contamination
GC/MS Tune/Inst. Performance	* EMPCs
Calibration	* Detects below the lower method calibration level
Method blanks	
Surrogates	
Matrix Spike/Dup LCS	
Field QC	
Internal Standard Performance	
Compound Identification and Quantitation	
System Performance	
COMMENTS[b]	

[a] Subcontracted analytical laboratory is not meeting contract and/or method requirements.
[b] Differences in protocol have been adopted by the laboratory but no action against the laboratory is required.

DATA VALIDATION REPORT

NPDES
Monitoring

ANALYSIS: DIOXINS/FURANS

SAMPLE DELIVERY GROUPS: Multiple SDGs

Prepared by

AMEC—Denver Operations
550 South Wadsworth Boulevard, Suite 500
Lakewood, Colorado 80226

1. INTRODUCTION

Task Order Title:	NPDES Monitoring
Contract Task Order #:	313150010
Sample Delivery Group #:	Multiple
Project Manager:	B. McIlvaine
Matrix:	Water
Analysis:	Dioxins/Furans
QC Level:	Level IV
No. of Samples:	9
No. of Reanalyses/Dilutions:	0
Reviewer:	K. Shadowlight
Date of Review:	February 18, 2005

The samples listed in Table 1 were validated based on the guidelines outlined in the *AMEC Data Validation Procedure for Dioxins and Furans (DVP-19, Rev. 1), EPA Method 1613, and the National National Functional Guidelines For Chlorinated Dioxin/Furan Data Review* (8/02). Any deviations from these procedures and guidelines are documented herein. Qualifiers were applied in cases where the data did not meet the required QC criteria or where special consideration by the data user is required. Data qualifiers were placed on Form Is with the associated qualification codes. Analytes that were rejected for any reason are denoted on the Form I as having only the "R" data qualifier and associated qualification code(s) denoting the reason for rejection. Any additional problems with the data that may have resulted in an estimated value were not denoted by a qualification code since the data had already been rejected.

Table 1. Sample Identification

Client ID	Laboratory ID (Del Mar)	Laboratory ID (Pace)	Matrix	COC Method
Outfall 001	IOA0551-01	106124001	water	1613
Outfall 002	IOA0550-01	106130001	water	1613
Outfall 007	IOA0556-01	106128001	water	1613
Outfall 008	IOA0553-01	106126001	water	1613
Outfall 009	IOA0554-01	106131001	water	1613
Outfall 010	IOA0555-01	106127001	water	1613
Outfall 011	IOA0549-01	106132001	water	1613
Outfall 011	IOA0567-01	106135001	water	1613
Outfall 018	IOA0552-01	106125001	water	1613

2. DATA VALIDATION FINDINGS

2.1 SAMPLE MANAGEMENT

Following are findings associated with sample management:

2.1.1 Sample Preservation, Handling, and Transport

The samples in these SDGs were received at Del Mar Analytical within the temperature limits of 4°C ±2°C. The samples were subcontracted to Pace Analytical for the dioxin/furan analyses. The samples in these SDGs were received at Pace Analytical Services within the temperature limits of 4°C ±2°C. The samples were received in good condition at both laboratories. No qualifications were required.

2.1.2 Chain of Custody

The COCs and transfer COCs were signed by the appropriate field and laboratory personnel. The samples and analyses were accounted for on both the original COCs and transfer COCs. As the samples were couriered directly to the laboratory (Del Mar Analytical), custody seals were not required. There was no information regarding custody seals upon receipt at Pace. No qualifications were required.

2.1.3 Holding Times

The samples were extracted and analyzed within a year of collection. No qualifications were required.

2.2 INSTRUMENT PERFORMANCE

Following are findings associated with instrument performance:

2.2.1 GC Column Performance

A column performance standard was combined with the daily calibration verification and analyzed at the beginning of each analytical sequence. The GC column performance was acceptable with the chromatographic separation of 2,3,7,8-TCDD and other TCDD isomers resolved with a valley of ≤25%. No qualifications were required.

2.2.2 Mass Spectrometer Performance

The mass spectrometer performance could not be evaluated as the laboratory did not provide selected ion current profiles for the lock-mass ions. No qualifications were required.

2.3 CALIBRATION

2.3.1 Initial Calibration

There was one initial calibration, analyzed 11/29/04 on Instrument 10MSHR05. The calibration consisted of five concentration level standards (CS1 through CS5) analyzed to verify instrument linearity. The initial calibration was acceptable with %RSDs ≤20% for the 15 native compounds (calibration by isotope dilution) and ≤35% for the 2 native and all labeled compounds (calibration by internal standard). The relative retention times and ion abundance ratios were within the QC limits listed in Method 1613 for all standards. A representative number of %RSDs were verified from the raw data, and no calculation or transcription errors were noted. No qualifications were required.

2.3.2 Continuing Calibration

Calibration verification (VER) consisted of a mid-level standard (CS3) analyzed at the beginning of each analytical sequence. The VER was acceptable with the concentrations within the acceptance criteria listed in the Table 6 of the EPA Method 1613. The ion abundance ratios and relative retention times were within the method QC limits. A representative number of %Ds were verified from the raw data, and no calculation or transcription errors were noted. No qualifications were required.

2.4 BLANKS

One method blank (Blank-6220) was extracted and analyzed with the samples in these SDGs. Target compounds total HpCDF, 1,2,3,4,6,7,8-HpCDF, total HpCDF, OCDF, and OCDD were reported in the method blank. Any detects for the aforementioned target compounds reported at concentrations <5× the concentrations reported in the method blank were qualified as estimated nondetects "UJ," at the levels of interference in the samples of these SDGs. A review of the method blank raw data and chromatograms indicated no false negatives or false positives. No further qualifications were required.

2.5 BLANK SPIKES AND LABORATORY CONTROL SAMPLES

One LCS/LCSD pair (LCS-6221/LCSD-6222) was extracted and analyzed with the samples in these SDGs. All recoveries were within the acceptance criteria listed in Table 6 of the Method 1613. There are no method QC limits established for RPDs. The reported RPDs were within ±20%. No qualifications were required.

2.6 MATRIX SPIKE/MATRIX SPIKE DUPLICATE

MS/MSD analyses were not performed in these SDGs. Evaluation of method accuracy and precision was based on the LCS/LCSD results. No qualifications were required.

2.7 FIELD QC SAMPLES

Following are findings associated with field QC:

2.7.1 Field Blanks and Equipment Rinsates

The samples in these SDGs had no associated field QC samples. No qualifications were required.

2.7.2 Field Duplicates

No field duplicate samples were identified for these SDGs.

2.8 INTERNAL STANDARDS

The labeled standard recoveries were within the acceptance criteria listed in Table 7 of Method 1613. No qualifications were required.

2.9 COMPOUND IDENTIFICATION

The laboratory analyzed for polychlorinated dioxins/furans by EPA Method 1613. The compound identifications were verified from the raw data and no false negatives or positives were noted. No qualifications were required.

2.10 COMPOUND QUANTIFICATION AND REPORTED DETECTION LIMITS

Compound quantitation was verified from the raw data. The laboratory calculated and reported compound-specific detection limits. Any detects below the lower method calibration limit (MCL) were qualified as estimated, "J." Any reported EMPC was qualified as an estimated nondetect, "UJ." No further qualifications were required.

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 1613B Analysis Results

Client - Del Mar Analytical

Client's Sample ID	IOA0550-01 Outfall 002		
Lab Sample ID	106130001		
Filename	F50129B_12		
Injected By	BAL		
Total Amount Extracted	1040 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	01/11/2005
ICAL Date	11/29/2004	Received	01/13/2005
CCal Filename(s)	F50129B_02	Extracted	01/28/2005
Method Blank ID	BLANK-6220	Analyzed	01/30/2005 04:48

Native Isomers	Conc pg/L	EMPC pg/L	LOD pg/L		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	0.63		2,3,7,8-TCDF-13C	2.00	60
Total TCDF	2.1	-----	0.63	J	2,3,7,8-TCDD-13C	2.00	75
					1,2,3,7,8-PeCDF-13C	2.00	67
2,3,7,8-TCDD	ND	-----	0.78		2,3,4,7,8-PeCDF-13C	2.00	69
Total TCDD	ND	-----	0.78		1,2,3,7,8-PeCDD-13C	2.00	83
					1,2,3,4,7,8-HxCDF-13C	2.00	68
1,2,3,7,8-PeCDF	ND	-----	1.20		1,2,3,6,7,8-HxCDF-13C	2.00	82
2,3,4,7,8-PeCDF	ND	-----	0.62		2,3,4,6,7,8-HxCDF-13C	2.00	74
Total PeCDF	ND	-----	0.90		1,2,3,7,8,9-HxCDF-13C	2.00	71
					1,2,3,4,7,8-HxCDD-13C	2.00	61
1,2,3,7,8-PeCDD	ND	-----	0.74		1,2,3,6,7,8-HxCDD-13C	2.00	88
Total PeCDD	ND	-----	0.74		1,2,3,4,6,7,8-HpCDF-13C	2.00	73
					1,2,3,4,7,8,9-HpCDF-13C	2.00	63
1,2,3,4,7,8-HxCDF	ND	-----	0.48		1,2,3,4,6,7,8-HpCDD-13C	2.00	81
1,2,3,6,7,8-HxCDF	ND	-----	0.61		OCDD-13C	4.00	70
2,3,4,6,7,8-HxCDF	ND	-----	0.55				
1,2,3,7,8,9-HxCDF	ND	-----	0.63		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	-----	0.57		1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	0.91				
1,2,3,6,7,8-HxCDD	ND	-----	0.57		2,3,7,8-TCDD-37Cl4	0.20	72
1,2,3,7,8,9-HxCDD	ND	-----	0.49				
Total HxCDD	1.5	-----	0.66	J			
1,2,3,4,6,7,8-HpCDF	-----	1.4	0.92	I			
1,2,3,4,7,8,9-HpCDF	ND	-----	1.00				
Total HpCDF	ND	-----	0.97				
1,2,3,4,6,7,8-HpCDD	8.0	-----	0.95	BJ			
Total HpCDD	16.0	-----	0.95	BJ			
OCDF	7.6	-----	1.50	BJ			
OCDD	71.0	-----	5.40	J			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection. Totals are averages of individual isomer LODs.
D = Result obtained from analysis of diluted sample
B = Less than 10 times higher than method blank level
P = Recovery outside of method 1613 control limits
J = Concentration detected is below the calibration range
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....106130

DATA VALIDATED

REPORT OF LABORATORY ANALYSIS

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CONTRACT COMPLIANCE SCREENING FORM FOR HARDCOPY DATA

AMEC Earth & Environmental
550 South Wadsworth Boulevard
Suite 500
Lakewood, CO 80226

Laboratory Del Mar
Reviewer M. Pokorny
Analysis/Method Volatiles

Package ID T711VO41
Task Order 313150010
SDG No. IOA0550, IOA0551
No. of Analyses 4

Date: February 9, 2005
Reviewer's Signature

ACTION ITEMS[a]	
1. **Case Narrative Deficiencies**	
2. **Out of Scope Analyses**	
3. **Analyses Not Conducted**	
4. **Missing Hardcopy Deliverables**	
5. **Incorrect Hardcopy Deliverables**	
6. **Deviations from Analysis Protocol, e.g.,**	Qualification required for a detect below the reporting limit.
Holding Times	
GC/MS Tune/Inst. Perform	
Calibrations	
Blanks	
Surrogates	
Matrix Spike/Dup LCS	
Field QC	
Internal Standard Performance	
Compound Identification and Quantitation	
System Performance	

COMMENTS[b]

[a] Subcontracted analytical laboratory is not meeting contract and/or method requirements.
[b] Differences in protocol have been adopted by the laboratory but no action against the laboratory is required.

DATA VALIDATION REPORT

NPDES Monitoring

ANALYSIS: VOLATILES

SAMPLE DELIVERY GROUP: IOA0550, IOA0551

Prepared by

AMEC Denver Operations
550 South Wadsworth Boulevard, Suite 500
Lakewood, Colorado 80226

1. INTRODUCTION

Task Order Title:	NPDES Monitoring
Contract Task Order #:	313150010
SDG#:	IOA0550, IOA0551
Project Manager:	B. McIlvaine
Matrix:	Water
Analysis:	Volatiles
QC Level:	Level IV
No. of Samples:	4
No. of Reanalyses/Dilutions:	0
Reviewer:	M. Pokorny
Date of Review:	February 9, 2005

The samples listed in Table 1 were validated based on the guidelines outlined in the *AMEC Data Validation Procedure for Levels C and D Volatile Organics (DVP-2, Rev. 2), EPA Method 624*, and the *National Functional Guidelines For Organic Data Review* (2/94). Any deviations from these procedures are documented herein. Qualifiers were applied in cases where the data did not meet the required QC criteria or where special consideration by the data user is required. Data qualifiers were placed on Form Is with the associated qualification codes. Analytes that were rejected for any reason are denoted on the summary forms as having only the "R" data qualifier and associated qualification code(s) denoting the reason for rejection. Any additional problems with the data that may have resulted in an estimated value were not denoted by a qualification code since the data had already been rejected.

Table 1. Sample identification

Client ID	EPA ID	Lab No.	Matrix	Method
Outfall 002	Outfall 002	IOA0550-01	water	624
Trip Blank	Trip Blank	IOA0550-02	water	624
Outfall 001	Outfall 001	IOA0551-01	water	624
Trip Blank	Trip Blank	IOA0551-02	water	624

2. DATA VALIDATION FINDINGS

2.1 SAMPLE MANAGEMENT

The following are findings associated with sample management:

2.1.1 Sample Preservation, Handling, and Transport

The samples in these SDGs were received at the laboratory within the temperature limits of 4°C ± 2°C. According to the COCs, the samples were received intact, without headspace, and in good condition. No qualifications were required.

2.1.2 Chain of Custody

The COCs were signed by field and laboratory personnel and accounted for the analyses presented in these SDGs. As the samples were couriered to the laboratory, custody seals are not required. No qualifications were required.

2.1.3 Holding Times

The samples were analyzed within 14 days of collection. No qualifications were required.

2.2 GC/MS TUNING

The ion abundance windows shown on the quantitation report were consistent with those specified in the EPA Method 624. All ion abundances were within the established windows and were therefore acceptable. The samples and associated QC were analyzed within 12 hours of the BFB injection times. The Form Vs were verified from the raw data and no discrepancies between the summary forms and the raw data were noted. No qualifications were required.

2.3 CALIBRATION

Three initial calibrations, dated 11/10/04, 12/13/04, and 01/04/05, were associated with these SDGs. The average RRFs were ≥0.05 and the %RSDs were ≤35% for the target compounds listed on the sample summary forms. Three continuing calibrations were associated with these SDGs. The RRFs for all target compounds were ≥0.05 and the %Ds were ≤20%. A representative number of %RSDs and average RRFs from the initial calibration, and %Ds and RRFs from the continuing calibration were recalculated from the raw data, and no calculation or transcription errors were found. No qualifications were required.

2.4 BLANKS

Three water method blanks (5A12001-BLK1, 5A12003-BLK1, 5A12008-BLK1) were associated with these SDGs. There were no detects for the target compounds listed on the summary forms. The method blank raw data showed no evidence of false negatives. No qualifications were required.

2.5 BLANK SPIKES AND LABORATORY CONTROL SAMPLES

Three water blank spikes (5A12001-BS1, 5A12003-BS1, 5A12008-BS1) were associated with these SDGs. All spike recoveries were within the laboratory-established QC limits. A representative number of recoveries were recalculated from the raw data and no calculation or transcription errors were found. No qualifications were required.

2.6 SURROGATE RECOVERY

The surrogates were within the QC limits of 80-120%. A representative number of surrogate recoveries were recalculated from the raw data and no calculation or transcription errors were found. No qualifications were required.

2.7 MATRIX SPIKE/MATRIX SPIKE DUPLICATE

MS/MSD analyses were not performed for these SDGs. Evaluation of method accuracy was based on LCS results. No qualifications were required.

2.8 FIELD QC SAMPLES

Field QC samples were evaluated, and if necessary, qualified based on method blanks and other laboratory QC results affecting the usability of the field QC data. Any remaining detects were used to evaluate the associated site sample. Following are findings associated with field QC samples:

2.8.1 Trip Blanks

Samples Trip Blank (IOA0550-02) and Trip Blank (IOA0551-02) were the trip blanks associated with the site samples of these SDGs. There were no target compounds detected in the trip blanks. No qualifications were required.

2.8.2 Field Blanks and Equipment Rinsates

There were no other field QC samples associated with these SDGs. No qualifications were required.

2.8.3 Field Duplicates

There were no field duplicate samples associated with these SDGs.

2.9 INTERNAL STANDARDS PERFORMANCE

Internal standard area counts and retention times for these SDGs were within the control limits established by the continuing calibration standards, of +100%/-50% for internal standard areas and ±0.50 minutes for retention times. A representative number of internal standard areas and retention times were verified from the raw data, and no calculation or transcription errors were noted. No qualifications were required.

2.10 COMPOUND IDENTIFICATION

Target compound identification was verified at a Level IV data validation. The laboratory analyzed for a subset of volatile target compounds by EPA Method 624. Chromatograms, retention times, and spectra for the samples and QC were examined and no target compound identification problems were noted. No qualifications were required.

2.11 COMPOUND QUANTIFICATION AND REPORTED DETECTION LIMITS

Compound quantification is verified at a Level IV data validation. The reporting limits were supported by the lowest concentrations of the initial calibration standards and by MDL study. Compound quantitation was verified by recalculating any sample detect, and/or a representative number of blank spike and surrogate recoveries from the raw data. No calculation or transcription errors were noted. Target compounds detected below the reporting limit were qualified as estimated, "J," by the laboratory. No further qualifications were required.

2.12 TENTATIVELY IDENTIFIED COMPOUNDS

The laboratory did not provide TICs for these SDGs. No qualifications were required.

2.13 SYSTEM PERFORMANCE

A review of the chromatograms and other raw data showed no identifiable problems with system performance. No qualifications were required.

Del Mar Analytical

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2520 E. Sunset Rd. #3, Las Vegas, NV 89120 (702) 798-3620 FAX (702) 798-3621

MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 002

Report Number: IOA0550

Sampled: 01/11/05
Received: 01/11/05

DRAFT: PURGEABLES BY GC/MS (EPA 624)

Analyte	Method	Batch	MDL	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers	REV QUAL	QUAL COD
Sample ID: IOA0550-01 (DRAFT: Outfall 002 - Water)											
Reporting Units: ug/l											
Benzene	EPA 624	5A12001	0.28	2.0	ND	1	01/12/05	01/12/05		U	
Carbon tetrachloride	EPA 624	5A12001	0.28	5.0	ND	1	01/12/05	01/12/05			
Chloroform	EPA 624	5A12001	0.33	2.0	ND	1	01/12/05	01/12/05			
1,1-Dichloroethane	EPA 624	5A12001	0.27	2.0	ND	1	01/12/05	01/12/05			
1,2-Dichloroethane	EPA 624	5A12001	0.28	2.0	ND	1	01/12/05	01/12/05			
1,1-Dichloroethene	EPA 624	5A12001	0.32	3.0	ND	1	01/12/05	01/12/05			
Ethylbenzene	EPA 624	5A12001	0.25	2.0	ND	1	01/12/05	01/12/05			
Tetrachloroethene	EPA 624	5A12001	0.32	2.0	ND	1	01/12/05	01/12/05			
Toluene	EPA 624	5A12001	0.36	2.0	ND	1	01/12/05	01/12/05			
1,1,1-Trichloroethane	EPA 624	5A12001	0.30	2.0	ND	1	01/12/05	01/12/05			
1,1,2-Trichloroethane	EPA 624	5A12001	0.30	2.0	ND	1	01/12/05	01/12/05			
Trichloroethene	EPA 624	5A12001	0.26	5.0	**0.95**	1	01/12/05	01/12/05	J	J	DNQ
Trichlorofluoromethane	EPA 624	5A12001	0.34	5.0	ND	1	01/12/05	01/12/05		U	
Vinyl chloride	EPA 624	5A12001	0.26	5.0	ND	1	01/12/05	01/12/05		U	
Xylenes, Total	EPA 624	5A12001	0.52	4.0	ND	1	01/12/05	01/12/05		U	
Surrogate: Dibromofluoromethane (80-120%)					*102 %*						
Surrogate: Toluene-d8 (80-120%)					*100 %*						
Surrogate: 4-Bromofluorobenzene (80-120%)					*98 %*						
Sample ID: IOA0550-02 (DRAFT: Trip Blank - Water)											
Reporting Units: ug/l											
Benzene	EPA 624	5A12003	0.28	2.0	ND	1	01/12/05	01/12/05		U	
Carbon tetrachloride	EPA 624	5A12003	0.28	5.0	ND	1	01/12/05	01/12/05			
Chloroform	EPA 624	5A12003	0.33	2.0	ND	1	01/12/05	01/12/05			
1,1-Dichloroethane	EPA 624	5A12003	0.27	2.0	ND	1	01/12/05	01/12/05			
1,2-Dichloroethane	EPA 624	5A12003	0.28	2.0	ND	1	01/12/05	01/12/05			
1,1-Dichloroethene	EPA 624	5A12003	0.32	3.0	ND	1	01/12/05	01/12/05			
Ethylbenzene	EPA 624	5A12003	0.25	2.0	ND	1	01/12/05	01/12/05			
Tetrachloroethene	EPA 624	5A12003	0.32	2.0	ND	1	01/12/05	01/12/05			
Toluene	EPA 624	5A12003	0.36	2.0	ND	1	01/12/05	01/12/05			
1,1,1-Trichloroethane	EPA 624	5A12003	0.30	2.0	ND	1	01/12/05	01/12/05			
1,1,2-Trichloroethane	EPA 624	5A12003	0.30	2.0	ND	1	01/12/05	01/12/05			
Trichloroethene	EPA 624	5A12003	0.26	5.0	ND	1	01/12/05	01/12/05			
Trichlorofluoromethane	EPA 624	5A12003	0.34	5.0	ND	1	01/12/05	01/12/05			
Vinyl chloride	EPA 624	5A12003	0.26	5.0	ND	1	01/12/05	01/12/05			
Xylenes, Total	EPA 624	5A12003	0.52	4.0	ND	1	01/12/05	01/12/05			
Surrogate: Dibromofluoromethane (80-120%)					*98 %*						
Surrogate: Toluene-d8 (80-120%)					*94 %*						
Surrogate: 4-Bromofluorobenzene (80-120%)					*101 %*						

AMEC VALIDATED

DRAFT REPORT
DRAFT REPORT
DATA SUBJECT TO CHANGE

LEVEL IV

The results pertain only to the samples tested in the laboratory. This report shall not be reproduced, except in full, without written permission from Del Mar Analytical.

CONTRACT COMPLIANCE SCREENING FORM FOR HARDCOPY DATA

AMEC Earth & Environmental
550 South Wadsworth Boulevard
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Lakewood, CO 80226

Laboratory Del Mar
Reviewer P. Meeks
Analysis/Method General Minerals

Package ID T711WC57
Task Order 313150010
SDG No. IOA0550, 0551
No. of Analyses 2

Date: 02/09/05
Reviewer's Signature P. Meeks

ACTION ITEMS[a]	
1. **Case Narrative Deficiencies**	
2. **Out of Scope Analyses**	
3. **Analyses Not Conducted**	
4. **Missing Hardcopy Deliverables**	
5. **Incorrect Hardcopy Deliverables**	
6. **Deviations from Analysis Protocol, e.g.,**	
Holding Times	
GC/MS Tune/Inst. Performance	
Calibrations	
Blanks	
Surrogates	
Matrix Spike/Dup LCS	
Field QC	
Internal Standard Performance	
Compound Identification and Quantitation	
System Performance	
COMMENTS[b]	Acceptable as reviewed.

[a] Subcontracted analytical laboratory is not meeting contract and/or method requirements.
[b] Differences in protocol have been adopted by the laboratory but no action against the laboratory is required.

DATA VALIDATION REPORT

NPDES Monitoring

ANALYSIS: GENERAL MINERALS

SAMPLE DELIVERY GROUPS: IOA0550 & IOA0551

Prepared by

AMEC—Denver Operations
550 South Wadsworth Boulevard, Suite 500
Lakewood, Colorado 80226

1. INTRODUCTION

Task Order Title:	NPDES Monitoring
Contract Task Order #:	313150010
Sample Delivery Group #:	IOA0550 & IOA0551
Project Manager:	B. McIlvaine
Matrix:	Water
Analysis:	General Minerals
QC Level:	Level IV
No. of Samples:	2
Reviewer:	P. Meeks
Date of Review:	February 09, 2005

The sample listed in Table 1 was validated based on the guidelines outlined in the AMEC *Data Validation Procedures* SOP DVP-6, Rev. 2, *USEPA Methods for Chemical Analysis of Water and Wastes Method 350.2, 180.1, and 120.1,* and validation guidelines outlined in the USEPA *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (2/94).* Any deviations from these procedures and guidelines are documented herein. Qualifiers were applied in cases where the data did not meet the required QC criteria or where special consideration by the data user is required. Data qualifiers were placed on Form Is with the associated qualification codes. Analytes that were rejected for any reason are denoted on the Form I as having only the "R" data qualifier and associated qualification code(s) denoting the reason for rejection. Any additional problems with the data that may have resulted in an estimated value were not denoted by a qualification code since the data had already been rejected.

Table 1. Sample identification

Client ID	EPA ID	Laboratory ID	Matrix	COC Method
Outfall 002	Outfall 002	IOA0550-01	water	General Minerals
Outfall 001	Outfall 001	IOA0551-01	water	General Minerals

2. DATA VALIDATION FINDINGS

2.1 SAMPLE MANAGEMENT

Following are findings associated with sample management:

2.1.1 Sample Preservation, Handling, and Transport

The samples in these SDGs were received at the laboratory within the temperature limits of 4°C ± 2°C. No preservation problems were noted by the laboratory. No qualifications were required.

2.1.2 Chain of Custody

The COCs were signed and dated by field and laboratory personnel and accounted for the samples and analyses presented. No sample qualifications were required.

2.1.3 Holding Times

The holding times were assessed by comparing the date of collection with the dates of analyses. The 28-day analytical holding time for ammonia and specific conductance, and the 48-hour holding time for turbidity were met, and no qualifications were required.

2.2 CALIBRATION

For the applicable analyses, the initial calibration correlation coefficients were ≥0.995. All ICV and continuing calibration information was acceptable with recoveries within the control limits of 90-110%. For the titration method, ammonia, no information regarding the standardization of the titrant was provided; however, as the LCS recovery for ammonia was within the CCV control limits, no qualifications were required. No qualifications were required.

2.3 BLANKS

The method blank and CCB results reported on the summary forms and in the raw data for blank analyses associated with the samples were nondetects at the reporting limit. No further qualifications were required.

2.4 BLANK SPIKES AND LABORATORY CONTROL SAMPLES

For the applicable methods, the laboratory control sample recoveries were within the laboratory-established control limits. The LCS is not applicable to turbidity or specific conductance. No qualifications were required.

2.5 SURROGATES RECOVERY

Surrogate recovery is not applicable to the analyses presented in these SDGs.

2.6 LABORATORY DUPLICATES

No MS/MSD or duplicate analyses were performed in association with the samples in these SDGs; therefore, no assessment was made with respect to this criterion.

2.7 MATRIX SPIKE/MATRIX SPIKE DUPLICATE

No MS/MSD analyses were performed in association with the samples in these SDGs; therefore, no assessment was made with respect to this criterion.

2.8 FURNACE ATOMIC ABSORPTION QC

Furnace atomic absorption was not utilized for the analysis of these samples; therefore, furnace atomic absorption QC is not applicable.

2.9 ICP SERIAL DILUTION

ICP serial dilution is not applicable to the analyses presented in this data validation report.

2.10 SAMPLE RESULT VERIFICATION

A Level IV review was performed for the samples in this data package. Calculations were verified, and the sample results reported on the Form Is were verified against the raw data. No qualifications were required.

2.11 FIELD QC SAMPLES

Field QC samples are evaluated, and if necessary, qualified based only on laboratory blanks. Any remaining detects are used to evaluate the associated samples. The following are findings associated with field QC samples:

2.11.1 Field Blanks and Equipment Rinsates

The samples in these SDGs had no associated field QC samples. No qualifications were required.

2.11.2 Field Duplicates

There were no field duplicate pairs associated with these SDGs.

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 002

Report Number: IOA0550

Sampled: 01/11/05
Received: 01/11/05

DRAFT: INORGANICS

Analyte	Method	Batch	MDL	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers (Rev Qual)	Qual Code
Sample ID: IOA0550-01 (DRAFT: Outfall 002 - Water)										
Reporting Units: mg/l										
Ammonia-N (Distilled)	EPA 350.2	5A13063	0.30	0.50	ND	1	01/13/05	01/13/05	U	
Sample ID: IOA0550-01 (DRAFT: Outfall 002 - Water)										
Reporting Units: NTU										
Turbidity	EPA 180.1	5A12058	0.040	1.0	**19**	1	01/12/05	01/12/05		
Sample ID: IOA0550-01 (DRAFT: Outfall 002 - Water)										
Reporting Units: umhos/cm										
Specific Conductance	EPA 120.1	5A13060	1.0	1.0	**220**	1	01/13/05	01/13/05		

AMEC VALIDATED

LEVEL IV

DRAFT REPORT
DRAFT REPORT
DATA SUBJECT TO CHANGE

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LABORATORY REPORT

Prepared For: MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project: Routine Outfall 002

Sampled: 01/26/05
Received: 01/26/05
Issued: 03/19/05 18:16

NELAP #01108CA California ELAP#1197 CSDLAC #10117

The results listed within this Laboratory Report pertain only to the samples tested in the laboratory. The analyses contained in this report were performed in accordance with the applicable certifications as noted. All soil samples are reported on a wet weight basis unless otherwise noted in the report. This Laboratory Report is confidential and is intended for the sole use of Del Mar Analytical and its client. This report shall not be reproduced, except in full, without written permission from Del Mar Analytical. The Chain of Custody, 1 page, is included and is an integral part of this report.

This entire report was reviewed and approved for release.

SAMPLE CROSS REFERENCE

SUBCONTRACTED: Refer to the last page for specific subcontract laboratory information included in this report.

LABORATORY ID	CLIENT ID	MATRIX
IOA1553-01	Outfall 002	Water
IOA1553-02	Trip Blank	Water

Reviewed By:

Michele Harper

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 002

Report Number: IOA1553

Sampled: 01/26/05
Received: 01/26/05

PURGEABLES BY GC/MS (EPA 624)

Analyte	Method	Batch	MDL Limit	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA1553-01 (Outfall 002 - Water)									
Reporting Units: ug/l									
Benzene	EPA 624	5A31022	0.28	2.0	ND	1	01/31/05	02/01/05	
Carbon tetrachloride	EPA 624	5A31022	0.28	5.0	ND	1	01/31/05	02/01/05	
Chloroform	EPA 624	5A31022	0.33	2.0	ND	1	01/31/05	02/01/05	
1,1-Dichloroethane	EPA 624	5A31022	0.27	2.0	ND	1	01/31/05	02/01/05	
1,2-Dichloroethane	EPA 624	5A31022	0.28	2.0	ND	1	01/31/05	02/01/05	
1,1-Dichloroethene	EPA 624	5A31022	0.32	3.0	ND	1	01/31/05	02/01/05	
Ethylbenzene	EPA 624	5A31022	0.25	2.0	ND	1	01/31/05	02/01/05	
Tetrachloroethene	EPA 624	5A31022	0.32	2.0	ND	1	01/31/05	02/01/05	
Toluene	EPA 624	5A31022	0.36	2.0	ND	1	01/31/05	02/01/05	
1,1,1-Trichloroethane	EPA 624	5A31022	0.30	2.0	ND	1	01/31/05	02/01/05	
1,1,2-Trichloroethane	EPA 624	5A31022	0.30	2.0	ND	1	01/31/05	02/01/05	
Trichloroethene	EPA 624	5A31022	0.26	5.0	ND	1	01/31/05	02/01/05	
Trichlorofluoromethane	EPA 624	5A31022	0.34	5.0	ND	1	01/31/05	02/01/05	
Vinyl chloride	EPA 624	5A31022	0.26	5.0	ND	1	01/31/05	02/01/05	
Xylenes, Total	EPA 624	5A31022	0.52	4.0	ND	1	01/31/05	02/01/05	
Surrogate: Dibromofluoromethane (80-120%)					*99 %*				
Surrogate: Toluene-d8 (80-120%)					*97 %*				
Surrogate: 4-Bromofluorobenzene (80-120%)					*92 %*				
Sample ID: IOA1553-02 (Trip Blank - Water)									
Reporting Units: ug/l									
Benzene	EPA 624	5B01008	0.28	2.0	ND	1	02/01/05	02/01/05	
Carbon tetrachloride	EPA 624	5B01008	0.28	5.0	ND	1	02/01/05	02/01/05	
Chloroform	EPA 624	5B01008	0.33	2.0	ND	1	02/01/05	02/01/05	
1,1-Dichloroethane	EPA 624	5B01008	0.27	2.0	ND	1	02/01/05	02/01/05	
1,2-Dichloroethane	EPA 624	5B01008	0.28	2.0	ND	1	02/01/05	02/01/05	
1,1-Dichloroethene	EPA 624	5B01008	0.32	3.0	ND	1	02/01/05	02/01/05	
Ethylbenzene	EPA 624	5B01008	0.25	2.0	ND	1	02/01/05	02/01/05	
Tetrachloroethene	EPA 624	5B01008	0.32	2.0	ND	1	02/01/05	02/01/05	
Toluene	EPA 624	5B01008	0.36	2.0	ND	1	02/01/05	02/01/05	
1,1,1-Trichloroethane	EPA 624	5B01008	0.30	2.0	ND	1	02/01/05	02/01/05	
1,1,2-Trichloroethane	EPA 624	5B01008	0.30	2.0	ND	1	02/01/05	02/01/05	
Trichloroethene	EPA 624	5B01008	0.26	5.0	ND	1	02/01/05	02/01/05	
Trichlorofluoromethane	EPA 624	5B01008	0.34	5.0	ND	1	02/01/05	02/01/05	
Vinyl chloride	EPA 624	5B01008	0.26	5.0	ND	1	02/01/05	02/01/05	
Xylenes, Total	EPA 624	5B01008	0.52	4.0	ND	1	02/01/05	02/01/05	
Surrogate: Dibromofluoromethane (80-120%)					*118 %*				
Surrogate: Toluene-d8 (80-120%)					*103 %*				
Surrogate: 4-Bromofluorobenzene (80-120%)					*100 %*				

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 002

Report Number: IOA1553

Sampled: 01/26/05
Received: 01/26/05

ACID & BASE/NEUTRALS BY GC/MS (EPA 625)

Analyte	Method	Batch	MDL Limit	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA1553-01 (Outfall 002 - Water)									
Reporting Units: ug/l									
Bis(2-ethylhexyl)phthalate	EPA 625	5A27040	1.1	5.0	ND	0.952	01/27/05	01/31/05	
2,4-Dinitrotoluene	EPA 625	5A27040	0.23	9.0	ND	0.952	01/27/05	01/31/05	
N-Nitrosodimethylamine	EPA 625	5A27040	0.22	8.0	ND	0.952	01/27/05	01/31/05	
Pentachlorophenol	EPA 625	5A27040	0.78	8.0	ND	0.952	01/27/05	01/31/05	
2,4,6-Trichlorophenol	EPA 625	5A27040	0.10	6.0	ND	0.952	01/27/05	01/31/05	
Surrogate: 2-Fluorophenol (35-120%)					*74 %*				
Surrogate: Phenol-d6 (45-120%)					*75 %*				
Surrogate: 2,4,6-Tribromophenol (50-125%)					*77 %*				
Surrogate: Nitrobenzene-d5 (45-120%)					*69 %*				
Surrogate: 2-Fluorobiphenyl (45-120%)					*73 %*				
Surrogate: Terphenyl-d14 (45-135%)					*76 %*				

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 002

Report Number: IOA1553

Sampled: 01/26/05
Received: 01/26/05

ORGANOCHLORINE PESTICIDES (EPA 608)

Analyte	Method	Batch	MDL Limit	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA1553-01 (Outfall 002 - Water) - cont.									
Reporting Units: ug/l									
alpha-BHC	EPA 608	5B01037	0.00049	0.010	ND	0.952	02/01/05	02/01/05	
Surrogate: Decachlorobiphenyl (45-120%)					*81 %*				
Surrogate: Tetrachloro-m-xylene (35-120%)					*73 %*				

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 002

Report Number: IOA1553

Sampled: 01/26/05
Received: 01/26/05

METALS

Analyte	Method	Batch	MDL Limit	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA1553-01 (Outfall 002 - Water) - cont.									
Reporting Units: ug/l									
Copper	EPA 200.8	5A26113	0.49	2.0	**2.1**	1	01/26/05	01/26/05	
Lead	EPA 200.8	5A26113	0.13	1.0	ND	1	01/26/05	01/26/05	
Mercury	EPA 245.1	5A27047	0.063	0.20	**0.13**	1	01/27/05	01/27/05	J

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Michele Harper
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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 002

Report Number: IOA1553

Sampled: 01/26/05
Received: 01/26/05

INORGANICS

Analyte	Method	Batch	MDL Limit	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA1553-01 (Outfall 002 - Water) - cont.									
Reporting Units: mg/l									
Ammonia-N (Distilled)	EPA 350.2	5A28077	0.30	0.50	ND	1	01/28/05	01/28/05	
Biochemical Oxygen Demand	EPA 405.1	5A27049	0.59	2.0	ND	1	01/27/05	02/01/05	
Chloride	EPA 300.0	5A27045	2.6	5.0	**39**	10	01/27/05	01/27/05	
Nitrate/Nitrite-N	EPA 300.0	5A27045	0.072	0.26	**0.32**	1	01/27/05	01/27/05	
Oil & Grease	EPA 413.1	5A26077	0.94	5.0	**1.7**	1	01/26/05	01/26/05	J
Sulfate	EPA 300.0	5A27045	1.8	5.0	**270**	10	01/27/05	01/27/05	
Surfactants (MBAS)	SM5540-C	5A26108	0.044	0.10	**0.046**	1	01/26/05	01/26/05	J
Total Dissolved Solids	SM2540C	5A28091	10	10	**660**	1	01/28/05	01/28/05	
Total Suspended Solids	EPA 160.2	5A27101	10	10	ND	1	01/27/05	01/27/05	
Sample ID: IOA1553-01 (Outfall 002 - Water)									
Reporting Units: ml/l/hr									
Total Settleable Solids	EPA 160.5	5A27060	0.10	0.10	ND	1	01/27/05	01/27/05	
Sample ID: IOA1553-01 (Outfall 002 - Water)									
Reporting Units: NTU									
Turbidity	EPA 180.1	5A27057	0.040	1.0	**4.2**	1	01/27/05	01/27/05	
Sample ID: IOA1553-01 (Outfall 002 - Water)									
Reporting Units: ug/l									
Total Cyanide	EPA 335.2	5A26117	2.2	5.0	ND	1	01/26/05	01/26/05	
Perchlorate	EPA 314.0	5A30022	0.80	4.0	ND	1	01/30/05	01/30/05	
Sample ID: IOA1553-01 (Outfall 002 - Water)									
Reporting Units: umhos/cm									
Specific Conductance	EPA 120.1	5A28087	1.0	1.0	**1000**	1	01/28/05	01/28/05	

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Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 002

Report Number: IOA1553

Sampled: 01/26/05
Received: 01/26/05

SHORT HOLD TIME DETAIL REPORT

	Hold Time (in days)	Date/Time Sampled	Date/Time Received	Date/Time Extracted	Date/Time Analyzed
Sample ID: Outfall 002 (IOA1553-01) - Water					
EPA 160.5	2	01/26/2005 12:47	01/26/2005 17:01	01/27/2005 09:56	01/27/2005 11:00
EPA 180.1	2	01/26/2005 12:47	01/26/2005 17:01	01/27/2005 08:00	01/27/2005 13:30
EPA 300.0	2	01/26/2005 12:47	01/26/2005 17:01	01/27/2005 10:00	01/27/2005 10:58
EPA 405.1	2	01/26/2005 12:47	01/26/2005 17:01	01/27/2005 09:21	02/01/2005 15:08
SM5540-C	2	01/26/2005 12:47	01/26/2005 17:01	01/26/2005 19:20	01/26/2005 23:01

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Project ID: Routine Outfall 002

Report Number: IOA1553

Sampled: 01/26/05
Received: 01/26/05

METHOD BLANK/QC DATA

PURGEABLES BY GC/MS (EPA 624)

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A31022 Extracted: 01/31/05											
Blank Analyzed: 01/31/2005 (5A31022-BLK1)											
Benzene	ND	2.0	0.28	ug/l							
Carbon tetrachloride	ND	5.0	0.28	ug/l							
Chloroform	ND	2.0	0.33	ug/l							
1,1-Dichloroethane	ND	2.0	0.27	ug/l							
1,2-Dichloroethane	ND	2.0	0.28	ug/l							
1,1-Dichloroethene	ND	3.0	0.32	ug/l							
Ethylbenzene	ND	2.0	0.25	ug/l							
Tetrachloroethene	ND	2.0	0.32	ug/l							
Toluene	ND	2.0	0.36	ug/l							
1,1,1-Trichloroethane	ND	2.0	0.30	ug/l							
1,1,2-Trichloroethane	ND	2.0	0.30	ug/l							
Trichloroethene	ND	5.0	0.26	ug/l							
Trichlorofluoromethane	ND	5.0	0.34	ug/l							
Vinyl chloride	ND	5.0	0.26	ug/l							
Xylenes, Total	ND	4.0	0.52	ug/l							
Surrogate: Dibromofluoromethane	*24.4*			*ug/l*	*25.0*		*98*	*80-120*			
Surrogate: Toluene-d8	*24.1*			*ug/l*	*25.0*		*96*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*23.3*			*ug/l*	*25.0*		*93*	*80-120*			
LCS Analyzed: 01/31/2005 (5A31022-BS1)											
Benzene	21.2	2.0	0.28	ug/l	25.0		85	70-120			
Carbon tetrachloride	25.2	5.0	0.28	ug/l	25.0		101	70-140			
Chloroform	22.4	2.0	0.33	ug/l	25.0		90	75-130			
1,1-Dichloroethane	21.9	2.0	0.27	ug/l	25.0		88	70-135			
1,2-Dichloroethane	22.4	2.0	0.28	ug/l	25.0		90	60-150			
1,1-Dichloroethene	21.1	3.0	0.32	ug/l	25.0		84	75-135			
Ethylbenzene	23.6	2.0	0.25	ug/l	25.0		94	80-120			
Tetrachloroethene	23.4	2.0	0.32	ug/l	25.0		94	75-125			
Toluene	23.0	2.0	0.36	ug/l	25.0		92	75-120			
1,1,1-Trichloroethane	24.6	2.0	0.30	ug/l	25.0		98	75-140			
1,1,2-Trichloroethane	23.4	2.0	0.30	ug/l	25.0		94	70-125			
Trichloroethene	23.9	5.0	0.26	ug/l	25.0		96	80-120			
Trichlorofluoromethane	22.1	5.0	0.34	ug/l	25.0		88	65-145			
Vinyl chloride	21.1	5.0	0.26	ug/l	25.0		84	50-130			
Surrogate: Dibromofluoromethane	*24.6*			*ug/l*	*25.0*		*98*	*80-120*			
Surrogate: Toluene-d8	*24.6*			*ug/l*	*25.0*		*98*	*80-120*			

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Michele Harper
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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 002

Report Number: IOA1553

Sampled: 01/26/05
Received: 01/26/05

METHOD BLANK/QC DATA

PURGEABLES BY GC/MS (EPA 624)

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A31022 Extracted: 01/31/05											
LCS Analyzed: 01/31/2005 (5A31022-BS1)											
Surrogate: 4-Bromofluorobenzene	*23.8*			*ug/l*	*25.0*		*95*	*80-120*			
Matrix Spike Analyzed: 01/31/2005 (5A31022-MS1)						**Source: IOA1551-01**					
Benzene	23.3	2.0	0.28	ug/l	25.0	ND	93	70-120			
Carbon tetrachloride	28.0	5.0	0.28	ug/l	25.0	ND	112	70-145			
Chloroform	24.8	2.0	0.33	ug/l	25.0	ND	99	70-135			
1,1-Dichloroethane	24.0	2.0	0.27	ug/l	25.0	ND	96	65-135			
1,2-Dichloroethane	23.8	2.0	0.28	ug/l	25.0	ND	95	60-150			
1,1-Dichloroethene	23.7	3.0	0.32	ug/l	25.0	ND	95	65-140			
Ethylbenzene	25.6	2.0	0.25	ug/l	25.0	ND	102	70-130			
Tetrachloroethene	25.7	2.0	0.32	ug/l	25.0	ND	103	70-130			
Toluene	25.0	2.0	0.36	ug/l	25.0	ND	100	70-120			
1,1,1-Trichloroethane	26.7	2.0	0.30	ug/l	25.0	ND	107	75-140			
1,1,2-Trichloroethane	24.1	2.0	0.30	ug/l	25.0	ND	96	60-135			
Trichloroethene	26.3	5.0	0.26	ug/l	25.0	ND	105	70-125			
Trichlorofluoromethane	24.0	5.0	0.34	ug/l	25.0	ND	96	55-145			
Vinyl chloride	22.0	5.0	0.26	ug/l	25.0	ND	88	40-135			
Surrogate: Dibromofluoromethane	*24.8*			*ug/l*	*25.0*		*99*	*80-120*			
Surrogate: Toluene-d8	*24.4*			*ug/l*	*25.0*		*98*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*23.4*			*ug/l*	*25.0*		*94*	*80-120*			
Matrix Spike Dup Analyzed: 01/31/2005 (5A31022-MSD1)						**Source: IOA1551-01**					
Benzene	22.2	2.0	0.28	ug/l	25.0	ND	89	70-120	5	20	
Carbon tetrachloride	26.8	5.0	0.28	ug/l	25.0	ND	107	70-145	4	25	
Chloroform	23.7	2.0	0.33	ug/l	25.0	ND	95	70-135	5	20	
1,1-Dichloroethane	23.0	2.0	0.27	ug/l	25.0	ND	92	65-135	4	20	
1,2-Dichloroethane	22.1	2.0	0.28	ug/l	25.0	ND	88	60-150	7	20	
1,1-Dichloroethene	22.1	3.0	0.32	ug/l	25.0	ND	88	65-140	7	20	
Ethylbenzene	25.0	2.0	0.25	ug/l	25.0	ND	100	70-130	2	20	
Tetrachloroethene	25.1	2.0	0.32	ug/l	25.0	ND	100	70-130	2	20	
Toluene	23.4	2.0	0.36	ug/l	25.0	ND	94	70-120	7	20	
1,1,1-Trichloroethane	25.9	2.0	0.30	ug/l	25.0	ND	104	75-140	3	20	
1,1,2-Trichloroethane	22.2	2.0	0.30	ug/l	25.0	ND	89	60-135	8	25	
Trichloroethene	25.2	5.0	0.26	ug/l	25.0	ND	101	70-125	4	20	
Trichlorofluoromethane	23.2	5.0	0.34	ug/l	25.0	ND	93	55-145	3	25	
Vinyl chloride	21.5	5.0	0.26	ug/l	25.0	ND	86	40-135	2	30	

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 002

Report Number: IOA1553

Sampled: 01/26/05
Received: 01/26/05

METHOD BLANK/QC DATA

PURGEABLES BY GC/MS (EPA 624)

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A31022 Extracted: 01/31/05											
Matrix Spike Dup Analyzed: 01/31/2005 (5A31022-MSD1)						**Source: IOA1551-01**					
Surrogate: Dibromofluoromethane	*24.5*			*ug/l*	*25.0*		*98*	*80-120*			
Surrogate: Toluene-d8	*24.1*			*ug/l*	*25.0*		*96*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*23.9*			*ug/l*	*25.0*		*96*	*80-120*			
Batch: 5B01008 Extracted: 02/01/05											
Blank Analyzed: 02/01/2005 (5B01008-BLK1)											
Benzene	ND	2.0	0.28	ug/l							
Carbon tetrachloride	ND	5.0	0.28	ug/l							
Chloroform	ND	2.0	0.33	ug/l							
1,1-Dichloroethane	ND	2.0	0.27	ug/l							
1,2-Dichloroethane	ND	2.0	0.28	ug/l							
1,1-Dichloroethene	ND	3.0	0.32	ug/l							
Ethylbenzene	ND	2.0	0.25	ug/l							
Tetrachloroethene	ND	2.0	0.32	ug/l							
Toluene	ND	2.0	0.36	ug/l							
1,1,1-Trichloroethane	ND	2.0	0.30	ug/l							
1,1,2-Trichloroethane	ND	2.0	0.30	ug/l							
Trichloroethene	ND	5.0	0.26	ug/l							
Trichlorofluoromethane	ND	5.0	0.34	ug/l							
Vinyl chloride	ND	5.0	0.26	ug/l							
Xylenes, Total	ND	4.0	0.52	ug/l							
Surrogate: Dibromofluoromethane	*29.3*			*ug/l*	*25.0*		*117*	*80-120*			
Surrogate: Toluene-d8	*25.8*			*ug/l*	*25.0*		*103*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*25.6*			*ug/l*	*25.0*		*102*	*80-120*			
LCS Analyzed: 02/01/2005 (5B01008-BS1)											
Benzene	25.6	2.0	0.28	ug/l	25.0		102	70-120			
Carbon tetrachloride	22.6	5.0	0.28	ug/l	25.0		90	70-140			
Chloroform	26.9	2.0	0.33	ug/l	25.0		108	75-130			
1,1-Dichloroethane	27.3	2.0	0.27	ug/l	25.0		109	70-135			
1,2-Dichloroethane	26.5	2.0	0.28	ug/l	25.0		106	60-150			
1,1-Dichloroethene	27.0	3.0	0.32	ug/l	25.0		108	75-135			
Ethylbenzene	25.7	2.0	0.25	ug/l	25.0		103	80-120			
Tetrachloroethene	23.3	2.0	0.32	ug/l	25.0		93	75-125			
Toluene	26.1	2.0	0.36	ug/l	25.0		104	75-120			

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 002

Report Number: IOA1553

Sampled: 01/26/05
Received: 01/26/05

METHOD BLANK/QC DATA

PURGEABLES BY GC/MS (EPA 624)

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5B01008 Extracted: 02/01/05											
LCS Analyzed: 02/01/2005 (5B01008-BS1)											
1,1,1-Trichloroethane	25.7	2.0	0.30	ug/l	25.0		103	75-140			
1,1,2-Trichloroethane	26.7	2.0	0.30	ug/l	25.0		107	70-125			
Trichloroethene	24.9	5.0	0.26	ug/l	25.0		100	80-120			
Trichlorofluoromethane	28.8	5.0	0.34	ug/l	25.0		115	65-145			
Vinyl chloride	26.5	5.0	0.26	ug/l	25.0		106	50-130			
Surrogate: Dibromofluoromethane	*28.4*			*ug/l*	*25.0*		*114*	*80-120*			
Surrogate: Toluene-d8	*26.0*			*ug/l*	*25.0*		*104*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*26.3*			*ug/l*	*25.0*		*105*	*80-120*			
Matrix Spike Analyzed: 02/01/2005 (5B01008-MS1)						**Source: IOA1553-02**					
Benzene	23.9	2.0	0.28	ug/l	25.0	ND	96	70-120			
Carbon tetrachloride	21.6	5.0	0.28	ug/l	25.0	ND	86	70-145			
Chloroform	25.9	2.0	0.33	ug/l	25.0	ND	104	70-135			
1,1-Dichloroethane	26.0	2.0	0.27	ug/l	25.0	ND	104	65-135			
1,2-Dichloroethane	25.6	2.0	0.28	ug/l	25.0	ND	102	60-150			
1,1-Dichloroethene	24.9	3.0	0.32	ug/l	25.0	ND	100	65-140			
Ethylbenzene	23.7	2.0	0.25	ug/l	25.0	ND	95	70-130			
Tetrachloroethene	21.0	2.0	0.32	ug/l	25.0	ND	84	70-130			
Toluene	24.9	2.0	0.36	ug/l	25.0	ND	100	70-120			
1,1,1-Trichloroethane	24.2	2.0	0.30	ug/l	25.0	ND	97	75-140			
1,1,2-Trichloroethane	25.9	2.0	0.30	ug/l	25.0	ND	104	60-135			
Trichloroethene	22.7	5.0	0.26	ug/l	25.0	ND	91	70-125			
Trichlorofluoromethane	26.6	5.0	0.34	ug/l	25.0	ND	106	55-145			
Vinyl chloride	24.6	5.0	0.26	ug/l	25.0	ND	98	40-135			
Surrogate: Dibromofluoromethane	*28.6*			*ug/l*	*25.0*		*114*	*80-120*			
Surrogate: Toluene-d8	*26.4*			*ug/l*	*25.0*		*106*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*28.0*			*ug/l*	*25.0*		*112*	*80-120*			

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Sampled: 01/26/05
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METHOD BLANK/QC DATA

PURGEABLES BY GC/MS (EPA 624)

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5B01008 Extracted: 02/01/05											
Matrix Spike Dup Analyzed: 02/01/2005 (5B01008-MSD1)						**Source: IOA1553-02**					
Benzene	23.7	2.0	0.28	ug/l	25.0	ND	95	70-120	1	20	
Carbon tetrachloride	21.8	5.0	0.28	ug/l	25.0	ND	87	70-145	1	25	
Chloroform	26.0	2.0	0.33	ug/l	25.0	ND	104	70-135	0	20	
1,1-Dichloroethane	26.6	2.0	0.27	ug/l	25.0	ND	106	65-135	2	20	
1,2-Dichloroethane	24.9	2.0	0.28	ug/l	25.0	ND	100	60-150	3	20	
1,1-Dichloroethene	24.6	3.0	0.32	ug/l	25.0	ND	98	65-140	1	20	
Ethylbenzene	24.2	2.0	0.25	ug/l	25.0	ND	97	70-130	2	20	
Tetrachloroethene	21.1	2.0	0.32	ug/l	25.0	ND	84	70-130	1	20	
Toluene	24.1	2.0	0.36	ug/l	25.0	ND	96	70-120	3	20	
1,1,1-Trichloroethane	24.4	2.0	0.30	ug/l	25.0	ND	98	75-140	1	20	
1,1,2-Trichloroethane	25.4	2.0	0.30	ug/l	25.0	ND	102	60-135	2	25	
Trichloroethene	21.7	5.0	0.26	ug/l	25.0	ND	87	70-125	5	20	
Trichlorofluoromethane	26.6	5.0	0.34	ug/l	25.0	ND	106	55-145	0	25	
Vinyl chloride	26.1	5.0	0.26	ug/l	25.0	ND	104	40-135	6	30	
Surrogate: Dibromofluoromethane	*29.7*			*ug/l*	*25.0*		*119*	*80-120*			
Surrogate: Toluene-d8	*25.9*			*ug/l*	*25.0*		*104*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*26.8*			*ug/l*	*25.0*		*107*	*80-120*			

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Received: 01/26/05

METHOD BLANK/QC DATA

ACID & BASE/NEUTRALS BY GC/MS (EPA 625)

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A27040 Extracted: 01/27/05											
Blank Analyzed: 01/31/2005 (5A27040-BLK1)											
Bis(2-ethylhexyl)phthalate	ND	5.0	1.1	ug/l							
2,4-Dinitrotoluene	ND	9.0	0.23	ug/l							
N-Nitrosodimethylamine	ND	8.0	0.22	ug/l							
Pentachlorophenol	ND	8.0	0.78	ug/l							
2,4,6-Trichlorophenol	ND	6.0	0.10	ug/l							
Surrogate: 2-Fluorophenol	*13.2*			*ug/l*	*20.0*		*66*	*35-120*			
Surrogate: Phenol-d6	*13.5*			*ug/l*	*20.0*		*68*	*45-120*			
Surrogate: 2,4,6-Tribromophenol	*12.9*			*ug/l*	*20.0*		*64*	*50-125*			
Surrogate: Nitrobenzene-d5	*7.58*			*ug/l*	*10.0*		*76*	*45-120*			
Surrogate: 2-Fluorobiphenyl	*8.04*			*ug/l*	*10.0*		*80*	*45-120*			
Surrogate: Terphenyl-d14	*7.46*			*ug/l*	*10.0*		*75*	*45-135*			
LCS Analyzed: 01/31/2005 (5A27040-BS1)											**M-NR1**
Bis(2-ethylhexyl)phthalate	8.12	5.0	1.1	ug/l	10.0		81	65-125			
2,4-Dinitrotoluene	7.52	9.0	0.23	ug/l	10.0		75	60-140			*J*
N-Nitrosodimethylamine	7.80	8.0	0.22	ug/l	10.0		78	40-120			*J*
Pentachlorophenol	8.72	8.0	0.78	ug/l	10.0		87	50-125			
2,4,6-Trichlorophenol	9.04	6.0	0.10	ug/l	10.0		90	60-120			
Surrogate: 2-Fluorophenol	*15.6*			*ug/l*	*20.0*		*78*	*35-120*			
Surrogate: Phenol-d6	*15.4*			*ug/l*	*20.0*		*77*	*45-120*			
Surrogate: 2,4,6-Tribromophenol	*15.6*			*ug/l*	*20.0*		*78*	*50-125*			
Surrogate: Nitrobenzene-d5	*7.68*			*ug/l*	*10.0*		*77*	*45-120*			
Surrogate: 2-Fluorobiphenyl	*8.02*			*ug/l*	*10.0*		*80*	*45-120*			
Surrogate: Terphenyl-d14	*7.56*			*ug/l*	*10.0*		*76*	*45-135*			
LCS Dup Analyzed: 01/31/2005 (5A27040-BSD1)											
Bis(2-ethylhexyl)phthalate	8.34	5.0	1.1	ug/l	10.0		83	65-125	3	20	
2,4-Dinitrotoluene	7.52	9.0	0.23	ug/l	10.0		75	60-140	0	20	*J*
N-Nitrosodimethylamine	8.20	8.0	0.22	ug/l	10.0		82	40-120	5	20	
Pentachlorophenol	9.00	8.0	0.78	ug/l	10.0		90	50-125	3	25	
2,4,6-Trichlorophenol	8.38	6.0	0.10	ug/l	10.0		84	60-120	8	20	
Surrogate: 2-Fluorophenol	*13.7*			*ug/l*	*20.0*		*68*	*35-120*			
Surrogate: Phenol-d6	*13.7*			*ug/l*	*20.0*		*68*	*45-120*			
Surrogate: 2,4,6-Tribromophenol	*16.1*			*ug/l*	*20.0*		*80*	*50-125*			
Surrogate: Nitrobenzene-d5	*6.84*			*ug/l*	*10.0*		*68*	*45-120*			
Surrogate: 2-Fluorobiphenyl	*7.34*			*ug/l*	*10.0*		*73*	*45-120*			

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METHOD BLANK/QC DATA

ACID & BASE/NEUTRALS BY GC/MS (EPA 625)

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A27040 Extracted: 01/27/05											
LCS Dup Analyzed: 01/31/2005 (5A27040-BSD1)											
Surrogate: Terphenyl-d14	*7.70*			*ug/l*	*10.0*		*77*	*45-135*			

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ORGANOCHLORINE PESTICIDES (EPA 608)

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5B01037 Extracted: 02/01/05											
Blank Analyzed: 02/01/2005 (5B01037-BLK1)											
alpha-BHC	ND	0.010	0.00049	ug/l							
Surrogate: Decachlorobiphenyl	*0.380*			*ug/l*	*0.500*		*76*	*45-120*			
Surrogate: Tetrachloro-m-xylene	*0.256*			*ug/l*	*0.500*		*51*	*35-120*			
LCS Analyzed: 02/01/2005 (5B01037-BS1)											**M-NR1**
alpha-BHC	0.434	0.010	0.00049	ug/l	0.500		87	45-115			
Surrogate: Decachlorobiphenyl	*0.460*			*ug/l*	*0.500*		*92*	*45-120*			
Surrogate: Tetrachloro-m-xylene	*0.361*			*ug/l*	*0.500*		*72*	*35-120*			
LCS Dup Analyzed: 02/01/2005 (5B01037-BSD1)											
alpha-BHC	0.349	0.010	0.00049	ug/l	0.500		70	45-115	22	30	
Surrogate: Decachlorobiphenyl	*0.358*			*ug/l*	*0.500*		*72*	*45-120*			
Surrogate: Tetrachloro-m-xylene	*0.280*			*ug/l*	*0.500*		*56*	*35-120*			

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METHOD BLANK/QC DATA

METALS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A26113 Extracted: 01/26/05											
Blank Analyzed: 01/26/2005 (5A26113-BLK1)											
Copper	ND	2.0	0.49	ug/l							
Lead	ND	1.0	0.13	ug/l							
LCS Analyzed: 01/26/2005 (5A26113-BS1)											
Copper	78.1	2.0	0.49	ug/l	80.0		98	85-115			
Lead	77.0	1.0	0.13	ug/l	80.0		96	85-115			
Matrix Spike Analyzed: 01/26/2005 (5A26113-MS1)						**Source: IOA1551-01**					
Copper	80.6	2.0	0.49	ug/l	80.0	1.7	99	70-130			
Lead	77.4	1.0	0.13	ug/l	80.0	ND	97	70-130			
Matrix Spike Dup Analyzed: 01/26/2005 (5A26113-MSD1)						**Source: IOA1551-01**					
Copper	81.2	2.0	0.49	ug/l	80.0	1.7	99	70-130	1	20	
Lead	77.1	1.0	0.13	ug/l	80.0	ND	96	70-130	0	20	
Batch: 5A27047 Extracted: 01/27/05											
Blank Analyzed: 01/27/2005 (5A27047-BLK1)											
Mercury	ND	0.20	0.063	ug/l							
LCS Analyzed: 01/27/2005 (5A27047-BS1)											
Mercury	8.51	0.20	0.063	ug/l	8.00		106	85-115			
Matrix Spike Analyzed: 01/27/2005 (5A27047-MS1)						**Source: IOA1551-01**					
Mercury	8.65	0.20	0.063	ug/l	8.00	0.13	106	70-130			
Matrix Spike Dup Analyzed: 01/27/2005 (5A27047-MSD1)						**Source: IOA1551-01**					
Mercury	8.48	0.20	0.063	ug/l	8.00	0.13	104	70-130	2	20	

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INORGANICS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A26077 Extracted: 01/26/05											
Blank Analyzed: 01/26/2005 (5A26077-BLK1)											
Oil & Grease	ND	5.0	0.94	mg/l							
LCS Analyzed: 01/26/2005 (5A26077-BS1)											**M-NR1**
Oil & Grease	18.6	5.0	0.94	mg/l	20.0		93	65-120			
LCS Dup Analyzed: 01/26/2005 (5A26077-BSD1)											
Oil & Grease	18.5	5.0	0.94	mg/l	20.0		92	65-120	1	20	
Batch: 5A26108 Extracted: 01/26/05											
Blank Analyzed: 01/26/2005 (5A26108-BLK1)											
Surfactants (MBAS)	ND	0.10	0.044	mg/l							
LCS Analyzed: 01/26/2005 (5A26108-BS1)											
Surfactants (MBAS)	0.255	0.10	0.044	mg/l	0.250		102	90-110			
Matrix Spike Analyzed: 01/26/2005 (5A26108-MS1)						**Source: IOA1558-02**					
Surfactants (MBAS)	0.240	0.10	0.044	mg/l	0.250	ND	96	50-125			
Matrix Spike Dup Analyzed: 01/26/2005 (5A26108-MSD1)						**Source: IOA1558-02**					
Surfactants (MBAS)	0.257	0.10	0.044	mg/l	0.250	ND	103	50-125	7	20	
Batch: 5A26117 Extracted: 01/26/05											
Blank Analyzed: 01/26/2005 (5A26117-BLK1)											
Total Cyanide	ND	5.0	2.2	ug/l							

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INORGANICS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A26117 Extracted: 01/26/05											
LCS Analyzed: 01/26/2005 (5A26117-BS1)											
Total Cyanide	196	5.0	2.2	ug/l	200		98	90-110			
Matrix Spike Analyzed: 01/26/2005 (5A26117-MS1)						**Source: IOA1551-01**					
Total Cyanide	198	5.0	2.2	ug/l	200	ND	99	70-115			
Matrix Spike Dup Analyzed: 01/26/2005 (5A26117-MSD1)						**Source: IOA1551-01**					
Total Cyanide	184	5.0	2.2	ug/l	200	ND	92	70-115	7	15	
Batch: 5A27045 Extracted: 01/27/05											
Blank Analyzed: 01/27/2005 (5A27045-BLK1)											
Chloride	ND	0.50	0.26	mg/l							
Nitrate/Nitrite-N	ND	0.26	0.072	mg/l							
Sulfate	ND	0.50	0.18	mg/l							
LCS Analyzed: 01/27/2005 (5A27045-BS1)											
Chloride	4.96	0.50	0.26	mg/l	5.00		99	90-110			*M-3*
Sulfate	9.98	0.50	0.18	mg/l	10.0		100	90-110			*M-3*
Batch: 5A27049 Extracted: 01/27/05											
Blank Analyzed: 02/01/2005 (5A27049-BLK1)											
Biochemical Oxygen Demand	ND	2.0	0.59	mg/l							
LCS Analyzed: 02/01/2005 (5A27049-BS1)											
Biochemical Oxygen Demand	206	100	30	mg/l	198		104	85-115			

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INORGANICS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A27049 Extracted: 01/27/05											
LCS Dup Analyzed: 02/01/2005 (5A27049-BSD1)											
Biochemical Oxygen Demand	204	100	30	mg/l	198		103	85-115	1	20	
Batch: 5A27057 Extracted: 01/27/05											
Blank Analyzed: 01/27/2005 (5A27057-BLK1)											
Turbidity	ND	1.0	0.040	NTU							
Duplicate Analyzed: 01/27/2005 (5A27057-DUP1)						**Source: IOA1457-01**					
Turbidity	10.2	1.0	0.040	NTU		10			2	20	
Batch: 5A27101 Extracted: 01/27/05											
Blank Analyzed: 01/27/2005 (5A27101-BLK1)											
Total Suspended Solids	ND	10	10	mg/l							
LCS Analyzed: 01/27/2005 (5A27101-BS1)											
Total Suspended Solids	977	10	10	mg/l	1000		98	85-115			
Duplicate Analyzed: 01/27/2005 (5A27101-DUP1)						**Source: IOA1542-02**					
Total Suspended Solids	ND	10	10	mg/l		ND				10	
Batch: 5A28077 Extracted: 01/28/05											
Blank Analyzed: 01/28/2005 (5A28077-BLK1)											
Ammonia-N (Distilled)	ND	0.50	0.30	mg/l							

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INORGANICS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A28077 Extracted: 01/28/05											
LCS Analyzed: 01/28/2005 (5A28077-BS1)											
Ammonia-N (Distilled)	10.1	0.50	0.30	mg/l	10.0		101	80-115			
Matrix Spike Analyzed: 01/28/2005 (5A28077-MS1)						**Source: IOA1520-01**					
Ammonia-N (Distilled)	9.24	0.50	0.30	mg/l	10.0	ND	92	70-120			
Matrix Spike Dup Analyzed: 01/28/2005 (5A28077-MSD1)						**Source: IOA1520-01**					
Ammonia-N (Distilled)	9.80	0.50	0.30	mg/l	10.0	ND	98	70-120	6	15	
Batch: 5A28087 Extracted: 01/28/05											
Duplicate Analyzed: 01/28/2005 (5A28087-DUP1)						**Source: IOA1740-01**					
Specific Conductance	136	1.0	1.0	umhos/cm		130			5	5	
Batch: 5A28091 Extracted: 01/28/05											
Blank Analyzed: 01/28/2005 (5A28091-BLK1)											
Total Dissolved Solids	ND	10	10	mg/l							
LCS Analyzed: 01/28/2005 (5A28091-BS1)											
Total Dissolved Solids	908	10	10	mg/l	1000		91	90-110			
Duplicate Analyzed: 01/28/2005 (5A28091-DUP1)						**Source: IOA1548-02**					
Total Dissolved Solids	586	10	10	mg/l		590			1	10	
Batch: 5A30022 Extracted: 01/30/05											
Blank Analyzed: 01/30/2005 (5A30022-BLK1)											
Perchlorate	ND	4.0	0.80	ug/l							

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INORGANICS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A30022 Extracted: 01/30/05											
LCS Analyzed: 01/30/2005 (5A30022-BS1)											
Perchlorate	54.1	4.0	0.80	ug/l	50.0		108	85-115			
Matrix Spike Analyzed: 01/30/2005 (5A30022-MS1)						**Source: IOA1744-02**					
Perchlorate	58.9	4.0	0.80	ug/l	50.0	0.87	116	80-120			
Matrix Spike Dup Analyzed: 01/30/2005 (5A30022-MSD1)						**Source: IOA1744-02**					
Perchlorate	54.3	4.0	0.80	ug/l	50.0	0.87	107	80-120	8	20	

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Compliance Check

The results obtained from the analytical testing of this data set were checked against compliance limits received from the client. Any results at or above the compliance limits appear in bold on this page.

LabNumber	Analysis	Analyte	Units	Result	MRL	Compliance Limit
IOA1553-01	413.1 Oil and Grease	Oil & Grease	mg/l	1.70	5.0	10.00
IOA1553-01	608-Pest Boeing 001/002 Q (LL)	alpha-BHC	ug/l	0	0.010	0.0100
IOA1553-01	624-Boeing 001/002 Q (Fr113+X)	1,1-Dichloroethene	ug/l	0	3.0	3.20
IOA1553-01	624-Boeing 001/002 Q (Fr113+X)	Trichloroethene	ug/l	0	5.0	5.00
IOA1553-01	625-Boeing 001/002 Q-LL	2,4,6-Trichlorophenol	ug/l	0	6.0	6.50
IOA1553-01	625-Boeing 001/002 Q-LL	2,4-Dinitrotoluene	ug/l	0	9.0	9.10
IOA1553-01	625-Boeing 001/002 Q-LL	Bis(2-ethylhexyl)phthalate	ug/l	0.61	5.0	4.00
IOA1553-01	625-Boeing 001/002 Q-LL	N-Nitrosodimethylamine	ug/l	0	8.0	8.10
IOA1553-01	625-Boeing 001/002 Q-LL	Pentachlorophenol	ug/l	0	8.0	8.20
IOA1553-01	BOD	Biochemical Oxygen Demand	mg/l	0.52	2.0	20
IOA1553-01	Chloride - 300.0	Chloride	mg/l	39	5.0	150
IOA1553-01	Copper-200.8	Copper	ug/l	2.10	2.0	7.10
IOA1553-01	Cyanide-335.2 5ppb	Total Cyanide	ug/l	-6	5.0	4.30
IOA1553-01	Lead-200.8	Lead	ug/l	0.030	1.0	2.60
IOA1553-01	MBAS - SM5540-C	Surfactants (MBAS)	mg/l	0.046	0.10	0.50
IOA1553-01	Mercury - 245.1	Mercury	ug/l	0.13	0.20	0.20
IOA1553-01	Nitrogen, NO3+NO2 -N	Nitrate/Nitrite-N	mg/l	0.32	0.26	8.00
IOA1553-01	Perchlorate 314.0	Perchlorate	ug/l	0	4.0	6.00
IOA1553-01	Sulfate-300.0	Sulfate	mg/l	270	5.0	300
IOA1553-01	TDS - SM 2540C	Total Dissolved Solids	mg/l	660	10	950
IOA1553-02	624-Boeing 001/002 Q (Fr113+X)	1,1-Dichloroethene	ug/l	0	3.0	3.20
IOA1553-02	624-Boeing 001/002 Q (Fr113+X)	Trichloroethene	ug/l	0	5.0	5.00

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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Del Mar Analytical

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9830 South 51st St., Suite B-120, Phoenix, AZ 85044 (480) 785-0043 FAX (480) 785-0851
2520 E. Sunset Rd. #3, Las Vegas, NV 89120 (702) 798-3620 FAX (702) 798-3621

MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 002

Report Number: IOA1553

Sampled: 01/26/05
Received: 01/26/05

DATA QUALIFIERS AND DEFINITIONS

J	Estimated value. Analyte detected at a level less than the Reporting Limit (RL) and greater than or equal to the Method Detection Limit (MDL). The user of this data should be aware that this data is of unknown quality.
M-3	Results exceeded the linear range in the MS/MSD and therefore are not available for reporting. The batch was accepted based on acceptable recovery in the Blank Spike (LCS).
M-NR1	There was no MS/MSD analyzed with this batch due to insufficient sample volume. See Blank Spike/Blank Spike Duplicate.
ND	Analyte NOT DETECTED at or above the reporting limit or MDL, if MDL is specified.
RPD	Relative Percent Difference

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 002

Report Number: IOA1553

Sampled: 01/26/05
Received: 01/26/05

Certification Summary

Del Mar Analytical, Irvine

Method	Matrix	Nelac	California
EPA 120.1	Water	X	X
EPA 160.2	Water	X	X
EPA 160.5	Water	X	X
EPA 180.1	Water	X	X
EPA 200.8	Water	X	X
EPA 245.1	Water	X	X
EPA 300.0	Water	X	X
EPA 314.0	Water	X	X
EPA 335.2	Water	X	X
EPA 350.2	Water	X	X
EPA 405.1	Water	X	X
EPA 413.1	Water	X	X
EPA 608	Water	X	X
EPA 624	Water	X	X
EPA 625	Water	X	X
SM2540C	Water	X	X
SM5540-C	Water	X	X

Nevada and NELAP provide analyte specific accreditations. Analyte specific information for Del Mar Analytical may be obtained by contacting the laboratory or visiting our website at www.dmalabs.com.

Subcontracted Laboratories

Pace Analytical, MN- SUB

1700 Elm Street, Ste 200 - Minneapolis, MN 55414

Analysis Performed: 1613-Dioxin-HR
Samples: IOA1553-01

Analysis Performed: EDD + Level 4
Samples: IOA1553-01

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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Del Mar Analytical Version 5 8/12/04 CHAIN OF CUSTODY FORM

Client Name/Address:	Project:
MWH-Pasadena 300 North Lake Avenue, Suite 1200 Pasadena, CA 91101	Boeing-SSFL NPDES **Routine Outfall 002**
Project Manager: Bronwyn Kelly Sampler: Rick Bunaga	Phone Number: (626) 568-6691 Fax Number: (626) 568-6515

ANALYSIS REQUIRED — 501553

Sample Description	Sample Matrix	Container Type	# of Cont.	Sampling Date/Time	Preservative	Bottle * #	Total Reoverable Metals: Cu, Pb, Hg,	Settleable Solids	VOCs 624 + xylenes	TCDD (and all congeners)	Oil & Grease (EPA 413.1)	Cyanide (total recoverable)	BOD5(20 degrees C)	Surfactants (MBAS)	Cl-, SO4, NO3+NO2-N, Perchlorate	Turbidity,TDS, TSS, Conductivity	Ammonia-N	Alpha BHC (608)	2,4,6 Trichlorophenol, 2,4 Dinitrotoluene, Bis(2-ethylhexyl)phthalate, NDMA, pentachlorophenol (EPA 625)		Comments
Outfall 002	W	Poly-1 liter	1	1-26-05 12:47	HNO3	1A	X														24 TAT
Outfall 002-Dup	W	Poly-1 liter	1		HNO3	1B	X														24 TAT
Outfall 002	W	Poly-1 liter	1		None	2		X													
Outfall 002	W	VOAs	3		HCl	3A, 3B, 3C			X												
Outfall 002	W	Glass-Amber	2		None	4A, 4B				X											
Outfall 002	W	1L Amber	2		HCl	5A, 5B					X										24 TAT
Outfall 002	W	Poly-500 ml	1		NaOH	6						X									24 TAT
Outfall 002	W	Poly-1 liter	1		None	7							X								
Outfall 002	W	Poly-500 ml	2		None	8A, 8B								X							
Outfall 002	W	Poly-500 ml	2		None	9A, 9B									X						
Outfall 002	W	Poly-500 ml	2		None	10A, 10B										X					
Outfall 002	W	Poly-500 ml	1		H2SO4	11											X				AB
Outfall 002	W	1L Amber	2		None	12A, 12B												X			
Outfall 002	W	1L Amber	2	1-26-05 12:47	None	13A, 13B													X		
Trip Blank	W	VOAs	3		HCl	14A, 14B, 14C			X												

Field readings:
Temp = 57.9
pH= 7.95

Relinquished By	Date/Time:	Received By	Date/Time:
Rick Bunaga	1-26-05 1410	[signature]	1/26/05 1410
[signature]	1/26/05 1705	[signature]	1/26/05 1701
Relinquished By	Date/Time:	Received By	Date/Time:

Turn around Time: (check)
24 Hours _____ 5 Days _____
48 Hours _____ 10 Days _____
72 Hours _____ Normal ✓
Perchlorate Only 72 Hours _____
Metals Only 72 Hours _____
Sample Integrity: (Check)
Intact ✓ On Ice: + 3°C

Del Mar Analytical

2852 Alton Ave., Irvine CA 92606 (949) 261-1022 FAX (949) 261-1228
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2520 E. Sunset Rd. #3, Las Vegas, NV 89120 (702) 798-3620 FAX (702) 798-3621

March 10, 2005

MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, Ca.91101

Attention: Bronwyn Kelly

Project: Routine Outfall 002
Sampled: 01/26/05
Del Mar Analytical Number: IOA1553

Dear Ms. Kelly:

Pace Analytical performed Method 1613B analysis for the project referenced above. Please use the following cross-reference table when reviewing your results.

MWH ID	DEL MAR ID	Pace ID
Outfall 002	IOA1553-01	106871001

Attached is the original report from the subcontract laboratory. If you have any questions or require further assistance, please do not hesitate to contact me.

Sincerely yours,
DEL MAR ANALYTICAL

Michele Harper
Project Manager

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 1613B Analysis Results

Client - Del Mar Analytical

Client's Sample ID	IOA1553-01		
Lab Sample ID	106871001		
Filename	F50204A_07		
Injected By	MRO		
Total Amount Extracted	1050 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	01/26/2005
ICAL Date	11/29/2004	Received	01/28/2005
CCal Filename(s)	F50203A_20	Extracted	01/31/2005
Method Blank ID	BLANK-6241	Analyzed	02/04/2005 14:59

Native Isomers	Conc pg/L	EMPC pg/L	LOD pg/L		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	1.20		2,3,7,8-TCDF-13C	2.00	74
Total TCDF	ND	-----	1.20		2,3,7,8-TCDD-13C	2.00	80
					1,2,3,7,8-PeCDF-13C	2.00	82
2,3,7,8-TCDD	ND	-----	1.10		2,3,4,7,8-PeCDF-13C	2.00	93
Total TCDD	ND	-----	1.10		1,2,3,7,8-PeCDD-13C	2.00	103
					1,2,3,4,7,8-HxCDF-13C	2.00	79
1,2,3,7,8-PeCDF	ND	-----	0.80		1,2,3,6,7,8-HxCDF-13C	2.00	87
2,3,4,7,8-PeCDF	ND	-----	0.68		2,3,4,6,7,8-HxCDF-13C	2.00	83
Total PeCDF	ND	-----	0.74		1,2,3,7,8,9-HxCDF-13C	2.00	84
					1,2,3,4,7,8-HxCDD-13C	2.00	80
1,2,3,7,8-PeCDD	ND	-----	0.82		1,2,3,6,7,8-HxCDD-13C	2.00	79
Total PeCDD	ND	-----	0.82		1,2,3,4,6,7,8-HpCDF-13C	2.00	78
					1,2,3,4,7,8,9-HpCDF-13C	2.00	76
1,2,3,4,7,8-HxCDF	ND	-----	0.49		1,2,3,4,6,7,8-HpCDD-13C	2.00	89
1,2,3,6,7,8-HxCDF	ND	-----	0.48		OCDD-13C	4.00	85
2,3,4,6,7,8-HxCDF	ND	-----	0.61				
1,2,3,7,8,9-HxCDF	ND	-----	0.40		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	-----	0.50		1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	0.58		2,3,7,8-TCDD-37Cl4	0.20	74
1,2,3,6,7,8-HxCDD	ND	-----	0.49				
1,2,3,7,8,9-HxCDD	ND	-----	0.51				
Total HxCDD	ND	-----	0.53				
1,2,3,4,6,7,8-HpCDF	ND	-----	0.63				
1,2,3,4,7,8,9-HpCDF	ND	-----	0.59				
Total HpCDF	2.2	-----	0.61	BJ			
1,2,3,4,6,7,8-HpCDD	1.6	-----	0.38	J			
Total HpCDD	2.6	-----	0.38	J			
OCDF	-----	3.2	0.90	I			
OCDD	12.0	-----	1.10	J			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection. Totals are averages of individual isomer LODs.
D = Result obtained from analysis of diluted sample
B = Less than 10 times higher than method blank level
P = Recovery outside of method 1613 control limits
J = Concentration detected is below the calibration range
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....106871

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Pace Analytical™

Method 1613B Blank Analysis Results

Client - Del Mar Analytical

Lab Sample ID	BLANK-6241	Matrix	Water
Filename	U50202B_06	Dilution	NA
Total Amount Extracted	1040 mL	Extracted	01/31/2005
ICAL Date	01/26/2005	Analyzed	02/02/2005 23:46
CCal Filename(s)	U50202B_01	Injected By	SMT

Native Isomers	Conc pg/L	EMPC pg/L	LOD pg/L		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	0.59		2,3,7,8-TCDF-13C	2.00	86
Total TCDF	1.10	-----	-----	J	2,3,7,8-TCDD-13C	2.00	86
					1,2,3,7,8-PeCDF-13C	2.00	92
2,3,7,8-TCDD	ND	-----	1.30		2,3,4,7,8-PeCDF-13C	2.00	98
Total TCDD	ND	-----	-----		1,2,3,7,8-PeCDD-13C	2.00	105
					1,2,3,4,7,8-HxCDF-13C	2.00	83
1,2,3,7,8-PeCDF	-----	0.73	0.53	I	1,2,3,6,7,8-HxCDF-13C	2.00	76
2,3,4,7,8-PeCDF	ND	-----	0.63		2,3,4,6,7,8-HxCDF-13C	2.00	79
Total PeCDF	ND	-----	-----		1,2,3,7,8,9-HxCDF-13C	2.00	82
					1,2,3,4,7,8-HxCDD-13C	2.00	82
1,2,3,7,8-PeCDD	ND	-----	1.10		1,2,3,6,7,8-HxCDD-13C	2.00	66
Total PeCDD	ND	-----	-----		1,2,3,4,6,7,8-HpCDF-13C	2.00	75
					1,2,3,4,7,8,9-HpCDF-13C	2.00	69
1,2,3,4,7,8-HxCDF	-----	1.30	0.26	E	1,2,3,4,6,7,8-HpCDD-13C	2.00	77
1,2,3,6,7,8-HxCDF	-----	0.75	0.29	E	OCDD-13C	4.00	79
2,3,4,6,7,8-HxCDF	-----	0.71	0.31	I			
1,2,3,7,8,9-HxCDF	-----	1.00	0.41	E	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	0.34	-----	-----	J	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	1.10		2,3,7,8-TCDD-37Cl4	0.20	89
1,2,3,6,7,8-HxCDD	ND	-----	0.69				
1,2,3,7,8,9-HxCDD	ND	-----	0.95				
Total HxCDD	ND	-----	-----				
1,2,3,4,6,7,8-HpCDF	1.20	-----	0.71	J			
1,2,3,4,7,8,9-HpCDF	ND	-----	0.99				
Total HpCDF	4.30	-----	-----	J			
1,2,3,4,6,7,8-HpCDD	-----	1.60	0.86	I			
Total HpCDD	ND	-----	-----				
OCDF	6.50	-----	1.20	J			
OCDD	-----	8.30	0.74	I			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection. Totals are averages of individual isomer LODs.
A = Limit of Detection based on signal to noise
P = Recovery outside of method 1613 control limits
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....106475

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 1613B Laboratory Control Spike Results

Client - Del Mar Analytical

Lab Sample ID	LCS-6242		
Filename	U50202B_02	Matrix	Water
Total Amount Extracted	1040 mL	Dilution	NA
ICAL Date	01/26/2005	Extracted	01/31/2005
CCal Filename	U50202B_01	Analyzed	02/02/2005 20:28
Method Blank ID	BLANK-6241	Injected By	SMT

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDF	10	8.8	7.5	15.8	88
2,3,7,8-TCDD	10	8.6	6.7	15.8	86
1,2,3,7,8-PeCDF	50	43.6	40.0	67.0	87
2,3,4,7,8-PeCDF	50	42.3	34.0	80.0	85
1,2,3,7,8-PeCDD	50	38.0	35.0	71.0	76
1,2,3,4,7,8-HxCDF	50	39.1	36.0	67.0	78
1,2,3,6,7,8-HxCDF	50	42.0	42.0	65.0	84
2,3,4,6,7,8-HxCDF	50	40.4	35.0	78.0	81
1,2,3,7,8,9-HxCDF	50	39.6	39.0	65.0	79
1,2,3,4,7,8-HxCDD	50	43.2	35.0	82.0	86
1,2,3,6,7,8-HxCDD	50	42.9	38.0	67.0	86
1,2,3,7,8,9-HxCDD	50	45.4	32.0	81.0	91
1,2,3,4,6,7,8-HpCDF	50	44.2	41.0	61.0	88
1,2,3,4,7,8,9-HpCDF	50	46.8	39.0	69.0	94
1,2,3,4,6,7,8-HpCDD	50	41.4	35.0	70.0	83
OCDF	100	79.6	63.0	170.0	80
OCDD	100	85.8	78.0	144.0	86
2,3,7,8-TCDD-37Cl4	10	7.8	3.1	19.1	78
2,3,7,8-TCDF-13C	100	85.1	22.0	152.0	85
2,3,7,8-TCDD-13C	100	80.0	20.0	175.0	80
1,2,3,7,8-PeCDF-13C	100	90.8	21.0	192.0	91
2,3,4,7,8-PeCDF-13C	100	94.3	13.0	328.0	94
1,2,3,7,8-PeCDD-13C	100	102.1	21.0	227.0	102
1,2,3,4,7,8-HxCDF-13C	100	81.8	19.0	202.0	82
1,2,3,6,7,8-HxCDF-13C	100	78.8	21.0	159.0	79
2,3,4,6,7,8-HxCDF-13C	100	83.3	22.0	176.0	83
1,2,3,7,8,9-HxCDF-13C	100	85.0	17.0	205.0	85
1,2,3,4,7,8-HxCDD-13C	100	83.5	21.0	193.0	83
1,2,3,6,7,8-HxCDD-13C	100	71.7	25.0	163.0	72
1,2,3,4,6,7,8-HpCDF-13C	100	76.4	21.0	158.0	76
1,2,3,4,7,8,9-HpCDF-13C	100	67.0	20.0	186.0	67
1,2,3,4,6,7,8-HpCDD-13C	100	73.0	26.0	166.0	73
OCDD-13C	200	148.7	26.0	397.0	74

Cs = Concentration Spiked (ng/mL)
Cr = Concentration Recovered (ng/mL)
Rec. = Recovery (Expressed as Percent)
Control Limit Reference: Method 1613, Table 6, 10/94 Revision
X = Background subtracted value
P = Recovery outside of control limits
Nn = Value obtained from additional analysis
* = See Discussion

Report No.....106475

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 1613B Laboratory Control Spike Results

Client - Del Mar Analytical

Lab Sample ID	LCSD-6243		
Filename	U50202B_03	Matrix	Water
Total Amount Extracted	1030 mL	Dilution	NA
ICAL Date	01/26/2005	Extracted	01/31/2005
CCal Filename	U50202B_01	Analyzed	02/02/2005 21:15
Method Blank ID	BLANK-6241	Injected By	SMT

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDF	10	9.7	7.5	15.8	97
2,3,7,8-TCDD	10	9.4	6.7	15.8	94
1,2,3,7,8-PeCDF	50	46.8	40.0	67.0	94
2,3,4,7,8-PeCDF	50	44.6	34.0	80.0	89
1,2,3,7,8-PeCDD	50	40.7	35.0	71.0	81
1,2,3,4,7,8-HxCDF	50	41.3	36.0	67.0	83
1,2,3,6,7,8-HxCDF	50	44.5	42.0	65.0	89
2,3,4,6,7,8-HxCDF	50	43.6	35.0	78.0	87
1,2,3,7,8,9-HxCDF	50	42.2	39.0	65.0	84
1,2,3,4,7,8-HxCDD	50	49.1	35.0	82.0	98
1,2,3,6,7,8-HxCDD	50	45.6	38.0	67.0	91
1,2,3,7,8,9-HxCDD	50	51.3	32.0	81.0	103
1,2,3,4,6,7,8-HpCDF	50	47.5	41.0	61.0	95
1,2,3,4,7,8,9-HpCDF	50	50.1	39.0	69.0	100
1,2,3,4,6,7,8-HpCDD	50	44.5	35.0	70.0	89
OCDF	100	89.7	63.0	170.0	90
OCDD	100	91.5	78.0	144.0	92
2,3,7,8-TCDD-37Cl4	10	9.3	3.1	19.1	93
2,3,7,8-TCDF-13C	100	100.2	22.0	152.0	100
2,3,7,8-TCDD-13C	100	97.2	20.0	175.0	97
1,2,3,7,8-PeCDF-13C	100	109.5	21.0	192.0	109
2,3,4,7,8-PeCDF-13C	100	114.8	13.0	328.0	115
1,2,3,7,8-PeCDD-13C	100	124.2	21.0	227.0	124
1,2,3,4,7,8-HxCDF-13C	100	93.9	19.0	202.0	94
1,2,3,6,7,8-HxCDF-13C	100	88.8	21.0	159.0	89
2,3,4,6,7,8-HxCDF-13C	100	89.8	22.0	176.0	90
1,2,3,7,8,9-HxCDF-13C	100	96.4	17.0	205.0	96
1,2,3,4,7,8-HxCDD-13C	100	86.2	21.0	193.0	86
1,2,3,6,7,8-HxCDD-13C	100	80.0	25.0	163.0	80
1,2,3,4,6,7,8-HpCDF-13C	100	85.0	21.0	158.0	85
1,2,3,4,7,8,9-HpCDF-13C	100	80.0	20.0	186.0	80
1,2,3,4,6,7,8-HpCDD-13C	100	81.7	26.0	166.0	82
OCDD-13C	200	177.3	26.0	397.0	89

Cs = Concentration Spiked (ng/mL)
Cr = Concentration Recovered (ng/mL)
Rec. = Recovery (Expressed as Percent)
Control Limit Reference: Method 1613, Table 6, 10/94 Revision
X = Background subtracted value
P = Recovery outside of control limits
Nn = Value obtained from additional analysis
* = See Discussion

Report No.....106475

REPORT OF LABORATORY ANALYSIS

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www.pacelabs.com

Pace Analytical Services, Inc.
1700 Elm Street
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444

SPIKE RECOVERY RELATIVE PERCENT DIFFERENCE (RPD) RESULTS

Client..... Del Mar Analytical

SPIKE 1 ID..... LCS-6242
SPIKE 1 Filename..... U50202B_02
SPIKE 2 ID..... LCSD-6243
SPIKE 2 Filename..... U50202B_03

COMPOUND	SPIKE 1 REC,%	SPIKE 2 REC,%	RPD,%
2378-TCDF	88	97	9.7
2378-TCDD	86	94	8.9
12378-PeCDF	87	94	7.7
23478-PeCDF	85	89	4.6
12378-PeCDD	76	81	6.4
123478-HxCDF	78	83	6.2
123678-HxCDF	84	89	5.8
234678-HxCDF	81	87	7.1
123789-HxCDF	79	84	6.1
123478-HxCDD	86	98	13.0
123678-HxCDD	86	91	5.6
123789-HxCDD	91	103	12.4
1234678-HpCDF	88	95	7.7
1234789-HpCDF	94	100	6.2
1234678-HpCDD	83	89	7.0
OCDF	80	90	11.8
OCDD	86	92	6.7

REC = Percent Recovered
RPD = The difference between the two values divided by the average.
NA = Not Applicable

Report No..... 106475

REPORT OF LABORATORY ANALYSIS

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Fax: 612.607.6444

TABLE 1. 2,3,7,8-TCDD Equivalency Factors (TEFs) for the Polychlorinated Dibenzo-p-dioxins and Dibenzofurans

Number	Compound(s)	TEF
1	2,3,7,8-TCDD	1.00
2	1,2,3,7,8-PeCDD	0.50
3	1,2,3,6,7,8-HxCDD	0.1
4	1,2,3,7,8,9-HxCDD	0.1
5	1,2,3,4,7,8-HxCDD	0.1
6	1,2,3,4,6,7,8-HpCDD	0.01
7	OCDD	0.001
8	* Total - TCDD	0.0
9	* Total - PeCDD	0.0
10	* Total - HxCDD	0.0
11	* Total - HpCDD	0.0
12	2,3,7,8-TCDF	0.10
13	1,2,3,7,8-PeCDF	0.05
14	2,3,4,7,8-PeCDF	0.5
15	1,2,3,6,7,8-HxCDF	0.1
16	1,2,3,7,8,9-HxCDF	0.1
17	1,2,3,4,7,8-HxCDF	0.1
18	2,3,4,6,7,8-HxCDF	0.1
19	1,2,3,4,6,7,8-HpCDF	0.01
20	1,2,3,4,7,8,9-HpCDF	0.01
21	OCDF	0.001
22	* Total - TCDF	0.0
23	* Total - PeCDF	0.0
24	* Total - HxCDF	0.0
25	* Total - HpCDF	0.0

*Excluding the 2,3,7,8-substituted congeners.

Reference: 1989 ITEFs

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2520 E. Sunset Rd., Suite #3, Las Vegas, NV 89120 Ph (702) 798-3620 Fax (702) 798-3621

SUBCONTRACT ORDER - PROJECT # IOA1553 10687

SENDING LABORATORY:	RECEIVING LABORATORY:
Del Mar Analytical, Irvine 17461 Derian Avenue. Suite 100 Irvine, CA 92614 Phone: (949) 261-1022 Fax: (949) 261-1228 Project Manager: Michele Harper	Pace Analytical, MN- SUB 1700 Elm Street, Ste 200 Minneapolis, MN 55414 Phone :(612) 607-1700 Fax: (612) 607-6444

Standard TAT is requested unless specific due date is requested => Due Date:_____ Initials:_____

Analysis	Expiration	Comments
Sample ID: IOA1553-01 Water	**Sampled: 01/26/05 12:47**	**"Instant Nofication"** 10687001
1613-Dioxin-HR	02/02/05 12:47	J flags, 17 congeners, no TEQ, sub to Pace-MN
EDD + Level 4	02/23/05 12:47	Excel EDD email to pm,Include Std logs for Lvl IV

Containers Supplied:
1 L Amber (IOA1553-01G)
1 L Amber (IOA1553-01H)

SAMPLE INTEGRITY:

All containers intact: ☐ Yes ☐ No Sample labels/COC agree: ☐ Yes ☐ No Samples Received On Ice:: ☐ Yes ☐ No
Custody Seals Present: ☐ Yes ☐ No Samples Preserved Properly: ☐ Yes ☐ No Samples Received at (temp): 2.7°C

Released By	Date	Time	Received By	Date	Time
	1-27-05	1700	Pace	1-28-05	09:30

Del Mar Analytical

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LABORATORY REPORT

Prepared For: MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project: Routine Outfall 002

Sampled: 01/11/05
Received: 01/11/05
Issued: 02/28/05 17:23

NELAP #01108CA California ELAP#1197 CSDLAC #10117

The results listed within this Laboratory Report pertain only to the samples tested in the laboratory. The analyses contained in this report were performed in accordance with the applicable certifications as noted. All soil samples are reported on a wet weight basis unless otherwise noted in the report. This Laboratory Report is confidential and is intended for the sole use of Del Mar Analytical and its client. This report shall not be reproduced, except in full, without written permission from Del Mar Analytical. The Chain of Custody, 1 page, is included and is an integral part of this report.
This entire report was reviewed and approved for release.

SAMPLE CROSS REFERENCE

SUBCONTRACTED: Refer to the last page for specific subcontract laboratory information included in this report.

LABORATORY ID	CLIENT ID	MATRIX
IOA0550-01	Outfall 002	Water
IOA0550-02	Trip Blank	Water

Reviewed By:

Michele Harper

Del Mar Analytical, Irvine
Michele Harper
Project Manager

Del Mar Analytical

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 002
Report Number: IOA0550

Sampled: 01/11/05
Received: 01/11/05

PURGEABLES BY GC/MS (EPA 624)

Analyte	Method	Batch	MDL Limit	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA0550-01 (Outfall 002 - Water)									
Reporting Units: ug/l									
1,1-Dichloroethene	EPA 624	5A12001	0.32	3.0	ND	1	01/12/05	01/12/05	
Trichloroethene	EPA 624	5A12001	0.26	5.0	**0.95**	1	01/12/05	01/12/05	J
Surrogate: Dibromofluoromethane (80-120%)					*102 %*				
Surrogate: Toluene-d8 (80-120%)					*100 %*				
Surrogate: 4-Bromofluorobenzene (80-120%)					*98 %*				
Sample ID: IOA0550-02 (Trip Blank - Water)									
Reporting Units: ug/l									
1,1-Dichloroethene	EPA 624	5A12003	0.32	3.0	ND	1	01/12/05	01/12/05	
Trichloroethene	EPA 624	5A12003	0.26	5.0	ND	1	01/12/05	01/12/05	
Surrogate: Dibromofluoromethane (80-120%)					*98 %*				
Surrogate: Toluene-d8 (80-120%)					*94 %*				
Surrogate: 4-Bromofluorobenzene (80-120%)					*101 %*				

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 002

Report Number: IOA0550

Sampled: 01/11/05
Received: 01/11/05

ACID & BASE/NEUTRALS BY GC/MS (EPA 625)

Analyte	Method	Batch	MDL Limit	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA0550-01 (Outfall 002 - Water)									
Reporting Units: ug/l									
Bis(2-ethylhexyl)phthalate	EPA 625	5A12027	1.1	5.0	ND	0.971	01/12/05	01/17/05	
2,4-Dinitrotoluene	EPA 625	5A12027	0.23	9.0	ND	0.971	01/12/05	01/17/05	
N-Nitrosodimethylamine	EPA 625	5A12027	0.22	8.0	ND	0.971	01/12/05	01/17/05	
Pentachlorophenol	EPA 625	5A12027	0.78	8.0	ND	0.971	01/12/05	01/17/05	
2,4,6-Trichlorophenol	EPA 625	5A12027	0.10	6.0	ND	0.971	01/12/05	01/17/05	
Surrogate: 2-Fluorophenol (35-120%)					*73 %*				
Surrogate: Phenol-d6 (45-120%)					*77 %*				
Surrogate: 2,4,6-Tribromophenol (50-125%)					*80 %*				
Surrogate: Nitrobenzene-d5 (45-120%)					*74 %*				
Surrogate: 2-Fluorobiphenyl (45-120%)					*80 %*				
Surrogate: Terphenyl-d14 (45-135%)					*86 %*				

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MWH-Pasadena/Boeing
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Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 002

Report Number: IOA0550

Sampled: 01/11/05
Received: 01/11/05

ORGANOCHLORINE PESTICIDES (EPA 608)

Analyte	Method	Batch	MDL Limit	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA0550-01 (Outfall 002 - Water) - cont.									
Reporting Units: ug/l									
alpha-BHC	EPA 608	5A13049	0.00049	0.010	ND	0.952	01/13/05	01/14/05	
Surrogate: Decachlorobiphenyl (45-120%)					*85 %*				
Surrogate: Tetrachloro-m-xylene (35-120%)					*62 %*				

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 002
Report Number: IOA0550

Sampled: 01/11/05
Received: 01/11/05

METALS

Analyte	Method	Batch	MDL Limit	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA0550-01 (Outfall 002 - Water) - cont.									
Reporting Units: ug/l									
Copper	EPA 200.8	5A11106	0.49	2.0	**4.0**	1	01/11/05	01/12/05	
Lead	EPA 200.8	5A11106	0.13	1.0	**0.68**	1	01/11/05	01/12/05	J
Mercury	EPA 245.1	5A12047	0.063	0.20	**0.094**	1	01/12/05	01/12/05	J

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Michele Harper
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Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 002
Report Number: IOA0550

Sampled: 01/11/05
Received: 01/11/05

INORGANICS

Analyte	Method	Batch	MDL	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA0550-01 (Outfall 002 - Water) - cont.									
Reporting Units: mg/l									
Ammonia-N (Distilled)	EPA 350.2	5A13063	0.30	0.50	ND	1	01/13/05	01/13/05	
Biochemical Oxygen Demand	EPA 405.1	5A12041	0.59	2.0	**0.80**	1	01/12/05	01/17/05	J
Chloride	EPA 300.0	5A11040	0.26	0.50	**8.2**	1	01/11/05	01/11/05	
Nitrate/Nitrite-N	EPA 300.0	5A11040	0.072	0.26	**1.4**	1	01/11/05	01/11/05	
Oil & Grease	EPA 413.1	5A12061	0.94	5.0	**7.9**	1	01/12/05	01/12/05	B
Sulfate	EPA 300.0	5A11040	0.18	0.50	**31**	1	01/11/05	01/11/05	
Surfactants (MBAS)	SM5540-C	5A12059	0.044	0.10	ND	1	01/12/05	01/12/05	
Total Dissolved Solids	SM2540C	5A13089	10	10	**180**	1	01/13/05	01/13/05	
Total Suspended Solids	EPA 160.2	5A14084	10	10	**14**	1	01/14/05	01/14/05	
Sample ID: IOA0550-01 (Outfall 002 - Water)									
Reporting Units: ml/l/hr									
Total Settleable Solids	EPA 160.5	5A12043	0.10	0.10	ND	1	01/12/05	01/12/05	
Sample ID: IOA0550-01 (Outfall 002 - Water)									
Reporting Units: NTU									
Turbidity	EPA 180.1	5A12058	0.040	1.0	**19**	1	01/12/05	01/12/05	
Sample ID: IOA0550-01 (Outfall 002 - Water)									
Reporting Units: ug/l									
Total Cyanide	EPA 335.2	5A11108	2.2	5.0	ND	1	01/11/05	01/11/05	
Perchlorate	EPA 314.0	5A13051	0.80	4.0	ND	1	01/13/05	01/13/05	
Sample ID: IOA0550-01 (Outfall 002 - Water)									
Reporting Units: umhos/cm									
Specific Conductance	EPA 120.1	5A13060	1.0	1.0	**220**	1	01/13/05	01/13/05	

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Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 002

Report Number: IOA0550

Sampled: 01/11/05
Received: 01/11/05

SHORT HOLD TIME DETAIL REPORT

	Hold Time (in days)	Date/Time Sampled	Date/Time Received	Date/Time Extracted	Date/Time Analyzed
Sample ID: Outfall 002 (IOA0550-01) - Water					
EPA 160.5	2	01/11/2005 13:13	01/11/2005 18:50	01/12/2005 09:30	01/12/2005 12:30
EPA 180.1	2	01/11/2005 13:13	01/11/2005 18:50	01/12/2005 11:30	01/12/2005 12:30
EPA 300.0	2	01/11/2005 13:13	01/11/2005 18:50	01/11/2005 21:00	01/11/2005 21:43
EPA 405.1	2	01/11/2005 13:13	01/11/2005 18:50	01/12/2005 11:00	01/17/2005 16:00
SM5540-C	2	01/11/2005 13:13	01/11/2005 18:50	01/12/2005 13:06	01/12/2005 20:16

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Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
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Attention: Bronwyn Kelly

Project ID: Routine Outfall 002

Report Number: IOA0550

Sampled: 01/11/05
Received: 01/11/05

METHOD BLANK/QC DATA

ACID & BASE/NEUTRALS BY GC/MS (EPA 625)

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A12027 Extracted: 01/12/05											
Blank Analyzed: 01/17/2005 (5A12027-BLK1)											
Bis(2-ethylhexyl)phthalate	ND	5.0	1.1	ug/l							
2,4-Dinitrotoluene	ND	9.0	0.23	ug/l							
N-Nitrosodimethylamine	ND	8.0	0.22	ug/l							
Pentachlorophenol	ND	8.0	0.78	ug/l							
2,4,6-Trichlorophenol	ND	6.0	0.10	ug/l							
Surrogate: 2-Fluorophenol	*14.2*			*ug/l*	*20.0*		*71*	*35-120*			
Surrogate: Phenol-d6	*14.7*			*ug/l*	*20.0*		*74*	*45-120*			
Surrogate: 2,4,6-Tribromophenol	*14.3*			*ug/l*	*20.0*		*72*	*50-125*			
Surrogate: Nitrobenzene-d5	*6.84*			*ug/l*	*10.0*		*68*	*45-120*			
Surrogate: 2-Fluorobiphenyl	*7.60*			*ug/l*	*10.0*		*76*	*45-120*			
Surrogate: Terphenyl-d14	*8.12*			*ug/l*	*10.0*		*81*	*45-135*			
LCS Analyzed: 01/17/2005 (5A12027-BS1)											**M-NR1**
Bis(2-ethylhexyl)phthalate	8.56	5.0	1.1	ug/l	10.0		86	65-125			
2,4-Dinitrotoluene	7.36	9.0	0.23	ug/l	10.0		74	60-140			*J*
N-Nitrosodimethylamine	7.68	8.0	0.22	ug/l	10.0		77	40-120			*J*
Pentachlorophenol	8.04	8.0	0.78	ug/l	10.0		80	50-125			
2,4,6-Trichlorophenol	8.64	6.0	0.10	ug/l	10.0		86	60-120			
Surrogate: 2-Fluorophenol	*14.5*			*ug/l*	*20.0*		*72*	*35-120*			
Surrogate: Phenol-d6	*14.5*			*ug/l*	*20.0*		*72*	*45-120*			
Surrogate: 2,4,6-Tribromophenol	*14.7*			*ug/l*	*20.0*		*74*	*50-125*			
Surrogate: Nitrobenzene-d5	*7.14*			*ug/l*	*10.0*		*71*	*45-120*			
Surrogate: 2-Fluorobiphenyl	*7.80*			*ug/l*	*10.0*		*78*	*45-120*			
Surrogate: Terphenyl-d14	*8.56*			*ug/l*	*10.0*		*86*	*45-135*			
LCS Dup Analyzed: 01/17/2005 (5A12027-BSD1)											
Bis(2-ethylhexyl)phthalate	8.24	5.0	1.1	ug/l	10.0		82	65-125	4	20	
2,4-Dinitrotoluene	7.48	9.0	0.23	ug/l	10.0		75	60-140	2	20	*J*
N-Nitrosodimethylamine	7.20	8.0	0.22	ug/l	10.0		72	40-120	6	20	*J*
Pentachlorophenol	7.68	8.0	0.78	ug/l	10.0		77	50-125	5	25	*J*
2,4,6-Trichlorophenol	8.76	6.0	0.10	ug/l	10.0		88	60-120	1	20	
Surrogate: 2-Fluorophenol	*14.3*			*ug/l*	*20.0*		*72*	*35-120*			
Surrogate: Phenol-d6	*14.5*			*ug/l*	*20.0*		*72*	*45-120*			
Surrogate: 2,4,6-Tribromophenol	*15.0*			*ug/l*	*20.0*		*75*	*50-125*			
Surrogate: Nitrobenzene-d5	*7.38*			*ug/l*	*10.0*		*74*	*45-120*			
Surrogate: 2-Fluorobiphenyl	*7.66*			*ug/l*	*10.0*		*77*	*45-120*			

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METHOD BLANK/QC DATA

ACID & BASE/NEUTRALS BY GC/MS (EPA 625)

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A12027 Extracted: 01/12/05											
LCS Dup Analyzed: 01/17/2005 (5A12027-BSD1)											
Surrogate: Terphenyl-d14	*9.00*			*ug/l*	*10.0*		*90*	*45-135*			

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METHOD BLANK/QC DATA

ORGANOCHLORINE PESTICIDES (EPA 608)

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A13049 Extracted: 01/13/05											
Blank Analyzed: 01/14/2005 (5A13049-BLK1)											
alpha-BHC	ND	0.010	0.00049	ug/l							
Surrogate: Decachlorobiphenyl	*0.456*			*ug/l*	*0.500*		*91*	*45-120*			
Surrogate: Tetrachloro-m-xylene	*0.349*			*ug/l*	*0.500*		*70*	*35-120*			
LCS Analyzed: 01/14/2005 (5A13049-BS1)											**M-NR1**
alpha-BHC	0.427	0.010	0.00049	ug/l	0.500		85	45-115			
Surrogate: Decachlorobiphenyl	*0.432*			*ug/l*	*0.500*		*86*	*45-120*			
Surrogate: Tetrachloro-m-xylene	*0.347*			*ug/l*	*0.500*		*69*	*35-120*			
LCS Dup Analyzed: 01/14/2005 (5A13049-BSD1)											
alpha-BHC	0.433	0.010	0.00049	ug/l	0.500		87	45-115	1	30	
Surrogate: Decachlorobiphenyl	*0.407*			*ug/l*	*0.500*		*81*	*45-120*			
Surrogate: Tetrachloro-m-xylene	*0.364*			*ug/l*	*0.500*		*73*	*35-120*			

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METHOD BLANK/QC DATA

METALS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A11106 Extracted: 01/11/05											
Blank Analyzed: 01/12/2005 (5A11106-BLK1)											
Copper	ND	2.0	0.49	ug/l							
Lead	ND	1.0	0.13	ug/l							
LCS Analyzed: 01/12/2005 (5A11106-BS1)											
Copper	82.0	2.0	0.49	ug/l	80.0		102	85-115			
Lead	81.6	1.0	0.13	ug/l	80.0		102	85-115			
Matrix Spike Analyzed: 01/12/2005 (5A11106-MS1)						**Source: IOA0550-01**					
Copper	79.0	2.0	0.49	ug/l	80.0	4.0	94	70-130			
Lead	75.8	1.0	0.13	ug/l	80.0	0.68	94	70-130			
Matrix Spike Dup Analyzed: 01/12/2005 (5A11106-MSD1)						**Source: IOA0550-01**					
Copper	84.7	2.0	0.49	ug/l	80.0	4.0	101	70-130	7	20	
Lead	82.0	1.0	0.13	ug/l	80.0	0.68	102	70-130	8	20	
Batch: 5A12047 Extracted: 01/12/05											
Blank Analyzed: 01/12/2005 (5A12047-BLK1)											
Mercury	ND	0.20	0.063	ug/l							
LCS Analyzed: 01/12/2005 (5A12047-BS1)											
Mercury	8.12	0.20	0.063	ug/l	8.00		102	85-115			
Matrix Spike Analyzed: 01/12/2005 (5A12047-MS1)						**Source: IOA0483-01**					
Mercury	8.00	0.20	0.063	ug/l	8.00	ND	100	70-130			
Matrix Spike Dup Analyzed: 01/12/2005 (5A12047-MSD1)						**Source: IOA0483-01**					
Mercury	8.26	0.20	0.063	ug/l	8.00	ND	103	70-130	3	20	

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METHOD BLANK/QC DATA

INORGANICS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A11040 Extracted: 01/11/05											
Blank Analyzed: 01/11/2005 (5A11040-BLK1)											
Chloride	ND	0.50	0.26	mg/l							
Nitrate/Nitrite-N	ND	0.26	0.072	mg/l							
Sulfate	ND	0.50	0.18	mg/l							
LCS Analyzed: 01/11/2005 (5A11040-BS1)											
Chloride	4.84	0.50	0.26	mg/l	5.00		97	90-110			
Sulfate	10.1	0.50	0.18	mg/l	10.0		101	90-110			
Matrix Spike Analyzed: 01/11/2005 (5A11040-MS1)						**Source: IOA0494-01**					
Chloride	24.1	2.5	1.3	mg/l	5.00	20	82	80-120			
Sulfate	38.6	2.5	0.90	mg/l	10.0	29	96	80-120			
Matrix Spike Dup Analyzed: 01/11/2005 (5A11040-MSD1)						**Source: IOA0494-01**					
Chloride	24.1	2.5	1.3	mg/l	5.00	20	82	80-120	0	20	
Sulfate	38.8	2.5	0.90	mg/l	10.0	29	98	80-120	1	20	
Batch: 5A11108 Extracted: 01/11/05											
Blank Analyzed: 01/11/2005 (5A11108-BLK1)											
Total Cyanide	ND	5.0	2.2	ug/l							
LCS Analyzed: 01/11/2005 (5A11108-BS1)											
Total Cyanide	184	5.0	2.2	ug/l	200		92	90-110			
Matrix Spike Analyzed: 01/11/2005 (5A11108-MS1)						**Source: IOA0214-01**					
Total Cyanide	171	5.0	2.2	ug/l	200	ND	86	70-115			

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INORGANICS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A11108 Extracted: 01/11/05											
Matrix Spike Dup Analyzed: 01/11/2005 (5A11108-MSD1)						**Source: IOA0214-01**					
Total Cyanide	169	5.0	2.2	ug/l	200	ND	84	70-115	1	15	
Batch: 5A12041 Extracted: 01/12/05											
Blank Analyzed: 01/17/2005 (5A12041-BLK1)											
Biochemical Oxygen Demand	ND	2.0	0.59	mg/l							
LCS Analyzed: 01/17/2005 (5A12041-BS1)											
Biochemical Oxygen Demand	208	100	30	mg/l	198		105	85-115			
LCS Dup Analyzed: 01/17/2005 (5A12041-BSD1)											
Biochemical Oxygen Demand	212	100	30	mg/l	198		107	85-115	2	20	
Batch: 5A12058 Extracted: 01/12/05											
Blank Analyzed: 01/12/2005 (5A12058-BLK1)											
Turbidity	ND	1.0	0.040	NTU							
Duplicate Analyzed: 01/12/2005 (5A12058-DUP1)						**Source: IOA0541-01**					
Turbidity	0.260	1.0	0.040	NTU		0.23			12	20	*J*
Batch: 5A12059 Extracted: 01/12/05											
Blank Analyzed: 01/12/2005 (5A12059-BLK1)											
Surfactants (MBAS)	ND	0.10	0.044	mg/l							

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INORGANICS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A12059 Extracted: 01/12/05											
LCS Analyzed: 01/12/2005 (5A12059-BS1)											
Surfactants (MBAS)	0.248	0.10	0.044	mg/l	0.250		99	90-110			
Matrix Spike Analyzed: 01/12/2005 (5A12059-MS1)						**Source: IOA0578-01**					
Surfactants (MBAS)	0.191	0.10	0.044	mg/l	0.250	0.052	56	50-125			
Matrix Spike Dup Analyzed: 01/12/2005 (5A12059-MSD1)						**Source: IOA0578-01**					
Surfactants (MBAS)	0.193	0.10	0.044	mg/l	0.250	0.052	56	50-125	1	20	
Batch: 5A12061 Extracted: 01/12/05											
Blank Analyzed: 01/12/2005 (5A12061-BLK1)											
Oil & Grease	1.60	5.0	0.94	mg/l							*J*
LCS Analyzed: 01/12/2005 (5A12061-BS1)											**M-NR1**
Oil & Grease	21.2	5.0	0.94	mg/l	20.0		106	65-120			
LCS Dup Analyzed: 01/12/2005 (5A12061-BSD1)											
Oil & Grease	20.8	5.0	0.94	mg/l	20.0		104	65-120	2	20	
Batch: 5A13051 Extracted: 01/13/05											
Blank Analyzed: 01/13/2005 (5A13051-BLK1)											
Perchlorate	ND	4.0	0.80	ug/l							
LCS Analyzed: 01/13/2005 (5A13051-BS1)											
Perchlorate	50.0	4.0	0.80	ug/l	50.0		100	85-115			

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INORGANICS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A13051 Extracted: 01/13/05											
Matrix Spike Analyzed: 01/13/2005 (5A13051-MS1)						**Source: IOA0417-02**					
Perchlorate	49.6	4.0	0.80	ug/l	50.0	0.93	97	80-120			
Matrix Spike Dup Analyzed: 01/13/2005 (5A13051-MSD1)						**Source: IOA0417-02**					
Perchlorate	50.7	4.0	0.80	ug/l	50.0	0.93	100	80-120	2	20	
Batch: 5A13060 Extracted: 01/13/05											
Duplicate Analyzed: 01/13/2005 (5A13060-DUP1)						**Source: IOA0552-01**					
Specific Conductance	164	1.0	1.0	umhos/cm		160			2	5	
Batch: 5A13063 Extracted: 01/13/05											
Blank Analyzed: 01/13/2005 (5A13063-BLK1)											
Ammonia-N (Distilled)	ND	0.50	0.30	mg/l							
LCS Analyzed: 01/13/2005 (5A13063-BS1)											
Ammonia-N (Distilled)	9.80	0.50	0.30	mg/l	10.0		98	80-115			
Matrix Spike Analyzed: 01/13/2005 (5A13063-MS1)						**Source: IOA0632-01**					
Ammonia-N (Distilled)	11.5	0.50	0.30	mg/l	10.0	0.56	109	70-120			
Matrix Spike Dup Analyzed: 01/13/2005 (5A13063-MSD1)						**Source: IOA0632-01**					
Ammonia-N (Distilled)	11.2	0.50	0.30	mg/l	10.0	0.56	106	70-120	3	15	
Batch: 5A13089 Extracted: 01/13/05											
Blank Analyzed: 01/13/2005 (5A13089-BLK1)											
Total Dissolved Solids	ND	10	10	mg/l							

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INORGANICS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A13089 Extracted: 01/13/05											
LCS Analyzed: 01/13/2005 (5A13089-BS1)											
Total Dissolved Solids	994	10	10	mg/l	1000		99	90-110			
Duplicate Analyzed: 01/13/2005 (5A13089-DUP1)						**Source: IOA0549-01**					
Total Dissolved Solids	92.0	10	10	mg/l		88			4	10	
Batch: 5A14084 Extracted: 01/14/05											
Blank Analyzed: 01/14/2005 (5A14084-BLK1)											
Total Suspended Solids	ND	10	10	mg/l							
LCS Analyzed: 01/14/2005 (5A14084-BS1)											
Total Suspended Solids	949	10	10	mg/l	1000		95	85-115			
Duplicate Analyzed: 01/14/2005 (5A14084-DUP1)						**Source: IOA0607-01**					
Total Suspended Solids	ND	10	10	mg/l		ND				10	

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Compliance Check

The results obtained from the analytical testing of this data set were checked against compliance limits received from the client. Any results at or above the compliance limits appear in bold on this page.

LabNumber	Analysis	Analyte	Units	Result	MRL	Compliance Limit
IOA0550-01	413.1 Oil and Grease	Oil & Grease	mg/l	7.90	5.0	10.00
IOA0550-01	608-Pest Boeing 001/002 Q (LL)	alpha-BHC	ug/l	0	0.010	0.0100
IOA0550-01	624-Boeing 001/002 Q (Fr113+X)	1,1-Dichloroethene	ug/l	0	3.0	3.20
IOA0550-01	624-Boeing 001/002 Q (Fr113+X)	Trichloroethene	ug/l	0.95	5.0	5.00
IOA0550-01	625-Boeing 001/002 Q-LL	2,4,6-Trichlorophenol	ug/l	0	6.0	6.50
IOA0550-01	625-Boeing 001/002 Q-LL	2,4-Dinitrotoluene	ug/l	0	9.0	9.10
IOA0550-01	625-Boeing 001/002 Q-LL	Bis(2-ethylhexyl)phthalate	ug/l	0.47	5.0	4.00
IOA0550-01	625-Boeing 001/002 Q-LL	N-Nitrosodimethylamine	ug/l	0	8.0	8.10
IOA0550-01	625-Boeing 001/002 Q-LL	Pentachlorophenol	ug/l	0	8.0	8.20
IOA0550-01	BOD	Biochemical Oxygen Demand	mg/l	0.80	2.0	20
IOA0550-01	Chloride - 300.0	Chloride	mg/l	8.20	0.50	150
IOA0550-01	Copper-200.8	Copper	ug/l	4.00	2.0	7.10
IOA0550-01	Cyanide-335.2 5ppb	Total Cyanide	ug/l	-6	5.0	4.30
IOA0550-01	Lead-200.8	Lead	ug/l	0.68	1.0	2.60
IOA0550-01	MBAS - SM5540-C	Surfactants (MBAS)	mg/l	0.019	0.10	0.50
IOA0550-01	Mercury - 245.1	Mercury	ug/l	0.094	0.20	0.20
IOA0550-01	Nitrogen, NO3+NO2 -N	Nitrate/Nitrite-N	mg/l	1.40	0.26	8.00
IOA0550-01	Perchlorate 314.0	Perchlorate	ug/l	0	4.0	6.00
IOA0550-01	Sulfate-300.0	Sulfate	mg/l	31	0.50	300
IOA0550-01	TDS - SM 2540C	Total Dissolved Solids	mg/l	180	10	950
IOA0550-02	624-Boeing 001/002 Q (Fr113+X)	1,1-Dichloroethene	ug/l	0	3.0	3.20
IOA0550-02	624-Boeing 001/002 Q (Fr113+X)	Trichloroethene	ug/l	0	5.0	5.00

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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Del Mar Analytical

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2520 E. Sunset Rd. #3, Las Vegas, NV 89120 (702) 798-3620 FAX (702) 798-3621

MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 002
Report Number: IOA0550

Sampled: 01/11/05
Received: 01/11/05

DATA QUALIFIERS AND DEFINITIONS

B	Analyte was detected in the associated Method Blank.
J	Estimated value. Analyte detected at a level less than the Reporting Limit (RL) and greater than or equal to the Method Detection Limit (MDL). The user of this data should be aware that this data is of unknown quality.
M-NR1	There was no MS/MSD analyzed with this batch due to insufficient sample volume. See Blank Spike/Blank Spike Duplicate.
ND	Analyte NOT DETECTED at or above the reporting limit or MDL, if MDL is specified.
RPD	Relative Percent Difference

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 002

Report Number: IOA0550

Sampled: 01/11/05
Received: 01/11/05

Certification Summary

Del Mar Analytical, Irvine

Method	Matrix	Nelac	California
EPA 120.1	Water	X	X
EPA 160.2	Water	X	X
EPA 160.5	Water	X	X
EPA 180.1	Water	X	X
EPA 200.8	Water	X	X
EPA 245.1	Water	X	X
EPA 300.0	Water	X	X
EPA 314.0	Water	X	X
EPA 335.2	Water	X	X
EPA 350.2	Water	X	X
EPA 405.1	Water	X	X
EPA 413.1	Water	X	X
EPA 608	Water	X	X
EPA 624	Water	X	X
EPA 625	Water	X	X
SM2540C	Water	X	X
SM5540-C	Water	X	X

Nevada and NELAP provide analyte specific accreditations. Analyte specific information for Del Mar Analytical may be obtained by contacting the laboratory or visiting our website at www.dmalabs.com.

Subcontracted Laboratories

Pace Analytical, MN- SUB

1700 Elm Street, Ste 200 - Minneapolis, MN 55414

Analysis Performed: 1613-Dioxin-HR
Samples: IOA0550-01

Analysis Performed: EDD + Level 4
Samples: IOA0550-01

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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IOA 0550

Del Mar Analytical Version 5 8/12/04 CHAIN OF CUSTODY FORM

Client Name/Address:

MWH-Pasadena
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101

Project Manager: Bronwyn Kelly
Rick Banaga
Sampler:
Ruben Barroso

Project:
Boeing-SSFL NPDES
Routine Outfall 002

Phone Number:
(626) 568-6691
Fax Number:
(626) 568-6515

ANALYSIS REQUIRED

Field readings:
Temp = 54.0 °F
pH= 6.95

Sample Description	Sample Matrix	Container Type	# of Cont.	Sampling Date/Time	Preservative	Bottle * #	Total Reoverable Metals: Cu, Pb, Hg,	Settleable Solids	VOCs 624 + xylenes	TCDD (and all congeners)	Oil & Grease (EPA 413.1)	Cyanide (total recoverable)	BOD5(20 degrees C)	Surfactants (MBAS)	Cl-, SO4, NO3+NO2-N, Perchlorate	Turbidity,TDS, TSS, Conductivity	Ammonia-N	Alpha BHC (608)	2,4,6 Trichlorophenol, 2,4 Dinitrotoluene, Bis(2-ethylhexyl)phthalate, NDMA, pentachlorophenol (EPA 625)		Comments
Outfall 002	W	Poly-1 liter	1	1-11-05 13:13	HNO3	1A	X														24 TAT
Outfall 002-Dup	W	Poly-1 liter	1		HNO3	1B	X														24 TAT
Outfall 002	W	Poly-1 liter	1		None	2		X													
Outfall 002	W	VOAs	3		HCl	3A, 3B, 3C			X												
Outfall 002	W	Glass-Amber	2		None	4A, 4B				X											
Outfall 002	W	1L Amber	2		HCl	5A, 5B					X										24 TAT
Outfall 002	W	Poly-500 ml	1		NaOH	6						X									24 TAT
Outfall 002	W	Poly-1 liter	1		None	7							X								
Outfall 002	W	Poly-500 ml	2		None	8A, 8B								X							
Outfall 002	W	Poly-500 ml	2		None	9A, 9B									X						
Outfall 002	W	Poly-500 ml	2		None	10A, 10B										X					
Outfall 002	W	Poly-500 ml	1		H2SO4	11											X				
Outfall 002	W	1L Amber	2		None	12A, 12B												X			
Outfall 002	W	1L Amber	2	1-11-05 13:13	None	13A, 13B													X		
Trip Blank	W	VOAs	3		HCl	14A, 14B, 14C			X												

Relinquished By	Date/Time:	Received By	Date/Time:
[signature]	1-11-05 13:13	[signature]	1-11-05 1435
[signature]	1-11-05 1850	[signature]	1/11/05 1352

Turn around Time: (check)
24 Hours _____ 5 Days _____
48 Hours _____ 10 Days _____
72 Hours _____ Normal ✓
Perchlorate Only 72 Hours_____
Metals Only 72 Hours_____
Sample Integrity: (Check)
Intact X On Ice: X 2°C

Del Mar Analytical

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2520 E. Sunset Rd. #3, Las Vegas, NV 89120 (702) 798-3620 FAX (702) 798-3621

February 25, 2005

MWH-Pasadena/Boeing
300 North Lake Avenue
Pasadena, Ca. 91101

Attention: Bronwyn Kelly

Project: Routine Outfall 002
Sampled: 01/11/05
Del Mar Analytical Number: IOA0550

Dear Ms. Kelly:

Pace Analytical performed Method 1613B analysis for the project referenced above. Please use the following cross-reference table when reviewing your results.

MWH ID	DEL MAR ID	Pace ID
Outfall 002	IOA0550-01	106130001

Attached is the original report from the subcontract laboratory. If you have any questions or require further assistance, please do not hesitate to contact me.

Sincerely yours,
DEL MAR ANALYTICAL

Michele Harper
Project Manager

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Pace Analytical™

Method 1613B Analysis Results

Client - Del Mar Analytical

Client's Sample ID	IOA0550-01		
Lab Sample ID	106130001		
Filename	F50129B_12		
Injected By	BAL		
Total Amount Extracted	1040 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	01/11/2005
ICAL Date	11/29/2004	Received	01/13/2005
CCal Filename(s)	F50129B_02	Extracted	01/28/2005
Method Blank ID	BLANK-6220	Analyzed	01/30/2005 04:48

Native Isomers	Conc pg/L	EMPC pg/L	LOD pg/L		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	0.63		2,3,7,8-TCDF-13C	2.00	60
Total TCDF	2.1	-----	0.63	J	2,3,7,8-TCDD-13C	2.00	75
					1,2,3,7,8-PeCDF-13C	2.00	67
2,3,7,8-TCDD	ND	-----	0.78		2,3,4,7,8-PeCDF-13C	2.00	69
Total TCDD	ND	-----	0.78		1,2,3,7,8-PeCDD-13C	2.00	83
					1,2,3,4,7,8-HxCDF-13C	2.00	68
1,2,3,7,8-PeCDF	ND	-----	1.20		1,2,3,6,7,8-HxCDF-13C	2.00	82
2,3,4,7,8-PeCDF	ND	-----	0.62		2,3,4,6,7,8-HxCDF-13C	2.00	74
Total PeCDF	ND	-----	0.90		1,2,3,7,8,9-HxCDF-13C	2.00	71
					1,2,3,4,7,8-HxCDD-13C	2.00	61
1,2,3,7,8-PeCDD	ND	-----	0.74		1,2,3,6,7,8-HxCDD-13C	2.00	88
Total PeCDD	ND	-----	0.74		1,2,3,4,6,7,8-HpCDF-13C	2.00	73
					1,2,3,4,7,8,9-HpCDF-13C	2.00	63
1,2,3,4,7,8-HxCDF	ND	-----	0.48		1,2,3,4,6,7,8-HpCDD-13C	2.00	81
1,2,3,6,7,8-HxCDF	ND	-----	0.61		OCDD-13C	4.00	70
2,3,4,6,7,8-HxCDF	ND	-----	0.55				
1,2,3,7,8,9-HxCDF	ND	-----	0.63		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	-----	0.57		1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	0.91		2,3,7,8-TCDD-37Cl4	0.20	72
1,2,3,6,7,8-HxCDD	ND	-----	0.57				
1,2,3,7,8,9-HxCDD	ND	-----	0.49				
Total HxCDD	1.5	-----	0.66	J			
1,2,3,4,6,7,8-HpCDF	-----	1.4	0.92	I			
1,2,3,4,7,8,9-HpCDF	ND	-----	1.00				
Total HpCDF	ND	-----	0.97				
1,2,3,4,6,7,8-HpCDD	8.0	-----	0.95	BJ			
Total HpCDD	16.0	-----	0.95	BJ			
OCDF	7.6	-----	1.50	BJ			
OCDD	71.0	-----	5.40	J			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection. Totals are averages of individual isomer LODs.
D = Result obtained from analysis of diluted sample
B = Less than 10 times higher than method blank level
P = Recovery outside of method 1613 control limits
J = Concentration detected is below the calibration range
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....106130

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Pace Analytical™

Method 1613B Blank Analysis Results

Client - Del Mar Analytical

Lab Sample ID	BLANK-6220	Matrix	Water
Filename	F50129B_06	Dilution	NA
Total Amount Extracted	1020 mL	Extracted	01/28/2005
ICAL Date	11/29/2004	Analyzed	01/29/2005 23:49
CCal Filename(s)	F50129B_02	Injected By	BAL

Native Isomers	Conc pg/L	EMPC pg/L	PRL pg/L		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	1.20		2,3,7,8-TCDF-13C	2.00	58
Total TCDF	ND	-----	-----		2,3,7,8-TCDD-13C	2.00	75
					1,2,3,7,8-PeCDF-13C	2.00	65
2,3,7,8-TCDD	ND	-----	1.20		2,3,4,7,8-PeCDF-13C	2.00	67
Total TCDD	ND	-----	-----		1,2,3,7,8-PeCDD-13C	2.00	80
					1,2,3,4,7,8-HxCDF-13C	2.00	70
1,2,3,7,8-PeCDF	ND	-----	1.50		1,2,3,6,7,8-HxCDF-13C	2.00	82
2,3,4,7,8-PeCDF	ND	-----	1.20		2,3,4,6,7,8-HxCDF-13C	2.00	77
Total PeCDF	ND	-----	-----		1,2,3,7,8,9-HxCDF-13C	2.00	72
					1,2,3,4,7,8-HxCDD-13C	2.00	66
1,2,3,7,8-PeCDD	ND	-----	1.60		1,2,3,6,7,8-HxCDD-13C	2.00	88
Total PeCDD	ND	-----	-----		1,2,3,4,6,7,8-HpCDF-13C	2.00	73
					1,2,3,4,7,8,9-HpCDF-13C	2.00	63
1,2,3,4,7,8-HxCDF	ND	-----	0.75		1,2,3,4,6,7,8-HpCDD-13C	2.00	80
1,2,3,6,7,8-HxCDF	ND	-----	0.86		OCDD-13C	4.00	68
2,3,4,6,7,8-HxCDF	ND	-----	1.10				
1,2,3,7,8,9-HxCDF	ND	-----	1.20		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	-----	-----		1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	1.10		2,3,7,8-TCDD-37Cl4	0.20	73
1,2,3,6,7,8-HxCDD	ND	-----	0.99				
1,2,3,7,8,9-HxCDD	ND	-----	1.00				
Total HxCDD	ND	-----	-----				
1,2,3,4,6,7,8-HpCDF	ND	-----	2.10				
1,2,3,4,7,8,9-HpCDF	ND	-----	1.90				
Total HpCDF	2.2	-----	-----	J			
1,2,3,4,6,7,8-HpCDD	2.4	-----	1.40	J			
Total HpCDD	2.4	-----	-----	J			
OCDF	5.2	-----	1.80	J			
OCDD	5.6	-----	2.90	J			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
PRL = Pace Analytical Reporting Limit
A = Limit of Detection based on signal to noise
P = Recovery outside of method 1613 control limits
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
J = Value below calibration range
* = See Discussion

Report No.....106124

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 1613B Laboratory Control Spike Results

Client - Del Mar Analytical

Lab Sample ID	LCS-6221		
Filename	F50129B_03	Matrix	Water
Total Amount Extracted	1040 mL	Dilution	NA
ICAL Date	11/29/2004	Extracted	01/28/2005
CCal Filename	F50129B_02	Analyzed	01/29/2005 21:22
Method Blank ID	BLANK-6220	Injected By	BAL

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDF	10	9.9	7.5	15.8	99
2,3,7,8-TCDD	10	8.6	6.7	15.8	86
1,2,3,7,8-PeCDF	50	50.5	40.0	67.0	101
2,3,4,7,8-PeCDF	50	48.2	34.0	80.0	96
1,2,3,7,8-PeCDD	50	43.3	35.0	71.0	87
1,2,3,4,7,8-HxCDF	50	45.6	36.0	67.0	91
1,2,3,6,7,8-HxCDF	50	48.7	42.0	65.0	97
2,3,4,6,7,8-HxCDF	50	49.1	35.0	78.0	98
1,2,3,7,8,9-HxCDF	50	46.5	39.0	65.0	93
1,2,3,4,7,8-HxCDD	50	49.9	35.0	82.0	100
1,2,3,6,7,8-HxCDD	50	51.3	38.0	67.0	103
1,2,3,7,8,9-HxCDD	50	50.1	32.0	81.0	100
1,2,3,4,6,7,8-HpCDF	50	50.3	41.0	61.0	101
1,2,3,4,7,8,9-HpCDF	50	53.3	39.0	69.0	107
1,2,3,4,6,7,8-HpCDD	50	45.4	35.0	70.0	91
OCDF	100	95.6	63.0	170.0	96
OCDD	100	97.1	78.0	144.0	97
2,3,7,8-TCDD-37Cl4	10	6.9	3.1	19.1	69
2,3,7,8-TCDF-13C	100	51.5	22.0	152.0	52
2,3,7,8-TCDD-13C	100	67.8	20.0	175.0	68
1,2,3,7,8-PeCDF-13C	100	61.4	21.0	192.0	61
2,3,4,7,8-PeCDF-13C	100	65.9	13.0	328.0	66
1,2,3,7,8-PeCDD-13C	100	77.8	21.0	227.0	78
1,2,3,4,7,8-HxCDF-13C	100	70.2	19.0	202.0	70
1,2,3,6,7,8-HxCDF-13C	100	78.0	21.0	159.0	78
2,3,4,6,7,8-HxCDF-13C	100	74.1	22.0	176.0	74
1,2,3,7,8,9-HxCDF-13C	100	70.4	17.0	205.0	70
1,2,3,4,7,8-HxCDD-13C	100	69.0	21.0	193.0	69
1,2,3,6,7,8-HxCDD-13C	100	82.8	25.0	163.0	83
1,2,3,4,6,7,8-HpCDF-13C	100	72.1	21.0	158.0	72
1,2,3,4,7,8,9-HpCDF-13C	100	62.4	20.0	186.0	62
1,2,3,4,6,7,8-HpCDD-13C	100	80.1	26.0	166.0	80
OCDD-13C	200	135.6	26.0	397.0	68

Cs = Concentration Spiked (ng/mL)
Cr = Concentration Recovered (ng/mL)
Rec. = Recovery (Expressed as Percent)
Control Limit Reference: Method 1613, Table 6, 10/94 Revision
X = Background subtracted value
P = Recovery outside of control limits
Nn = Value obtained from additional analysis
* = See Discussion

Report No.....106124

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Pace Analytical™

Method 1613B Laboratory Control Spike Results

Client - Del Mar Analytical

Lab Sample ID	LCSD-6222		
Filename	F50129B_04	Matrix	Water
Total Amount Extracted	1040 mL	Dilution	NA
ICAL Date	11/29/2004	Extracted	01/28/2005
CCal Filename	F50129B_02	Analyzed	01/29/2005 22:09
Method Blank ID	BLANK-6220	Injected By	BAL

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDF	10	10.6	7.5	15.8	106
2,3,7,8-TCDD	10	9.4	6.7	15.8	94
1,2,3,7,8-PeCDF	50	53.2	40.0	67.0	106
2,3,4,7,8-PeCDF	50	50.7	34.0	80.0	101
1,2,3,7,8-PeCDD	50	46.0	35.0	71.0	92
1,2,3,4,7,8-HxCDF	50	47.6	36.0	67.0	95
1,2,3,6,7,8-HxCDF	50	50.9	42.0	65.0	102
2,3,4,6,7,8-HxCDF	50	50.9	35.0	78.0	102
1,2,3,7,8,9-HxCDF	50	49.0	39.0	65.0	98
1,2,3,4,7,8-HxCDD	50	52.4	35.0	82.0	105
1,2,3,6,7,8-HxCDD	50	54.2	38.0	67.0	108
1,2,3,7,8,9-HxCDD	50	52.5	32.0	81.0	105
1,2,3,4,6,7,8-HpCDF	50	55.0	41.0	61.0	110
1,2,3,4,7,8,9-HpCDF	50	55.7	39.0	69.0	111
1,2,3,4,6,7,8-HpCDD	50	48.0	35.0	70.0	96
OCDF	100	100.6	63.0	170.0	101
OCDD	100	101.9	78.0	144.0	102
2,3,7,8-TCDD-37Cl4	10	8.7	3.1	19.1	87
2,3,7,8-TCDF-13C	100	70.4	22.0	152.0	70
2,3,7,8-TCDD-13C	100	88.6	20.0	175.0	89
1,2,3,7,8-PeCDF-13C	100	73.6	21.0	192.0	74
2,3,4,7,8-PeCDF-13C	100	79.0	13.0	328.0	79
1,2,3,7,8-PeCDD-13C	100	95.5	21.0	227.0	96
1,2,3,4,7,8-HxCDF-13C	100	84.8	19.0	202.0	85
1,2,3,6,7,8-HxCDF-13C	100	89.5	21.0	159.0	90
2,3,4,6,7,8-HxCDF-13C	100	87.2	22.0	176.0	87
1,2,3,7,8,9-HxCDF-13C	100	82.1	17.0	205.0	82
1,2,3,4,7,8-HxCDD-13C	100	80.1	21.0	193.0	80
1,2,3,6,7,8-HxCDD-13C	100	97.0	25.0	163.0	97
1,2,3,4,6,7,8-HpCDF-13C	100	84.4	21.0	158.0	84
1,2,3,4,7,8,9-HpCDF-13C	100	71.7	20.0	186.0	72
1,2,3,4,6,7,8-HpCDD-13C	100	92.4	26.0	166.0	92
OCDD-13C	200	159.2	26.0	397.0	80

Cs = Concentration Spiked (ng/mL)
Cr = Concentration Recovered (ng/mL)
Rec. = Recovery (Expressed as Percent)
Control Limit Reference: Method 1613, Table 6, 10/94 Revision
X = Background subtracted value
P = Recovery outside of control limits
Nn = Value obtained from additional analysis
* = See Discussion

Report No.....106124

REPORT OF LABORATORY ANALYSIS

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SPIKE RECOVERY RELATIVE PERCENT DIFFERENCE (RPD) RESULTS

Client..... Del Mar Analytical

SPIKE 1 ID..... LCS-6221
SPIKE 1 Filename..... F50129B_03
SPIKE 2 ID..... LCSD-6222
SPIKE 2 Filename..... F50129B_04

COMPOUND	SPIKE 1 REC,%	SPIKE 2 REC,%	RPD,%
2378-TCDF	99	106	6.8
2378-TCDD	86	94	8.9
12378-PeCDF	101	106	4.8
23478-PeCDF	96	101	5.1
12378-PeCDD	87	92	5.6
123478-HxCDF	91	95	4.3
123678-HxCDF	97	102	5.0
234678-HxCDF	98	102	4.0
123789-HxCDF	93	98	5.2
123478-HxCDD	100	105	4.9
123678-HxCDD	103	108	4.7
123789-HxCDD	100	105	4.9
1234678-HpCDF	101	110	8.5
1234789-HpCDF	107	111	3.7
1234678-HpCDD	91	96	5.3
OCDF	96	101	5.1
OCDD	97	102	5.0

REC = Percent Recovered
RPD = The difference between the two values divided by the average.
NA = Not Applicable

Report No..... 106124, 106125, 106126
106127, 106128, 106130
106131, 106132, 106135

REPORT OF LABORATORY ANALYSIS

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TABLE 1. 2,3,7,8-TCDD Equivalency Factors (TEFs) for the Polychlorinated Dibenzo-p-dioxins and Dibenzofurans

Number	Compound(s)	TEF
1	2,3,7,8-TCDD	1.00
2	1,2,3,7,8-PeCDD	0.50
3	1,2,3,6,7,8-HxCDD	0.1
4	1,2,3,7,8,9-HxCDD	0.1
5	1,2,3,4,7,8-HxCDD	0.1
6	1,2,3,4,6,7,8-HpCDD	0.01
7	OCDD	0.001
8	* Total - TCDD	0.0
9	* Total - PeCDD	0.0
10	* Total - HxCDD	0.0
11	* Total - HpCDD	0.0
12	2,3,7,8-TCDF	0.10
13	1,2,3,7,8-PeCDF	0.05
14	2,3,4,7,8-PeCDF	0.5
15	1,2,3,6,7,8-HxCDF	0.1
16	1,2,3,7,8,9-HxCDF	0.1
17	1,2,3,4,7,8-HxCDF	0.1
18	2,3,4,6,7,8-HxCDF	0.1
19	1,2,3,4,6,7,8-HpCDF	0.01
20	1,2,3,4,7,8,9-HpCDF	0.01
21	OCDF	0.001
22	* Total - TCDF	0.0
23	* Total - PeCDF	0.0
24	* Total - HxCDF	0.0
25	* Total - HpCDF	0.0

*Excluding the 2,3,7,8-substituted congeners.

Reference: 1989 ITEFs

REPORT OF LABORATORY ANALYSIS

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Del Mar Analytical

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1014 E. Cooley Dr., Suite A, Colton, CA 92324 Ph (909) 370-4667 Fax (909) 370-1046
9484 Chesapeake Drive, Suite 805, San Diego, CA 92123 Ph (619) 505-9596 Fax (619) 505-9689
9830 South 51st Street, Suite B-120, Phoenix, AZ 85044 Ph (480) 785-0043 Fax (480) 785-0851
2520 E. Sunset Rd., Suite #3, Las Vegas, NV 89120 Ph (702) 798-3620 Fax (702) 798-3621

SUBCONTRACT ORDER - PROJECT # IOA0550

106130

SENDING LABORATORY:

Del Mar Analytical, Irvine
17461 Derian Avenue. Suite 100
Irvine, CA 92614
Phone: (949) 261-1022
Fax: (949) 261-1228
Project Manager: Michele Harper

RECEIVING LABORATORY:

Pace Analytical, MN- SUB
1700 Elm Street, Ste 200
Minneapolis, MN 55414
Phone :(612) 607-1700
Fax: (612) 607-6444

Standard TAT is requested unless specific due date is requested => Due Date:_____ **Initials:**_____

Analysis	Expiration	Comments
Sample ID: IOA0550-01 Water	**Sampled: 01/11/05 13:13**	**Instant Nofication**
1613-Dioxin-HR	01/18/05 13:13	J flags, 17 congeners, no TEQ, sub to Pace-MN
EDD + Level 4	02/08/05 13:13	Excel EDD email to pm,Include Std logs for Lvl IV

106130001

Containers Supplied:
1 L Amber (IOA0550-01G)
1 L Amber (IOA0550-01H)

SAMPLE INTEGRITY:

All containers intact: ☐ Yes ☐ No
Custody Seals Present: ☐ Yes ☐ No
Sample labels/COC agree: ☐ Yes ☐ No
Samples Preserved Properly: ☐ Yes ☐ No
Samples Received On Ice:: ☒ Yes ☐ No
Samples Received at (temp): 2.3°C

Released By	Date	Time	Received By	Date	Time
	1/12/05			1/13/05	9.45

CONTRACT COMPLIANCE SCREENING FORM FOR HARDCOPY DATA

AMEC Earth & Environmental
550 South Wadsworth Boulevard
Suite 500
Lakewood, CO 80226

Package ID T711DF24
Task Order 313150010
SDG No. Multiple
No. of Analyses 7

Laboratory Pace
Reviewer K. Shadowlight
Analysis/Method Dioxins

Date: February 18, 2005
Reviewer's Signature K Shadowlight

ACTION ITEMS[a]	
1. **Case Narrative Deficiencies**	
2. **Out of Scope Analyses**	
3. **Analyses Not Conducted**	
4. **Missing Hardcopy Deliverables**	
5. **Incorrect Hardcopy Deliverables**	
6. **Deviations from Analysis Protocol, e.g.,**	Qualifications were assigned for the following:
Holding Times	* Method blank contamination
GC/MS Tune/Inst. Performance	* EMPCs
Calibration	* Detects below the lower method calibration level
Method blanks	
Surrogates	
Matrix Spike/Dup LCS	
Field QC	
Internal Standard Performance	
Compound Identification and Quantitation	
System Performance	
COMMENTS[b]	

[a] Subcontracted analytical laboratory is not meeting contract and/or method requirements.
[b] Differences in protocol have been adopted by the laboratory but no action against the laboratory is required.

DATA VALIDATION REPORT

NPDES
Monitoring

ANALYSIS: DIOXINS/FURANS

SAMPLE DELIVERY GROUPS: Multiple SDGs

Prepared by

AMEC—Denver Operations
550 South Wadsworth Boulevard, Suite 500
Lakewood, Colorado 80226

1. INTRODUCTION

Task Order Title:	NPDES Monitoring
Contract Task Order #:	313150010
Sample Delivery Group #:	Multiple
Project Manager:	B. McIlvaine
Matrix:	Water
Analysis:	Dioxins/Furans
QC Level:	Level IV
No. of Samples:	7
No. of Reanalyses/Dilutions:	0
Reviewer:	K. Shadowlight
Date of Review:	February 21, 2005

The samples listed in Table 1 were validated based on the guidelines outlined in the *AMEC Data Validation Procedure for Dioxins and Furans (DVP-19, Rev. 1), EPA Method 1613, and the National National Functional Guidelines For Chlorinated Dioxin/Furan Data Review* (8/02). Any deviations from these procedures and guidelines are documented herein. Qualifiers were applied in cases where the data did not meet the required QC criteria or where special consideration by the data user is required. Data qualifiers were placed on Form Is with the associated qualification codes. Analytes that were rejected for any reason are denoted on the Form I as having only the "R" data qualifier and associated qualification code(s) denoting the reason for rejection. Any additional problems with the data that may have resulted in an estimated value were not denoted by a qualification code since the data had already been rejected.

Table 1. Sample Identification

Client ID	Laboratory ID (Del Mar)	Laboratory ID (Pace)	Matrix	COC Method
Outfall 001	IOA0997-01	106475001	water	1613
Outfall 001	IOA1551-01	106840001	water	1613
Outfall 002	IOA0999-01	106478001	water	1613
Outfall 002	IOA1553-01	106871001	water	1613
Outfall 003	IOA1556-01	106869001	water	1613
Outfall 008	IOA1555-01	10687001	water	1613
Outfall 009	IOA1554-01	106842001	water	1613

2. DATA VALIDATION FINDINGS

2.1 SAMPLE MANAGEMENT

Following are findings associated with sample management:

2.1.1 Sample Preservation, Handling, and Transport

The samples in these SDGs were received at Del Mar Analytical within the temperature limits of 4°C ±2°C. The samples were subcontracted to Pace Analytical for the dioxin/furan analyses. The samples in these SDGs were received at Pace Analytical Services below the temperature limits of 4°C ± 2°C, at 1.8°C; however, as the samples were not noted to have been frozen or damaged, no qualifications were required. No qualifications were required.

2.1.2 Chain of Custody

The COCs and transfer COCs were signed by the appropriate field and laboratory personnel. The samples and analyses were accounted for on both the original COCs and transfer COCs. As the samples were couriered directly to the laboratory (Del Mar Analytical), custody seals were not required. There was no information regarding custody seals upon receipt at Pace. No qualifications were required.

2.1.3 Holding Times

The samples were extracted and analyzed within a year of collection. No qualifications were required.

2.2 INSTRUMENT PERFORMANCE

Following are findings associated with instrument performance:

2.2.1 GC Column Performance

A column performance standard was combined with the daily calibration verification and analyzed at the beginning of each analytical sequence. The GC column performance was acceptable with the chromatographic separation of 2,3,7,8-TCDD and other TCDD isomers resolved with a valley of ≤25%. No qualifications were required.

2.2.2 Mass Spectrometer Performance

The mass spectrometer performance could not be evaluated as the laboratory did not provide selected ion current profiles for the lock-mass ions. No qualifications were required.

2.3 CALIBRATION

2.3.1 Initial Calibration

There were two initial calibrations, analyzed 11/29/04 on instrument 10MSHR05 and 01/26/05 on instrument 10MSHR06. The calibrations consisted of five concentration level standards (CS1 through CS5) analyzed to verify instrument linearity. The initial calibrations were acceptable with %RSDs ≤20% for the 15 native compounds (calibration by isotope dilution) and ≤35% for the 2 native and all labeled compounds (calibration by internal standard). The relative retention times and ion abundance ratios were within the QC limits listed in Method 1613 for all standards. A representative number of %RSDs were verified from the raw data, and no calculation or transcription errors were noted. No qualifications were required.

2.3.2 Continuing Calibration

Calibration verification (VER) consisted of a mid-level standard (CS3) analyzed at the beginning of each analytical sequence. The VER was acceptable with the concentrations within the acceptance criteria listed in the Table 6 of the EPA Method 1613. The ion abundance ratios and relative retention times were within the method QC limits. A representative number of %Ds were verified from the raw data, and no calculation or transcription errors were noted. No qualifications were required.

2.4 BLANKS

One method blank (Blank-6241) was extracted and analyzed with the samples in these SDGs. Target compounds 1,2,3,6,7,8-HxCDF, total HxCDF, total HpCDF, 1,2,3,4,6,7,8-HpCDD, total HpCDD, and OCDF were reported in the method blank. Any detects for the aforementioned target compounds reported at concentrations <5× the concentrations reported in the method blank were qualified as estimated nondetects "UJ," at the levels of interference in the samples of these SDGs. The detect for total TCDF was qualified as estimated, "J," in sample Outfall 002 (IOA0999-01), as a portion of the total concentration was attributed to method blank contamination. Target compounds 1,2,3,4,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, and OCDD were reported as EMPCs in the method blank. A review of the method blank raw data and chromatograms indicated no false negatives or false positives. No further qualifications were required.

2.5 BLANK SPIKES AND LABORATORY CONTROL SAMPLES

One LCS/LCSD pair (LCS-6242/LCSD-6243) was extracted and analyzed with the samples in these SDGs. All recoveries were within the acceptance criteria listed in Table 6 of the Method 1613. There are no method QC limits established for RPDs. The reported RPDs were within ±20%. No qualifications were required.

2.6 MATRIX SPIKE/MATRIX SPIKE DUPLICATE

MS/MSD analyses were not performed in these SDGs. Evaluation of method accuracy and precision was based on the LCS/LCSD results. No qualifications were required.

2.7 FIELD QC SAMPLES

Following are findings associated with field QC:

2.7.1 Field Blanks and Equipment Rinsates

The samples in these SDGs had no associated field QC samples. No qualifications were required.

2.7.2 Field Duplicates

No field duplicate samples were identified for these SDGs.

2.8 INTERNAL STANDARDS

The labeled standard recoveries were within the acceptance criteria listed in Table 7 of Method 1613. No qualifications were required.

2.9 COMPOUND IDENTIFICATION

The laboratory analyzed for polychlorinated dioxins/furans by EPA Method 1613. The compound identifications were verified from the raw data and no false negatives or positives were noted. No qualifications were required.

2.10 COMPOUND QUANTIFICATION AND REPORTED DETECTION LIMITS

Compound quantitation was verified from the raw data. The laboratory calculated and reported compound-specific detection limits. Any detects below the lower method calibration limit (MCL) were qualified as estimated, "J." Any reported EMPC was qualified as an estimated nondetect, "UJ." No further qualifications were required.

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 1613B Analysis Results

Client - Del Mar Analytical

Client's Sample ID	IOA0999-01		
Lab Sample ID	106478001		
Filename	U50203A_08		
Injected By	SMT		
Total Amount Extracted	1030 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	01/18/2005
ICAL Date	01/26/2005	Received	01/20/2005
CCal Filename(s)	U50202B_12	Extracted	01/31/2005
Method Blank ID	BLANK-6241	Analyzed	02/03/2005 11:34

Native Isomers	Conc pg/L	EMPC pg/L	LOD pg/L		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	0.60		2,3,7,8-TCDF-13C	2.00	86
Total TCDF	1.60	-----	0.60	BJ	2,3,7,8-TCDD-13C	2.00	84
					1,2,3,7,8-PeCDF-13C	2.00	90
2,3,7,8-TCDD	ND	-----	0.82		2,3,4,7,8-PeCDF-13C	2.00	96
Total TCDD	ND	-----	0.82		1,2,3,7,8-PeCDD-13C	2.00	107
					1,2,3,4,7,8-HxCDF-13C	2.00	80
1,2,3,7,8-PeCDF	ND	-----	0.30		1,2,3,6,7,8-HxCDF-13C	2.00	81
2,3,4,7,8-PeCDF	0.53	-----	0.25	J	2,3,4,6,7,8-HxCDF-13C	2.00	81
Total PeCDF	0.53	-----	0.27	J	1,2,3,7,8,9-HxCDF-13C	2.00	87
					1,2,3,4,7,8-HxCDD-13C	2.00	80
1,2,3,7,8-PeCDD	ND	-----	0.87		1,2,3,6,7,8-HxCDD-13C	2.00	74
Total PeCDD	ND	-----	0.87		1,2,3,4,6,7,8-HpCDF-13C	2.00	79
					1,2,3,4,7,8,9-HpCDF-13C	2.00	73
1,2,3,4,7,8-HxCDF	-----	0.95	0.18	I	1,2,3,4,6,7,8-HpCDD-13C	2.00	80
1,2,3,6,7,8-HxCDF	0.66	-----	0.29	J	OCDD-13C	4.00	83
2,3,4,6,7,8-HxCDF	-----	0.43	0.27	I			
1,2,3,7,8,9-HxCDF	0.45	-----	0.30	J	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	2.00	-----	0.26	BJ	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	0.50		2,3,7,8-TCDD-37Cl4	0.20	78
1,2,3,6,7,8-HxCDD	ND	-----	0.42				
1,2,3,7,8,9-HxCDD	ND	-----	0.40				
Total HxCDD	ND	-----	0.44				
1,2,3,4,6,7,8-HpCDF	-----	1.20	0.60	I			
1,2,3,4,7,8,9-HpCDF	ND	-----	0.64				
Total HpCDF	4.50	-----	0.62	BJ			
1,2,3,4,6,7,8-HpCDD	2.40	-----	0.29	J			
Total HpCDD	3.80	-----	0.29	J			
OCDF	6.90	-----	0.98	BJ			
OCDD	9.20	-----	0.36	J			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection. Totals are averages of individual isomer LODs.
D = Result obtained from analysis of diluted sample
B = Less than 10 times higher than method blank level
P = Recovery outside of method 1613 control limits
J = Concentration detected is below the calibration range
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....106478

REPORT OF LABORATORY ANALYSIS

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AMEC VALIDATED LEVEL IV

CONTRACT COMPLIANCE SCREENING FORM FOR HARDCOPY DATA

AMEC Earth & Environmental
550 South Wadsworth Boulevard
Suite 500
Lakewood, CO 80226

Laboratory Del Mar
Reviewer P. Meeks
Analysis/Method Metals

Package ID T711MT26
Task Order 313150010
SDG No. IOA0999
No. of Analyses 1

Date: 02/09/05
Reviewer's Signature P. Meeks

ACTION ITEMS[a]	
1. **Case Narrative Deficiencies**	
2. **Out of Scope Analyses**	
3. **Analyses Not Conducted**	
4. **Missing Hardcopy Deliverables**	
5. **Incorrect Hardcopy Deliverables**	
6. **Deviations from Analysis Protocol, e.g.,**	Mercury was rejected in the reanalysis in favor of the original result.
Holding Times	
GC/MS Tune/Inst. Performance	
Calibrations	
Blanks	
Surrogates	
Matrix Spike/Dup LCS	
Field QC	
Internal Standard Performance	
Compound Identification and Quantitation	
System Performance	

COMMENTS[b]	

[a] Subcontracted analytical laboratory is not meeting contract and/or method requirements.
[b] Differences in protocol have been adopted by the laboratory but no action against the laboratory is required.

DATA VALIDATION REPORT

NPDES
Monitoring

ANALYSIS: METALS

SAMPLE DELIVERY GROUP: IOA0999

Prepared by

AMEC—Denver Operations
550 South Wadsworth Boulevard, Suite 500
Lakewood, Colorado 80226

1. INTRODUCTION

Task Order Title:	NPDES Monitoring
Contract Task Order #:	313150010
SDG#:	IOA0999
Project Manager:	B. McIlvaine
Matrix:	Water
Analysis:	Metals
QC Level:	Level IV
No. of Samples:	1
No. of Reanalyses/Dilutions:	1
Reviewer:	P. Meeks
Date of Review:	February 9, 2005

The samples listed in Table 1 were validated based on the guidelines outlined in the *AMEC Data Validation Procedure for Levels III and IV ICP-MS Metals, (DVP-5-A, Rev.0), AMEC Data Validation Procedure for Levels III and IV ICP Metals* (DVP-5, Rev. 0), SW-846 *Method 6020B for Inductively Coupled Plasma – Mass Spectrometry*, SW-846 *Method 7471A for Mercury (Manual Cold-Vapor Technique)*, and validation guidelines outlined in the USEPA CLP *National Functional Guidelines for Inorganic Data Review* (2/94). Any deviations from these procedures and guidelines are documented herein. Qualifiers were applied in cases where the data did not meet the required QC criteria or where special consideration by the data user is required. Data qualifiers were placed on Form Is with the associated qualification codes. Analytes that were rejected for any reason are denoted on the Form I as having only the "R" data qualifier and associated qualification code(s) denoting the reason for rejection. Any additional problems with the data that may have resulted in an estimated value were not denoted by a qualification code since the data had already been rejected.

Table 1. Sample identification

Client ID	EPA ID	Laboratory ID	Matrix	COC Method
Outfall 002	Outfall 002	IOA0999-01	water	ILM04
Outfall 002 RE1	Outfall 002 RE1	IOA0999-01RE1	water	ILM04

2. DATA VALIDATION FINDINGS

2.1 SAMPLE MANAGEMENT

Following are findings associated with sample management:

2.1.1 Sample Preservation, Handling, and Transport

The sample in this SDG was received at the laboratory within the temperature limits of 4°C ±2°C. No sample preservation, handling, or transport problems were noted, and no qualifications were necessary.

2.1.2 Chain of Custody

The COC was signed and dated by field and laboratory personnel. Mercury in Outfall 002 was reanalyzed and reported as Outfall 002. To differentiate between the original analysis and the reanalysis, the reviewer appended the ID of the reanalysis with an "RE1" suffix. No sample qualifications were required.

2.1.3 Holding Times

The date of collection recorded on the COC and the dates of analysis recorded in the raw data, documented that the sample analysis was performed within the specified holding times of 28 days for mercury. No qualifications were assigned.

2.2 ICP-MS TUNING

The ICP-MS tuning is not applicable to the mercury analysis.

2.3 CALIBRATION

The ICV and CCV results showed acceptable recoveries, 80-120% for mercury. The mercury reporting limit check standard was recovered within the AMEC control limits of 70-130%. No qualifications were required.

2.4 BLANKS

The calibration and method blanks associated with the samples in this SDG were nondetected for mercury at the laboratory MDL; therefore, no sample qualifications were required due to the blanks.

2.5 ICP INTERFERENCE CHECK SAMPLE (ICS A/AB)

ICP interference check samples are not applicable to the mercury analysis.

2.6 BLANK SPIKES AND LABORATORY CONTROL SAMPLES

The mercury LCS samples were identified as 5A20051-BS1 and 5A21065-BS1. The LCS results on the summary form and in the raw data were within the laboratory-established mercury control limits of 85-115%. No qualifications were required.

2.7 LABORATORY DUPLICATES

No MS/MSD or duplicate analyses were performed in association with the sample in this SDG; therefore, no assessment was made with respect to this criterion.

2.8 MATRIX SPIKE

No MS/MSD analyses were performed in association with the sample in this SDG; therefore, no assessment was made with respect to this criterion.

2.9 FURNACE ATOMIC ABSORPTION QC

Furnace atomic absorption was not utilized for the analysis of the sample; therefore, furnace atomic absorption QC is not applicable.

2.10 ICP/MS SERIAL DILUTION

No serial dilution analysis was performed in association with the sample in this data package; therefore, no assessment was made with respect to this criterion.

2.11 INTERNAL STANDARDS PERFORMANCE

The ICP-MS internal standard recoveries are not applicable to the mercury analysis.

2.12 SAMPLE RESULT VERIFICATION

A Level IV review was performed for the samples in these data packages. Calculations were verified, and the sample results reported on the Form Is were verified against the raw data. No transcription errors or calculation errors were noted. Outfall 002 was reanalyzed for mercury and reported as Outfall 002 RE1.

As the original and reanalysis results were similar, the reanalysis, Outfall 002 RE1, was rejected, "R," in favor of the original result, Outfall 002. No further qualifications were required.

2.13 FIELD QC SAMPLES

Field QC samples are evaluated, and if necessary, qualified based only on laboratory blanks. Any remaining detects are used to evaluate the associated samples.

2.13.1 Field Blanks and Equipment Rinsates

The sample in this SDG had no associated field QC samples. No qualifications were required.

2.13.2 Field Duplicates

There were no field duplicate analyses performed in association with the site sample reported in this data package.

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 002
Report Number: IOA0999

Sampled: 01/18/05
Received: 01/19/05

DRAFT: METALS

Analyte	Method	Batch	MDL	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers: Rev Qual	Data Qualifiers: Qual Code
Sample ID: IOA0999-01 (DRAFT: Outfall 002 - Water)										
Reporting Units: ug/l										
Mercury	EPA 245.1	5A20051	0.063	0.20	**0.23**	1	01/20/05	01/20/05		
Sample ID: IOA0999-01RE1 (DRAFT: ~~Outfall 002~~ - Water)										
Reporting Units: ug/l	Outfall 002 RE1									
Mercury	EPA 245.1	5A21065	0.063	0.20	**0.21**	1	01/21/05	01/21/05	R	D

pm 2/9/05

AMEC VALIDATED

LEVEL IV

DRAFT REPORT
DRAFT REPORT
DATA SUBJECT TO CHANGE

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CONTRACT COMPLIANCE SCREENING FORM FOR HARDCOPY DATA

AMEC Earth & Environmental
550 South Wadsworth Boulevard
Suite 500
Lakewood, CO 80226

Laboratory Del Mar
Reviewer M. Pokorny
Analysis/Method Volatiles

Package ID T711VO42
Task Order 313150010
SDG No. IOA0999
No. of Analyses 2

Date: February 9, 2005
Reviewer's Signature M. Pokorny

ACTION ITEMS[a]	
1. **Case Narrative Deficiencies**	
2. **Out of Scope Analyses**	
3. **Analyses Not Conducted**	
4. **Missing Hardcopy Deliverables**	
5. **Incorrect Hardcopy Deliverables**	
6. **Deviations from Analysis Protocol, e.g.,**	
Holding Times	
GC/MS Tune/Inst. Perform	
Calibrations	
Blanks	
Surrogates	
Matrix Spike/Dup LCS	
Field QC	
Internal Standard Performance	
Compound Identification and Quantitation	
System Performance	
COMMENTS[b]	Acceptable as reviewed.

[a] Subcontracted analytical laboratory is not meeting contract and/or method requirements.
[b] Differences in protocol have been adopted by the laboratory but no action against the laboratory is required.



DATA VALIDATION REPORT

NPDES Monitoring

ANALYSIS: VOLATILES

SAMPLE DELIVERY GROUP: IOA0999

Prepared by

AMEC Denver Operations
550 South Wadsworth Boulevard, Suite 500
Lakewood, Colorado 80226

1. INTRODUCTION

Task Order Title:	NPDES Monitoring
Contract Task Order #:	313150010
SDG#:	IOA0999
Project Manager:	B. McIlvaine
Matrix:	Water
Analysis:	Volatiles
QC Level:	Level IV
No. of Samples:	2
No. of Reanalyses/Dilutions:	0
Reviewer:	M. Pokorny
Date of Review:	February 9, 2005

The samples listed in Table 1 were validated based on the guidelines outlined in the *AMEC Data Validation Procedure for Levels C and D Volatile Organics (DVP-2, Rev. 2), EPA Method 624,* and the *National Functional Guidelines For Organic Data Review* (2/94). Any deviations from these procedures are documented herein. Qualifiers were applied in cases where the data did not meet the required QC criteria or where special consideration by the data user is required. Data qualifiers were placed on Form Is with the associated qualification codes. Analytes that were rejected for any reason are denoted on the summary forms as having only the "R" data qualifier and associated qualification code(s) denoting the reason for rejection. Any additional problems with the data that may have resulted in an estimated value were not denoted by a qualification code since the data had already been rejected.

Table 1. Sample identification

Client ID	EPA ID	Lab No.	Matrix	Method
Outfall 002	Outfall 002	IOA0999-01	water	624
Trip Blank	Trip Blank	IOA0999-02	water	624

2. DATA VALIDATION FINDINGS

2.1 SAMPLE MANAGEMENT

The following are findings associated with sample management:

2.1.1 Sample Preservation, Handling, and Transport

The samples in this SDG were received at the laboratory within the temperature limits of 4°C ± 2°C. According to the COC, the samples were received intact, without headspace, and in good condition. No qualifications were required.

2.1.2 Chain of Custody

The COC was signed by field and laboratory personnel and accounted for the analyses presented in this SDG. As the samples were couriered to the laboratory, custody seals are not required. No qualifications were required.

2.1.3 Holding Times

The samples were analyzed within 14 days of collection. No qualifications were required.

2.2 GC/MS TUNING

The ion abundance windows shown on the quantitation report were consistent with those specified in the EPA Method 624. All ion abundances were within the established windows and were therefore acceptable. The samples and associated QC were analyzed within 12 hours of the BFB injection times. The Form Vs were verified from the raw data and no discrepancies between the summary forms and the raw data were noted. No qualifications were required.

2.3 CALIBRATION

One initial calibration, dated 11/16/04, was associated with this SDG. The average RRFs were ≥0.05 and the %RSDs were ≤35% for the target compounds listed on the sample summary forms. One continuing calibration, dated 01/23/05, was associated with this SDG. The RRFs for all target compounds were ≥0.05 and the %Ds were ≤20%. A representative number of %RSDs and average RRFs from the initial calibration, and %Ds and RRFs from the continuing calibration were recalculated from the raw data, and no calculation or transcription errors were found. No qualifications were required.

2.4 BLANKS

One water method blank (5A23003-BLK1) was associated with this SDG. There were no detects for the target compounds listed on the summary form. The method blank raw data showed no evidence of false negatives. No qualifications were required.

2.5 BLANK SPIKES AND LABORATORY CONTROL SAMPLES

One water blank spike (5A23003-BS1) was associated with this SDG. All spike recoveries were within the laboratory-established QC limits. A representative number of recoveries were recalculated from the raw data and no calculation or transcription errors were found. No qualifications were required.

2.6 SURROGATE RECOVERY

The surrogates were within the QC limits of 80-120%. A representative number of surrogate recoveries were recalculated from the raw data and no calculation or transcription errors were found. No qualifications were required.

2.7 MATRIX SPIKE/MATRIX SPIKE DUPLICATE

An MS/MSD analyses was not performed with this SDG. Evaluation of method accuracy was based on the LCS results. No qualifications were required.

2.8 FIELD QC SAMPLES

Field QC samples were evaluated, and if necessary, qualified based on method blanks and other laboratory QC results affecting the usability of the field QC data. Any remaining detects were used to evaluate the associated site sample. Following are findings associated with field QC samples:

2.8.1 Trip Blanks

Sample Trip Blank (IOA0999-02) was the trip blank associated with the site sample of this SDG. There were no target compounds detected in the trip blank. No qualifications were required.

2.8.2 Field Blanks and Equipment Rinsates

There were no other field QC samples associated with this SDG. No qualifications were required.

2.8.3 Field Duplicates

There were no field duplicate samples associated with this SDG.

2.9 INTERNAL STANDARDS PERFORMANCE

Internal standard area counts and retention times for this SDG were within the control limits established by the continuing calibration standards, of +100%/-50% for internal standard areas and ±0.50 minutes for retention times. A representative number of internal standard areas and retention times were verified from the raw data, and no calculation or transcription errors were noted. No qualifications were required.

2.10 COMPOUND IDENTIFICATION

Target compound identification was verified at a Level IV data validation. The laboratory analyzed for a subset of volatile target compounds by EPA Method 624. Chromatograms, retention times, and spectra for the samples and QC were examined and no target compound identification problems were noted. No qualifications were required.

2.11 COMPOUND QUANTIFICATION AND REPORTED DETECTION LIMITS

Compound quantification is verified at a Level IV data validation. The reporting limits were supported by the lowest concentrations of the initial calibration standards and by MDL study. Compound quantitation was verified by recalculating any sample detect, and/or a representative number of blank spike and surrogate recoveries from the raw data. No calculation or transcription errors were noted. No qualifications were required.

2.12 TENTATIVELY IDENTIFIED COMPOUNDS

The laboratory did not provide TICs for this SDG. No qualifications were required.

2.13 SYSTEM PERFORMANCE

A review of the chromatograms and other raw data showed no identifiable problems with system performance. No qualifications were required.

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 002
Report Number: IOA0999

Sampled: 01/18/05
Received: 01/19/05

DRAFT: PURGEABLES BY GC/MS (EPA 624)

Analyte	Method	Batch	MDL	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers REV QUAL	Data Qualifiers QUAL CODE
Sample ID: IOA0999-01 (DRAFT: Outfall 002 - Water)										
Reporting Units: ug/l										
Benzene	EPA 624	5A23003	0.28	2.0	ND	1	01/23/05	01/23/05	U	
Carbon tetrachloride	EPA 624	5A23003	0.28	5.0	ND	1	01/23/05	01/23/05		
Chloroform	EPA 624	5A23003	0.33	2.0	ND	1	01/23/05	01/23/05		
1,1-Dichloroethane	EPA 624	5A23003	0.27	2.0	ND	1	01/23/05	01/23/05		
1,2-Dichloroethane	EPA 624	5A23003	0.28	2.0	ND	1	01/23/05	01/23/05		
1,1-Dichloroethene	EPA 624	5A23003	0.32	3.0	ND	1	01/23/05	01/23/05		
Ethylbenzene	EPA 624	5A23003	0.25	2.0	ND	1	01/23/05	01/23/05		
Tetrachloroethene	EPA 624	5A23003	0.32	2.0	ND	1	01/23/05	01/23/05		
Toluene	EPA 624	5A23003	0.36	2.0	ND	1	01/23/05	01/23/05		
1,1,1-Trichloroethane	EPA 624	5A23003	0.30	2.0	ND	1	01/23/05	01/23/05		
1,1,2-Trichloroethane	EPA 624	5A23003	0.30	2.0	ND	1	01/23/05	01/23/05		
Trichloroethene	EPA 624	5A23003	0.26	5.0	ND	1	01/23/05	01/23/05		
Trichlorofluoromethane	EPA 624	5A23003	0.34	5.0	ND	1	01/23/05	01/23/05		
Vinyl chloride	EPA 624	5A23003	0.26	5.0	ND	1	01/23/05	01/23/05		
Xylenes, Total	EPA 624	5A23003	0.52	4.0	ND	1	01/23/05	01/23/05		
Surrogate: Dibromofluoromethane (80-120%)					*98 %*					
Surrogate: Toluene-d8 (80-120%)					*90 %*					
Surrogate: 4-Bromofluorobenzene (80-120%)					*81 %*					
Sample ID: IOA0999-02 (DRAFT: Trip Blank - Water)										
Reporting Units: ug/l										
Benzene	EPA 624	5A23003	0.28	2.0	ND	1	01/23/05	01/23/05	U	
Carbon tetrachloride	EPA 624	5A23003	0.28	5.0	ND	1	01/23/05	01/23/05		
Chloroform	EPA 624	5A23003	0.33	2.0	ND	1	01/23/05	01/23/05		
1,1-Dichloroethane	EPA 624	5A23003	0.27	2.0	ND	1	01/23/05	01/23/05		
1,2-Dichloroethane	EPA 624	5A23003	0.28	2.0	ND	1	01/23/05	01/23/05		
1,1-Dichloroethene	EPA 624	5A23003	0.32	3.0	ND	1	01/23/05	01/23/05		
Ethylbenzene	EPA 624	5A23003	0.25	2.0	ND	1	01/23/05	01/23/05		
Tetrachloroethene	EPA 624	5A23003	0.32	2.0	ND	1	01/23/05	01/23/05		
Toluene	EPA 624	5A23003	0.36	2.0	ND	1	01/23/05	01/23/05		
1,1,1-Trichloroethane	EPA 624	5A23003	0.30	2.0	ND	1	01/23/05	01/23/05		
1,1,2-Trichloroethane	EPA 624	5A23003	0.30	2.0	ND	1	01/23/05	01/23/05		
Trichloroethene	EPA 624	5A23003	0.26	5.0	ND	1	01/23/05	01/23/05		
Trichlorofluoromethane	EPA 624	5A23003	0.34	5.0	ND	1	01/23/05	01/23/05		
Vinyl chloride	EPA 624	5A23003	0.26	5.0	ND	1	01/23/05	01/23/05		
Xylenes, Total	EPA 624	5A23003	0.52	4.0	ND	1	01/23/05	01/23/05		
Surrogate: Dibromofluoromethane (80-120%)					*93 %*					
Surrogate: Toluene-d8 (80-120%)					*89 %*					
Surrogate: 4-Bromofluorobenzene (80-120%)					*82 %*					

QUAL CODE

BMEC VALIDATED

LEVEL IV

DRAFT REPORT
DRAFT REPORT
DATA SUBJECT TO CHANGE

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CONTRACT COMPLIANCE SCREENING FORM FOR HARDCOPY DATA

AMEC Earth & Environmental
550 South Wadsworth Boulevard
Suite 500
Lakewood, CO 80226

Laboratory Del Mar
Reviewer P. Meeks
Analysis/Method General Minerals

Package ID T711WC58
Task Order 313150010
SDG No. IOA0999
No. of Analyses 1

Date: 02/09/05
Reviewer's Signature P. Meeks

ACTION ITEMS[a]	
1. **Case Narrative Deficiencies**	
2. **Out of Scope Analyses**	
3. **Analyses Not Conducted**	
4. **Missing Hardcopy Deliverables**	
5. **Incorrect Hardcopy Deliverables**	
6. **Deviations from Analysis Protocol, e.g.,**	
Holding Times	
GC/MS Tune/Inst. Performance	
Calibrations	
Blanks	
Surrogates	
Matrix Spike/Dup LCS	
Field QC	
Internal Standard Performance	
Compound Identification and Quantitation	
System Performance	

COMMENTS[b]	Acceptable as reviewed.

[a] Subcontracted analytical laboratory is not meeting contract and/or method requirements.
[b] Differences in protocol have been adopted by the laboratory but no action against the laboratory is required.

DATA VALIDATION REPORT

NPDES Monitoring

ANALYSIS: GENERAL MINERALS

SAMPLE DELIVERY GROUP: IOA0999

Prepared by

AMEC—Denver Operations
550 South Wadsworth Boulevard, Suite 500
Lakewood, Colorado 80226

1. INTRODUCTION

Task Order Title:	NPDES Monitoring
Contract Task Order #:	313150010
Sample Delivery Group #:	IOA0999
Project Manager:	B. McIlvaine
Matrix:	Water
Analysis:	General Minerals
QC Level:	Level IV
No. of Samples:	1
Reviewer:	P. Meeks
Date of Review:	February 09, 2005

The sample listed in Table 1 was validated based on the guidelines outlined in the AMEC *Data Validation Procedures* SOP DVP-6, Rev. 2, *USEPA Methods for Chemical Analysis of Water and Wastes Method 350.2, 180.1, and 120.1,* and validation guidelines outlined in the USEPA *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (2/94).* Any deviations from these procedures and guidelines are documented herein. Qualifiers were applied in cases where the data did not meet the required QC criteria or where special consideration by the data user is required. Data qualifiers were placed on Form Is with the associated qualification codes. Analytes that were rejected for any reason are denoted on the Form I as having only the "R" data qualifier and associated qualification code(s) denoting the reason for rejection. Any additional problems with the data that may have resulted in an estimated value were not denoted by a qualification code since the data had already been rejected.

Table 1. Sample identification

Client ID	EPA ID	Laboratory ID	Matrix	COC Method
Outfall 002	Outfall 002	IOA0999-01	water	General Minerals

2. DATA VALIDATION FINDINGS

2.1 SAMPLE MANAGEMENT

Following are findings associated with sample management:

2.1.1 Sample Preservation, Handling, and Transport

The sample in this SDG was received at the laboratory within the temperature limits of 4°C ± 2°C. No preservation problems were noted by the laboratory. No qualifications were required.

2.1.2 Chain of Custody

The COC was signed and dated by field and laboratory personnel and accounted for the sample and analyses presented. No sample qualifications were required.

2.1.3 Holding Times

The holding times were assessed by comparing the date of collection with the dates of analyses. The 28-day analytical holding time for ammonia and specific conductance, and the 48-hour holding time for turbidity were met, and no qualifications were required.

2.2 CALIBRATION

For the applicable analyses, the initial calibration correlation coefficients were ≥0.995. All ICV and continuing calibration information was acceptable with recoveries within the control limits of 90-110%. For the titration method, ammonia, no information regarding the standardization of the titrant was provided; however, as the LCS recovery for ammonia was within the CCV control limits, no qualifications were required. No qualifications were required.

2.3 BLANKS

The method blank and CCB results reported on the summary forms and in the raw data for blank analyses associated with the sample were nondetects at the reporting limit. No further qualifications were required.

2.4 BLANK SPIKES AND LABORATORY CONTROL SAMPLES

For the applicable methods, the laboratory control sample recoveries were within the laboratory-established control limits. The LCS is not applicable to turbidity or specific conductance. No qualifications were required.

2.5 SURROGATES RECOVERY

Surrogate recovery is not applicable to the analyses presented in this SDG.

2.6 LABORATORY DUPLICATES

MS/MSD analyses were performed for Outfall 002 for ammonia. The RPD was within the laboratory-established control limit of ≤15% and no qualifications were required.

2.7 MATRIX SPIKE/MATRIX SPIKE DUPLICATE

MS/MSD analyses were performed for Outfall 002 for ammonia. The recoveries were within the laboratory-established control limits of 70-120% and no qualifications were required.

2.8 FURNACE ATOMIC ABSORPTION QC

Furnace atomic absorption was not utilized for the analysis of this sample; therefore, furnace atomic absorption QC is not applicable.

2.9 ICP SERIAL DILUTION

ICP serial dilution is not applicable to the analyses presented in this data validation report.

2.10 SAMPLE RESULT VERIFICATION

A Level IV review was performed for the sample in this data package. Calculations were verified, and the sample results reported on the Form Is were verified against the raw data. No qualifications were required.

2.11 FIELD QC SAMPLES

Field QC samples are evaluated, and if necessary, qualified based only on laboratory blanks. Any remaining detects are used to evaluate the associated samples. The following are findings associated with field QC samples:

2.11.1 Field Blanks and Equipment Rinsates

The sample in this SDG had no associated field QC samples. No qualifications were required.

2.11.2 Field Duplicates

There were no field duplicate pairs associated with this SDG.

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 002

Report Number: IOA0999

Sampled: 01/18/05
Received: 01/19/05

DRAFT: INORGANICS

Analyte	Method	Batch	MDL	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers (Rev Qual)	Qual Code
Sample ID: IOA0999-01 (DRAFT: Outfall 002 - Water) - cont.										
Reporting Units: mg/l										
Ammonia-N (Distilled)	EPA 350.2	5A20065	0.30	0.50	ND	1	01/20/05	01/20/05	U	
Sample ID: IOA0999-01 (DRAFT: Outfall 002 - Water)										
Reporting Units: NTU										
Turbidity	EPA 180.1	5A19080	0.040	1.0	**1.5**	1	01/19/05	01/19/05		
Sample ID: IOA0999-01 (DRAFT: Outfall 002 - Water)										
Reporting Units: umhos/cm										
Specific Conductance	EPA 120.1	5A19072	1.0	1.0	**750**	1	01/19/05	01/19/05		

AMEC VALIDATED

LEVEL IV

DRAFT REPORT
DRAFT REPORT
DATA SUBJECT TO CHANGE

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LABORATORY REPORT

Prepared For: MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project: Routine Outfall 002

Sampled: 01/18/05
Received: 01/19/05
Issued: 02/28/05 17:36

NELAP #01108CA California ELAP#1197 CSDLAC #10117

The results listed within this Laboratory Report pertain only to the samples tested in the laboratory. The analyses contained in this report were performed in accordance with the applicable certifications as noted. All soil samples are reported on a wet weight basis unless otherwise noted in the report. This Laboratory Report is confidential and is intended for the sole use of Del Mar Analytical and its client. This report shall not be reproduced, except in full, without written permission from Del Mar Analytical. The Chain of Custody, 1 page, is included and is an integral part of this report.

This entire report was reviewed and approved for release.

SAMPLE CROSS REFERENCE

SUBCONTRACTED: Refer to the last page for specific subcontract laboratory information included in this report.

LABORATORY ID	CLIENT ID	MATRIX
IOA0999-01	Outfall 002	Water
IOA0999-02	Trip Blank	Water

Reviewed By:

Michele Harper

Del Mar Analytical, Irvine
Michele Harper
Project Manager

Del Mar Analytical

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 002

Report Number: IOA0999

Sampled: 01/18/05
Received: 01/19/05

PURGEABLES BY GC/MS (EPA 624)

Analyte	Method	Batch	MDL	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA0999-01 (Outfall 002 - Water)									
Reporting Units: ug/l									
Benzene	EPA 624	5A23003	0.28	2.0	ND	1	01/23/05	01/23/05	
Carbon tetrachloride	EPA 624	5A23003	0.28	5.0	ND	1	01/23/05	01/23/05	
Chloroform	EPA 624	5A23003	0.33	2.0	ND	1	01/23/05	01/23/05	
1,1-Dichloroethane	EPA 624	5A23003	0.27	2.0	ND	1	01/23/05	01/23/05	
1,2-Dichloroethane	EPA 624	5A23003	0.28	2.0	ND	1	01/23/05	01/23/05	
1,1-Dichloroethene	EPA 624	5A23003	0.32	3.0	ND	1	01/23/05	01/23/05	
Ethylbenzene	EPA 624	5A23003	0.25	2.0	ND	1	01/23/05	01/23/05	
Tetrachloroethene	EPA 624	5A23003	0.32	2.0	ND	1	01/23/05	01/23/05	
Toluene	EPA 624	5A23003	0.36	2.0	ND	1	01/23/05	01/23/05	
1,1,1-Trichloroethane	EPA 624	5A23003	0.30	2.0	ND	1	01/23/05	01/23/05	
1,1,2-Trichloroethane	EPA 624	5A23003	0.30	2.0	ND	1	01/23/05	01/23/05	
Trichloroethene	EPA 624	5A23003	0.26	5.0	ND	1	01/23/05	01/23/05	
Trichlorofluoromethane	EPA 624	5A23003	0.34	5.0	ND	1	01/23/05	01/23/05	
Vinyl chloride	EPA 624	5A23003	0.26	5.0	ND	1	01/23/05	01/23/05	
Xylenes, Total	EPA 624	5A23003	0.52	4.0	ND	1	01/23/05	01/23/05	
Surrogate: Dibromofluoromethane (80-120%)					*98 %*				
Surrogate: Toluene-d8 (80-120%)					*90 %*				
Surrogate: 4-Bromofluorobenzene (80-120%)					*81 %*				
Sample ID: IOA0999-02 (Trip Blank - Water)									
Reporting Units: ug/l									
Benzene	EPA 624	5A23003	0.28	2.0	ND	1	01/23/05	01/23/05	
Carbon tetrachloride	EPA 624	5A23003	0.28	5.0	ND	1	01/23/05	01/23/05	
Chloroform	EPA 624	5A23003	0.33	2.0	ND	1	01/23/05	01/23/05	
1,1-Dichloroethane	EPA 624	5A23003	0.27	2.0	ND	1	01/23/05	01/23/05	
1,2-Dichloroethane	EPA 624	5A23003	0.28	2.0	ND	1	01/23/05	01/23/05	
1,1-Dichloroethene	EPA 624	5A23003	0.32	3.0	ND	1	01/23/05	01/23/05	
Ethylbenzene	EPA 624	5A23003	0.25	2.0	ND	1	01/23/05	01/23/05	
Tetrachloroethene	EPA 624	5A23003	0.32	2.0	ND	1	01/23/05	01/23/05	
Toluene	EPA 624	5A23003	0.36	2.0	ND	1	01/23/05	01/23/05	
1,1,1-Trichloroethane	EPA 624	5A23003	0.30	2.0	ND	1	01/23/05	01/23/05	
1,1,2-Trichloroethane	EPA 624	5A23003	0.30	2.0	ND	1	01/23/05	01/23/05	
Trichloroethene	EPA 624	5A23003	0.26	5.0	ND	1	01/23/05	01/23/05	
Trichlorofluoromethane	EPA 624	5A23003	0.34	5.0	ND	1	01/23/05	01/23/05	
Vinyl chloride	EPA 624	5A23003	0.26	5.0	ND	1	01/23/05	01/23/05	
Xylenes, Total	EPA 624	5A23003	0.52	4.0	ND	1	01/23/05	01/23/05	
Surrogate: Dibromofluoromethane (80-120%)					*93 %*				
Surrogate: Toluene-d8 (80-120%)					*89 %*				
Surrogate: 4-Bromofluorobenzene (80-120%)					*82 %*				

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Michele Harper
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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 002

Report Number: IOA0999

Sampled: 01/18/05
Received: 01/19/05

ACID & BASE/NEUTRALS BY GC/MS (EPA 625)

Analyte	Method	Batch	MDL Limit	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA0999-01 (Outfall 002 - Water)									
Reporting Units: ug/l									
Bis(2-ethylhexyl)phthalate	EPA 625	5A23027	1.1	5.0	ND	0.957	01/23/05	01/26/05	
2,4-Dinitrotoluene	EPA 625	5A23027	0.23	9.0	ND	0.957	01/23/05	01/26/05	
N-Nitrosodimethylamine	EPA 625	5A23027	0.22	8.0	ND	0.957	01/23/05	01/26/05	
Pentachlorophenol	EPA 625	5A23027	0.78	8.0	ND	0.957	01/23/05	01/26/05	
2,4,6-Trichlorophenol	EPA 625	5A23027	0.10	6.0	ND	0.957	01/23/05	01/26/05	
Surrogate: 2-Fluorophenol (35-120%)					*78 %*				
Surrogate: Phenol-d6 (45-120%)					*79 %*				
Surrogate: 2,4,6-Tribromophenol (50-125%)					*82 %*				
Surrogate: Nitrobenzene-d5 (45-120%)					*75 %*				
Surrogate: 2-Fluorobiphenyl (45-120%)					*80 %*				
Surrogate: Terphenyl-d14 (45-135%)					*84 %*				

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Project ID: Routine Outfall 002

Report Number: IOA0999

Sampled: 01/18/05
Received: 01/19/05

ORGANOCHLORINE PESTICIDES (EPA 608)

Analyte	Method	Batch	MDL Limit	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA0999-01 (Outfall 002 - Water) - cont.									
Reporting Units: ug/l									
alpha-BHC	EPA 608	5A20040	0.00049	0.010	ND	0.99	01/20/05	01/20/05	
Surrogate: Decachlorobiphenyl (45-120%)					*91 %*				
Surrogate: Tetrachloro-m-xylene (35-120%)					*74 %*				

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Received: 01/19/05

METALS

Analyte	Method	Batch	MDL	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA0999-01 (Outfall 002 - Water) - cont.									
Reporting Units: ug/l									
Copper	EPA 200.8	5A19083	0.49	2.0	**3.6**	1	01/19/05	01/19/05	
Lead	EPA 200.8	5A19083	0.13	1.0	**0.22**	1	01/19/05	01/19/05	J
Mercury	EPA 245.1	5A20051	0.063	0.20	**0.23**	1	01/20/05	01/20/05	
Sample ID: IOA0999-01RE1 (Outfall 002 - Water)									
Reporting Units: ug/l									
Mercury	EPA 245.1	5A21065	0.063	0.20	**0.21**	1	01/21/05	01/21/05	

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Received: 01/19/05

INORGANICS

Analyte	Method	Batch	MDL	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA0999-01 (Outfall 002 - Water) - cont.									
Reporting Units: mg/l									
Ammonia-N (Distilled)	EPA 350.2	5A20065	0.30	0.50	ND	1	01/20/05	01/20/05	
Biochemical Oxygen Demand	EPA 405.1	5A19046	0.59	2.0	ND	1	01/19/05	01/24/05	
Chloride	EPA 300.0	5A19040	2.6	5.0	**30**	10	01/19/05	01/19/05	
Nitrate/Nitrite-N	EPA 300.0	5A19040	0.072	0.26	**0.84**	1	01/19/05	01/19/05	
Oil & Grease	EPA 413.1	5A19067	0.94	5.0	**2.4**	1	01/19/05	01/19/05	B, J
Sulfate	EPA 300.0	5A19040	1.8	5.0	**190**	10	01/19/05	01/19/05	
Surfactants (MBAS)	SM5540-C	5A19095	0.044	0.10	**0.060**	1	01/19/05	01/19/05	J
Total Dissolved Solids	SM2540C	5A19098	10	10	**480**	1	01/19/05	01/19/05	
Total Suspended Solids	EPA 160.2	5A19090	10	10	ND	1	01/19/05	01/19/05	
Sample ID: IOA0999-01 (Outfall 002 - Water)									
Reporting Units: ml/l/hr									
Total Settleable Solids	EPA 160.5	5A19047	0.10	0.10	ND	1	01/19/05	01/19/05	
Sample ID: IOA0999-01 (Outfall 002 - Water)									
Reporting Units: NTU									
Turbidity	EPA 180.1	5A19080	0.040	1.0	**1.5**	1	01/19/05	01/19/05	
Sample ID: IOA0999-01 (Outfall 002 - Water)									
Reporting Units: ug/l									
Total Cyanide	EPA 335.2	5A19096	2.2	5.0	ND	1	01/19/05	01/19/05	M2
Perchlorate	EPA 314.0	5A19048	0.80	4.0	ND	1	01/19/05	01/20/05	
Sample ID: IOA0999-01 (Outfall 002 - Water)									
Reporting Units: umhos/cm									
Specific Conductance	EPA 120.1	5A19072	1.0	1.0	**750**	1	01/19/05	01/19/05	

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Attention: Bronwyn Kelly

Project ID: Routine Outfall 002

Report Number: IOA0999

Sampled: 01/18/05
Received: 01/19/05

SHORT HOLD TIME DETAIL REPORT

Sample ID: Outfall 002 (IOA0999-01) - Water	Hold Time (in days)	Date/Time Sampled	Date/Time Received	Date/Time Extracted	Date/Time Analyzed
EPA 160.5	2	01/18/2005 11:21	01/19/2005 12:00	01/19/2005 14:30	01/19/2005 16:00
EPA 180.1	2	01/18/2005 11:21	01/19/2005 12:00	01/19/2005 14:15	01/19/2005 15:15
EPA 300.0	2	01/18/2005 11:21	01/19/2005 12:00	01/19/2005 15:12	01/19/2005 15:26
EPA 405.1	2	01/18/2005 11:21	01/19/2005 12:00	01/19/2005 15:00	01/24/2005 17:00
SM5540-C	2	01/18/2005 11:21	01/19/2005 12:00	01/19/2005 18:22	01/19/2005 21:46

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Project ID: Routine Outfall 002

Report Number: IOA0999

Sampled: 01/18/05
Received: 01/19/05

METHOD BLANK/QC DATA

PURGEABLES BY GC/MS (EPA 624)

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A23003 Extracted: 01/23/05											
Blank Analyzed: 01/23/2005 (5A23003-BLK1)											
Benzene	ND	2.0	0.28	ug/l							
Carbon tetrachloride	ND	5.0	0.28	ug/l							
Chloroform	ND	2.0	0.33	ug/l							
1,1-Dichloroethane	ND	2.0	0.27	ug/l							
1,2-Dichloroethane	ND	2.0	0.28	ug/l							
1,1-Dichloroethene	ND	3.0	0.32	ug/l							
Ethylbenzene	ND	2.0	0.25	ug/l							
Tetrachloroethene	ND	2.0	0.32	ug/l							
Toluene	ND	2.0	0.36	ug/l							
1,1,1-Trichloroethane	ND	2.0	0.30	ug/l							
1,1,2-Trichloroethane	ND	2.0	0.30	ug/l							
Trichloroethene	ND	5.0	0.26	ug/l							
Trichlorofluoromethane	ND	5.0	0.34	ug/l							
Vinyl chloride	ND	5.0	0.26	ug/l							
Xylenes, Total	ND	4.0	0.52	ug/l							
Surrogate: Dibromofluoromethane	*23.5*			*ug/l*	*25.0*		*94*	*80-120*			
Surrogate: Toluene-d8	*22.5*			*ug/l*	*25.0*		*90*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*20.9*			*ug/l*	*25.0*		*84*	*80-120*			
LCS Analyzed: 01/23/2005 (5A23003-BS1)											
Benzene	23.7	2.0	0.28	ug/l	25.0		95	70-120			
Carbon tetrachloride	27.6	5.0	0.28	ug/l	25.0		110	70-140			
Chloroform	24.4	2.0	0.33	ug/l	25.0		98	75-130			
1,1-Dichloroethane	24.0	2.0	0.27	ug/l	25.0		96	70-135			
1,2-Dichloroethane	24.7	2.0	0.28	ug/l	25.0		99	60-150			
1,1-Dichloroethene	25.2	3.0	0.32	ug/l	25.0		101	75-135			
Ethylbenzene	22.8	2.0	0.25	ug/l	25.0		91	80-120			
Tetrachloroethene	21.8	2.0	0.32	ug/l	25.0		87	75-125			
Toluene	24.1	2.0	0.36	ug/l	25.0		96	75-120			
1,1,1-Trichloroethane	24.8	2.0	0.30	ug/l	25.0		99	75-140			
1,1,2-Trichloroethane	25.4	2.0	0.30	ug/l	25.0		102	70-125			
Trichloroethene	25.9	5.0	0.26	ug/l	25.0		104	80-120			
Trichlorofluoromethane	27.5	5.0	0.34	ug/l	25.0		110	65-145			
Vinyl chloride	23.3	5.0	0.26	ug/l	25.0		93	50-130			
Surrogate: Dibromofluoromethane	*23.4*			*ug/l*	*25.0*		*94*	*80-120*			
Surrogate: Toluene-d8	*23.2*			*ug/l*	*25.0*		*93*	*80-120*			

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Attention: Bronwyn Kelly

Project ID: Routine Outfall 002

Report Number: IOA0999

Sampled: 01/18/05
Received: 01/19/05

METHOD BLANK/QC DATA

PURGEABLES BY GC/MS (EPA 624)

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A23003 Extracted: 01/23/05											
LCS Analyzed: 01/23/2005 (5A23003-BS1)											
Surrogate: 4-Bromofluorobenzene	*22.8*			*ug/l*	*25.0*		*91*	*80-120*			
Matrix Spike Analyzed: 01/23/2005 (5A23003-MS1)						**Source: IOA1188-02**					
Benzene	22.9	2.0	0.28	ug/l	25.0	0.56	89	70-120			
Carbon tetrachloride	25.7	5.0	0.28	ug/l	25.0	ND	103	70-145			
Chloroform	23.2	2.0	0.33	ug/l	25.0	ND	93	70-135			
1,1-Dichloroethane	22.7	2.0	0.27	ug/l	25.0	ND	91	65-135			
1,2-Dichloroethane	22.9	2.0	0.28	ug/l	25.0	ND	92	60-150			
1,1-Dichloroethene	23.4	3.0	0.32	ug/l	25.0	ND	94	65-140			
Ethylbenzene	29.5	2.0	0.25	ug/l	25.0	8.4	84	70-130			
Tetrachloroethene	20.4	2.0	0.32	ug/l	25.0	ND	82	70-130			
Toluene	22.7	2.0	0.36	ug/l	25.0	ND	91	70-120			
1,1,1-Trichloroethane	23.3	2.0	0.30	ug/l	25.0	ND	93	75-140			
1,1,2-Trichloroethane	23.8	2.0	0.30	ug/l	25.0	ND	95	60-135			
Trichloroethene	23.8	5.0	0.26	ug/l	25.0	ND	95	70-125			
Trichlorofluoromethane	24.7	5.0	0.34	ug/l	25.0	ND	99	55-145			
Vinyl chloride	20.8	5.0	0.26	ug/l	25.0	ND	83	40-135			
Surrogate: Dibromofluoromethane	*23.7*			*ug/l*	*25.0*		*95*	*80-120*			
Surrogate: Toluene-d8	*22.9*			*ug/l*	*25.0*		*92*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*22.5*			*ug/l*	*25.0*		*90*	*80-120*			
Matrix Spike Dup Analyzed: 01/23/2005 (5A23003-MSD1)						**Source: IOA1188-02**					
Benzene	24.0	2.0	0.28	ug/l	25.0	0.56	94	70-120	5	20	
Carbon tetrachloride	27.6	5.0	0.28	ug/l	25.0	ND	110	70-145	7	25	
Chloroform	24.7	2.0	0.33	ug/l	25.0	ND	99	70-135	6	20	
1,1-Dichloroethane	24.0	2.0	0.27	ug/l	25.0	ND	96	65-135	6	20	
1,2-Dichloroethane	25.7	2.0	0.28	ug/l	25.0	ND	103	60-150	12	20	
1,1-Dichloroethene	24.6	3.0	0.32	ug/l	25.0	ND	98	65-140	5	20	
Ethylbenzene	31.1	2.0	0.25	ug/l	25.0	8.4	91	70-130	5	20	
Tetrachloroethene	22.1	2.0	0.32	ug/l	25.0	ND	88	70-130	8	20	
Toluene	24.1	2.0	0.36	ug/l	25.0	ND	96	70-120	6	20	
1,1,1-Trichloroethane	24.9	2.0	0.30	ug/l	25.0	ND	100	75-140	7	20	
1,1,2-Trichloroethane	27.3	2.0	0.30	ug/l	25.0	ND	109	60-135	14	25	
Trichloroethene	25.4	5.0	0.26	ug/l	25.0	ND	102	70-125	7	20	
Trichlorofluoromethane	27.2	5.0	0.34	ug/l	25.0	ND	109	55-145	10	25	
Vinyl chloride	22.0	5.0	0.26	ug/l	25.0	ND	88	40-135	6	30	

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Sampled: 01/18/05
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METHOD BLANK/QC DATA

PURGEABLES BY GC/MS (EPA 624)

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A23003 Extracted: 01/23/05											
Matrix Spike Dup Analyzed: 01/23/2005 (5A23003-MSD1)						**Source: IOA1188-02**					
Surrogate: Dibromofluoromethane	*24.1*			*ug/l*	*25.0*		*96*	*80-120*			
Surrogate: Toluene-d8	*22.9*			*ug/l*	*25.0*		*92*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*23.1*			*ug/l*	*25.0*		*92*	*80-120*			

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MWH-Pasadena/Boeing
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Attention: Bronwyn Kelly

Project ID: Routine Outfall 002

Report Number: IOA0999

Sampled: 01/18/05
Received: 01/19/05

METHOD BLANK/QC DATA

ACID & BASE/NEUTRALS BY GC/MS (EPA 625)

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A23027 Extracted: 01/23/05											
Blank Analyzed: 01/26/2005 (5A23027-BLK1)											
Bis(2-ethylhexyl)phthalate	ND	5.0	1.1	ug/l							
2,4-Dinitrotoluene	ND	9.0	0.23	ug/l							
N-Nitrosodimethylamine	ND	8.0	0.22	ug/l							
Pentachlorophenol	ND	8.0	0.78	ug/l							
2,4,6-Trichlorophenol	ND	6.0	0.10	ug/l							
Surrogate: 2-Fluorophenol	*15.7*			*ug/l*	*20.0*		*78*	*35-120*			
Surrogate: Phenol-d6	*15.2*			*ug/l*	*20.0*		*76*	*45-120*			
Surrogate: 2,4,6-Tribromophenol	*14.8*			*ug/l*	*20.0*		*74*	*50-125*			
Surrogate: Nitrobenzene-d5	*7.38*			*ug/l*	*10.0*		*74*	*45-120*			
Surrogate: 2-Fluorobiphenyl	*8.30*			*ug/l*	*10.0*		*83*	*45-120*			
Surrogate: Terphenyl-d14	*8.54*			*ug/l*	*10.0*		*85*	*45-135*			
LCS Analyzed: 01/26/2005 (5A23027-BS1)											
Bis(2-ethylhexyl)phthalate	9.80	5.0	1.1	ug/l	10.0		98	65-125			
2,4-Dinitrotoluene	8.40	9.0	0.23	ug/l	10.0		84	60-140			*J*
N-Nitrosodimethylamine	5.78	8.0	0.22	ug/l	10.0		58	40-120			*J*
Pentachlorophenol	8.72	8.0	0.78	ug/l	10.0		87	50-125			
2,4,6-Trichlorophenol	9.42	6.0	0.10	ug/l	10.0		94	60-120			
Surrogate: 2-Fluorophenol	*14.5*			*ug/l*	*20.0*		*72*	*35-120*			
Surrogate: Phenol-d6	*14.1*			*ug/l*	*20.0*		*70*	*45-120*			
Surrogate: 2,4,6-Tribromophenol	*16.7*			*ug/l*	*20.0*		*84*	*50-125*			
Surrogate: Nitrobenzene-d5	*7.76*			*ug/l*	*10.0*		*78*	*45-120*			
Surrogate: 2-Fluorobiphenyl	*8.76*			*ug/l*	*10.0*		*88*	*45-120*			
Surrogate: Terphenyl-d14	*8.24*			*ug/l*	*10.0*		*82*	*45-135*			
LCS Dup Analyzed: 01/26/2005 (5A23027-BSD1)											**M-NR1**
Bis(2-ethylhexyl)phthalate	10.2	5.0	1.1	ug/l	10.0		102	65-125	4	20	
2,4-Dinitrotoluene	8.72	9.0	0.23	ug/l	10.0		87	60-140	4	20	*J*
N-Nitrosodimethylamine	7.70	8.0	0.22	ug/l	10.0		77	40-120	28	20	*R-7, J*
Pentachlorophenol	8.94	8.0	0.78	ug/l	10.0		89	50-125	2	25	
2,4,6-Trichlorophenol	9.56	6.0	0.10	ug/l	10.0		96	60-120	1	20	
Surrogate: 2-Fluorophenol	*14.4*			*ug/l*	*20.0*		*72*	*35-120*			
Surrogate: Phenol-d6	*15.1*			*ug/l*	*20.0*		*76*	*45-120*			
Surrogate: 2,4,6-Tribromophenol	*16.9*			*ug/l*	*20.0*		*84*	*50-125*			
Surrogate: Nitrobenzene-d5	*7.66*			*ug/l*	*10.0*		*77*	*45-120*			
Surrogate: 2-Fluorobiphenyl	*8.60*			*ug/l*	*10.0*		*86*	*45-120*			

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ACID & BASE/NEUTRALS BY GC/MS (EPA 625)

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A23027 Extracted: 01/23/05											
LCS Dup Analyzed: 01/26/2005 (5A23027-BSD1)											
Surrogate: Terphenyl-d14	*8.36*			*ug/l*	*10.0*		*84*	*45-135*			**M-NR1**

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ORGANOCHLORINE PESTICIDES (EPA 608)

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A20040 Extracted: 01/20/05											
Blank Analyzed: 01/20/2005 (5A20040-BLK1)											
alpha-BHC	ND	0.010	0.00049	ug/l							
Surrogate: Decachlorobiphenyl	*0.446*			*ug/l*	*0.500*		*89*	*45-120*			
Surrogate: Tetrachloro-m-xylene	*0.303*			*ug/l*	*0.500*		*61*	*35-120*			
LCS Analyzed: 01/20/2005 (5A20040-BS1)											
alpha-BHC	0.476	0.010	0.00049	ug/l	0.500		95	45-115			**M-NR1**
Surrogate: Decachlorobiphenyl	*0.498*			*ug/l*	*0.500*		*100*	*45-120*			
Surrogate: Tetrachloro-m-xylene	*0.392*			*ug/l*	*0.500*		*78*	*35-120*			
LCS Dup Analyzed: 01/20/2005 (5A20040-BSD1)											
alpha-BHC	0.449	0.010	0.00049	ug/l	0.500		90	45-115	6	30	
Surrogate: Decachlorobiphenyl	*0.469*			*ug/l*	*0.500*		*94*	*45-120*			
Surrogate: Tetrachloro-m-xylene	*0.364*			*ug/l*	*0.500*		*73*	*35-120*			

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METALS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A19083 Extracted: 01/19/05											
Blank Analyzed: 01/19/2005 (5A19083-BLK1)											
Copper	ND	2.0	0.49	ug/l							
Lead	ND	1.0	0.13	ug/l							
LCS Analyzed: 01/19/2005 (5A19083-BS1)											
Copper	78.6	2.0	0.49	ug/l	80.0		98	85-115			
Lead	78.1	1.0	0.13	ug/l	80.0		98	85-115			
Matrix Spike Analyzed: 01/19/2005 (5A19083-MS1)						**Source: IOA0999-01**					
Copper	77.0	2.0	0.49	ug/l	80.0	3.6	92	70-130			
Lead	75.6	1.0	0.13	ug/l	80.0	0.22	94	70-130			
Matrix Spike Dup Analyzed: 01/19/2005 (5A19083-MSD1)						**Source: IOA0999-01**					
Copper	78.9	2.0	0.49	ug/l	80.0	3.6	94	70-130	2	20	
Lead	77.3	1.0	0.13	ug/l	80.0	0.22	96	70-130	2	20	
Batch: 5A20051 Extracted: 01/20/05											
Blank Analyzed: 01/20/2005 (5A20051-BLK1)											
Mercury	ND	0.20	0.063	ug/l							
LCS Analyzed: 01/20/2005 (5A20051-BS1)											
Mercury	8.31	0.20	0.063	ug/l	8.00		104	85-115			
Matrix Spike Analyzed: 01/20/2005 (5A20051-MS1)						**Source: IOA1004-02**					
Mercury	8.49	0.20	0.063	ug/l	8.00	0.15	104	70-130			
Matrix Spike Dup Analyzed: 01/20/2005 (5A20051-MSD1)						**Source: IOA1004-02**					
Mercury	8.38	0.20	0.063	ug/l	8.00	0.15	103	70-130	1	20	

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METALS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A21065 Extracted: 01/21/05											
Blank Analyzed: 01/21/2005 (5A21065-BLK1)											
Mercury	ND	0.20	0.063	ug/l							
LCS Analyzed: 01/21/2005 (5A21065-BS1)											
Mercury	7.92	0.20	0.063	ug/l	8.00		99	85-115			
Matrix Spike Analyzed: 01/21/2005 (5A21065-MS1)						**Source: IOA1185-01**					
Mercury	7.25	0.20	0.063	ug/l	8.00	ND	91	70-130			
Matrix Spike Dup Analyzed: 01/21/2005 (5A21065-MSD1)						**Source: IOA1185-01**					
Mercury	7.19	0.20	0.063	ug/l	8.00	ND	90	70-130	1	20	

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INORGANICS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A19040 Extracted: 01/19/05											
Blank Analyzed: 01/19/2005 (5A19040-BLK1)											
Chloride	ND	0.50	0.26	mg/l							
Nitrate/Nitrite-N	ND	0.26	0.072	mg/l							
Sulfate	ND	0.50	0.18	mg/l							
LCS Analyzed: 01/19/2005 (5A19040-BS1)											
Chloride	4.68	0.50	0.26	mg/l	5.00		94	90-110			*M-3*
Sulfate	9.91	0.50	0.18	mg/l	10.0		99	90-110			*M-3*
Batch: 5A19046 Extracted: 01/19/05											
Blank Analyzed: 01/24/2005 (5A19046-BLK1)											
Biochemical Oxygen Demand	ND	100	30	mg/l							
LCS Analyzed: 01/24/2005 (5A19046-BS1)											
Biochemical Oxygen Demand	201	100	30	mg/l	198		102	85-115			
LCS Dup Analyzed: 01/24/2005 (5A19046-BSD1)											
Biochemical Oxygen Demand	203	100	30	mg/l	198		103	85-115	1	20	
Batch: 5A19048 Extracted: 01/19/05											
Blank Analyzed: 01/19/2005 (5A19048-BLK1)											
Perchlorate	ND	4.0	0.80	ug/l							
LCS Analyzed: 01/19/2005 (5A19048-BS1)											
Perchlorate	50.6	4.0	0.80	ug/l	50.0		101	85-115			*M-3*

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INORGANICS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A19067 Extracted: 01/19/05											
Blank Analyzed: 01/19/2005 (5A19067-BLK1)											
Oil & Grease	1.30	5.0	0.94	mg/l							*J*
LCS Analyzed: 01/19/2005 (5A19067-BS1)											
Oil & Grease	18.1	5.0	0.94	mg/l	20.0		90	65-120			**M-NR1**
LCS Dup Analyzed: 01/19/2005 (5A19067-BSD1)											
Oil & Grease	20.8	5.0	0.94	mg/l	20.0		104	65-120	14	20	
Batch: 5A19072 Extracted: 01/19/05											
Duplicate Analyzed: 01/19/2005 (5A19072-DUP1)						**Source: IOA0950-04**					
Specific Conductance	825	1.0	1.0	umhos/cm		830			1	5	
Batch: 5A19080 Extracted: 01/19/05											
Blank Analyzed: 01/19/2005 (5A19080-BLK1)											
Turbidity	0.0400	1.0	0.040	NTU							*J*
Duplicate Analyzed: 01/19/2005 (5A19080-DUP1)						**Source: IOA0945-01**					
Turbidity	0.130	1.0	0.040	NTU		0.15			14	20	*J*
Batch: 5A19090 Extracted: 01/19/05											
Blank Analyzed: 01/19/2005 (5A19090-BLK1)											
Total Suspended Solids	ND	10	10	mg/l							

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INORGANICS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A19090 Extracted: 01/19/05											
LCS Analyzed: 01/19/2005 (5A19090-BS1)											
Total Suspended Solids	971	10	10	mg/l	1000		97	85-115			
Duplicate Analyzed: 01/19/2005 (5A19090-DUP1)						**Source: IOA0988-01**					
Total Suspended Solids	ND	10	10	mg/l		ND				10	
Batch: 5A19095 Extracted: 01/19/05											
Blank Analyzed: 01/19/2005 (5A19095-BLK1)											
Surfactants (MBAS)	ND	0.10	0.044	mg/l							
LCS Analyzed: 01/19/2005 (5A19095-BS1)											
Surfactants (MBAS)	0.248	0.10	0.044	mg/l	0.250		99	90-110			
Matrix Spike Analyzed: 01/19/2005 (5A19095-MS1)						**Source: IOA0999-01**					
Surfactants (MBAS)	0.268	0.10	0.044	mg/l	0.250	0.060	83	50-125			
Matrix Spike Dup Analyzed: 01/19/2005 (5A19095-MSD1)						**Source: IOA0999-01**					
Surfactants (MBAS)	0.283	0.10	0.044	mg/l	0.250	0.060	89	50-125	5	20	
Batch: 5A19096 Extracted: 01/19/05											
Blank Analyzed: 01/19/2005 (5A19096-BLK1)											
Total Cyanide	ND	5.0	2.2	ug/l							
LCS Analyzed: 01/19/2005 (5A19096-BS1)											
Total Cyanide	187	5.0	2.2	ug/l	200		94	90-110			

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Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A19096 Extracted: 01/19/05											
Matrix Spike Analyzed: 01/19/2005 (5A19096-MS1)						**Source: IOA0999-01**					
Total Cyanide	92.8	5.0	2.2	ug/l	200	ND	46	70-115			*M2*
Matrix Spike Dup Analyzed: 01/19/2005 (5A19096-MSD1)						**Source: IOA0999-01**					
Total Cyanide	80.1	5.0	2.2	ug/l	200	ND	40	70-115	15	15	*M2*
Batch: 5A19098 Extracted: 01/19/05											
Blank Analyzed: 01/19/2005 (5A19098-BLK1)											
Total Dissolved Solids	ND	10	10	mg/l							
LCS Analyzed: 01/19/2005 (5A19098-BS1)											
Total Dissolved Solids	986	10	10	mg/l	1000		99	90-110			
Duplicate Analyzed: 01/19/2005 (5A19098-DUP1)						**Source: IOA0952-01**					
Total Dissolved Solids	493	10	10	mg/l		490			1	10	
Batch: 5A20065 Extracted: 01/20/05											
Blank Analyzed: 01/20/2005 (5A20065-BLK1)											
Ammonia-N (Distilled)	ND	0.50	0.30	mg/l							
LCS Analyzed: 01/20/2005 (5A20065-BS1)											
Ammonia-N (Distilled)	9.80	0.50	0.30	mg/l	10.0		98	80-115			
Matrix Spike Analyzed: 01/20/2005 (5A20065-MS1)						**Source: IOA0999-01**					
Ammonia-N (Distilled)	9.52	0.50	0.30	mg/l	10.0	ND	95	70-120			

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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2520 E. Sunset Rd. #3, Las Vegas, NV 89120 (702) 798-3620 FAX (702) 798-3621

MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 002

Report Number: IOA0999

Sampled: 01/18/05
Received: 01/19/05

METHOD BLANK/QC DATA

INORGANICS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A20065 Extracted: 01/20/05											
Matrix Spike Dup Analyzed: 01/20/2005 (5A20065-MSD1)						**Source: IOA0999-01**					
Ammonia-N (Distilled)	9.80	0.50	0.30	mg/l	10.0	ND	98	70-120	3	15	

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Michele Harper
Project Manager

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300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 002

Report Number: IOA0999

Sampled: 01/18/05
Received: 01/19/05

Compliance Check

The results obtained from the analytical testing of this data set were checked against compliance limits received from the client. Any results at or above the compliance limits appear in bold on this page.

LabNumber	Analysis	Analyte	Units	Result	MRL	Compliance Limit
IOA0999-01	413.1 Oil and Grease	Oil & Grease	mg/l	2.40	5.0	10.00
IOA0999-01	608-Pest Boeing 001/002 Q (LL)	alpha-BHC	ug/l	0	0.010	0.0100
IOA0999-01	624-Boeing 001/002 Q (Fr113+X)	1,1-Dichloroethene	ug/l	0	3.0	3.20
IOA0999-01	624-Boeing 001/002 Q (Fr113+X)	Trichloroethene	ug/l	0.13	5.0	5.00
IOA0999-01	625-Boeing 001/002 Q-LL	2,4,6-Trichlorophenol	ug/l	0	6.0	6.50
IOA0999-01	625-Boeing 001/002 Q-LL	2,4-Dinitrotoluene	ug/l	0	9.0	9.10
IOA0999-01	625-Boeing 001/002 Q-LL	Bis(2-ethylhexyl)phthalate	ug/l	0.13	5.0	4.00
IOA0999-01	625-Boeing 001/002 Q-LL	N-Nitrosodimethylamine	ug/l	0	8.0	8.10
IOA0999-01	625-Boeing 001/002 Q-LL	Pentachlorophenol	ug/l	0	8.0	8.20
IOA0999-01	BOD	Biochemical Oxygen Demand	mg/l	0.51	2.0	20
IOA0999-01	Chloride - 300.0	Chloride	mg/l	30	5.0	150
IOA0999-01	Copper-200.8	Copper	ug/l	3.60	2.0	7.10
IOA0999-01	Cyanide-335.2 5ppb	Total Cyanide	ug/l	-4	5.0	4.30
IOA0999-01	Lead-200.8	Lead	ug/l	0.22	1.0	2.60
IOA0999-01	MBAS - SM5540-C	Surfactants (MBAS)	mg/l	0.060	0.10	0.50
IOA0999-01	**Mercury - 245.1**	**Mercury**	**ug/l**	**0.23**	**0.20**	**0.20**
IOA0999-01	Nitrogen, NO3+NO2 -N	Nitrate/Nitrite-N	mg/l	0.84	0.26	8.00
IOA0999-01	Perchlorate 314.0	Perchlorate	ug/l	0	4.0	6.00
IOA0999-01	Sulfate-300.0	Sulfate	mg/l	190	5.0	300
IOA0999-01	TDS - SM 2540C	Total Dissolved Solids	mg/l	480	10	950
IOA0999-01RE1	**Mercury - 245.1**	**Mercury**	**ug/l**	**0.21**	**0.20**	**0.20**
IOA0999-02	624-Boeing 001/002 Q (Fr113+X)	1,1-Dichloroethene	ug/l	0	3.0	3.20
IOA0999-02	624-Boeing 001/002 Q (Fr113+X)	Trichloroethene	ug/l	0	5.0	5.00

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 002

Report Number: IOA0999

Sampled: 01/18/05
Received: 01/19/05

DATA QUALIFIERS AND DEFINITIONS

B	Analyte was detected in the associated Method Blank.
J	Estimated value. Analyte detected at a level less than the Reporting Limit (RL) and greater than or equal to the Method Detection Limit (MDL). The user of this data should be aware that this data is of unknown quality.
M2	The MS and/or MSD were below the acceptance limits due to sample matrix interference. See Blank Spike (LCS).
M-3	Results exceeded the linear range in the MS/MSD and therefore are not available for reporting. The batch was accepted based on acceptable recovery in the Blank Spike (LCS).
M-NR1	There was no MS/MSD analyzed with this batch due to insufficient sample volume. See Blank Spike/Blank Spike Duplicate.
R-7	LFB/LFBD RPD exceeded the method control limit. Recovery met acceptance criteria.
ND	Analyte NOT DETECTED at or above the reporting limit or MDL, if MDL is specified.
RPD	Relative Percent Difference

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 002

Report Number: IOA0999

Sampled: 01/18/05
Received: 01/19/05

Certification Summary

Del Mar Analytical, Irvine

Method	Matrix	Nelac	California
EPA 120.1	Water	X	X
EPA 160.2	Water	X	X
EPA 160.5	Water	X	X
EPA 180.1	Water	X	X
EPA 200.8	Water	X	X
EPA 245.1	Water	X	X
EPA 300.0	Water	X	X
EPA 314.0	Water	X	X
EPA 335.2	Water	X	X
EPA 350.2	Water	X	X
EPA 405.1	Water	X	X
EPA 413.1	Water	X	X
EPA 608	Water	X	X
EPA 624	Water	X	X
EPA 625	Water	X	X
SM2540C	Water	X	X
SM5540-C	Water	X	X

Nevada and NELAP provide analyte specific accreditations. Analyte specific information for Del Mar Analytical may be obtained by contacting the laboratory or visiting our website at www.dmalabs.com.

Subcontracted Laboratories

Pace Analytical, MN- SUB

1700 Elm Street, Ste 200 - Minneapolis, MN 55414

Analysis Performed: 1613-Dioxin-HR
Samples: IOA0999-01

Analysis Performed: EDD + Level 4
Samples: IOA0999-01

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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089 10A0999

Del Mar Analytical Version 5 8/12/04 CHAIN OF CUSTODY FORM

Client Name/Address:

MWH-Pasadena
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101

Project Manager: Bronwyn Kelly

Sampler: Pollock

Project:
Boeing-SSFL NPDES
Routine Outfall 002

Phone Number:
(626) 568-6691
Fax Number:
(626) 568-6515

ANALYSIS REQUIRED

Field readings:
Temp = 56.3
pH= 7.6

Sample Description	Sample Matrix	Container Type	# of Cont.	Sampling Date/Time	Preservative	Bottle * #	Total Reoverable Metals: Cu, Pb, Hg,	Settleable Solids	VOCs 624 + xylenes	TCDD (and all congeners)	Oil & Grease (EPA 413.1)	Cyanide (total recoverable)	BOD5(20 degrees C)	Surfactants (MBAS)	Cl-, SO4, NO3+NO2-N, Perchlorate	Turbidity,TDS, TSS, Conductivity	Ammonia-N	Alpha BHC (608)	2,4,6 Trichlorophenol, 2,4 Dinitrotoluene, Bis(2-ethylhexyl)phthalate, NDMA, pentachlorophenol (EPA 625)		Comments
Outfall 002	W	Poly-1 liter	1	1-19-05 11:21	HNO3	1A	X														24 TAT
Outfall 002-Dup	W	Poly-1 liter	1		HNO3	1B	X														24 TAT
Outfall 002	W	Poly-1 liter	1		None	2		X													
Outfall 002	W	VOAs	3		HCl	3A, 3B, 3C			X												
Outfall 002	W	Glass-Amber	2		None	4A, 4B				X											
Outfall 002	W	1L Amber	2		HCl	5A, 5B					X										24 TAT
Outfall 002	W	Poly-500 ml	1		NaOH	6						X									24 TAT
Outfall 002	W	Poly-1 liter	1		None	7							X								
Outfall 002	W	Poly-500 ml	2		None	8A, 8B								X							
Outfall 002	W	Poly-500 ml	2		None	9A, 9B									X						
Outfall 002	W	Poly-500 ml	2		None	10A, 10B										X					
Outfall 002	W	Poly-500 ml	1		H2SO4	11											X				
Outfall 002	W	1L Amber	2		None	12A, 12B												X			
Outfall 002	W	1L Amber	2		None	13A, 13B													X		
Trip Blank	W	VOAs	3		HCl	14A, 14B, 14C			X												

Relinquished By	Date/Time:	Received By	Date/Time:
[signature]	1-19-05 09:45	[signature]	1/19/05 0945
[signature]	1/19/05 1200		
		[signature]	1/19/05 12:00

Turn around Time: (check)
24 Hours ____ 5 Days ____
48 Hours ____ 10 Days ____
72 Hours ____ Normal ____
Perchlorate Only 72 Hours ____
Metals Only 72 Hours ____
Sample Integrity: (Check)
Intact X On Ice: 4°C

Del Mar Analytical

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February 25, 2005

MWH-Pasadena/Boeing
300 North Lake Avenue
Pasadena, Ca. 91101

Attention: Bronwyn Kelly

Project: Routine Outfall 002
Sampled: 01/18/05
Del Mar Analytical Number: IOA0999

Dear Ms. Kelly:

Pace Analytical performed Method 1613B analysis for the project referenced above. Please use the following cross-reference table when reviewing your results.

MWH ID	DEL MAR ID	Pace ID
Outfall 002	IOA0999-01	106478001

Attached is the original report from the subcontract laboratory. If you have any questions or require further assistance, please do not hesitate to contact me.

Sincerely yours,
DEL MAR ANALYTICAL

Michele Harper
Project Manager

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Pace Analytical™

Method 1613B Analysis Results

Client - Del Mar Analytical

Client's Sample ID	IOA0999-01		
Lab Sample ID	106478001		
Filename	U50203A_08		
Injected By	SMT		
Total Amount Extracted	1030 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	01/18/2005
ICAL Date	01/26/2005	Received	01/20/2005
CCal Filename(s)	U50202B_12	Extracted	01/31/2005
Method Blank ID	BLANK-6241	Analyzed	02/03/2005 11:34

Native Isomers	Conc pg/L	EMPC pg/L	LOD pg/L		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	0.60		2,3,7,8-TCDF-13C	2.00	86
Total TCDF	1.60	-----	0.60	BJ	2,3,7,8-TCDD-13C	2.00	84
					1,2,3,7,8-PeCDF-13C	2.00	90
2,3,7,8-TCDD	ND	-----	0.82		2,3,4,7,8-PeCDF-13C	2.00	96
Total TCDD	ND	-----	0.82		1,2,3,7,8-PeCDD-13C	2.00	107
					1,2,3,4,7,8-HxCDF-13C	2.00	80
1,2,3,7,8-PeCDF	ND	-----	0.30		1,2,3,6,7,8-HxCDF-13C	2.00	81
2,3,4,7,8-PeCDF	0.53	-----	0.25	J	2,3,4,6,7,8-HxCDF-13C	2.00	81
Total PeCDF	0.53	-----	0.27	J	1,2,3,7,8,9-HxCDF-13C	2.00	87
					1,2,3,4,7,8-HxCDD-13C	2.00	80
1,2,3,7,8-PeCDD	ND	-----	0.87		1,2,3,6,7,8-HxCDD-13C	2.00	74
Total PeCDD	ND	-----	0.87		1,2,3,4,6,7,8-HpCDF-13C	2.00	79
					1,2,3,4,7,8,9-HpCDF-13C	2.00	73
1,2,3,4,7,8-HxCDF	-----	0.95	0.18	I	1,2,3,4,6,7,8-HpCDD-13C	2.00	80
1,2,3,6,7,8-HxCDF	0.66	-----	0.29	J	OCDD-13C	4.00	83
2,3,4,6,7,8-HxCDF	-----	0.43	0.27	I			
1,2,3,7,8,9-HxCDF	0.45	-----	0.30	J	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	2.00	-----	0.26	BJ	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	0.50		2,3,7,8-TCDD-37Cl4	0.20	78
1,2,3,6,7,8-HxCDD	ND	-----	0.42				
1,2,3,7,8,9-HxCDD	ND	-----	0.40				
Total HxCDD	ND	-----	0.44				
1,2,3,4,6,7,8-HpCDF	-----	1.20	0.60	I			
1,2,3,4,7,8,9-HpCDF	ND	-----	0.64				
Total HpCDF	4.50	-----	0.62	BJ			
1,2,3,4,6,7,8-HpCDD	2.40	-----	0.29	J			
Total HpCDD	3.80	-----	0.29	J			
OCDF	6.90	-----	0.98	BJ			
OCDD	9.20	-----	0.36	J			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection. Totals are averages of individual isomer LODs.
D = Result obtained from analysis of diluted sample
B = Less than 10 times higher than method blank level
P = Recovery outside of method 1613 control limits
J = Concentration detected is below the calibration range
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....106478

REPORT OF LABORATORY ANALYSIS

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Pace Analytical™

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 1613B Blank Analysis Results

Client - Del Mar Analytical

Lab Sample ID	BLANK-6241	Matrix	Water
Filename	U50202B_06	Dilution	NA
Total Amount Extracted	1040 mL	Extracted	01/31/2005
ICAL Date	01/26/2005	Analyzed	02/02/2005 23:46
CCal Filename(s)	U50202B_01	Injected By	SMT

Native Isomers	Conc pg/L	EMPC pg/L	LOD pg/L		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	0.59		2,3,7,8-TCDF-13C	2.00	86
Total TCDF	1.10	-----	-----	J	2,3,7,8-TCDD-13C	2.00	86
					1,2,3,7,8-PeCDF-13C	2.00	92
2,3,7,8-TCDD	ND	-----	1.30		2,3,4,7,8-PeCDF-13C	2.00	98
Total TCDD	ND	-----	-----		1,2,3,7,8-PeCDD-13C	2.00	105
					1,2,3,4,7,8-HxCDF-13C	2.00	83
1,2,3,7,8-PeCDF	-----	0.73	0.53	I	1,2,3,6,7,8-HxCDF-13C	2.00	76
2,3,4,7,8-PeCDF	ND	-----	0.63		2,3,4,6,7,8-HxCDF-13C	2.00	79
Total PeCDF	ND	-----	-----		1,2,3,7,8,9-HxCDF-13C	2.00	82
					1,2,3,4,7,8-HxCDD-13C	2.00	82
1,2,3,7,8-PeCDD	ND	-----	1.10		1,2,3,6,7,8-HxCDD-13C	2.00	66
Total PeCDD	ND	-----	-----		1,2,3,4,6,7,8-HpCDF-13C	2.00	75
					1,2,3,4,7,8,9-HpCDF-13C	2.00	69
1,2,3,4,7,8-HxCDF	-----	1.30	0.26	E	1,2,3,4,6,7,8-HpCDD-13C	2.00	77
1,2,3,6,7,8-HxCDF	-----	0.75	0.29	E	OCDD-13C	4.00	79
2,3,4,6,7,8-HxCDF	-----	0.71	0.31	I			
1,2,3,7,8,9-HxCDF	-----	1.00	0.41	E	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	0.34	-----	-----	J	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	1.10		2,3,7,8-TCDD-37Cl4	0.20	89
1,2,3,6,7,8-HxCDD	ND	-----	0.69				
1,2,3,7,8,9-HxCDD	ND	-----	0.95				
Total HxCDD	ND	-----	-----				
1,2,3,4,6,7,8-HpCDF	1.20	-----	0.71	J			
1,2,3,4,7,8,9-HpCDF	ND	-----	0.99				
Total HpCDF	4.30	-----	-----	J			
1,2,3,4,6,7,8-HpCDD	-----	1.60	0.86	I			
Total HpCDD	ND	-----	-----				
OCDF	6.50	-----	1.20	J			
OCDD	-----	8.30	0.74	I			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection. Totals are averages of individual isomer LODs.
A = Limit of Detection based on signal to noise
P = Recovery outside of method 1613 control limits
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....106475

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 1613B Laboratory Control Spike Results

Client - Del Mar Analytical

Lab Sample ID	LCS-6242		
Filename	U50202B_02	Matrix	Water
Total Amount Extracted	1040 mL	Dilution	NA
ICAL Date	01/26/2005	Extracted	01/31/2005
CCal Filename	U50202B_01	Analyzed	02/02/2005 20:28
Method Blank ID	BLANK-6241	Injected By	SMT

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDF	10	8.8	7.5	15.8	88
2,3,7,8-TCDD	10	8.6	6.7	15.8	86
1,2,3,7,8-PeCDF	50	43.6	40.0	67.0	87
2,3,4,7,8-PeCDF	50	42.3	34.0	80.0	85
1,2,3,7,8-PeCDD	50	38.0	35.0	71.0	76
1,2,3,4,7,8-HxCDF	50	39.1	36.0	67.0	78
1,2,3,6,7,8-HxCDF	50	42.0	42.0	65.0	84
2,3,4,6,7,8-HxCDF	50	40.4	35.0	78.0	81
1,2,3,7,8,9-HxCDF	50	39.6	39.0	65.0	79
1,2,3,4,7,8-HxCDD	50	43.2	35.0	82.0	86
1,2,3,6,7,8-HxCDD	50	42.9	38.0	67.0	86
1,2,3,7,8,9-HxCDD	50	45.4	32.0	81.0	91
1,2,3,4,6,7,8-HpCDF	50	44.2	41.0	61.0	88
1,2,3,4,7,8,9-HpCDF	50	46.8	39.0	69.0	94
1,2,3,4,6,7,8-HpCDD	50	41.4	35.0	70.0	83
OCDF	100	79.6	63.0	170.0	80
OCDD	100	85.8	78.0	144.0	86
2,3,7,8-TCDD-37Cl4	10	7.8	3.1	19.1	78
2,3,7,8-TCDF-13C	100	85.1	22.0	152.0	85
2,3,7,8-TCDD-13C	100	80.0	20.0	175.0	80
1,2,3,7,8-PeCDF-13C	100	90.8	21.0	192.0	91
2,3,4,7,8-PeCDF-13C	100	94.3	13.0	328.0	94
1,2,3,7,8-PeCDD-13C	100	102.1	21.0	227.0	102
1,2,3,4,7,8-HxCDF-13C	100	81.8	19.0	202.0	82
1,2,3,6,7,8-HxCDF-13C	100	78.8	21.0	159.0	79
2,3,4,6,7,8-HxCDF-13C	100	83.3	22.0	176.0	83
1,2,3,7,8,9-HxCDF-13C	100	85.0	17.0	205.0	85
1,2,3,4,7,8-HxCDD-13C	100	83.5	21.0	193.0	83
1,2,3,6,7,8-HxCDD-13C	100	71.7	25.0	163.0	72
1,2,3,4,6,7,8-HpCDF-13C	100	76.4	21.0	158.0	76
1,2,3,4,7,8,9-HpCDF-13C	100	67.0	20.0	186.0	67
1,2,3,4,6,7,8-HpCDD-13C	100	73.0	26.0	166.0	73
OCDD-13C	200	148.7	26.0	397.0	74

Cs = Concentration Spiked (ng/mL)
Cr = Concentration Recovered (ng/mL)
Rec. = Recovery (Expressed as Percent)
Control Limit Reference: Method 1613, Table 6, 10/94 Revision
X = Background subtracted value
P = Recovery outside of control limits
Nn = Value obtained from additional analysis
* = See Discussion

Report No.....106475

REPORT OF LABORATORY ANALYSIS

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Pace Analytical™

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 1613B Laboratory Control Spike Results

Client - Del Mar Analytical

Lab Sample ID	LCSD-6243		
Filename	U50202B_03	Matrix	Water
Total Amount Extracted	1030 mL	Dilution	NA
ICAL Date	01/26/2005	Extracted	01/31/2005
CCal Filename	U50202B_01	Analyzed	02/02/2005 21:15
Method Blank ID	BLANK-6241	Injected By	SMT

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDF	10	9.7	7.5	15.8	97
2,3,7,8-TCDD	10	9.4	6.7	15.8	94
1,2,3,7,8-PeCDF	50	46.8	40.0	67.0	94
2,3,4,7,8-PeCDF	50	44.6	34.0	80.0	89
1,2,3,7,8-PeCDD	50	40.7	35.0	71.0	81
1,2,3,4,7,8-HxCDF	50	41.3	36.0	67.0	83
1,2,3,6,7,8-HxCDF	50	44.5	42.0	65.0	89
2,3,4,6,7,8-HxCDF	50	43.6	35.0	78.0	87
1,2,3,7,8,9-HxCDF	50	42.2	39.0	65.0	84
1,2,3,4,7,8-HxCDD	50	49.1	35.0	82.0	98
1,2,3,6,7,8-HxCDD	50	45.6	38.0	67.0	91
1,2,3,7,8,9-HxCDD	50	51.3	32.0	81.0	103
1,2,3,4,6,7,8-HpCDF	50	47.5	41.0	61.0	95
1,2,3,4,7,8,9-HpCDF	50	50.1	39.0	69.0	100
1,2,3,4,6,7,8-HpCDD	50	44.5	35.0	70.0	89
OCDF	100	89.7	63.0	170.0	90
OCDD	100	91.5	78.0	144.0	92
2,3,7,8-TCDD-37Cl4	10	9.3	3.1	19.1	93
2,3,7,8-TCDF-13C	100	100.2	22.0	152.0	100
2,3,7,8-TCDD-13C	100	97.2	20.0	175.0	97
1,2,3,7,8-PeCDF-13C	100	109.5	21.0	192.0	109
2,3,4,7,8-PeCDF-13C	100	114.8	13.0	328.0	115
1,2,3,7,8-PeCDD-13C	100	124.2	21.0	227.0	124
1,2,3,4,7,8-HxCDF-13C	100	93.9	19.0	202.0	94
1,2,3,6,7,8-HxCDF-13C	100	88.8	21.0	159.0	89
2,3,4,6,7,8-HxCDF-13C	100	89.8	22.0	176.0	90
1,2,3,7,8,9-HxCDF-13C	100	96.4	17.0	205.0	96
1,2,3,4,7,8-HxCDD-13C	100	86.2	21.0	193.0	86
1,2,3,6,7,8-HxCDD-13C	100	80.0	25.0	163.0	80
1,2,3,4,6,7,8-HpCDF-13C	100	85.0	21.0	158.0	85
1,2,3,4,7,8,9-HpCDF-13C	100	80.0	20.0	186.0	80
1,2,3,4,6,7,8-HpCDD-13C	100	81.7	26.0	166.0	82
OCDD-13C	200	177.3	26.0	397.0	89

Cs = Concentration Spiked (ng/mL)
Cr = Concentration Recovered (ng/mL)
Rec. = Recovery (Expressed as Percent)
Control Limit Reference: Method 1613, Table 6, 10/94 Revision
X = Background subtracted value
P = Recovery outside of control limits
Nn = Value obtained from additional analysis
* = See Discussion

Report No.....106475

REPORT OF LABORATORY ANALYSIS

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www.pacelabs.com

Pace Analytical Services, Inc.
1700 Elm Street
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444

SPIKE RECOVERY RELATIVE PERCENT DIFFERENCE (RPD) RESULTS

Client..... Del Mar Analytical

SPIKE 1 ID..... LCS-6242
SPIKE 1 Filename..... U50202B_02
SPIKE 2 ID..... LCSD-6243
SPIKE 2 Filename..... U50202B_03

COMPOUND	SPIKE 1 REC,%	SPIKE 2 REC,%	RPD,%
2378-TCDF	88	97	9.7
2378-TCDD	86	94	8.9
12378-PeCDF	87	94	7.7
23478-PeCDF	85	89	4.6
12378-PeCDD	76	81	6.4
123478-HxCDF	78	83	6.2
123678-HxCDF	84	89	5.8
234678-HxCDF	81	87	7.1
123789-HxCDF	79	84	6.1
123478-HxCDD	86	98	13.0
123678-HxCDD	86	91	5.6
123789-HxCDD	91	103	12.4
1234678-HpCDF	88	95	7.7
1234789-HpCDF	94	100	6.2
1234678-HpCDD	83	89	7.0
OCDF	80	90	11.8
OCDD	86	92	6.7

REC = Percent Recovered
RPD = The difference between the two values divided by the average.
NA = Not Applicable

Report No..... 106475

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Pace Analytical Services, Inc.
1700 Elm Street
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444

TABLE 1. 2,3,7,8-TCDD Equivalency Factors (TEFs) for the Polychlorinated Dibenzo-p-dioxins and Dibenzofurans

Number	Compound(s)	TEF
1	2,3,7,8-TCDD	1.00
2	1,2,3,7,8-PeCDD	0.50
3	1,2,3,6,7,8-HxCDD	0.1
4	1,2,3,7,8,9-HxCDD	0.1
5	1,2,3,4,7,8-HxCDD	0.1
6	1,2,3,4,6,7,8-HpCDD	0.01
7	OCDD	0.001
8	* Total - TCDD	0.0
9	* Total - PeCDD	0.0
10	* Total - HxCDD	0.0
11	* Total - HpCDD	0.0
12	2,3,7,8-TCDF	0.10
13	1,2,3,7,8-PeCDF	0.05
14	2,3,4,7,8-PeCDF	0.5
15	1,2,3,6,7,8-HxCDF	0.1
16	1,2,3,7,8,9-HxCDF	0.1
17	1,2,3,4,7,8-HxCDF	0.1
18	2,3,4,6,7,8-HxCDF	0.1
19	1,2,3,4,6,7,8-HpCDF	0.01
20	1,2,3,4,7,8,9-HpCDF	0.01
21	OCDF	0.001
22	* Total - TCDF	0.0
23	* Total - PeCDF	0.0
24	* Total - HxCDF	0.0
25	* Total - HpCDF	0.0

*Excluding the 2,3,7,8-substituted congeners.

Reference: 1989 ITEFs

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Del Mar Analytical

17461 Derian Ave. Suite 100, Irvine, CA 92614 Ph (949) 261-1022 Fax (949) 261-1228
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9484 Chesapeake Drive, Suite 805, San Diego, CA 92123 Ph (619) 505-9596 Fax (619) 505-9689
9830 South 51st Street, Suite B-120, Phoenix, AZ 85044 Ph (480) 785-0043 Fax (480) 785-0851
2520 E. Sunset Rd., Suite #3, Las Vegas, NV 89120 Ph (702) 798-3620 Fax (702) 798-3621

SUBCONTRACT ORDER - PROJECT # IOA0999

10647B

SENDING LABORATORY:
Del Mar Analytical, Irvine
17461 Derian Avenue. Suite 100
Irvine, CA 92614
Phone: (949) 261-1022
Fax: (949) 261-1228
Project Manager: Michele Harper

RECEIVING LABORATORY:
Pace Analytical, MN- SUB
1700 Elm Street, Ste 200
Minneapolis, MN 55414
Phone :(612) 607-1700
Fax: (612) 607-6444

Standard TAT is requested unless specific due date is requested => Due Date: _____ **Initials:** _____

Analysis	Expiration	Comments
Sample ID: IOA0999-01 Water	**Sampled: 01/18/05 11:21**	
1613-Dioxin-HR	01/25/05 11:21	J flags, 17 congeners, no TEQ, sub to Pace-MN
EDD + Level 4	02/15/05 11:21	Excel EDD email to pm,Include Std logs for Lvl IV

10647800/

Containers Supplied:
1 L Amber (IOA0999-01G)
1 L Amber (IOA0999-01H)

SAMPLE INTEGRITY:

All containers intact: ☐ Yes ☐ No
Custody Seals Present: ☐ Yes ☐ No
Sample labels/COC agree: ☐ Yes ☐ No
Samples Preserved Properly: ☐ Yes ☐ No
Samples Received On Ice:: ☐ Yes ☐ No
Samples Received at (temp): 4.6°C

Released By	Date	Time	Received By	Date	Time
[signature]	1-19-05	1700	[signature]	1.20.05	09:20

Del Mar Analytical

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2520 E. Sunset Rd. #3, Las Vegas, NV 89120 (702) 798-3620 FAX (702) 798-3621

LABORATORY REPORT

Prepared For: MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project: Routine Outfall 002

Sampled: 01/21/05
Received: 01/21/05
Issued: 01/25/05 14:23

NELAP #01108CA CA ELAP #1197 CSDLAC #10117

The results listed within this Laboratory Report pertain only to the samples tested in the laboratory. The analyses contained in this report were performed in accordance with the applicable certifications as noted. All soil samples are reported on a wet weight basis unless otherwise noted in the report. This Laboratory Report is confidential and is intended for the sole use of Del Mar Analytical and its client. This report shall not be reproduced, except in full, without written permission from Del Mar Analytical. The Chain of Custody, 1 page, is included and is an integral part of this report.

This entire report was reviewed and approved for release.

SAMPLE CROSS REFERENCE

LABORATORY ID	CLIENT ID	MATRIX
IOA1335-01	Outfall 002	Water

Reviewed By:

Michele Harper

Del Mar Analytical, Irvine
Michele Harper
Project Manager

Del Mar Analytical

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 002

Report Number: IOA1335

Sampled: 01/21/05
Received: 01/21/05

METALS

Analyte	Method	Batch	MDL Limit	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA1335-01 (Outfall 002 - Water)									
Reporting Units: ug/l									
Mercury	EPA 245.1	5A24044	0.063	0.20	ND	1	01/24/05	01/24/05	

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 002

Report Number: IOA1335

Sampled: 01/21/05
Received: 01/21/05

METHOD BLANK/QC DATA

METALS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A24044 Extracted: 01/24/05											
Blank Analyzed: 01/24/2005 (5A24044-BLK1)											
Mercury	ND	0.20	0.063	ug/l							
LCS Analyzed: 01/24/2005 (5A24044-BS1)											
Mercury	8.57	0.20	0.063	ug/l	8.00		107	85-115			
Matrix Spike Analyzed: 01/24/2005 (5A24044-MS1)						**Source: IOA1305-06**					
Mercury	8.28	0.20	0.063	ug/l	8.00	ND	104	70-130			
Matrix Spike Dup Analyzed: 01/24/2005 (5A24044-MSD1)						**Source: IOA1305-06**					
Mercury	8.45	0.20	0.063	ug/l	8.00	ND	106	70-130	2	20	

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Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 002

Report Number: IOA1335

Sampled: 01/21/05
Received: 01/21/05

Compliance Check

The results obtained from the analytical testing of this data set were checked against compliance limits received from the client. Any results at or above the compliance limits appear in bold on this page.

LabNumber	Analysis	Analyte	Units	Result	MRL	Compliance Limit
IOA1335-01	Mercury - 245.1	Mercury	ug/l	0.0027	0.20	0.20

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 002

Report Number: IOA1335

Sampled: 01/21/05
Received: 01/21/05

DATA QUALIFIERS AND DEFINITIONS

ND Analyte NOT DETECTED at or above the reporting limit or MDL, if MDL is specified.

RPD Relative Percent Difference

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 002

Report Number: IOA1335

Sampled: 01/21/05
Received: 01/21/05

Certification Summary

Del Mar Analytical, Irvine

Method	Matrix	NELAP	CA
EPA 245.1	Water	X	X

NV and NELAP provide analyte specific accreditations. Analyte specific information for Del Mar Analytical may be obtained by contacting the laboratory or visiting our website at www.dmalabs.com.

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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SSFL ANALYTICAL — CHAIN OF CUSTODY FORM

205

Project: SSFL OUTFALL

Project Manager/Phone Number: KELLY 818-586-5431

Sampler: POLLOCK

ANALYSIS REQUIRED

Boeing Log#	Sample Description	Sample Matrix	Container Type	# of Containers	Sampling Date/Time	Preservation	MERCURY			IOA1335 Sampler's ID#
	OUTFALL #2	W	PLASTIC	1	1-21-05 15:35	HNO3	✓			1 L Poly
	OUTFALL #1	W	"	1	" 15:50	"	✓			

Relinquished By: [signature] Date/Time: 1-21-05 15:59

Received By: [signature] Date/Time: 1/21/05 15:59

Relinquished By: [signature] Date/Time: 1/21/05 1900

Received By: [signature] Date/Time: 1-21-05 19:00

Relinquished By: Date/Time:

Received By: Date/Time:

Turnaround Time: (check)
Same Day _____ 72 Hours _____
24 Hours _____ 5 days _____
48 hours _____ normal _____

Sample Integrity: (Check)
Intact X On Ice: 3°

CONTRACT COMPLIANCE SCREENING FORM FOR HARDCOPY DATA

AMEC Earth & Environmental
550 South Wadsworth Boulevard
Suite 500
Lakewood, CO 80226

Package ID T711DF24
Task Order 313150010
SDG No. Multiple
No. of Analyses 7

Laboratory Pace
Reviewer K. Shadowlight
Analysis/Method Dioxins

Date: February 18, 2005
Reviewer's Signature K Shadowlight

ACTION ITEMS[a]	
1. **Case Narrative Deficiencies**	
2. **Out of Scope Analyses**	
3. **Analyses Not Conducted**	
4. **Missing Hardcopy Deliverables**	
5. **Incorrect Hardcopy Deliverables**	
6. **Deviations from Analysis Protocol, e.g.,**	Qualifications were assigned for the following:
Holding Times	* Method blank contamination
GC/MS Tune/Inst. Performance	* EMPCs
Calibration	* Detects below the lower method calibration level
Method blanks	
Surrogates	
Matrix Spike/Dup LCS	
Field QC	
Internal Standard Performance	
Compound Identification and Quantitation	
System Performance	
COMMENTS[b]	

[a] Subcontracted analytical laboratory is not meeting contract and/or method requirements.
[b] Differences in protocol have been adopted by the laboratory but no action against the laboratory is required.

DATA VALIDATION REPORT

NPDES
Monitoring

ANALYSIS: DIOXINS/FURANS

SAMPLE DELIVERY GROUPS: Multiple SDGs

Prepared by

AMEC—Denver Operations
550 South Wadsworth Boulevard, Suite 500
Lakewood, Colorado 80226

1. INTRODUCTION

Task Order Title:	NPDES Monitoring
Contract Task Order #:	313150010
Sample Delivery Group #:	Multiple
Project Manager:	B. McIlvaine
Matrix:	Water
Analysis:	Dioxins/Furans
QC Level:	Level IV
No. of Samples:	7
No. of Reanalyses/Dilutions:	0
Reviewer:	K. Shadowlight
Date of Review:	February 21, 2005

The samples listed in Table 1 were validated based on the guidelines outlined in the *AMEC Data Validation Procedure for Dioxins and Furans (DVP-19, Rev. 1), EPA Method 1613, and the National National Functional Guidelines For Chlorinated Dioxin/Furan Data Review* (8/02). Any deviations from these procedures and guidelines are documented herein. Qualifiers were applied in cases where the data did not meet the required QC criteria or where special consideration by the data user is required. Data qualifiers were placed on Form Is with the associated qualification codes. Analytes that were rejected for any reason are denoted on the Form I as having only the "R" data qualifier and associated qualification code(s) denoting the reason for rejection. Any additional problems with the data that may have resulted in an estimated value were not denoted by a qualification code since the data had already been rejected.

Table 1. Sample Identification

Client ID	Laboratory ID (Del Mar)	Laboratory ID (Pace)	Matrix	COC Method
Outfall 001	IOA0997-01	106475001	water	1613
Outfall 001	IOA1551-01	106840001	water	1613
Outfall 002	IOA0999-01	106478001	water	1613
Outfall 002	IOA1553-01	106871001	water	1613
Outfall 003	IOA1556-01	106869001	water	1613
Outfall 008	IOA1555-01	10687001	water	1613
Outfall 009	IOA1554-01	106842001	water	1613

2. DATA VALIDATION FINDINGS

2.1 SAMPLE MANAGEMENT

Following are findings associated with sample management:

2.1.1 Sample Preservation, Handling, and Transport

The samples in these SDGs were received at Del Mar Analytical within the temperature limits of 4°C ±2°C. The samples were subcontracted to Pace Analytical for the dioxin/furan analyses. The samples in these SDGs were received at Pace Analytical Services below the temperature limits of 4°C ± 2°C, at 1.8°C; however, as the samples were not noted to have been frozen or damaged, no qualifications were required. No qualifications were required.

2.1.2 Chain of Custody

The COCs and transfer COCs were signed by the appropriate field and laboratory personnel. The samples and analyses were accounted for on both the original COCs and transfer COCs. As the samples were couriered directly to the laboratory (Del Mar Analytical), custody seals were not required. There was no information regarding custody seals upon receipt at Pace. No qualifications were required.

2.1.3 Holding Times

The samples were extracted and analyzed within a year of collection. No qualifications were required.

2.2 INSTRUMENT PERFORMANCE

Following are findings associated with instrument performance:

2.2.1 GC Column Performance

A column performance standard was combined with the daily calibration verification and analyzed at the beginning of each analytical sequence. The GC column performance was acceptable with the chromatographic separation of 2,3,7,8-TCDD and other TCDD isomers resolved with a valley of ≤25%. No qualifications were required.

2.2.2 Mass Spectrometer Performance

The mass spectrometer performance could not be evaluated as the laboratory did not provide selected ion current profiles for the lock-mass ions. No qualifications were required.

2.3 CALIBRATION

2.3.1 Initial Calibration

There were two initial calibrations, analyzed 11/29/04 on instrument 10MSHR05 and 01/26/05 on instrument 10MSHR06. The calibrations consisted of five concentration level standards (CS1 through CS5) analyzed to verify instrument linearity. The initial calibrations were acceptable with %RSDs ≤20% for the 15 native compounds (calibration by isotope dilution) and ≤35% for the 2 native and all labeled compounds (calibration by internal standard). The relative retention times and ion abundance ratios were within the QC limits listed in Method 1613 for all standards. A representative number of %RSDs were verified from the raw data, and no calculation or transcription errors were noted. No qualifications were required.

2.3.2 Continuing Calibration

Calibration verification (VER) consisted of a mid-level standard (CS3) analyzed at the beginning of each analytical sequence. The VER was acceptable with the concentrations within the acceptance criteria listed in the Table 6 of the EPA Method 1613. The ion abundance ratios and relative retention times were within the method QC limits. A representative number of %Ds were verified from the raw data, and no calculation or transcription errors were noted. No qualifications were required.

2.4 BLANKS

One method blank (Blank-6241) was extracted and analyzed with the samples in these SDGs. Target compounds 1,2,3,6,7,8-HxCDF, total HxCDF, total HpCDF, 1,2,3,4,6,7,8-HpCDD, total HpCDD, and OCDF were reported in the method blank. Any detects for the aforementioned target compounds reported at concentrations <5× the concentrations reported in the method blank were qualified as estimated nondetects "UJ," at the levels of interference in the samples of these SDGs. The detect for total TCDF was qualified as estimated, "J," in sample Outfall 002 (IOA0999-01), as a portion of the total concentration was attributed to method blank contamination. Target compounds 1,2,3,4,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, and OCDD were reported as EMPCs in the method blank. A review of the method blank raw data and chromatograms indicated no false negatives or false positives. No further qualifications were required.

2.5 BLANK SPIKES AND LABORATORY CONTROL SAMPLES

One LCS/LCSD pair (LCS-6242/LCSD-6243) was extracted and analyzed with the samples in these SDGs. All recoveries were within the acceptance criteria listed in Table 6 of the Method 1613. There are no method QC limits established for RPDs. The reported RPDs were within ±20%. No qualifications were required.

2.6 MATRIX SPIKE/MATRIX SPIKE DUPLICATE

MS/MSD analyses were not performed in these SDGs. Evaluation of method accuracy and precision was based on the LCS/LCSD results. No qualifications were required.

2.7 FIELD QC SAMPLES

Following are findings associated with field QC:

2.7.1 Field Blanks and Equipment Rinsates

The samples in these SDGs had no associated field QC samples. No qualifications were required.

2.7.2 Field Duplicates

No field duplicate samples were identified for these SDGs.

2.8 INTERNAL STANDARDS

The labeled standard recoveries were within the acceptance criteria listed in Table 7 of Method 1613. No qualifications were required.

2.9 COMPOUND IDENTIFICATION

The laboratory analyzed for polychlorinated dioxins/furans by EPA Method 1613. The compound identifications were verified from the raw data and no false negatives or positives were noted. No qualifications were required.

2.10 COMPOUND QUANTIFICATION AND REPORTED DETECTION LIMITS

Compound quantitation was verified from the raw data. The laboratory calculated and reported compound-specific detection limits. Any detects below the lower method calibration limit (MCL) were qualified as estimated, "J." Any reported EMPC was qualified as an estimated nondetect, "UJ." No further qualifications were required.

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 1613B Analysis Results

Client - Del Mar Analytical

Client's Sample ID	IOA1553-01 Outfall 002		
Lab Sample ID	106871001		
Filename	F50204A_07		
Injected By	MRO		
Total Amount Extracted	1050 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	01/26/2005
ICAL Date	11/29/2004	Received	01/28/2005
CCal Filename(s)	F50203A_20	Extracted	01/31/2005
Method Blank ID	BLANK-6241	Analyzed	02/04/2005 14:59

Native Isomers	Conc pg/L	EMPC pg/L	LOD pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	1.20	2,3,7,8-TCDF-13C	2.00	74
Total TCDF	ND	-----	1.20	2,3,7,8-TCDD-13C	2.00	80
				1,2,3,7,8-PeCDF-13C	2.00	82
2,3,7,8-TCDD	ND	-----	1.10	2,3,4,7,8-PeCDF-13C	2.00	93
Total TCDD	ND	-----	1.10	1,2,3,7,8-PeCDD-13C	2.00	103
				1,2,3,4,7,8-HxCDF-13C	2.00	79
1,2,3,7,8-PeCDF	ND	-----	0.80	1,2,3,6,7,8-HxCDF-13C	2.00	87
2,3,4,7,8-PeCDF	ND	-----	0.68	2,3,4,6,7,8-HxCDF-13C	2.00	83
Total PeCDF	ND	-----	0.74	1,2,3,7,8,9-HxCDF-13C	2.00	84
				1,2,3,4,7,8-HxCDD-13C	2.00	80
1,2,3,7,8-PeCDD	ND	-----	0.82	1,2,3,6,7,8-HxCDD-13C	2.00	79
Total PeCDD	ND	-----	0.82	1,2,3,4,6,7,8-HpCDF-13C	2.00	78
				1,2,3,4,7,8,9-HpCDF-13C	2.00	76
1,2,3,4,7,8-HxCDF	ND	-----	0.49	1,2,3,4,6,7,8-HpCDD-13C	2.00	89
1,2,3,6,7,8-HxCDF	ND	-----	0.48	OCDD-13C	4.00	85
2,3,4,6,7,8-HxCDF	ND	-----	0.61			
1,2,3,7,8,9-HxCDF	ND	-----	0.40	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	-----	0.50	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	0.58	2,3,7,8-TCDD-37Cl4	0.20	74
1,2,3,6,7,8-HxCDD	ND	-----	0.49			
1,2,3,7,8,9-HxCDD	ND	-----	0.51			
Total HxCDD	ND	-----	0.53			
1,2,3,4,6,7,8-HpCDF	ND	-----	0.63			
1,2,3,4,7,8,9-HpCDF	ND	-----	0.59			
Total HpCDF	2.2	-----	0.61 BJ			
1,2,3,4,6,7,8-HpCDD	1.6	-----	0.38 J			
Total HpCDD	2.6	-----	0.38 J			
OCDF	-----	3.2	0.90 I			
OCDD	12.0	-----	1.10 J			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection. Totals are averages of individual isomer LODs.
D = Result obtained from analysis of diluted sample
B = Less than 10 times higher than method blank level
P = Recovery outside of method 1613 control limits
J = Concentration detected is below the calibration range
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....106871

REPORT OF LABORATORY ANALYSIS

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CONTRACT COMPLIANCE SCREENING FORM FOR HARDCOPY DATA

AMEC Earth & Environmental
550 South Wadsworth Boulevard
Suite 500
Lakewood, CO 80226

Laboratory Del Mar
Reviewer M. Pokorny
Analysis/Method Volatiles

Package ID T711VO52
Task Order 313150010
SDG No. IOA1551, 1553
No. of Analyses 4

Date: March 7, 2005
Reviewer's Signature M. Pokorny

ACTION ITEMS[a]	
1. **Case Narrative Deficiencies**	
2. **Out of Scope Analyses**	
3. **Analyses Not Conducted**	
4. **Missing Hardcopy Deliverables**	
5. **Incorrect Hardcopy Deliverables**	
6. **Deviations from Analysis Protocol, e.g.,**	Qualifications were required for calibration outliers.
Holding Times	
GC/MS Tune/Inst. Perform	
Calibrations	
Blanks	
Surrogates	
Matrix Spike/Dup LCS	
Field QC	
Internal Standard Performance	
Compound Identification and Quantitation	
System Performance	
COMMENTS[b]	

[a] Subcontracted analytical laboratory is not meeting contract and/or method requirements.
[b] Differences in protocol have been adopted by the laboratory but no action against the laboratory is required.

DATA VALIDATION REPORT

NPDES Monitoring

ANALYSIS: VOLATILES

SAMPLE DELIVERY GROUPs: IOA1551, IOA1553

Prepared by

AMEC Denver Operations
550 South Wadsworth Boulevard, Suite 500
Lakewood, Colorado 80226

1. INTRODUCTION

Task Order Title:	NPDES Monitoring
Contract Task Order #:	313150010
SDG#:	IOA1551, IOA1553
Project Manager:	B. McIlvaine
Matrix:	Water
Analysis:	Volatiles
QC Level:	Level IV
No. of Samples:	4
No. of Reanalyses/Dilutions:	0
Reviewer:	M. Pokorny
Date of Review:	March 7, 2005

The samples listed in Table 1 were validated based on the guidelines outlined in the *AMEC Data Validation Procedure for Levels C and D Volatile Organics (DVP-2, Rev. 2), EPA Method 624,* and the *National Functional Guidelines For Organic Data Review* (2/94). Any deviations from these procedures are documented herein. Qualifiers were applied in cases where the data did not meet the required QC criteria or where special consideration by the data user is required. Data qualifiers were placed on Form Is with the associated qualification codes. Analytes that were rejected for any reason are denoted on the summary forms as having only the "R" data qualifier and associated qualification code(s) denoting the reason for rejection. Any additional problems with the data that may have resulted in an estimated value were not denoted by a qualification code since the data had already been rejected.

Table 1. Sample identification

Client ID	EPA ID	Lab No.	Matrix	Method
Outfall 001	Outfall 001	IOA1551-01	water	624
TRIP BLANK	TRIP BLANK	IOA1551-02	water	624
Outfall 002	Outfall 002	IOA1553-01	water	624
TRIP BLANK	TRIP BLANK	IOA1553-02	water	624

2. DATA VALIDATION FINDINGS

2.1 SAMPLE MANAGEMENT

The following are findings associated with sample management:

2.1.1 Sample Preservation, Handling, and Transport

The samples in these SDGs were received at the laboratory within the temperature limits of 4°C ± 2°C. According to the COCs, the samples were received intact, without headspace, and in good condition. No qualifications were required.

2.1.2 Chain of Custody

The COCs were signed by field and laboratory personnel and accounted for the analyses presented in these SDGs. As the samples were couriered to the laboratory, custody seals are not required. No qualifications were required.

2.1.3 Holding Times

The samples were analyzed within 14 days of collection. No qualifications were required.

2.2 GC/MS TUNING

The ion abundance windows shown on the quantitation report were consistent with those specified in the EPA Method 624. All ion abundances were within the established windows and were therefore acceptable. The samples and associated QC were analyzed within 12 hours of the BFB injection times. The Form Vs were verified from the raw data and no discrepancies between the summary forms and the raw data were noted. No qualifications were required.

2.3 CALIBRATION

Two initial calibrations, dated 01/05/05 and 01/26/05, were associated with these SDGs. The average RRFs were ≥0.05 and the %RSDs were ≤35% for the target compounds listed on the sample summary forms for both initial calibrations. Two continuing calibrations, dated 01/31/05 and 02/01/05, were associated with this SDG. The RRFs for all target compounds were ≥0.05 and the %Ds were ≤20% except for the %Ds for 1,2-dichloroethane and 1,1,2-trichloroethane in the continuing calibration dated 01/31/05. 1,2-Dichloroethane and 1,1,2-trichloroethane were qualified as estimated nondetects, "UJ," in both of the site samples of these SDGs. A representative number of %RSDs and average RRFs from the initial calibration, and %Ds and RRFs from the continuing calibration were recalculated from the raw data, and no calculation or transcription errors were found. No further qualifications were required.

2.4 BLANKS

Two water method blanks (5A31022-BLK1 and 5B01008-BLK1) were associated with these SDGs. No target compounds were reported in the method blanks. The method blank raw data showed no evidence of false negatives. No qualifications were required.

2.5 BLANK SPIKES AND LABORATORY CONTROL SAMPLES

Two water blank spikes (5A31022-BS1 and 5B01008-BS1) were associated with these SDGs. All spike recoveries were within the laboratory-established QC limits. A representative number of recoveries were recalculated from the raw data and no calculation or transcription errors were found. No qualifications were required.

2.6 SURROGATE RECOVERY

The surrogates were within the QC limits of 80-120%. A representative number of surrogate recoveries were recalculated from the raw data and no calculation or transcription errors were found. No qualifications were required.

2.7 MATRIX SPIKE/MATRIX SPIKE DUPLICATE

Samples Outfall 001 and TRIP BLANK (IOA1553-02) were analyzed as the MS/MSDs performed with these SDGs; however, as sample TRIP BLANK was identified as a field QC sample the MS/MSD was not evaluated for that sample. All percent recoveries and RPDs were within the QC limits. No qualifications were required.

2.8 FIELD QC SAMPLES

Field QC samples were evaluated, and if necessary, qualified based on method blanks and other laboratory QC results affecting the usability of the field QC data. Any remaining detects were used to evaluate the associated site sample. Following are findings associated with field QC samples:

2.8.1 Trip Blanks

Samples TRIP BLANK (IOA1551-02) and TRIP BLANK (IOA1553-02) were the trip blanks associated with these SDGs. No target compounds were reported in the trip blanks. No qualifications were required.

2.8.2 Field Blanks and Equipment Rinsates

There were no field QC samples associated with this SDG. No qualifications were required.

2.8.3 Field Duplicates

There were no field duplicate samples associated with this SDG.

2.9 INTERNAL STANDARDS PERFORMANCE

Internal standard area counts and retention times for these SDGs were within the control limits established by the continuing calibration standards, of +100%/-50% for internal standard areas and ±0.50 minutes for retention times. A representative number of internal standard areas and retention times were verified from the raw data, and no calculation or transcription errors were noted. No qualifications were required.

2.10 COMPOUND IDENTIFICATION

Target compound identification was verified at a Level IV data validation. The laboratory analyzed for a subset of volatile target compounds by EPA Method 624. Chromatograms, retention times, and spectra for the sample and QC were examined and no target compound identification problems were noted. No qualifications were required.

2.11 COMPOUND QUANTIFICATION AND REPORTED DETECTION LIMITS

Compound quantification is verified at a Level IV data validation. The reporting limits were supported by the lowest concentrations of the initial calibration standards and by the MDL study. Compound quantitation was verified by recalculating sample detects, and/or a representative number of blank spike and surrogate recoveries from the raw data. No calculation or transcription errors were noted. No qualifications were required.

2.12 TENTATIVELY IDENTIFIED COMPOUNDS

The laboratory did not provide TICs for these SDGs. No qualifications were required.

2.13 SYSTEM PERFORMANCE

A review of the chromatograms and other raw data showed no identifiable problems with system performance. No qualifications were required.

Del Mar Analytical

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 002

Report Number: IOA1553

Sampled: 01/26/05
Received: 01/25/05

DRAFT: PURGEABLES BY GC/MS (EPA 624)

Analyte	Method	Batch	MDL	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers	REV QUAL	QUAL CODE
Sample ID: IOA1553-01 (DRAFT: Outfall 002 - Water)											
Reporting Units: ug/l											
Benzene	EPA 624	5A31022	0.28	2.0	ND	1	01/31/05	02/01/05		U	
Carbon tetrachloride	EPA 624	5A31022	0.28	5.0	ND	1	01/31/05	02/01/05			
Chloroform	EPA 624	5A31022	0.33	2.0	ND	1	01/31/05	02/01/05			
1,1-Dichloroethane	EPA 624	5A31022	0.27	2.0	ND	1	01/31/05	02/01/05			
1,2-Dichloroethane	EPA 624	5A31022	0.28	2.0	ND	1	01/31/05	02/01/05		UJ	C
1,1-Dichloroethene	EPA 624	5A31022	0.32	3.0	ND	1	01/31/05	02/01/05		U	
Ethylbenzene	EPA 624	5A31022	0.25	2.0	ND	1	01/31/05	02/01/05			
Tetrachloroethene	EPA 624	5A31022	0.32	2.0	ND	1	01/31/05	02/01/05			
Toluene	EPA 624	5A31022	0.36	2.0	ND	1	01/31/05	02/01/05			
1,1,1-Trichloroethane	EPA 624	5A31022	0.30	2.0	ND	1	01/31/05	02/01/05			
1,1,2-Trichloroethane	EPA 624	5A31022	0.30	2.0	ND	1	01/31/05	02/01/05		UJ	C
Trichloroethene	EPA 624	5A31022	0.26	5.0	ND	1	01/31/05	02/01/05		U	
Trichlorofluoromethane	EPA 624	5A31022	0.34	5.0	ND	1	01/31/05	02/01/05			
Vinyl chloride	EPA 624	5A31022	0.26	5.0	ND	1	01/31/05	02/01/05			
Xylenes, Total	EPA 624	5A31022	0.52	4.0	ND	1	01/31/05	02/01/05			
Surrogate: Dibromofluoromethane (80-120%)					*99 %*						
Surrogate: Toluene-d8 (80-120%)					*97 %*						
Surrogate: 4-Bromofluorobenzene (80-120%)					*92 %*						
Sample ID: IOA1553-02 (DRAFT: Trip Blank - Water)											
Reporting Units: ug/l											
Benzene	EPA 624	5B01008	0.28	2.0	ND	1	02/01/05	02/01/05		U	
Carbon tetrachloride	EPA 624	5B01008	0.28	5.0	ND	1	02/01/05	02/01/05			
Chloroform	EPA 624	5B01008	0.33	2.0	ND	1	02/01/05	02/01/05			
1,1-Dichloroethane	EPA 624	5B01008	0.27	2.0	ND	1	02/01/05	02/01/05			
1,2-Dichloroethane	EPA 624	5B01008	0.28	2.0	ND	1	02/01/05	02/01/05			
1,1-Dichloroethene	EPA 624	5B01008	0.32	3.0	ND	1	02/01/05	02/01/05			
Ethylbenzene	EPA 624	5B01008	0.25	2.0	ND	1	02/01/05	02/01/05			
Tetrachloroethene	EPA 624	5B01008	0.32	2.0	ND	1	02/01/05	02/01/05			
Toluene	EPA 624	5B01008	0.36	2.0	ND	1	02/01/05	02/01/05			
1,1,1-Trichloroethane	EPA 624	5B01008	0.30	2.0	ND	1	02/01/05	02/01/05			
1,1,2-Trichloroethane	EPA 624	5B01008	0.30	2.0	ND	1	02/01/05	02/01/05			
Trichloroethene	EPA 624	5B01008	0.26	5.0	ND	1	02/01/05	02/01/05			
Trichlorofluoromethane	EPA 624	5B01008	0.34	5.0	ND	1	02/01/05	02/01/05			
Vinyl chloride	EPA 624	5B01008	0.26	5.0	ND	1	02/01/05	02/01/05			
Xylenes, Total	EPA 624	5B01008	0.52	4.0	ND	1	02/01/05	02/01/05			
Surrogate: Dibromofluoromethane (80-120%)					*118 %*						
Surrogate: Toluene-d8 (80-120%)					*103 %*						
Surrogate: 4-Bromofluorobenzene (80-120%)					*100 %*						

DRAFT REPORT
DRAFT REPORT
DATA SUBJECT TO CHANGE

AMEC VALIDATED

LEVEL IV

The data in person only to the samples tested at the laboratory. This report shall not be reproduced except in full, without written permission from Del Mar Analytical.

CONTRACT COMPLIANCE SCREENING FORM FOR HARDCOPY DATA

AMEC Earth & Environmental
550 South Wadsworth Boulevard
Suite 500
Lakewood, CO 80226

Laboratory Del Mar Analytical
Reviewer L. Jarusewic
Analysis/Method General Minerals

Package ID T711WC69
Task Order 313150010
SDG No. IOA1551 &IOA1553
No. of Analyses 2

Date: 03/07/05
Reviewer's Signature

ACTION ITEMS[a]	
1. **Case Narrative Deficiencies**	
2. **Out of Scope Analyses**	
3. **Analyses Not Conducted**	
4. **Missing Hardcopy Deliverables**	
5. **Incorrect Hardcopy Deliverables**	
6. **Deviations from Analysis Protocol, e.g.,**	
Holding Times	
GC/MS Tune/Inst. Performance	
Calibrations	
Blanks	
Surrogates	
Matrix Spike/Dup LCS	
Field QC	
Internal Standard Performance	
Compound Identification and Quantitation	
System Performance	

COMMENTS[b]	Acceptable as reviewed.

[a] Subcontracted analytical laboratory is not meeting contract and/or method requirements.
[b] Differences in protocol have been adopted by the laboratory but no action against the laboratory is required.

DATA VALIDATION REPORT

NPDES Monitoring

ANALYSIS: GENERAL MINERALS

SAMPLE DELIVERY GROUPS: IOA1551 & IOA1553

Prepared by

AMEC—Denver Operations
550 South Wadsworth Boulevard, Suite 500
Lakewood, Colorado 80226

1. INTRODUCTION

Task Order Title:	NPDES Monitoring
Contract Task Order #:	313150010
Sample Delivery Group #:	IOA1551 & IOA1553
Project Manager:	B. McIlvaine
Matrix:	Water
Analysis:	General Minerals
QC Level:	Level IV
No. of Samples:	2
Reviewer:	L. Jarusewic
Date of Review:	March 7, 2005

The sample listed in Table 1 was validated based on the guidelines outlined in the AMEC *Data Validation Procedures* SOP DVP-6, Rev. 2, *USEPA Methods for Chemical Analysis of Water and Wastes Method 350.2 and 120.1,* and validation guidelines outlined in the USEPA *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (2/94).* Any deviations from these procedures and guidelines are documented herein. Qualifiers were applied in cases where the data did not meet the required QC criteria or where special consideration by the data user is required. Data qualifiers were placed on Form Is with the associated qualification codes. Analytes that were rejected for any reason are denoted on the Form I as having only the "R" data qualifier and associated qualification code(s) denoting the reason for rejection. Any additional problems with the data that may have resulted in an estimated value were not denoted by a qualification code since the data had already been rejected.

Table 1. Sample identification

Client ID	EPA ID	Laboratory ID	Matrix	COC Method
Outfall 001	Outfall 001	IOA1551-01	water	General Minerals
Outfall 002	Outfall 002	IOA1553-01	water	General Minerals

2. DATA VALIDATION FINDINGS

2.1 SAMPLE MANAGEMENT

Following are findings associated with sample management:

2.1.1 Sample Preservation, Handling, and Transport

The samples in these SDGs were received at the laboratory within the temperature limits of 4°C ± 2°C. No preservation problems were noted by the laboratory. No qualifications were required.

2.1.2 Chain of Custody

The COCs were signed and dated by field and laboratory personnel, and accounted for the samples and analyses presented in these SDGs. No qualifications were required.

2.1.3 Holding Times

The holding times were assessed by comparing the dates of collection with the dates of analyses. The 28-day analytical holding time for ammonia and conductivity and the 48-hour holding time for turbidity were met. No qualifications were required.

2.2 CALIBRATION

For the turbidity analysis, the initial calibration correlation coefficient was ≥ 0.995. The specific conductance and turbidity ICV and continuing calibration information was acceptable with %Rs within the control limits of 90-110%. For the ammonia titration method, no information regarding the standardization of the titrant was provided; however, as the LCS recovery was within the CCV control limits, no qualifications were required.

2.3 BLANKS

The method blank and CCB results reported on the summary forms and in the raw data for blank analyses associated with the samples were nondetects at the reporting limit. No qualifications were required.

2.4 BLANK SPIKES AND LABORATORY CONTROL SAMPLES

The ammonia laboratory control sample recovery was within the laboratory-established control limits. The LCS is not applicable to turbidity and specific conductance. No qualifications were required.

2.5 SURROGATES RECOVERY

Surrogate recovery is not applicable to the analyses presented in these SDGs.

2.6 LABORATORY DUPLICATES

No MS/MSD or duplicate analyses were performed in association with the samples in these SDGs; therefore, no assessment was made with respect to this criterion.

2.7 MATRIX SPIKE/MATRIX SPIKE DUPLICATE

No MS/MSD analyses were performed in association with the samples in these SDGs; therefore, no assessment was made with respect to this criterion. Method accuracy was evaluated based on LCS results.

2.8 FURNACE ATOMIC ABSORPTION QC

Furnace atomic absorption was not utilized for the analysis of these samples; therefore, furnace atomic absorption QC is not applicable.

2.9 ICP SERIAL DILUTION

ICP serial dilution is not applicable to the analyses presented in this data validation report.

2.10 SAMPLE RESULT VERIFICATION

A Level IV review was performed for the samples in this data package. Calculations were verified, and the sample results reported on the Form Is were verified against the raw data. No transcription errors or calculations errors were noted. No qualifications were required.

2.11 FIELD QC SAMPLES

Field QC samples are evaluated, and if necessary, qualified based only on laboratory blanks. Any remaining detects are used to evaluate the associated samples. The following are findings associated with field QC samples:

2.11.1 Field Blanks and Equipment Rinsates

The samples in these SDGs had no associated field QC samples. No qualifications were required.

2.11.2 Field Duplicates

There were no field duplicate pairs associated with these SDGs.

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9830 South 51st St., Suite B-120, Phoenix, AZ 85044 (480) 785-0043 FAX (480) 785-0851
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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 002

Report Number: IOA1553

Sampled: 01/26/05
Received: 01/26/05

DRAFT: INORGANICS

Analyte	Method	Batch	MDL	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA1553-01 (DRAFT: Outfall 002 - Water)									
Reporting Units: mg/l									
Ammonia-N (Distilled)	EPA 350.2	5A28077	0.30	0.50	ND	1	01/28/05	01/28/05	U
Sample ID: IOA1553-01 (DRAFT: Outfall 002 - Water)									
Reporting Units: NTU									
Turbidity	EPA 180.1	5A27057	0.040	1.0	**4.2**	1	01/27/05	01/27/05	
Sample ID: IOA1553-01 (DRAFT: Outfall 002 - Water)									
Reporting Units: umhos/cm									
Specific Conductance	EPA 120.1	5A28087	1.0	1.0	**1000**	1	01/28/05	01/28/05	

REV QUAL CODE

AMEC VALIDATED

LEVEL IV

DRAFT REPORT
DRAFT REPORT
DATA SUBJECT TO CHANGE

The results pertain only to the samples tested in the laboratory. This report shall not be reproduced, except in full, without written permission from Del Mar Analytical.

APPENDIX G

Section 3

January Outfall 003

AMEC Data Validation Reports

Del Mar Analytical Laboratory Reports

CONTRACT COMPLIANCE SCREENING FORM FOR HARDCOPY DATA

AMEC Earth & Environmental
550 South Wadsworth Boulevard
Suite 500
Lakewood, CO 80226

Package ID T711DF20
Task Order 313150010
SDG No. Multiple
No. of Analyses 15

Laboratory Alta
Reviewer K. Shadowlight
Analysis/Method Dioxins

Date: February 11, 2005
Reviewer's Signature K Shadowlight

ACTION ITEMS[a]	
1. **Case Narrative Deficiencies**	
2. **Out of Scope Analyses**	
3. **Analyses Not Conducted**	
4. **Missing Hardcopy Deliverables**	
5. **Incorrect Hardcopy Deliverables**	
6. **Deviations from Analysis Protocol, e.g.,**	Qualifications were assigned for the following:
Holding Times	* Method blank contamination
GC/MS Tune/Inst. Performance	* EMPCs
Calibration	* Detects below the lower method calibration level
Method blanks	
Surrogates	
Matrix Spike/Dup LCS	
Field QC	
Internal Standard Performance	
Compound Identification and Quantitation	
System Performance	
COMMENTS[b]	Kev.

[a] Subcontracted analytical laboratory is not meeting contract and/or method requirements.
[b] Differences in protocol have been adopted by the laboratory but no action against the laboratory is required.

DATA VALIDATION REPORT

NPDES
Monitoring

ANALYSIS: DIOXINS/FURANS

SAMPLE DELIVERY GROUPS: Multiple SDGs

Prepared by

AMEC—Denver Operations
550 South Wadsworth Boulevard, Suite 500
Lakewood, Colorado 80226

1. INTRODUCTION

Task Order Title:	NPDES Monitoring
Contract Task Order #:	313150010
Sample Delivery Group #:	Multiple
Project Manager:	B. McIlvaine
Matrix:	Water
Analysis:	Dioxins/Furans
QC Level:	Level IV
No. of Samples:	15
No. of Reanalyses/Dilutions:	0
Reviewer:	K. Shadowlight
Date of Review:	February 11, 2005

The samples listed in Table 1 were validated based on the guidelines outlined in the *AMEC Data Validation Procedure for Dioxins and Furans (DVP-19, Rev. 1), EPA Method 1613, and the National National Functional Guidelines For Chlorinated Dioxin/Furan Data Review* (8/02). Any deviations from these procedures and guidelines are documented herein. Qualifiers were applied in cases where the data did not meet the required QC criteria or where special consideration by the data user is required. Data qualifiers were placed on Form Is with the associated qualification codes. Analytes that were rejected for any reason are denoted on the Form I as having only the "R" data qualifier and associated qualification code(s) denoting the reason for rejection. Any additional problems with the data that may have resulted in an estimated value were not denoted by a qualification code since the data had already been rejected.

Table 1. Sample Identification

Client ID	Laboratory ID (Del Mar)	Laboratory ID (Pace)	Matrix	COC Method
Outfall 003	IOA0026-01	105648001	water	1613
Outfall 004	IOA0027-01	105646001	water	1613
Outfall 005	IOA0028-01	105645001	water	1613
Outfall 007	IOA0108-01	105774001	water	1613
Outfall 008	IOA0109-01	105775001	water	1613
Outfall 009	IOA0110-01	105770001	water	1613
Outfall 010	IOA0111-01	105758001	water	1613
Outfall 001	IOA0112-01	105778001	water	1613
Outfall 002	IOA0119-01	105772001	water	1613
Outfall 018	IOA0122-01	105779001	water	1613
Outfall 011	IOA0131-01	105773001	water	1613
Outfall 006	IOA0458-01	106048001	water	1613
Outfall 004	IOA0460-01	106050001	water	1613
Outfall 005	IOA0464-01	106052001	water	1613
Outfall 003	IOA0466-01	106051001	water	1613

2. DATA VALIDATION FINDINGS

2.1 SAMPLE MANAGEMENT

Following are findings associated with sample management:

2.1.1 Sample Preservation, Handling, and Transport

All of the samples in these SDGs were received at Del Mar Analytical within the temperature limits of 4°C ±2°C. Several of the samples in these SDGs were received at Pace Analytical Services below the temperature limits of 4°C ±2°C; however, as none of the samples were noted to have been damaged, no qualifications were required. The samples were received in good condition at both laboratories. No qualifications were required.

2.1.2 Chain of Custody

The COC and transfer COC were signed by the appropriate field and laboratory personnel, and accounted for the analyses presented in these SDGs. As the samples were couriered directly to the laboratory (Del Mar Analytical), custody seals were not required. There was no information regarding custody seals upon receipt at Pace. No qualifications were required.

2.1.3 Holding Times

The samples were extracted and analyzed within a year of collection. No qualifications were required.

2.2 INSTRUMENT PERFORMANCE

Following are findings associated with instrument performance:

2.2.1 GC Column Performance

A column performance standard was combined with the daily calibration verification and analyzed at the beginning of each analytical sequence. The GC column performance was acceptable with the chromatographic separation of 2,3,7,8-TCDD and other TCDD isomers resolved with a valley of ≤25%. No qualifications were required.

2.2.2 Mass Spectrometer Performance

The mass spectrometer performance could not be evaluated as the laboratory did not provide selected ion current profiles for the lock-mass ions. No qualifications were required.

2.3 CALIBRATION

2.3.1 Initial Calibration

There was one initial calibration, analyzed 11/29/04 on Instrument 10MSHR05. The calibration consisted of five concentration level standards (CS1 through CS5) analyzed to verify instrument linearity. The initial calibration was acceptable with %RSDs ≤20% for the 15 native compounds (calibration by isotope dilution) and ≤35% for the 2 native and all labeled compounds (calibration by internal standard). The relative retention times and ion abundance ratios were within the QC limits listed in Method 1613 for all standards. A representative number of %RSDs were verified from the raw data, and no calculation or transcription errors were noted. No qualifications were required.

2.3.2 Continuing Calibration

Calibration verification (VER) consisted of a mid-level standard (CS3) analyzed at the beginning of each analytical sequence. The VER was acceptable with the concentrations within the acceptance criteria listed in the Table 6 of the EPA Method 1613. The ion abundance ratios and relative retention times were within the method QC limits. A representative number of %Ds were verified from the raw data, and no calculation or transcription errors were noted. No qualifications were required.

2.4 BLANKS

One method blank (Blank-6202) was extracted and analyzed with the samples in these SDGs. Target compounds 1,2,3,4,6,7,8-HpCDD, total HpCDD, OCDF, and OCDD were reported in the method blank. Any detects for the aforementioned target compounds reported at concentrations <5x the concentrations reported in the method blank were qualified as estimated nondetects "UJ," at the levels of interference in the samples of these SDGs. A review of the method blank raw data and chromatograms indicated no false negatives or false positives. No further qualifications were required.

2.5 BLANK SPIKES AND LABORATORY CONTROL SAMPLES

One LCS/LCSD pair (LCS-6203/LCSD-6204) was extracted and analyzed with the samples in these SDGs. All recoveries were within the acceptance criteria listed in Table 6 of the Method 1613. There were no QC limits established for RPDs. The reported RPDs were within ±20%. No qualifications were required.

2.6 MATRIX SPIKE/MATRIX SPIKE DUPLICATE

MS/MSD analyses were not performed in these SDGs. Evaluation of method accuracy and precision was based on the LCS/LCSD results. No qualifications were required.

2.7 FIELD QC SAMPLES

Following are findings associated with field QC:

2.7.1 Field Blanks and Equipment Rinsates

The samples in these SDGs had no associated field QC samples. No qualifications were required.

2.7.2 Field Duplicates

No field duplicate samples were identified for these SDGs.

2.8 INTERNAL STANDARDS

The labeled standard recoveries were within the acceptance criteria listed in Table 7 of Method 1613. No qualifications were required.

2.9 COMPOUND IDENTIFICATION

The laboratory analyzed for polychlorinated dioxins/furans by EPA Method 1613. The compound identifications were verified from the raw data and no false negatives or positives were noted. No qualifications were required.

2.10 COMPOUND QUANTIFICATION AND REPORTED DETECTION LIMITS

Compound quantitation was verified from the raw data. The laboratory calculated and reported compound-specific detection limits. Any detects below the lower method calibration limit (MCL) were qualified as estimated, "J." Any reported EMPC was qualified as an estimated nondetect, "UJ." No further qualifications were required.

Pace Analytical™

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
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Method 1613B Analysis Results

Client - Del Mar Analytical

Client's Sample ID	IOA0026-01		
Lab Sample ID	105648001		
Filename	F50127A_10		
Injected By	MRO		
Total Amount Extracted	994 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	01/03/2005
ICAL Date	11/29/2004	Received	01/04/2005
CCal Filename(s)	F50127A_02	Extracted	01/24/2005
Method Blank ID	BLANK-6202	Analyzed	01/27/2005 17:34

Native Isomers	Conc pg/L	EMPC pg/L	LOD pg/L		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	2.80		2,3,7,8-TCDF-13C	2.00	60
Total TCDF	ND	-----	2.80		2,3,7,8-TCDD-13C	2.00	71
2,3,7,8-TCDD	ND	-----	2.60		1,2,3,7,8-PeCDF-13C	2.00	83
Total TCDD	ND	-----	2.60		2,3,4,7,8-PeCDF-13C	2.00	86
					1,2,3,7,8-PeCDD-13C	2.00	100
1,2,3,7,8-PeCDF	ND	-----	1.50		1,2,3,4,7,8-HxCDF-13C	2.00	80
2,3,4,7,8-PeCDF	ND	-----	1.20		1,2,3,6,7,8-HxCDF-13C	2.00	101
Total PeCDF	ND	-----	1.30		2,3,4,6,7,8-HxCDF-13C	2.00	97
					1,2,3,7,8,9-HxCDF-13C	2.00	87
1,2,3,7,8-PeCDD	ND	-----	1.50		1,2,3,4,7,8-HxCDD-13C	2.00	75
Total PeCDD	ND	-----	1.50		1,2,3,6,7,8-HxCDD-13C	2.00	98
					1,2,3,4,6,7,8-HpCDF-13C	2.00	90
1,2,3,4,7,8-HxCDF	ND	-----	1.10		1,2,3,4,7,8,9-HpCDF-13C	2.00	79
1,2,3,6,7,8-HxCDF	ND	-----	0.91		1,2,3,4,6,7,8-HpCDD-13C	2.00	103
2,3,4,6,7,8-HxCDF	ND	-----	0.94		OCDD-13C	4.00	100
1,2,3,7,8,9-HxCDF	ND	-----	0.95				
Total HxCDF	1.3	-----	0.98	J	1,2,3,4-TCDD-13C	2.00	NA
					1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	1.60				
1,2,3,6,7,8-HxCDD	ND	-----	1.80		2,3,7,8-TCDD-37Cl4	0.20	70
1,2,3,7,8,9-HxCDD	ND	-----	1.80				
Total HxCDD	ND	-----	1.70				
1,2,3,4,6,7,8-HpCDF	1.7	-----	1.10	J			
1,2,3,4,7,8,9-HpCDF	ND	-----	1.50				
Total HpCDF	5.5	-----	1.30	J			
1,2,3,4,6,7,8-HpCDD	5.8	-----	1.70	BJ			
Total HpCDD	17.0	-----	1.70	BJ			
OCDF	7.4	-----	2.00	BJ			
OCDD	62.0	-----	3.10	BJ			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection. Totals are averages of individual isomer LODs.
D = Result obtained from analysis of diluted sample
B = Less than 10 times higher than method blank level
P = Recovery outside of method 1613 control limits
J = Concentration detected is below the calibration range
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....105648

REPORT OF LABORATORY ANALYSIS

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CONTRACT COMPLIANCE SCREENING FORM FOR HARDCOPY DATA

AMEC Earth & Environmental
550 South Wadsworth Boulevard
Suite 500
Lakewood, CO 80226

Laboratory Del Mar
Reviewer P. Meeks
Analysis/Method Metals

Package ID T711MT21
Task Order 313150010
SDG No. IOA0026
No. of Analyses 1

Date: 02/01/05
Reviewer's Signature P. Meeks

ACTION ITEMS[a]	
1. **Case Narrative Deficiencies**	
2. **Out of Scope Analyses**	
3. **Analyses Not Conducted**	
4. **Missing Hardcopy Deliverables**	
5. **Incorrect Hardcopy Deliverables**	
6. **Deviations from Analysis Protocol, e.g.,**	Qualification applied for lead detected below the reporting limit.
Holding Times	
GC/MS Tune/Inst. Performance	
Calibrations	
Blanks	
Surrogates	
Matrix Spike/Dup LCS	
Field QC	
Internal Standard Performance	
Compound Identification and Quantitation	
System Performance	

COMMENTS[b]	

[a] Subcontracted analytical laboratory is not meeting contract and/or method requirements.
[b] Differences in protocol have been adopted by the laboratory but no action against the laboratory is required.

DATA VALIDATION REPORT

NPDES
Monitoring

ANALYSIS: METALS

SAMPLE DELIVERY GROUP: IOA0026

Prepared by

AMEC—Denver Operations
550 South Wadsworth Boulevard, Suite 500
Lakewood, Colorado 80226

1. INTRODUCTION

Task Order Title:	NPDES Monitoring
Contract Task Order #:	313150010
SDG#:	IOA0026
Project Manager:	B. McIlvaine
Matrix:	Water
Analysis:	Metals
QC Level:	Level IV
No. of Samples:	1
No. of Reanalyses/Dilutions:	0
Reviewer:	P. Meeks
Date of Review:	February 01, 2005

The samples listed in Table 1 were validated based on the guidelines outlined in the *AMEC Data Validation Procedure for Levels III and IV ICP-MS Metals, (DVP-5-A, Rev.0), AMEC Data Validation Procedure for Levels III and IV ICP Metals* (DVP-5, Rev. 0), SW-846 *Method 6020B for Inductively Coupled Plasma – Mass Spectrometry*, SW-846 *Method 6010B for Inductively Coupled Plasma* , SW-846 *Method 7471A for Mercury (Manual Cold-Vapor Technique)*, and validation guidelines outlined in the USEPA CLP *National Functional Guidelines for Inorganic Data Review* (2/94). Any deviations from these procedures and guidelines are documented herein. Qualifiers were applied in cases where the data did not meet the required QC criteria or where special consideration by the data user is required. Data qualifiers were placed on Form Is with the associated qualification codes. Analytes that were rejected for any reason are denoted on the Form I as having only the "R" data qualifier and associated qualification code(s) denoting the reason for rejection. Any additional problems with the data that may have resulted in an estimated value were not denoted by a qualification code since the data had already been rejected.

Table 1. Sample identification

Client ID	EPA ID	Laboratory ID	Matrix	COC Method
Outfall 003	Outfall 003	IOA0026-01	water	ILM04

2. DATA VALIDATION FINDINGS

2.1 SAMPLE MANAGEMENT

Following are findings associated with sample management:

2.1.1 Sample Preservation, Handling, and Transport

The sample in this SDG was received at the laboratory within the temperature limits of 4°C ±2°C. No sample preservation, handling, or transport problems were noted, and no qualifications were necessary.

2.1.2 Chain of Custody

The COC was signed and dated by field and laboratory personnel. The COC listed a duplicate sample for metals analysis for Outfall 003; however, a duplicate analysis was not required. No sample qualifications were required.

2.1.3 Holding Times

The date of collection recorded on the COC and the date of analysis recorded in the raw data, documented that the sample analysis were performed within the specified holding times of six months for the ICP/MS metals. No qualifications were required.

2.2 ICP-MS TUNING

The ICP/MS tuning solution analyses are not included in the raw data package; therefore, the sample is not assessed for this criterion.

2.3 CALIBRATION

The ICV and CCV results showed acceptable recoveries, 90-110% for the ICP/MS. The reporting limit check standard was recovered within the AMEC control limits of 70-130%. No qualifications were required.

2.4 BLANKS

Lead was not detected in the method blank or CCB associated with Outfall 003. No qualifications were required.

2.5 ICP INTERFERENCE CHECK SAMPLE (ICS A/AB)

The results for aluminum, sodium, and potassium were above the calibration range of the instrument in both the ICSA and ICSAB analyses and lead was not spiked into the ICSAB solution. The ICSA/AB recoveries for the spiked analytes were within the control limits of 80-120%. The validator reviewed the raw data for the site sample ICP/MS analysis for the level of reported interferents, Al, Ca, Fe, and Mg, and determined that the concentration of interferents was not high enough to cause matrix affects. No assessment could be made with respect to possible interference from sulfur, phosphorus, carbon, and chloride. No qualifications were required.

2.6 BLANK SPIKES AND LABORATORY CONTROL SAMPLES

The ICP/MS LCS sample was identified as 5A04040-BS1. The LCS result on the summary form and in the raw data were within the laboratory-established ICP/MS control limits of 85-115%. No qualifications were required.

2.7 LABORATORY DUPLICATES

No MS/MSD or duplicate analyses were performed in association with the sample inthis SDG; therefore, no assessment was made with respect to this criterion.

2.8 MATRIX SPIKE

No MS/MSD analyses were performed in association with the sample inthis SDG; therefore, no assessment was made with respect to this criterion. Evaluation of method accuracy was based on the LCS result.

2.9 FURNACE ATOMIC ABSORPTION QC

Furnace atomic absorption was not utilized for the analysis of this sample; therefore, furnace atomic absorption QC is not applicable.

2.10 ICP/MS SERIAL DILUTION

No serial dilution analysis was performed in association with the sample in this SDG; therefore, no assessment was made with respect to this criterion.

2.11 INTERNAL STANDARDS PERFORMANCE

The ICP-MS internal standard recoveries for the site sample and associated QC sample analyses were within the 60-125% control limits and no qualifications were required.

2.12 SAMPLE RESULT VERIFICATION

A Level IV review was performed for the sample in this data package. Calculations were verified, and the sample result reported on the Form I was verified against the raw data. No transcription errors or calculation errors were noted. Lead detected below the reporting limit in Outfall 003 was qualified as estimated, "J." No further qualifications were required.

2.13 FIELD QC SAMPLES

Field QC samples are evaluated, and if necessary, qualified based only on laboratory blanks. Any remaining detects are used to evaluate the associated samples.

2.13.1 Field Blanks and Equipment Rinsates

The sample in this SDG had no associated field QC samples. No qualifications were required.

2.13.2 Field Duplicates

There were no field duplicate analyses performed in association with the site sample reported in this data package.

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2520 E. Sunset Rd. #3, Las Vegas, NV 89120 (702) 798-3620 FAX (702) 798-3621

MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 003

Report Number: IOA0026

Sampled: 01/03/05
Received: 01/03/05

DRAFT: METALS

Analyte	Method	Batch	MDL	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers	Rev Qual	Qual Code
Sample ID: IOA0026-01 (DRAFT: Outfall 003 - Water)											
Reporting Units: ug/l											
Lead	EPA 200.8	5A04040	0.13	1.0	**0.73**	1	01/04/05	01/04/05		J	DNQ

pm 2/1/05

AMEC VALIDATED

LEVEL IV

DRAFT REPORT
DRAFT REPORT
DATA SUBJECT TO CHANGE

The results pertain only to the samples tested in the laboratory. This report shall not be reproduced, except in full, without written permission from Del Mar Analytical.

Del Mar Analytical

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LABORATORY REPORT

Prepared For: MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project: Routine Outfall 003

Sampled: 01/03/05
Received: 01/03/05
Issued: 02/15/05 15:02

NELAP #01108CA CA ELAP #1197 CSDLAC #10117

The results listed within this Laboratory Report pertain only to the samples tested in the laboratory. The analyses contained in this report were performed in accordance with the applicable certifications as noted. All soil samples are reported on a wet weight basis unless otherwise noted in the report. This Laboratory Report is confidential and is intended for the sole use of Del Mar Analytical and its client. This report shall not be reproduced, except in full, without written permission from Del Mar Analytical. The Chain of Custody, 1 page, is included and is an integral part of this report.

This entire report was reviewed and approved for release.

SAMPLE CROSS REFERENCE

SUBCONTRACTED: Refer to the last page for specific subcontract laboratory information included in this report.

LABORATORY ID	CLIENT ID	MATRIX
IOA0026-01	Outfall 003	Water

Reviewed By:

Michele Harper

Del Mar Analytical, Irvine
Michele Harper
Project Manager

Del Mar Analytical

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 003

Report Number: IOA0026

Sampled: 01/03/05
Received: 01/03/05

METALS

Analyte	Method	Batch	MDL Limit	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA0026-01 (Outfall 003 - Water)									
Reporting Units: ug/l									
Antimony	EPA 200.8	5A04040	0.18	2.0	ND	1	01/04/05	01/04/05	
Cadmium	EPA 200.8	5A04040	0.015	1.0	**0.057**	1	01/04/05	01/04/05	J
Copper	EPA 200.8	5A04040	0.49	2.0	**2.3**	1	01/04/05	01/04/05	B
Lead	EPA 200.8	5A04040	0.13	1.0	**0.73**	1	01/04/05	01/04/05	J
Mercury	EPA 245.1	5A04047	0.063	0.20	**0.10**	1	01/04/05	01/04/05	J

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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Attention: Bronwyn Kelly

Project ID: Routine Outfall 003

Report Number: IOA0026

Sampled: 01/03/05
Received: 01/03/05

INORGANICS

Analyte	Method	Batch	MDL	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA0026-01 (Outfall 003 - Water) - cont.									
Reporting Units: mg/l									
Chloride	EPA 300.0	5A03042	0.26	0.50	**4.5**	1	01/03/05	01/03/05	
Nitrate/Nitrite-N	EPA 300.0	5A03042	0.072	0.26	**0.96**	1	01/03/05	01/03/05	
Oil & Grease	EPA 413.1	5A05068	0.94	5.0	**2.0**	1	01/05/05	01/05/05	J
Sulfate	EPA 300.0	5A03042	0.18	0.50	**4.3**	1	01/03/05	01/03/05	
Total Dissolved Solids	SM2540C	5A05071	10	10	**99**	1	01/05/05	01/05/05	

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300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 003

Report Number: IOA0026

Sampled: 01/03/05
Received: 01/03/05

SHORT HOLD TIME DETAIL REPORT

	Hold Time (in days)	Date/Time Sampled	Date/Time Received	Date/Time Extracted	Date/Time Analyzed
Sample ID: Outfall 003 (IOA0026-01) - Water					
EPA 300.0	2	01/03/2005 09:24	01/03/2005 15:00	01/03/2005 16:15	01/03/2005 16:45

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 003

Report Number: IOA0026

Sampled: 01/03/05
Received: 01/03/05

METHOD BLANK/QC DATA

METALS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A04040 Extracted: 01/04/05											
Blank Analyzed: 01/04/2005 (5A04040-BLK1)											
Antimony	ND	2.0	0.18	ug/l							
Cadmium	ND	1.0	0.015	ug/l							
Copper	0.492	2.0	0.49	ug/l							J
Lead	ND	1.0	0.13	ug/l							
LCS Analyzed: 01/04/2005-01/05/2005 (5A04040-BS1)											
Antimony	91.9	2.0	0.18	ug/l	80.0		115	85-115			
Cadmium	84.0	1.0	0.015	ug/l	80.0		105	85-115			
Copper	77.4	2.0	0.49	ug/l	80.0		97	85-115			
Lead	75.7	1.0	0.13	ug/l	80.0		95	85-115			
Matrix Spike Analyzed: 01/04/2005-01/05/2005 (5A04040-MS1)						**Source: IOA0028-01**					
Antimony	95.3	2.0	0.18	ug/l	80.0	ND	119	70-130			
Cadmium	84.9	1.0	0.015	ug/l	80.0	0.026	106	70-130			
Copper	77.6	2.0	0.49	ug/l	80.0	0.71	96	70-130			
Lead	78.4	1.0	0.13	ug/l	80.0	0.19	98	70-130			
Matrix Spike Dup Analyzed: 01/04/2005-01/05/2005 (5A04040-MSD1)						**Source: IOA0028-01**					
Antimony	93.3	2.0	0.18	ug/l	80.0	ND	117	70-130	2	20	
Cadmium	83.4	1.0	0.015	ug/l	80.0	0.026	104	70-130	2	20	
Copper	77.2	2.0	0.49	ug/l	80.0	0.71	96	70-130	1	20	
Lead	77.0	1.0	0.13	ug/l	80.0	0.19	96	70-130	2	20	
Batch: 5A04047 Extracted: 01/04/05											
Blank Analyzed: 01/04/2005 (5A04047-BLK1)											
Mercury	ND	0.20	0.063	ug/l							

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Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 003

Report Number: IOA0026

Sampled: 01/03/05
Received: 01/03/05

METHOD BLANK/QC DATA

METALS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A04047 Extracted: 01/04/05											
LCS Analyzed: 01/04/2005 (5A04047-BS1)											
Mercury	8.41	0.20	0.063	ug/l	8.00		105	85-115			
Matrix Spike Analyzed: 01/04/2005 (5A04047-MS1)						**Source: IOA0028-01**					
Mercury	8.10	0.20	0.063	ug/l	8.00	0.13	100	70-130			
Matrix Spike Dup Analyzed: 01/04/2005 (5A04047-MSD1)						**Source: IOA0028-01**					
Mercury	8.27	0.20	0.063	ug/l	8.00	0.13	102	70-130	2	20	

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Attention: Bronwyn Kelly

Project ID: Routine Outfall 003

Report Number: IOA0026

Sampled: 01/03/05
Received: 01/03/05

METHOD BLANK/QC DATA

INORGANICS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A03042 Extracted: 01/03/05											
Blank Analyzed: 01/03/2005 (5A03042-BLK1)											
Chloride	ND	0.50	0.26	mg/l							
Nitrate/Nitrite-N	ND	0.26	0.072	mg/l							
Sulfate	ND	0.50	0.18	mg/l							
LCS Analyzed: 01/03/2005 (5A03042-BS1)											
Chloride	4.90	0.50	0.26	mg/l	5.00		98	90-110			
Sulfate	9.85	0.50	0.18	mg/l	10.0		98	90-110			
Matrix Spike Analyzed: 01/03/2005 (5A03042-MS1)						**Source: IOA0026-01**					
Chloride	9.42	0.50	0.26	mg/l	5.00	4.5	98	80-120			
Sulfate	14.6	0.50	0.18	mg/l	10.0	4.3	103	80-120			
Matrix Spike Dup Analyzed: 01/03/2005 (5A03042-MSD1)						**Source: IOA0026-01**					
Chloride	9.36	0.50	0.26	mg/l	5.00	4.5	97	80-120	1	20	
Sulfate	15.1	0.50	0.18	mg/l	10.0	4.3	108	80-120	3	20	
Batch: 5A05068 Extracted: 01/05/05											
Blank Analyzed: 01/05/2005 (5A05068-BLK1)											
Oil & Grease	ND	5.0	0.94	mg/l							
LCS Analyzed: 01/05/2005 (5A05068-BS1)											
Oil & Grease	20.1	5.0	0.94	mg/l	20.0		100	65-120			M-NR1
LCS Dup Analyzed: 01/05/2005 (5A05068-BSD1)											
Oil & Grease	21.1	5.0	0.94	mg/l	20.0		106	65-120	5	20	

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 003

Report Number: IOA0026

Sampled: 01/03/05
Received: 01/03/05

METHOD BLANK/QC DATA

INORGANICS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A05071 Extracted: 01/05/05											
Blank Analyzed: 01/05/2005 (5A05071-BLK1)											
Total Dissolved Solids	ND	10	10	mg/l							
LCS Analyzed: 01/05/2005 (5A05071-BS1)											
Total Dissolved Solids	1070	10	10	mg/l	1000		107	90-110			
Duplicate Analyzed: 01/05/2005 (5A05071-DUP1)						**Source: IOA0066-02**					
Total Dissolved Solids	250	10	10	mg/l		250			0	10	

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Attention: Bronwyn Kelly

Project ID: Routine Outfall 003

Report Number: IOA0026

Sampled: 01/03/05
Received: 01/03/05

Compliance Check

The results obtained from the analytical testing of this data set were checked against compliance limits received from the client. Any results at or above the compliance limits appear in bold on this page.

LabNumber	Analysis	Analyte	Units	Result	MRL	Compliance Limit
IOA0026-01	413.1 Oil and Grease	Oil & Grease	mg/l	2.00	5.0	15
IOA0026-01	Antimony-200.8	Antimony	ug/l	0	2.0	6.00
IOA0026-01	Cadmium-200.8	Cadmium	ug/l	0.057	1.0	4.00
IOA0026-01	Chloride - 300.0	Chloride	mg/l	4.50	0.50	150
IOA0026-01	Copper-200.8	Copper	ug/l	2.30	2.0	14
IOA0026-01	Mercury - 245.1	Mercury	ug/l	0.100	0.20	0.20
IOA0026-01	Nitrogen, NO3+NO2 -N	Nitrate/Nitrite-N	mg/l	0.96	0.26	10.00
IOA0026-01	Sulfate-300.0	Sulfate	mg/l	4.30	0.50	250
IOA0026-01	TDS - SM 2540C	Total Dissolved Solids	mg/l	99	10	850

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Attention: Bronwyn Kelly

Project ID: Routine Outfall 003

Report Number: IOA0026

Sampled: 01/03/05
Received: 01/03/05

DATA QUALIFIERS AND DEFINITIONS

B	Analyte was detected in the associated Method Blank.
J	Estimated value. Analyte detected at a level less than the Reporting Limit (RL) and greater than or equal to the Method Detection Limit (MDL). The user of this data should be aware that this data is of unknown quality.
M-NR1	There was no MS/MSD analyzed with this batch due to insufficient sample volume. See Blank Spike/Blank Spike Duplicate.
ND	Analyte NOT DETECTED at or above the reporting limit or MDL, if MDL is specified.
RPD	Relative Percent Difference

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Michele Harper
Project Manager

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300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 003

Report Number: IOA0026

Sampled: 01/03/05
Received: 01/03/05

Certification Summary

Del Mar Analytical, Irvine

Method	Matrix	NELAP	CA
EPA 200.8	Water	X	X
EPA 245.1	Water	X	X
EPA 300.0	Water	X	X
EPA 413.1	Water	X	X
SM2540C	Water	X	X

NV and NELAP provide analyte specific accreditations. Analyte specific information for Del Mar Analytical may be obtained by contacting the laboratory or visiting our website at www.dmalabs.com.

Subcontracted Laboratories

Pace Analytical, MN- SUB
1700 Elm Street, Ste 200 - Minneapolis, MN 55414

Analysis Performed: 1613-Dioxin-HR
Samples: IOA0026-01

Analysis Performed: EDD + Level 4
Samples: IOA0026-01

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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IOA0026

Del Mar Analytical Version 5 8/12/04 CHAIN OF CUSTODY FORM

Client Name/Address:	Project:
MWH-Pasadena 300 North Lake Avenue, Suite 1200 Pasadena, CA 91101	Boeing-SSFL NPDES **Routine Outfall 003** Stormwater at RMHF
Project Manager: Bronwyn Kelly Sampler: Pollock	Phone Number: (626) 568-6691 Fax Number: (626) 568-6515

Sample Description	Sample Matrix	Container Type	# of Cont.	Sampling Date/Time	Preservative	Bottle * #	Total Recoverable Metals: Sb, Cd, Cu, Pb, Hg	TCDD (and all congeners)	Oil & Grease (EPA 413.1)	Cl-, SO4, NO3+NO2-N	TDS					Field readings: / Comments
							ANALYSIS REQUIRED									
Outfall 003	W	1L Poly	1	1-3-05 09:24	HNO3	1A	X									Temp = 49.6
Outfall 003-Dup	W	1L Poly	1		HNO3	1B	X									pH= 7.0
Outfall 003	W	1L Amber	2		None	2A, 2B		X								
Outfall 003	W	1L Amber	2		HCl	3A, 3B			X							
Outfall 003	W	Poly-500 ml	2		None	4A, 4B				X						
Outfall 003	W	Poly-500 ml	2		None	5A, 5B					X					

Cg

Relinquished By	Date/Time:	Received By	Date/Time:
	1-3-05 1300		1-3-05 1300
Relinquished By	Date/Time:	Received By	Date/Time:
	1-3-05 1500		
Relinquished By	Date/Time:	Received By	Date/Time:
			1/3/05 15:00

Turn around Time: (check)
24 Hours _____ 5 Days _____
48 Hours _____ 10 Days _____
72 Hours _____ Normal X
Perchlorate Only 72 Hours _____
Metals Only 72 Hours _____
Sample Integrity: (Check)
Intact X On Ice: 4°C

Del Mar Analytical

2852 Alton Ave., Irvine CA 92606 (949) 261-1022 FAX (949) 261-1228
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February 3, 2005

MWH-Pasadena/Boeing
300 North Lake Avenue
Pasadena, Ca. 91101

Attention: Bronwyn Kelly

Project: Routine Outfall 003
Sampled: 01/03/05
Del Mar Analytical Number: IOA0026

Dear Ms. Kelly:

Pace Analytical performed Method 1613B analysis for the project referenced above. Please use the following cross-reference table when reviewing your results.

MWH ID	DEL MAR ID	Pace ID
Outfall 003	IOA0026-01	105648001

Attached is the original report from the subcontract laboratory. If you have any questions or require further assistance, please do not hesitate to contact me.

Sincerely yours,
DEL MAR ANALYTICAL

Michele Harper
Project Manager

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax 612-607-6444

Method 1613B Analysis Results

Client - Del Mar Analytical

Client's Sample ID	IOA0026-01
Lab Sample ID	105648001
Filename	F50127A_10
Injected By	MRO
Total Amount Extracted	994 mL
% Moisture	NA
Dry Weight Extracted	NA
ICAL Date	11/29/2004
CCal Filename(s)	F50127A_02
Method Blank ID	BLANK-6202

Matrix	Water
Dilution	NA
Collected	01/03/2005
Received	01/04/2005
Extracted	01/24/2005
Analyzed	01/27/2005 17:34

Native Isomers	Conc pg/L	EMPC pg/L	LOD pg/L		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	—	2.80		2,3,7,8-TCDF-13C	2.00	60
Total TCDF	ND	—	2.80		2,3,7,8-TCDD-13C	2.00	71
					1,2,3,7,8-PeCDF-13C	2.00	83
2,3,7,8-TCDD	ND	—	2.60		2,3,4,7,8-PeCDF-13C	2.00	86
Total TCDD	ND	—	2.60		1,2,3,7,8-PeCDD-13C	2.00	100
					1,2,3,4,7,8-HxCDF-13C	2.00	80
1,2,3,7,8-PeCDF	ND	—	1.50		1,2,3,6,7,8-HxCDF-13C	2.00	101
2,3,4,7,8-PeCDF	ND	—	1.20		2,3,4,6,7,8-HxCDF-13C	2.00	97
Total PeCDF	ND	—	1.30		1,2,3,7,8,9-HxCDF-13C	2.00	87
					1,2,3,4,7,8-HxCDD-13C	2.00	75
1,2,3,7,8-PeCDD	ND	—	1.50		1,2,3,6,7,8-HxCDD-13C	2.00	98
Total PeCDD	ND	—	1.50		1,2,3,4,6,7,8-HpCDF-13C	2.00	90
					1,2,3,4,7,8,9-HpCDF-13C	2.00	79
1,2,3,4,7,8-HxCDF	ND	—	1.10		1,2,3,4,6,7,8-HpCDD-13C	2.00	103
1,2,3,6,7,8-HxCDF	ND	—	0.91		OCDD-13C	4.00	100
2,3,4,6,7,8-HxCDF	ND	—	0.94				
1,2,3,7,8,9-HxCDF	ND	—	0.95		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	1.3	—	0.98	J	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	—	1.60		2,3,7,8-TCDD-37Cl4	0.20	70
1,2,3,6,7,8-HxCDD	ND	—	1.80				
1,2,3,7,8,9-HxCDD	ND	—	1.80				
Total HxCDD	ND	—	1.70				
1,2,3,4,6,7,8-HpCDF	1.7	—	1.10	J			
1,2,3,4,7,8,9-HpCDF	ND	—	1.50				
Total HpCDF	5.5	—	1.30	J			
1,2,3,4,6,7,8-HpCDD	5.8	—	1.70	BJ			
Total HpCDD	17.0	—	1.70	BJ			
OCDF	7.4	—	2.00	BJ			
OCDD	62.0	—	3.10	BJ			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection. Totals are averages of individual isomer LODs.
D = Result obtained from analysis of diluted sample
B = Less than 10 times higher than method blank level
P = Recovery outside of method 1613 control limits
J = Concentration detected is below the calibration range
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....105648

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 1613B Blank Analysis Results

Client - Del Mar Analytical

Lab Sample ID	BLANK-6202	Matrix	Water
Filename	F50127A_06	Dilution	NA
Total Amount Extracted	982 mL	Extracted	01/24/2005
ICAL Date	11/29/2004	Analyzed	01/27/2005 14:13
CCal Filename(s)	F50127A_02	Injected By	MRO

Native Isomers	Conc pg/L	EMPC pg/L	LOD pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	—	4.7	2,3,7,8-TCDF-13C	2.00	33
Total TCDF	ND	—	—	2,3,7,8-TCDD-13C	2.00	45
				1,2,3,7,8-PeCDF-13C	2.00	68
2,3,7,8-TCDD	ND	—	5.1	2,3,4,7,8-PeCDF-13C	2.00	70
Total TCDD	ND	—	—	1,2,3,7,8-PeCDD-13C	2.00	81
				1,2,3,4,7,8-HxCDF-13C	2.00	75
1,2,3,7,8-PeCDF	ND	—	2.2	1,2,3,6,7,8-HxCDF-13C	2.00	95
2,3,4,7,8-PeCDF	ND	—	1.5	2,3,4,6,7,8-HxCDF-13C	2.00	98
Total PeCDF	ND	—	—	1,2,3,7,8,9-HxCDF-13C	2.00	85
				1,2,3,4,7,8-HxCDD-13C	2.00	78
1,2,3,7,8-PeCDD	ND	—	1.6	1,2,3,6,7,8-HxCDD-13C	2.00	94
Total PeCDD	ND	—	—	1,2,3,4,6,7,8-HpCDF-13C	2.00	85
				1,2,3,4,7,8,9-HpCDF-13C	2.00	78
1,2,3,4,7,8-HxCDF	ND	—	1.6	1,2,3,4,6,7,8-HpCDD-13C	2.00	99
1,2,3,6,7,8-HxCDF	ND	—	1.4	OCDD-13C	4.00	97
2,3,4,6,7,8-HxCDF	ND	—	1.1			
1,2,3,7,8,9-HxCDF	ND	—	1.6	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	—	—	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	—	1.6	2,3,7,8-TCDD-37Cl4	0.20	40
1,2,3,6,7,8-HxCDD	ND	—	1.2			
1,2,3,7,8,9-HxCDD	ND	—	1.7			
Total HxCDD	ND	—	—			
1,2,3,4,6,7,8-HpCDF	ND	—	1.5			
1,2,3,4,7,8,9-HpCDF	ND	—	1.4			
Total HpCDF	ND	—	—			
1,2,3,4,6,7,8-HpCDD	1.9	—	1.3 J			
Total HpCDD	1.9	—	— J			
OCDF	8.3	—	1.9 J			
OCDD	26.0	—	2.3 J			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection. Totals are averages of individual isomer LODs.
A = Limit of Detection based on signal to noise
P = Recovery outside of method 1613 control limits
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....105645

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 1613B Laboratory Control Spike Results

Client - Del Mar Analytical

Lab Sample ID	LCS-6203		
Filename	F50127A_03	Matrix	Water
Total Amount Extracted	1030 mL	Dilution	NA
ICAL Date	11/29/2004	Extracted	01/24/2005
CCal Filename	F50127A_02	Analyzed	01/27/2005 11:44
Method Blank ID	BLANK-6202	Injected By	MRO

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDF	10	10.2	7.5	15.8	102
2,3,7,8-TCDD	10	9.0	6.7	15.8	90
1,2,3,7,8-PeCDF	50	50.1	40.0	67.0	100
2,3,4,7,8-PeCDF	50	48.4	34.0	80.0	97
1,2,3,7,8-PeCDD	50	43.4	35.0	71.0	87
1,2,3,4,7,8-HxCDF	50	44.8	36.0	67.0	90
1,2,3,6,7,8-HxCDF	50	48.0	42.0	65.0	96
2,3,4,6,7,8-HxCDF	50	48.6	35.0	78.0	97
1,2,3,7,8,9-HxCDF	50	46.4	39.0	65.0	93
1,2,3,4,7,8-HxCDD	50	50.0	35.0	82.0	100
1,2,3,6,7,8-HxCDD	50	51.7	38.0	67.0	103
1,2,3,7,8,9-HxCDD	50	48.5	32.0	81.0	97
1,2,3,4,6,7,8-HpCDF	50	51.4	41.0	61.0	103
1,2,3,4,7,8,9-HpCDF	50	52.3	39.0	69.0	105
1,2,3,4,6,7,8-HpCDD	50	43.4	35.0	70.0	87
OCDF	100	89.5	63.0	170.0	90
OCDD	100	96.9	78.0	144.0	97
2,3,7,8-TCDD-37Cl4	10	6.2	3.1	19.1	62
2,3,7,8-TCDF-13C	100	49.8	22.0	152.0	50
2,3,7,8-TCDD-13C	100	65.8	20.0	175.0	66
1,2,3,7,8-PeCDF-13C	100	75.7	21.0	192.0	76
2,3,4,7,8-PeCDF-13C	100	76.9	13.0	328.0	77
1,2,3,7,8-PeCDD-13C	100	93.4	21.0	227.0	93
1,2,3,4,7,8-HxCDF-13C	100	78.9	19.0	202.0	79
1,2,3,6,7,8-HxCDF-13C	100	89.8	21.0	159.0	90
2,3,4,6,7,8-HxCDF-13C	100	88.2	22.0	176.0	88
1,2,3,7,8,9-HxCDF-13C	100	81.5	17.0	205.0	81
1,2,3,4,7,8-HxCDD-13C	100	82.2	21.0	193.0	82
1,2,3,6,7,8-HxCDD-13C	100	95.2	25.0	163.0	95
1,2,3,4,6,7,8-HpCDF-13C	100	86.3	21.0	158.0	86
1,2,3,4,7,8,9-HpCDF-13C	100	75.6	20.0	186.0	76
1,2,3,4,6,7,8-HpCDD-13C	100	102.9	26.0	166.0	103
OCDD-13C	200	195.1	26.0	397.0	98

Cs = Concentration Spiked (ng/mL)
Cr = Concentration Recovered (ng/mL)
Rec. = Recovery (Expressed as Percent)
Control Limit Reference: Method 1613, Table 6, 10/94 Revision
X = Background subtracted value
P = Recovery outside of control limits
Nn = Value obtained from additional analysis
* = See Discussion

Report No.....105645

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 1613B Laboratory Control Spike Results

Client - Del Mar Analytical

Lab Sample ID	LCSD-6204		
Filename	F50127A_04	Matrix	Water
Total Amount Extracted	1000 mL	Dilution	NA
ICAL Date	11/29/2004	Extracted	01/24/2005
CCal Filename	F50127A_02	Analyzed	01/27/2005 12:32
Method Blank ID	BLANK-6202	Injected By	MRO

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDF	10	9.9	7.5	15.8	99
2,3,7,8-TCDD	10	8.8	6.7	15.8	88
1,2,3,7,8-PeCDF	50	49.8	40.0	67.0	100
2,3,4,7,8-PeCDF	50	47.6	34.0	80.0	95
1,2,3,7,8-PeCDD	50	41.4	35.0	71.0	83
1,2,3,4,7,8-HxCDF	50	46.6	36.0	67.0	93
1,2,3,6,7,8-HxCDF	50	44.0	42.0	65.0	88
2,3,4,6,7,8-HxCDF	50	47.2	35.0	78.0	94
1,2,3,7,8,9-HxCDF	50	44.8	39.0	65.0	90
1,2,3,4,7,8-HxCDD	50	46.5	35.0	82.0	93
1,2,3,6,7,8-HxCDD	50	48.9	38.0	67.0	98
1,2,3,7,8,9-HxCDD	50	46.7	32.0	81.0	93
1,2,3,4,6,7,8-HpCDF	50	48.7	41.0	61.0	97
1,2,3,4,7,8,9-HpCDF	50	49.9	39.0	69.0	100
1,2,3,4,6,7,8-HpCDD	50	42.7	35.0	70.0	85
OCDF	100	84.8	63.0	170.0	85
OCDD	100	92.5	78.0	144.0	92
2,3,7,8-TCDD-37Cl4	10	7.5	3.1	19.1	75
2,3,7,8-TCDF-13C	100	65.7	22.0	152.0	66
2,3,7,8-TCDD-13C	100	83.8	20.0	175.0	84
1,2,3,7,8-PeCDF-13C	100	84.9	21.0	192.0	85
2,3,4,7,8-PeCDF-13C	100	85.6	13.0	328.0	86
1,2,3,7,8-PeCDD-13C	100	105.3	21.0	227.0	105
1,2,3,4,7,8-HxCDF-13C	100	82.6	19.0	202.0	83
1,2,3,6,7,8-HxCDF-13C	100	96.7	21.0	159.0	97
2,3,4,6,7,8-HxCDF-13C	100	92.3	22.0	176.0	92
1,2,3,7,8,9-HxCDF-13C	100	84.5	17.0	205.0	84
1,2,3,4,7,8-HxCDD-13C	100	81.9	21.0	193.0	82
1,2,3,6,7,8-HxCDD-13C	100	102.0	25.0	163.0	102
1,2,3,4,6,7,8-HpCDF-13C	100	90.1	21.0	158.0	90
1,2,3,4,7,8,9-HpCDF-13C	100	78.6	20.0	186.0	79
1,2,3,4,6,7,8-HpCDD-13C	100	106.1	26.0	166.0	106
OCDD-13C	200	196.4	26.0	397.0	98

Cs = Concentration Spiked (ng/mL)
Cr = Concentration Recovered (ng/mL)
Rec. = Recovery (Expressed as Percent)
Control Limit Reference: Method 1613, Table 6, 10/94 Revision
X = Background subtracted value
P = Recovery outside of control limits
Nn = Value obtained from additional analysis
* = See Discussion

Report No.....105645

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, Inc.
1700 Elm Street
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444

SPIKE RECOVERY RELATIVE PERCENT DIFFERENCE (RPD) RESULTS

Client..... Del Mar Analytical

SPIKE 1 ID..... LCS-6203
SPIKE 1 Filename..... F50127A_03
SPIKE 2 ID..... LCSD-6204
SPIKE 2 Filename..... F50127A_04

COMPOUND	SPIKE 1 REC,%	SPIKE 2 REC,%	RPD,%
2378-TCDF	102	99	3.0
2378-TCDD	90	88	2.2
12378-PeCDF	100	100	0.0
23478-PeCDF	97	95	2.1
12378-PeCDD	87	83	4.7
123478-HxCDF	90	93	3.3
123678-HxCDF	96	88	8.7
234678-HxCDF	97	94	3.1
123789-HxCDF	93	90	3.3
123478-HxCDD	100	93	7.3
123678-HxCDD	103	98	5.0
123789-HxCDD	97	93	4.2
1234678-HpCDF	103	97	6.0
1234789-HpCDF	105	100	4.9
1234678-HpCDD	87	85	2.3
OCDF	90	85	5.7
OCDD	97	92	5.3

REC = Percent Recovered
RPD = The difference between the two values divided by the average.
NA = Not Applicable

Report No..... 105645

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Minneapolis, MN 55414
Phone: 612.607.1700
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TABLE 1. 2,3,7,8-TCDD Equivalency Factors (TEFs) for the Polychlorinated Dibenzo-p-dioxins and Dibenzofurans

Number	Compound(s)	TEF
1	2,3,7,8-TCDD	1.00
2	1,2,3,7,8-PeCDD	0.50
3	1,2,3,6,7,8-HxCDD	0.1
4	1,2,3,7,8,9-HxCDD	0.1
5	1,2,3,4,7,8-HxCDD	0.1
6	1,2,3,4,6,7,8-HpCDD	0.01
7	OCDD	0.001
8	* Total - TCDD	0.0
9	* Total - PeCDD	0.0
10	* Total - HxCDD	0.0
11	* Total - HpCDD	0.0
12	2,3,7,8-TCDF	0.10
13	1,2,3,7,8-PeCDF	0.05
14	2,3,4,7,8-PeCDF	0.5
15	1,2,3,6,7,8-HxCDF	0.1
16	1,2,3,7,8,9-HxCDF	0.1
17	1,2,3,4,7,8-HxCDF	0.1
18	2,3,4,6,7,8-HxCDF	0.1
19	1,2,3,4,6,7,8-HpCDF	0.01
20	1,2,3,4,7,8,9-HpCDF	0.01
21	OCDF	0.001
22	* Total - TCDF	0.0
23	* Total - PeCDF	0.0
24	* Total - HxCDF	0.0
25	* Total - HpCDF	0.0

*Excluding the 2,3,7,8-substituted congeners.

Reference: 1989 ITEFs

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Del Mar Analytical

17461 Derian Ave. Suite 100, Irvine, CA 92614 Ph (949) 261-1022 Fax (949) 261-1228
1014 E. Cooley Dr., Suite A, Colton, CA 92324 Ph (909) 370-4667 Fax (909) 370-1046
9484 Chesapeake Drive, Suite 805, San Diego, CA 92123 Ph (619) 505-9596 Fax (619) 505-9689
9830 South 51st Street, Suite B-120, Phoenix, AZ 85044 Ph (480) 785-0043 Fax (480) 785-0851
2520 E. Sunset Rd., Suite #3, Las Vegas, NV 89120 Ph (702) 798-3620 Fax (702) 798-3621

SUBCONTRACT ORDER - PROJECT # IOA0026 105648

SENDING LABORATORY:
Del Mar Analytical, Irvine
17461 Derian Avenue. Suite 100
Irvine, CA 92614
Phone: (949) 261-1022
Fax: (949) 261-1228
Project Manager: Michele Harper

RECEIVING LABORATORY:
Pace Analytical, MN- SUB
1700 Elm Street, Ste 200
Minneapolis, MN 55414
Phone :(612) 607-1700
Fax: (612) 607-6444

Standard TAT is requested unless specific due date is requested => Due Date: _____ **Initials:** _____

Analysis	Expiration	Comments
Sample ID: IOA0026-01 Water	**Sampled: 01/03/05 09:24**	105648001
1613-Dioxin-HR	01/10/05 09:24	J flags, 17 congeners, no TEQ, sub to Pace-MN

Containers Supplied:
1 L Amber (IOA0026-01C)
1 L Amber (IOA0026-01D)

SAMPLE INTEGRITY:

All containers intact: ☒ Yes ☐ No | Sample labels/COC agree: ☒ Yes ☐ No | Samples Received On Ice:: ☒ Yes ☐ No
Custody Seals Present: ☐ Yes ☒ No | Samples Preserved Properly: ☒ Yes ☐ No | Samples Received at (temp): 2.0

Released By	Date	Time	Received By	Date	Time
	01/03/05	1700	FN Blum PACE	1/4/05	0820

Del Mar Analytical

17461 Derian Ave. Suite 100, Irvine, CA 92614 Ph (949) 261-1022 Fax (949) 261-1228
1014 E. Cooley Dr., Suite A, Colton, CA 92324 Ph (909) 370-4667 Fax (909) 370-1046
9404 Chesapeake Drive, Suite 503, San Diego, CA 92123 Ph (619) 505-6596 Fax (619) 505-6599
5628 South 51st Street, Suite B-120, Phoenix, AZ 85044 Ph (480) 785-0046 Fax (480) 785-0851
2520 E. Sunset Rd., Suite 60, Las Vegas, NV 89120 Ph (702) 798-3620 Fax (702) 798-3621

SUBCONTRACT ORDER - PROJECT # IOA0026

SENDING LABORATORY:
Del Mar Analytical, Irvine
17461 Derian Avenue. Suite 100
Irvine, CA 92614
Phone: (949) 261-1022
Fax: (949) 261-1228
Project Manager: Michele Harper

RECEIVING LABORATORY:
Pace Analytical, MN- SUB
1700 Elm Street, Ste 200
Minneapolis, MN 55414
Phone :(612) 607-1700
Fax: (612) 607-6444

105648

Standard TAT is requested unless specific due date is requested => Due Date:_____ Initials:_____

Analysis	Expiration	Comments
Sample ID: IOA0026-01 Water	**Sampled: 01/03/05 09:24**	
1613-Dioxin-HR	01/10/05 09:24	J flags, 17 congeners, no TEQ, sub to Pace-MN
EDD + Level 4	01/31/05 09:24	Excel EDD email to pm,Include Std logs for Lvl IV

Containers Supplied:
1 L Amber (IOA0026-01C)
1 L Amber (IOA0026-01D)

FAXED 1/5/05

SAMPLE INTEGRITY:

All containers intact: ☐ Yes ☐ No
Custody Seals Present: ☐ Yes ☐ No
Sample labels/COC agree: ☐ Yes ☐ No
Samples Preserved Properly: ☐ Yes ☐ No
Samples Received On Ice: ☐ Yes ☐ No
Samples Received at (temp): _____

Released By	Date	Time	Received By	Date	Time
[signature]	1/5/05				

Released By	Date	Time	Received By	Date	Time

CONTRACT COMPLIANCE SCREENING FORM FOR HARDCOPY DATA

AMEC Earth & Environmental
550 South Wadsworth Boulevard
Suite 500
Lakewood, CO 80226

Laboratory Del Mar
Reviewer P. Meeks
Analysis/Method Radionuclides

Package ID T711RA2
Task Order 313150010
SDG No. IOA0115, 0121, 0131
No. of Analyses 1

Date: 03/03/05
Reviewer's Signature P. Mee

ACTION ITEMS[a]	
1. **Case Narrative Deficiencies**	
2. **Out of Scope Analyses**	
3. **Analyses Not Conducted**	
4. **Missing Hardcopy Deliverables**	
5. **Incorrect Hardcopy Deliverables**	
6. **Deviations from Analysis Protocol, e.g.,**	Qualifications applied for:
Holding Times	1. Exceeded holding time
GC/MS Tune/Inst. Performance	2. Lack of preservation
Calibrations	3. Incorrect sample container
Blanks	4. Detector efficiencies less than 20%
Surrogates	
Matrix Spike/Dup LCS	
Field QC	
Internal Standard Performance	
Compound Identification and Quantitation	
System Performance	

COMMENTS[b]

[a] Subcontracted analytical laboratory is not meeting contract and/or method requirements.
[b] Differences in protocol have been adopted by the laboratory but no action against the laboratory is required.

DATA VALIDATION REPORT

NPDES
Monitoring

ANALYSIS: RADIONUCLIDES

SAMPLE DELIVERY GROUPS:
IOA0115, IOA0121, IOA0131

Prepared by

AMEC—Denver Operations
550 South Wadsworth Boulevard, Suite 500
Lakewood, Colorado 80226

1. INTRODUCTION

Task Order Title:	NPDES Monitoring
Contract Task Order #:	313150010
SDG#:	IOA0115, IOA0121, IOA0131
Project Manager:	B. McIlvaine
Matrix:	Water
Analysis:	Radionuclides
QC Level:	Level IV
No. of Samples:	4
No. of Reanalyses/Dilutions:	0
Reviewer:	P. Meeks
Date of Review:	March 03, 2005

The samples listed in Table 1 were validated based on the guidelines outlined in the *EPA Prescribed Procedures for Measurements of Radioactivity in Drinking Water, Methods 900.0, 905.0, and 906.0,* and validation procedures outlined in the *USEPA CLP National Functional Guidelines for Inorganic Data Review* (2/94). Any deviations from these procedures and guidelines are documented herein. Qualifiers were applied in cases where the data did not meet the required QC criteria or where special consideration by the data user is required. Data qualifiers were placed on Form Is with the associated qualification codes. Analytes that were rejected for any reason are denoted on the Form I as having only the "R" data qualifier and associated qualification code(s) denoting the reason for rejection. Any additional problems with the data that may have resulted in an estimated value were not denoted by a qualification code since the data had already been rejected.

Table 1. Sample identification

Client ID[a]	Del Mar ID	Eberline ID	Matrix	COC Method
Outfall 003 Unfiltered	IOA0115-01	8149-01	water	900.0, 905.0, 906.0
Outfall 003 Filtered	IOA0115-02	8149-02	water	900.0, 905.0, 906.0
Outfall 011	IOA0121-01	8148-01	water	900.0, 905.0, 906.0
Outfall 011 - Composite	IOA0131-01	8147-01	water	900.0, 905.0, 906.0

2. DATA VALIDATION FINDINGS

2.1 SAMPLE MANAGEMENT

Following are findings associated with sample management:

2.1.1 Sample Preservation, Handling, and Transport

The samples in these SDGs were received at Del Mar Analytical within the temperature limits of 4±2°C. No temperature information was provided by Eberline, the subcontract laboratory; however, as it is not necessary to chill radiological samples, no qualifications were required. All samples were intact and in good condition.

According to the Eberline login sheet, none of the samples were received preserved. It was confirmed in correspondence with Eberline dated 01/31/05, that the gross alpha, gross beta, and strontium samples were not preserved upon receipt. According to the Los Angeles Water Quality Control Board (LARWQCB) guidance letter dated 01/12/05, unfiltered samples should not be preserved and filtered aliquots should be preserved after filtration. As the strontium aliquot for Outfall 003 Filtered was not preserved; the nondetect strontium result was qualified as estimated, "UJ." Additionally, according to the 01/12/05 LARWQCB guidance letter, samples collected for tritium analysis should be submitted in glass containers to avoid potential loss of tritium by sorption onto the plastic container. As none of the tritium samples were submitted on glass containers, all nondetect tritium results were qualified as estimated, "UJ." No further qualifications were required.

2.1.2 Chain of Custody

The original COCs were signed and dated by field and laboratory personnel and the transfer COCs were signed by personnel from both laboratories. The original COCs for Outfall 003 did not request that an aliquot of each sample be filtered; however, the Del Mar project manager confirmed in a telephone conversation dated 1/31/05, that this was required by MWH. The original COC for Outfall 011 (SDG IOA0121) did not request that the sample containers received be analyzed for radionuclides. A memo from MWH personnel dated 2/17/05 requested these analyses. The transfer COCs accounted for all samples. Eberline did not list the MWH IDs on the Form Is; therefore, the reviewer edited the Form Is to reflect these IDs. No qualifications were required.

2.1.3 Holding Times

The tritium and strontium samples were analyzed within 180 days of collection. The gross alpha and gross beta samples were analyzed beyond the five day holding time for unpreserved samples; therefore, the gross alpha and gross beta results were qualified as estimated, "J," for detects and, "UJ," for nondetects. No qualifications were necessary.

2.2 CALIBRATION

The laboratory calibration information included the standard certificates and applicable preparation/dilutions logs for NIST-traceability.

Gross Alpha

The initial calibration included with the data was performed in February 2003. All detector efficiencies were below 20%; therefore, the nondetected alpha results were qualified as estimated, "UJ," for nondetects and "J," for detects.

Tritium

No calibration standards were analyzed for this method. According to the laboratory, every sample was spiked for efficiency determination; therefore, no calibration is necessary. All detector efficiencies in the samples were at least 20% and were considered acceptable.

Gross Beta and Strontium-90

The initial calibrations were performed in June 1997. All detector efficiencies were at least 20% and were considered acceptable. All continuing calibration results were within the laboratory control limits; therefore, no qualifications were necessary.

2.3 BLANKS

No measurable activities were detected in the method blanks; therefore, no qualifications were necessary.

2.4 BLANK SPIKES AND LABORATORY CONTROL SAMPLES

One blank spike (8147-002) was analyzed in association with the samples in these SDGs. All recoveries were within both 3-sigma limits and the laboratory control limits. No qualifications were necessary.

2.5 LABORATORY DUPLICATES

The laboratory performed a duplicate analysis on Outfall 011 Composite. The RPDs for gross beta, tritium, and strontium were ≤20%. The RPD for gross alpha was >20%; however, as the results were within the 3 sigma limit, no qualifications were necessary.

2.6 MATRIX SPIKE/MATRIX SPIKE DUPLICATE

The laboratory performed matrix spike analyses on Outfall 011 Composite for gross alpha, gross beta and tritium. The recoveries were within both 3-sigma limits and the laboratory control limits. No qualifications were necessary.

2.7 SAMPLE RESULT VERIFICATION

An EPA Level IV review was performed for the samples in these data packages. Sample results and MDAs reported on the sample result forms were verified against the raw data and no calculation or transcription errors were noted. No qualifications were necessary.

2.8 FIELD QC SAMPLES

Field QC samples were evaluated, and if necessary, qualified based only on laboratory blanks. Any remaining detects are used to evaluate the associated samples.

2.8.1 Field Blanks and Equipment Rinsates

The samples in these SDGs had no associated field QC samples. No qualifications were required.

2.8.2 Field Duplicates

There were no field duplicate samples in these SDGs:

Eberline Services

ANALYSIS RESULTS

SDG 8149
Work Order R501015-01
Received Date 01/06/05

Client DEL MAR ANAL
Contract PROJECT# IOA0115
Matrix WATER

Client Sample ID	Lab Sample ID	Collected	Analyzed	Nuclide	Results ± 2σ	Units	MDA	Rev Qual	Qual Code
Outfall 003 Unfiltered									
IOA0115-01	8149-001	01/04/05	01/26/05	GrossAlpha	8.96 ± 2.2	pCi/L	1.30	J	H, *2
			01/26/05	Gross Beta	10.7 ± 1.6	pCi/L	1.78	J	H
			01/27/05	H3	25.3 ± 180	pCi/L	303	UJ	*1
			01/14/05	Sr90	0.740 ± 0.25	pCi/L	0.344		
Outfall 003 Filtered									
IOA0115-02	8149-002	01/04/05	01/26/05	GrossAlpha	0.179 ± 0.60	pCi/L	1.15	UJ	H, *2
			01/26/05	Gross Beta	4.87 ± 1.3	pCi/L	1.76	J	H
			01/27/05	H3	-12.7 ± 180	pCi/L	302	UJ	*1
			01/14/05	Sr90	0.822 ± 0.33	pCi/L	0.420	J	*1

pm 3/4/05

AMEC VALIDATED

LEVEL IV

Certified by
Report Date 02/13/05
Page 1

Del Mar Analytical Version 5 8/12/04 CHAIN OF CUSTODY FORM

Client Name/Address:	Project:
MWH-Pasadena 300 North Lake Avenue, Suite 1200 Pasadena, CA 91101	Boeing-SSFL NPDES **Routine Outfall 003** Stormwater at RMHF
Project Manager: Bronwyn Kelly Sampler: Pollock	Phone Number: (626) 568-6691 Fax Number: (626) 568-6515

Sample Description	Sample Matrix	Container Type	# of Cont.	Sampling Date/Time	Preservative	Bottle * #	Total Reoverable Metals: Sb, Cd, Cu, Pb, Hg	TCDD (and all congeners)	Oil & Grease (EPA 413.1)	Cl-, SO4, NO3+NO2-N	TDS	Gross Alpha, Gross Beta, Tritium (906.0), Sr-90 (905.0), Total Combined Radium 226 & Radium 228				Comments
~~Outfall 003~~	~~W~~	~~1L Poly~~ BLL	~~2~~	~~1/4/05~~	~~HNO3~~	~~1A~~	X									Field readings:
Outfall 003 Dup	W	1L Poly BLL	2	1/4/05	HNO3	1B	X									Temp = ~~52.0~~ BU
~~Outfall 003~~	~~W~~	~~1L Amber~~ BLL	~~2~~	~~1/4/05~~	~~None~~	~~2A, 2B~~		X								pH=
Outfall 003	W	1L Amber BLL	2	1/4/05	HCl	3A, 3B			X							
~~Outfall 003~~	~~W~~	~~Poly-500 ml~~ BLL	~~2~~	~~1/4/05~~	~~None~~	~~4A, 4B~~				X						**Comments**
~~Outfall 003~~	~~W~~	~~Poly-500 ml~~ BLL	~~2~~	~~1/4/05~~	~~None~~	~~5A, 5B~~					X					
Outfall 003	W	Poly-1 gal	2	1-4-05 14:50	None							X				Analyze for Total Combined RA-226&228 only if Gross Alpha > 15pCi/L

Relinquished By	Date/Time:	Received By	Date/Time:
[signature]	1-4-05 1522	[signature]	1/4/05 1522
~~Relinquished By~~ [signature]	Date/Time: 1/4/05 1825	Received By [signature]	Date/Time: 1/4/05 1825
Relinquished By	Date/Time:	Received By	Date/Time:

Turn around Time: (check)
24 Hours _____ 5 Days _____
48 Hours _____ 10 Days _____
72 Hours _____ Normal ✓
Perchlorate Only 72 Hours_____
Metals Only 72 Hours_____
Sample Integrity: (Check)
Intact ✓ On Ice: ✓ 5°C

Del Mar Analytical

2852 Alton Ave., Irvine CA 92606 (949) 261-1022 FAX (949) 261-1228
1014 E. Cooley Dr., Suite A, Colton, CA 92324 (909) 370-4667 FAX (949) 370-1046
9484 Chesapeake Dr., Suite 805, San Diego, CA 92123 (858) 505-8596 FAX (858) 505-9689
9830 South 51st St., Suite B-120, Phoenix, AZ 85044 (480) 785-0043 FAX (480) 785-0851
2520 E. Sunset Rd. #3, Las Vegas, NV 89120 (702) 798-3620 FAX (702) 798-3621

February 22, 2005

MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, Ca.91101

Attention: Bronwyn Kelly

Project: 13267 (Study 2)
Sampled: 01/04/05
Del Mar Analytical Number: IOA0115

Dear Ms. Kelly:

Eberline Services performed the Gross Alpha and Gross Beta analysis by EPA 900.0, the Tritium analysis by EPA 906.0, and the Stronium-90 analysis by EPA 905.0 for the project referenced above. Please use the following cross-reference table when reviewing your results.

MWH ID	DEL MAR ID	Eberline ID
Outfall 003 unfiltered	IOA0115-01	8149-001
Outfall 003 filtered	IOA0115-02	8149-002

Attached is the original report from the subcontract laboratory. If you have any questions or require further assistance, please do not hesitate to contact me.

Sincerely yours,
DEL MAR ANALYTICAL

Michele Harper
Project Manager

EBERLINE SERVICES

February 14, 2005

Ms. Michele Harper
Project Manager
Del Mar Analytical
17461 Derian Avenue, Suite 100
Irvine, CA 92614

Reference: Del Mar Analytical Project No. IOA0115
Eberline Services NELAP Cert #01120CA (exp. 01/31/06)
Eberline Services Report R501015-8149

Dear Ms. Harper:

Enclosed are results from the analyses of two water samples received at Eberline Services on January 6, 2005. The samples were analyzed according to the accompanying Del Mar Analytical Subcontract Order Form. The requested analyses were gross alpha/gross beta (EPA900.0), tritium (H-3, EPA906.0), and strontium-90 (Sr-90, EPA905.0). The QC LCS, blank analyses, sample duplicates, and matrix spike results for the analyses were within the limits defined in Eberline Services Quality Control Procedures Manual. Analyses that involve the yielding of an analytical tracer or carrier, such as Sr-90, do not require matrix spike analyses to be performed.

Please call me if you have any questions concerning this report.

Regards,

Melissa Mannion
Senior Program Manager

MCM/njv

Enclosure: *Report*
Subcontract Form
Receipt checklist
Invoice

Analytical Services
2030 Wright Avenue
P.O. Box 4040
Richmond, California 94804-0040
(510) 235-2633 Fax (510) 235-0438
Toll Free (800) 841-5487
www.eberlineservices.com

Eberline Services

ANALYSIS RESULTS

SDG 8149
Work Order R501015-01
Received Date 01/06/05

Client DEL MAR ANAL
Contract PROJECT# IOA0115
Matrix WATER

Client Sample ID	Lab Sample ID	Collected	Analyzed	Nuclide	Results ± 2σ	Units	MDA
IOA0115-01	8149-001	01/04/05	01/26/05	GrossAlpha	8.96 ± 2.2	pCi/L	1.30
			01/26/05	Gross Beta	10.7 ± 1.6	pCi/L	1.78
			01/27/05	H3	25.3 ± 180	pCi/L	303
			01/14/05	Sr90	0.740 ± 0.25	pCi/L	0.344
IOA0115-02	8149-002	01/04/05	01/26/05	GrossAlpha	0.179 ± 0.60	pCi/L	1.15
			01/26/05	Gross Beta	4.87 ± 1.3	pCi/L	1.76
			01/27/05	H3	-12.7 ± 180	pCi/L	302
			01/14/05	Sr90	0.822 ± 0.33	pCi/L	0.420

Certified by
Report Date 02/13/05

Eberline Services

QC RESULTS

SDG 8149
Work Order R501015-01
Received Date 01/06/05

Client DEL MAR ANAL
Contract PROJECT# IOA0115
Matrix WATER

Lab Sample ID	Nuclide	Results	Units	Amount Added	MDA	Evaluation
LCS						
8147-002	GrossAlpha	11.7 ± 1.3	pCi/Smpl	11.2	0.522	104% recovery
	Gross Beta	11.8 ± 0.84	pCi/Smpl	12.1	0.607	98% recovery
	H3	264 ± 18	pCi/Smpl	260	15.8	102% recovery
	Sr90	11.7 ± 0.57	pCi/Smpl	11.1	0.229	105% recovery
BLANK						
8147-003	GrossAlpha	0.122 ± 0.23	pCi/Smpl	NA	0.411	<MDA
	Gross Beta	0.050 ± 0.34	pCi/Smpl	NA	0.577	<MDA
	H3	-3.80 ± 17	pCi/Smpl	NA	30.2	<MDA
	Sr90	-0.041 ± 0.12	pCi/Smpl	NA	0.243	<MDA

DUPLICATES

Sample ID	Nuclide	Results ± 2σ	MDA
8147-004	GrossAlpha	1.13 ± 0.74	0.963
	Gross Beta	2.74 ± 1.1	1.71
	H3	-62.6 ± 170	299
	Sr90	0.058 ± 0.35	0.608

ORIGINALS

Sample ID	Results ± 2σ	MDA	RPD	3σ (Tot)	Eval
8147-001	-0.671 ± 1.0	1.99	200	212	satis.
	2.37 ± 1.2	1.80	14	101	satis.
	-125 ± 170	300	-	0	satis.
	0.002 ± 0.22	0.446	-	0	satis.

SPIKED SAMPLE

Sample ID	Nuclide	Results ± 2σ	MDA
8147-005	GrossAlpha	76.1 ± 4.9	1.11
	Gross Beta	79.6 ± 3.6	1.75
	H3	18900 ± 610	311

ORIGINAL SAMPLE

Sample ID	Results ± 2σ	MDA	Added	%Recv
8147-001	-0.671 ± 1.0	1.99	76.6	100
	2.37 ± 1.2	1.80	74.1	104
	-125 ± 170	300	19000	100

Certified by [signature]
Report Date 02/13/05

Del Mar Analytical

17461 Derian Ave. Suite 100, Irvine, CA 92614 Ph (949) 261-1022 Fax (949) 261-1228
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9830 South 51st Street, Suite B-128, Phoenix, AZ 85044 Ph (480) 785-0043 Fax (480) 785-0851
2520 E. Sunset Rd., Suite 43, Las Vegas, NV 89120 Ph (702) 798-3620 Fax (702) 798-3621

SUBCONTRACT ORDER - PROJECT # IOA0115

SENDING LABORATORY:
Del Mar Analytical, Irvine
17461 Derian Avenue. Suite 100
Irvine, CA 92614
Phone: (949) 261-1022
Fax: (949) 261-1228
Project Manager: Michele Harper

RECEIVING LABORATORY:
Eberline Services
2030 Wright Avenue
Richmond, CA 94804
Phone :(510) 235-2633
Fax: (510) 235-0438

Revised MH 1/6/05

Standard TAT is requested unless specific due date is requested => Due Date:_____ Initials:_____

Analysis	Expiration	Comments
Sample ID: IOA0115-01 Water Sampled: 01/04/05 14:50		
EDD + Level 4	02/01/05 14:50	*on entire ~~work~~ project
Gross Alpha-O	01/04/06 14:50	900.0, IF RESULT>15 pCi/L, run Radium 226 & 228
Gross Beta-O	01/04/06 14:50	900.0, IF RESULT>50 pCi/L, run Radium 226 & 228
Radium, Combined-O	01/04/06 14:50	HOLD for Gross Alpha/Beta result;EPA 903.1 & 904.0
Strontium 90-O	01/04/06 14:50	905.0
Tritium-O	01/04/06 14:50	906
Containers Supplied:		
1 gal Poly (IOA0115-01A)	Unfiltered	
Sample ID: IOA0115-02 Water Sampled: 01/04/05 14:50		
Gross Alpha-O	01/04/06 14:50	900.0, IF RESULT>15 pCi/L, run Radium 226 & 228
Gross Beta-O	01/04/06 14:50	900.0, IF RESULT>50 pCi/L, run Radium 226 & 228
Radium, Combined-O	01/04/06 14:50	HOLD for Gross Alpha/Beta result;EPA 903.1 & 904.0
Strontium 90-O	01/04/06 14:50	905.0
Tritium-O	01/04/06 14:50	906
Containers Supplied:		
1 gal Poly (IOA0115-02A)	Filtered	

~~Incorrectly~~ * container labelled IOA0115-01B *

SAMPLE INTEGRITY:

All containers intact: ☐ Yes ☐ No | Sample labels/COC agree: ☐ Yes ☐ No | Samples Received On Ice: ☐ Yes ☐ No
Custody Seals Present: ☐ Yes ☐ No | Samples Preserved Properly: ☐ Yes ☐ No | Samples Received at (temp): _____

Released By	Date	Time	Received By	Date	Time
Fed Ex	1-6-05	10:00	T. Nagel	1-6-05	10:00
Released By	Date	Time	Received By	Date	Time

EBERLINE SERVICES

RICHMOND, CA LABORATORY

SAMPLE RECEIPT CHECKLIST

Client: Del Mar Analytical City: Irvine State: CA

Date/Time received: 1-06-05 10:00 CoC No.: IOA Ø115

Container I.D. No.: Styrofoam in Cardboard Requested TAT (Days): 14 P.O. Received Yes [ ] No [ ]

INSPECTION

1. Custody seals on shipping container intact? Yes [ ] No [ ] N/A [X]
2. Custody seals on shipping container dated & signed? Yes [ ] No [ ] N/A [X]
3. Custody seals on sample containers intact? Yes [ ] No [ ] N/A [X]
4. Custody seals on sample containers dated & signed? Yes [ ] No [ ] N/A [X]
5. Packing material is: Wet [X] Dry [ ]
6. Number of samples in shipping container: 2 Sample Matrix: Water
7. Number of containers per sample: 1 (Or see CoC ____)
8. Samples are in correct container Yes [X] No [ ]
9. Paperwork agrees with samples? Yes [X] KKK No [X]
10. Samples have: Tape [ ] Hazard labels [ ] Rad labels [ ] Appropriate sample labels [X]
11. Samples are: In good condition [X] Leaking [ ] Broken Container [ ] Missing [ ]
12. Samples are: Preserved [ ] Not preserved [X] pH 7 Preservative ____
13. Describe any anomalies: Sample Container received wet, but no sample lost. Styrofoam cooler broke apart during shipment and wetness was due only to melted ice.
14. Was P.M. notified of any anomalies? Yes [X] No [ ] Date: 1-06-05
15. Inspected by: [signature] Date: 1-06-05 Time: 10:00

Customer Sample No.	cpm	mR/hr	wipe	Customer Sample No.	cpm	mR/hr	wipe
Also: C.C. indicates samples collected in 2006 KKK							

Ion Chamber Ser. No. ____ Calibration date ____

Alpha Meter Ser. No. ____ Calibration date ____

Beta/Gamma Meter Ser. No. ____ Calibration date ____

Form SCP-01.2, 01-16-04

"over 50 years of quality nuclear services"

CONTRACT COMPLIANCE SCREENING FORM FOR HARDCOPY DATA

AMEC Earth & Environmental
550 South Wadsworth Boulevard
Suite 500
Lakewood, CO 80226

Package ID T711DF20
Task Order 313150010
SDG No. Multiple
No. of Analyses 15

Laboratory Alta
Reviewer K. Shadowlight
Analysis/Method Dioxins

Date: February 11, 2005
Reviewer's Signature K Shadowlight

ACTION ITEMS[a]	
1. **Case Narrative Deficiencies**	
2. **Out of Scope Analyses**	
3. **Analyses Not Conducted**	
4. **Missing Hardcopy Deliverables**	
5. **Incorrect Hardcopy Deliverables**	
6. **Deviations from Analysis Protocol, e.g.,**	Qualifications were assigned for the following:
Holding Times	* Method blank contamination
GC/MS Tune/Inst. Performance	* EMPCs
Calibration	* Detects below the lower method calibration level
Method blanks	
Surrogates	
Matrix Spike/Dup LCS	
Field QC	
Internal Standard Performance	
Compound Identification and Quantitation	
System Performance	
COMMENTS[b]	Rev. 1

[a] Subcontracted analytical laboratory is not meeting contract and/or method requirements.
[b] Differences in protocol have been adopted by the laboratory but no action against the laboratory is required.

DATA VALIDATION REPORT

NPDES
Monitoring

ANALYSIS: DIOXINS/FURANS

SAMPLE DELIVERY GROUPS: Multiple SDGs

Prepared by

AMEC—Denver Operations
550 South Wadsworth Boulevard, Suite 500
Lakewood, Colorado 80226

1. INTRODUCTION

Task Order Title:	NPDES Monitoring
Contract Task Order #:	313150010
Sample Delivery Group #:	Multiple
Project Manager:	B. McIlvaine
Matrix:	Water
Analysis:	Dioxins/Furans
QC Level:	Level IV
No. of Samples:	15
No. of Reanalyses/Dilutions:	0
Reviewer:	K. Shadowlight
Date of Review:	February 11, 2005

The samples listed in Table 1 were validated based on the guidelines outlined in the *AMEC Data Validation Procedure for Dioxins and Furans (DVP-19, Rev. 1), EPA Method 1613, and the National National Functional Guidelines For Chlorinated Dioxin/Furan Data Review* (8/02). Any deviations from these procedures and guidelines are documented herein. Qualifiers were applied in cases where the data did not meet the required QC criteria or where special consideration by the data user is required. Data qualifiers were placed on Form Is with the associated qualification codes. Analytes that were rejected for any reason are denoted on the Form I as having only the "R" data qualifier and associated qualification code(s) denoting the reason for rejection. Any additional problems with the data that may have resulted in an estimated value were not denoted by a qualification code since the data had already been rejected.

Table 1. Sample Identification

Client ID	Laboratory ID (Del Mar)	Laboratory ID (Pace)	Matrix	COC Method
Outfall 003	IOA0026-01	105648001	water	1613
Outfall 004	IOA0027-01	105646001	water	1613
Outfall 005	IOA0028-01	105645001	water	1613
Outfall 007	IOA0108-01	105774001	water	1613
Outfall 008	IOA0109-01	105775001	water	1613
Outfall 009	IOA0110-01	105770001	water	1613
Outfall 010	IOA0111-01	105758001	water	1613
Outfall 001	IOA0112-01	105778001	water	1613
Outfall 002	IOA0119-01	105772001	water	1613
Outfall 018	IOA0122-01	105779001	water	1613
Outfall 011	IOA0131-01	105773001	water	1613
Outfall 006	IOA0458-01	106048001	water	1613
Outfall 004	IOA0460-01	106050001	water	1613
Outfall 005	IOA0464-01	106052001	water	1613
Outfall 003	IOA0466-01	106051001	water	1613

2. DATA VALIDATION FINDINGS

2.1 SAMPLE MANAGEMENT

Following are findings associated with sample management:

2.1.1 Sample Preservation, Handling, and Transport

All of the samples in these SDGs were received at Del Mar Analytical within the temperature limits of 4°C ±2°C. Several of the samples in these SDGs were received at Pace Analytical Services below the temperature limits of 4°C ±2°C; however, as none of the samples were noted to have been damaged, no qualifications were required. The samples were received in good condition at both laboratories. No qualifications were required.

2.1.2 Chain of Custody

The COC and transfer COC were signed by the appropriate field and laboratory personnel, and accounted for the analyses presented in these SDGs. As the samples were couriered directly to the laboratory (Del Mar Analytical), custody seals were not required. There was no information regarding custody seals upon receipt at Pace. No qualifications were required.

2.1.3 Holding Times

The samples were extracted and analyzed within a year of collection. No qualifications were required.

2.2 INSTRUMENT PERFORMANCE

Following are findings associated with instrument performance:

2.2.1 GC Column Performance

A column performance standard was combined with the daily calibration verification and analyzed at the beginning of each analytical sequence. The GC column performance was acceptable with the chromatographic separation of 2,3,7,8-TCDD and other TCDD isomers resolved with a valley of ≤25%. No qualifications were required.

2.2.2 Mass Spectrometer Performance

The mass spectrometer performance could not be evaluated as the laboratory did not provide selected ion current profiles for the lock-mass ions. No qualifications were required.

2.3 CALIBRATION

2.3.1 Initial Calibration

There was one initial calibration, analyzed 11/29/04 on Instrument 10MSHR05. The calibration consisted of five concentration level standards (CS1 through CS5) analyzed to verify instrument linearity. The initial calibration was acceptable with %RSDs ≤20% for the 15 native compounds (calibration by isotope dilution) and ≤35% for the 2 native and all labeled compounds (calibration by internal standard). The relative retention times and ion abundance ratios were within the QC limits listed in Method 1613 for all standards. A representative number of %RSDs were verified from the raw data, and no calculation or transcription errors were noted. No qualifications were required.

2.3.2 Continuing Calibration

Calibration verification (VER) consisted of a mid-level standard (CS3) analyzed at the beginning of each analytical sequence. The VER was acceptable with the concentrations within the acceptance criteria listed in the Table 6 of the EPA Method 1613. The ion abundance ratios and relative retention times were within the method QC limits. A representative number of %Ds were verified from the raw data, and no calculation or transcription errors were noted. No qualifications were required.

2.4 BLANKS

One method blank (Blank-6202) was extracted and analyzed with the samples in these SDGs. Target compounds 1,2,3,4,6,7,8-HpCDD, total HpCDD, OCDF, and OCDD were reported in the method blank. Any detects for the aforementioned target compounds reported at concentrations <5x the concentrations reported in the method blank were qualified as estimated nondetects "UJ," at the levels of interference in the samples of these SDGs. A review of the method blank raw data and chromatograms indicated no false negatives or false positives. No further qualifications were required.

2.5 BLANK SPIKES AND LABORATORY CONTROL SAMPLES

One LCS/LCSD pair (LCS-6203/LCSD-6204) was extracted and analyzed with the samples in these SDGs. All recoveries were within the acceptance criteria listed in Table 6 of the Method 1613. There were no QC limits established for RPDs. The reported RPDs were within ±20%. No qualifications were required.

2.6 MATRIX SPIKE/MATRIX SPIKE DUPLICATE

MS/MSD analyses were not performed in these SDGs. Evaluation of method accuracy and precision was based on the LCS/LCSD results. No qualifications were required.

2.7 FIELD QC SAMPLES

Following are findings associated with field QC:

2.7.1 Field Blanks and Equipment Rinsates

The samples in these SDGs had no associated field QC samples. No qualifications were required.

2.7.2 Field Duplicates

No field duplicate samples were identified for these SDGs.

2.8 INTERNAL STANDARDS

The labeled standard recoveries were within the acceptance criteria listed in Table 7 of Method 1613. No qualifications were required.

2.9 COMPOUND IDENTIFICATION

The laboratory analyzed for polychlorinated dioxins/furans by EPA Method 1613. The compound identifications were verified from the raw data and no false negatives or positives were noted. No qualifications were required.

2.10 COMPOUND QUANTIFICATION AND REPORTED DETECTION LIMITS

Compound quantitation was verified from the raw data. The laboratory calculated and reported compound-specific detection limits. Any detects below the lower method calibration limit (MCL) were qualified as estimated, "J." Any reported EMPC was qualified as an estimated nondetect, "UJ." No further qualifications were required.

Pace Analytical Services, Inc.
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Minneapolis, MN 55414

Tel: 612-607-1700
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Method 1613B Analysis Results

Client - Del Mar Analytical

Client's Sample ID	IOA0466-01 Outfall 003		
Lab Sample ID	106051001		
Filename	F50127B_10		
Injected By	MRO		
Total Amount Extracted	1030 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	01/10/2005
ICAL Date	11/29/2004	Received	01/12/2005
CCal Filename(s)	F50127A_13	Extracted	01/24/2005
Method Blank ID	BLANK-6202	Analyzed	01/28/2005 04:30

Rev Qual	Final Qual	Native Isomers	Conc pg/L	EMPC pg/L	LOD pg/L	
U		2,3,7,8-TCDF	ND	-----	2.4	
U		Total TCDF	ND	-----	2.4	
U		2,3,7,8-TCDD	ND	-----	1.9	
U		Total TCDD	ND	-----	1.9	
U		1,2,3,7,8-PeCDF	ND	-----	1.5	
U		2,3,4,7,8-PeCDF	ND	-----	1.0	
		Total PeCDF	ND	-----	1.3	
U		1,2,3,7,8-PeCDD	ND	-----	2.1	
U		Total PeCDD	ND	-----	2.1	
U		1,2,3,4,7,8-HxCDF	ND	-----	1.2	
		1,2,3,6,7,8-HxCDF	ND	-----	1.1	
		2,3,4,6,7,8-HxCDF	ND	-----	1.3	
		1,2,3,7,8,9-HxCDF	ND	-----	2.2	
		Total HxCDF	ND	-----	1.5	
U		1,2,3,4,7,8-HxCDD	ND	-----	1.7	
		1,2,3,6,7,8-HxCDD	ND	-----	1.3	
J	DNQ	1,2,3,7,8,9-HxCDD	ND	-----	2.0	
		Total HxCDD	3.7	-----	1.7	J
UJ	*10	1,2,3,4,6,7,8-HpCDF	-----	3.9	1.3	I
U		1,2,3,4,7,8,9-HpCDF	ND	-----	1.9	
		Total HpCDF	ND	-----	1.6	
J	DNQ	1,2,3,4,6,7,8-HpCDD	18.0	-----	1.8	BJ
		Total HpCDD	66.0	-----	1.8	
UJ	B	OCDF	18.0	-----	2.2	BJ
		OCDD	280.0	-----	3.9	

Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF-13C	2.00	70
2,3,7,8-TCDD-13C	2.00	82
1,2,3,7,8-PeCDF-13C	2.00	92
2,3,4,7,8-PeCDF-13C	2.00	88
1,2,3,7,8-PeCDD-13C	2.00	102
1,2,3,4,7,8-HxCDF-13C	2.00	82
1,2,3,6,7,8-HxCDF-13C	2.00	102
2,3,4,6,7,8-HxCDF-13C	2.00	97
1,2,3,7,8,9-HxCDF-13C	2.00	83
1,2,3,4,7,8-HxCDD-13C	2.00	77
1,2,3,6,7,8-HxCDD-13C	2.00	93
1,2,3,4,6,7,8-HpCDF-13C	2.00	86
1,2,3,4,7,8,9-HpCDF-13C	2.00	76
1,2,3,4,6,7,8-HpCDD-13C	2.00	100
OCDD-13C	4.00	90
1,2,3,4-TCDD-13C	2.00	NA
1,2,3,7,8,9-HxCDD-13C	2.00	NA
2,3,7,8-TCDD-37Cl4	0.20	78

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection. Totals are averages of individual isomer LODs.
D = Result obtained from analysis of diluted sample
B = Less than 10 times higher than method blank level
P = Recovery outside of method 1613 control limits
J = Concentration detected is below the calibration range
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

DATA VALIDATED

Report No.....106051

REPORT OF LABORATORY ANALYSIS

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CONTRACT COMPLIANCE SCREENING FORM FOR HARDCOPY DATA

AMEC Earth & Environmental
550 South Wadsworth Boulevard
Suite 500
Lakewood, CO 80226

Laboratory Del Mar
Reviewer P. Meeks
Analysis/Method Metals

Package ID T711MT25
Task Order 313150010
SDG No. Multiple
No. of Analyses 4

Date: 02/03/05
Reviewer's Signature
P. Meeks for K Okonek

ACTION ITEMS[a]	
1. **Case Narrative Deficiencies**	
2. **Out of Scope Analyses**	
3. **Analyses Not Conducted**	
4. **Missing Hardcopy Deliverables**	
5. **Incorrect Hardcopy Deliverables**	
6. **Deviations from Analysis Protocol, e.g.,**	Qualifications were applied for lead detected below the reporting limit.
Holding Times	
GC/MS Tune/Inst. Performance	
Calibrations	
Blanks	
Surrogates	
Matrix Spike/Dup LCS	
Field QC	
Internal Standard Performance	
Compound Identification and Quantitation	
System Performance	

COMMENTS[b]

[a] Subcontracted analytical laboratory is not meeting contract and/or method requirements.
[b] Differences in protocol have been adopted by the laboratory but no action against the laboratory is required.

DATA VALIDATION REPORT

NPDES
Monitoring

ANALYSIS: METALS

SAMPLE DELIVERY GROUPS: IOA0458, IOA0460, IOA0464, & IOA0466

Prepared by

AMEC—Denver Operations
550 South Wadsworth Boulevard, Suite 500
Lakewood, Colorado 80226

1. INTRODUCTION

Task Order Title:	NPDES Monitoring
Contract Task Order #:	313150010
SDG#:	IOA0458, IOA0460, IOA0464, & IOA0466
Project Manager:	B. McIlvaine
Matrix:	Water
Analysis:	Metals
QC Level:	Level IV
No. of Samples:	4
No. of Reanalyses/Dilutions:	0
Reviewer:	K. Okonzak-Lowry
Date of Review:	February 02, 2005

The samples listed in Table 1 were validated based on the guidelines outlined in the *AMEC Data Validation Procedure for Levels III and IV ICP-MS Metals, (DVP-5-A, Rev.0), AMEC Data Validation Procedure for Levels III and IV ICP Metals* (DVP-5, Rev. 0), SW-846 *Method 6020B for Inductively Coupled Plasma – Mass Spectrometry*, SW-846 *Method 6010B for Inductively Coupled Plasma* , SW-846 *Method 7471A for Mercury (Manual Cold-Vapor Technique)*, and validation guidelines outlined in the USEPA CLP *National Functional Guidelines for Inorganic Data Review* (2/94). Any deviations from these procedures and guidelines are documented herein. Qualifiers were applied in cases where the data did not meet the required QC criteria or where special consideration by the data user is required. Data qualifiers were placed on Form Is with the associated qualification codes. Analytes that were rejected for any reason are denoted on the Form I as having only the "R" data qualifier and associated qualification code(s) denoting the reason for rejection. Any additional problems with the data that may have resulted in an estimated value were not denoted by a qualification code since the data had already been rejected.

Table 1. Sample identification

Client ID	EPA ID	Laboratory ID	Matrix	COC Method
Outfall 006	Outfall 006	IOA0458-01	water	ILM04
Outfall 004	Outfall 004	IOA0460-01	water	ILM04
Outfall 005	Outfall 005	IOA0464-01	water	ILM04
Outfall 003	Outfall 003	IOA0466-01	water	ILM04

2. DATA VALIDATION FINDINGS

2.1 SAMPLE MANAGEMENT

Following are findings associated with sample management:

2.1.1 Sample Preservation, Handling, and Transport

The samples in these SDGs were received at the laboratory within the temperature limits of 4°C ±2°C. No sample preservation, handling, or transport problems were noted, and no qualifications were necessary.

2.1.2 Chain of Custody

The COCs were signed and dated by field and laboratory personnel. The COCs listed duplicate samples for all samples; however, duplicate analyses were not required. No sample qualifications were required.

2.1.3 Holding Times

The dates of collection recorded on the COCs and the dates of analyses recorded in the raw data, documented that the sample analyses were performed within the specified holding times of six months for the ICP/MS metals. No qualifications were required.

2.2 ICP-MS TUNING

A precalibration routine must be completed prior to calibrating the instrument, which consists of analyzing a tuning solution to verify resolution, mass calibration, and thermal stability. The solution must be analyzed a minimum of five times and must contain isotopes representing all mass regions of interest. The laboratory performed the required tune solution analyses but did not report %RSDs. The laboratory SOP states that to be acceptable, the %RSD must be less than 5%. The mass calibrations were within 0.1 amu of the true mass and an the instrument resolutions were less than 0.9 amu at 10 percent peak height for all analytes in the tune solution. No site sample qualifications were required.

2.3 CALIBRATION

The ICV and CCV results showed acceptable recoveries, 90-110% for the ICP/MS. The reporting limit check standards were recovered within the AMEC control limits of 70-130%. No qualifications were required.

2.4 BLANKS

Lead was not detected in any of the method blanks or CCBs associated with the samples in these SDGs. No qualifications were required.

2.5 ICP INTERFERENCE CHECK SAMPLE (ICS A/AB)

No ICPMS interference check samples were analyzed in association with the samples in these SDGs; therefore, no assessment was made with respect to this criterion.

2.6 BLANK SPIKES AND LABORATORY CONTROL SAMPLES

The ICP/MS LCS samples were identified as 5A10077-BS1 and 5A11081-BS1. The LCS results on the summary forms and in the raw data were within the laboratory-established ICP/MS control limits of 85-115%. No qualifications were required.

2.7 LABORATORY DUPLICATES

No MS/MSD or duplicate analyses were performed in association with the samples in these SDGs; therefore, no assessment was made with respect to this criterion.

2.8 MATRIX SPIKE

No MS/MSD analyses were performed in association with the samples in these SDGs; therefore, no assessment was made with respect to this criterion.

2.9 FURNACE ATOMIC ABSORPTION QC

Furnace atomic absorption was not utilized for the analysis of these samples; therefore, furnace atomic absorption QC is not applicable.

2.10 ICP/MS SERIAL DILUTION

No serial dilution analysis was performed in association with the samples in these SDGs; therefore, no assessment was made with respect to this criterion.

2.11 INTERNAL STANDARDS PERFORMANCE

The ICP-MS internal standard recoveries for the site samples and associated QC sample analyses were within the 60-125% control limits and no qualifications were required.

2.12 SAMPLE RESULT VERIFICATION

A Level IV review was performed for the samples in these data packages. Calculations were verified, and the sample results reported on the Form Is were verified against the raw data. No transcription errors or calculation errors were noted. Lead detected below the reporting limit were qualified as estimated, "J." No further qualifications were required.

2.13 FIELD QC SAMPLES

Field QC samples are evaluated, and if necessary, qualified based only on laboratory blanks. Any remaining detects are used to evaluate the associated samples.

2.13.1 Field Blanks and Equipment Rinsates

The samples in these SDGs had no associated field QC samples. No qualifications were required.

2.13.2 Field Duplicates

There were no field duplicate analyses performed in association with the site samples.

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Semiannual Outfall 003

Report Number: IOA0466

Sampled: 01/10/05
Received: 01/10/05

DRAFT: METALS

Analyte	Method	Batch	MDL	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers Rev Qual	Qual Code
Sample ID: IOA0466-01 (DRAFT: Outfall 003 - Water)										
Reporting Units: ug/l										
Lead	EPA 200.8	5A10077	0.13	1.0	**0.51**	1	01/10/05	01/11/05	J1	DNQ

AMEC VALIDATED

LEVEL IV

CWL
2/8/05

DRAFT REPORT
DRAFT REPORT
DATA SUBJECT TO CHANGE

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LABORATORY REPORT

Prepared For: MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project: Semiannual Outfall 003

Sampled: 01/10/05
Received: 01/10/05
Issued: 02/22/05 11:59

NELAP #01108CA California ELAP#1197 CSDLAC #10117

The results listed within this Laboratory Report pertain only to the samples tested in the laboratory. The analyses contained in this report were performed in accordance with the applicable certifications as noted. All soil samples are reported on a wet weight basis unless otherwise noted in the report. This Laboratory Report is confidential and is intended for the sole use of Del Mar Analytical and its client. This report shall not be reproduced, except in full, without written permission from Del Mar Analytical. The Chain of Custody, 1 page, is included and is an integral part of this report.

This entire report was reviewed and approved for release.

SAMPLE CROSS REFERENCE

SUBCONTRACTED: Refer to the last page for specific subcontract laboratory information included in this report.

LABORATORY ID	CLIENT ID	MATRIX
IOA0466-01	Outfall 003	Water

Reviewed By:

Michele Harper

Del Mar Analytical, Irvine
Michele Harper
Project Manager

Del Mar Analytical

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Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Semiannual Outfall 003

Report Number: IOA0466

Sampled: 01/10/05
Received: 01/10/05

METALS

Analyte	Method	Batch	MDL Limit	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA0466-01 (Outfall 003 - Water)									
Reporting Units: ug/l									
Antimony	EPA 200.8	5A10077	0.18	2.0	**0.33**	1	01/10/05	01/11/05	B, J
Cadmium	EPA 200.8	5A10077	0.015	1.0	**0.055**	1	01/10/05	01/11/05	J
Copper	EPA 200.8	5A10077	0.49	2.0	**1.9**	1	01/10/05	01/11/05	J
Lead	EPA 200.8	5A10077	0.13	1.0	**0.51**	1	01/10/05	01/11/05	J
Mercury	EPA 245.1	5A11061	0.063	0.20	**0.13**	1	01/11/05	01/11/05	J

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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Attention: Bronwyn Kelly

Project ID: Semiannual Outfall 003

Report Number: IOA0466

Sampled: 01/10/05
Received: 01/10/05

INORGANICS

Analyte	Method	Batch	MDL Limit	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA0466-01 (Outfall 003 - Water) - cont.									
Reporting Units: mg/l									
Chloride	EPA 300.0	5A10035	0.26	0.50	**5.5**	1	01/10/05	01/10/05	
Nitrate/Nitrite-N	EPA 300.0	5A10035	0.072	0.26	**0.49**	1	01/10/05	01/10/05	
Oil & Grease	EPA 413.1	5A12061	0.94	5.0	**7.6**	1	01/12/05	01/12/05	B
Sulfate	EPA 300.0	5A10035	0.18	0.50	**6.0**	1	01/10/05	01/10/05	
Total Dissolved Solids	SM2540C	5A11087	10	10	**100**	1	01/11/05	01/11/05	
Sample ID: IOA0466-01 (Outfall 003 - Water)									
Reporting Units: ug/l									
Perchlorate	EPA 314.0	5A13051	0.80	4.0	ND	1	01/13/05	01/13/05	

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Michele Harper
Project Manager

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MWH-Pasadena/Boeing
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Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Semiannual Outfall 003

Report Number: IOA0466

Sampled: 01/10/05
Received: 01/10/05

SHORT HOLD TIME DETAIL REPORT

	Hold Time (in days)	Date/Time Sampled	Date/Time Received	Date/Time Extracted	Date/Time Analyzed
Sample ID: Outfall 003 (IOA0466-01) - Water					
EPA 300.0	2	01/10/2005 10:48	01/10/2005 16:20	01/10/2005 20:30	01/10/2005 20:49

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Michele Harper
Project Manager

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Attention: Bronwyn Kelly

Project ID: Semiannual Outfall 003

Report Number: IOA0466

Sampled: 01/10/05
Received: 01/10/05

METHOD BLANK/QC DATA

METALS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A10077 Extracted: 01/10/05											
Blank Analyzed: 01/11/2005 (5A10077-BLK1)											
Antimony	0.360	2.0	0.18	ug/l							J
Cadmium	ND	1.0	0.015	ug/l							
Copper	ND	2.0	0.49	ug/l							
Lead	ND	1.0	0.13	ug/l							
LCS Analyzed: 01/11/2005 (5A10077-BS1)											
Antimony	88.4	2.0	0.18	ug/l	80.0		110	85-115			
Cadmium	77.3	1.0	0.015	ug/l	80.0		97	85-115			
Copper	80.8	2.0	0.49	ug/l	80.0		101	85-115			
Lead	79.9	1.0	0.13	ug/l	80.0		100	85-115			
Matrix Spike Analyzed: 01/11/2005 (5A10077-MS1)						**Source: IOA0418-01**					
Antimony	85.6	2.0	0.18	ug/l	80.0	0.46	106	70-130			
Cadmium	77.4	1.0	0.015	ug/l	80.0	0.020	97	70-130			
Copper	107	2.0	0.49	ug/l	80.0	29	98	70-130			
Lead	79.8	1.0	0.13	ug/l	80.0	0.60	99	70-130			
Matrix Spike Dup Analyzed: 01/11/2005 (5A10077-MSD1)						**Source: IOA0418-01**					
Antimony	88.2	2.0	0.18	ug/l	80.0	0.46	110	70-130	3	20	
Cadmium	77.0	1.0	0.015	ug/l	80.0	0.020	96	70-130	1	20	
Copper	108	2.0	0.49	ug/l	80.0	29	99	70-130	1	20	
Lead	82.4	1.0	0.13	ug/l	80.0	0.60	102	70-130	3	20	
Batch: 5A11061 Extracted: 01/11/05											
Blank Analyzed: 01/11/2005 (5A11061-BLK1)											
Mercury	ND	0.20	0.063	ug/l							

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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Attention: Bronwyn Kelly

Project ID: Semiannual Outfall 003

Report Number: IOA0466

Sampled: 01/10/05
Received: 01/10/05

METHOD BLANK/QC DATA

METALS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A11061 Extracted: 01/11/05											
LCS Analyzed: 01/11/2005 (5A11061-BS1)											
Mercury	8.57	0.20	0.063	ug/l	8.00		107	85-115			
Matrix Spike Analyzed: 01/11/2005 (5A11061-MS1)						**Source: IOA0439-01**					
Mercury	8.47	0.20	0.063	ug/l	8.00	ND	106	70-130			
Matrix Spike Dup Analyzed: 01/11/2005 (5A11061-MSD1)						**Source: IOA0439-01**					
Mercury	8.48	0.20	0.063	ug/l	8.00	ND	106	70-130	0	20	

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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Del Mar Analytical

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2520 E. Sunset Rd. #3, Las Vegas, NV 89120 (702) 798-3620 FAX (702) 798-3621

MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Semiannual Outfall 003

Report Number: IOA0466

Sampled: 01/10/05
Received: 01/10/05

METHOD BLANK/QC DATA

INORGANICS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A10035 Extracted: 01/10/05											
Blank Analyzed: 01/10/2005 (5A10035-BLK1)											
Chloride	ND	0.50	0.26	mg/l							
Nitrate/Nitrite-N	ND	0.26	0.072	mg/l							
Sulfate	ND	0.50	0.18	mg/l							
LCS Analyzed: 01/10/2005 (5A10035-BS1)											
Chloride	4.85	0.50	0.26	mg/l	5.00		97	90-110			
Sulfate	10.2	0.50	0.18	mg/l	10.0		102	90-110			
Matrix Spike Analyzed: 01/10/2005 (5A10035-MS1)						**Source: IOA0441-01**					
Chloride	22.1	2.5	1.3	mg/l	5.00	17	102	80-120			
Sulfate	60.2	2.5	0.90	mg/l	10.0	49	112	80-120			
Matrix Spike Dup Analyzed: 01/10/2005 (5A10035-MSD1)						**Source: IOA0441-01**					
Chloride	22.0	2.5	1.3	mg/l	5.00	17	100	80-120	1	20	
Sulfate	60.7	2.5	0.90	mg/l	10.0	49	117	80-120	1	20	
Batch: 5A11087 Extracted: 01/11/05											
Blank Analyzed: 01/11/2005 (5A11087-BLK1)											
Total Dissolved Solids	ND	10	10	mg/l							
LCS Analyzed: 01/11/2005 (5A11087-BS1)											
Total Dissolved Solids	978	10	10	mg/l	1000		98	90-110			
Duplicate Analyzed: 01/11/2005 (5A11087-DUP1)						**Source: IOA0364-01**					
Total Dissolved Solids	ND	10	10	mg/l		ND				10	

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Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Semiannual Outfall 003

Report Number: IOA0466

Sampled: 01/10/05
Received: 01/10/05

METHOD BLANK/QC DATA

INORGANICS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A12061 Extracted: 01/12/05											
Blank Analyzed: 01/12/2005 (5A12061-BLK1)											
Oil & Grease	1.60	5.0	0.94	mg/l							*J*
LCS Analyzed: 01/12/2005 (5A12061-BS1)											**M-NR1**
Oil & Grease	21.2	5.0	0.94	mg/l	20.0		106	65-120			
LCS Dup Analyzed: 01/12/2005 (5A12061-BSD1)											
Oil & Grease	20.8	5.0	0.94	mg/l	20.0		104	65-120	2	20	
Batch: 5A13051 Extracted: 01/13/05											
Blank Analyzed: 01/13/2005 (5A13051-BLK1)											
Perchlorate	ND	4.0	0.80	ug/l							
LCS Analyzed: 01/13/2005 (5A13051-BS1)											
Perchlorate	50.0	4.0	0.80	ug/l	50.0		100	85-115			
Matrix Spike Analyzed: 01/13/2005 (5A13051-MS1)						**Source: IOA0417-02**					
Perchlorate	49.6	4.0	0.80	ug/l	50.0	0.93	97	80-120			
Matrix Spike Dup Analyzed: 01/13/2005 (5A13051-MSD1)						**Source: IOA0417-02**					
Perchlorate	50.7	4.0	0.80	ug/l	50.0	0.93	100	80-120	2	20	

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Semiannual Outfall 003

Report Number: IOA0466

Sampled: 01/10/05
Received: 01/10/05

Compliance Check

The results obtained from the analytical testing of this data set were checked against compliance limits received from the client. Any results at or above the compliance limits appear in bold on this page.

LabNumber	Analysis	Analyte	Units	Result	MRL	Compliance Limit
IOA0466-01	413.1 Oil and Grease	Oil & Grease	mg/l	7.60	5.0	15
IOA0466-01	Antimony-200.8	Antimony	ug/l	0.33	2.0	6.00
IOA0466-01	Cadmium-200.8	Cadmium	ug/l	0.055	1.0	4.00
IOA0466-01	Chloride - 300.0	Chloride	mg/l	5.50	0.50	150
IOA0466-01	Copper-200.8	Copper	ug/l	1.90	2.0	14
IOA0466-01	Mercury - 245.1	Mercury	ug/l	0.13	0.20	0.20
IOA0466-01	Nitrogen, NO3+NO2 -N	Nitrate/Nitrite-N	mg/l	0.49	0.26	10.00
IOA0466-01	Perchlorate 314.0	Perchlorate	ug/l	0	4.0	6.00
IOA0466-01	Sulfate-300.0	Sulfate	mg/l	6.00	0.50	250
IOA0466-01	TDS - SM 2540C	Total Dissolved Solids	mg/l	100	10	850

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Semiannual Outfall 003

Report Number: IOA0466

Sampled: 01/10/05
Received: 01/10/05

DATA QUALIFIERS AND DEFINITIONS

B	Analyte was detected in the associated Method Blank.
J	Estimated value. Analyte detected at a level less than the Reporting Limit (RL) and greater than or equal to the Method Detection Limit (MDL). The user of this data should be aware that this data is of unknown quality.
M-NR1	There was no MS/MSD analyzed with this batch due to insufficient sample volume. See Blank Spike/Blank Spike Duplicate.
ND	Analyte NOT DETECTED at or above the reporting limit or MDL, if MDL is specified.
RPD	Relative Percent Difference

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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Del Mar Analytical

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Semiannual Outfall 003

Report Number: IOA0466

Sampled: 01/10/05
Received: 01/10/05

Certification Summary

Del Mar Analytical, Irvine

Method	Matrix	Nelac	California
EPA 200.8	Water	X	X
EPA 245.1	Water	X	X
EPA 300.0	Water	X	X
EPA 314.0	Water	X	X
EPA 413.1	Water	X	X
SM2540C	Water	X	X

Nevada and NELAP provide analyte specific accreditations. Analyte specific information for Del Mar Analytical may be obtained by contacting the laboratory or visiting our website at www.dmalabs.com.

Subcontracted Laboratories

Pace Analytical, MN- SUB

1700 Elm Street, Ste 200 - Minneapolis, MN 55414

Analysis Performed: 1613-Dioxin-HR
Samples: IOA0466-01

Analysis Performed: EDD + Level 4
Samples: IOA0466-01

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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IOA 0466

Del Mar Analytical Version 5 8/12/04 CHAIN OF CUSTODY FORM

Client Name/Address:

MWH-Pasadena
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101

Project Manager: Bronwyn Kelly

Sampler:

Project:
Boeing-SSFL NPDES
Routine/Semi-Annual (Perchlorate) Outfall 003
Stormwater at RMHF

Phone Number:
(626) 568-6691
Fax Number:
(626) 568-6515

ANALYSIS REQUIRED

Field readings:
Temp = 59°
pH= 7.72

Sample Description	Sample Matrix	Container Type	# of Cont.	Sampling Date/Time	Preservative	Bottle * #	Total Reoverable Metals: Sb, Cd, Cu, Pb, Hg	TCDD (and all congeners)	Oil & Grease (EPA 413.1)	Cl-, SO4, NO3+NO2-N, Perchlorate	TDS					Comments
Outfall 003	W	1L Poly	1	1-10-05 10:48	HNO3	1A	X									
Outfall 003-Dup	W	1L Poly	1		HNO3	1B	X									
Outfall 003	W	1L Amber	2		None	2A, 2B		X								
Outfall 003	W	1L Amber	2		HCl	3A, 3B			X							
Outfall 003	W	Poly-500 ml	2		None	4A, 4B				X						
Outfall 003	W	Poly-500 ml	2	1-10-05 10:48	None	5A, 5B					X					

VB

Relinquished By	Date/Time:	Received By	Date/Time:
[signature]	1-10-05 1250	[signature]	1/10/05 1250
[signature]	1/10/05 1620	[signature]	1/10/05 1620

Turn around Time: (check)
24 Hours ____ 5 Days ____
48 Hours ____ 10 Days ____
72 Hours ____ Normal ✓
Perchlorate Only 72 Hours____
Metals Only 72 Hours____
Sample Integrity: (Check)
Intact X On Ice: X 4°C

Del Mar Analytical

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February 7, 2005

MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, Ca.91101

Attention: Bronwyn Kelly

Project: Semiannual Outfall 003
Sampled: 01/10/05
Del Mar Analytical Number: IOA0466

Dear Ms. Kelly:

Pace Analytical performed Method 1613B analysis for the project referenced above. Please use the following cross-reference table when reviewing your results.

MWH ID	DEL MAR ID	Pace ID
Outfall 003	IOA0466-01	106051001

Attached is the original report from the subcontract laboratory. If you have any questions or require further assistance, please do not hesitate to contact me.

Sincerely yours,
DEL MAR ANALYTICAL

Michele Harper
Project Manager

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 1613B Analysis Results

Client - Del Mar Analytical

Client's Sample ID	IOA0466-01		
Lab Sample ID	106051001		
Filename	F50127B_10		
Injected By	MRO		
Total Amount Extracted	1030 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	01/10/2005
ICAL Date	11/29/2004	Received	01/12/2005
CCal Filename(s)	F50127A_13	Extracted	01/24/2005
Method Blank ID	BLANK-6202	Analyzed	01/28/2005 04:30

Native Isomers	Conc pg/L	EMPC pg/L	LOD pg/L		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	2.4		2,3,7,8-TCDF-13C	2.00	70
Total TCDF	ND	-----	2.4		2,3,7,8-TCDD-13C	2.00	82
					1,2,3,7,8-PeCDF-13C	2.00	92
2,3,7,8-TCDD	ND	-----	1.9		2,3,4,7,8-PeCDF-13C	2.00	88
Total TCDD	ND	-----	1.9		1,2,3,7,8-PeCDD-13C	2.00	102
					1,2,3,4,7,8-HxCDF-13C	2.00	82
1,2,3,7,8-PeCDF	ND	-----	1.5		1,2,3,6,7,8-HxCDF-13C	2.00	102
2,3,4,7,8-PeCDF	ND	-----	1.0		2,3,4,6,7,8-HxCDF-13C	2.00	97
Total PeCDF	ND	-----	1.3		1,2,3,7,8,9-HxCDF-13C	2.00	83
					1,2,3,4,7,8-HxCDD-13C	2.00	77
1,2,3,7,8-PeCDD	ND	-----	2.1		1,2,3,6,7,8-HxCDD-13C	2.00	93
Total PeCDD	ND	-----	2.1		1,2,3,4,6,7,8-HpCDF-13C	2.00	86
					1,2,3,4,7,8,9-HpCDF-13C	2.00	76
1,2,3,4,7,8-HxCDF	ND	-----	1.2		1,2,3,4,6,7,8-HpCDD-13C	2.00	100
1,2,3,6,7,8-HxCDF	ND	-----	1.1		OCDD-13C	4.00	90
2,3,4,6,7,8-HxCDF	ND	-----	1.3				
1,2,3,7,8,9-HxCDF	ND	-----	2.2		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	-----	1.5		1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	1.7		2,3,7,8-TCDD-37Cl4	0.20	78
1,2,3,6,7,8-HxCDD	ND	-----	1.3				
1,2,3,7,8,9-HxCDD	ND	-----	2.0				
Total HxCDD	3.7	-----	1.7	J			
1,2,3,4,6,7,8-HpCDF	-----	3.9	1.3	I			
1,2,3,4,7,8,9-HpCDF	ND	-----	1.9				
Total HpCDF	ND	-----	1.6				
1,2,3,4,6,7,8-HpCDD	18.0	-----	1.8	BJ			
Total HpCDD	66.0	-----	1.8				
OCDF	18.0	-----	2.2	BJ			
OCDD	280.0	-----	3.9				

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection. Totals are averages of individual isomer LODs.
D = Result obtained from analysis of diluted sample
B = Less than 10 times higher than method blank level
P = Recovery outside of method 1613 control limits
J = Concentration detected is below the calibration range
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....106051

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Pace Analytical™

Method 1613B Blank Analysis Results

Client - Del Mar Analytical

Lab Sample ID	BLANK-6202	Matrix	Water
Filename	F50127A_06	Dilution	NA
Total Amount Extracted	982 mL	Extracted	01/24/2005
ICAL Date	11/29/2004	Analyzed	01/27/2005 14:13
CCal Filename(s)	F50127A_02	Injected By	MRO

Native Isomers	Conc pg/L	EMPC pg/L	LOD pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	4.7	2,3,7,8-TCDF-13C	2.00	33
Total TCDF	ND	-----	-----	2,3,7,8-TCDD-13C	2.00	45
				1,2,3,7,8-PeCDF-13C	2.00	68
2,3,7,8-TCDD	ND	-----	5.1	2,3,4,7,8-PeCDF-13C	2.00	70
Total TCDD	ND	-----	-----	1,2,3,7,8-PeCDD-13C	2.00	81
				1,2,3,4,7,8-HxCDF-13C	2.00	75
1,2,3,7,8-PeCDF	ND	-----	2.2	1,2,3,6,7,8-HxCDF-13C	2.00	95
2,3,4,7,8-PeCDF	ND	-----	1.5	2,3,4,6,7,8-HxCDF-13C	2.00	98
Total PeCDF	ND	-----	-----	1,2,3,7,8,9-HxCDF-13C	2.00	85
				1,2,3,4,7,8-HxCDD-13C	2.00	78
1,2,3,7,8-PeCDD	ND	-----	1.6	1,2,3,6,7,8-HxCDD-13C	2.00	94
Total PeCDD	ND	-----	-----	1,2,3,4,6,7,8-HpCDF-13C	2.00	85
				1,2,3,4,7,8,9-HpCDF-13C	2.00	78
1,2,3,4,7,8-HxCDF	ND	-----	1.6	1,2,3,4,6,7,8-HpCDD-13C	2.00	99
1,2,3,6,7,8-HxCDF	ND	-----	1.4	OCDD-13C	4.00	97
2,3,4,6,7,8-HxCDF	ND	-----	1.1			
1,2,3,7,8,9-HxCDF	ND	-----	1.6	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	-----	-----	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	1.6	2,3,7,8-TCDD-37Cl4	0.20	40
1,2,3,6,7,8-HxCDD	ND	-----	1.2			
1,2,3,7,8,9-HxCDD	ND	-----	1.7			
Total HxCDD	ND	-----	-----			
1,2,3,4,6,7,8-HpCDF	ND	-----	1.5			
1,2,3,4,7,8,9-HpCDF	ND	-----	1.4			
Total HpCDF	ND	-----	-----			
1,2,3,4,6,7,8-HpCDD	1.9	-----	1.3 J			
Total HpCDD	1.9	-----	----- J			
OCDF	8.3	-----	1.9 J			
OCDD	26.0	-----	2.3 J			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection. Totals are averages of individual isomer LODs.
A = Limit of Detection based on signal to noise
P = Recovery outside of method 1613 control limits
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....105645

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 1613B Laboratory Control Spike Results

Client - Del Mar Analytical

Lab Sample ID	LCS-6203		
Filename	F50127A_03	Matrix	Water
Total Amount Extracted	1030 mL	Dilution	NA
ICAL Date	11/29/2004	Extracted	01/24/2005
CCal Filename	F50127A_02	Analyzed	01/27/2005 11:44
Method Blank ID	BLANK-6202	Injected By	MRO

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDF	10	10.2	7.5	15.8	102
2,3,7,8-TCDD	10	9.0	6.7	15.8	90
1,2,3,7,8-PeCDF	50	50.1	40.0	67.0	100
2,3,4,7,8-PeCDF	50	48.4	34.0	80.0	97
1,2,3,7,8-PeCDD	50	43.4	35.0	71.0	87
1,2,3,4,7,8-HxCDF	50	44.8	36.0	67.0	90
1,2,3,6,7,8-HxCDF	50	48.0	42.0	65.0	96
2,3,4,6,7,8-HxCDF	50	48.6	35.0	78.0	97
1,2,3,7,8,9-HxCDF	50	46.4	39.0	65.0	93
1,2,3,4,7,8-HxCDD	50	50.0	35.0	82.0	100
1,2,3,6,7,8-HxCDD	50	51.7	38.0	67.0	103
1,2,3,7,8,9-HxCDD	50	48.5	32.0	81.0	97
1,2,3,4,6,7,8-HpCDF	50	51.4	41.0	61.0	103
1,2,3,4,7,8,9-HpCDF	50	52.3	39.0	69.0	105
1,2,3,4,6,7,8-HpCDD	50	43.4	35.0	70.0	87
OCDF	100	89.5	63.0	170.0	90
OCDD	100	96.9	78.0	144.0	97
2,3,7,8-TCDD-37Cl4	10	6.2	3.1	19.1	62
2,3,7,8-TCDF-13C	100	49.8	22.0	152.0	50
2,3,7,8-TCDD-13C	100	65.8	20.0	175.0	66
1,2,3,7,8-PeCDF-13C	100	75.7	21.0	192.0	76
2,3,4,7,8-PeCDF-13C	100	76.9	13.0	328.0	77
1,2,3,7,8-PeCDD-13C	100	93.4	21.0	227.0	93
1,2,3,4,7,8-HxCDF-13C	100	78.9	19.0	202.0	79
1,2,3,6,7,8-HxCDF-13C	100	89.8	21.0	159.0	90
2,3,4,6,7,8-HxCDF-13C	100	88.2	22.0	176.0	88
1,2,3,7,8,9-HxCDF-13C	100	81.5	17.0	205.0	81
1,2,3,4,7,8-HxCDD-13C	100	82.2	21.0	193.0	82
1,2,3,6,7,8-HxCDD-13C	100	95.2	25.0	163.0	95
1,2,3,4,6,7,8-HpCDF-13C	100	86.3	21.0	158.0	86
1,2,3,4,7,8,9-HpCDF-13C	100	75.6	20.0	186.0	76
1,2,3,4,6,7,8-HpCDD-13C	100	102.9	26.0	166.0	103
OCDD-13C	200	195.1	26.0	397.0	98

Cs = Concentration Spiked (ng/mL)
Cr = Concentration Recovered (ng/mL)
Rec. = Recovery (Expressed as Percent)
Control Limit Reference: Method 1613, Table 6, 10/94 Revision
X = Background subtracted value
P = Recovery outside of control limits
Nn = Value obtained from additional analysis
* = See Discussion

Report No.....105645

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 1613B Laboratory Control Spike Results

Client - Del Mar Analytical

Lab Sample ID	LCSD-6204		
Filename	F50127A_04	Matrix	Water
Total Amount Extracted	1000 mL	Dilution	NA
ICAL Date	11/29/2004	Extracted	01/24/2005
CCal Filename	F50127A_02	Analyzed	01/27/2005 12:32
Method Blank ID	BLANK-6202	Injected By	MRO

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDF	10	9.9	7.5	15.8	99
2,3,7,8-TCDD	10	8.8	6.7	15.8	88
1,2,3,7,8-PeCDF	50	49.8	40.0	67.0	100
2,3,4,7,8-PeCDF	50	47.6	34.0	80.0	95
1,2,3,7,8-PeCDD	50	41.4	35.0	71.0	83
1,2,3,4,7,8-HxCDF	50	46.6	36.0	67.0	93
1,2,3,6,7,8-HxCDF	50	44.0	42.0	65.0	88
2,3,4,6,7,8-HxCDF	50	47.2	35.0	78.0	94
1,2,3,7,8,9-HxCDF	50	44.8	39.0	65.0	90
1,2,3,4,7,8-HxCDD	50	46.5	35.0	82.0	93
1,2,3,6,7,8-HxCDD	50	48.9	38.0	67.0	98
1,2,3,7,8,9-HxCDD	50	46.7	32.0	81.0	93
1,2,3,4,6,7,8-HpCDF	50	48.7	41.0	61.0	97
1,2,3,4,7,8,9-HpCDF	50	49.9	39.0	69.0	100
1,2,3,4,6,7,8-HpCDD	50	42.7	35.0	70.0	85
OCDF	100	84.8	63.0	170.0	85
OCDD	100	92.5	78.0	144.0	92
2,3,7,8-TCDD-37Cl4	10	7.5	3.1	19.1	75
2,3,7,8-TCDF-13C	100	65.7	22.0	152.0	66
2,3,7,8-TCDD-13C	100	83.8	20.0	175.0	84
1,2,3,7,8-PeCDF-13C	100	84.9	21.0	192.0	85
2,3,4,7,8-PeCDF-13C	100	85.6	13.0	328.0	86
1,2,3,7,8-PeCDD-13C	100	105.3	21.0	227.0	105
1,2,3,4,7,8-HxCDF-13C	100	82.6	19.0	202.0	83
1,2,3,6,7,8-HxCDF-13C	100	96.7	21.0	159.0	97
2,3,4,6,7,8-HxCDF-13C	100	92.3	22.0	176.0	92
1,2,3,7,8,9-HxCDF-13C	100	84.5	17.0	205.0	84
1,2,3,4,7,8-HxCDD-13C	100	81.9	21.0	193.0	82
1,2,3,6,7,8-HxCDD-13C	100	102.0	25.0	163.0	102
1,2,3,4,6,7,8-HpCDF-13C	100	90.1	21.0	158.0	90
1,2,3,4,7,8,9-HpCDF-13C	100	78.6	20.0	186.0	79
1,2,3,4,6,7,8-HpCDD-13C	100	106.1	26.0	166.0	106
OCDD-13C	200	196.4	26.0	397.0	98

Cs = Concentration Spiked (ng/mL)
Cr = Concentration Recovered (ng/mL)
Rec. = Recovery (Expressed as Percent)
Control Limit Reference: Method 1613, Table 6, 10/94 Revision
X = Background subtracted value
P = Recovery outside of control limits
Nn = Value obtained from additional analysis
* = See Discussion

Report No.....105645

REPORT OF LABORATORY ANALYSIS

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SPIKE RECOVERY RELATIVE PERCENT DIFFERENCE (RPD) RESULTS

Client..... Del Mar Analytical

SPIKE 1 ID.....LCS-6203
SPIKE 1 Filename..... F50127A_03
SPIKE 2 ID.....LCSD-6204
SPIKE 2 Filename..... F50127A_04

COMPOUND	SPIKE 1 REC,%	SPIKE 2 REC,%	RPD,%
2378-TCDF	102	99	3.0
2378-TCDD	90	88	2.2
12378-PeCDF	100	100	0.0
23478-PeCDF	97	95	2.1
12378-PeCDD	87	83	4.7
123478-HxCDF	90	93	3.3
123678-HxCDF	96	88	8.7
234678-HxCDF	97	94	3.1
123789-HxCDF	93	90	3.3
123478-HxCDD	100	93	7.3
123678-HxCDD	103	98	5.0
123789-HxCDD	97	93	4.2
1234678-HpCDF	103	97	6.0
1234789-HpCDF	105	100	4.9
1234678-HpCDD	87	85	2.3
OCDF	90	85	5.7
OCDD	97	92	5.3

REC = Percent Recovered
RPD = The difference between the two values divided by the average.
NA = Not Applicable

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TABLE 1. 2,3,7,8-TCDD Equivalency Factors (TEFs) for the Polychlorinated Dibenzo-p-dioxins and Dibenzofurans

Number	Compound(s)	TEF
1	2,3,7,8-TCDD	1.00
2	1,2,3,7,8-PeCDD	0.50
3	1,2,3,6,7,8-HxCDD	0.1
4	1,2,3,7,8,9-HxCDD	0.1
5	1,2,3,4,7,8-HxCDD	0.1
6	1,2,3,4,6,7,8-HpCDD	0.01
7	OCDD	0.001
8	* Total - TCDD	0.0
9	* Total - PeCDD	0.0
10	* Total - HxCDD	0.0
11	* Total - HpCDD	0.0
12	2,3,7,8-TCDF	0.10
13	1,2,3,7,8-PeCDF	0.05
14	2,3,4,7,8-PeCDF	0.5
15	1,2,3,6,7,8-HxCDF	0.1
16	1,2,3,7,8,9-HxCDF	0.1
17	1,2,3,4,7,8-HxCDF	0.1
18	2,3,4,6,7,8-HxCDF	0.1
19	1,2,3,4,6,7,8-HpCDF	0.01
20	1,2,3,4,7,8,9-HpCDF	0.01
21	OCDF	0.001
22	* Total - TCDF	0.0
23	* Total - PeCDF	0.0
24	* Total - HxCDF	0.0
25	* Total - HpCDF	0.0

*Excluding the 2,3,7,8-substituted congeners.

Reference: 1989 ITEFs

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Del Mar Analytical

17461 Derian Ave. Suite 100, Irvine, CA 92614 Ph (949) 261-1022 Fax (949) 261-1228
1014 E. Cooley Dr., Suite A, Colton, CA 92324 Ph (909) 370-4667 Fax (909) 370-1046
9484 Chesapeake Drive, Suite 805, San Diego, CA 92123 Ph (619) 505-9596 Fax (619) 505-9689
9830 South 51st Street, Suite B-120, Phoenix, AZ 85044 Ph (480) 785-0043 Fax (480) 785-0851
2520 E. Sunset Rd., Suite #3, Las Vegas, NV 89120 Ph (702) 798-3620 Fax (702) 798-3621

SUBCONTRACT ORDER - PROJECT # IOA0466

10605/

SENDING LABORATORY:	RECEIVING LABORATORY:
Del Mar Analytical, Irvine 17461 Derian Avenue. Suite 100 Irvine, CA 92614 Phone: (949) 261-1022 Fax: (949) 261-1228 Project Manager: Michele Harper	Pace Analytical, MN- SUB 1700 Elm Street, Ste 200 Minneapolis, MN 55414 Phone :(612) 607-1700 Fax: (612) 607-6444

Standard TAT is requested unless specific due date is requested => Due Date:_____ Initials:_____

Analysis	Expiration	Comments
Sample ID: IOA0466-01 Water	**Sampled: 01/10/05 10:48**	10605/001
1613-Dioxin-HR	01/17/05 10:48	J flags, 17 congeners, no TEQ, sub to Pace-MN
EDD + Level 4-OUT	02/07/05 10:48	

Containers Supplied:
1 L Amber (IOA0466-01C)
1 L Amber (IOA0466-01D)

SAMPLE INTEGRITY:

All containers intact: ☐ Yes ☐ No | Sample labels/COC agree: ☐ Yes ☐ No | Samples Received On Ice:: ☐ Yes ☐ No
Custody Seals Present: ☐ Yes ☐ No | Samples Preserved Properly: ☐ Yes ☐ No | Samples Received at (temp): 6°C

Released By	Date	Time	Received By	Date	Time
Vu Bank	1/11/05				
			Kate Anderson	1/12/05	9:00
Released By	Date	Time	Received By	Date	Time

CONTRACT COMPLIANCE SCREENING FORM FOR HARDCOPY DATA

AMEC Earth & Environmental
550 South Wadsworth Boulevard
Suite 500
Lakewood, CO 80226

Laboratory Pace
Reviewer K. Shadowlight
Analysis/Method Dioxins

Package ID T711DF24
Task Order 313150010
SDG No. Multiple
No. of Analyses 7
Date: February 18, 2005
Reviewer's Signature K. Shadowlight

ACTION ITEMS[a]	
1. **Case Narrative Deficiencies**	
2. **Out of Scope Analyses**	
3. **Analyses Not Conducted**	
4. **Missing Hardcopy Deliverables**	
5. **Incorrect Hardcopy Deliverables**	
6. **Deviations from Analysis Protocol, e.g.,**	Qualifications were assigned for the following:
Holding Times	* Method blank contamination
GC/MS Tune/Inst. Performance	* EMPCs
Calibration	* Detects below the lower method calibration level
Method blanks	
Surrogates	
Matrix Spike/Dup LCS	
Field QC	
Internal Standard Performance	
Compound Identification and Quantitation	
System Performance	
COMMENTS[b]	

[a] Subcontracted analytical laboratory is not meeting contract and/or method requirements.
[b] Differences in protocol have been adopted by the laboratory but no action against the laboratory is required.

DATA VALIDATION REPORT

NPDES
Monitoring

ANALYSIS: DIOXINS/FURANS

SAMPLE DELIVERY GROUPS: Multiple SDGs

Prepared by

AMEC—Denver Operations
550 South Wadsworth Boulevard, Suite 500
Lakewood, Colorado 80226

1. INTRODUCTION

Task Order Title:	NPDES Monitoring
Contract Task Order #:	313150010
Sample Delivery Group #:	Multiple
Project Manager:	B. McIlvaine
Matrix:	Water
Analysis:	Dioxins/Furans
QC Level:	Level IV
No. of Samples:	7
No. of Reanalyses/Dilutions:	0
Reviewer:	K. Shadowlight
Date of Review:	February 21, 2005

The samples listed in Table 1 were validated based on the guidelines outlined in the *AMEC Data Validation Procedure for Dioxins and Furans (DVP-19, Rev. 1), EPA Method 1613, and the National National Functional Guidelines For Chlorinated Dioxin/Furan Data Review* (8/02). Any deviations from these procedures and guidelines are documented herein. Qualifiers were applied in cases where the data did not meet the required QC criteria or where special consideration by the data user is required. Data qualifiers were placed on Form Is with the associated qualification codes. Analytes that were rejected for any reason are denoted on the Form I as having only the "R" data qualifier and associated qualification code(s) denoting the reason for rejection. Any additional problems with the data that may have resulted in an estimated value were not denoted by a qualification code since the data had already been rejected.

Table 1. Sample Identification

Client ID	Laboratory ID (Del Mar)	Laboratory ID (Pace)	Matrix	COC Method
Outfall 001	IOA0997-01	106475001	water	1613
Outfall 001	IOA1551-01	106840001	water	1613
Outfall 002	IOA0999-01	106478001	water	1613
Outfall 002	IOA1553-01	106871001	water	1613
Outfall 003	IOA1556-01	106869001	water	1613
Outfall 008	IOA1555-01	10687001	water	1613
Outfall 009	IOA1554-01	106842001	water	1613

2. DATA VALIDATION FINDINGS

2.1 SAMPLE MANAGEMENT

Following are findings associated with sample management:

2.1.1 Sample Preservation, Handling, and Transport

The samples in these SDGs were received at Del Mar Analytical within the temperature limits of 4°C ±2°C. The samples were subcontracted to Pace Analytical for the dioxin/furan analyses. The samples in these SDGs were received at Pace Analytical Services below the temperature limits of 4°C ± 2°C, at 1.8°C; however, as the samples were not noted to have been frozen or damaged, no qualifications were required. No qualifications were required.

2.1.2 Chain of Custody

The COCs and transfer COCs were signed by the appropriate field and laboratory personnel. The samples and analyses were accounted for on both the original COCs and transfer COCs. As the samples were couriered directly to the laboratory (Del Mar Analytical), custody seals were not required. There was no information regarding custody seals upon receipt at Pace. No qualifications were required.

2.1.3 Holding Times

The samples were extracted and analyzed within a year of collection. No qualifications were required.

2.2 INSTRUMENT PERFORMANCE

Following are findings associated with instrument performance:

2.2.1 GC Column Performance

A column performance standard was combined with the daily calibration verification and analyzed at the beginning of each analytical sequence. The GC column performance was acceptable with the chromatographic separation of 2,3,7,8-TCDD and other TCDD isomers resolved with a valley of ≤25%. No qualifications were required.

2.2.2 Mass Spectrometer Performance

The mass spectrometer performance could not be evaluated as the laboratory did not provide selected ion current profiles for the lock-mass ions. No qualifications were required.

2.3 CALIBRATION

2.3.1 Initial Calibration

There were two initial calibrations, analyzed 11/29/04 on instrument 10MSHR05 and 01/26/05 on instrument 10MSHR06. The calibrations consisted of five concentration level standards (CS1 through CS5) analyzed to verify instrument linearity. The initial calibrations were acceptable with %RSDs ≤20% for the 15 native compounds (calibration by isotope dilution) and ≤35% for the 2 native and all labeled compounds (calibration by internal standard). The relative retention times and ion abundance ratios were within the QC limits listed in Method 1613 for all standards. A representative number of %RSDs were verified from the raw data, and no calculation or transcription errors were noted. No qualifications were required.

2.3.2 Continuing Calibration

Calibration verification (VER) consisted of a mid-level standard (CS3) analyzed at the beginning of each analytical sequence. The VER was acceptable with the concentrations within the acceptance criteria listed in the Table 6 of the EPA Method 1613. The ion abundance ratios and relative retention times were within the method QC limits. A representative number of %Ds were verified from the raw data, and no calculation or transcription errors were noted. No qualifications were required.

2.4 BLANKS

One method blank (Blank-6241) was extracted and analyzed with the samples in these SDGs. Target compounds 1,2,3,6,7,8-HxCDF, total HxCDF, total HpCDF, 1,2,3,4,6,7,8-HpCDD, total HpCDD, and OCDF were reported in the method blank. Any detects for the aforementioned target compounds reported at concentrations <5× the concentrations reported in the method blank were qualified as estimated nondetects "UJ," at the levels of interference in the samples of these SDGs. The detect for total TCDF was qualified as estimated, "J," in sample Outfall 002 (IOA0999-01), as a portion of the total concentration was attributed to method blank contamination. Target compounds 1,2,3,4,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, and OCDD were reported as EMPCs in the method blank. A review of the method blank raw data and chromatograms indicated no false negatives or false positives. No further qualifications were required.

2.5 BLANK SPIKES AND LABORATORY CONTROL SAMPLES

One LCS/LCSD pair (LCS-6242/LCSD-6243) was extracted and analyzed with the samples in these SDGs. All recoveries were within the acceptance criteria listed in Table 6 of the Method 1613. There are no method QC limits established for RPDs. The reported RPDs were within ±20%. No qualifications were required.

2.6 MATRIX SPIKE/MATRIX SPIKE DUPLICATE

MS/MSD analyses were not performed in these SDGs. Evaluation of method accuracy and precision was based on the LCS/LCSD results. No qualifications were required.

2.7 FIELD QC SAMPLES

Following are findings associated with field QC:

2.7.1 Field Blanks and Equipment Rinsates

The samples in these SDGs had no associated field QC samples. No qualifications were required.

2.7.2 Field Duplicates

No field duplicate samples were identified for these SDGs.

2.8 INTERNAL STANDARDS

The labeled standard recoveries were within the acceptance criteria listed in Table 7 of Method 1613. No qualifications were required.

2.9 COMPOUND IDENTIFICATION

The laboratory analyzed for polychlorinated dioxins/furans by EPA Method 1613. The compound identifications were verified from the raw data and no false negatives or positives were noted. No qualifications were required.

2.10 COMPOUND QUANTIFICATION AND REPORTED DETECTION LIMITS

Compound quantitation was verified from the raw data. The laboratory calculated and reported compound-specific detection limits. Any detects below the lower method calibration limit (MCL) were qualified as estimated, "J." Any reported EMPC was qualified as an estimated nondetect, "UJ." No further qualifications were required.

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Pace Analytical™

Method 1613B Analysis Results

Client - Del Mar Analytical

Client's Sample ID	IOA1556-01 Outfall 003		
Lab Sample ID	106869001		
Filename	F50204A_05		
Injected By	MRO		
Total Amount Extracted	1040 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	01/26/2005
ICAL Date	11/29/2004	Received	01/28/2005
CCal Filename(s)	F50203A_20	Extracted	01/31/2005
Method Blank ID	BLANK-6241	Analyzed	02/04/2005 13:19

Rec Qual	Qual Code	Native Isomers	Conc pg/L	EMPC pg/L	LOD pg/L		Internal Standards	ng's Added	Percent Recovery
U		2,3,7,8-TCDF	ND	-----	1.40		2,3,7,8-TCDF-13C	2.00	51
U		Total TCDF	ND	-----	1.40		2,3,7,8-TCDD-13C	2.00	55
							1,2,3,7,8-PeCDF-13C	2.00	66
U		2,3,7,8-TCDD	ND	-----	2.10		2,3,4,7,8-PeCDF-13C	2.00	67
U		Total TCDD	ND	-----	2.10		1,2,3,7,8-PeCDD-13C	2.00	76
							1,2,3,4,7,8-HxCDF-13C	2.00	54
U		1,2,3,7,8-PeCDF	ND	-----	1.10		1,2,3,6,7,8-HxCDF-13C	2.00	60
↓		2,3,4,7,8-PeCDF	ND	-----	1.20		2,3,4,6,7,8-HxCDF-13C	2.00	61
		Total PeCDF	ND	-----	1.10		1,2,3,7,8,9-HxCDF-13C	2.00	58
							1,2,3,4,7,8-HxCDD-13C	2.00	56
U		1,2,3,7,8-PeCDD	ND	-----	1.80		1,2,3,6,7,8-HxCDD-13C	2.00	57
U		Total PeCDD	ND	-----	1.80		1,2,3,4,6,7,8-HpCDF-13C	2.00	53
							1,2,3,4,7,8,9-HpCDF-13C	2.00	50
U		1,2,3,4,7,8-HxCDF	ND	-----	1.10		1,2,3,4,6,7,8-HpCDD-13C	2.00	60
		1,2,3,6,7,8-HxCDF	ND	-----	1.10		OCDD-13C	4.00	58
		2,3,4,6,7,8-HxCDF	ND	-----	1.00				
↓		1,2,3,7,8,9-HxCDF	ND	-----	1.00		1,2,3,4-TCDD-13C	2.00	NA
J	DNQ	Total HxCDF	2.3	-----	1.10	BJ	1,2,3,7,8,9-HxCDD-13C	2.00	NA
U		1,2,3,4,7,8-HxCDD	ND	-----	1.10		2,3,7,8-TCDD-37Cl4	0.20	51
		1,2,3,6,7,8-HxCDD	ND	-----	1.10				
↓		1,2,3,7,8,9-HxCDD	ND	-----	0.82				
J	DNQ	Total HxCDD	1.5	-----	1.00	J			
UJ	B	1,2,3,4,6,7,8-HpCDF	1.7	-----	1.00	BJ			
U		1,2,3,4,7,8,9-HpCDF	ND	-----	1.20				
J	DNQ	Total HpCDF	5.8	-----	1.10	BJ			
J	DNQ	1,2,3,4,6,7,8-HpCDD	5.6	-----	1.50	J			
J	DNQ	Total HpCDD	15.0	-----	1.50	J			
UJ	B	OCDF	5.8	-----	1.50	BJ			
J	DNQ	OCDD	92.0	-----	2.60	J			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection. Totals are averages of individual isomer LODs.
D = Result obtained from analysis of diluted sample
B = Less than 10 times higher than method blank level
P = Recovery outside of method 1613 control limits
J = Concentration detected is below the calibration range
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....106869

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AMEC Earth & Environmental
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Lakewood, CO 80226

Package ID T711MT31
Task Order 313150010
SDG No. IOA1554, IOA1555, IOA1556
No. of Analyses 3

Laboratory Del Mar Analytical
Reviewer K. Okonzak
Analysis/Method Metals

Date: 3/07/05
Reviewer's Signature

ACTION ITEMS[a]	
1. **Case Narrative Deficiencies**	
2. **Out of Scope Analyses**	
3. **Analyses Not Conducted**	
4. **Missing Hardcopy Deliverables**	
5. **Incorrect Hardcopy Deliverables**	
6. **Deviations from Analysis Protocol, e.g.,**	Qualifications applied for:
Holding Times	Detects below the reporting limit were qualified as estimated, "J."
	Detects were qualified as estimated, "UJ" due to detects in the associated method blank or CCBs.
GC/MS Tune/Inst. Perform	
Calibrations	
Blanks	
Surrogates	
Matrix Spike/Dup LCS	
Field QC	
Internal Standard Performance	
Compound Identification and Quantitation	
System Performance	

COMMENTS[b]	

[a] Subcontracted analytical laboratory is not meeting contract and/or method requirements.
[b] Differences in protocol have been adopted by the laboratory but no action against the laboratory is required.

Data Qualifier Reference Table

Qualifier	Organics	Inorganics
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.	The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.	The associated value is an estimated quantity.
N	The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification."	Not applicable.
NJ	The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.	Not applicable.
UJ	The analyte was not deemed above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.	The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.
R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and to meet quality control criteria. The presence or absence of the analyte cannot be verified.	The data are unusable. (Note: Analyte may or may not be present).

Qualification Code Reference Table

Qualifier	Organics	Inorganics
H	Holding times were exceeded.	Holding times were exceeded.
S	Surrogate recovery was outside QC limits.	The sequence or number of standards used for the calibration was incorrect
C	Calibration %RSD or %D were noncompliant.	Correlation coefficient is <0.995.
R	Calibration RRF was <0.05.	%R for calibration is not within control limits.
B	Presumed contamination from preparation (method) blank.	Presumed contamination from preparation (method) or calibration blank.
L	Laboratory Blank Spike/Blank Spike Duplicate %R was not within control limits.	Laboratory Control Sample %R was not within control limits.
Q	MS/MSD recovery was poor or RPD high.	MS recovery was poor.
E	Not applicable.	Duplicates showed poor agreement.
I	Internal standard performance was unsatisfactory.	ICP ICS results were unsatisfactory.
A	Not applicable.	ICP Serial Dilution %D were not within control limits.
M	Tuning (BFB or DFTPP) was noncompliant.	Not applicable.
T	Presumed contamination from trip blank.	Not applicable.
+	False positive – reported compound was not present. Not applicable.	
-	False negative – compound was present but not reported.	Not applicable.
F	Presumed contamination from FB, or ER.	Presumed contamination from FB or ER.
$	Reported result or other information was incorrect.	Reported result or other information was incorrect.
?	TIC identity or reported retention time has been changed.	Not applicable.
D	The analysis with this flag should not be used because another more technically sound analysis is available.	The analysis with this flag should not be used because another more technically sound analysis is available.
P	Instrument performance for pesticides was poor.	Post Digestion Spike recovery was not within control limits.
DNQ	The compound was detected between the MDL and the RL and, by definition, is considered an estimated value.	The compound was detected between the MDL and the RL and, by definition, is considered an estimated value.

*#	Unusual problems found with the data that have been described in Section 2.#, "Data Validation Findings." The number following the asterisk (*) will indicate the subsection where a description of the problem can be found (eg. *1 would indicate a sample was not within temperature limits).	Unusual problems found with the data that have been described in Section 2.#, "Data Validation Findings." The number following the asterisk (*) will indicate the subsection where a description of the problem can be found (eg. *1 would indicate a sample was not within temperature limits).

DATA VALIDATION REPORT

NPDES
Monitoring

ANALYSIS: METALS

SAMPLE DELIVERY GROUPS: IOA1554, IOA1555, IOA1556

Prepared by

AMEC—Denver Operations
550 South Wadsworth Boulevard, Suite 500
Lakewood, Colorado 80226

1. INTRODUCTION

Task Order Title:	NPDES Monitoring
Contract Task Order #:	313150010
SDG#:	IOA1554, IOA1555, IOA1556
Project Manager:	B. McIlvaine
Matrix:	Water
Analysis:	Metals
QC Level:	Level IV
No. of Samples:	3
No. of Reanalyses/Dilutions:	0
Reviewer:	K. Okonzak-Lowry
Date of Review:	March 7, 2005

The samples listed in Table 1 were validated based on the guidelines outlined in the *AMEC Data Validation Procedure for Levels III and IV ICP-MS Metals, (DVP-5-A, Rev.0), AMEC Data Validation Procedure for Levels III and IV ICP Metals* (DVP-5, Rev. 0), SW-846 *Method 6020B for Inductively Coupled Plasma – Mass Spectrometry*, SW-846 *Method 6010B for Inductively Coupled Plasma* , SW-846 *Method 7471A for Mercury (Manual Cold-Vapor Technique)*, and validation guidelines outlined in the USEPA CLP *National Functional Guidelines for Inorganic Data Review* (2/94). Any deviations from these procedures and guidelines are documented herein. Qualifiers were applied in cases where the data did not meet the required QC criteria or where special consideration by the data user is required. Data qualifiers were placed on Form Is with the associated qualification codes. Analytes that were rejected for any reason are denoted on the Form I as having only the "R" data qualifier and associated qualification code(s) denoting the reason for rejection. Any additional problems with the data that may have resulted in an estimated value were not denoted by a qualification code since the data had already been rejected.

Table 1. Sample identification

Client ID	EPA ID	Laboratory ID	Matrix	COC Method
Outfall 009	Outfall 009	IOA1554-01	water	ILM04
Outfall 008	Outfall 008	IOA1555-01	water	ILM04
Outfall 003	Outfall 003	IOA1556-01	water	ILM04

2. DATA VALIDATION FINDINGS

2.1 SAMPLE MANAGEMENT

Following are findings associated with sample management:

2.1.1 Sample Preservation, Handling, and Transport

The samples in these SDGs were received at the laboratory within the temperature limits of 4°C ±2°C. No sample preservation, handling, or transport problems were noted, and no qualifications were necessary.

2.1.2 Chain of Custody

The COCs were signed and dated by field and laboratory personnel. The COCs listed duplicate samples for all three samples; however, duplicate analyses were not required. No sample qualifications were required.

2.1.3 Holding Times

The dates of collection recorded on the COCs and the dates of analyses recorded in the raw data, documented that the sample analyses were performed within the specified holding times of six months for the ICP/MS metals and 28 days for mercury. No qualifications were required.

2.2 ICP-MS TUNING

A precalibration routine must be completed prior to calibrating the instrument, which consists of analyzing a tuning solution to verify resolution, mass calibration, and thermal stability. The solution must be analyzed a minimum of five times and must contain isotopes representing all mass regions of interest. The laboratory performed the required tune solution analyses but did not report %RSDs, with the exception of the ICP/MS run analyzed on 2/02/05 for which copper was reported for sample Outfall 009. The %RSDs for this tune were all within the 5% control limit. The laboratory SOP states that to be acceptable, the %RSD must be less than 5%. The mass calibrations were within 0.1 amu of the true mass and the instrument resolutions were less than 0.75 amu at 5 percent peak height for all analytes in the tune solution. No site sample qualifications were required.

2.3 CALIBRATION

The ICV and CCV results showed acceptable recoveries, 90-110% for the ICP/MS and 80-120% for Hg. The applicable reporting limit check standards were recovered within the AMEC control limits of 70-130%, No qualifications were required.

2.4 BLANKS

The method blanks and bracketing ICBs/CCBs associated with the samples in these SDGs were nondetected at the laboratory's MDLs, with the following exceptions: copper was detected in MB 5A29039-BLK1 at 0.555 µg/L; therefore, copper detected in sample Outfall 008 was qualified as estimated, "UJ," cadmium was detected in CCB1 and CCB2 at 0.026 and 0.033 µg/L; therefore cadmium detected in sample Outfall 008 was qualified as estimated, "UJ," and antimony was detected in CCB1 and CCB2 at 0.58 and 0.82 µg/L, respectively; therefore, the antimony detected in sample Outfall 009 was qualified as estimated, "UJ." No further qualifications were required.

2.5 ICP INTERFERENCE CHECK SAMPLE (ICS A/AB)

Results were not provided for ICP-MS spiked interferents sulfur, phosphorus, carbon, titanium, and chloride. The results for sodium and potassium were above the calibration range of the instrument in both the ICSA and ICSAB analyses. Lead was not spiked into the ICSAB solution. The validator reviewed the raw data for the site sample ICP/MS analyses for the level of reported interferents, Al, Ca, Fe, and Mg, and determined that the concentration of interferents was not high enough to cause matrix affects. No assessment could be made with respect to possible interference from sulfur, phosphorus, carbon, and chloride. No qualifications were required.

2.6 BLANK SPIKES AND LABORATORY CONTROL SAMPLES

The ICP/MS LCS samples were identified as 5A29041-BS1 and 5A29039-BS1, and the mercury LCS sample was identified as 5A31050-BS1. The LCS results on the summary forms and in the raw data were within the laboratory-established ICP/MS and mercury control limits of 85-115%. No qualifications were required.

2.7 LABORATORY DUPLICATES

No MS/MSD or duplicate analyses were performed in association with the samples in these SDGs; therefore, no assessment was made with respect to this criterion.

2.8 MATRIX SPIKE

No MS/MSD analyses were performed in association with the samples in these SDGs; therefore, no assessment was made with respect to this criterion. Method accuracy was evaluated based on LCS results.

2.9 FURNACE ATOMIC ABSORPTION QC

Furnace atomic absorption was not utilized for the analysis of these samples; therefore, furnace atomic absorption QC is not applicable.

2.10 ICP/MS SERIAL DILUTION

No serial dilution analysis was performed in association with the samples in these SDGs; therefore, no assessment was made with respect to this criterion.

2.11 INTERNAL STANDARDS PERFORMANCE

The ICP-MS internal standard recoveries for the site samples and associated QC sample analyses were within the 60-125% control limits and no qualifications were required.

2.12 SAMPLE RESULT VERIFICATION

A Level IV review was performed for the samples in these data packages. Calculations were verified, and the sample results reported on the Form Is were verified against the raw data. No transcription errors or calculation errors were noted. Analytes detected below the reporting limit were qualified as estimated, "J." No qualifications were required.

2.13 FIELD QC SAMPLES

Field QC samples are evaluated, and if necessary, qualified based only on laboratory blanks. Any remaining detects are used to evaluate the associated samples.

2.13.1 Field Blanks and Equipment Rinsates

The samples in these SDGs had no associated field QC samples. No qualifications were required.

2.13.2 Field Duplicates

There were no field duplicate analyses performed in association with the site samples.

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 003
Report Number: IOA1556

Sampled: 01/26/05
Received: 01/26/05

DRAFT: METALS

Analyte	Method	Batch	MDL Limit	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers Rev Qual	Qual Code
Sample ID: IOA1556-01 (DRAFT: Outfall 003 - Water)										
Reporting Units: ug/l										
Lead	EPA 200.8	5A29039	0.13	1.0	ND	1	01/29/05	01/31/05	LL	

AMEC VALIDATED
Level IV

DRAFT REPORT
DRAFT REPORT
DATA SUBJECT TO CHANGE

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LABORATORY REPORT

Prepared For: MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project: Routine Outfall 003

Sampled: 01/26/05
Received: 01/26/05
Issued: 03/19/05 18:20

NELAP #01108CA California ELAP#1197 CSDLAC #10117

The results listed within this Laboratory Report pertain only to the samples tested in the laboratory. The analyses contained in this report were performed in accordance with the applicable certifications as noted. All soil samples are reported on a wet weight basis unless otherwise noted in the report. This Laboratory Report is confidential and is intended for the sole use of Del Mar Analytical and its client. This report shall not be reproduced, except in full, without written permission from Del Mar Analytical. The Chain of Custody, 1 page, is included and is an integral part of this report.

This entire report was reviewed and approved for release.

SAMPLE CROSS REFERENCE

SUBCONTRACTED: Refer to the last page for specific subcontract laboratory information included in this report.

LABORATORY ID	CLIENT ID	MATRIX
IOA1556-01	Outfall 003	Water

Reviewed By:

Michele Harper

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 003
Report Number: IOA1556

Sampled: 01/26/05
Received: 01/26/05

METALS

Analyte	Method	Batch	MDL	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA1556-01 (Outfall 003 - Water)									
Reporting Units: ug/l									
Antimony	EPA 200.8	5A29039	0.18	2.0	ND	1	01/29/05	01/31/05	
Cadmium	EPA 200.8	5A29039	0.015	1.0	**0.037**	1	01/29/05	01/31/05	J
Copper	EPA 200.8	5A29039	0.49	2.0	**2.5**	1	01/29/05	01/31/05	B
Lead	EPA 200.8	5A29039	0.13	1.0	ND	1	01/29/05	01/31/05	
Mercury	EPA 245.1	5A31050	0.063	0.20	**0.10**	1	01/31/05	01/31/05	J

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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Project ID: Routine Outfall 003
Report Number: IOA1556

Sampled: 01/26/05
Received: 01/26/05

INORGANICS

Analyte	Method	Batch	MDL Limit	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA1556-01 (Outfall 003 - Water) - cont.									
Reporting Units: mg/l									
Chloride	EPA 300.0	5A26051	0.26	0.50	**15**	1	01/26/05	01/27/05	
Nitrate/Nitrite-N	EPA 300.0	5A26051	0.072	0.26	ND	1	01/26/05	01/27/05	
Oil & Grease	EPA 413.1	5A31068	0.94	5.0	**2.2**	1	01/31/05	01/31/05	J
Sulfate	EPA 300.0	5A26051	0.18	0.50	**28**	1	01/26/05	01/27/05	
Total Dissolved Solids	SM2540C	5A28091	10	10	**240**	1	01/28/05	01/28/05	

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Sampled: 01/26/05
Received: 01/26/05

SHORT HOLD TIME DETAIL REPORT

	Hold Time (in days)	Date/Time Sampled	Date/Time Received	Date/Time Extracted	Date/Time Analyzed
Sample ID: Outfall 003 (IOA1556-01) - Water					
EPA 300.0	2	01/26/2005 10:55	01/26/2005 17:05	01/26/2005 23:30	01/27/2005 09:45

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Attention: Bronwyn Kelly

Project ID: Routine Outfall 003
Report Number: IOA1556

Sampled: 01/26/05
Received: 01/26/05

METHOD BLANK/QC DATA

METALS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A29039 Extracted: 01/29/05											
Blank Analyzed: 01/31/2005 (5A29039-BLK1)											
Antimony	ND	2.0	0.18	ug/l							
Cadmium	ND	1.0	0.015	ug/l							
Copper	0.555	2.0	0.49	ug/l							*J*
Lead	ND	1.0	0.13	ug/l							
LCS Analyzed: 01/31/2005 (5A29039-BS1)											
Antimony	86.5	2.0	0.18	ug/l	80.0		108	85-115			
Cadmium	78.7	1.0	0.015	ug/l	80.0		98	85-115			
Copper	76.2	2.0	0.49	ug/l	80.0		95	85-115			
Lead	79.9	1.0	0.13	ug/l	80.0		100	85-115			
Matrix Spike Analyzed: 01/31/2005 (5A29039-MS1)						**Source: IOA1457-01**					
Antimony	88.6	2.0	0.18	ug/l	80.0	0.67	110	70-130			
Cadmium	77.9	1.0	0.015	ug/l	80.0	0.080	97	70-130			
Copper	77.4	2.0	0.49	ug/l	80.0	4.9	91	70-130			
Lead	80.3	1.0	0.13	ug/l	80.0	0.94	99	70-130			
Matrix Spike Dup Analyzed: 01/31/2005 (5A29039-MSD1)						**Source: IOA1457-01**					
Antimony	92.5	2.0	0.18	ug/l	80.0	0.67	115	70-130	4	20	
Cadmium	81.4	1.0	0.015	ug/l	80.0	0.080	102	70-130	4	20	
Copper	80.1	2.0	0.49	ug/l	80.0	4.9	94	70-130	3	20	
Lead	80.2	1.0	0.13	ug/l	80.0	0.94	99	70-130	0	20	
Batch: 5A31050 Extracted: 01/31/05											
Blank Analyzed: 01/31/2005 (5A31050-BLK1)											
Mercury	ND	0.20	0.063	ug/l							

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Attention: Bronwyn Kelly

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Sampled: 01/26/05
Received: 01/26/05

METHOD BLANK/QC DATA

METALS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A31050 Extracted: 01/31/05											
LCS Analyzed: 01/31/2005 (5A31050-BS1)											
Mercury	8.24	0.20	0.063	ug/l	8.00		103	85-115			
Matrix Spike Analyzed: 01/31/2005 (5A31050-MS1)						**Source: IOA1690-21**					
Mercury	9.46	0.20	0.063	ug/l	8.00	1.4	101	70-130			
Matrix Spike Dup Analyzed: 01/31/2005 (5A31050-MSD1)						**Source: IOA1690-21**					
Mercury	9.39	0.20	0.063	ug/l	8.00	1.4	100	70-130	1	20	

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Attention: Bronwyn Kelly

Project ID: Routine Outfall 003
Report Number: IOA1556

Sampled: 01/26/05
Received: 01/26/05

METHOD BLANK/QC DATA

INORGANICS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A26051 Extracted: 01/26/05											
Blank Analyzed: 01/26/2005 (5A26051-BLK1)											
Chloride	ND	0.50	0.26	mg/l							
Nitrate/Nitrite-N	ND	0.26	0.072	mg/l							
Sulfate	ND	0.50	0.18	mg/l							
LCS Analyzed: 01/26/2005 (5A26051-BS1)											
Chloride	4.65	0.50	0.26	mg/l	5.00		93	90-110			
Sulfate	9.60	0.50	0.18	mg/l	10.0		96	90-110			
Matrix Spike Analyzed: 01/26/2005 (5A26051-MS1)						**Source: IOA1551-01**					
Chloride	23.7	0.50	0.26	mg/l	5.00	19	94	80-120			
Sulfate	37.9	0.50	0.18	mg/l	10.0	28	99	80-120			
Matrix Spike Dup Analyzed: 01/26/2005 (5A26051-MSD1)						**Source: IOA1551-01**					
Chloride	23.4	0.50	0.26	mg/l	5.00	19	88	80-120	1	20	
Sulfate	38.1	0.50	0.18	mg/l	10.0	28	101	80-120	1	20	
Batch: 5A28091 Extracted: 01/28/05											
Blank Analyzed: 01/28/2005 (5A28091-BLK1)											
Total Dissolved Solids	ND	10	10	mg/l							
LCS Analyzed: 01/28/2005 (5A28091-BS1)											
Total Dissolved Solids	908	10	10	mg/l	1000		91	90-110			
Duplicate Analyzed: 01/28/2005 (5A28091-DUP1)						**Source: IOA1548-02**					
Total Dissolved Solids	586	10	10	mg/l		590			1	10	

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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2520 E. Sunset Rd. #3, Las Vegas, NV 89120 (702) 798-3620 FAX (702) 798-3621

MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 003
Report Number: IOA1556

Sampled: 01/26/05
Received: 01/26/05

METHOD BLANK/QC DATA

INORGANICS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A31068 Extracted: 01/31/05											
Blank Analyzed: 01/31/2005 (5A31068-BLK1)											
Oil & Grease	ND	5.0	0.94	mg/l							
LCS Analyzed: 01/31/2005 (5A31068-BS1)											**M-NR1**
Oil & Grease	17.0	5.0	0.94	mg/l	20.0		85	65-120			
LCS Dup Analyzed: 01/31/2005 (5A31068-BSD1)											
Oil & Grease	19.6	5.0	0.94	mg/l	20.0		98	65-120	14	20	

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 003

Report Number: IOA1556

Sampled: 01/26/05
Received: 01/26/05

Compliance Check

The results obtained from the analytical testing of this data set were checked against compliance limits received from the client. Any results at or above the compliance limits appear in bold on this page.

LabNumber	Analysis	Analyte	Units	Result	MRL	Compliance Limit
IOA1556-01	413.1 Oil and Grease	Oil & Grease	mg/l	2.20	5.0	15
IOA1556-01	Antimony-200.8	Antimony	ug/l	0.069	2.0	6.00
IOA1556-01	Cadmium-200.8	Cadmium	ug/l	0.037	1.0	4.00
IOA1556-01	Chloride - 300.0	Chloride	mg/l	15	0.50	150
IOA1556-01	Copper-200.8	Copper	ug/l	2.50	2.0	14
IOA1556-01	Mercury - 245.1	Mercury	ug/l	0.100	0.20	0.20
IOA1556-01	Nitrogen, NO3+NO2 -N	Nitrate/Nitrite-N	mg/l	0.042	0.26	10.00
IOA1556-01	Sulfate-300.0	Sulfate	mg/l	28	0.50	250
IOA1556-01	TDS - SM 2540C	Total Dissolved Solids	mg/l	240	10	850

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Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 003
Report Number: IOA1556

Sampled: 01/26/05
Received: 01/26/05

DATA QUALIFIERS AND DEFINITIONS

B	Analyte was detected in the associated Method Blank.
J	Estimated value. Analyte detected at a level less than the Reporting Limit (RL) and greater than or equal to the Method Detection Limit (MDL). The user of this data should be aware that this data is of unknown quality.
M-NR1	There was no MS/MSD analyzed with this batch due to insufficient sample volume. See Blank Spike/Blank Spike Duplicate.
ND	Analyte NOT DETECTED at or above the reporting limit or MDL, if MDL is specified.
RPD	Relative Percent Difference

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 003

Report Number: IOA1556

Sampled: 01/26/05
Received: 01/26/05

Certification Summary

Del Mar Analytical, Irvine

Method	Matrix	Nelac	California
EPA 200.8	Water	X	X
EPA 245.1	Water	X	X
EPA 300.0	Water	X	X
EPA 413.1	Water	X	X
SM2540C	Water	X	X

Nevada and NELAP provide analyte specific accreditations. Analyte specific information for Del Mar Analytical may be obtained by contacting the laboratory or visiting our website at www.dmalabs.com.

Subcontracted Laboratories

Pace Analytical, MN- SUB

1700 Elm Street, Ste 200 - Minneapolis, MN 55414

Analysis Performed: 1613-Dioxin-HR
Samples: IOA1556-01

Analysis Performed: EDD + Level 4
Samples: IOA1556-01

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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Del Mar Analytical Version 5 8/12/04

CHAIN OF CUSTODY FORM

IOA1556

Client Name/Address:

MWH-Pasadena
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101

Project:
Boeing-SSFL NPDES
Routine Outfall 003
Stormwater at RMHF

Project Manager: Bronwyn Kelly

Sampler: Pollock

Phone Number:
(626) 568-6691
Fax Number:
(626) 568-6515

ANALYSIS REQUIRED

Field readings:
Temp = 55.2°F
pH= 7.6

Sample Description	Sample Matrix	Container Type	# of Cont.	Sampling Date/Time	Preservative	Bottle * #	Total Reoverable Metals: Sb, Cd, Cu, Pb, Hg	TCDD (and all congeners) ✓	Oil & Grease (EPA 413.1) ✓	Cl-, SO4, NO3+NO2-N	TDS					Comments
Outfall 003	W	1L Poly	1	1-26-05 10:55	HNO3	1A	X									
Outfall 003-Dup	W	1L Poly	1		HNO3	1B	X									
Outfall 003	W	1L Amber	2		None	2A, 2B		X								
Outfall 003	W	1L Amber	2		HCl	3A, 3B			X							
Outfall 003	W	Poly-500 ml	2		None	4A, 4B				X						
Outfall 003	W	Poly-500 ml	2		None	5A, 5B					X					

AB

Relinquished By	Date/Time:	Received By	Date/Time:
[signature]	1-26-05 1400	[signature]	1/26/05 1400
[signature]	1/26/05 1705	[signature]	1/26/05 1705

Turn around Time: (check)
24 Hours _____ 5 Days _____
48 Hours _____ 10 Days _____
72 Hours _____ Normal _____
Perchlorate Only 72 Hours_____
Metals Only 72 Hours_____
Sample Integrity: (Check)
Intact X On Ice: X 3°C

Del Mar Analytical

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March 10, 2005

MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, Ca.91101

Attention: Bronwyn Kelly

Project: Routine Outfall 003
Sampled: 01/26/05
Del Mar Analytical Number: IOA1556

Dear Ms. Kelly:

Pace Analytical performed Method 1613B analysis for the project referenced above. Please use the following cross-reference table when reviewing your results.

MWH ID	DEL MAR ID	Pace ID
Outfall 003	IOA1556-01	106869001

Attached is the original report from the subcontract laboratory. If you have any questions or require further assistance, please do not hesitate to contact me.

Sincerely yours,
DEL MAR ANALYTICAL

Michele Harper
Project Manager

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Pace Analytical™

Method 1613B Analysis Results

Client - Del Mar Analytical

Client's Sample ID	IOA1556-01		
Lab Sample ID	106869001		
Filename	F50204A_05		
Injected By	MRO		
Total Amount Extracted	1040 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	01/26/2005
ICAL Date	11/29/2004	Received	01/28/2005
CCal Filename(s)	F50203A_20	Extracted	01/31/2005
Method Blank ID	BLANK-6241	Analyzed	02/04/2005 13:19

Native Isomers	Conc pg/L	EMPC pg/L	LOD pg/L		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	1.40		2,3,7,8-TCDF-13C	2.00	51
Total TCDF	ND	-----	1.40		2,3,7,8-TCDD-13C	2.00	55
					1,2,3,7,8-PeCDF-13C	2.00	66
2,3,7,8-TCDD	ND	-----	2.10		2,3,4,7,8-PeCDF-13C	2.00	67
Total TCDD	ND	-----	2.10		1,2,3,7,8-PeCDD-13C	2.00	76
					1,2,3,4,7,8-HxCDF-13C	2.00	54
1,2,3,7,8-PeCDF	ND	-----	1.10		1,2,3,6,7,8-HxCDF-13C	2.00	60
2,3,4,7,8-PeCDF	ND	-----	1.20		2,3,4,6,7,8-HxCDF-13C	2.00	61
Total PeCDF	ND	-----	1.10		1,2,3,7,8,9-HxCDF-13C	2.00	58
					1,2,3,4,7,8-HxCDD-13C	2.00	56
1,2,3,7,8-PeCDD	ND	-----	1.80		1,2,3,6,7,8-HxCDD-13C	2.00	57
Total PeCDD	ND	-----	1.80		1,2,3,4,6,7,8-HpCDF-13C	2.00	53
					1,2,3,4,7,8,9-HpCDF-13C	2.00	50
1,2,3,4,7,8-HxCDF	ND	-----	1.10		1,2,3,4,6,7,8-HpCDD-13C	2.00	60
1,2,3,6,7,8-HxCDF	ND	-----	1.10		OCDD-13C	4.00	58
2,3,4,6,7,8-HxCDF	ND	-----	1.00				
1,2,3,7,8,9-HxCDF	ND	-----	1.00		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	2.3	-----	1.10	BJ	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	1.10		2,3,7,8-TCDD-37Cl4	0.20	51
1,2,3,6,7,8-HxCDD	ND	-----	1.10				
1,2,3,7,8,9-HxCDD	ND	-----	0.82				
Total HxCDD	1.5	-----	1.00	J			
1,2,3,4,6,7,8-HpCDF	1.7	-----	1.00	BJ			
1,2,3,4,7,8,9-HpCDF	ND	-----	1.20				
Total HpCDF	5.8	-----	1.10	BJ			
1,2,3,4,6,7,8-HpCDD	5.6	-----	1.50	J			
Total HpCDD	15.0	-----	1.50	J			
OCDF	5.8	-----	1.50	BJ			
OCDD	92.0	-----	2.60	J			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection. Totals are averages of individual isomer LODs.
D = Result obtained from analysis of diluted sample
B = Less than 10 times higher than method blank level
P = Recovery outside of method 1613 control limits
J = Concentration detected is below the calibration range
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....106869

REPORT OF LABORATORY ANALYSIS

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1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Pace Analytical™

Method 1613B Blank Analysis Results

Client - Del Mar Analytical

Lab Sample ID	BLANK-6241	Matrix	Water
Filename	U50202B_06	Dilution	NA
Total Amount Extracted	1040 mL	Extracted	01/31/2005
ICAL Date	01/26/2005	Analyzed	02/02/2005 23:46
CCal Filename(s)	U50202B_01	Injected By	SMT

Native Isomers	Conc pg/L	EMPC pg/L	LOD pg/L		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	0.59		2,3,7,8-TCDF-13C	2.00	86
Total TCDF	1.10	-----	-----	J	2,3,7,8-TCDD-13C	2.00	86
					1,2,3,7,8-PeCDF-13C	2.00	92
2,3,7,8-TCDD	ND	-----	1.30		2,3,4,7,8-PeCDF-13C	2.00	98
Total TCDD	ND	-----	-----		1,2,3,7,8-PeCDD-13C	2.00	105
					1,2,3,4,7,8-HxCDF-13C	2.00	83
1,2,3,7,8-PeCDF	-----	0.73	0.53	I	1,2,3,6,7,8-HxCDF-13C	2.00	76
2,3,4,7,8-PeCDF	ND	-----	0.63		2,3,4,6,7,8-HxCDF-13C	2.00	79
Total PeCDF	ND	-----	-----		1,2,3,7,8,9-HxCDF-13C	2.00	82
					1,2,3,4,7,8-HxCDD-13C	2.00	82
1,2,3,7,8-PeCDD	ND	-----	1.10		1,2,3,6,7,8-HxCDD-13C	2.00	66
Total PeCDD	ND	-----	-----		1,2,3,4,6,7,8-HpCDF-13C	2.00	75
					1,2,3,4,7,8,9-HpCDF-13C	2.00	69
1,2,3,4,7,8-HxCDF	-----	1.30	0.26	E	1,2,3,4,6,7,8-HpCDD-13C	2.00	77
1,2,3,6,7,8-HxCDF	-----	0.75	0.29	E	OCDD-13C	4.00	79
2,3,4,6,7,8-HxCDF	-----	0.71	0.31	I			
1,2,3,7,8,9-HxCDF	-----	1.00	0.41	E	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	0.34	-----	-----	J	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	1.10		2,3,7,8-TCDD-37Cl4	0.20	89
1,2,3,6,7,8-HxCDD	ND	-----	0.69				
1,2,3,7,8,9-HxCDD	ND	-----	0.95				
Total HxCDD	ND	-----	-----				
1,2,3,4,6,7,8-HpCDF	1.20	-----	0.71	J			
1,2,3,4,7,8,9-HpCDF	ND	-----	0.99				
Total HpCDF	4.30	-----	-----	J			
1,2,3,4,6,7,8-HpCDD	-----	1.60	0.86	I			
Total HpCDD	ND	-----	-----				
OCDF	6.50	-----	1.20	J			
OCDD	-----	8.30	0.74	I			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection. Totals are averages of individual isomer LODs.
A = Limit of Detection based on signal to noise
P = Recovery outside of method 1613 control limits
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....106475

REPORT OF LABORATORY ANALYSIS

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1700 Elm Street - Suite 200
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Tel: 612-607-1700
Fax: 612- 607-6444

Pace Analytical™

Method 1613B Laboratory Control Spike Results

Client - Del Mar Analytical

Lab Sample ID	LCS-6242		
Filename	U50202B_02	Matrix	Water
Total Amount Extracted	1040 mL	Dilution	NA
ICAL Date	01/26/2005	Extracted	01/31/2005
CCal Filename	U50202B_01	Analyzed	02/02/2005 20:28
Method Blank ID	BLANK-6241	Injected By	SMT

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDF	10	8.8	7.5	15.8	88
2,3,7,8-TCDD	10	8.6	6.7	15.8	86
1,2,3,7,8-PeCDF	50	43.6	40.0	67.0	87
2,3,4,7,8-PeCDF	50	42.3	34.0	80.0	85
1,2,3,7,8-PeCDD	50	38.0	35.0	71.0	76
1,2,3,4,7,8-HxCDF	50	39.1	36.0	67.0	78
1,2,3,6,7,8-HxCDF	50	42.0	42.0	65.0	84
2,3,4,6,7,8-HxCDF	50	40.4	35.0	78.0	81
1,2,3,7,8,9-HxCDF	50	39.6	39.0	65.0	79
1,2,3,4,7,8-HxCDD	50	43.2	35.0	82.0	86
1,2,3,6,7,8-HxCDD	50	42.9	38.0	67.0	86
1,2,3,7,8,9-HxCDD	50	45.4	32.0	81.0	91
1,2,3,4,6,7,8-HpCDF	50	44.2	41.0	61.0	88
1,2,3,4,7,8,9-HpCDF	50	46.8	39.0	69.0	94
1,2,3,4,6,7,8-HpCDD	50	41.4	35.0	70.0	83
OCDF	100	79.6	63.0	170.0	80
OCDD	100	85.8	78.0	144.0	86
2,3,7,8-TCDD-37Cl4	10	7.8	3.1	19.1	78
2,3,7,8-TCDF-13C	100	85.1	22.0	152.0	85
2,3,7,8-TCDD-13C	100	80.0	20.0	175.0	80
1,2,3,7,8-PeCDF-13C	100	90.8	21.0	192.0	91
2,3,4,7,8-PeCDF-13C	100	94.3	13.0	328.0	94
1,2,3,7,8-PeCDD-13C	100	102.1	21.0	227.0	102
1,2,3,4,7,8-HxCDF-13C	100	81.8	19.0	202.0	82
1,2,3,6,7,8-HxCDF-13C	100	78.8	21.0	159.0	79
2,3,4,6,7,8-HxCDF-13C	100	83.3	22.0	176.0	83
1,2,3,7,8,9-HxCDF-13C	100	85.0	17.0	205.0	85
1,2,3,4,7,8-HxCDD-13C	100	83.5	21.0	193.0	83
1,2,3,6,7,8-HxCDD-13C	100	71.7	25.0	163.0	72
1,2,3,4,6,7,8-HpCDF-13C	100	76.4	21.0	158.0	76
1,2,3,4,7,8,9-HpCDF-13C	100	67.0	20.0	186.0	67
1,2,3,4,6,7,8-HpCDD-13C	100	73.0	26.0	166.0	73
OCDD-13C	200	148.7	26.0	397.0	74

Cs = Concentration Spiked (ng/mL)
Cr = Concentration Recovered (ng/mL)
Rec. = Recovery (Expressed as Percent)
Control Limit Reference: Method 1613, Table 6, 10/94 Revision
X = Background subtracted value
P = Recovery outside of control limits
Nn = Value obtained from additional analysis
* = See Discussion

Report No.....106475

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Pace Analytical™

Method 1613B Laboratory Control Spike Results

Client - Del Mar Analytical

Lab Sample ID	LCSD-6243		
Filename	U50202B_03	Matrix	Water
Total Amount Extracted	1030 mL	Dilution	NA
ICAL Date	01/26/2005	Extracted	01/31/2005
CCal Filename	U50202B_01	Analyzed	02/02/2005 21:15
Method Blank ID	BLANK-6241	Injected By	SMT

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDF	10	9.7	7.5	15.8	97
2,3,7,8-TCDD	10	9.4	6.7	15.8	94
1,2,3,7,8-PeCDF	50	46.8	40.0	67.0	94
2,3,4,7,8-PeCDF	50	44.6	34.0	80.0	89
1,2,3,7,8-PeCDD	50	40.7	35.0	71.0	81
1,2,3,4,7,8-HxCDF	50	41.3	36.0	67.0	83
1,2,3,6,7,8-HxCDF	50	44.5	42.0	65.0	89
2,3,4,6,7,8-HxCDF	50	43.6	35.0	78.0	87
1,2,3,7,8,9-HxCDF	50	42.2	39.0	65.0	84
1,2,3,4,7,8-HxCDD	50	49.1	35.0	82.0	98
1,2,3,6,7,8-HxCDD	50	45.6	38.0	67.0	91
1,2,3,7,8,9-HxCDD	50	51.3	32.0	81.0	103
1,2,3,4,6,7,8-HpCDF	50	47.5	41.0	61.0	95
1,2,3,4,7,8,9-HpCDF	50	50.1	39.0	69.0	100
1,2,3,4,6,7,8-HpCDD	50	44.5	35.0	70.0	89
OCDF	100	89.7	63.0	170.0	90
OCDD	100	91.5	78.0	144.0	92
2,3,7,8-TCDD-37Cl4	10	9.3	3.1	19.1	93
2,3,7,8-TCDF-13C	100	100.2	22.0	152.0	100
2,3,7,8-TCDD-13C	100	97.2	20.0	175.0	97
1,2,3,7,8-PeCDF-13C	100	109.5	21.0	192.0	109
2,3,4,7,8-PeCDF-13C	100	114.8	13.0	328.0	115
1,2,3,7,8-PeCDD-13C	100	124.2	21.0	227.0	124
1,2,3,4,7,8-HxCDF-13C	100	93.9	19.0	202.0	94
1,2,3,6,7,8-HxCDF-13C	100	88.8	21.0	159.0	89
2,3,4,6,7,8-HxCDF-13C	100	89.8	22.0	176.0	90
1,2,3,7,8,9-HxCDF-13C	100	96.4	17.0	205.0	96
1,2,3,4,7,8-HxCDD-13C	100	86.2	21.0	193.0	86
1,2,3,6,7,8-HxCDD-13C	100	80.0	25.0	163.0	80
1,2,3,4,6,7,8-HpCDF-13C	100	85.0	21.0	158.0	85
1,2,3,4,7,8,9-HpCDF-13C	100	80.0	20.0	186.0	80
1,2,3,4,6,7,8-HpCDD-13C	100	81.7	26.0	166.0	82
OCDD-13C	200	177.3	26.0	397.0	89

Cs = Concentration Spiked (ng/mL)
Cr = Concentration Recovered (ng/mL)
Rec. = Recovery (Expressed as Percent)
Control Limit Reference: Method 1613, Table 6, 10/94 Revision
X = Background subtracted value
P = Recovery outside of control limits
Nn = Value obtained from additional analysis
* = See Discussion

Report No.....106475

REPORT OF LABORATORY ANALYSIS

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Minneapolis, MN 55414
Phone: 612.607.1700
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SPIKE RECOVERY RELATIVE PERCENT DIFFERENCE (RPD) RESULTS

Client..... Del Mar Analytical

SPIKE 1 ID..... LCS-6242
SPIKE 1 Filename..... U50202B_02
SPIKE 2 ID..... LCSD-6243
SPIKE 2 Filename..... U50202B_03

COMPOUND	SPIKE 1 REC,%	SPIKE 2 REC,%	RPD,%
2378-TCDF	88	97	9.7
2378-TCDD	86	94	8.9
12378-PeCDF	87	94	7.7
23478-PeCDF	85	89	4.6
12378-PeCDD	76	81	6.4
123478-HxCDF	78	83	6.2
123678-HxCDF	84	89	5.8
234678-HxCDF	81	87	7.1
123789-HxCDF	79	84	6.1
123478-HxCDD	86	98	13.0
123678-HxCDD	86	91	5.6
123789-HxCDD	91	103	12.4
1234678-HpCDF	88	95	7.7
1234789-HpCDF	94	100	6.2
1234678-HpCDD	83	89	7.0
OCDF	80	90	11.8
OCDD	86	92	6.7

REC = Percent Recovered
RPD = The difference between the two values divided by the average.
NA = Not Applicable

Report No..... 106475

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TABLE 1. 2,3,7,8-TCDD Equivalency Factors (TEFs) for the Polychlorinated Dibenzo-p-dioxins and Dibenzofurans

Number	Compound(s)	TEF
1	2,3,7,8-TCDD	1.00
2	1,2,3,7,8-PeCDD	0.50
3	1,2,3,6,7,8-HxCDD	0.1
4	1,2,3,7,8,9-HxCDD	0.1
5	1,2,3,4,7,8-HxCDD	0.1
6	1,2,3,4,6,7,8-HpCDD	0.01
7	OCDD	0.001
8	* Total - TCDD	0.0
9	* Total - PeCDD	0.0
10	* Total - HxCDD	0.0
11	* Total - HpCDD	0.0
12	2,3,7,8-TCDF	0.10
13	1,2,3,7,8-PeCDF	0.05
14	2,3,4,7,8-PeCDF	0.5
15	1,2,3,6,7,8-HxCDF	0.1
16	1,2,3,7,8,9-HxCDF	0.1
17	1,2,3,4,7,8-HxCDF	0.1
18	2,3,4,6,7,8-HxCDF	0.1
19	1,2,3,4,6,7,8-HpCDF	0.01
20	1,2,3,4,7,8,9-HpCDF	0.01
21	OCDF	0.001
22	* Total - TCDF	0.0
23	* Total - PeCDF	0.0
24	* Total - HxCDF	0.0
25	* Total - HpCDF	0.0

*Excluding the 2,3,7,8-substituted congeners.

Reference: 1989 ITEFs

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Del Mar Analytical

17461 Derian Ave. Suite 100, Irvine, CA 92614 Ph (949) 261-1022 Fax (949) 261-1228
1014 E. Cooley Dr., Suite A, Colton, CA 92324 Ph (909) 370-4667 Fax (909) 370-1046
9484 Chesapeake Drive, Suite 805, San Diego, CA 92123 Ph (619) 505-9596 Fax (619) 505-9689
9830 South 51st Street, Suite B-120, Phoenix, AZ 85044 Ph (480) 785-0043 Fax (480) 785-0851
2520 E. Sunset Rd., Suite #3, Las Vegas, NV 89120 Ph (702) 798-3620 Fax (702) 798-3621

SUBCONTRACT ORDER - PROJECT # IOA1556

10686?

SENDING LABORATORY:	RECEIVING LABORATORY:
Del Mar Analytical, Irvine 17461 Derian Avenue. Suite 100 Irvine, CA 92614 Phone: (949) 261-1022 Fax: (949) 261-1228 Project Manager: Michele Harper	Pace Analytical, MN- SUB 1700 Elm Street, Ste 200 Minneapolis, MN 55414 Phone :(612) 607-1700 Fax: (612) 607-6444

Standard TAT is requested unless specific due date is requested => Due Date:_____ Initials:_____

Analysis	Expiration	Comments
Sample ID: IOA1556-01 Water	**Sampled: 01/26/05 10:55**	10686001
1613-Dioxin-HR	02/02/05 10:55	J flags, 17 congeners, no TEQ, sub to Pace-MN
EDD + Level 4	02/23/05 10:55	Excel EDD email to pm,Include Std logs for Lvl IV

Containers Supplied:
1 L Amber (IOA1556-01C)
1 L Amber (IOA1556-01D)

SAMPLE INTEGRITY:

All containers intact: ☐ Yes ☐ No Sample labels/COC agree: ☐ Yes ☐ No Samples Received On Ice:: ☐ Yes ☐ No
Custody Seals Present: ☐ Yes ☐ No Samples Preserved Properly: ☐ Yes ☐ No Samples Received at (temp): 2.7°C

Released By	Date	Time	Received By	Date	Time
	1-27-05	1700		1.28.05	09:30

APPENDIX G

Section 4

January Outfall 004

AMEC Data Validation Reports

Del Mar Analytical Laboratory Reports

CONTRACT COMPLIANCE SCREENING FORM FOR HARDCOPY DATA

AMEC Earth & Environmental
550 South Wadsworth Boulevard
Suite 500
Lakewood, CO 80226

Laboratory Alta
Reviewer K. Shadowlight
Analysis/Method Dioxins

Package ID T711DF20
Task Order 313150010
SDG No. Multiple
No. of Analyses 15

Date: February 11, 2005
Reviewer's Signature K Shadowlight

ACTION ITEMS[a]	
1. **Case Narrative Deficiencies**	
2. **Out of Scope Analyses**	
3. **Analyses Not Conducted**	
4. **Missing Hardcopy Deliverables**	
5. **Incorrect Hardcopy Deliverables**	
6. **Deviations from Analysis Protocol, e.g.,**	Qualifications were assigned for the following:
Holding Times	* Method blank contamination
GC/MS Tune/Inst. Performance	* EMPCs
Calibration	* Detects below the lower method calibration level
Method blanks	
Surrogates	
Matrix Spike/Dup LCS	
Field QC	
Internal Standard Performance	
Compound Identification and Quantitation	
System Performance	
COMMENTS[b]	Rev. 1

[a] Subcontracted analytical laboratory is not meeting contract and/or method requirements.
[b] Differences in protocol have been adopted by the laboratory but no action against the laboratory is required.

DATA VALIDATION REPORT

NPDES
Monitoring

ANALYSIS: DIOXINS/FURANS

SAMPLE DELIVERY GROUPS: Multiple SDGs

Prepared by

AMEC—Denver Operations
550 South Wadsworth Boulevard, Suite 500
Lakewood, Colorado 80226

1. INTRODUCTION

Task Order Title:	NPDES Monitoring
Contract Task Order #:	313150010
Sample Delivery Group #:	Multiple
Project Manager:	B. McIlvaine
Matrix:	Water
Analysis:	Dioxins/Furans
QC Level:	Level IV
No. of Samples:	15
No. of Reanalyses/Dilutions:	0
Reviewer:	K. Shadowlight
Date of Review:	February 11, 2005

The samples listed in Table 1 were validated based on the guidelines outlined in the *AMEC Data Validation Procedure for Dioxins and Furans (DVP-19, Rev. 1), EPA Method 1613, and the National National Functional Guidelines For Chlorinated Dioxin/Furan Data Review* (8/02). Any deviations from these procedures and guidelines are documented herein. Qualifiers were applied in cases where the data did not meet the required QC criteria or where special consideration by the data user is required. Data qualifiers were placed on Form Is with the associated qualification codes. Analytes that were rejected for any reason are denoted on the Form I as having only the "R" data qualifier and associated qualification code(s) denoting the reason for rejection. Any additional problems with the data that may have resulted in an estimated value were not denoted by a qualification code since the data had already been rejected.

Table 1. Sample Identification

Client ID	Laboratory ID (Del Mar)	Laboratory ID (Pace)	Matrix	COC Method
Outfall 003	IOA0026-01	105648001	water	1613
Outfall 004	IOA0027-01	105646001	water	1613
Outfall 005	IOA0028-01	105645001	water	1613
Outfall 007	IOA0108-01	105774001	water	1613
Outfall 008	IOA0109-01	105775001	water	1613
Outfall 009	IOA0110-01	105770001	water	1613
Outfall 010	IOA0111-01	105758001	water	1613
Outfall 001	IOA0112-01	105778001	water	1613
Outfall 002	IOA0119-01	105772001	water	1613
Outfall 018	IOA0122-01	105779001	water	1613
Outfall 011	IOA0131-01	105773001	water	1613
Outfall 006	IOA0458-01	106048001	water	1613
Outfall 004	IOA0460-01	106050001	water	1613
Outfall 005	IOA0464-01	106052001	water	1613
Outfall 003	IOA0466-01	106051001	water	1613

2. DATA VALIDATION FINDINGS

2.1 SAMPLE MANAGEMENT

Following are findings associated with sample management:

2.1.1 Sample Preservation, Handling, and Transport

All of the samples in these SDGs were received at Del Mar Analytical within the temperature limits of 4°C ±2°C. Several of the samples in these SDGs were received at Pace Analytical Services below the temperature limits of 4°C ±2°C; however, as none of the samples were noted to have been damaged, no qualifications were required. The samples were received in good condition at both laboratories. No qualifications were required.

2.1.2 Chain of Custody

The COC and transfer COC were signed by the appropriate field and laboratory personnel, and accounted for the analyses presented in these SDGs. As the samples were couriered directly to the laboratory (Del Mar Analytical), custody seals were not required. There was no information regarding custody seals upon receipt at Pace. No qualifications were required.

2.1.3 Holding Times

The samples were extracted and analyzed within a year of collection. No qualifications were required.

2.2 INSTRUMENT PERFORMANCE

Following are findings associated with instrument performance:

2.2.1 GC Column Performance

A column performance standard was combined with the daily calibration verification and analyzed at the beginning of each analytical sequence. The GC column performance was acceptable with the chromatographic separation of 2,3,7,8-TCDD and other TCDD isomers resolved with a valley of ≤25%. No qualifications were required.

2.2.2 Mass Spectrometer Performance

The mass spectrometer performance could not be evaluated as the laboratory did not provide selected ion current profiles for the lock-mass ions. No qualifications were required.

2.3 CALIBRATION

2.3.1 Initial Calibration

There was one initial calibration, analyzed 11/29/04 on Instrument 10MSHR05. The calibration consisted of five concentration level standards (CS1 through CS5) analyzed to verify instrument linearity. The initial calibration was acceptable with %RSDs ≤20% for the 15 native compounds (calibration by isotope dilution) and ≤35% for the 2 native and all labeled compounds (calibration by internal standard). The relative retention times and ion abundance ratios were within the QC limits listed in Method 1613 for all standards. A representative number of %RSDs were verified from the raw data, and no calculation or transcription errors were noted. No qualifications were required.

2.3.2 Continuing Calibration

Calibration verification (VER) consisted of a mid-level standard (CS3) analyzed at the beginning of each analytical sequence. The VER was acceptable with the concentrations within the acceptance criteria listed in the Table 6 of the EPA Method 1613. The ion abundance ratios and relative retention times were within the method QC limits. A representative number of %Ds were verified from the raw data, and no calculation or transcription errors were noted. No qualifications were required.

2.4 BLANKS

One method blank (Blank-6202) was extracted and analyzed with the samples in these SDGs. Target compounds 1,2,3,4,6,7,8-HpCDD, total HpCDD, OCDF, and OCDD were reported in the method blank. Any detects for the aforementioned target compounds reported at concentrations <5x the concentrations reported in the method blank were qualified as estimated nondetects "UJ," at the levels of interference in the samples of these SDGs. A review of the method blank raw data and chromatograms indicated no false negatives or false positives. No further qualifications were required.

2.5 BLANK SPIKES AND LABORATORY CONTROL SAMPLES

One LCS/LCSD pair (LCS-6203/LCSD-6204) was extracted and analyzed with the samples in these SDGs. All recoveries were within the acceptance criteria listed in Table 6 of the Method 1613. There were no QC limits established for RPDs. The reported RPDs were within ±20%. No qualifications were required.

2.6 MATRIX SPIKE/MATRIX SPIKE DUPLICATE

MS/MSD analyses were not performed in these SDGs. Evaluation of method accuracy and precision was based on the LCS/LCSD results. No qualifications were required.

2.7 FIELD QC SAMPLES

Following are findings associated with field QC:

2.7.1 Field Blanks and Equipment Rinsates

The samples in these SDGs had no associated field QC samples. No qualifications were required.

2.7.2 Field Duplicates

No field duplicate samples were identified for these SDGs.

2.8 INTERNAL STANDARDS

The labeled standard recoveries were within the acceptance criteria listed in Table 7 of Method 1613. No qualifications were required.

2.9 COMPOUND IDENTIFICATION

The laboratory analyzed for polychlorinated dioxins/furans by EPA Method 1613. The compound identifications were verified from the raw data and no false negatives or positives were noted. No qualifications were required.

2.10 COMPOUND QUANTIFICATION AND REPORTED DETECTION LIMITS

Compound quantitation was verified from the raw data. The laboratory calculated and reported compound-specific detection limits. Any detects below the lower method calibration limit (MCL) were qualified as estimated, "J." Any reported EMPC was qualified as an estimated nondetect, "UJ." No further qualifications were required.

Pace Analytical Services, Inc.
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Minneapolis, MN 55414

Tel: 612-607-1700
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Pace Analytical™

Method 1613B Analysis Results

Client - Del Mar Analytical

Client's Sample ID	IOA0027-01		
Lab Sample ID	105646001		
Filename	F50127A_09		
Injected By	MRO		
Total Amount Extracted	1040 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	01/03/2005
ICAL Date	11/29/2004	Received	01/04/2005
CCal Filename(s)	F50127A_02	Extracted	01/24/2005
Method Blank ID	BLANK-6202	Analyzed	01/27/2005 16:44

Native Isomers	Conc pg/L	EMPC pg/L	LOD pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	2.7	2,3,7,8-TCDF-13C	2.00	51
Total TCDF	ND	-----	2.7	2,3,7,8-TCDD-13C	2.00	64
				1,2,3,7,8-PeCDF-13C	2.00	80
2,3,7,8-TCDD	ND	-----	3.1	2,3,4,7,8-PeCDF-13C	2.00	77
Total TCDD	ND	-----	3.1	1,2,3,7,8-PeCDD-13C	2.00	90
				1,2,3,4,7,8-HxCDF-13C	2.00	77
1,2,3,7,8-PeCDF	ND	-----	1.7	1,2,3,6,7,8-HxCDF-13C	2.00	102
2,3,4,7,8-PeCDF	ND	-----	1.2	2,3,4,6,7,8-HxCDF-13C	2.00	94
Total PeCDF	ND	-----	1.5	1,2,3,7,8,9-HxCDF-13C	2.00	83
				1,2,3,4,7,8-HxCDD-13C	2.00	74
1,2,3,7,8-PeCDD	ND	-----	2.6	1,2,3,6,7,8-HxCDD-13C	2.00	96
Total PeCDD	ND	-----	2.6	1,2,3,4,6,7,8-HpCDF-13C	2.00	85
				1,2,3,4,7,8,9-HpCDF-13C	2.00	74
1,2,3,4,7,8-HxCDF	ND	-----	1.6	1,2,3,4,6,7,8-HpCDD-13C	2.00	99
1,2,3,6,7,8-HxCDF	ND	-----	1.3	OCDD-13C	4.00	95
2,3,4,6,7,8-HxCDF	ND	-----	1.1			
1,2,3,7,8,9-HxCDF	ND	-----	2.0	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	-----	1.5	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	1.6	2,3,7,8-TCDD-37Cl4	0.20	58
1,2,3,6,7,8-HxCDD	ND	-----	1.5			
1,2,3,7,8,9-HxCDD	ND	-----	1.4			
Total HxCDD	ND	-----	1.5			
1,2,3,4,6,7,8-HpCDF	-----	2.1	1.7 I			
1,2,3,4,7,8,9-HpCDF	ND	-----	2.2			
Total HpCDF	ND	-----	2.0			
1,2,3,4,6,7,8-HpCDD	8.8	-----	1.6 BJ			
Total HpCDD	17.0	-----	1.6 BJ			
OCDF	9.0	-----	2.1 BJ			
OCDD	110.0	-----	3.3 B			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection. Totals are averages of individual isomer LODs.
D = Result obtained from analysis of diluted sample
B = Less than 10 times higher than method blank level
P = Recovery outside of method 1613 control limits
J = Concentration detected is below the calibration range
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....105646

REPORT OF LABORATORY ANALYSIS

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CONTRACT COMPLIANCE SCREENING FORM FOR HARDCOPY DATA

AMEC Earth & Environmental
550 South Wadsworth Boulevard
Suite 500
Lakewood, CO 80226

Laboratory Del Mar Analytical
Reviewer K. Okonzak
Analysis/Method metals

Package ID T711MT22
Task Order 3131500120
SDG No. IOA0027, 0028, 0029
No. of Analyses 3

Date: 2/01/05
Reviewer's Signature

ACTION ITEMS[a]	
1. **Case Narrative Deficiencies**	
2. **Out of Scope Analyses**	
3. **Analyses Not Conducted**	
4. **Missing Hardcopy Deliverables**	
5. **Incorrect Hardcopy Deliverables**	
6. **Deviations from Analysis Protocol, e.g.,**	Qualifications applied for lead detected between the MDL and the reporting limit.
	The mercury reanalysis, for sample Outfall 004 was rejected, "R," and the original mercury analysis was reported for this sample. The reanalysis confirmed the original mercury detect.
Holding Times	
GC/MS Tune/Inst. Perform	
Calibrations	
Blanks	
Surrogates	
Matrix Spike/Dup LCS	
Field QC	
Internal Standard Performance	
Compound Identification and Quantitation	
System Performance	

COMMENTS[b]	

[a] Subcontracted analytical laboratory is not meeting contract and/or method requirements.
[b] Differences in protocol have been adopted by the laboratory but no action against the laboratory is required.

Data Qualifier Reference Table

Qualifier	Organics	Inorganics
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.	The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.	The associated value is an estimated quantity.
N	The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification."	Not applicable.
NJ	The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.	Not applicable.
UJ	The analyte was not deemed above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.	The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.
R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and to meet quality control criteria. The presence or absence of the analyte cannot be verified.	The data are unusable. (Note: Analyte may or may not be present).

Qualification Code Reference Table

Qualifier	Organics	Inorganics
H	Holding times were exceeded.	Holding times were exceeded.
S	Surrogate recovery was outside QC limits.	The sequence or number of standards used for the calibration was incorrect
C	Calibration %RSD or %D were noncompliant.	Correlation coefficient is <0.995.
R	Calibration RRF was <0.05.	%R for calibration is not within control limits.
B	Presumed contamination from preparation (method) blank.	Presumed contamination from preparation (method) or calibration blank.
L	Laboratory Blank Spike/Blank Spike Duplicate %R was not within control limits.	Laboratory Control Sample %R was not within control limits.
Q	MS/MSD recovery was poor or RPD high.	MS recovery was poor.
E	Not applicable.	Duplicates showed poor agreement.
I	Internal standard performance was unsatisfactory.	ICP ICS results were unsatisfactory.
A	Not applicable.	ICP Serial Dilution %D were not within control limits.
M	Tuning (BFB or DFTPP) was noncompliant.	Not applicable.
T	Presumed contamination from trip blank.	Not applicable.
+	False positive – reported compound was not present. Not applicable.	
-	False negative – compound was present but not reported.	Not applicable.
F	Presumed contamination from FB, or ER.	Presumed contamination from FB or ER.
$	Reported result or other information was incorrect.	Reported result or other information was incorrect.
?	TIC identity or reported retention time has been changed.	Not applicable.
D	The analysis with this flag should not be used because another more technically sound analysis is available.	The analysis with this flag should not be used because another more technically sound analysis is available.
P	Instrument performance for pesticides was poor.	Post Digestion Spike recovery was not within control limits.
DNQ	The compound was detected between the MDL and the RL and, by definition, is considered an estimated value.	The compound was detected between the MDL and the RL and, by definition, is considered an estimated value.

*#	Unusual problems found with the data that have been described in Section 2.#, "Data Validation Findings." The number following the asterisk (*) will indicate the subsection where a description of the problem can be found (eg. *1 would indicate a sample was not within temperature limits).	Unusual problems found with the data that have been described in Section 2.#, "Data Validation Findings." The number following the asterisk (*) will indicate the subsection where a description of the problem can be found (eg. *1 would indicate a sample was not within temperature limits).

DATA VALIDATION REPORT

NPDES
Monitoring

ANALYSIS: METALS

SAMPLE DELIVERY GROUP: IOA0027, IOA0028, IOA0029

Prepared by

AMEC—Denver Operations
550 South Wadsworth Boulevard, Suite 500
Lakewood, Colorado 80226

1. INTRODUCTION

Task Order Title:	NPDES Monitoring
Contract Task Order #:	313150010
SDG#:	IOA0027, IOA0028, IOA0029
Project Manager:	B. McIlvaine
Matrix:	Water
Analysis:	Metals
QC Level:	Level IV
No. of Samples:	3
No. of Reanalyses/Dilutions:	0
Reviewer:	K. Okonzak
Date of Review:	February 1, 2005

The samples listed in Table 1 were validated based on the guidelines outlined in the *AMEC Data Validation Procedure for Levels III and IV ICP-MS Metals, (DVP-5-A, Rev.0), AMEC Data Validation Procedure for Levels III and IV ICP Metals* (DVP-5, Rev. 0), SW-846 *Method 6020B for Inductively Coupled Plasma – Mass Spectrometry*, SW-846 *Method 7471A for Mercury (Manual Cold-Vapor Technique)*, and validation guidelines outlined in the USEPA CLP *National Functional Guidelines for Inorganic Data Review* (2/94). Any deviations from these procedures and guidelines are documented herein. Qualifiers were applied in cases where the data did not meet the required QC criteria or where special consideration by the data user is required. Data qualifiers were placed on Form Is with the associated qualification codes. Analytes that were rejected for any reason are denoted on the Form I as having only the "R" data qualifier and associated qualification code(s) denoting the reason for rejection. Any additional problems with the data that may have resulted in an estimated value were not denoted by a qualification code since the data had already been rejected.

Table 1. Sample identification

Client ID	EPA ID	Laboratory ID	Matrix	COC Method
Outfall 004	Outfall 004	IOA0027-01	water	ILM04
Outfall 005	Outfall 005	IOA0028-01	water	ILM04
Outfall 006	Outfall 006	IOA0029-01	water	ILM04

2. DATA VALIDATION FINDINGS

2.1 SAMPLE MANAGEMENT

Following are findings associated with sample management:

2.1.1 Sample Preservation, Handling, and Transport

The samples in these SDGs were received at the laboratory within the temperature limits of 4°C ±2°C. No sample preservation, handling, or transport problems were noted, and no qualifications were necessary.

2.1.2 Chain of Custody

The COCs were signed and dated by field and laboratory personnel. The COCs listed duplicate samples for metals analysis for all three site samples. A duplicate analysis, Outfall 004-RE1, was performed for mercury for sample Outfall 004 to confirm the mercury detect reported for this sample. Since the reanalysis confirmed the mercury result, the reanalysis was rejected, and the original mercury analysis was reported for sample Outfall 004. Duplicate analyses were not required for the lead results reported for the three site samples. No sample qualifications were required.

2.1.3 Holding Times

The date of collection recorded on the COCs and the dates of analysis recorded in the raw data, documented that the sample analysis was performed within the specified holding times of six months for the ICP/MS lead and 28 days for mercury. No qualifications were assigned.

2.2 ICP-MS TUNING

The ICP-MS tuning solution analyses are not included in the raw data package; therefore, the samples were not assessed for this criterion.

2.3 CALIBRATION

The ICV and CCV results showed acceptable %Rs, 90-110% for the ICP/MS and 80-120% for mercury. The ICP/MS and mercury 0.2 ppb check standards were within the laboratory-established control limits, and no sample qualifications were required due to calibration.

2.4 BLANKS

The calibration and method blanks associated with the samples in these SDGs were nondetected for mercury and lead at the laboratory MDL; therefore, no sample qualifications were required due to the blanks.

2.5 ICP INTERFERENCE CHECK SAMPLE (ICS A/AB)

Results were not provided for ICP-MS spiked interferents sulfur, phosphorus, carbon, titanium, and chloride. The results for aluminum, sodium, and potassium were above the calibration range of the instrument in both the ICSA and ICSAB analyses. Lead was not spiked into the ICSAB solution. The validator reviewed the raw data for the site sample ICP/MS analysis for the level of reported interferents, Al, Ca, Fe, and Mg, and determined that the concentration of interferents was not high enough to cause matrix affects. No assessment could be made with respect to possible interference from sulfur, phosphorus, carbon, and chloride. No qualifications were required.

2.6 BLANK SPIKES AND LABORATORY CONTROL SAMPLES

The ICP/MS LCS was identified as 5A04040-BS1, and the mercury LCS samples were identified as 5A04047-BS1 and 5A20051-BS1. The LCS results on the summary form and in the raw data were within the laboratory-established ICP/MS and mercury control limits of 85-115%. No qualifications were required.

2.7 LABORATORY DUPLICATES

The laboratory MS/MSD analyses were performed on sample Outfall 005. The precision between the MS/MSD aliquots was within the 20% RPD control limit for the lead and mercury analyses, and no sample qualifications were required.

2.8 MATRIX SPIKE

The laboratory MS/MSD analyses were performed on sample Outfall 005. The MS/MSD recoveries for lead and mercury were within the 70-130%R control limit, and no sample qualifications were required.

2.9 FURNACE ATOMIC ABSORPTION QC

Furnace atomic absorption was not utilized for the analysis of the samples; therefore, furnace atomic absorption QC is not applicable.

2.10 ICP/MS SERIAL DILUTION

No serial dilution analysis was performed in association with the samples in these data packages; therefore, no assessment was made with respect to this criterion.

2.11 INTERNAL STANDARDS PERFORMANCE

The ICP-MS internal standard recoveries for the site sample and associated QC sample analyses were within the 60-125% control limits used for validation, and no qualifications were required.

2.12 SAMPLE RESULT VERIFICATION

A Level IV review was performed for the samples in these data packages. Calculations were verified, and the sample results reported on the Form Is were verified against the raw data. No transcription errors or calculation errors were noted. Lead detected below the reporting limit in all three site samples was qualified as estimated, "J," by the laboratory. Outfall 004 was reanalyzed for mercury and reported as Outfall 004 RE1. As the original and reanalysis results were similar, the reanalysis, Outfall 004 RE1, was rejected, "R," in favor of the original result, Outfall 004. No further qualifications were required.

2.13 FIELD QC SAMPLES

Field QC samples are evaluated, and if necessary, qualified based only on laboratory blanks. Any remaining detects are used to evaluate the associated samples.

2.13.1 Field Blanks and Equipment Rinsates

The samples in these SDGs had no associated field QC samples. No qualifications were required.

2.13.2 Field Duplicates

There were no field duplicate analyses performed in association with the site samples reported in these data packages.

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 004

Report Number: IOA0027

Sampled: 01/03/05
Received: 01/05/05

DRAFT: METALS

Analyte	Method	Batch	MDL	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers	Rev Qual	Qual Code
Sample ID: IOA0027-01 (DRAFT: Outfall 004 - Water)											
Reporting Units: ug/l											
Lead	EPA 200.8	5A04040	0.13	1.0	**0.50**	1	01/04/05	01/04/05	J	X	DNQ
Mercury	EPA 245.1	5A04047	0.063	0.20	**0.23**	1	01/04/05	01/04/05			
Sample ID: IOA0027-01RE1 (DRAFT: Outfall 004 - Water)											
Reporting Units: ug/l											
Mercury	EPA 245.1	5A20051	0.063	0.20	**0.22**	1	01/04/05	01/20/05	R		D

AMEC VALIDATED

KML 2/10/05

LEVEL IV

DRAFT REPORT
DRAFT REPORT
DATA SUBJECT TO CHANGE

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LABORATORY REPORT

Prepared For: MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project: Routine Outfall 004

Sampled: 01/03/05
Received: 01/03/05
Issued: 02/15/05 15:13

NELAP #01108CA CA ELAP #1197 CSDLAC #10117

The results listed within this Laboratory Report pertain only to the samples tested in the laboratory. The analyses contained in this report were performed in accordance with the applicable certifications as noted. All soil samples are reported on a wet weight basis unless otherwise noted in the report. This Laboratory Report is confidential and is intended for the sole use of Del Mar Analytical and its client. This report shall not be reproduced, except in full, without written permission from Del Mar Analytical. The Chain of Custody, 1 page, is included and is an integral part of this report.
This entire report was reviewed and approved for release.

SAMPLE CROSS REFERENCE

SUBCONTRACTED: Refer to the last page for specific subcontract laboratory information included in this report.

LABORATORY ID	CLIENT ID	MATRIX
IOA0027-01	Outfall 004	Water

Reviewed By:

Michele Harper

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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Attention: Bronwyn Kelly

Project ID: Routine Outfall 004
Report Number: IOA0027

Sampled: 01/03/05
Received: 01/03/05

METALS

Analyte	Method	Batch	MDL Limit	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA0027-01 (Outfall 004 - Water)									
Reporting Units: ug/l									
Antimony	EPA 200.8	5A04040	0.18	2.0	**0.31**	1	01/04/05	01/04/05	J
Cadmium	EPA 200.8	5A04040	0.015	1.0	**0.055**	1	01/04/05	01/04/05	J
Copper	EPA 200.8	5A04040	0.49	2.0	**3.2**	1	01/04/05	01/04/05	B
Lead	EPA 200.8	5A04040	0.13	1.0	**0.50**	1	01/04/05	01/04/05	J
Mercury	EPA 245.1	5A04047	0.063	0.20	**0.23**	1	01/04/05	01/04/05	
Sample ID: IOA0027-01RE1 (Outfall 004 - Water)									
Reporting Units: ug/l									
Mercury	EPA 245.1	5A20051	0.063	0.20	**0.22**	1	01/04/05	01/20/05	

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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Attention: Bronwyn Kelly

Project ID: Routine Outfall 004
Report Number: IOA0027

Sampled: 01/03/05
Received: 01/03/05

INORGANICS

Analyte	Method	Batch	MDL Limit	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA0027-01 (Outfall 004 - Water) - cont.									
Reporting Units: mg/l									
Chloride	EPA 300.0	5A03042	0.26	0.50	**5.0**	1	01/03/05	01/03/05	
Nitrate/Nitrite-N	EPA 300.0	5A03042	0.072	0.26	**1.5**	1	01/03/05	01/03/05	
Oil & Grease	EPA 413.1	5A05068	0.94	5.0	ND	1	01/05/05	01/05/05	
Sulfate	EPA 300.0	5A03042	0.18	0.50	**8.0**	1	01/03/05	01/03/05	
Total Dissolved Solids	SM2540C	5A05071	10	10	**94**	1	01/05/05	01/05/05	

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Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 004
Report Number: IOA0027

Sampled: 01/03/05
Received: 01/03/05

SHORT HOLD TIME DETAIL REPORT

	Hold Time (in days)	Date/Time Sampled	Date/Time Received	Date/Time Extracted	Date/Time Analyzed
Sample ID: Outfall 004 (IOA0027-01) - Water					
EPA 300.0	2	01/03/2005 10:00	01/03/2005 15:00	01/03/2005 16:15	01/03/2005 16:58

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Attention: Bronwyn Kelly

Project ID: Routine Outfall 004

Report Number: IOA0027

Sampled: 01/03/05
Received: 01/03/05

METHOD BLANK/QC DATA

METALS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A04040 Extracted: 01/04/05											
Blank Analyzed: 01/04/2005 (5A04040-BLK1)											
Antimony	ND	2.0	0.18	ug/l							
Cadmium	ND	1.0	0.015	ug/l							
Copper	0.492	2.0	0.49	ug/l							J
Lead	ND	1.0	0.13	ug/l							
LCS Analyzed: 01/04/2005-01/05/2005 (5A04040-BS1)											
Antimony	91.9	2.0	0.18	ug/l	80.0		115	85-115			
Cadmium	84.0	1.0	0.015	ug/l	80.0		105	85-115			
Copper	77.4	2.0	0.49	ug/l	80.0		97	85-115			
Lead	75.7	1.0	0.13	ug/l	80.0		95	85-115			
Matrix Spike Analyzed: 01/04/2005-01/05/2005 (5A04040-MS1)						**Source: IOA0028-01**					
Antimony	95.3	2.0	0.18	ug/l	80.0	ND	119	70-130			
Cadmium	84.9	1.0	0.015	ug/l	80.0	0.026	106	70-130			
Copper	77.6	2.0	0.49	ug/l	80.0	0.71	96	70-130			
Lead	78.4	1.0	0.13	ug/l	80.0	0.19	98	70-130			
Matrix Spike Dup Analyzed: 01/04/2005-01/05/2005 (5A04040-MSD1)						**Source: IOA0028-01**					
Antimony	93.3	2.0	0.18	ug/l	80.0	ND	117	70-130	2	20	
Cadmium	83.4	1.0	0.015	ug/l	80.0	0.026	104	70-130	2	20	
Copper	77.2	2.0	0.49	ug/l	80.0	0.71	96	70-130	1	20	
Lead	77.0	1.0	0.13	ug/l	80.0	0.19	96	70-130	2	20	
Batch: 5A04047 Extracted: 01/04/05											
Blank Analyzed: 01/04/2005 (5A04047-BLK1)											
Mercury	ND	0.20	0.063	ug/l							

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Michele Harper
Project Manager

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Attention: Bronwyn Kelly

Project ID: Routine Outfall 004

Report Number: IOA0027

Sampled: 01/03/05
Received: 01/03/05

METHOD BLANK/QC DATA

METALS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A04047 Extracted: 01/04/05											
LCS Analyzed: 01/04/2005 (5A04047-BS1)											
Mercury	8.41	0.20	0.063	ug/l	8.00		105	85-115			
Matrix Spike Analyzed: 01/04/2005 (5A04047-MS1)						**Source: IOA0028-01**					
Mercury	8.10	0.20	0.063	ug/l	8.00	0.13	100	70-130			
Matrix Spike Dup Analyzed: 01/04/2005 (5A04047-MSD1)						**Source: IOA0028-01**					
Mercury	8.27	0.20	0.063	ug/l	8.00	0.13	102	70-130	2	20	
Batch: 5A20051 Extracted: 01/20/05											
Blank Analyzed: 01/20/2005 (5A20051-BLK1)											
Mercury	ND	0.20	0.063	ug/l							
LCS Analyzed: 01/20/2005 (5A20051-BS1)											
Mercury	8.31	0.20	0.063	ug/l	8.00		104	85-115			
Matrix Spike Analyzed: 01/20/2005 (5A20051-MS1)						**Source: IOA1004-02**					
Mercury	8.49	0.20	0.063	ug/l	8.00	0.15	104	70-130			
Matrix Spike Dup Analyzed: 01/20/2005 (5A20051-MSD1)						**Source: IOA1004-02**					
Mercury	8.38	0.20	0.063	ug/l	8.00	0.15	103	70-130	1	20	

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Attention: Bronwyn Kelly

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Report Number: IOA0027

Sampled: 01/03/05
Received: 01/03/05

METHOD BLANK/QC DATA

INORGANICS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A03042 Extracted: 01/03/05											
Blank Analyzed: 01/03/2005 (5A03042-BLK1)											
Chloride	ND	0.50	0.26	mg/l							
Nitrate/Nitrite-N	ND	0.26	0.072	mg/l							
Sulfate	ND	0.50	0.18	mg/l							
LCS Analyzed: 01/03/2005 (5A03042-BS1)											
Chloride	4.90	0.50	0.26	mg/l	5.00		98	90-110			
Sulfate	9.85	0.50	0.18	mg/l	10.0		98	90-110			
Matrix Spike Analyzed: 01/03/2005 (5A03042-MS1)						**Source: IOA0026-01**					
Chloride	9.42	0.50	0.26	mg/l	5.00	4.5	98	80-120			
Sulfate	14.6	0.50	0.18	mg/l	10.0	4.3	103	80-120			
Matrix Spike Dup Analyzed: 01/03/2005 (5A03042-MSD1)						**Source: IOA0026-01**					
Chloride	9.36	0.50	0.26	mg/l	5.00	4.5	97	80-120	1	20	
Sulfate	15.1	0.50	0.18	mg/l	10.0	4.3	108	80-120	3	20	
Batch: 5A05068 Extracted: 01/05/05											
Blank Analyzed: 01/05/2005 (5A05068-BLK1)											
Oil & Grease	ND	5.0	0.94	mg/l							
LCS Analyzed: 01/05/2005 (5A05068-BS1)											**M-NR1**
Oil & Grease	20.1	5.0	0.94	mg/l	20.0		100	65-120			
LCS Dup Analyzed: 01/05/2005 (5A05068-BSD1)											
Oil & Grease	21.1	5.0	0.94	mg/l	20.0		106	65-120	5	20	

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Attention: Bronwyn Kelly

Project ID: Routine Outfall 004

Report Number: IOA0027

Sampled: 01/03/05
Received: 01/03/05

METHOD BLANK/QC DATA

INORGANICS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A05071 Extracted: 01/05/05											
Blank Analyzed: 01/05/2005 (5A05071-BLK1)											
Total Dissolved Solids	ND	10	10	mg/l							
LCS Analyzed: 01/05/2005 (5A05071-BS1)											
Total Dissolved Solids	1070	10	10	mg/l	1000		107	90-110			
Duplicate Analyzed: 01/05/2005 (5A05071-DUP1)						**Source: IOA0066-02**					
Total Dissolved Solids	250	10	10	mg/l		250			0	10	

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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Del Mar Analytical

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9830 South 51st St., Suite B-120, Phoenix, AZ 85044 (480) 785-0043 FAX (480) 785-0851
2520 E. Sunset Rd. #3, Las Vegas, NV 89120 (702) 798-3620 FAX (702) 798-3621

MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 004

Report Number: IOA0027

Sampled: 01/03/05
Received: 01/03/05

Compliance Check

The results obtained from the analytical testing of this data set were checked against compliance limits received from the client. Any results at or above the compliance limits appear in bold on this page.

LabNumber	Analysis	Analyte	Units	Result	MRL	Compliance Limit
IOA0027-01	413.1 Oil and Grease	Oil & Grease	mg/l	0	5.0	15
IOA0027-01	Antimony-200.8	Antimony	ug/l	0.31	2.0	6.00
IOA0027-01	Cadmium-200.8	Cadmium	ug/l	0.055	1.0	4.00
IOA0027-01	Chloride - 300.0	Chloride	mg/l	5.00	0.50	150
IOA0027-01	Copper-200.8	Copper	ug/l	3.20	2.0	14
IOA0027-01	**Mercury - 245.1**	**Mercury**	**ug/l**	**0.23**	**0.20**	**0.20**
IOA0027-01	Nitrogen, NO3+NO2 -N	Nitrate/Nitrite-N	mg/l	1.50	0.26	10.00
IOA0027-01	Sulfate-300.0	Sulfate	mg/l	8.00	0.50	250
IOA0027-01	TDS - SM 2540C	Total Dissolved Solids	mg/l	94	10	850
IOA0027-01RE1	**Mercury - 245.1**	**Mercury**	**ug/l**	**0.22**	**0.20**	**0.20**

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Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 004

Report Number: IOA0027

Sampled: 01/03/05
Received: 01/03/05

DATA QUALIFIERS AND DEFINITIONS

B	Analyte was detected in the associated Method Blank.
J	Estimated value. Analyte detected at a level less than the Reporting Limit (RL) and greater than or equal to the Method Detection Limit (MDL). The user of this data should be aware that this data is of unknown quality.
M-NR1	There was no MS/MSD analyzed with this batch due to insufficient sample volume. See Blank Spike/Blank Spike Duplicate.
ND	Analyte NOT DETECTED at or above the reporting limit or MDL, if MDL is specified.
RPD	Relative Percent Difference

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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2520 E. Sunset Rd. #3, Las Vegas, NV 89120 (702) 798-3620 FAX (702) 798-3621

MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 004
Report Number: IOA0027

Sampled: 01/03/05
Received: 01/03/05

Certification Summary

Del Mar Analytical, Irvine

Method	Matrix	NELAP	CA
EPA 200.8	Water	X	X
EPA 245.1	Water	X	X
EPA 300.0	Water	X	X
EPA 413.1	Water	X	X
SM2540C	Water	X	X

NV and NELAP provide analyte specific accreditations. Analyte specific information for Del Mar Analytical may be obtained by contacting the laboratory or visiting our website at www.dmalabs.com.

Subcontracted Laboratories

Pace Analytical, MN- SUB

1700 Elm Street, Ste 200 - Minneapolis, MN 55414

Analysis Performed: 1613-Dioxin-HR
Samples: IOA0027-01

Analysis Performed: EDD + Level 4
Samples: IOA0027-01

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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IOA0027

Del Mar Analytical Version 5 8/12/04 CHAIN OF CUSTODY FORM

Client Name/Address:

MWH-Pasadena
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101

Project Manager: Bronwyn Kelly

Sampler: Pollock

Project:
Boeing-SSFL NPDES
Routine Outfall 004
Stormwater at SRE

Phone Number:
(626) 568-6691
Fax Number:
(626) 568-6515

ANALYSIS REQUIRED

Field readings:
Temp = 49.5
pH= 6.9

Sample Description	Sample Matrix	Container Type	# of Cont.	Sampling Date/Time	Preservative	Bottle * #	Total Reoverable Metals: Sb, Cd, Cu, Pb, Hg	TCDD (and all congeners)	Oil & Grease (EPA 413.1)	Cl-, SO4, NO3+NO2-N	TDS					Comments
Outfall 004	W	Poly-1L	1	1-3-05 10:00	HNO3	1A	X									
Outfall 004-Dup	W	Poly-1L	1		HNO3	1B	X									
Outfall 004	W	Glass-Amber	2		None	2A, 2B		X								
Outfall 004	W	Glass-Amber	2		HCl	3A, 3B			X							
Outfall 004	W	Poly-500 ml	2		None	4A, 4B				X						
Outfall 004	W	Poly-500 ml	2		None	5A, 5B					X					

Relinquished By	Date/Time:	Received By	Date/Time:
[signature]	1-3-05 1300	[signature]	1-3-05 1300
[signature]	1-3-05 1500		
		[signature]	1/3/05 15:00

Turn around Time: (check)
24 Hours _____ 5 Days _____
48 Hours _____ 10 Days _____
72 Hours _____ Normal X
Perchlorate Only 72 Hours_____
Metals Only 72 Hours_____
Sample Integrity (Check)
Intact X On Ice 4°

TR

Del Mar Analytical

2852 Alton Ave., Irvine CA 92606 (949) 261-1022 FAX (949) 261-1228
1014 E. Cooley Dr., Suite A, Colton, CA 92324 (909) 370-4667 FAX (949) 370-1046
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2520 E. Sunset Rd. #3, Las Vegas, NV 89120 (702) 798-3620 FAX (702) 798-3621

February 3, 2005

MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, Ca.91101

Attention: Bronwyn Kelly

Project: Routine Outfall 004
Sampled: 01/03/05
Del Mar Analytical Number: IOA0027

Dear Ms. Kelly:

Pace Analytical performed Method 1613B analysis for the project referenced above. Please use the following cross-reference table when reviewing your results.

MWH ID	DEL MAR ID	Pace ID
Outfall 004	IOA0027-01	105646001

Attached is the original report from the subcontract laboratory. If you have any questions or require further assistance, please do not hesitate to contact me.

Sincerely yours,
DEL MAR ANALYTICAL

Michele Harper
Project Manager

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Pace Analytical™

Method 1613B Analysis Results

Client - Del Mar Analytical

Client's Sample ID	IOA0027-01		
Lab Sample ID	105646001		
Filename	F50127A_09		
Injected By	MRO		
Total Amount Extracted	1040 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	01/03/2005
ICAL Date	11/29/2004	Received	01/04/2005
CCal Filename(s)	F50127A_02	Extracted	01/24/2005
Method Blank ID	BLANK-6202	Analyzed	01/27/2005 16:44

Native Isomers	Conc pg/L	EMPC pg/L	LOD pg/L		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	2.7		2,3,7,8-TCDF-13C	2.00	51
Total TCDF	ND	-----	2.7		2,3,7,8-TCDD-13C	2.00	64
					1,2,3,7,8-PeCDF-13C	2.00	80
2,3,7,8-TCDD	ND	-----	3.1		2,3,4,7,8-PeCDF-13C	2.00	77
Total TCDD	ND	-----	3.1		1,2,3,7,8-PeCDD-13C	2.00	90
					1,2,3,4,7,8-HxCDF-13C	2.00	77
1,2,3,7,8-PeCDF	ND	-----	1.7		1,2,3,6,7,8-HxCDF-13C	2.00	102
2,3,4,7,8-PeCDF	ND	-----	1.2		2,3,4,6,7,8-HxCDF-13C	2.00	94
Total PeCDF	ND	-----	1.5		1,2,3,7,8,9-HxCDF-13C	2.00	83
					1,2,3,4,7,8-HxCDD-13C	2.00	74
1,2,3,7,8-PeCDD	ND	-----	2.6		1,2,3,6,7,8-HxCDD-13C	2.00	96
Total PeCDD	ND	-----	2.6		1,2,3,4,6,7,8-HpCDF-13C	2.00	85
					1,2,3,4,7,8,9-HpCDF-13C	2.00	74
1,2,3,4,7,8-HxCDF	ND	-----	1.6		1,2,3,4,6,7,8-HpCDD-13C	2.00	99
1,2,3,6,7,8-HxCDF	ND	-----	1.3		OCDD-13C	4.00	95
2,3,4,6,7,8-HxCDF	ND	-----	1.1				
1,2,3,7,8,9-HxCDF	ND	-----	2.0		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	-----	1.5		1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	1.6		2,3,7,8-TCDD-37Cl4	0.20	58
1,2,3,6,7,8-HxCDD	ND	-----	1.5				
1,2,3,7,8,9-HxCDD	ND	-----	1.4				
Total HxCDD	ND	-----	1.5				
1,2,3,4,6,7,8-HpCDF	-----	2.1	1.7	I			
1,2,3,4,7,8,9-HpCDF	ND	-----	2.2				
Total HpCDF	ND	-----	2.0				
1,2,3,4,6,7,8-HpCDD	8.8	-----	1.6	BJ			
Total HpCDD	17.0	-----	1.6	BJ			
OCDF	9.0	-----	2.1	BJ			
OCDD	110.0	-----	3.3	B			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection. Totals are averages of individual isomer LODs.
D = Result obtained from analysis of diluted sample
B = Less than 10 times higher than method blank level
P = Recovery outside of method 1613 control limits
J = Concentration detected is below the calibration range
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....105646

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Pace Analytical™

Method 1613B Blank Analysis Results

Client - Del Mar Analytical

Lab Sample ID	BLANK-6202	Matrix	Water
Filename	F50127A_06	Dilution	NA
Total Amount Extracted	982 mL	Extracted	01/24/2005
ICAL Date	11/29/2004	Analyzed	01/27/2005 14:13
CCal Filename(s)	F50127A_02	Injected By	MRO

Native Isomers	Conc pg/L	EMPC pg/L	LOD pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	4.7	2,3,7,8-TCDF-13C	2.00	33
Total TCDF	ND	-----	-----	2,3,7,8-TCDD-13C	2.00	45
				1,2,3,7,8-PeCDF-13C	2.00	68
2,3,7,8-TCDD	ND	-----	5.1	2,3,4,7,8-PeCDF-13C	2.00	70
Total TCDD	ND	-----	-----	1,2,3,7,8-PeCDD-13C	2.00	81
				1,2,3,4,7,8-HxCDF-13C	2.00	75
1,2,3,7,8-PeCDF	ND	-----	2.2	1,2,3,6,7,8-HxCDF-13C	2.00	95
2,3,4,7,8-PeCDF	ND	-----	1.5	2,3,4,6,7,8-HxCDF-13C	2.00	98
Total PeCDF	ND	-----	-----	1,2,3,7,8,9-HxCDF-13C	2.00	85
				1,2,3,4,7,8-HxCDD-13C	2.00	78
1,2,3,7,8-PeCDD	ND	-----	1.6	1,2,3,6,7,8-HxCDD-13C	2.00	94
Total PeCDD	ND	-----	-----	1,2,3,4,6,7,8-HpCDF-13C	2.00	85
				1,2,3,4,7,8,9-HpCDF-13C	2.00	78
1,2,3,4,7,8-HxCDF	ND	-----	1.6	1,2,3,4,6,7,8-HpCDD-13C	2.00	99
1,2,3,6,7,8-HxCDF	ND	-----	1.4	OCDD-13C	4.00	97
2,3,4,6,7,8-HxCDF	ND	-----	1.1			
1,2,3,7,8,9-HxCDF	ND	-----	1.6	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	-----	-----	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	1.6	2,3,7,8-TCDD-37Cl4	0.20	40
1,2,3,6,7,8-HxCDD	ND	-----	1.2			
1,2,3,7,8,9-HxCDD	ND	-----	1.7			
Total HxCDD	ND	-----	-----			
1,2,3,4,6,7,8-HpCDF	ND	-----	1.5			
1,2,3,4,7,8,9-HpCDF	ND	-----	1.4			
Total HpCDF	ND	-----	-----			
1,2,3,4,6,7,8-HpCDD	1.9	-----	1.3 J			
Total HpCDD	1.9	-----	----- J			
OCDF	8.3	-----	1.9 J			
OCDD	26.0	-----	2.3 J			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection. Totals are averages of individual isomer LODs.
A = Limit of Detection based on signal to noise
P = Recovery outside of method 1613 control limits
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....105645

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 1613B Laboratory Control Spike Results

Client - Del Mar Analytical

Lab Sample ID	LCS-6203		
Filename	F50127A_03	Matrix	Water
Total Amount Extracted	1030 mL	Dilution	NA
ICAL Date	11/29/2004	Extracted	01/24/2005
CCal Filename	F50127A_02	Analyzed	01/27/2005 11:44
Method Blank ID	BLANK-6202	Injected By	MRO

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDF	10	10.2	7.5	15.8	102
2,3,7,8-TCDD	10	9.0	6.7	15.8	90
1,2,3,7,8-PeCDF	50	50.1	40.0	67.0	100
2,3,4,7,8-PeCDF	50	48.4	34.0	80.0	97
1,2,3,7,8-PeCDD	50	43.4	35.0	71.0	87
1,2,3,4,7,8-HxCDF	50	44.8	36.0	67.0	90
1,2,3,6,7,8-HxCDF	50	48.0	42.0	65.0	96
2,3,4,6,7,8-HxCDF	50	48.6	35.0	78.0	97
1,2,3,7,8,9-HxCDF	50	46.4	39.0	65.0	93
1,2,3,4,7,8-HxCDD	50	50.0	35.0	82.0	100
1,2,3,6,7,8-HxCDD	50	51.7	38.0	67.0	103
1,2,3,7,8,9-HxCDD	50	48.5	32.0	81.0	97
1,2,3,4,6,7,8-HpCDF	50	51.4	41.0	61.0	103
1,2,3,4,7,8,9-HpCDF	50	52.3	39.0	69.0	105
1,2,3,4,6,7,8-HpCDD	50	43.4	35.0	70.0	87
OCDF	100	89.5	63.0	170.0	90
OCDD	100	96.9	78.0	144.0	97
2,3,7,8-TCDD-37Cl4	10	6.2	3.1	19.1	62
2,3,7,8-TCDF-13C	100	49.8	22.0	152.0	50
2,3,7,8-TCDD-13C	100	65.8	20.0	175.0	66
1,2,3,7,8-PeCDF-13C	100	75.7	21.0	192.0	76
2,3,4,7,8-PeCDF-13C	100	76.9	13.0	328.0	77
1,2,3,7,8-PeCDD-13C	100	93.4	21.0	227.0	93
1,2,3,4,7,8-HxCDF-13C	100	78.9	19.0	202.0	79
1,2,3,6,7,8-HxCDF-13C	100	89.8	21.0	159.0	90
2,3,4,6,7,8-HxCDF-13C	100	88.2	22.0	176.0	88
1,2,3,7,8,9-HxCDF-13C	100	81.5	17.0	205.0	81
1,2,3,4,7,8-HxCDD-13C	100	82.2	21.0	193.0	82
1,2,3,6,7,8-HxCDD-13C	100	95.2	25.0	163.0	95
1,2,3,4,6,7,8-HpCDF-13C	100	86.3	21.0	158.0	86
1,2,3,4,7,8,9-HpCDF-13C	100	75.6	20.0	186.0	76
1,2,3,4,6,7,8-HpCDD-13C	100	102.9	26.0	166.0	103
OCDD-13C	200	195.1	26.0	397.0	98

Cs = Concentration Spiked (ng/mL)
Cr = Concentration Recovered (ng/mL)
Rec. = Recovery (Expressed as Percent)
Control Limit Reference: Method 1613, Table 6, 10/94 Revision
X = Background subtracted value
P = Recovery outside of control limits
Nn = Value obtained from additional analysis
* = See Discussion

Report No.....105645

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 1613B Laboratory Control Spike Results

Client - Del Mar Analytical

Lab Sample ID	LCSD-6204		
Filename	F50127A_04	Matrix	Water
Total Amount Extracted	1000 mL	Dilution	NA
ICAL Date	11/29/2004	Extracted	01/24/2005
CCal Filename	F50127A_02	Analyzed	01/27/2005 12:32
Method Blank ID	BLANK-6202	Injected By	MRO

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDF	10	9.9	7.5	15.8	99
2,3,7,8-TCDD	10	8.8	6.7	15.8	88
1,2,3,7,8-PeCDF	50	49.8	40.0	67.0	100
2,3,4,7,8-PeCDF	50	47.6	34.0	80.0	95
1,2,3,7,8-PeCDD	50	41.4	35.0	71.0	83
1,2,3,4,7,8-HxCDF	50	46.6	36.0	67.0	93
1,2,3,6,7,8-HxCDF	50	44.0	42.0	65.0	88
2,3,4,6,7,8-HxCDF	50	47.2	35.0	78.0	94
1,2,3,7,8,9-HxCDF	50	44.8	39.0	65.0	90
1,2,3,4,7,8-HxCDD	50	46.5	35.0	82.0	93
1,2,3,6,7,8-HxCDD	50	48.9	38.0	67.0	98
1,2,3,7,8,9-HxCDD	50	46.7	32.0	81.0	93
1,2,3,4,6,7,8-HpCDF	50	48.7	41.0	61.0	97
1,2,3,4,7,8,9-HpCDF	50	49.9	39.0	69.0	100
1,2,3,4,6,7,8-HpCDD	50	42.7	35.0	70.0	85
OCDF	100	84.8	63.0	170.0	85
OCDD	100	92.5	78.0	144.0	92
2,3,7,8-TCDD-37Cl4	10	7.5	3.1	19.1	75
2,3,7,8-TCDF-13C	100	65.7	22.0	152.0	66
2,3,7,8-TCDD-13C	100	83.8	20.0	175.0	84
1,2,3,7,8-PeCDF-13C	100	84.9	21.0	192.0	85
2,3,4,7,8-PeCDF-13C	100	85.6	13.0	328.0	86
1,2,3,7,8-PeCDD-13C	100	105.3	21.0	227.0	105
1,2,3,4,7,8-HxCDF-13C	100	82.6	19.0	202.0	83
1,2,3,6,7,8-HxCDF-13C	100	96.7	21.0	159.0	97
2,3,4,6,7,8-HxCDF-13C	100	92.3	22.0	176.0	92
1,2,3,7,8,9-HxCDF-13C	100	84.5	17.0	205.0	84
1,2,3,4,7,8-HxCDD-13C	100	81.9	21.0	193.0	82
1,2,3,6,7,8-HxCDD-13C	100	102.0	25.0	163.0	102
1,2,3,4,6,7,8-HpCDF-13C	100	90.1	21.0	158.0	90
1,2,3,4,7,8,9-HpCDF-13C	100	78.6	20.0	186.0	79
1,2,3,4,6,7,8-HpCDD-13C	100	106.1	26.0	166.0	106
OCDD-13C	200	196.4	26.0	397.0	98

Cs = Concentration Spiked (ng/mL)
Cr = Concentration Recovered (ng/mL)
Rec. = Recovery (Expressed as Percent)
Control Limit Reference: Method 1613, Table 6, 10/94 Revision
X = Background subtracted value
P = Recovery outside of control limits
Nn = Value obtained from additional analysis
* = See Discussion

Report No.....105645

REPORT OF LABORATORY ANALYSIS

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Pace Analytical®
www.pacelabs.com

Pace Analytical Services, Inc.
1700 Elm Street
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444

SPIKE RECOVERY RELATIVE PERCENT DIFFERENCE (RPD) RESULTS

Client..... Del Mar Analytical

SPIKE 1 ID..... LCS-6203
SPIKE 1 Filename..... F50127A_03
SPIKE 2 ID..... LCSD-6204
SPIKE 2 Filename..... F50127A_04

COMPOUND	SPIKE 1 REC,%	SPIKE 2 REC,%	RPD,%
2378-TCDF	102	99	3.0
2378-TCDD	90	88	2.2
12378-PeCDF	100	100	0.0
23478-PeCDF	97	95	2.1
12378-PeCDD	87	83	4.7
123478-HxCDF	90	93	3.3
123678-HxCDF	96	88	8.7
234678-HxCDF	97	94	3.1
123789-HxCDF	93	90	3.3
123478-HxCDD	100	93	7.3
123678-HxCDD	103	98	5.0
123789-HxCDD	97	93	4.2
1234678-HpCDF	103	97	6.0
1234789-HpCDF	105	100	4.9
1234678-HpCDD	87	85	2.3
OCDF	90	85	5.7
OCDD	97	92	5.3

REC = Percent Recovered
RPD = The difference between the two values divided by the average.
NA = Not Applicable

Report No..... 105645

REPORT OF LABORATORY ANALYSIS

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TABLE 1. 2,3,7,8-TCDD Equivalency Factors (TEFs) for the Polychlorinated Dibenzo-p-dioxins and Dibenzofurans

Number	Compound(s)	TEF
1	2,3,7,8-TCDD	1.00
2	1,2,3,7,8-PeCDD	0.50
3	1,2,3,6,7,8-HxCDD	0.1
4	1,2,3,7,8,9-HxCDD	0.1
5	1,2,3,4,7,8-HxCDD	0.1
6	1,2,3,4,6,7,8-HpCDD	0.01
7	OCDD	0.001
8	* Total - TCDD	0.0
9	* Total - PeCDD	0.0
10	* Total - HxCDD	0.0
11	* Total - HpCDD	0.0
12	2,3,7,8-TCDF	0.10
13	1,2,3,7,8-PeCDF	0.05
14	2,3,4,7,8-PeCDF	0.5
15	1,2,3,6,7,8-HxCDF	0.1
16	1,2,3,7,8,9-HxCDF	0.1
17	1,2,3,4,7,8-HxCDF	0.1
18	2,3,4,6,7,8-HxCDF	0.1
19	1,2,3,4,6,7,8-HpCDF	0.01
20	1,2,3,4,7,8,9-HpCDF	0.01
21	OCDF	0.001
22	* Total - TCDF	0.0
23	* Total - PeCDF	0.0
24	* Total - HxCDF	0.0
25	* Total - HpCDF	0.0

*Excluding the 2,3,7,8-substituted congeners.

Reference: 1989 ITEFs

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Del Mar Analytical

17461 Derian Ave. Suite 100, Irvine, CA 92614 Ph (949) 261-1022 Fax (949) 261-1228
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9830 South 51st Street, Suite B-120, Phoenix, AZ 85044 Ph (480) 785-0043 Fax (480) 785-0851
2520 E. Sunset Rd., Suite #3, Las Vegas, NV 89120 Ph (702) 798-3620 Fax (702) 798-3621

SUBCONTRACT ORDER - PROJECT # IOA0027

105646

SENDING LABORATORY:	RECEIVING LABORATORY:
Del Mar Analytical, Irvine 17461 Derian Avenue. Suite 100 Irvine, CA 92614 Phone: (949) 261-1022 Fax: (949) 261-1228 Project Manager: Michele Harper	Pace Analytical, MN- SUB 1700 Elm Street, Ste 200 Minneapolis, MN 55414 Phone :(612) 607-1700 Fax: (612) 607-6444

Standard TAT is requested unless specific due date is requested => Due Date:_____ Initials:_____

Analysis	Expiration	Comments
Sample ID: IOA0027-01 Water	**Sampled: 01/03/05 10:00**	105646001
1613-Dioxin-HR	01/10/05 10:00	J flags, 17 congeners, no TEQ, sub to Pace-MN

Containers Supplied:
1 L Amber (IOA0027-01C)
1 L Amber (IOA0027-01D)

SAMPLE INTEGRITY:

All containers intact: ☒ Yes ☐ No Sample labels/COC agree: ☒ Yes ☐ No Samples Received On Ice:: ☒ Yes ☐ No
Custody Seals Present: ☐ Yes ☒ No Samples Preserved Properly: ☑ Yes ☐ No Samples Received at (temp): 2.0

Released By	Date	Time	Received By	Date	Time
[signature]	01-03-05	1700	[signature] PACE	1/4/05	0800
Released By	Date	Time	Received By	Date	Time

Del Mar Analytical

17461 Derian Ave. Suite 100, Irvine, CA 92614 Ph (949) 261-1022 Fax (949) 261-1228
1014 E. Cooley Dr., Suite A, Colton, CA 92324 Ph (909) 370-4667 Fax (909) 370-1046
9484 Chesapeake Drive, Suite 805, San Diego, CA 92123 Ph (619) 505-9596 Fax (619) 505-9689
9830 South 51st Street, Suite B-120, Phoenix, AZ 85044 Ph (480) 785-0043 Fax (480) 785-0851
2520 E. Sunset Rd., Suite #3, Las Vegas, NV 89120 Ph (702) 798-8050 Fax (702) 798-3621

SUBCONTRACT ORDER - PROJECT # IOA0027

SENDING LABORATORY:

Del Mar Analytical, Irvine
17461 Derian Avenue. Suite 100
Irvine, CA 92614
Phone: (949) 261-1022
Fax: (949) 261-1228
Project Manager: Michele Harper

RECEIVING LABORATORY:

Pace Analytical, MN- SUB
1700 Elm Street, Ste 200
Minneapolis, MN 55414
Phone :(612) 607-1700
Fax: (612) 607-6444

105646

Standard TAT is requested unless specific due date is requested => Due Date:_____ Initials:_____

Analysis	Expiration	Comments
Sample ID: IOA0027-01 Water	**Sampled: 01/03/05 10:00**	
1613-Dioxin-HR	01/10/05 10:00	J flags, 17 congeners, no TEQ, sub to Pace-MN
EDD + Level 4	01/31/05 10:00	Excel EDD email to pm,Include Std logs for Lvl IV

Containers Supplied:

1 L Amber (IOA0027-01C)
1 L Amber (IOA0027-01D)

FAXED 1/5/05

SAMPLE INTEGRITY:

All containers intact: ☐ Yes ☐ No Sample labels/COC agree: ☐ Yes ☐ No Samples Received On Ice:: ☐ Yes ☐ No
Custody Seals Present: ☐ Yes ☐ No Samples Preserved Properly: ☐ Yes ☐ No Samples Received at (temp): _____

1/5/05

Released By	Date	Time	Received By	Date	Time
Released By	Date	Time	Received By	Date	Time

Del Mar Analytical Version 02/23/05 CHAIN OF CUSTODY FORM

Client Name/Address:

MWH-Pasadena
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101

Project:
Boeing-SSFL NPDES
Outfall 011 -- 13267
Perimeter Pond

Project Manager: Bronwyn Kelly

Sampler:

Phone Number:
(626) 568-6691
Fax Number:
(626) 568-6515

Sample Description	Sample Matrix	Container Type	# of Cont.	Sampling Date/Time	Preservative	Bottle * #	Residual Chlorine	TOC, 1, 4 Dioxane	Chromium VI (218.6)	Total Rec. Petroleum Hydrocarbons (EPA 418.1)	Diesel	8015 (GRO)	Monomethylhydrazine	624-Mod A+A+2CVE	Acute and Chronic toxicity-bioassays	Gross Alpha, Gross Beta, Tritium (906.0), Sr-90 (905.0), Total Combined Radium 226 & Radium 228 *, Tritium		**Comments**
							ANALYSIS REQUIRED											
Outfall 011	W	150ml Brown Poly	1		None	15	X											
Outfall 011	W	VOA	6		HCl	16A, 16B, 16C, 16D, 16E, 16G		X										
Outfall 011	W	500ml Poly	1		None	17			X									
Outfall 011	W	1L Amber	2		HCl	18A, 18B				X								
Outfall 011	W	1L Amber	2		None	19A, 19B					X							
Outfall 011	W	VOA	3		HCl	20A, 20B						X						
Outfall 011	W	1L Amber	2		None	21A, 21B							X					
Outfall 011	W	VOA	3		None	22A, 22B, 22C								X				
Outfall 011	W	Poly -1Gal	2		None	23A, 23B									X			
Outfall 011	W	1L Amber VOA	8 4		None None	24A, 24B, 24C, 24D, 24E, 24F, 24G, 24H, 24I, 24j, 24k, 24l										X		*** ANALYZE FOR TOTAL COMBINED RA-226 & 228 ONLY IF GROSS ALPHA >15pCi/L**
Trip Blanks	W	VOA	3		None	25A, 25B, 25C								X				
Trip Blanks	W	VOA	3		HCl	26A, 26B, 26C						X						

Relinquished By Date/Time: Received By Date/Time:

Relinquished By Date/Time: Received By Date/Time:

Relinquished By Date/Time: Received By Date/Time:

Turn around Time: (check)
24 Hours _____ 5 Days _____
48 Hours _____ 10 Days _____
72 Hours _____ Normal _____
Perchlorate Only 72 Hours_____
Metals Only 72 Hours_____

Sample Integrity: (Check)
Intact _____ On Ice: _____

Del Mar Analytical Version 02/23/05 CHAIN OF CUSTODY FORM

Client Name/Address:	Project:
MWH-Pasadena 300 North Lake Avenue, Suite 1200 Pasadena, CA 91101	Boeing-SSFL NPDES **Outfall 011 -- 13267** Perimeter Pond
Project Manager: Bronwyn Kelly Sampler:	Phone Number: (626) 568-6691 Fax Number: (626) 568-6515

Sample Description	Sample Matrix	Container Type	# of Cont.	Sampling Date/Time	Preservative	Bottle * #	Total Recoverable Metals: B, Ba, Cu, Pb, B, Fe, Mn, Sb, As, Be, Cd, Ni, Se, Ag, Tl, Zn, Co, V, Cr, Hg,	Settleable Solids	VOCs 624 + xylenes + Freon 113 + Freon 123 A + PP list	TCDD (and all congeners)	Oil & Grease (EPA 413.1)	Cyanide (total recoverable)	BOD5(20 degrees C)	Surfactants (MBAS)	Cl-, SO4, NO3+NO2-N, Perchlorate, Fluoride	Turbidity,TDS, TSS, Conductivity	Ammonia-N, Titr (350.2) w/dist	Alpha BHC (608) + PP list + 608-PcBs	2,4,6 Trichlorophenol, 2,4 Dinitrotoluene, Bis(2-ethylhexyl)phthalate, NDMA, pentachlorophenol (EPA 625) + PP list	Field readings: Temp = pH= Comments
Outfall 011	W	Poly-1L	1		HNO3	1A	X													
Outfall 011-Dup	W	Poly-1L	1		HNO3	1B	X													
Outfall 011	W	Poly-1L	1		None	2		X												
Outfall 011	W	VOAs	3		HCl	3A, 3B, 3C			X											
Outfall 011	W	1L Amber	2		None	4A, 4B				X										
Outfall 011	W	1L Amber	2		HCl	5A, 5B					X									
Outfall 011	W	Poly-500 ml	1		NaOH	6						X								
Outfall 011	W	Poly-1L	1		None	7							X							
Outfall 011	W	Poly-500 ml	2		None	8A, 8B								X						
Outfall 011	W	Poly-500 ml	2		None	9A, 9B									X					
Outfall 011	W	Poly-500 ml	2		None	10A, 10B										X				
Outfall 011	W	Poly-500 ml	1		H2SO4	11											X			
Outfall 011	W	1L Amber	2		None	12A, 12B												X		
Outfall 011	W	1L Amber	2		None	13A, 13B													X	
Trip Blank	W	VOAs	3		HCl	14A, 14B, 14C			X											

ANALYSIS REQUIRED

Relinquished By	Date/Time:	Received By	Date/Time:
Relinquished By	Date/Time:	Received By	Date/Time:
Relinquished By	Date/Time:	Received By	Date/Time:

Turn around Time: (check)
24 Hours _____ 5 Days _____
48 Hours _____ 10 Days _____
72 Hours _____ Normal _____
Perchlorate Only 72 Hours_____
Metals Only 72 Hours_____
Sample Integrity: (Check)
Intact _____ On Ice: _____

CONTRACT COMPLIANCE SCREENING FORM FOR HARDCOPY DATA

AMEC Earth & Environmental
550 South Wadsworth Boulevard
Suite 500
Lakewood, CO 80226

Laboratory Alta
Reviewer K. Shadowlight
Analysis/Method Dioxins

Package ID T711DF20
Task Order 313150010
SDG No. Multiple
No. of Analyses 15

Date: February 11, 2005
Reviewer's Signature K Shadowlight

ACTION ITEMS[a]	
1. **Case Narrative Deficiencies**	
2. **Out of Scope Analyses**	
3. **Analyses Not Conducted**	
4. **Missing Hardcopy Deliverables**	
5. **Incorrect Hardcopy Deliverables**	
6. **Deviations from Analysis Protocol, e.g.,**	Qualifications were assigned for the following:
Holding Times	* Method blank contamination
GC/MS Tune/Inst. Performance	* EMPCs
Calibration	* Detects below the lower method calibration level
Method blanks	
Surrogates	
Matrix Spike/Dup LCS	
Field QC	
Internal Standard Performance	
Compound Identification and Quantitation	
System Performance	
COMMENTS[b]	Rev. 1

[a] Subcontracted analytical laboratory is not meeting contract and/or method requirements.
[b] Differences in protocol have been adopted by the laboratory but no action against the laboratory is required.

DATA VALIDATION REPORT

NPDES
Monitoring

ANALYSIS: DIOXINS/FURANS

SAMPLE DELIVERY GROUPS: Multiple SDGs

Prepared by

AMEC—Denver Operations
550 South Wadsworth Boulevard, Suite 500
Lakewood, Colorado 80226

1. INTRODUCTION

Task Order Title:	NPDES Monitoring
Contract Task Order #:	313150010
Sample Delivery Group #:	Multiple
Project Manager:	B. McIlvaine
Matrix:	Water
Analysis:	Dioxins/Furans
QC Level:	Level IV
No. of Samples:	15
No. of Reanalyses/Dilutions:	0
Reviewer:	K. Shadowlight
Date of Review:	February 11, 2005

The samples listed in Table 1 were validated based on the guidelines outlined in the *AMEC Data Validation Procedure for Dioxins and Furans (DVP-19, Rev. 1), EPA Method 1613, and the National National Functional Guidelines For Chlorinated Dioxin/Furan Data Review* (8/02). Any deviations from these procedures and guidelines are documented herein. Qualifiers were applied in cases where the data did not meet the required QC criteria or where special consideration by the data user is required. Data qualifiers were placed on Form Is with the associated qualification codes. Analytes that were rejected for any reason are denoted on the Form I as having only the "R" data qualifier and associated qualification code(s) denoting the reason for rejection. Any additional problems with the data that may have resulted in an estimated value were not denoted by a qualification code since the data had already been rejected.

Table 1. Sample Identification

Client ID	Laboratory ID (Del Mar)	Laboratory ID (Pace)	Matrix	COC Method
Outfall 003	IOA0026-01	105648001	water	1613
Outfall 004	IOA0027-01	105646001	water	1613
Outfall 005	IOA0028-01	105645001	water	1613
Outfall 007	IOA0108-01	105774001	water	1613
Outfall 008	IOA0109-01	105775001	water	1613
Outfall 009	IOA0110-01	105770001	water	1613
Outfall 010	IOA0111-01	105758001	water	1613
Outfall 001	IOA0112-01	105778001	water	1613
Outfall 002	IOA0119-01	105772001	water	1613
Outfall 018	IOA0122-01	105779001	water	1613
Outfall 011	IOA0131-01	105773001	water	1613
Outfall 006	IOA0458-01	106048001	water	1613
Outfall 004	IOA0460-01	106050001	water	1613
Outfall 005	IOA0464-01	106052001	water	1613
Outfall 003	IOA0466-01	106051001	water	1613

2. DATA VALIDATION FINDINGS

2.1 SAMPLE MANAGEMENT

Following are findings associated with sample management:

2.1.1 Sample Preservation, Handling, and Transport

All of the samples in these SDGs were received at Del Mar Analytical within the temperature limits of 4°C ±2°C. Several of the samples in these SDGs were received at Pace Analytical Services below the temperature limits of 4°C ±2°C; however, as none of the samples were noted to have been damaged, no qualifications were required. The samples were received in good condition at both laboratories. No qualifications were required.

2.1.2 Chain of Custody

The COC and transfer COC were signed by the appropriate field and laboratory personnel, and accounted for the analyses presented in these SDGs. As the samples were couriered directly to the laboratory (Del Mar Analytical), custody seals were not required. There was no information regarding custody seals upon receipt at Pace. No qualifications were required.

2.1.3 Holding Times

The samples were extracted and analyzed within a year of collection. No qualifications were required.

2.2 INSTRUMENT PERFORMANCE

Following are findings associated with instrument performance:

2.2.1 GC Column Performance

A column performance standard was combined with the daily calibration verification and analyzed at the beginning of each analytical sequence. The GC column performance was acceptable with the chromatographic separation of 2,3,7,8-TCDD and other TCDD isomers resolved with a valley of ≤25%. No qualifications were required.

2.2.2 Mass Spectrometer Performance

The mass spectrometer performance could not be evaluated as the laboratory did not provide selected ion current profiles for the lock-mass ions. No qualifications were required.

2.3 CALIBRATION

2.3.1 Initial Calibration

There was one initial calibration, analyzed 11/29/04 on Instrument 10MSHR05. The calibration consisted of five concentration level standards (CS1 through CS5) analyzed to verify instrument linearity. The initial calibration was acceptable with %RSDs ≤20% for the 15 native compounds (calibration by isotope dilution) and ≤35% for the 2 native and all labeled compounds (calibration by internal standard). The relative retention times and ion abundance ratios were within the QC limits listed in Method 1613 for all standards. A representative number of %RSDs were verified from the raw data, and no calculation or transcription errors were noted. No qualifications were required.

2.3.2 Continuing Calibration

Calibration verification (VER) consisted of a mid-level standard (CS3) analyzed at the beginning of each analytical sequence. The VER was acceptable with the concentrations within the acceptance criteria listed in the Table 6 of the EPA Method 1613. The ion abundance ratios and relative retention times were within the method QC limits. A representative number of %Ds were verified from the raw data, and no calculation or transcription errors were noted. No qualifications were required.

2.4 BLANKS

One method blank (Blank-6202) was extracted and analyzed with the samples in these SDGs. Target compounds 1,2,3,4,6,7,8-HpCDD, total HpCDD, OCDF, and OCDD were reported in the method blank. Any detects for the aforementioned target compounds reported at concentrations <5x the concentrations reported in the method blank were qualified as estimated nondetects "UJ," at the levels of interference in the samples of these SDGs. A review of the method blank raw data and chromatograms indicated no false negatives or false positives. No further qualifications were required.

2.5 BLANK SPIKES AND LABORATORY CONTROL SAMPLES

One LCS/LCSD pair (LCS-6203/LCSD-6204) was extracted and analyzed with the samples in these SDGs. All recoveries were within the acceptance criteria listed in Table 6 of the Method 1613. There were no QC limits established for RPDs. The reported RPDs were within ±20%. No qualifications were required.

2.6 MATRIX SPIKE/MATRIX SPIKE DUPLICATE

MS/MSD analyses were not performed in these SDGs. Evaluation of method accuracy and precision was based on the LCS/LCSD results. No qualifications were required.

2.7 FIELD QC SAMPLES

Following are findings associated with field QC:

2.7.1 Field Blanks and Equipment Rinsates

The samples in these SDGs had no associated field QC samples. No qualifications were required.

2.7.2 Field Duplicates

No field duplicate samples were identified for these SDGs.

2.8 INTERNAL STANDARDS

The labeled standard recoveries were within the acceptance criteria listed in Table 7 of Method 1613. No qualifications were required.

2.9 COMPOUND IDENTIFICATION

The laboratory analyzed for polychlorinated dioxins/furans by EPA Method 1613. The compound identifications were verified from the raw data and no false negatives or positives were noted. No qualifications were required.

2.10 COMPOUND QUANTIFICATION AND REPORTED DETECTION LIMITS

Compound quantitation was verified from the raw data. The laboratory calculated and reported compound-specific detection limits. Any detects below the lower method calibration limit (MCL) were qualified as estimated, "J." Any reported EMPC was qualified as an estimated nondetect, "UJ." No further qualifications were required.

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 1613B Analysis Results

Client - Del Mar Analytical

Client's Sample ID	IOA0460-01	Matrix	Water
Lab Sample ID	106050001	Dilution	NA
Filename	F50127B_09	Collected	01/10/2005
Injected By	MRO	Received	01/12/2005
Total Amount Extracted	1030 mL	Extracted	01/24/2005
% Moisture	NA	Analyzed	01/28/2005 03:39
Dry Weight Extracted	NA		
ICAL Date	11/29/2004		
CCal Filename(s)	F50127A_13		
Method Blank ID	BLANK-6202		

Native Isomers	Conc pg/L	EMPC pg/L	LOD pg/L		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	3.0		2,3,7,8-TCDF-13C	2.00	44
Total TCDF	ND	-----	3.0		2,3,7,8-TCDD-13C	2.00	56
					1,2,3,7,8-PeCDF-13C	2.00	68
2,3,7,8-TCDD	ND	-----	3.3		2,3,4,7,8-PeCDF-13C	2.00	72
Total TCDD	ND	-----	3.3		1,2,3,7,8-PeCDD-13C	2.00	85
					1,2,3,4,7,8-HxCDF-13C	2.00	72
1,2,3,7,8-PeCDF	ND	-----	2.5		1,2,3,6,7,8-HxCDF-13C	2.00	96
2,3,4,7,8-PeCDF	ND	-----	1.9		2,3,4,6,7,8-HxCDF-13C	2.00	92
Total PeCDF	ND	-----	2.2		1,2,3,7,8,9-HxCDF-13C	2.00	81
					1,2,3,4,7,8-HxCDD-13C	2.00	70
1,2,3,7,8-PeCDD	ND	-----	3.5		1,2,3,6,7,8-HxCDD-13C	2.00	92
Total PeCDD	ND	-----	3.5		1,2,3,4,6,7,8-HpCDF-13C	2.00	83
					1,2,3,4,7,8,9-HpCDF-13C	2.00	73
1,2,3,4,7,8-HxCDF	ND	-----	1.7		1,2,3,4,6,7,8-HpCDD-13C	2.00	95
1,2,3,6,7,8-HxCDF	ND	-----	1.5		OCDD-13C	4.00	84
2,3,4,6,7,8-HxCDF	ND	-----	1.2				
1,2,3,7,8,9-HxCDF	ND	-----	1.4		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	-----	1.5		1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	2.3		2,3,7,8-TCDD-37Cl4	0.20	56
1,2,3,6,7,8-HxCDD	ND	-----	1.5				
1,2,3,7,8,9-HxCDD	ND	-----	1.9				
Total HxCDD	ND	-----	1.9				
1,2,3,4,6,7,8-HpCDF	ND	-----	2.7				
1,2,3,4,7,8,9-HpCDF	ND	-----	2.1				
Total HpCDF	ND	-----	2.4				
1,2,3,4,6,7,8-HpCDD	6.5	-----	1.2	BJ			
Total HpCDD	13.0	-----	1.2	BJ			
OCDF	3.6	-----	1.4	BJ			
OCDD	85.0	-----	2.7	BJ			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection. Totals are averages of individual isomer LODs.
D = Result obtained from analysis of diluted sample
B = Less than 10 times higher than method blank level
P = Recovery outside of method 1613 control limits
J = Concentration detected is below the calibration range
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....106050

REPORT OF LABORATORY ANALYSIS

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CONTRACT COMPLIANCE SCREENING FORM FOR HARDCOPY DATA

AMEC Earth & Environmental
550 South Wadsworth Boulevard
Suite 500
Lakewood, CO 80226

Laboratory Del Mar
Reviewer P. Meeks
Analysis/Method Metals

Package ID T711MT25
Task Order 313150010
SDG No. Multiple
No. of Analyses 4

Date: 02/03/05
Reviewer's Signature
P. Meeks for K Okonek

ACTION ITEMS[a]	
1. **Case Narrative Deficiencies**	
2. **Out of Scope Analyses**	
3. **Analyses Not Conducted**	
4. **Missing Hardcopy Deliverables**	
5. **Incorrect Hardcopy Deliverables**	
6. **Deviations from Analysis Protocol, e.g.,**	Qualifications were applied for lead detected below the reporting limit.
Holding Times	
GC/MS Tune/Inst. Performance	
Calibrations	
Blanks	
Surrogates	
Matrix Spike/Dup LCS	
Field QC	
Internal Standard Performance	
Compound Identification and Quantitation	
System Performance	

COMMENTS[b]	

[a] Subcontracted analytical laboratory is not meeting contract and/or method requirements.
[b] Differences in protocol have been adopted by the laboratory but no action against the laboratory is required.

DATA VALIDATION REPORT

NPDES
Monitoring

ANALYSIS: METALS

SAMPLE DELIVERY GROUPS: IOA0458, IOA0460, IOA0464, & IOA0466

Prepared by

AMEC—Denver Operations
550 South Wadsworth Boulevard, Suite 500
Lakewood, Colorado 80226

1. INTRODUCTION

Task Order Title:	NPDES Monitoring
Contract Task Order #:	313150010
SDG#:	IOA0458, IOA0460, IOA0464, & IOA0466
Project Manager:	B. McIlvaine
Matrix:	Water
Analysis:	Metals
QC Level:	Level IV
No. of Samples:	4
No. of Reanalyses/Dilutions:	0
Reviewer:	K. Okonzak-Lowry
Date of Review:	February 02, 2005

The samples listed in Table 1 were validated based on the guidelines outlined in the *AMEC Data Validation Procedure for Levels III and IV ICP-MS Metals, (DVP-5-A, Rev.0), AMEC Data Validation Procedure for Levels III and IV ICP Metals* (DVP-5, Rev. 0), SW-846 *Method 6020B for Inductively Coupled Plasma – Mass Spectrometry*, SW-846 *Method 6010B for Inductively Coupled Plasma* , SW-846 *Method 7471A for Mercury (Manual Cold-Vapor Technique)*, and validation guidelines outlined in the USEPA CLP *National Functional Guidelines for Inorganic Data Review* (2/94). Any deviations from these procedures and guidelines are documented herein. Qualifiers were applied in cases where the data did not meet the required QC criteria or where special consideration by the data user is required. Data qualifiers were placed on Form Is with the associated qualification codes. Analytes that were rejected for any reason are denoted on the Form I as having only the "R" data qualifier and associated qualification code(s) denoting the reason for rejection. Any additional problems with the data that may have resulted in an estimated value were not denoted by a qualification code since the data had already been rejected.

Table 1. Sample identification

Client ID	EPA ID	Laboratory ID	Matrix	COC Method
Outfall 006	Outfall 006	IOA0458-01	water	ILM04
Outfall 004	Outfall 004	IOA0460-01	water	ILM04
Outfall 005	Outfall 005	IOA0464-01	water	ILM04
Outfall 003	Outfall 003	IOA0466-01	water	ILM04

2. DATA VALIDATION FINDINGS

2.1 SAMPLE MANAGEMENT

Following are findings associated with sample management:

2.1.1 Sample Preservation, Handling, and Transport

The samples in these SDGs were received at the laboratory within the temperature limits of 4°C ±2°C. No sample preservation, handling, or transport problems were noted, and no qualifications were necessary.

2.1.2 Chain of Custody

The COCs were signed and dated by field and laboratory personnel. The COCs listed duplicate samples for all samples; however, duplicate analyses were not required. No sample qualifications were required.

2.1.3 Holding Times

The dates of collection recorded on the COCs and the dates of analyses recorded in the raw data, documented that the sample analyses were performed within the specified holding times of six months for the ICP/MS metals. No qualifications were required.

2.2 ICP-MS TUNING

A precalibration routine must be completed prior to calibrating the instrument, which consists of analyzing a tuning solution to verify resolution, mass calibration, and thermal stability. The solution must be analyzed a minimum of five times and must contain isotopes representing all mass regions of interest. The laboratory performed the required tune solution analyses but did not report %RSDs. The laboratory SOP states that to be acceptable, the %RSD must be less than 5%. The mass calibrations were within 0.1 amu of the true mass and an the instrument resolutions were less than 0.9 amu at 10 percent peak height for all analytes in the tune solution. No site sample qualifications were required.

2.3 CALIBRATION

The ICV and CCV results showed acceptable recoveries, 90-110% for the ICP/MS. The reporting limit check standards were recovered within the AMEC control limits of 70-130%. No qualifications were required.

2.4 BLANKS

Lead was not detected in any of the method blanks or CCBs associated with the samples in these SDGs. No qualifications were required.

2.5 ICP INTERFERENCE CHECK SAMPLE (ICS A/AB)

No ICPMS interference check samples were analyzed in association with the samples in these SDGs; therefore, no assessment was made with respect to this criterion.

2.6 BLANK SPIKES AND LABORATORY CONTROL SAMPLES

The ICP/MS LCS samples were identified as 5A10077-BS1 and 5A11081-BS1. The LCS results on the summary forms and in the raw data were within the laboratory-established ICP/MS control limits of 85-115%. No qualifications were required.

2.7 LABORATORY DUPLICATES

No MS/MSD or duplicate analyses were performed in association with the samples in these SDGs; therefore, no assessment was made with respect to this criterion.

2.8 MATRIX SPIKE

No MS/MSD analyses were performed in association with the samples in these SDGs; therefore, no assessment was made with respect to this criterion.

2.9 FURNACE ATOMIC ABSORPTION QC

Furnace atomic absorption was not utilized for the analysis of these samples; therefore, furnace atomic absorption QC is not applicable.

2.10 ICP/MS SERIAL DILUTION

No serial dilution analysis was performed in association with the samples in these SDGs; therefore, no assessment was made with respect to this criterion.

2.11 INTERNAL STANDARDS PERFORMANCE

The ICP-MS internal standard recoveries for the site samples and associated QC sample analyses were within the 60-125% control limits and no qualifications were required.

2.12 SAMPLE RESULT VERIFICATION

A Level IV review was performed for the samples in these data packages. Calculations were verified, and the sample results reported on the Form Is were verified against the raw data. No transcription errors or calculation errors were noted. Lead detected below the reporting limit were qualified as estimated, "J." No further qualifications were required.

2.13 FIELD QC SAMPLES

Field QC samples are evaluated, and if necessary, qualified based only on laboratory blanks. Any remaining detects are used to evaluate the associated samples.

2.13.1 Field Blanks and Equipment Rinsates

The samples in these SDGs had no associated field QC samples. No qualifications were required.

2.13.2 Field Duplicates

There were no field duplicate analyses performed in association with the site samples.

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 004

Report Number: IOA0460

Sampled: 01/10/05
Received: 01/10/05

DRAFT: METALS

Analyte	Method	Batch	MDL	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers	Rev Qual	Qual Code
Sample ID: IOA0460-01 (DRAFT: Outfall 004 - Water)											
Reporting Units: ug/l											
Lead	EPA 200.8	5A10077	0.13	1.0	**0.22**	1	01/10/05	01/11/05	J	A	QW2

AMEC VALIDATED

LEVEL IV

Karl
1/18/05

DRAFT REPORT
DRAFT REPORT
DATA SUBJECT TO CHANGE

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LABORATORY REPORT

Prepared For: MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project: Routine Outfall 004

Sampled: 01/10/05
Received: 01/10/05
Issued: 02/22/05 11:56

NELAP #01108CA California ELAP#1197 CSDLAC #10117

The results listed within this Laboratory Report pertain only to the samples tested in the laboratory. The analyses contained in this report were performed in accordance with the applicable certifications as noted. All soil samples are reported on a wet weight basis unless otherwise noted in the report. This Laboratory Report is confidential and is intended for the sole use of Del Mar Analytical and its client. This report shall not be reproduced, except in full, without written permission from Del Mar Analytical. The Chain of Custody, 1 page, is included and is an integral part of this report.
This entire report was reviewed and approved for release.

SAMPLE CROSS REFERENCE

SUBCONTRACTED: Refer to the last page for specific subcontract laboratory information included in this report.

LABORATORY ID	CLIENT ID	MATRIX
IOA0460-01	Outfall 004	Water

Reviewed By:

Michele Harper

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 004
Report Number: IOA0460

Sampled: 01/10/05
Received: 01/10/05

METALS

Analyte	Method	Batch	MDL Limit	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA0460-01 (Outfall 004 - Water)									
Reporting Units: ug/l									
Antimony	EPA 200.8	5A10077	0.18	2.0	**1.2**	1	01/10/05	01/11/05	B, J
Cadmium	EPA 200.8	5A10077	0.015	1.0	**0.037**	1	01/10/05	01/11/05	J
Copper	EPA 200.8	5A10077	0.49	2.0	**2.1**	1	01/10/05	01/11/05	
Lead	EPA 200.8	5A10077	0.13	1.0	**0.22**	1	01/10/05	01/11/05	J
Mercury	EPA 245.1	5A11057	0.063	0.20	**0.14**	1	01/11/05	01/11/05	J

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 004

Report Number: IOA0460

Sampled: 01/10/05
Received: 01/10/05

INORGANICS

Analyte	Method	Batch	MDL Limit	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA0460-01 (Outfall 004 - Water) - cont.									
Reporting Units: mg/l									
Chloride	EPA 300.0	5A10035	0.26	0.50	**3.6**	1	01/10/05	01/10/05	
Nitrate/Nitrite-N	EPA 300.0	5A10035	0.072	0.26	**1.3**	1	01/10/05	01/10/05	
Oil & Grease	EPA 413.1	5A12061	0.94	5.0	**7.8**	1	01/12/05	01/12/05	B
Sulfate	EPA 300.0	5A10035	0.18	0.50	**8.1**	1	01/10/05	01/10/05	
Total Dissolved Solids	SM2540C	5A11087	10	10	**82**	1	01/11/05	01/11/05	

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Michele Harper
Project Manager

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300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 004

Report Number: IOA0460

Sampled: 01/10/05
Received: 01/10/05

SHORT HOLD TIME DETAIL REPORT

	Hold Time (in days)	Date/Time Sampled	Date/Time Received	Date/Time Extracted	Date/Time Analyzed
Sample ID: Outfall 004 (IOA0460-01) - Water					
EPA 300.0	2	01/10/2005 11:13	01/10/2005 16:20	01/10/2005 20:00	01/10/2005 20:34

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Michele Harper
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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 004

Report Number: IOA0460

Sampled: 01/10/05
Received: 01/10/05

METHOD BLANK/QC DATA

METALS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A10077 Extracted: 01/10/05											
Blank Analyzed: 01/11/2005 (5A10077-BLK1)											
Antimony	0.360	2.0	0.18	ug/l							J
Cadmium	ND	1.0	0.015	ug/l							
Copper	ND	2.0	0.49	ug/l							
Lead	ND	1.0	0.13	ug/l							
LCS Analyzed: 01/11/2005 (5A10077-BS1)											
Antimony	88.4	2.0	0.18	ug/l	80.0		110	85-115			
Cadmium	77.3	1.0	0.015	ug/l	80.0		97	85-115			
Copper	80.8	2.0	0.49	ug/l	80.0		101	85-115			
Lead	79.9	1.0	0.13	ug/l	80.0		100	85-115			
Matrix Spike Analyzed: 01/11/2005 (5A10077-MS1)						**Source: IOA0418-01**					
Antimony	85.6	2.0	0.18	ug/l	80.0	0.46	106	70-130			
Cadmium	77.4	1.0	0.015	ug/l	80.0	0.020	97	70-130			
Copper	107	2.0	0.49	ug/l	80.0	29	98	70-130			
Lead	79.8	1.0	0.13	ug/l	80.0	0.60	99	70-130			
Matrix Spike Dup Analyzed: 01/11/2005 (5A10077-MSD1)						**Source: IOA0418-01**					
Antimony	88.2	2.0	0.18	ug/l	80.0	0.46	110	70-130	3	20	
Cadmium	77.0	1.0	0.015	ug/l	80.0	0.020	96	70-130	1	20	
Copper	108	2.0	0.49	ug/l	80.0	29	99	70-130	1	20	
Lead	82.4	1.0	0.13	ug/l	80.0	0.60	102	70-130	3	20	
Batch: 5A11057 Extracted: 01/11/05											
Blank Analyzed: 01/11/2005 (5A11057-BLK1)											
Mercury	ND	0.20	0.063	ug/l							

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 004
Report Number: IOA0460

Sampled: 01/10/05
Received: 01/10/05

METHOD BLANK/QC DATA

METALS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A11057 Extracted: 01/11/05											
LCS Analyzed: 01/11/2005 (5A11057-BS1)											
Mercury	8.38	0.20	0.063	ug/l	8.00		105	85-115			
Matrix Spike Analyzed: 01/11/2005 (5A11057-MS1)						**Source: IOA0471-01**					
Mercury	8.37	0.20	0.063	ug/l	8.00	ND	105	70-130			
Matrix Spike Dup Analyzed: 01/11/2005 (5A11057-MSD1)						**Source: IOA0471-01**					
Mercury	8.31	0.20	0.063	ug/l	8.00	ND	104	70-130	1	20	

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 004

Report Number: IOA0460

Sampled: 01/10/05
Received: 01/10/05

METHOD BLANK/QC DATA

INORGANICS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A10035 Extracted: 01/10/05											
Blank Analyzed: 01/10/2005 (5A10035-BLK1)											
Chloride	ND	0.50	0.26	mg/l							
Nitrate/Nitrite-N	ND	0.26	0.072	mg/l							
Sulfate	ND	0.50	0.18	mg/l							
LCS Analyzed: 01/10/2005 (5A10035-BS1)											
Chloride	4.85	0.50	0.26	mg/l	5.00		97	90-110			
Sulfate	10.2	0.50	0.18	mg/l	10.0		102	90-110			
Matrix Spike Analyzed: 01/10/2005 (5A10035-MS1)						**Source: IOA0441-01**					
Chloride	22.1	2.5	1.3	mg/l	5.00	17	102	80-120			
Sulfate	60.2	2.5	0.90	mg/l	10.0	49	112	80-120			
Matrix Spike Dup Analyzed: 01/10/2005 (5A10035-MSD1)						**Source: IOA0441-01**					
Chloride	22.0	2.5	1.3	mg/l	5.00	17	100	80-120	1	20	
Sulfate	60.7	2.5	0.90	mg/l	10.0	49	117	80-120	1	20	
Batch: 5A11087 Extracted: 01/11/05											
Blank Analyzed: 01/11/2005 (5A11087-BLK1)											
Total Dissolved Solids	ND	10	10	mg/l							
LCS Analyzed: 01/11/2005 (5A11087-BS1)											
Total Dissolved Solids	978	10	10	mg/l	1000		98	90-110			
Duplicate Analyzed: 01/11/2005 (5A11087-DUP1)						**Source: IOA0364-01**					
Total Dissolved Solids	ND	10	10	mg/l		ND				10	

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 004

Report Number: IOA0460

Sampled: 01/10/05
Received: 01/10/05

METHOD BLANK/QC DATA

INORGANICS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A12061 Extracted: 01/12/05											
Blank Analyzed: 01/12/2005 (5A12061-BLK1)											
Oil & Grease	1.60	5.0	0.94	mg/l							J
LCS Analyzed: 01/12/2005 (5A12061-BS1)											M-NR1
Oil & Grease	21.2	5.0	0.94	mg/l	20.0		106	65-120			
LCS Dup Analyzed: 01/12/2005 (5A12061-BSD1)											
Oil & Grease	20.8	5.0	0.94	mg/l	20.0		104	65-120	2	20	

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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9484 Chesapeake Dr., Suite 805, San Diego, CA 92123 (858) 505-8596 FAX (858) 505-9689
9830 South 51st St., Suite B-120, Phoenix, AZ 85044 (480) 785-0043 FAX (480) 785-0851
2520 E. Sunset Rd. #3, Las Vegas, NV 89120 (702) 798-3620 FAX (702) 798-3621

MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 004

Report Number: IOA0460

Sampled: 01/10/05
Received: 01/10/05

Compliance Check

The results obtained from the analytical testing of this data set were checked against compliance limits received from the client. Any results at or above the compliance limits appear in bold on this page.

LabNumber	Analysis	Analyte	Units	Result	MRL	Compliance Limit
IOA0460-01	413.1 Oil and Grease	Oil & Grease	mg/l	7.80	5.0	15
IOA0460-01	Antimony-200.8	Antimony	ug/l	1.20	2.0	6.00
IOA0460-01	Cadmium-200.8	Cadmium	ug/l	0.037	1.0	4.00
IOA0460-01	Chloride - 300.0	Chloride	mg/l	3.60	0.50	150
IOA0460-01	Copper-200.8	Copper	ug/l	2.10	2.0	14
IOA0460-01	Mercury - 245.1	Mercury	ug/l	0.14	0.20	0.20
IOA0460-01	Nitrogen, NO3+NO2 -N	Nitrate/Nitrite-N	mg/l	1.30	0.26	10.00
IOA0460-01	Sulfate-300.0	Sulfate	mg/l	8.10	0.50	250
IOA0460-01	TDS - SM 2540C	Total Dissolved Solids	mg/l	82	10	850

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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2520 E. Sunset Rd. #3, Las Vegas, NV 89120 (702) 798-3620 FAX (702) 798-3621

MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 004

Report Number: IOA0460

Sampled: 01/10/05
Received: 01/10/05

DATA QUALIFIERS AND DEFINITIONS

B	Analyte was detected in the associated Method Blank.
J	Estimated value. Analyte detected at a level less than the Reporting Limit (RL) and greater than or equal to the Method Detection Limit (MDL). The user of this data should be aware that this data is of unknown quality.
M-NR1	There was no MS/MSD analyzed with this batch due to insufficient sample volume. See Blank Spike/Blank Spike Duplicate.
ND	Analyte NOT DETECTED at or above the reporting limit or MDL, if MDL is specified.
RPD	Relative Percent Difference

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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2520 E. Sunset Rd. #3, Las Vegas, NV 89120 (702) 798-3620 FAX (702) 798-3621

MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 004

Report Number: IOA0460

Sampled: 01/10/05
Received: 01/10/05

Certification Summary

Del Mar Analytical, Irvine

Method	Matrix	Nelac	California
EPA 200.8	Water	X	X
EPA 245.1	Water	X	X
EPA 300.0	Water	X	X
EPA 413.1	Water	X	X
SM2540C	Water	X	X

Nevada and NELAP provide analyte specific accreditations. Analyte specific information for Del Mar Analytical may be obtained by contacting the laboratory or visiting our website at www.dmalabs.com.

Subcontracted Laboratories

Pace Analytical, MN- SUB

1700 Elm Street, Ste 200 - Minneapolis, MN 55414

Analysis Performed: 1613-Dioxin-HR
Samples: IOA0460-01

Analysis Performed: EDD + Level 4
Samples: IOA0460-01

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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IOAD460

Del Mar Analytical Version 5 8/12/04 CHAIN OF CUSTODY FORM

Client Name/Address:	Project:
MWH-Pasadena 300 North Lake Avenue, Suite 1200 Pasadena, CA 91101	Boeing-SSFL NPDES **Routine Outfall 004** Stormwater at SRE
Project Manager: Bronwyn Kelly Sampler:	Phone Number: (626) 568-6691 Fax Number: (626) 568-6515

Sample Description	Sample Matrix	Container Type	# of Cont.	Sampling Date/Time	Preservative	Bottle * #	Total Reoverable Metals: Sb, Cd, Cu, Pb, Hg	TCDD (and all congeners)	Oil & Grease (EPA 413.1)	Cl-, SO4, NO3+NO2-N	TDS					Field readings: Temp = pH= **Comments**
Outfall 004	W	Poly-1L	1	1-10-05 11:13	HNO3	1A	X									
Outfall 004-Dup	W	Poly-1L	1		HNO3	1B	X									
Outfall 004	W	Glass-Amber	2		None	2A, 2B		X								
Outfall 004	W	Glass-Amber	2		HCl	3A, 3B			X							
Outfall 004	W	Poly-500 ml	2		None	4A, 4B				X						
Outfall 004	W	Poly-500 ml	2	1-10-05 11:13	None	5A, 5B					X					
																VB

Relinquished By	Date/Time:	Received By	Date/Time:
	1-10-05 1250		1/10/05 1250
Relinquished By	Date/Time:	Received By	Date/Time:
	1/10/05 1620		1/10/05 1620
Relinquished By	Date/Time:	Received By	Date/Time:

Turn around Time: (check)
24 Hours _____ 5 Days _____
48 Hours _____ 10 Days _____
72 Hours _____ Normal ✓
Perchlorate Only 72 Hours_____
Metals Only 72 Hours_____
Sample Integrity: (Check)
Intact ✓ On Ice: ✓ 6°C

Del Mar Analytical

2852 Alton Ave., Irvine CA 92606 (949) 261-1022 FAX (949) 261-1228
1014 E. Cooley Dr., Suite A, Colton, CA 92324 (909) 370-4667 FAX (949) 370-1046
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2520 E. Sunset Rd. #3, Las Vegas, NV 89120 (702) 798-3620 FAX (702) 798-3621

February 7, 2005

MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, Ca.91101

Attention: Bronwyn Kelly

Project: Routine Outfall 004
Sampled: 01/10/05
Del Mar Analytical Number: IOA0460

Dear Ms. Kelly:

Pace Analytical performed Method 1613B analysis for the project referenced above. Please use the following cross-reference table when reviewing your results.

MWH ID	DEL MAR ID	Pace ID
Outfall 004	IOA0460-01	106050001

Attached is the original report from the subcontract laboratory. If you have any questions or require further assistance, please do not hesitate to contact me.

Sincerely yours,
DEL MAR ANALYTICAL

Michele Harper
Project Manager

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Pace Analytical™

Method 1613B Analysis Results

Client - Del Mar Analytical

Client's Sample ID	IOA0460-01		
Lab Sample ID	106050001		
Filename	F50127B_09		
Injected By	MRO		
Total Amount Extracted	1030 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	01/10/2005
ICAL Date	11/29/2004	Received	01/12/2005
CCal Filename(s)	F50127A_13	Extracted	01/24/2005
Method Blank ID	BLANK-6202	Analyzed	01/28/2005 03:39

Native Isomers	Conc pg/L	EMPC pg/L	LOD pg/L		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	3.0		2,3,7,8-TCDF-13C	2.00	44
Total TCDF	ND	-----	3.0		2,3,7,8-TCDD-13C	2.00	56
					1,2,3,7,8-PeCDF-13C	2.00	68
2,3,7,8-TCDD	ND	-----	3.3		2,3,4,7,8-PeCDF-13C	2.00	72
Total TCDD	ND	-----	3.3		1,2,3,7,8-PeCDD-13C	2.00	85
					1,2,3,4,7,8-HxCDF-13C	2.00	72
1,2,3,7,8-PeCDF	ND	-----	2.5		1,2,3,6,7,8-HxCDF-13C	2.00	96
2,3,4,7,8-PeCDF	ND	-----	1.9		2,3,4,6,7,8-HxCDF-13C	2.00	92
Total PeCDF	ND	-----	2.2		1,2,3,7,8,9-HxCDF-13C	2.00	81
					1,2,3,4,7,8-HxCDD-13C	2.00	70
1,2,3,7,8-PeCDD	ND	-----	3.5		1,2,3,6,7,8-HxCDD-13C	2.00	92
Total PeCDD	ND	-----	3.5		1,2,3,4,6,7,8-HpCDF-13C	2.00	83
					1,2,3,4,7,8,9-HpCDF-13C	2.00	73
1,2,3,4,7,8-HxCDF	ND	-----	1.7		1,2,3,4,6,7,8-HpCDD-13C	2.00	95
1,2,3,6,7,8-HxCDF	ND	-----	1.5		OCDD-13C	4.00	84
2,3,4,6,7,8-HxCDF	ND	-----	1.2				
1,2,3,7,8,9-HxCDF	ND	-----	1.4		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	-----	1.5		1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	2.3		2,3,7,8-TCDD-37Cl4	0.20	56
1,2,3,6,7,8-HxCDD	ND	-----	1.5				
1,2,3,7,8,9-HxCDD	ND	-----	1.9				
Total HxCDD	ND	-----	1.9				
1,2,3,4,6,7,8-HpCDF	ND	-----	2.7				
1,2,3,4,7,8,9-HpCDF	ND	-----	2.1				
Total HpCDF	ND	-----	2.4				
1,2,3,4,6,7,8-HpCDD	6.5	-----	1.2	BJ			
Total HpCDD	13.0	-----	1.2	BJ			
OCDF	3.6	-----	1.4	BJ			
OCDD	85.0	-----	2.7	BJ			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection. Totals are averages of individual isomer LODs.
D = Result obtained from analysis of diluted sample
B = Less than 10 times higher than method blank level
P = Recovery outside of method 1613 control limits
J = Concentration detected is below the calibration range
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....106050

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Pace Analytical™

Method 1613B Blank Analysis Results

Client - Del Mar Analytical

Lab Sample ID	BLANK-6202	Matrix	Water
Filename	F50127A_06	Dilution	NA
Total Amount Extracted	982 mL	Extracted	01/24/2005
ICAL Date	11/29/2004	Analyzed	01/27/2005 14:13
CCal Filename(s)	F50127A_02	Injected By	MRO

Native Isomers	Conc pg/L	EMPC pg/L	LOD pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	4.7	2,3,7,8-TCDF-13C	2.00	33
Total TCDF	ND	-----	-----	2,3,7,8-TCDD-13C	2.00	45
				1,2,3,7,8-PeCDF-13C	2.00	68
2,3,7,8-TCDD	ND	-----	5.1	2,3,4,7,8-PeCDF-13C	2.00	70
Total TCDD	ND	-----	-----	1,2,3,7,8-PeCDD-13C	2.00	81
				1,2,3,4,7,8-HxCDF-13C	2.00	75
1,2,3,7,8-PeCDF	ND	-----	2.2	1,2,3,6,7,8-HxCDF-13C	2.00	95
2,3,4,7,8-PeCDF	ND	-----	1.5	2,3,4,6,7,8-HxCDF-13C	2.00	98
Total PeCDF	ND	-----	-----	1,2,3,7,8,9-HxCDF-13C	2.00	85
				1,2,3,4,7,8-HxCDD-13C	2.00	78
1,2,3,7,8-PeCDD	ND	-----	1.6	1,2,3,6,7,8-HxCDD-13C	2.00	94
Total PeCDD	ND	-----	-----	1,2,3,4,6,7,8-HpCDF-13C	2.00	85
				1,2,3,4,7,8,9-HpCDF-13C	2.00	78
1,2,3,4,7,8-HxCDF	ND	-----	1.6	1,2,3,4,6,7,8-HpCDD-13C	2.00	99
1,2,3,6,7,8-HxCDF	ND	-----	1.4	OCDD-13C	4.00	97
2,3,4,6,7,8-HxCDF	ND	-----	1.1			
1,2,3,7,8,9-HxCDF	ND	-----	1.6	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	-----	-----	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	1.6	2,3,7,8-TCDD-37Cl4	0.20	40
1,2,3,6,7,8-HxCDD	ND	-----	1.2			
1,2,3,7,8,9-HxCDD	ND	-----	1.7			
Total HxCDD	ND	-----	-----			
1,2,3,4,6,7,8-HpCDF	ND	-----	1.5			
1,2,3,4,7,8,9-HpCDF	ND	-----	1.4			
Total HpCDF	ND	-----	-----			
1,2,3,4,6,7,8-HpCDD	1.9	-----	1.3 J			
Total HpCDD	1.9	-----	----- J			
OCDF	8.3	-----	1.9 J			
OCDD	26.0	-----	2.3 J			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection. Totals are averages of individual isomer LODs.
A = Limit of Detection based on signal to noise
P = Recovery outside of method 1613 control limits
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....105645

REPORT OF LABORATORY ANALYSIS

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1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Pace Analytical™

Method 1613B Laboratory Control Spike Results

Client - Del Mar Analytical

Lab Sample ID	LCS-6203		
Filename	F50127A_03	Matrix	Water
Total Amount Extracted	1030 mL	Dilution	NA
ICAL Date	11/29/2004	Extracted	01/24/2005
CCal Filename	F50127A_02	Analyzed	01/27/2005 11:44
Method Blank ID	BLANK-6202	Injected By	MRO

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDF	10	10.2	7.5	15.8	102
2,3,7,8-TCDD	10	9.0	6.7	15.8	90
1,2,3,7,8-PeCDF	50	50.1	40.0	67.0	100
2,3,4,7,8-PeCDF	50	48.4	34.0	80.0	97
1,2,3,7,8-PeCDD	50	43.4	35.0	71.0	87
1,2,3,4,7,8-HxCDF	50	44.8	36.0	67.0	90
1,2,3,6,7,8-HxCDF	50	48.0	42.0	65.0	96
2,3,4,6,7,8-HxCDF	50	48.6	35.0	78.0	97
1,2,3,7,8,9-HxCDF	50	46.4	39.0	65.0	93
1,2,3,4,7,8-HxCDD	50	50.0	35.0	82.0	100
1,2,3,6,7,8-HxCDD	50	51.7	38.0	67.0	103
1,2,3,7,8,9-HxCDD	50	48.5	32.0	81.0	97
1,2,3,4,6,7,8-HpCDF	50	51.4	41.0	61.0	103
1,2,3,4,7,8,9-HpCDF	50	52.3	39.0	69.0	105
1,2,3,4,6,7,8-HpCDD	50	43.4	35.0	70.0	87
OCDF	100	89.5	63.0	170.0	90
OCDD	100	96.9	78.0	144.0	97
2,3,7,8-TCDD-37Cl4	10	6.2	3.1	19.1	62
2,3,7,8-TCDF-13C	100	49.8	22.0	152.0	50
2,3,7,8-TCDD-13C	100	65.8	20.0	175.0	66
1,2,3,7,8-PeCDF-13C	100	75.7	21.0	192.0	76
2,3,4,7,8-PeCDF-13C	100	76.9	13.0	328.0	77
1,2,3,7,8-PeCDD-13C	100	93.4	21.0	227.0	93
1,2,3,4,7,8-HxCDF-13C	100	78.9	19.0	202.0	79
1,2,3,6,7,8-HxCDF-13C	100	89.8	21.0	159.0	90
2,3,4,6,7,8-HxCDF-13C	100	88.2	22.0	176.0	88
1,2,3,7,8,9-HxCDF-13C	100	81.5	17.0	205.0	81
1,2,3,4,7,8-HxCDD-13C	100	82.2	21.0	193.0	82
1,2,3,6,7,8-HxCDD-13C	100	95.2	25.0	163.0	95
1,2,3,4,6,7,8-HpCDF-13C	100	86.3	21.0	158.0	86
1,2,3,4,7,8,9-HpCDF-13C	100	75.6	20.0	186.0	76
1,2,3,4,6,7,8-HpCDD-13C	100	102.9	26.0	166.0	103
OCDD-13C	200	195.1	26.0	397.0	98

Cs = Concentration Spiked (ng/mL)
Cr = Concentration Recovered (ng/mL)
Rec. = Recovery (Expressed as Percent)
Control Limit Reference: Method 1613, Table 6, 10/94 Revision
X = Background subtracted value
P = Recovery outside of control limits
Nn = Value obtained from additional analysis
* = See Discussion

Report No.....105645

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 1613B Laboratory Control Spike Results

Client - Del Mar Analytical

Lab Sample ID	LCSD-6204		
Filename	F50127A_04	Matrix	Water
Total Amount Extracted	1000 mL	Dilution	NA
ICAL Date	11/29/2004	Extracted	01/24/2005
CCal Filename	F50127A_02	Analyzed	01/27/2005 12:32
Method Blank ID	BLANK-6202	Injected By	MRO

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDF	10	9.9	7.5	15.8	99
2,3,7,8-TCDD	10	8.8	6.7	15.8	88
1,2,3,7,8-PeCDF	50	49.8	40.0	67.0	100
2,3,4,7,8-PeCDF	50	47.6	34.0	80.0	95
1,2,3,7,8-PeCDD	50	41.4	35.0	71.0	83
1,2,3,4,7,8-HxCDF	50	46.6	36.0	67.0	93
1,2,3,6,7,8-HxCDF	50	44.0	42.0	65.0	88
2,3,4,6,7,8-HxCDF	50	47.2	35.0	78.0	94
1,2,3,7,8,9-HxCDF	50	44.8	39.0	65.0	90
1,2,3,4,7,8-HxCDD	50	46.5	35.0	82.0	93
1,2,3,6,7,8-HxCDD	50	48.9	38.0	67.0	98
1,2,3,7,8,9-HxCDD	50	46.7	32.0	81.0	93
1,2,3,4,6,7,8-HpCDF	50	48.7	41.0	61.0	97
1,2,3,4,7,8,9-HpCDF	50	49.9	39.0	69.0	100
1,2,3,4,6,7,8-HpCDD	50	42.7	35.0	70.0	85
OCDF	100	84.8	63.0	170.0	85
OCDD	100	92.5	78.0	144.0	92
2,3,7,8-TCDD-37Cl4	10	7.5	3.1	19.1	75
2,3,7,8-TCDF-13C	100	65.7	22.0	152.0	66
2,3,7,8-TCDD-13C	100	83.8	20.0	175.0	84
1,2,3,7,8-PeCDF-13C	100	84.9	21.0	192.0	85
2,3,4,7,8-PeCDF-13C	100	85.6	13.0	328.0	86
1,2,3,7,8-PeCDD-13C	100	105.3	21.0	227.0	105
1,2,3,4,7,8-HxCDF-13C	100	82.6	19.0	202.0	83
1,2,3,6,7,8-HxCDF-13C	100	96.7	21.0	159.0	97
2,3,4,6,7,8-HxCDF-13C	100	92.3	22.0	176.0	92
1,2,3,7,8,9-HxCDF-13C	100	84.5	17.0	205.0	84
1,2,3,4,7,8-HxCDD-13C	100	81.9	21.0	193.0	82
1,2,3,6,7,8-HxCDD-13C	100	102.0	25.0	163.0	102
1,2,3,4,6,7,8-HpCDF-13C	100	90.1	21.0	158.0	90
1,2,3,4,7,8,9-HpCDF-13C	100	78.6	20.0	186.0	79
1,2,3,4,6,7,8-HpCDD-13C	100	106.1	26.0	166.0	106
OCDD-13C	200	196.4	26.0	397.0	98

Cs = Concentration Spiked (ng/mL)
Cr = Concentration Recovered (ng/mL)
Rec. = Recovery (Expressed as Percent)
Control Limit Reference: Method 1613, Table 6, 10/94 Revision
X = Background subtracted value
P = Recovery outside of control limits
Nn = Value obtained from additional analysis
* = See Discussion

Report No.....105645

REPORT OF LABORATORY ANALYSIS

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www.pacelabs.com

Pace Analytical Services, Inc.
1700 Elm Street
Minneapolis, MN 55414
Phone: 612.607.1700
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SPIKE RECOVERY RELATIVE PERCENT DIFFERENCE (RPD) RESULTS

Client..... Del Mar Analytical

SPIKE 1 ID..... LCS-6203
SPIKE 1 Filename..... F50127A_03
SPIKE 2 ID..... LCSD-6204
SPIKE 2 Filename..... F50127A_04

COMPOUND	SPIKE 1 REC,%	SPIKE 2 REC,%	RPD,%
2378-TCDF	102	99	3.0
2378-TCDD	90	88	2.2
12378-PeCDF	100	100	0.0
23478-PeCDF	97	95	2.1
12378-PeCDD	87	83	4.7
123478-HxCDF	90	93	3.3
123678-HxCDF	96	88	8.7
234678-HxCDF	97	94	3.1
123789-HxCDF	93	90	3.3
123478-HxCDD	100	93	7.3
123678-HxCDD	103	98	5.0
123789-HxCDD	97	93	4.2
1234678-HpCDF	103	97	6.0
1234789-HpCDF	105	100	4.9
1234678-HpCDD	87	85	2.3
OCDF	90	85	5.7
OCDD	97	92	5.3

REC = Percent Recovered
RPD = The difference between the two values divided by the average.
NA = Not Applicable

Report No.....105645

REPORT OF LABORATORY ANALYSIS

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TABLE 1. 2,3,7,8-TCDD Equivalency Factors (TEFs) for the Polychlorinated Dibenzo-p-dioxins and Dibenzofurans

Number	Compound(s)	TEF
1	2,3,7,8-TCDD	1.00
2	1,2,3,7,8-PeCDD	0.50
3	1,2,3,6,7,8-HxCDD	0.1
4	1,2,3,7,8,9-HxCDD	0.1
5	1,2,3,4,7,8-HxCDD	0.1
6	1,2,3,4,6,7,8-HpCDD	0.01
7	OCDD	0.001
8	* Total - TCDD	0.0
9	* Total - PeCDD	0.0
10	* Total - HxCDD	0.0
11	* Total - HpCDD	0.0
12	2,3,7,8-TCDF	0.10
13	1,2,3,7,8-PeCDF	0.05
14	2,3,4,7,8-PeCDF	0.5
15	1,2,3,6,7,8-HxCDF	0.1
16	1,2,3,7,8,9-HxCDF	0.1
17	1,2,3,4,7,8-HxCDF	0.1
18	2,3,4,6,7,8-HxCDF	0.1
19	1,2,3,4,6,7,8-HpCDF	0.01
20	1,2,3,4,7,8,9-HpCDF	0.01
21	OCDF	0.001
22	* Total - TCDF	0.0
23	* Total - PeCDF	0.0
24	* Total - HxCDF	0.0
25	* Total - HpCDF	0.0

*Excluding the 2,3,7,8-substituted congeners.

Reference: 1989 ITEFs

REPORT OF LABORATORY ANALYSIS

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Del Mar Analytical

17461 Derian Ave. Suite 100, Irvine, CA 92614 Ph (949) 261-1022 Fax (949) 261-1228
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2520 E. Sunset Rd., Suite #3, Las Vegas, NV 89120 Ph (702) 798-3620 Fax (702) 798-3621

SUBCONTRACT ORDER - PROJECT # IOA0460 106050

SENDING LABORATORY:	RECEIVING LABORATORY:
Del Mar Analytical, Irvine 17461 Derian Avenue. Suite 100 Irvine, CA 92614 Phone: (949) 261-1022 Fax: (949) 261-1228 Project Manager: Michele Harper	Pace Analytical, MN- SUB 1700 Elm Street, Ste 200 Minneapolis, MN 55414 Phone :(612) 607-1700 Fax: (612) 607-6444

Standard TAT is requested unless specific due date is requested => Due Date:_____ Initials:_____

Analysis	Expiration	Comments
Sample ID: IOA0460-01 Water	**Sampled: 01/10/05 11:13**	106050001
1613-Dioxin-HR	01/17/05 11:13	J flags, 17 congeners, no TEQ, sub to Pace-MN
EDD + Level 4	02/07/05 11:13	Excel EDD email to pm,Include Std logs for Lvl IV

Containers Supplied:
1 L Amber (IOA0460-01C)
1 L Amber (IOA0460-01D)

SAMPLE INTEGRITY:

All containers intact: ☐ Yes ☐ No Sample labels/COC agree: ☐ Yes ☐ No Samples Received On Ice:: ☐ Yes ☐ No
Custody Seals Present: ☐ Yes ☐ No Samples Preserved Properly: ☐ Yes ☐ No Samples Received at (temp): 6°C

Released By	Date	Time	Received By	Date	Time
In Bank	1/11/05				
			Kathy Adamson	1/12/05	9.00
Released By	Date	Time	Received By	Date	Time

CONTRACT COMPLIANCE SCREENING FORM FOR HARDCOPY DATA

AMEC Earth & Environmental
550 South Wadsworth Boulevard
Suite 500
Lakewood, CO 80226

Package ID T711DF33
Task Order 313150010
SDG No. Multiple
No. of Analyses 3

Laboratory Pace
Reviewer K. Shadowlight
Analysis/Method Dioxins

Date: March 18, 2005
Reviewer's Signature K Shadowlight

ACTION ITEMS[a]	
1. **Case Narrative Deficiencies**	
2. **Out of Scope Analyses**	
3. **Analyses Not Conducted**	
4. **Missing Hardcopy Deliverables**	
5. **Incorrect Hardcopy Deliverables**	
6. **Deviations from Analysis Protocol, e.g.,**	Qualifications were assigned for the following:
Holding Times	* Method blank contamination
GC/MS Tune/Inst. Performance	* Internal standard recovery outliers
Calibration	* Detects below the lower method calibration level
Method blanks	
Surrogates	
Matrix Spike/Dup LCS	
Field QC	
Internal Standard Performance	
Compound Identification and Quantitation	
System Performance	
COMMENTS[b]	

[a] Subcontracted analytical laboratory is not meeting contract and/or method requirements.
[b] Differences in protocol have been adopted by the laboratory but no action against the laboratory is required.

DATA VALIDATION REPORT

NPDES
Monitoring

ANALYSIS: DIOXINS/FURANS

SAMPLE DELIVERY GROUPS: IOA1674, IOA1803, IOA1804

Prepared by

AMEC—Denver Operations
550 South Wadsworth Boulevard, Suite 500
Lakewood, Colorado 80226

1. INTRODUCTION

Task Order Title:	NPDES Monitoring
Contract Task Order #:	313150010
Sample Delivery Group #:	IOA1674, IOA1803, IOA1804
Project Manager:	B. McIlvaine
Matrix:	Water
Analysis:	Dioxins/Furans
QC Level:	Level IV
No. of Samples:	3
No. of Reanalyses/Dilutions:	0
Reviewer:	K. Shadowlight
Date of Review:	March 18, 2005

The samples listed in Table 1 were validated based on the guidelines outlined in the *AMEC Data Validation Procedure for Dioxins and Furans (DVP-19, Rev. 1), EPA Method 1613, and the National National Functional Guidelines For Chlorinated Dioxin/Furan Data Review* (8/02). Any deviations from these procedures and guidelines are documented herein. Qualifiers were applied in cases where the data did not meet the required QC criteria or where special consideration by the data user is required. Data qualifiers were placed on Form Is with the associated qualification codes. Analytes that were rejected for any reason are denoted on the Form I as having only the "R" data qualifier and associated qualification code(s) denoting the reason for rejection. Any additional problems with the data that may have resulted in an estimated value were not denoted by a qualification code since the data had already been rejected.

Table 1. Sample Identification

Client ID	Laboratory ID (Del Mar)	Laboratory ID (Pace)	Matrix	COC Method
Outfall 004	IOA1804-01	106983001	water	1613
Outfall 005	IOA1674-01	106914001	water	1613
Outfall 006	IOA1803-01	106982001	water	1613

2. DATA VALIDATION FINDINGS

2.1 SAMPLE MANAGEMENT

Following are findings associated with sample management:

2.1.1 Sample Preservation, Handling, and Transport

The samples in these SDGs were received at Del Mar Analytical within the temperature limits of 4°C ±2°C. The samples were subcontracted to Pace Analytical for the dioxin/furan analyses. Sample Outfall 005 was received at Pace below the temperature limits of 4°C ± 2°C, at 1.2°C; however, as the sample was not noted to have been frozen or damaged, no qualifications were required. The remaining samples in these SDGs were received at Pace Analytical Services within the temperature limits of 4°C ± 2°C. No qualifications were required.

2.1.2 Chain of Custody

The COCs and transfer COCs were signed by the appropriate field and laboratory personnel. The samples and analyses were accounted for on both the original COCs and transfer COCs. As the samples were couriered directly to the laboratory (Del Mar Analytical), custody seals were not required. There was no information regarding custody seals upon receipt at Pace. No qualifications were required.

2.1.3 Holding Times

The samples were extracted and analyzed within one year of collection. No qualifications were required.

2.2 INSTRUMENT PERFORMANCE

Following are findings associated with instrument performance:

2.2.1 GC Column Performance

A column performance standard was combined with the daily calibration verification and analyzed at the beginning of each analytical sequence. The GC column performance was acceptable with the chromatographic separation of 2,3,7,8-TCDD and other TCDD isomers resolved with a valley of ≤25%. No qualifications were required.

2.2.2 Mass Spectrometer Performance

The mass spectrometer performance could not be evaluated as the laboratory did not provide selected ion current profiles for the lock-mass ions. No qualifications were required.

2.3 CALIBRATION

2.3.1 Initial Calibration

There was one initial calibration, analyzed 11/29/04 on instrument 10MSHR05. The calibration consisted of five concentration level standards (CS1 through CS5) analyzed to verify instrument linearity. The initial calibration was acceptable with %RSDs ≤20% for the 15 native compounds (calibration by isotope dilution) and ≤35% for the 2 native and all labeled compounds (calibration by internal standard). The relative retention times and ion abundance ratios were within the QC limits listed in Method 1613 for all standards. A representative number of %RSDs were verified from the raw data, and no calculation or transcription errors were noted. No qualifications were required.

2.3.2 Continuing Calibration

Calibration verification (VER) consisted of a mid-level standard (CS3) analyzed at the beginning of each analytical sequence. The VER was acceptable with the concentrations within the acceptance criteria listed in the Table 6 of the EPA Method 1613. The ion abundance ratios and relative retention times were within the method QC limits. A representative number of %Ds were verified from the raw data, and no calculation or transcription errors were noted. No qualifications were required.

2.4 BLANKS

One method blank (Blank-6264) was extracted and analyzed with the samples in these SDGs. Target compounds 1,2,3,4,6,7,8-HpCDF, total HpCDF, and OCDF were reported in the method blank at concentrations below the lower method calibration limit. Any detects for the aforementioned target compounds reported at concentrations <5× the concentrations reported in the method blank were qualified as estimated nondetects "UJ," at the levels of interference in the samples of these SDGs. The detect for total HpCDF was qualified as estimated, "J," in sample Outfall 006, as only a portion of the total concentration was attributed to method blank contamination. Target compound OCDD was reported as an EMPC in the method blank. A review of the method blank raw data and chromatograms indicated no false negatives or false positives. No further qualifications were required.

2.5 BLANK SPIKES AND LABORATORY CONTROL SAMPLES

One LCS/LCSD pair (LCS-6265/LCSD-6266) was extracted and analyzed with the samples in these SDGs. All recoveries were within the acceptance criteria listed in Table 6 of the Method 1613. There are no method QC limits established for RPDs. The reported RPDs were within ±20%. No qualifications were required.

2.6 MATRIX SPIKE/MATRIX SPIKE DUPLICATE

MS/MSD analyses were not performed in these SDGs. Evaluation of method accuracy and precision was based on the LCS/LCSD results. No qualifications were required.

2.7 FIELD QC SAMPLES

Following are findings associated with field QC:

2.7.1 Field Blanks and Equipment Rinsates

The samples in these SDGs had no associated field QC samples. No qualifications were required.

2.7.2 Field Duplicates

No field duplicate samples were identified for these SDGs.

2.8 INTERNAL STANDARDS

Internal standard 2,3,7,8-TCDF-13C was recovered below QC limits at 22% and 8% in samples Outfall 004 and Outfall 005, respectively. Internal standard 2,3,7,8-TCDD-13C was recovered below QC limits in Oufall 005, and cleanup standard 2,3,7,8-37Cl4 was recovered below QC limits in both samples Outfall 004 and Outfall 005. The samples were re-extracted and reanalyzed; however, according to laboratory personnel, the re-extracted analyses were affected by cross-contamination and were not reported by the laboratory. The nondetect results for 2,3,7,8-TCDF and total TCDF were rejected, "R," in sample Outfall 005. Nondetect results for 2,3,7,8-TCDD and total TCDD were qualified as estimated, "UJ," in Outfall 004 and nondetects for 2,3,7,8-TCDD and total TCDD were qualified as estimated, "UJ," in sample Outfall 005. As the cleanup standard was recovered below QC limits in samples Outfall 004 and Outfall 005, the results for all target compounds were qualified as estimated, "J," for detects and "UJ," for nondetects in both samples, unless otherwise rejected. The remaining labeled standard recoveries were within the acceptance criteria listed in Table 7 of Method 1613. No further qualifications were required.

2.9 COMPOUND IDENTIFICATION

The laboratory analyzed for polychlorinated dioxins/furans by EPA Method 1613. The compound identifications were verified from the raw data and no false negatives or positives were noted. No qualifications were required.

2.10 COMPOUND QUANTIFICATION AND REPORTED DETECTION LIMITS

Compound quantitation was verified from the raw data. The laboratory calculated and reported compound-specific detection limits. Any detects below the lower method calibration limit (MCL) were qualified as estimated, "J." No further qualifications were required.

Pace Analytical™

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 1613B Analysis Results

Client - Del Mar Analytical

Client's Sample ID	IOA1804-01 Outfall 004		
Lab Sample ID	106983001		
Filename	F50209B_12		
Injected By	MRO		
Total Amount Extracted	1040 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	01/28/2005
ICAL Date	11/29/2004	Received	02/01/2005
CCal Filename(s)	F50209A_13	Extracted	02/04/2005
Method Blank ID	BLANK-6264	Analyzed	02/10/2005 04:26

Rev Qual	Qual Code	Native Isomers	Conc pg/L	EMPC pg/L	LOD pg/L		Internal Standards	ng's Added	Percent Recovery	
		2,3,7,8-TCDF	ND	-----	4.20		2,3,7,8-TCDF-13C	2.00	22	P
		Total TCDF	ND	-----	4.20		2,3,7,8-TCDD-13C	2.00	33	
							1,2,3,7,8-PeCDF-13C	2.00	50	
		2,3,7,8-TCDD	ND	-----	4.00		2,3,4,7,8-PeCDF-13C	2.00	55	
		Total TCDD	ND	-----	4.00		1,2,3,7,8-PeCDD-13C	2.00	67	
							1,2,3,4,7,8-HxCDF-13C	2.00	63	
		1,2,3,7,8-PeCDF	ND	-----	2.20		1,2,3,6,7,8-HxCDF-13C	2.00	71	
		2,3,4,7,8-PeCDF	ND	-----	1.80		2,3,4,6,7,8-HxCDF-13C	2.00	77	
		Total PeCDF	ND	-----	2.00		1,2,3,7,8,9-HxCDF-13C	2.00	72	
							1,2,3,4,7,8-HxCDD-13C	2.00	70	
		1,2,3,7,8-PeCDD	ND	-----	1.80		1,2,3,6,7,8-HxCDD-13C	2.00	77	
		Total PeCDD	ND	-----	1.80		1,2,3,4,6,7,8-HpCDF-13C	2.00	72	
							1,2,3,4,7,8,9-HpCDF-13C	2.00	69	
		1,2,3,4,7,8-HxCDF	ND	-----	1.70		1,2,3,4,6,7,8-HpCDD-13C	2.00	87	
		1,2,3,6,7,8-HxCDF	ND	-----	1.60		OCDD-13C	4.00	88	
		2,3,4,6,7,8-HxCDF	ND	-----	1.10					
		1,2,3,7,8,9-HxCDF	ND	-----	0.86		1,2,3,4-TCDD-13C	2.00	NA	
		Total HxCDF	ND	-----	1.30		1,2,3,7,8,9-HxCDD-13C	2.00	NA	
		1,2,3,4,7,8-HxCDD	ND	-----	1.70		2,3,7,8-TCDD-37Cl4	0.20	31	P
		1,2,3,6,7,8-HxCDD	ND	-----	1.80					
		1,2,3,7,8,9-HxCDD	ND	-----	1.40					
		Total HxCDD	ND	-----	1.70					
		1,2,3,4,6,7,8-HpCDF	ND	-----	1.20					
		1,2,3,4,7,8,9-HpCDF	ND	-----	1.80					
J	DNQ, I	Total HpCDF	4.2	-----	1.50	BJ				
J	DNQ, I	1,2,3,4,6,7,8-HpCDD	4.6	-----	1.80	J				
J	DNQ, I	Total HpCDD	4.6	-----	1.80	J				
UJ	B, I	OCDF	6.2	-----	1.20	BJ				
J	I, DNQ	OCDD	43.0	-----	2.00	J				

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection. Totals are averages of individual isomer LODs.
D = Result obtained from analysis of diluted sample
B = Less than 10 times higher than method blank level
P = Recovery outside of method 1613 control limits
J = Concentration detected is below the calibration range
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....106983

REPORT OF LABORATORY ANALYSIS

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AMEC VALIDATED

REVIEWED

CONTRACT COMPLIANCE SCREENING FORM FOR HARDCOPY DATA

AMEC Earth & Environmental
550 South Wadsworth Boulevard
Suite 500
Lakewood, CO 80226

Laboratory Del Mar Analytical
Reviewer K. Okonzak
Analysis/Method Metals

Package ID T711MT33
Task Order 313150010
SDG No. IOA1803, IOA1804
No. of Analyses 2

Date: 3/14/05
Reviewer's Signature

ACTION ITEMS[a]	
1. **Case Narrative Deficiencies**	
2. **Out of Scope Analyses**	
3. **Analyses Not Conducted**	
4. **Missing Hardcopy Deliverables**	
5. **Incorrect Hardcopy Deliverables**	
6. **Deviations from Analysis Protocol, e.g.,**	Qualifications applied for:
Holding Times	Detects below the reporting limit were qualified as estimated, "J."
GC/MS Tune/Inst. Perform	
Calibrations	
Blanks	
Surrogates	
Matrix Spike/Dup LCS	
Field QC	
Internal Standard Performance	
Compound Identification and Quantitation	
System Performance	
COMMENTS[b]	

[a] Subcontracted analytical laboratory is not meeting contract and/or method requirements.
[b] Differences in protocol have been adopted by the laboratory but no action against the laboratory is required.

Data Qualifier Reference Table

Qualifier	Organics	Inorganics
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.	The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.	The associated value is an estimated quantity.
N	The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification."	Not applicable.
NJ	The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.	Not applicable.
UJ	The analyte was not deemed above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.	The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.
R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and to meet quality control criteria. The presence or absence of the analyte cannot be verified.	The data are unusable. (Note: Analyte may or may not be present).

Qualification Code Reference Table

Qualifier	Organics	Inorganics
H	Holding times were exceeded.	Holding times were exceeded.
S	Surrogate recovery was outside QC limits.	The sequence or number of standards used for the calibration was incorrect
C	Calibration %RSD or %D were noncompliant.	Correlation coefficient is <0.995.
R	Calibration RRF was <0.05.	%R for calibration is not within control limits.
B	Presumed contamination from preparation (method) blank.	Presumed contamination from preparation (method) or calibration blank.
L	Laboratory Blank Spike/Blank Spike Duplicate %R was not within control limits.	Laboratory Control Sample %R was not within control limits.
Q	MS/MSD recovery was poor or RPD high.	MS recovery was poor.
E	Not applicable.	Duplicates showed poor agreement.
I	Internal standard performance was unsatisfactory.	ICP ICS results were unsatisfactory.
A	Not applicable.	ICP Serial Dilution %D were not within control limits.
M	Tuning (BFB or DFTPP) was noncompliant.	Not applicable.
T	Presumed contamination from trip blank.	Not applicable.
+	False positive – reported compound was not present. Not applicable.	
-	False negative – compound was present but not reported.	Not applicable.
F	Presumed contamination from FB, or ER.	Presumed contamination from FB or ER.
$	Reported result or other information was incorrect.	Reported result or other information was incorrect.
?	TIC identity or reported retention time has been changed.	Not applicable.
D	The analysis with this flag should not be used because another more technically sound analysis is available.	The analysis with this flag should not be used because another more technically sound analysis is available.
P	Instrument performance for pesticides was poor.	Post Digestion Spike recovery was not within control limits.
DNQ	The compound was detected between the MDL and the RL and, by definition, is considered an estimated value.	The compound was detected between the MDL and the RL and, by definition, is considered an estimated value.

*#	Unusual problems found with the data that have been described in Section 2.#, "Data Validation Findings." The number following the asterisk (*) will indicate the subsection where a description of the problem can be found (eg. *1 would indicate a sample was not within temperature limits).	Unusual problems found with the data that have been described in Section 2.#, "Data Validation Findings." The number following the asterisk (*) will indicate the subsection where a description of the problem can be found (eg. *1 would indicate a sample was not within temperature limits).

DATA VALIDATION REPORT

NPDES
Monitoring

ANALYSIS: METALS

SAMPLE DELIVERY GROUPS: IOA1803, IOA1804

Prepared by

AMEC—Denver Operations
550 South Wadsworth Boulevard, Suite 500
Lakewood, Colorado 80226

1. INTRODUCTION

Task Order Title:	NPDES Monitoring
Contract Task Order #:	313150010
SDG#:	IOA1803, IOA1804
Project Manager:	B. McIlvaine
Matrix:	Water
Analysis:	Metals
QC Level:	Level IV
No. of Samples:	2
No. of Reanalyses/Dilutions:	0
Reviewer:	K. Okonzak-Lowry
Date of Review:	March 14, 2005

The samples listed in Table 1 were validated based on the guidelines outlined in the *AMEC Data Validation Procedure for Levels III and IV ICP-MS Metals, (DVP-5-A, Rev.0), AMEC Data Validation Procedure for Levels III and IV ICP Metals* (DVP-5, Rev. 0), SW-846 *Method 6020B for Inductively Coupled Plasma – Mass Spectrometry*, SW-846 *Method 6010B for Inductively Coupled Plasma* , SW-846 *Method 7471A for Mercury (Manual Cold-Vapor Technique)*, and validation guidelines outlined in the USEPA CLP *National Functional Guidelines for Inorganic Data Review* (2/94). Any deviations from these procedures and guidelines are documented herein. Qualifiers were applied in cases where the data did not meet the required QC criteria or where special consideration by the data user is required. Data qualifiers were placed on Form Is with the associated qualification codes. Analytes that were rejected for any reason are denoted on the Form I as having only the "R" data qualifier and associated qualification code(s) denoting the reason for rejection. Any additional problems with the data that may have resulted in an estimated value were not denoted by a qualification code since the data had already been rejected.

Table 1. Sample identification

Client ID	EPA ID	Laboratory ID	Matrix	COC Method
Outfall 006	Outfall 006	IOA1803-01	water	ILM04
Outfall 004	Outfall 004	IOA1804-01	water	ILM04

2. DATA VALIDATION FINDINGS

2.1 SAMPLE MANAGEMENT

Following are findings associated with sample management:

2.1.1 Sample Preservation, Handling, and Transport

The samples in these SDGs were received at the laboratory within the temperature limits of 4°C ±2°C. No sample preservation, handling, or transport problems were noted, and no qualifications were necessary.

2.1.2 Chain of Custody

The COCs were signed and dated by field and laboratory personnel. The COCs listed duplicate samples for both site samples; however, duplicate analyses were not required. No sample qualifications were required.

2.1.3 Holding Times

The dates of collection recorded on the COCs and the dates of analyses recorded in the raw data, documented that the sample analyses were performed within the specified holding times of six months for the ICP/MS metals. No qualifications were required.

2.2 ICP-MS TUNING

A precalibration routine must be completed prior to calibrating the instrument, which consists of analyzing a tuning solution to verify resolution, mass calibration, and thermal stability. The solution must be analyzed a minimum of five times and must contain isotopes representing all mass regions of interest. The laboratory performed the required tune solution analyses. The %RSDs for the tune were all within the 5% control limit. The mass calibrations were within 0.1 amu of the true mass and the instrument resolutions were less than 0.75 amu at 5 percent peak height for all analytes in the tune solution. No site sample qualifications were required.

2.3 CALIBRATION

The ICV and CCV results showed acceptable recoveries, 90-110% for the ICP/MS. The applicable reporting limit check standards were recovered within the AMEC control limits of 70-130%. No qualifications were required.

2.4 BLANKS

The method blanks and bracketing ICBs/CCBs associated with the samples in these SDGs were nondetected at the laboratory's MDL for lead. No sample qualifications were required.

2.5 ICP INTERFERENCE CHECK SAMPLE (ICS A/AB)

There were no ICP/MS interference check sample analyses performed in association with the site sample results reported in these data packages; therefore, the samples were not assessed for this criterion.

2.6 BLANK SPIKES AND LABORATORY CONTROL SAMPLES

The ICP/MS LCS sample was identified as 5B02059-BS1. The LCS result on the summary form and in the raw data was within the laboratory-established ICP/MS control limits of 85-115%. No qualifications were required.

2.7 LABORATORY DUPLICATES

No MS/MSD or duplicate analyses were performed in association with the samples in these SDGs; therefore, no assessment was made with respect to this criterion.

2.8 MATRIX SPIKE

No MS/MSD analyses were performed in association with the samples in these SDGs; therefore, no assessment was made with respect to this criterion. Method accuracy was evaluated based on LCS results.

2.9 FURNACE ATOMIC ABSORPTION QC

Furnace atomic absorption was not utilized for the analysis of these samples; therefore, furnace atomic absorption QC is not applicable.

2.10 ICP/MS SERIAL DILUTION

No serial dilution analysis was performed in association with the samples in these SDGs; therefore, no assessment was made with respect to this criterion.

2.11 INTERNAL STANDARDS PERFORMANCE

The ICP-MS internal standard recoveries for the site samples and associated QC sample analyses were within the 60-125% control limits and no qualifications were required.

2.12 SAMPLE RESULT VERIFICATION

A Level IV review was performed for the samples in these data packages. Calculations were verified, and the sample results reported on the Form Is were verified against the raw data. No transcription errors or calculation errors were noted. Analytes detected below the reporting limit were qualified as estimated, "J." No qualifications were required.

2.13 FIELD QC SAMPLES

Field QC samples are evaluated, and if necessary, qualified based only on laboratory blanks. Any remaining detects are used to evaluate the associated samples.

2.13.1 Field Blanks and Equipment Rinsates

The samples in these SDGs had no associated field QC samples. No qualifications were required.

2.13.2 Field Duplicates

There were no field duplicate analyses performed in association with the site samples.

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 004

Report Number: IOA1804

Sampled: 01/28/05
Received: 01/28/05

DRAFT: METALS

Analyte	Method	Batch	MDL	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers	
Sample ID: IOA1804-01 (DRAFT: Outfall 004 - Water)									Rev Qual	Qual Code
Reporting Units: ug/l										
Lead	EPA 200.8	5B02059	0.13	1.0	**0.36**	1	02/02/05	02/04/05	J	J DNQ

AMEC VALIDATED

Level IV

DRAFT REPORT
DRAFT REPORT
DATA SUBJECT TO CHANGE

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LABORATORY REPORT

Prepared For: MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project: Routine Outfall 004

Sampled: 01/28/05
Received: 01/28/05
Issued: 03/18/05 14:41

NELAP #01108CA California ELAP#1197 CSDLAC #10117

The results listed within this Laboratory Report pertain only to the samples tested in the laboratory. The analyses contained in this report were performed in accordance with the applicable certifications as noted. All soil samples are reported on a wet weight basis unless otherwise noted in the report. This Laboratory Report is confidential and is intended for the sole use of Del Mar Analytical and its client. This report shall not be reproduced, except in full, without written permission from Del Mar Analytical. The Chain of Custody, 1 page, is included and is an integral part of this report.
This entire report was reviewed and approved for release.

SAMPLE CROSS REFERENCE

SUBCONTRACTED: Refer to the last page for specific subcontract laboratory information included in this report.

LABORATORY ID	CLIENT ID	MATRIX
IOA1804-01	Outfall 004	Water

Reviewed By:

Michele Harper

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 004
Report Number: IOA1804

Sampled: 01/28/05
Received: 01/28/05

METALS

Analyte	Method	Batch	MDL Limit	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA1804-01 (Outfall 004 - Water)									
Reporting Units: ug/l									
Antimony	EPA 200.8	5B02059	0.18	2.0	**0.26**	1	02/02/05	02/05/05	J
Cadmium	EPA 200.8	5B02059	0.015	1.0	**0.018**	1	02/02/05	02/04/05	J
Copper	EPA 200.8	5B02059	0.49	2.0	**2.3**	1	02/02/05	02/04/05	
Lead	EPA 200.8	5B02059	0.13	1.0	**0.36**	1	02/02/05	02/04/05	J
Mercury	EPA 245.1	5B01042	0.063	0.20	**0.12**	1	02/01/05	02/01/05	J

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Michele Harper
Project Manager

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Report Number: IOA1804

Sampled: 01/28/05
Received: 01/28/05

INORGANICS

Analyte	Method	Batch	MDL Limit	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA1804-01 (Outfall 004 - Water) - cont.									
Reporting Units: mg/l									
Chloride	EPA 300.0	5A28042	0.26	0.50	**1.7**	1	01/28/05	01/28/05	
Nitrate/Nitrite-N	EPA 300.0	5A28042	0.072	0.26	**0.94**	1	01/28/05	01/28/05	
Oil & Grease	EPA 413.1	5A31068	0.94	5.0	ND	1	01/31/05	01/31/05	
Sulfate	EPA 300.0	5A28042	0.18	0.50	**1.5**	1	01/28/05	01/28/05	
Total Dissolved Solids	SM2540C	5B03098	10	10	**57**	1	02/03/05	02/03/05	

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Attention: Bronwyn Kelly

Project ID: Routine Outfall 004

Report Number: IOA1804

Sampled: 01/28/05
Received: 01/28/05

SHORT HOLD TIME DETAIL REPORT

	Hold Time (in days)	Date/Time Sampled	Date/Time Received	Date/Time Extracted	Date/Time Analyzed
Sample ID: Outfall 004 (IOA1804-01) - Water					
EPA 300.0	2	01/28/2005 09:38	01/28/2005 17:00	01/28/2005 22:30	01/28/2005 23:11

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Attention: Bronwyn Kelly

Project ID: Routine Outfall 004

Report Number: IOA1804

Sampled: 01/28/05
Received: 01/28/05

METHOD BLANK/QC DATA

METALS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5B01042 Extracted: 02/01/05											
Blank Analyzed: 02/01/2005 (5B01042-BLK1)											
Mercury	ND	0.20	0.063	ug/l							
LCS Analyzed: 02/01/2005 (5B01042-BS1)											
Mercury	7.84	0.20	0.063	ug/l	8.00		98	85-115			
Matrix Spike Analyzed: 02/01/2005 (5B01042-MS1)						**Source: IOA1674-01**					
Mercury	7.90	0.20	0.063	ug/l	8.00	0.14	97	70-130			
Matrix Spike Dup Analyzed: 02/01/2005 (5B01042-MSD1)						**Source: IOA1674-01**					
Mercury	7.85	0.20	0.063	ug/l	8.00	0.14	96	70-130	1	20	
Batch: 5B02059 Extracted: 02/02/05											
Blank Analyzed: 02/03/2005 (5B02059-BLK1)											
Antimony	ND	2.0	0.18	ug/l							
Cadmium	ND	1.0	0.015	ug/l							
Copper	ND	2.0	0.49	ug/l							
Lead	ND	1.0	0.13	ug/l							
LCS Analyzed: 02/03/2005 (5B02059-BS1)											
Antimony	88.3	2.0	0.18	ug/l	80.0		110	85-115			
Cadmium	80.9	1.0	0.015	ug/l	80.0		101	85-115			
Copper	76.6	2.0	0.49	ug/l	80.0		96	85-115			
Lead	84.1	1.0	0.13	ug/l	80.0		105	85-115			
Matrix Spike Analyzed: 02/03/2005 (5B02059-MS1)						**Source: IOA1674-01**					
Antimony	91.1	2.0	0.18	ug/l	80.0	ND	114	70-130			
Cadmium	84.2	1.0	0.015	ug/l	80.0	ND	105	70-130			
Copper	81.6	2.0	0.49	ug/l	80.0	0.93	101	70-130			
Lead	85.2	1.0	0.13	ug/l	80.0	0.32	106	70-130			

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Michele Harper
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MWH-Pasadena/Boeing
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Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 004

Report Number: IOA1804

Sampled: 01/28/05
Received: 01/28/05

METHOD BLANK/QC DATA

METALS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5B02059 Extracted: 02/02/05											
Matrix Spike Analyzed: 02/03/2005 (5B02059-MS2)						**Source: IOB0107-01**					
Antimony	86.7	2.0	0.18	ug/l	80.0	ND	108	70-130			
Cadmium	76.7	1.0	0.015	ug/l	80.0	ND	96	70-130			
Copper	75.2	2.0	0.49	ug/l	80.0	2.1	91	70-130			
Lead	79.7	1.0	0.13	ug/l	80.0	ND	100	70-130			
Matrix Spike Dup Analyzed: 02/03/2005 (5B02059-MSD1)						**Source: IOA1674-01**					
Antimony	93.0	2.0	0.18	ug/l	80.0	ND	116	70-130	2	20	
Cadmium	85.0	1.0	0.015	ug/l	80.0	ND	106	70-130	1	20	
Copper	77.0	2.0	0.49	ug/l	80.0	0.93	95	70-130	6	20	
Lead	85.1	1.0	0.13	ug/l	80.0	0.32	106	70-130	0	20	

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Report Number: IOA1804

Sampled: 01/28/05
Received: 01/28/05

METHOD BLANK/QC DATA

INORGANICS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A28042 Extracted: 01/28/05											
Blank Analyzed: 01/28/2005 (5A28042-BLK1)											
Chloride	ND	0.50	0.26	mg/l							
Nitrate/Nitrite-N	ND	0.26	0.072	mg/l							
Sulfate	ND	0.50	0.18	mg/l							
LCS Analyzed: 01/28/2005 (5A28042-BS1)											
Chloride	4.91	0.50	0.26	mg/l	5.00		98	90-110			
Sulfate	10.2	0.50	0.18	mg/l	10.0		102	90-110			
Matrix Spike Analyzed: 01/28/2005 (5A28042-MS1)						**Source: IOA1608-01**					
Chloride	105	5.0	2.6	mg/l	50.0	60	90	80-120			
Sulfate	298	5.0	1.8	mg/l	100	210	88	80-120			
Matrix Spike Dup Analyzed: 01/28/2005 (5A28042-MSD1)						**Source: IOA1608-01**					
Chloride	110	5.0	2.6	mg/l	50.0	60	100	80-120	5	20	
Sulfate	301	5.0	1.8	mg/l	100	210	91	80-120	1	20	
Batch: 5A31068 Extracted: 01/31/05											
Blank Analyzed: 01/31/2005 (5A31068-BLK1)											
Oil & Grease	ND	5.0	0.94	mg/l							
LCS Analyzed: 01/31/2005 (5A31068-BS1)											**M-NR1**
Oil & Grease	17.0	5.0	0.94	mg/l	20.0		85	65-120			
LCS Dup Analyzed: 01/31/2005 (5A31068-BSD1)											
Oil & Grease	19.6	5.0	0.94	mg/l	20.0		98	65-120	14	20	

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Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 004
Report Number: IOA1804

Sampled: 01/28/05
Received: 01/28/05

METHOD BLANK/QC DATA

INORGANICS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5B03098 Extracted: 02/03/05											
Blank Analyzed: 02/03/2005 (5B03098-BLK1)											
Total Dissolved Solids	ND	10	10	mg/l							
LCS Analyzed: 02/03/2005 (5B03098-BS1)											
Total Dissolved Solids	984	10	10	mg/l	1000		98	90-110			
Duplicate Analyzed: 02/03/2005 (5B03098-DUP1)						**Source: IOA1803-01**					
Total Dissolved Solids	79.0	10	10	mg/l		85			7	10	

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Report Number: IOA1804

Sampled: 01/28/05
Received: 01/28/05

Compliance Check

The results obtained from the analytical testing of this data set were checked against compliance limits received from the client. Any results at or above the compliance limits appear in bold on this page.

LabNumber	Analysis	Analyte	Units	Result	MRL	Compliance Limit
IOA1804-01	413.1 Oil and Grease	Oil & Grease	mg/l	-1	5.0	15
IOA1804-01	Antimony-200.8	Antimony	ug/l	0.26	2.0	6.00
IOA1804-01	Cadmium-200.8	Cadmium	ug/l	0.018	1.0	4.00
IOA1804-01	Chloride - 300.0	Chloride	mg/l	1.70	0.50	150
IOA1804-01	Copper-200.8	Copper	ug/l	2.30	2.0	14
IOA1804-01	Mercury - 245.1	Mercury	ug/l	0.12	0.20	0.20
IOA1804-01	Nitrogen, NO3+NO2 -N	Nitrate/Nitrite-N	mg/l	0.94	0.26	10.00
IOA1804-01	Sulfate-300.0	Sulfate	mg/l	1.50	0.50	250
IOA1804-01	TDS - SM 2540C	Total Dissolved Solids	mg/l	57	10	850

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Attention: Bronwyn Kelly

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Report Number: IOA1804

Sampled: 01/28/05
Received: 01/28/05

DATA QUALIFIERS AND DEFINITIONS

J	Estimated value. Analyte detected at a level less than the Reporting Limit (RL) and greater than or equal to the Method Detection Limit (MDL). The user of this data should be aware that this data is of unknown quality.
M-NR1	There was no MS/MSD analyzed with this batch due to insufficient sample volume. See Blank Spike/Blank Spike Duplicate.
ND	Analyte NOT DETECTED at or above the reporting limit or MDL, if MDL is specified.
RPD	Relative Percent Difference

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9830 South 51st St., Suite B-120, Phoenix, AZ 85044 (480) 785-0043 FAX (480) 785-0851
2520 E. Sunset Rd. #3, Las Vegas, NV 89120 (702) 798-3620 FAX (702) 798-3621

Del Mar Analytical

MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 004

Report Number: IOA1804

Sampled: 01/28/05
Received: 01/28/05

Certification Summary

Del Mar Analytical, Irvine

Method	Matrix	Nelac	California
EPA 200.8	Water	X	X
EPA 245.1	Water	X	X
EPA 300.0	Water	X	X
EPA 413.1	Water	X	X
SM2540C	Water	X	X

Nevada and NELAP provide analyte specific accreditations. Analyte specific information for Del Mar Analytical may be obtained by contacting the laboratory or visiting our website at www.dmalabs.com.

Subcontracted Laboratories

Pace Analytical, MN- SUB

1700 Elm Street, Ste 200 - Minneapolis, MN 55414

Analysis Performed: 1613-Dioxin-HR
Samples: IOA1804-01

Analysis Performed: EDD + Level 4
Samples: IOA1804-01

Del Mar Analytical, Irvine
Michele Harper
Project Manager

The results pertain only to the samples tested in the laboratory. This report shall not be reproduced, except in full, without written permission from Del Mar Analytical.

1OA1804

Del Mar Analytical Version 5 8/12/04 CHAIN OF CUSTODY FORM

Client Name/Address:	Project:
MWH-Pasadena 300 North Lake Avenue, Suite 1200 Pasadena, CA 91101	Boeing-SSFL NPDES **Routine Outfall 004** Stormwater at SRE
Project Manager: Bronwyn Kelly Sampler: Rick Banuyan	Phone Number: (626) 568-6691 Fax Number: (626) 568-6515

Sample Description	Sample Matrix	Container Type	# of Cont.	Sampling Date/Time	Preservative	Bottle #	Total Recoverable Metals: Sb, Cd, Cu, Pb, Hg	TCDD (and all congeners)	Oil & Grease (EPA 413.1)	Cl-, SO4, NO3+NO2-N	TDS					Field readings: / Comments
Outfall 004	W	Poly-1L	1	1-28-05 09:18	HNO3	1A	X									Temp = 52.7 pH = ~~8.69~~ 7.76
Outfall 004-Dup	W	Poly-1L	1		HNO3	1B	X									
Outfall 004	W	Glass-Amber	2		None	2A, 2B		X								
Outfall 004	W	Glass-Amber	2		HCl	3A, 3B			X							
Outfall 004	W	Poly-500 ml	2		None	4A, 4B				X						
Outfall 004	W	Poly-500 ml	2	1-28-05 09:38	None	5A, 5B					X					

Relinquished By	Date/Time:	Received By	Date/Time:
Richard Banuyan	1-28-05 10:25	[illegible]	1/28/05 10:25
[illegible]	1/28/05 1700	[illegible]	1/28/05 1700
Relinquished By	Date/Time:	Received By	Date/Time:

Turn around Time: (check)
24 Hours ____ 5 Days ____
48 Hours ____ 10 Days ____
72 Hours ____ Normal ✓
Perchlorate Only 72 Hours ____
Metals Only 72 Hours ____
Sample Integrity: (Check)
Intact ✓ On Ice: 6°C

Del Mar Analytical

2852 Alton Ave., Irvine CA 92606 (949) 261-1022 FAX (949) 261-1228
1014 E. Cooley Dr., Suite A, Colton, CA 92324 (909) 370-4667 FAX (949) 370-1046
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9830 South 51st St., Suite B-120, Phoenix, AZ 85044 (480) 785-0043 FAX (480) 785-0851
2520 E. Sunset Rd. #3, Las Vegas, NV 89120 (702) 798-3620 FAX (702) 798-3621

March 17, 2005

MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, Ca.91101

Attention: Bronwyn Kelly

Project: Routine Outfall 004
Sampled: 01/28/05
Del Mar Analytical Number: IOA1804

Dear Ms. Kelly:

Pace Analytical performed Method 1613B analysis for the project referenced above. Please use the following cross-reference table when reviewing your results.

MWH ID	DEL MAR ID	Pace ID
Outfall 004	IOA1804-01	106982001

Attached is the original report from the subcontract laboratory. If you have any questions or require further assistance, please do not hesitate to contact me.

Sincerely yours,
DEL MAR ANALYTICAL

Michele Harper
Project Manager

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Pace Analytical™

Method 1613B Analysis Results

Client - Del Mar Analytical

Client's Sample ID	IOA1804-01		
Lab Sample ID	106983001		
Filename	F50209B_12		
Injected By	MRO		
Total Amount Extracted	1040 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	01/28/2005
ICAL Date	11/29/2004	Received	02/01/2005
CCal Filename(s)	F50209A_13	Extracted	02/04/2005
Method Blank ID	BLANK-6264	Analyzed	02/10/2005 04:26

Native Isomers	Conc pg/L	EMPC pg/L	LOD pg/L		Internal Standards	ng's Added	Percent Recovery	
2,3,7,8-TCDF	ND	----	4.20		2,3,7,8-TCDF-13C	2.00	22	P
Total TCDF	ND	----	4.20		2,3,7,8-TCDD-13C	2.00	33	
					1,2,3,7,8-PeCDF-13C	2.00	50	
2,3,7,8-TCDD	ND	----	4.00		2,3,4,7,8-PeCDF-13C	2.00	55	
Total TCDD	ND	----	4.00		1,2,3,7,8-PeCDD-13C	2.00	67	
					1,2,3,4,7,8-HxCDF-13C	2.00	63	
1,2,3,7,8-PeCDF	ND	----	2.20		1,2,3,6,7,8-HxCDF-13C	2.00	71	
2,3,4,7,8-PeCDF	ND	----	1.80		2,3,4,6,7,8-HxCDF-13C	2.00	77	
Total PeCDF	ND	----	2.00		1,2,3,7,8,9-HxCDF-13C	2.00	72	
					1,2,3,4,7,8-HxCDD-13C	2.00	70	
1,2,3,7,8-PeCDD	ND	----	1.80		1,2,3,6,7,8-HxCDD-13C	2.00	77	
Total PeCDD	ND	----	1.80		1,2,3,4,6,7,8-HpCDF-13C	2.00	72	
					1,2,3,4,7,8,9-HpCDF-13C	2.00	69	
1,2,3,4,7,8-HxCDF	ND	----	1.70		1,2,3,4,6,7,8-HpCDD-13C	2.00	87	
1,2,3,6,7,8-HxCDF	ND	----	1.60		OCDD-13C	4.00	88	
2,3,4,6,7,8-HxCDF	ND	----	1.10					
1,2,3,7,8,9-HxCDF	ND	----	0.86		1,2,3,4-TCDD-13C	2.00	NA	
Total HxCDF	ND	----	1.30		1,2,3,7,8,9-HxCDD-13C	2.00	NA	
1,2,3,4,7,8-HxCDD	ND	----	1.70		2,3,7,8-TCDD-37Cl4	0.20	31	P
1,2,3,6,7,8-HxCDD	ND	----	1.80					
1,2,3,7,8,9-HxCDD	ND	----	1.40					
Total HxCDD	ND	----	1.70					
1,2,3,4,6,7,8-HpCDF	ND	----	1.20					
1,2,3,4,7,8,9-HpCDF	ND	----	1.80					
Total HpCDF	4.2	----	1.50	BJ				
1,2,3,4,6,7,8-HpCDD	4.6	----	1.80	J				
Total HpCDD	4.6	----	1.80	J				
OCDF	6.2	----	1.20	BJ				
OCDD	43.0	----	2.00	J				

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection. Totals are averages of individual isomer LODs.
D = Result obtained from analysis of diluted sample
B = Less than 10 times higher than method blank level
P = Recovery outside of method 1613 control limits
J = Concentration detected is below the calibration range
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....106983

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Pace Analytical™

Method 1613B Blank Analysis Results

Client - Del Mar Analytical

Lab Sample ID	BLANK-6264	Matrix	Water
Filename	F50209B_05	Dilution	NA
Total Amount Extracted	929 mL	Extracted	02/04/2005
ICAL Date	11/29/2004	Analyzed	02/09/2005 22:34
CCal Filename(s)	F50209A_13	Injected By	MRO

Native Isomers	Conc pg/L	EMPC pg/L	LOD pg/L		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	—	11.0		2,3,7,8-TCDF-13C	2.00	9 P
Total TCDF	ND	—	—		2,3,7,8-TCDD-13C	2.00	14 P
					1,2,3,7,8-PeCDF-13C	2.00	26
2,3,7,8-TCDD	ND	—	13.0		2,3,4,7,8-PeCDF-13C	2.00	35
Total TCDD	ND	—	—		1,2,3,7,8-PeCDD-13C	2.00	45
					1,2,3,4,7,8-HxCDF-13C	2.00	50
1,2,3,7,8-PeCDF	ND	—	5.0		1,2,3,6,7,8-HxCDF-13C	2.00	57
2,3,4,7,8-PeCDF	ND	—	2.5		2,3,4,6,7,8-HxCDF-13C	2.00	69
Total PeCDF	ND	—	—		1,2,3,7,8,9-HxCDF-13C	2.00	58
					1,2,3,4,7,8-HxCDD-13C	2.00	58
1,2,3,7,8-PeCDD	ND	—	3.7		1,2,3,6,7,8-HxCDD-13C	2.00	63
Total PeCDD	ND	—	—		1,2,3,4,6,7,8-HpCDF-13C	2.00	63
					1,2,3,4,7,8,9-HpCDF-13C	2.00	60
1,2,3,4,7,8-HxCDF	ND	—	1.8		1,2,3,4,6,7,8-HpCDD-13C	2.00	78
1,2,3,6,7,8-HxCDF	ND	—	1.9		OCDD-13C	4.00	80
2,3,4,6,7,8-HxCDF	ND	—	1.5				
1,2,3,7,8,9-HxCDF	ND	—	1.9		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	—	—		1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	—	2.6		2,3,7,8-TCDD-37Cl4	0.20	16 P
1,2,3,6,7,8-HxCDD	ND	—	2.2				
1,2,3,7,8,9-HxCDD	ND	—	2.2				
Total HxCDD	ND	—	—				
1,2,3,4,6,7,8-HpCDF	1.9	—	1.8	J			
1,2,3,4,7,8,9-HpCDF	ND	—	1.9				
Total HpCDF	1.9	—	—	J			
1,2,3,4,6,7,8-HpCDD	ND	—	2.0				
Total HpCDD	ND	—	—				
OCDF	4.8	—	1.7	J			
OCDD	—	8.7	3.5	I			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection. Totals are averages of individual isomer LODs.
A = Limit of Detection based on signal to noise
P = Recovery outside of method 1613 control limits
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....106914

REPORT OF LABORATORY ANALYSIS

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1700 Elm Street - Suite 200
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Tel: 612-607-1700
Fax: 612-607-6444

Pace Analytical™

Method 1613B Laboratory Control Spike Results

Client - Del Mar Analytical

Lab Sample ID	LCS-6265	Matrix	Water
Filename	F50209B_01	Dilution	NA
Total Amount Extracted	956 mL	Extracted	02/04/2005
ICAL Date	11/29/2004	Analyzed	02/09/2005 19:13
CCal Filename	F50209A_13	Injected By	MRO
Method Blank ID	BLANK-6264		

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDF	10	10.2	7.5	15.8	102
2,3,7,8-TCDD	10	9.3	6.7	15.8	93
1,2,3,7,8-PeCDF	50	51.4	40.0	67.0	103
2,3,4,7,8-PeCDF	50	48.6	34.0	80.0	97
1,2,3,7,8-PeCDD	50	43.2	35.0	71.0	86
1,2,3,4,7,8-HxCDF	50	48.1	36.0	67.0	96
1,2,3,6,7,8-HxCDF	50	47.3	42.0	65.0	95
2,3,4,6,7,8-HxCDF	50	50.1	35.0	78.0	100
1,2,3,7,8,9-HxCDF	50	46.8	39.0	65.0	94
1,2,3,4,7,8-HxCDD	50	50.3	35.0	82.0	101
1,2,3,6,7,8-HxCDD	50	51.8	38.0	67.0	104
1,2,3,7,8,9-HxCDD	50	49.8	32.0	81.0	100
1,2,3,4,6,7,8-HpCDF	50	52.1	41.0	61.0	104
1,2,3,4,7,8,9-HpCDF	50	51.9	39.0	69.0	104
1,2,3,4,6,7,8-HpCDD	50	43.8	35.0	70.0	88
OCDF	100	95.4	63.0	170.0	95
OCDD	100	96.8	78.0	144.0	97
2,3,7,8-TCDD-37Cl4	10	4.2	3.1	19.1	42
2,3,7,8-TCDF-13C	100	31.8	22.0	152.0	32
2,3,7,8-TCDD-13C	100	41.3	20.0	175.0	41
1,2,3,7,8-PeCDF-13C	100	53.7	21.0	192.0	54
2,3,4,7,8-PeCDF-13C	100	60.1	13.0	328.0	60
1,2,3,7,8-PeCDD-13C	100	71.7	21.0	227.0	72
1,2,3,4,7,8-HxCDF-13C	100	63.5	19.0	202.0	64
1,2,3,6,7,8-HxCDF-13C	100	75.5	21.0	159.0	75
2,3,4,6,7,8-HxCDF-13C	100	78.8	22.0	176.0	79
1,2,3,7,8,9-HxCDF-13C	100	69.4	17.0	205.0	69
1,2,3,4,7,8-HxCDD-13C	100	71.3	21.0	193.0	71
1,2,3,6,7,8-HxCDD-13C	100	72.9	25.0	163.0	73
1,2,3,4,6,7,8-HpCDF-13C	100	72.8	21.0	158.0	73
1,2,3,4,7,8,9-HpCDF-13C	100	68.2	20.0	186.0	68
1,2,3,4,6,7,8-HpCDD-13C	100	87.9	26.0	166.0	88
OCDD-13C	200	173.9	26.0	397.0	87

Cs = Concentration Spiked (ng/mL)
Cr = Concentration Recovered (ng/mL)
Rec. = Recovery (Expressed as Percent)
Control Limit Reference: Method 1613, Table 6, 10/94 Revision
X = Background subtracted value
P = Recovery outside of control limits
Nn = Value obtained from additional analysis
* = See Discussion

Report No.....106914

REPORT OF LABORATORY ANALYSIS

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1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Pace Analytical™

Method 1613B Laboratory Control Spike Results

Client - Del Mar Analytical

Lab Sample ID	LCSD-6266	Matrix	Water
Filename	F50209B_02	Dilution	NA
Total Amount Extracted	983 mL	Extracted	02/04/2005
ICAL Date	11/29/2004	Analyzed	02/09/2005 20:04
CCal Filename	F50209A_13	Injected By	MRO
Method Blank ID	BLANK-6264		

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDF	10	9.9	7.5	15.8	99
2,3,7,8-TCDD	10	8.9	6.7	15.8	89
1,2,3,7,8-PeCDF	50	51.6	40.0	67.0	103
2,3,4,7,8-PeCDF	50	49.3	34.0	80.0	99
1,2,3,7,8-PeCDD	50	43.1	35.0	71.0	86
1,2,3,4,7,8-HxCDF	50	46.4	36.0	67.0	93
1,2,3,6,7,8-HxCDF	50	47.6	42.0	65.0	95
2,3,4,6,7,8-HxCDF	50	49.6	35.0	78.0	99
1,2,3,7,8,9-HxCDF	50	47.0	39.0	65.0	94
1,2,3,4,7,8-HxCDD	50	50.7	35.0	82.0	101
1,2,3,6,7,8-HxCDD	50	51.4	38.0	67.0	103
1,2,3,7,8,9-HxCDD	50	49.5	32.0	81.0	99
1,2,3,4,6,7,8-HpCDF	50	51.2	41.0	61.0	102
1,2,3,4,7,8,9-HpCDF	50	52.9	39.0	69.0	106
1,2,3,4,6,7,8-HpCDD	50	43.8	35.0	70.0	88
OCDF	100	95.1	63.0	170.0	95
OCDD	100	98.2	78.0	144.0	98
2,3,7,8-TCDD-37Cl4	10	5.0	3.1	19.1	50
2,3,7,8-TCDF-13C	100	39.8	22.0	152.0	40
2,3,7,8-TCDD-13C	100	51.4	20.0	175.0	51
1,2,3,7,8-PeCDF-13C	100	61.4	21.0	192.0	61
2,3,4,7,8-PeCDF-13C	100	66.8	13.0	328.0	67
1,2,3,7,8-PeCDD-13C	100	82.2	21.0	227.0	82
1,2,3,4,7,8-HxCDF-13C	100	70.8	19.0	202.0	71
1,2,3,6,7,8-HxCDF-13C	100	79.9	21.0	159.0	80
2,3,4,6,7,8-HxCDF-13C	100	85.0	22.0	176.0	85
1,2,3,7,8,9-HxCDF-13C	100	75.4	17.0	205.0	75
1,2,3,4,7,8-HxCDD-13C	100	72.5	21.0	193.0	72
1,2,3,6,7,8-HxCDD-13C	100	82.8	25.0	163.0	83
1,2,3,4,6,7,8-HpCDF-13C	100	80.0	21.0	158.0	80
1,2,3,4,7,8,9-HpCDF-13C	100	73.7	20.0	186.0	74
1,2,3,4,6,7,8-HpCDD-13C	100	94.2	26.0	166.0	94
OCDD-13C	200	186.1	26.0	397.0	93

Cs = Concentration Spiked (ng/mL)
Cr = Concentration Recovered (ng/mL)
Rec. = Recovery (Expressed as Percent)
Control Limit Reference: Method 1613, Table 6, 10/94 Revision
X = Background subtracted value
P = Recovery outside of control limits
Nn = Value obtained from additional analysis
* = See Discussion

Report No.....106914

REPORT OF LABORATORY ANALYSIS

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Phone: 612.607.1700
Fax: 612.607.6444

SPIKE RECOVERY RELATIVE PERCENT DIFFERENCE (RPD) RESULTS

Client..... Del Mar Analytical

SPIKE 1 ID.....LCS-6265
SPIKE 1 Filename..... F50209B_01
SPIKE 2 ID.....LCSD-6266
SPIKE 2 Filename..... F50209B_02

COMPOUND	SPIKE 1 REC,%	SPIKE 2 REC,%	RPD,%
2378-TCDF	102	99	3.0
2378-TCDD	93	89	4.4
12378-PeCDF	103	103	0.0
23478-PeCDF	97	99	2.0
12378-PeCDD	86	86	0.0
123478-HxCDF	96	93	3.2
123678-HxCDF	95	95	0.0
234678-HxCDF	100	99	1.0
123789-HxCDF	94	94	0.0
123478-HxCDD	101	101	0.0
123678-HxCDD	104	103	1.0
123789-HxCDD	100	99	1.0
1234678-HpCDF	104	102	1.9
1234789-HpCDF	104	106	1.9
1234678-HpCDD	88	88	0.0
OCDF	95	95	0.0
OCDD	97	98	1.0

REC = Percent Recovered
RPD = The difference between the two values divided by the average.
NA = Not Applicable

Report No.....106914

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nelac

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Pace Analytical Services, Inc.
1700 Elm Street
Minneapolis, MN 55414
Phone: 612.607.1700
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TABLE 1. 2,3,7,8-TCDD Equivalency Factors (TEFs) for the Polychlorinated Dibenzo-p-dioxins and Dibenzofurans

Number	Compound(s)	TEF
1	2,3,7,8-TCDD	1.00
2	1,2,3,7,8-PeCDD	0.50
3	1,2,3,6,7,8-HxCDD	0.1
4	1,2,3,7,8,9-HxCDD	0.1
5	1,2,3,4,7,8-HxCDD	0.1
6	1,2,3,4,6,7,8-HpCDD	0.01
7	OCDD	0.001
8	* Total - TCDD	0.0
9	* Total - PeCDD	0.0
10	* Total - HxCDD	0.0
11	* Total - HpCDD	0.0
12	2,3,7,8-TCDF	0.10
13	1,2,3,7,8-PeCDF	0.05
14	2,3,4,7,8-PeCDF	0.5
15	1,2,3,6,7,8-HxCDF	0.1
16	1,2,3,7,8,9-HxCDF	0.1
17	1,2,3,4,7,8-HxCDF	0.1
18	2,3,4,6,7,8-HxCDF	0.1
19	1,2,3,4,6,7,8-HpCDF	0.01
20	1,2,3,4,7,8,9-HpCDF	0.01
21	OCDF	0.001
22	* Total - TCDF	0.0
23	* Total - PeCDF	0.0
24	* Total - HxCDF	0.0
25	* Total - HpCDF	0.0

*Excluding the 2,3,7,8-substituted congeners.

Reference: 1989 ITEFs

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ACCREDITED IN ACCORDANCE WITH nelac

Del Mar Analytical

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SUBCONTRACT ORDER - PROJECT # IOA1804 106983

SENDING LABORATORY:
Del Mar Analytical, Irvine
17461 Derian Avenue. Suite 100
Irvine, CA 92614
Phone: (949) 261-1022
Fax: (949) 261-1228
Project Manager: Michele Harper

RECEIVING LABORATORY:
Pace Analytical, MN- SUB
1700 Elm Street, Ste 200
Minneapolis, MN 55414
Phone :(612) 607-1700
Fax: (612) 607-6444

Standard TAT is requested unless specific due date is requested => Due Date:_____ Initials:_____

Analysis	Expiration	Comments
Sample ID: IOA1804-01 Water	**Sampled: 01/28/05 09:38**	106983001
1613-Dioxin-HR	02/04/05 09:38	J flags, 17 congeners, no TEQ, sub to Pace-MN
EDD + Level 4	02/25/05 09:38	Excel EDD email to pm,Include Std logs for Lvl IV

Containers Supplied:
(F) 1 L Amber (IOA1804-01C)
1 L Amber (IOA1804-01D)

SAMPLE INTEGRITY:

All containers intact: ☐ Yes ☐ No Sample labels/COC agree: ☐ Yes ☐ No Samples Received On Ice:: ☐ Yes ☐ No
Custody Seals Present: ☐ Yes ☐ No Samples Preserved Properly: ☐ Yes ☐ No Samples Received at (temp): 2.1°C

Released By	Date	Time	Received By	Date	Time
	1-31-05	1700		2-1-05	09:45
Released By	Date	Time	Received By	Date	Time

(F) 1 GL Received Broken JF 2-1-05

APPENDIX G

Section 5

January Outfall 005

AMEC Data Validation Reports

Del Mar Analytical Laboratory Reports

CONTRACT COMPLIANCE SCREENING FORM FOR HARDCOPY DATA

AMEC Earth & Environmental
550 South Wadsworth Boulevard
Suite 500
Lakewood, CO 80226

Laboratory Alta
Reviewer K. Shadowlight
Analysis/Method Dioxins

Package ID T711DF20
Task Order 313150010
SDG No. Multiple
No. of Analyses 15
Date: February 11, 2005
Reviewer's Signature K Shadowlight

ACTION ITEMS[a]	
1. **Case Narrative Deficiencies**	
2. **Out of Scope Analyses**	
3. **Analyses Not Conducted**	
4. **Missing Hardcopy Deliverables**	
5. **Incorrect Hardcopy Deliverables**	
6. **Deviations from Analysis Protocol, e.g.,**	Qualifications were assigned for the following:
Holding Times	* Method blank contamination
GC/MS Tune/Inst. Performance	* EMPCs
Calibration	* Detects below the lower method calibration level
Method blanks	
Surrogates	
Matrix Spike/Dup LCS	
Field QC	
Internal Standard Performance	
Compound Identification and Quantitation	
System Performance	
COMMENTS[b]	Rev. 1

[a] Subcontracted analytical laboratory is not meeting contract and/or method requirements.
[b] Differences in protocol have been adopted by the laboratory but no action against the laboratory is required.

DATA VALIDATION REPORT

NPDES
Monitoring

ANALYSIS: DIOXINS/FURANS

SAMPLE DELIVERY GROUPS: Multiple SDGs

Prepared by

AMEC—Denver Operations
550 South Wadsworth Boulevard, Suite 500
Lakewood, Colorado 80226

1. INTRODUCTION

Task Order Title:	NPDES Monitoring
Contract Task Order #:	313150010
Sample Delivery Group #:	Multiple
Project Manager:	B. McIlvaine
Matrix:	Water
Analysis:	Dioxins/Furans
QC Level:	Level IV
No. of Samples:	15
No. of Reanalyses/Dilutions:	0
Reviewer:	K. Shadowlight
Date of Review:	February 11, 2005

The samples listed in Table 1 were validated based on the guidelines outlined in the *AMEC Data Validation Procedure for Dioxins and Furans (DVP-19, Rev. 1), EPA Method 1613, and the National National Functional Guidelines For Chlorinated Dioxin/Furan Data Review* (8/02). Any deviations from these procedures and guidelines are documented herein. Qualifiers were applied in cases where the data did not meet the required QC criteria or where special consideration by the data user is required. Data qualifiers were placed on Form Is with the associated qualification codes. Analytes that were rejected for any reason are denoted on the Form I as having only the "R" data qualifier and associated qualification code(s) denoting the reason for rejection. Any additional problems with the data that may have resulted in an estimated value were not denoted by a qualification code since the data had already been rejected.

Table 1. Sample Identification

Client ID	Laboratory ID (Del Mar)	Laboratory ID (Pace)	Matrix	COC Method
Outfall 003	IOA0026-01	105648001	water	1613
Outfall 004	IOA0027-01	105646001	water	1613
Outfall 005	IOA0028-01	105645001	water	1613
Outfall 007	IOA0108-01	105774001	water	1613
Outfall 008	IOA0109-01	105775001	water	1613
Outfall 009	IOA0110-01	105770001	water	1613
Outfall 010	IOA0111-01	105758001	water	1613
Outfall 001	IOA0112-01	105778001	water	1613
Outfall 002	IOA0119-01	105772001	water	1613
Outfall 018	IOA0122-01	105779001	water	1613
Outfall 011	IOA0131-01	105773001	water	1613
Outfall 006	IOA0458-01	106048001	water	1613
Outfall 004	IOA0460-01	106050001	water	1613
Outfall 005	IOA0464-01	106052001	water	1613
Outfall 003	IOA0466-01	106051001	water	1613

2. DATA VALIDATION FINDINGS

2.1 SAMPLE MANAGEMENT

Following are findings associated with sample management:

2.1.1 Sample Preservation, Handling, and Transport

All of the samples in these SDGs were received at Del Mar Analytical within the temperature limits of 4°C ±2°C. Several of the samples in these SDGs were received at Pace Analytical Services below the temperature limits of 4°C ±2°C; however, as none of the samples were noted to have been damaged, no qualifications were required. The samples were received in good condition at both laboratories. No qualifications were required.

2.1.2 Chain of Custody

The COC and transfer COC were signed by the appropriate field and laboratory personnel, and accounted for the analyses presented in these SDGs. As the samples were couriered directly to the laboratory (Del Mar Analytical), custody seals were not required. There was no information regarding custody seals upon receipt at Pace. No qualifications were required.

2.1.3 Holding Times

The samples were extracted and analyzed within a year of collection. No qualifications were required.

2.2 INSTRUMENT PERFORMANCE

Following are findings associated with instrument performance:

2.2.1 GC Column Performance

A column performance standard was combined with the daily calibration verification and analyzed at the beginning of each analytical sequence. The GC column performance was acceptable with the chromatographic separation of 2,3,7,8-TCDD and other TCDD isomers resolved with a valley of ≤25%. No qualifications were required.

2.2.2 Mass Spectrometer Performance

The mass spectrometer performance could not be evaluated as the laboratory did not provide selected ion current profiles for the lock-mass ions. No qualifications were required.

2.3 CALIBRATION

2.3.1 Initial Calibration

There was one initial calibration, analyzed 11/29/04 on Instrument 10MSHR05. The calibration consisted of five concentration level standards (CS1 through CS5) analyzed to verify instrument linearity. The initial calibration was acceptable with %RSDs ≤20% for the 15 native compounds (calibration by isotope dilution) and ≤35% for the 2 native and all labeled compounds (calibration by internal standard). The relative retention times and ion abundance ratios were within the QC limits listed in Method 1613 for all standards. A representative number of %RSDs were verified from the raw data, and no calculation or transcription errors were noted. No qualifications were required.

2.3.2 Continuing Calibration

Calibration verification (VER) consisted of a mid-level standard (CS3) analyzed at the beginning of each analytical sequence. The VER was acceptable with the concentrations within the acceptance criteria listed in the Table 6 of the EPA Method 1613. The ion abundance ratios and relative retention times were within the method QC limits. A representative number of %Ds were verified from the raw data, and no calculation or transcription errors were noted. No qualifications were required.

2.4 BLANKS

One method blank (Blank-6202) was extracted and analyzed with the samples in these SDGs. Target compounds 1,2,3,4,6,7,8-HpCDD, total HpCDD, OCDF, and OCDD were reported in the method blank. Any detects for the aforementioned target compounds reported at concentrations <5x the concentrations reported in the method blank were qualified as estimated nondetects "UJ," at the levels of interference in the samples of these SDGs. A review of the method blank raw data and chromatograms indicated no false negatives or false positives. No further qualifications were required.

2.5 BLANK SPIKES AND LABORATORY CONTROL SAMPLES

One LCS/LCSD pair (LCS-6203/LCSD-6204) was extracted and analyzed with the samples in these SDGs. All recoveries were within the acceptance criteria listed in Table 6 of the Method 1613. There were no QC limits established for RPDs. The reported RPDs were within ±20%. No qualifications were required.

2.6 MATRIX SPIKE/MATRIX SPIKE DUPLICATE

MS/MSD analyses were not performed in these SDGs. Evaluation of method accuracy and precision was based on the LCS/LCSD results. No qualifications were required.

2.7 FIELD QC SAMPLES

Following are findings associated with field QC:

2.7.1 Field Blanks and Equipment Rinsates

The samples in these SDGs had no associated field QC samples. No qualifications were required.

2.7.2 Field Duplicates

No field duplicate samples were identified for these SDGs.

2.8 INTERNAL STANDARDS

The labeled standard recoveries were within the acceptance criteria listed in Table 7 of Method 1613. No qualifications were required.

2.9 COMPOUND IDENTIFICATION

The laboratory analyzed for polychlorinated dioxins/furans by EPA Method 1613. The compound identifications were verified from the raw data and no false negatives or positives were noted. No qualifications were required.

2.10 COMPOUND QUANTIFICATION AND REPORTED DETECTION LIMITS

Compound quantitation was verified from the raw data. The laboratory calculated and reported compound-specific detection limits. Any detects below the lower method calibration limit (MCL) were qualified as estimated, "J." Any reported EMPC was qualified as an estimated nondetect, "UJ." No further qualifications were required.

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Pace Analytical™

Method 1613B Analysis Results

Client - Del Mar Analytical

Client's Sample ID	IOA0028-01 outfall 005		
Lab Sample ID	105645001		
Filename	F50127A_08		
Injected By	MRO		
Total Amount Extracted	1030 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	01/03/2005
ICAL Date	11/29/2004	Received	01/04/2005
CCal Filename(s)	F50127A_02	Extracted	01/24/2005
Method Blank ID	BLANK-6202	Analyzed	01/27/2005 15:54

Native Isomers	Conc pg/L	EMPC pg/L	LOD pg/L		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	4.0		2,3,7,8-TCDF-13C	2.00	39
Total TCDF	ND	-----	4.0		2,3,7,8-TCDD-13C	2.00	51
					1,2,3,7,8-PeCDF-13C	2.00	68
2,3,7,8-TCDD	ND	-----	3.4		2,3,4,7,8-PeCDF-13C	2.00	69
Total TCDD	ND	-----	3.4		1,2,3,7,8-PeCDD-13C	2.00	80
					1,2,3,4,7,8-HxCDF-13C	2.00	73
1,2,3,7,8-PeCDF	ND	-----	2.3		1,2,3,6,7,8-HxCDF-13C	2.00	89
2,3,4,7,8-PeCDF	ND	-----	1.4		2,3,4,6,7,8-HxCDF-13C	2.00	90
Total PeCDF	ND	-----	1.9		1,2,3,7,8,9-HxCDF-13C	2.00	78
					1,2,3,4,7,8-HxCDD-13C	2.00	71
1,2,3,7,8-PeCDD	ND	-----	2.3		1,2,3,6,7,8-HxCDD-13C	2.00	87
Total PeCDD	ND	-----	2.3		1,2,3,4,6,7,8-HpCDF-13C	2.00	80
					1,2,3,4,7,8,9-HpCDF-13C	2.00	72
1,2,3,4,7,8-HxCDF	ND	-----	2.3		1,2,3,4,6,7,8-HpCDD-13C	2.00	92
1,2,3,6,7,8-HxCDF	ND	-----	1.8		OCDD-13C	4.00	88
2,3,4,6,7,8-HxCDF	ND	-----	1.3				
1,2,3,7,8,9-HxCDF	ND	-----	1.5		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	-----	1.7		1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	2.2		2,3,7,8-TCDD-37Cl4	0.20	48
1,2,3,6,7,8-HxCDD	ND	-----	2.0				
1,2,3,7,8,9-HxCDD	ND	-----	1.4				
Total HxCDD	ND	-----	1.9				
1,2,3,4,6,7,8-HpCDF	11	-----	3.3	J			
1,2,3,4,7,8,9-HpCDF	ND	-----	1.8				
Total HpCDF	11	-----	2.5	J			
1,2,3,4,6,7,8-HpCDD	21	-----	1.9	J			
Total HpCDD	35	-----	1.9	J			
OCDF	79	-----	3.5	BJ			
OCDD	310	-----	3.0				

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection. Totals are averages of individual isomer LODs.
D = Result obtained from analysis of diluted sample
B = Less than 10 times higher than method blank level
P = Recovery outside of method 1613 control limits
J = Concentration detected is below the calibration range
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....105645

ANCS VALIDATED

REPORT OF LABORATORY ANALYSIS

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CONTRACT COMPLIANCE SCREENING FORM FOR HARDCOPY DATA

AMEC Earth & Environmental
550 South Wadsworth Boulevard
Suite 500
Lakewood, CO 80226

Laboratory Del Mar Analytical
Reviewer K. Okonzak
Analysis/Method metals

Package ID T711MT22
Task Order 3131500120
SDG No. IOA0027, 0028, 0029
No. of Analyses 3

Date: 2/01/05
Reviewer's Signature

ACTION ITEMS[a]	
1. **Case Narrative Deficiencies**	
2. **Out of Scope Analyses**	
3. **Analyses Not Conducted**	
4. **Missing Hardcopy Deliverables**	
5. **Incorrect Hardcopy Deliverables**	
6. **Deviations from Analysis Protocol, e.g.,**	Qualifications applied for lead detected between the MDL and the reporting limit.
	The mercury reanalysis, for sample Outfall 004 was rejected, "R," and the original mercury analysis was reported for this sample. The reanalysis confirmed the original mercury detect.
Holding Times	
GC/MS Tune/Inst. Perform	
Calibrations	
Blanks	
Surrogates	
Matrix Spike/Dup LCS	
Field QC	
Internal Standard Performance	
Compound Identification and Quantitation	
System Performance	

COMMENTS[b]	

[a] Subcontracted analytical laboratory is not meeting contract and/or method requirements.
[b] Differences in protocol have been adopted by the laboratory but no action against the laboratory is required.

Data Qualifier Reference Table

Qualifier	Organics	Inorganics
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.	The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.	The associated value is an estimated quantity.
N	The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification."	Not applicable.
NJ	The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.	Not applicable.
UJ	The analyte was not deemed above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.	The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.
R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and to meet quality control criteria. The presence or absence of the analyte cannot be verified.	The data are unusable. (Note: Analyte may or may not be present).

Qualification Code Reference Table

Qualifier	Organics	Inorganics
H	Holding times were exceeded.	Holding times were exceeded.
S	Surrogate recovery was outside QC limits.	The sequence or number of standards used for the calibration was incorrect
C	Calibration %RSD or %D were noncompliant.	Correlation coefficient is <0.995.
R	Calibration RRF was <0.05.	%R for calibration is not within control limits.
B	Presumed contamination from preparation (method) blank.	Presumed contamination from preparation (method) or calibration blank.
L	Laboratory Blank Spike/Blank Spike Duplicate %R was not within control limits.	Laboratory Control Sample %R was not within control limits.
Q	MS/MSD recovery was poor or RPD high.	MS recovery was poor.
E	Not applicable.	Duplicates showed poor agreement.
I	Internal standard performance was unsatisfactory.	ICP ICS results were unsatisfactory.
A	Not applicable.	ICP Serial Dilution %D were not within control limits.
M	Tuning (BFB or DFTPP) was noncompliant.	Not applicable.
T	Presumed contamination from trip blank.	Not applicable.
+	False positive – reported compound was not present. Not applicable.	
-	False negative – compound was present but not reported.	Not applicable.
F	Presumed contamination from FB, or ER.	Presumed contamination from FB or ER.
$	Reported result or other information was incorrect.	Reported result or other information was incorrect.
?	TIC identity or reported retention time has been changed.	Not applicable.
D	The analysis with this flag should not be used because another more technically sound analysis is available.	The analysis with this flag should not be used because another more technically sound analysis is available.
P	Instrument performance for pesticides was poor.	Post Digestion Spike recovery was not within control limits.
DNQ	The compound was detected between the MDL and the RL and, by definition, is considered an estimated value.	The compound was detected between the MDL and the RL and, by definition, is considered an estimated value.

*#	Unusual problems found with the data that have been described in Section 2.#, "Data Validation Findings." The number following the asterisk (*) will indicate the subsection where a description of the problem can be found (eg. *1 would indicate a sample was not within temperature limits).	Unusual problems found with the data that have been described in Section 2.#, "Data Validation Findings." The number following the asterisk (*) will indicate the subsection where a description of the problem can be found (eg. *1 would indicate a sample was not within temperature limits).

DATA VALIDATION REPORT

NPDES
Monitoring

ANALYSIS: METALS

SAMPLE DELIVERY GROUP: IOA0027, IOA0028, IOA0029

Prepared by

AMEC—Denver Operations
550 South Wadsworth Boulevard, Suite 500
Lakewood, Colorado 80226

1. INTRODUCTION

Task Order Title:	NPDES Monitoring
Contract Task Order #:	313150010
SDG#:	IOA0027, IOA0028, IOA0029
Project Manager:	B. McIlvaine
Matrix:	Water
Analysis:	Metals
QC Level:	Level IV
No. of Samples:	3
No. of Reanalyses/Dilutions:	0
Reviewer:	K. Okonzak
Date of Review:	February 1, 2005

The samples listed in Table 1 were validated based on the guidelines outlined in the *AMEC Data Validation Procedure for Levels III and IV ICP-MS Metals, (DVP-5-A, Rev.0), AMEC Data Validation Procedure for Levels III and IV ICP Metals* (DVP-5, Rev. 0), SW-846 *Method 6020B for Inductively Coupled Plasma – Mass Spectrometry*, SW-846 *Method 7471A for Mercury (Manual Cold-Vapor Technique)*, and validation guidelines outlined in the USEPA CLP *National Functional Guidelines for Inorganic Data Review* (2/94). Any deviations from these procedures and guidelines are documented herein. Qualifiers were applied in cases where the data did not meet the required QC criteria or where special consideration by the data user is required. Data qualifiers were placed on Form Is with the associated qualification codes. Analytes that were rejected for any reason are denoted on the Form I as having only the "R" data qualifier and associated qualification code(s) denoting the reason for rejection. Any additional problems with the data that may have resulted in an estimated value were not denoted by a qualification code since the data had already been rejected.

Table 1. Sample identification

Client ID	EPA ID	Laboratory ID	Matrix	COC Method
Outfall 004	Outfall 004	IOA0027-01	water	ILM04
Outfall 005	Outfall 005	IOA0028-01	water	ILM04
Outfall 006	Outfall 006	IOA0029-01	water	ILM04

2. DATA VALIDATION FINDINGS

2.1 SAMPLE MANAGEMENT

Following are findings associated with sample management:

2.1.1 Sample Preservation, Handling, and Transport

The samples in these SDGs were received at the laboratory within the temperature limits of 4°C ±2°C. No sample preservation, handling, or transport problems were noted, and no qualifications were necessary.

2.1.2 Chain of Custody

The COCs were signed and dated by field and laboratory personnel. The COCs listed duplicate samples for metals analysis for all three site samples. A duplicate analysis, Outfall 004-RE1, was performed for mercury for sample Outfall 004 to confirm the mercury detect reported for this sample. Since the reanalysis confirmed the mercury result, the reanalysis was rejected, and the original mercury analysis was reported for sample Outfall 004. Duplicate analyses were not required for the lead results reported for the three site samples. No sample qualifications were required.

2.1.3 Holding Times

The date of collection recorded on the COCs and the dates of analysis recorded in the raw data, documented that the sample analysis was performed within the specified holding times of six months for the ICP/MS lead and 28 days for mercury. No qualifications were assigned.

2.2 ICP-MS TUNING

The ICP-MS tuning solution analyses are not included in the raw data package; therefore, the samples were not assessed for this criterion.

2.3 CALIBRATION

The ICV and CCV results showed acceptable %Rs, 90-110% for the ICP/MS and 80-120% for mercury. The ICP/MS and mercury 0.2 ppb check standards were within the laboratory-established control limits, and no sample qualifications were required due to calibration.

2.4 BLANKS

The calibration and method blanks associated with the samples in these SDGs were nondetected for mercury and lead at the laboratory MDL; therefore, no sample qualifications were required due to the blanks.

2.5 ICP INTERFERENCE CHECK SAMPLE (ICS A/AB)

Results were not provided for ICP-MS spiked interferents sulfur, phosphorus, carbon, titanium, and chloride. The results for aluminum, sodium, and potassium were above the calibration range of the instrument in both the ICSA and ICSAB analyses. Lead was not spiked into the ICSAB solution. The validator reviewed the raw data for the site sample ICP/MS analysis for the level of reported interferents, Al, Ca, Fe, and Mg, and determined that the concentration of interferents was not high enough to cause matrix affects. No assessment could be made with respect to possible interference from sulfur, phosphorus, carbon, and chloride. No qualifications were required.

2.6 BLANK SPIKES AND LABORATORY CONTROL SAMPLES

The ICP/MS LCS was identified as 5A04040-BS1, and the mercury LCS samples were identified as 5A04047-BS1 and 5A20051-BS1. The LCS results on the summary form and in the raw data were within the laboratory-established ICP/MS and mercury control limits of 85-115%. No qualifications were required.

2.7 LABORATORY DUPLICATES

The laboratory MS/MSD analyses were performed on sample Outfall 005. The precision between the MS/MSD aliquots was within the 20% RPD control limit for the lead and mercury analyses, and no sample qualifications were required.

2.8 MATRIX SPIKE

The laboratory MS/MSD analyses were performed on sample Outfall 005. The MS/MSD recoveries for lead and mercury were within the 70-130%R control limit, and no sample qualifications were required.

2.9 FURNACE ATOMIC ABSORPTION QC

Furnace atomic absorption was not utilized for the analysis of the samples; therefore, furnace atomic absorption QC is not applicable.

2.10 ICP/MS SERIAL DILUTION

No serial dilution analysis was performed in association with the samples in these data packages; therefore, no assessment was made with respect to this criterion.

2.11 INTERNAL STANDARDS PERFORMANCE

The ICP-MS internal standard recoveries for the site sample and associated QC sample analyses were within the 60-125% control limits used for validation, and no qualifications were required.

2.12 SAMPLE RESULT VERIFICATION

A Level IV review was performed for the samples in these data packages. Calculations were verified, and the sample results reported on the Form Is were verified against the raw data. No transcription errors or calculation errors were noted. Lead detected below the reporting limit in all three site samples was qualified as estimated, "J," by the laboratory. Outfall 004 was reanalyzed for mercury and reported as Outfall 004 RE1. As the original and reanalysis results were similar, the reanalysis, Outfall 004 RE1, was rejected, "R," in favor of the original result, Outfall 004. No further qualifications were required.

2.13 FIELD QC SAMPLES

Field QC samples are evaluated, and if necessary, qualified based only on laboratory blanks. Any remaining detects are used to evaluate the associated samples.

2.13.1 Field Blanks and Equipment Rinsates

The samples in these SDGs had no associated field QC samples. No qualifications were required.

2.13.2 Field Duplicates

There were no field duplicate analyses performed in association with the site samples reported in these data packages.

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 005

Report Number: IOA0023

Sampled: 01/03/05
Received: 01/03/05

DRAFT: METALS

Analyte	Method	Batch	MDL	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers Rev Qual	Qual Code
Sample ID: IOA0028-01 (DRAFT: Outfall 005 - Water)										
Reporting Units: ug/l										
Lead	EPA 200.8	5A04040	0.13	1.0	**0.19**	1	01/04/05	01/04/05	J	DNQ

KMC 2/01/05

AMEC VALIDATED

LEVEL IV

DRAFT REPORT
DRAFT REPORT
DATA SUBJECT TO CHANGE

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Del Mar Analytical

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2520 E. Sunset Rd. #3, Las Vegas, NV 89120 (702) 798-3620 FAX (702) 798-3621

LABORATORY REPORT

Prepared For: MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project: Routine Outfall 005

Sampled: 01/03/05
Received: 01/03/05
Issued: 02/15/05 15:14

NELAP #01108CA CA ELAP #1197 CSDLAC #10117

The results listed within this Laboratory Report pertain only to the samples tested in the laboratory. The analyses contained in this report were performed in accordance with the applicable certifications as noted. All soil samples are reported on a wet weight basis unless otherwise noted in the report. This Laboratory Report is confidential and is intended for the sole use of Del Mar Analytical and its client. This report shall not be reproduced, except in full, without written permission from Del Mar Analytical. The Chain of Custody, 1 page, is included and is an integral part of this report.
This entire report was reviewed and approved for release.

SAMPLE CROSS REFERENCE

SUBCONTRACTED: Refer to the last page for specific subcontract laboratory information included in this report.

LABORATORY ID	CLIENT ID	MATRIX
IOA0028-01	Outfall 005	Water

Reviewed By:

Michele Harper

Del Mar Analytical, Irvine
Michele Harper
Project Manager

Del Mar Analytical

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 005
Report Number: IOA0028

Sampled: 01/03/05
Received: 01/03/05

METALS

Analyte	Method	Batch	MDL Limit	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA0028-01 (Outfall 005 - Water)									
Reporting Units: ug/l									
Antimony	EPA 200.8	5A04040	0.18	2.0	ND	1	01/04/05	01/04/05	
Cadmium	EPA 200.8	5A04040	0.015	1.0	**0.026**	1	01/04/05	01/04/05	J
Copper	EPA 200.8	5A04040	0.49	2.0	**0.71**	1	01/04/05	01/04/05	B, J
Lead	EPA 200.8	5A04040	0.13	1.0	**0.19**	1	01/04/05	01/04/05	J
Mercury	EPA 245.1	5A04047	0.063	0.20	**0.13**	1	01/04/05	01/04/05	J

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 005
Report Number: IOA0028

Sampled: 01/03/05
Received: 01/03/05

INORGANICS

Analyte	Method	Batch	MDL Limit	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA0028-01 (Outfall 005 - Water) - cont.									
Reporting Units: mg/l									
Chloride	EPA 300.0	5A03042	0.26	0.50	**1.0**	1	01/03/05	01/03/05	
Nitrate/Nitrite-N	EPA 300.0	5A03042	0.072	0.26	**4.6**	1	01/03/05	01/03/05	
Oil & Grease	EPA 413.1	5A05068	0.94	5.0	ND	1	01/05/05	01/05/05	
Sulfate	EPA 300.0	5A03042	0.18	0.50	**2.7**	1	01/03/05	01/03/05	
Total Dissolved Solids	SM2540C	5A05071	10	10	**84**	1	01/05/05	01/05/05	

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 005
Report Number: IOA0028

Sampled: 01/03/05
Received: 01/03/05

SHORT HOLD TIME DETAIL REPORT

	Hold Time (in days)	Date/Time Sampled	Date/Time Received	Date/Time Extracted	Date/Time Analyzed
Sample ID: Outfall 005 (IOA0028-01) - Water					
EPA 300.0	2	01/03/2005 10:45	01/03/2005 15:00	01/03/2005 16:15	01/03/2005 17:11

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Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 005
Report Number: IOA0028

Sampled: 01/03/05
Received: 01/03/05

METHOD BLANK/QC DATA

METALS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A04040 Extracted: 01/04/05											
Blank Analyzed: 01/04/2005 (5A04040-BLK1)											
Antimony	ND	2.0	0.18	ug/l							
Cadmium	ND	1.0	0.015	ug/l							
Copper	0.492	2.0	0.49	ug/l							J
Lead	ND	1.0	0.13	ug/l							
LCS Analyzed: 01/04/2005-01/05/2005 (5A04040-BS1)											
Antimony	91.9	2.0	0.18	ug/l	80.0		115	85-115			
Cadmium	84.0	1.0	0.015	ug/l	80.0		105	85-115			
Copper	77.4	2.0	0.49	ug/l	80.0		97	85-115			
Lead	75.7	1.0	0.13	ug/l	80.0		95	85-115			
Matrix Spike Analyzed: 01/04/2005-01/05/2005 (5A04040-MS1)						**Source: IOA0028-01**					
Antimony	95.3	2.0	0.18	ug/l	80.0	ND	119	70-130			
Cadmium	84.9	1.0	0.015	ug/l	80.0	0.026	106	70-130			
Copper	77.6	2.0	0.49	ug/l	80.0	0.71	96	70-130			
Lead	78.4	1.0	0.13	ug/l	80.0	0.19	98	70-130			
Matrix Spike Dup Analyzed: 01/04/2005-01/05/2005 (5A04040-MSD1)						**Source: IOA0028-01**					
Antimony	93.3	2.0	0.18	ug/l	80.0	ND	117	70-130	2	20	
Cadmium	83.4	1.0	0.015	ug/l	80.0	0.026	104	70-130	2	20	
Copper	77.2	2.0	0.49	ug/l	80.0	0.71	96	70-130	1	20	
Lead	77.0	1.0	0.13	ug/l	80.0	0.19	96	70-130	2	20	
Batch: 5A04047 Extracted: 01/04/05											
Blank Analyzed: 01/04/2005 (5A04047-BLK1)											
Mercury	ND	0.20	0.063	ug/l							

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 005
Report Number: IOA0028

Sampled: 01/03/05
Received: 01/03/05

METHOD BLANK/QC DATA

METALS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A04047 Extracted: 01/04/05											
LCS Analyzed: 01/04/2005 (5A04047-BS1)											
Mercury	8.41	0.20	0.063	ug/l	8.00		105	85-115			
Matrix Spike Analyzed: 01/04/2005 (5A04047-MS1)						**Source: IOA0028-01**					
Mercury	8.10	0.20	0.063	ug/l	8.00	0.13	100	70-130			
Matrix Spike Dup Analyzed: 01/04/2005 (5A04047-MSD1)						**Source: IOA0028-01**					
Mercury	8.27	0.20	0.063	ug/l	8.00	0.13	102	70-130	2	20	

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Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 005
Report Number: IOA0028

Sampled: 01/03/05
Received: 01/03/05

METHOD BLANK/QC DATA

INORGANICS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A03042 Extracted: 01/03/05											
Blank Analyzed: 01/03/2005 (5A03042-BLK1)											
Chloride	ND	0.50	0.26	mg/l							
Nitrate/Nitrite-N	ND	0.26	0.072	mg/l							
Sulfate	ND	0.50	0.18	mg/l							
LCS Analyzed: 01/03/2005 (5A03042-BS1)											
Chloride	4.90	0.50	0.26	mg/l	5.00		98	90-110			
Sulfate	9.85	0.50	0.18	mg/l	10.0		98	90-110			
Matrix Spike Analyzed: 01/03/2005 (5A03042-MS1)						**Source: IOA0026-01**					
Chloride	9.42	0.50	0.26	mg/l	5.00	4.5	98	80-120			
Sulfate	14.6	0.50	0.18	mg/l	10.0	4.3	103	80-120			
Matrix Spike Dup Analyzed: 01/03/2005 (5A03042-MSD1)						**Source: IOA0026-01**					
Chloride	9.36	0.50	0.26	mg/l	5.00	4.5	97	80-120	1	20	
Sulfate	15.1	0.50	0.18	mg/l	10.0	4.3	108	80-120	3	20	
Batch: 5A05068 Extracted: 01/05/05											
Blank Analyzed: 01/05/2005 (5A05068-BLK1)											
Oil & Grease	ND	5.0	0.94	mg/l							
LCS Analyzed: 01/05/2005 (5A05068-BS1)											**M-NR1**
Oil & Grease	20.1	5.0	0.94	mg/l	20.0		100	65-120			
LCS Dup Analyzed: 01/05/2005 (5A05068-BSD1)											
Oil & Grease	21.1	5.0	0.94	mg/l	20.0		106	65-120	5	20	

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 005
Report Number: IOA0028

Sampled: 01/03/05
Received: 01/03/05

METHOD BLANK/QC DATA

INORGANICS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A05071 Extracted: 01/05/05											
Blank Analyzed: 01/05/2005 (5A05071-BLK1)											
Total Dissolved Solids	ND	10	10	mg/l							
LCS Analyzed: 01/05/2005 (5A05071-BS1)											
Total Dissolved Solids	1070	10	10	mg/l	1000		107	90-110			
Duplicate Analyzed: 01/05/2005 (5A05071-DUP1)						**Source: IOA0066-02**					
Total Dissolved Solids	250	10	10	mg/l		250			0	10	

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 005
Report Number: IOA0028

Sampled: 01/03/05
Received: 01/03/05

Compliance Check

The results obtained from the analytical testing of this data set were checked against compliance limits received from the client. Any results at or above the compliance limits appear in bold on this page.

LabNumber	Analysis	Analyte	Units	Result	MRL	Compliance Limit
IOA0028-01	413.1 Oil and Grease	Oil & Grease	mg/l	-2	5.0	15
IOA0028-01	Antimony-200.8	Antimony	ug/l	0	2.0	6.00
IOA0028-01	Cadmium-200.8	Cadmium	ug/l	0.026	1.0	4.00
IOA0028-01	Chloride - 300.0	Chloride	mg/l	1.00	0.50	150
IOA0028-01	Copper-200.8	Copper	ug/l	0.71	2.0	14
IOA0028-01	Mercury - 245.1	Mercury	ug/l	0.13	0.20	0.20
IOA0028-01	Nitrogen, NO3+NO2 -N	Nitrate/Nitrite-N	mg/l	4.60	0.26	10.00
IOA0028-01	Sulfate-300.0	Sulfate	mg/l	2.70	0.50	250
IOA0028-01	TDS - SM 2540C	Total Dissolved Solids	mg/l	84	10	850

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Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 005
Report Number: IOA0028

Sampled: 01/03/05
Received: 01/03/05

DATA QUALIFIERS AND DEFINITIONS

B	Analyte was detected in the associated Method Blank.
J	Estimated value. Analyte detected at a level less than the Reporting Limit (RL) and greater than or equal to the Method Detection Limit (MDL). The user of this data should be aware that this data is of unknown quality.
M-NR1	There was no MS/MSD analyzed with this batch due to insufficient sample volume. See Blank Spike/Blank Spike Duplicate.
ND	Analyte NOT DETECTED at or above the reporting limit or MDL, if MDL is specified.
RPD	Relative Percent Difference

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 005

Report Number: IOA0028

Sampled: 01/03/05
Received: 01/03/05

Certification Summary

Del Mar Analytical, Irvine

Method	Matrix	NELAP	CA
EPA 200.8	Water	X	X
EPA 245.1	Water	X	X
EPA 300.0	Water	X	X
EPA 413.1	Water	X	X
SM2540C	Water	X	X

NV and NELAP provide analyte specific accreditations. Analyte specific information for Del Mar Analytical may be obtained by contacting the laboratory or visiting our website at www.dmalabs.com.

Subcontracted Laboratories

Pace Analytical, MN- SUB

1700 Elm Street, Ste 200 - Minneapolis, MN 55414

Analysis Performed: 1613-Dioxin-HR
Samples: IOA0028-01

Analysis Performed: EDD + Level 4
Samples: IOA0028-01

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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IOA0025

Del Mar Analytical Version 5 8/12/04 CHAIN OF CUSTODY FORM

Client Name/Address:	Project:
MWH-Pasadena 300 North Lake Avenue, Suite 1200 Pasadena, CA 91101	Boeing-SSFL NPDES **Routine Outfall 005** Stormwater at FSDF-1
Project Manager: Bronwyn Kelly Sampler: Ruben E. Barrosa	Phone Number: (626) 568-6691 Fax Number: (626) 568-6515

Sample Description	Sample Matrix	Container Type	# of Cont.	Sampling Date/Time	Preservative	Bottle * #	ANALYSIS REQUIRED: Total Reoverable Metals: Sb, Cd, Cu, Pb, Hg	TCDD (and all congeners)	Oil & Grease (EPA 413.1)	Cl-, SO4, NO3+NO2-N	TDS					Field readings: / Comments
Outfall 005	W	Poly-1L	1	01/03/05	HNO3	1A	X									Temp = 49.8 pH= 7.1
Outfall 005-Dup	W	Poly-1L	1		HNO3	1B	X									
Outfall 005	W	Glass-Amber	2		None	2A, 2B		X								
Outfall 005	W	Glass-Amber	2		HCl	3A, 3B			X							
Outfall 005	W	Poly-500 ml	2		None	4A, 4B				X						
Outfall 005	W	Poly-500 ml	2		None	5A, 5B					X					

Relinquished By	Date/Time:	Received By	Date/Time:
Ruben E. Barrosa	1-3-05 1300		1-3-05 1300
		Received By	Date/Time:
Relinquished By	Date/Time:		
	1-3-05 1500		
Relinquished By	Date/Time:	Received By	Date/Time:
			1/3/05 15:00

Turn around Time: (check)
24 Hours _____ 5 Days _____
48 Hours _____ 10 Days _____
72 Hours _____ Normal X
Perchlorate Only 72 Hours_____
Metals Only 72 Hours_____
Sample Integrity: (Check)
Intact X On Ice: 4°C

Del Mar Analytical

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MWH-Pasadena/Boeing
300 North Lake Avenue
Pasadena, Ca. 91101

Attention: Bronwyn Kelly

Project: Routine Outfall 005
Sampled: 01/03/05
Del Mar Analytical Number: IOA0028

Dear Ms. Kelly:

Pace Analytical performed Method 1613B analysis for the project referenced above. Please use the following cross-reference table when reviewing your results.

MWH ID	DEL MAR ID	Pace ID
Outfall 005	IOA0028-01	105645001

Attached is the original report from the subcontract laboratory. If you have any questions or require further assistance, please do not hesitate to contact me.

Sincerely yours,
DEL MAR ANALYTICAL

Michele Harper
Project Manager

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
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Pace Analytical™

Method 1613B Analysis Results

Client - Del Mar Analytical

Client's Sample ID	IOA0028-01		
Lab Sample ID	105645001		
Filename	F50127A_08		
Injected By	MRO		
Total Amount Extracted	1030 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	01/03/2005
ICAL Date	11/29/2004	Received	01/04/2005
CCal Filename(s)	F50127A_02	Extracted	01/24/2005
Method Blank ID	BLANK-6202	Analyzed	01/27/2005 15:54

Native Isomers	Conc pg/L	EMPC pg/L	LOD pg/L		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	4.0		2,3,7,8-TCDF-13C	2.00	39
Total TCDF	ND	-----	4.0		2,3,7,8-TCDD-13C	2.00	51
					1,2,3,7,8-PeCDF-13C	2.00	68
2,3,7,8-TCDD	ND	-----	3.4		2,3,4,7,8-PeCDF-13C	2.00	69
Total TCDD	ND	-----	3.4		1,2,3,7,8-PeCDD-13C	2.00	80
					1,2,3,4,7,8-HxCDF-13C	2.00	73
1,2,3,7,8-PeCDF	ND	-----	2.3		1,2,3,6,7,8-HxCDF-13C	2.00	89
2,3,4,7,8-PeCDF	ND	-----	1.4		2,3,4,6,7,8-HxCDF-13C	2.00	90
Total PeCDF	ND	-----	1.9		1,2,3,7,8,9-HxCDF-13C	2.00	78
					1,2,3,4,7,8-HxCDD-13C	2.00	71
1,2,3,7,8-PeCDD	ND	-----	2.3		1,2,3,6,7,8-HxCDD-13C	2.00	87
Total PeCDD	ND	-----	2.3		1,2,3,4,6,7,8-HpCDF-13C	2.00	80
					1,2,3,4,7,8,9-HpCDF-13C	2.00	72
1,2,3,4,7,8-HxCDF	ND	-----	2.3		1,2,3,4,6,7,8-HpCDD-13C	2.00	92
1,2,3,6,7,8-HxCDF	ND	-----	1.8		OCDD-13C	4.00	88
2,3,4,6,7,8-HxCDF	ND	-----	1.3				
1,2,3,7,8,9-HxCDF	ND	-----	1.5		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	-----	1.7		1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	2.2		2,3,7,8-TCDD-37Cl4	0.20	48
1,2,3,6,7,8-HxCDD	ND	-----	2.0				
1,2,3,7,8,9-HxCDD	ND	-----	1.4				
Total HxCDD	ND	-----	1.9				
1,2,3,4,6,7,8-HpCDF	11	-----	3.3	J			
1,2,3,4,7,8,9-HpCDF	ND	-----	1.8				
Total HpCDF	11	-----	2.5	J			
1,2,3,4,6,7,8-HpCDD	21	-----	1.9	J			
Total HpCDD	35	-----	1.9	J			
OCDF	79	-----	3.5	BJ			
OCDD	310	-----	3.0				

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection. Totals are averages of individual isomer LODs.
D = Result obtained from analysis of diluted sample
B = Less than 10 times higher than method blank level
P = Recovery outside of method 1613 control limits
J = Concentration detected is below the calibration range
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....105645

REPORT OF LABORATORY ANALYSIS

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Pace Analytical™

Method 1613B Blank Analysis Results

Client - Del Mar Analytical

Lab Sample ID	BLANK-6202	Matrix	Water
Filename	F50127A_06	Dilution	NA
Total Amount Extracted	982 mL	Extracted	01/24/2005
ICAL Date	11/29/2004	Analyzed	01/27/2005 14:13
CCal Filename(s)	F50127A_02	Injected By	MRO

Native Isomers	Conc pg/L	EMPC pg/L	LOD pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	4.7	2,3,7,8-TCDF-13C	2.00	33
Total TCDF	ND	-----	-----	2,3,7,8-TCDD-13C	2.00	45
				1,2,3,7,8-PeCDF-13C	2.00	68
2,3,7,8-TCDD	ND	-----	5.1	2,3,4,7,8-PeCDF-13C	2.00	70
Total TCDD	ND	-----	-----	1,2,3,7,8-PeCDD-13C	2.00	81
				1,2,3,4,7,8-HxCDF-13C	2.00	75
1,2,3,7,8-PeCDF	ND	-----	2.2	1,2,3,6,7,8-HxCDF-13C	2.00	95
2,3,4,7,8-PeCDF	ND	-----	1.5	2,3,4,6,7,8-HxCDF-13C	2.00	98
Total PeCDF	ND	-----	-----	1,2,3,7,8,9-HxCDF-13C	2.00	85
				1,2,3,4,7,8-HxCDD-13C	2.00	78
1,2,3,7,8-PeCDD	ND	-----	1.6	1,2,3,6,7,8-HxCDD-13C	2.00	94
Total PeCDD	ND	-----	-----	1,2,3,4,6,7,8-HpCDF-13C	2.00	85
				1,2,3,4,7,8,9-HpCDF-13C	2.00	78
1,2,3,4,7,8-HxCDF	ND	-----	1.6	1,2,3,4,6,7,8-HpCDD-13C	2.00	99
1,2,3,6,7,8-HxCDF	ND	-----	1.4	OCDD-13C	4.00	97
2,3,4,6,7,8-HxCDF	ND	-----	1.1			
1,2,3,7,8,9-HxCDF	ND	-----	1.6	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	-----	-----	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	1.6	2,3,7,8-TCDD-37Cl4	0.20	40
1,2,3,6,7,8-HxCDD	ND	-----	1.2			
1,2,3,7,8,9-HxCDD	ND	-----	1.7			
Total HxCDD	ND	-----	-----			
1,2,3,4,6,7,8-HpCDF	ND	-----	1.5			
1,2,3,4,7,8,9-HpCDF	ND	-----	1.4			
Total HpCDF	ND	-----	-----			
1,2,3,4,6,7,8-HpCDD	1.9	-----	1.3 J			
Total HpCDD	1.9	-----	----- J			
OCDF	8.3	-----	1.9 J			
OCDD	26.0	-----	2.3 J			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection. Totals are averages of individual isomer LODs.
A = Limit of Detection based on signal to noise
P = Recovery outside of method 1613 control limits
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....105645

REPORT OF LABORATORY ANALYSIS

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Pace Analytical™

Method 1613B Laboratory Control Spike Results

Client - Del Mar Analytical

Lab Sample ID	LCS-6203		
Filename	F50127A_03	Matrix	Water
Total Amount Extracted	1030 mL	Dilution	NA
ICAL Date	11/29/2004	Extracted	01/24/2005
CCal Filename	F50127A_02	Analyzed	01/27/2005 11:44
Method Blank ID	BLANK-6202	Injected By	MRO

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDF	10	10.2	7.5	15.8	102
2,3,7,8-TCDD	10	9.0	6.7	15.8	90
1,2,3,7,8-PeCDF	50	50.1	40.0	67.0	100
2,3,4,7,8-PeCDF	50	48.4	34.0	80.0	97
1,2,3,7,8-PeCDD	50	43.4	35.0	71.0	87
1,2,3,4,7,8-HxCDF	50	44.8	36.0	67.0	90
1,2,3,6,7,8-HxCDF	50	48.0	42.0	65.0	96
2,3,4,6,7,8-HxCDF	50	48.6	35.0	78.0	97
1,2,3,7,8,9-HxCDF	50	46.4	39.0	65.0	93
1,2,3,4,7,8-HxCDD	50	50.0	35.0	82.0	100
1,2,3,6,7,8-HxCDD	50	51.7	38.0	67.0	103
1,2,3,7,8,9-HxCDD	50	48.5	32.0	81.0	97
1,2,3,4,6,7,8-HpCDF	50	51.4	41.0	61.0	103
1,2,3,4,7,8,9-HpCDF	50	52.3	39.0	69.0	105
1,2,3,4,6,7,8-HpCDD	50	43.4	35.0	70.0	87
OCDF	100	89.5	63.0	170.0	90
OCDD	100	96.9	78.0	144.0	97
2,3,7,8-TCDD-37Cl4	10	6.2	3.1	19.1	62
2,3,7,8-TCDF-13C	100	49.8	22.0	152.0	50
2,3,7,8-TCDD-13C	100	65.8	20.0	175.0	66
1,2,3,7,8-PeCDF-13C	100	75.7	21.0	192.0	76
2,3,4,7,8-PeCDF-13C	100	76.9	13.0	328.0	77
1,2,3,7,8-PeCDD-13C	100	93.4	21.0	227.0	93
1,2,3,4,7,8-HxCDF-13C	100	78.9	19.0	202.0	79
1,2,3,6,7,8-HxCDF-13C	100	89.8	21.0	159.0	90
2,3,4,6,7,8-HxCDF-13C	100	88.2	22.0	176.0	88
1,2,3,7,8,9-HxCDF-13C	100	81.5	17.0	205.0	81
1,2,3,4,7,8-HxCDD-13C	100	82.2	21.0	193.0	82
1,2,3,6,7,8-HxCDD-13C	100	95.2	25.0	163.0	95
1,2,3,4,6,7,8-HpCDF-13C	100	86.3	21.0	158.0	86
1,2,3,4,7,8,9-HpCDF-13C	100	75.6	20.0	186.0	76
1,2,3,4,6,7,8-HpCDD-13C	100	102.9	26.0	166.0	103
OCDD-13C	200	195.1	26.0	397.0	98

Cs = Concentration Spiked (ng/mL)
Cr = Concentration Recovered (ng/mL)
Rec. = Recovery (Expressed as Percent)
Control Limit Reference: Method 1613, Table 6, 10/94 Revision
X = Background subtracted value
P = Recovery outside of control limits
Nn = Value obtained from additional analysis
* = See Discussion

Report No.....105645

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Pace Analytical™

Method 1613B Laboratory Control Spike Results

Client - Del Mar Analytical

Lab Sample ID	LCSD-6204		
Filename	F50127A_04	Matrix	Water
Total Amount Extracted	1000 mL	Dilution	NA
ICAL Date	11/29/2004	Extracted	01/24/2005
CCal Filename	F50127A_02	Analyzed	01/27/2005 12:32
Method Blank ID	BLANK-6202	Injected By	MRO

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDF	10	9.9	7.5	15.8	99
2,3,7,8-TCDD	10	8.8	6.7	15.8	88
1,2,3,7,8-PeCDF	50	49.8	40.0	67.0	100
2,3,4,7,8-PeCDF	50	47.6	34.0	80.0	95
1,2,3,7,8-PeCDD	50	41.4	35.0	71.0	83
1,2,3,4,7,8-HxCDF	50	46.6	36.0	67.0	93
1,2,3,6,7,8-HxCDF	50	44.0	42.0	65.0	88
2,3,4,6,7,8-HxCDF	50	47.2	35.0	78.0	94
1,2,3,7,8,9-HxCDF	50	44.8	39.0	65.0	90
1,2,3,4,7,8-HxCDD	50	46.5	35.0	82.0	93
1,2,3,6,7,8-HxCDD	50	48.9	38.0	67.0	98
1,2,3,7,8,9-HxCDD	50	46.7	32.0	81.0	93
1,2,3,4,6,7,8-HpCDF	50	48.7	41.0	61.0	97
1,2,3,4,7,8,9-HpCDF	50	49.9	39.0	69.0	100
1,2,3,4,6,7,8-HpCDD	50	42.7	35.0	70.0	85
OCDF	100	84.8	63.0	170.0	85
OCDD	100	92.5	78.0	144.0	92
2,3,7,8-TCDD-37Cl4	10	7.5	3.1	19.1	75
2,3,7,8-TCDF-13C	100	65.7	22.0	152.0	66
2,3,7,8-TCDD-13C	100	83.8	20.0	175.0	84
1,2,3,7,8-PeCDF-13C	100	84.9	21.0	192.0	85
2,3,4,7,8-PeCDF-13C	100	85.6	13.0	328.0	86
1,2,3,7,8-PeCDD-13C	100	105.3	21.0	227.0	105
1,2,3,4,7,8-HxCDF-13C	100	82.6	19.0	202.0	83
1,2,3,6,7,8-HxCDF-13C	100	96.7	21.0	159.0	97
2,3,4,6,7,8-HxCDF-13C	100	92.3	22.0	176.0	92
1,2,3,7,8,9-HxCDF-13C	100	84.5	17.0	205.0	84
1,2,3,4,7,8-HxCDD-13C	100	81.9	21.0	193.0	82
1,2,3,6,7,8-HxCDD-13C	100	102.0	25.0	163.0	102
1,2,3,4,6,7,8-HpCDF-13C	100	90.1	21.0	158.0	90
1,2,3,4,7,8,9-HpCDF-13C	100	78.6	20.0	186.0	79
1,2,3,4,6,7,8-HpCDD-13C	100	106.1	26.0	166.0	106
OCDD-13C	200	196.4	26.0	397.0	98

Cs = Concentration Spiked (ng/mL)
Cr = Concentration Recovered (ng/mL)
Rec. = Recovery (Expressed as Percent)
Control Limit Reference: Method 1613, Table 6, 10/94 Revision
X = Background subtracted value
P = Recovery outside of control limits
Nn = Value obtained from additional analysis
* = See Discussion

Report No.....105645

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SPIKE RECOVERY RELATIVE PERCENT DIFFERENCE (RPD) RESULTS

Client..... Del Mar Analytical

SPIKE 1 ID..... LCS-6203
SPIKE 1 Filename..... F50127A_03
SPIKE 2 ID..... LCSD-6204
SPIKE 2 Filename..... F50127A_04

COMPOUND	SPIKE 1 REC,%	SPIKE 2 REC,%	RPD,%
2378-TCDF	102	99	3.0
2378-TCDD	90	88	2.2
12378-PeCDF	100	100	0.0
23478-PeCDF	97	95	2.1
12378-PeCDD	87	83	4.7
123478-HxCDF	90	93	3.3
123678-HxCDF	96	88	8.7
234678-HxCDF	97	94	3.1
123789-HxCDF	93	90	3.3
123478-HxCDD	100	93	7.3
123678-HxCDD	103	98	5.0
123789-HxCDD	97	93	4.2
1234678-HpCDF	103	97	6.0
1234789-HpCDF	105	100	4.9
1234678-HpCDD	87	85	2.3
OCDF	90	85	5.7
OCDD	97	92	5.3

REC = Percent Recovered
RPD = The difference between the two values divided by the average.
NA = Not Applicable

Report No..... 105645

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TABLE 1. 2,3,7,8-TCDD Equivalency Factors (TEFs) for the Polychlorinated Dibenzo-p-dioxins and Dibenzofurans

Number	Compound(s)	TEF
1	2,3,7,8-TCDD	1.00
2	1,2,3,7,8-PeCDD	0.50
3	1,2,3,6,7,8-HxCDD	0.1
4	1,2,3,7,8,9-HxCDD	0.1
5	1,2,3,4,7,8-HxCDD	0.1
6	1,2,3,4,6,7,8-HpCDD	0.01
7	OCDD	0.001
8	* Total - TCDD	0.0
9	* Total - PeCDD	0.0
10	* Total - HxCDD	0.0
11	* Total - HpCDD	0.0
12	2,3,7,8-TCDF	0.10
13	1,2,3,7,8-PeCDF	0.05
14	2,3,4,7,8-PeCDF	0.5
15	1,2,3,6,7,8-HxCDF	0.1
16	1,2,3,7,8,9-HxCDF	0.1
17	1,2,3,4,7,8-HxCDF	0.1
18	2,3,4,6,7,8-HxCDF	0.1
19	1,2,3,4,6,7,8-HpCDF	0.01
20	1,2,3,4,7,8,9-HpCDF	0.01
21	OCDF	0.001
22	* Total - TCDF	0.0
23	* Total - PeCDF	0.0
24	* Total - HxCDF	0.0
25	* Total - HpCDF	0.0

*Excluding the 2,3,7,8-substituted congeners.

Reference: 1989 ITEFs

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Del Mar Analytical

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9830 South 51st Street, Suite B-120, Phoenix, AZ 85044 Ph (480) 785-0043 Fax (480) 785-0851
2520 E. Sunset Rd., Suite #3, Las Vegas, NV 89120 Ph (702) 798-3620 Fax (702) 798-3621

SUBCONTRACT ORDER - PROJECT # IOA0028

10564S

SENDING LABORATORY:	RECEIVING LABORATORY:
Del Mar Analytical, Irvine 17461 Derian Avenue. Suite 100 Irvine, CA 92614 Phone: (949) 261-1022 Fax: (949) 261-1228 Project Manager: Michele Harper	Pace Analytical, MN- SUB 1700 Elm Street, Ste 200 Minneapolis, MN 55414 Phone :(612) 607-1700 Fax: (612) 607-6444

Standard TAT is requested unless specific due date is requested => Due Date:_____ Initials:_____

Analysis	Expiration	Comments
Sample ID: IOA0028-01 Water	**Sampled: 01/03/05 10:45**	10564STC1
1613-Dioxin-HR	01/10/05 10:45	J flags, 17 congeners, no TEQ, sub to Pace-MN

Containers Supplied:
1 L Amber (IOA0028-01C)
1 L Amber (IOA0028-01D)

SAMPLE INTEGRITY:

All containers intact: ☒ Yes ☐ No
Custody Seals Present: ☐ Yes ☒ No
Sample labels/COC agree: ☒ Yes ☐ No
Samples Preserved Properly: ☒ Yes ☐ No
Samples Received On Ice:: ☒ Yes ☐ No
Samples Received at (temp): 2.0

Released By	Date	Time	Received By	Date	Time
	01-03-05	1700	PACE	1/4/05	0820
Released By	Date	Time	Received By	Date	Time

Del Mar Analytical

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2800 E. Sunset Rd., Suite #3, Las Vegas, NV 89120 Ph (702) 798-3620 Fax (702) 798-3621

SUBCONTRACT ORDER - PROJECT # IOA0028

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Del Mar Analytical, Irvine
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Irvine, CA 92614
Phone: (949) 261-1022
Fax: (949) 261-1228
Project Manager: Michele Harper

RECEIVING LABORATORY:
Pace Analytical, MN- SUB
1700 Elm Street, Ste 200
Minneapolis, MN 55414
Phone :(612) 607-1700
Fax: (612) 607-6444

105645

Standard TAT is requested unless specific due date is requested => Due Date:_____ Initials:_____

Analysis	Expiration	Comments
Sample ID: IOA0028-01 Water	**Sampled: 01/03/05 10:45**	
1613-Dioxin-HR	01/10/05 10:45	J flags, 17 congeners, no TEQ, sub to Pace-MN
EDD + Level 4	01/31/05 10:45	Excel EDD email to pm,Include Std logs for Lvl IV

Containers Supplied:
1 L Amber (IOA0028-01C)
1 L Amber (IOA0028-01D)

FAXED 1/5/05

SAMPLE INTEGRITY:

All containers intact: ☐ Yes ☐ No Sample labels/COC agree: ☐ Yes ☐ No Samples Received On Ice: ☐ Yes ☐ No
Custody Seals Present: ☐ Yes ☐ No Samples Preserved Properly: ☐ Yes ☐ No Samples Received at (temp): _____

Released By	Date	Time	Received By	Date	Time
1/5/05					
Released By	Date	Time	Received By	Date	Time

CONTRACT COMPLIANCE SCREENING FORM FOR HARDCOPY DATA

AMEC Earth & Environmental
550 South Wadsworth Boulevard
Suite 500
Lakewood, CO 80226

Laboratory Alta
Reviewer K. Shadowlight
Analysis/Method Dioxins

Package ID T711DF20
Task Order 313150010
SDG No. Multiple
No. of Analyses 15

Date: February 11, 2005
Reviewer's Signature K Shadowlight

ACTION ITEMS[a]	
1. **Case Narrative Deficiencies**	
2. **Out of Scope Analyses**	
3. **Analyses Not Conducted**	
4. **Missing Hardcopy Deliverables**	
5. **Incorrect Hardcopy Deliverables**	
6. **Deviations from Analysis Protocol, e.g.,**	Qualifications were assigned for the following:
Holding Times	* Method blank contamination
GC/MS Tune/Inst. Performance	* EMPCs
Calibration	* Detects below the lower method calibration level
Method blanks	
Surrogates	
Matrix Spike/Dup LCS	
Field QC	
Internal Standard Performance	
Compound Identification and Quantitation	
System Performance	
COMMENTS[b]	Rev. 1

[a] Subcontracted analytical laboratory is not meeting contract and/or method requirements.
[b] Differences in protocol have been adopted by the laboratory but no action against the laboratory is required.

DATA VALIDATION REPORT

NPDES
Monitoring

ANALYSIS: DIOXINS/FURANS

SAMPLE DELIVERY GROUPS: Multiple SDGs

Prepared by

AMEC—Denver Operations
550 South Wadsworth Boulevard, Suite 500
Lakewood, Colorado 80226

1. INTRODUCTION

Task Order Title:	NPDES Monitoring
Contract Task Order #:	313150010
Sample Delivery Group #:	Multiple
Project Manager:	B. McIlvaine
Matrix:	Water
Analysis:	Dioxins/Furans
QC Level:	Level IV
No. of Samples:	15
No. of Reanalyses/Dilutions:	0
Reviewer:	K. Shadowlight
Date of Review:	February 11, 2005

The samples listed in Table 1 were validated based on the guidelines outlined in the *AMEC Data Validation Procedure for Dioxins and Furans (DVP-19, Rev. 1), EPA Method 1613, and the National National Functional Guidelines For Chlorinated Dioxin/Furan Data Review* (8/02). Any deviations from these procedures and guidelines are documented herein. Qualifiers were applied in cases where the data did not meet the required QC criteria or where special consideration by the data user is required. Data qualifiers were placed on Form Is with the associated qualification codes. Analytes that were rejected for any reason are denoted on the Form I as having only the "R" data qualifier and associated qualification code(s) denoting the reason for rejection. Any additional problems with the data that may have resulted in an estimated value were not denoted by a qualification code since the data had already been rejected.

Table 1. Sample Identification

Client ID	Laboratory ID (Del Mar)	Laboratory ID (Pace)	Matrix	COC Method
Outfall 003	IOA0026-01	105648001	water	1613
Outfall 004	IOA0027-01	105646001	water	1613
Outfall 005	IOA0028-01	105645001	water	1613
Outfall 007	IOA0108-01	105774001	water	1613
Outfall 008	IOA0109-01	105775001	water	1613
Outfall 009	IOA0110-01	105770001	water	1613
Outfall 010	IOA0111-01	105758001	water	1613
Outfall 001	IOA0112-01	105778001	water	1613
Outfall 002	IOA0119-01	105772001	water	1613
Outfall 018	IOA0122-01	105779001	water	1613
Outfall 011	IOA0131-01	105773001	water	1613
Outfall 006	IOA0458-01	106048001	water	1613
Outfall 004	IOA0460-01	106050001	water	1613
Outfall 005	IOA0464-01	106052001	water	1613
Outfall 003	IOA0466-01	106051001	water	1613

2. DATA VALIDATION FINDINGS

2.1 SAMPLE MANAGEMENT

Following are findings associated with sample management:

2.1.1 Sample Preservation, Handling, and Transport

All of the samples in these SDGs were received at Del Mar Analytical within the temperature limits of 4°C ±2°C. Several of the samples in these SDGs were received at Pace Analytical Services below the temperature limits of 4°C ±2°C; however, as none of the samples were noted to have been damaged, no qualifications were required. The samples were received in good condition at both laboratories. No qualifications were required.

2.1.2 Chain of Custody

The COC and transfer COC were signed by the appropriate field and laboratory personnel, and accounted for the analyses presented in these SDGs. As the samples were couriered directly to the laboratory (Del Mar Analytical), custody seals were not required. There was no information regarding custody seals upon receipt at Pace. No qualifications were required.

2.1.3 Holding Times

The samples were extracted and analyzed within a year of collection. No qualifications were required.

2.2 INSTRUMENT PERFORMANCE

Following are findings associated with instrument performance:

2.2.1 GC Column Performance

A column performance standard was combined with the daily calibration verification and analyzed at the beginning of each analytical sequence. The GC column performance was acceptable with the chromatographic separation of 2,3,7,8-TCDD and other TCDD isomers resolved with a valley of ≤25%. No qualifications were required.

2.2.2 Mass Spectrometer Performance

The mass spectrometer performance could not be evaluated as the laboratory did not provide selected ion current profiles for the lock-mass ions. No qualifications were required.

2.3 CALIBRATION

2.3.1 Initial Calibration

There was one initial calibration, analyzed 11/29/04 on Instrument 10MSHR05. The calibration consisted of five concentration level standards (CS1 through CS5) analyzed to verify instrument linearity. The initial calibration was acceptable with %RSDs ≤20% for the 15 native compounds (calibration by isotope dilution) and ≤35% for the 2 native and all labeled compounds (calibration by internal standard). The relative retention times and ion abundance ratios were within the QC limits listed in Method 1613 for all standards. A representative number of %RSDs were verified from the raw data, and no calculation or transcription errors were noted. No qualifications were required.

2.3.2 Continuing Calibration

Calibration verification (VER) consisted of a mid-level standard (CS3) analyzed at the beginning of each analytical sequence. The VER was acceptable with the concentrations within the acceptance criteria listed in the Table 6 of the EPA Method 1613. The ion abundance ratios and relative retention times were within the method QC limits. A representative number of %Ds were verified from the raw data, and no calculation or transcription errors were noted. No qualifications were required.

2.4 BLANKS

One method blank (Blank-6202) was extracted and analyzed with the samples in these SDGs. Target compounds 1,2,3,4,6,7,8-HpCDD, total HpCDD, OCDF, and OCDD were reported in the method blank. Any detects for the aforementioned target compounds reported at concentrations <5x the concentrations reported in the method blank were qualified as estimated nondetects "UJ," at the levels of interference in the samples of these SDGs. A review of the method blank raw data and chromatograms indicated no false negatives or false positives. No further qualifications were required.

2.5 BLANK SPIKES AND LABORATORY CONTROL SAMPLES

One LCS/LCSD pair (LCS-6203/LCSD-6204) was extracted and analyzed with the samples in these SDGs. All recoveries were within the acceptance criteria listed in Table 6 of the Method 1613. There were no QC limits established for RPDs. The reported RPDs were within ±20%. No qualifications were required.

2.6 MATRIX SPIKE/MATRIX SPIKE DUPLICATE

MS/MSD analyses were not performed in these SDGs. Evaluation of method accuracy and precision was based on the LCS/LCSD results. No qualifications were required.

2.7 FIELD QC SAMPLES

Following are findings associated with field QC:

2.7.1 Field Blanks and Equipment Rinsates

The samples in these SDGs had no associated field QC samples. No qualifications were required.

2.7.2 Field Duplicates

No field duplicate samples were identified for these SDGs.

2.8 INTERNAL STANDARDS

The labeled standard recoveries were within the acceptance criteria listed in Table 7 of Method 1613. No qualifications were required.

2.9 COMPOUND IDENTIFICATION

The laboratory analyzed for polychlorinated dioxins/furans by EPA Method 1613. The compound identifications were verified from the raw data and no false negatives or positives were noted. No qualifications were required.

2.10 COMPOUND QUANTIFICATION AND REPORTED DETECTION LIMITS

Compound quantitation was verified from the raw data. The laboratory calculated and reported compound-specific detection limits. Any detects below the lower method calibration limit (MCL) were qualified as estimated, "J." Any reported EMPC was qualified as an estimated nondetect, "UJ." No further qualifications were required.

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
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Method 1613B Analysis Results

Client - Del Mar Analytical

Client's Sample ID	IOA0464-01 Outfall 005		
Lab Sample ID	106052001		
Filename	F50127B_11		
Injected By	MRO		
Total Amount Extracted	1040 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	01/10/2005
ICAL Date	11/29/2004	Received	01/12/2005
CCal Filename(s)	F50127A_13	Extracted	01/24/2005
Method Blank ID	BLANK-6202	Analyzed	01/28/2005 05:20

Rev Qual	Qual code	Native Isomers	Conc pg/L	EMPC pg/L	LOD pg/L		Internal Standards	ng's Added	Percent Recovery
U		2,3,7,8-TCDF	ND	-----	2.20		2,3,7,8-TCDF-13C	2.00	61
U		Total TCDF	ND	-----	2.20		2,3,7,8-TCDD-13C	2.00	73
							1,2,3,7,8-PeCDF-13C	2.00	84
U		2,3,7,8-TCDD	ND	-----	3.00		2,3,4,7,8-PeCDF-13C	2.00	80
U		Total TCDD	ND	-----	3.00		1,2,3,7,8-PeCDD-13C	2.00	93
							1,2,3,4,7,8-HxCDF-13C	2.00	75
U		1,2,3,7,8-PeCDF	ND	-----	1.90		1,2,3,6,7,8-HxCDF-13C	2.00	100
↓		2,3,4,7,8-PeCDF	ND	-----	1.40		2,3,4,6,7,8-HxCDF-13C	2.00	88
		Total PeCDF	ND	-----	1.70		1,2,3,7,8,9-HxCDF-13C	2.00	80
							1,2,3,4,7,8-HxCDD-13C	2.00	69
U		1,2,3,7,8-PeCDD	ND	-----	2.20		1,2,3,6,7,8-HxCDD-13C	2.00	94
U		Total PeCDD	ND	-----	2.20		1,2,3,4,6,7,8-HpCDF-13C	2.00	81
							1,2,3,4,7,8,9-HpCDF-13C	2.00	71
U		1,2,3,4,7,8-HxCDF	ND	-----	1.60		1,2,3,4,6,7,8-HpCDD-13C	2.00	94
		1,2,3,6,7,8-HxCDF	ND	-----	0.94		OCDD-13C	4.00	85
		2,3,4,6,7,8-HxCDF	ND	-----	1.00				
		1,2,3,7,8,9-HxCDF	ND	-----	1.10		1,2,3,4-TCDD-13C	2.00	NA
↓		Total HxCDF	ND	-----	1.20		1,2,3,7,8,9-HxCDD-13C	2.00	NA
U		1,2,3,4,7,8-HxCDD	ND	-----	1.50		2,3,7,8-TCDD-37Cl4	0.20	67
		1,2,3,6,7,8-HxCDD	ND	-----	1.40				
↓		1,2,3,7,8,9-HxCDD	ND	-----	1.50				
J	DNQ	Total HxCDD	3.2	-----	1.50	J			
U		1,2,3,4,6,7,8-HpCDF	ND	-----	1.20				
U		1,2,3,4,7,8,9-HpCDF	ND	-----	1.70				
J	DNQ	Total HpCDF	2.8	-----	1.40	J			
UJ	B	1,2,3,4,6,7,8-HpCDD	7.8	-----	1.70	BJ			
J	DNQ	Total HpCDD	15.0	-----	1.70	BJ			
UJ	*10	OCDF	-----	4.0	2.20	I			
		OCDD	260.0	-----	2.30				

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection. Totals are averages of individual isomer LODs.
D = Result obtained from analysis of diluted sample
B = Less than 10 times higher than method blank level
P = Recovery outside of method 1613 control limits
J = Concentration detected is below the calibration range
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....106052

PEER EVALUATED

REPORT OF LABORATORY ANALYSIS

LEVEL IV

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CONTRACT COMPLIANCE SCREENING FORM FOR HARDCOPY DATA

AMEC Earth & Environmental
550 South Wadsworth Boulevard
Suite 500
Lakewood, CO 80226

Laboratory Del Mar
Reviewer P. Meeks
Analysis/Method Metals

Package ID T711MT25
Task Order 313150010
SDG No. Multiple
No. of Analyses 4

Date: 02/03/05
Reviewer's Signature
P. Meeks for K Okonek

ACTION ITEMS[a]	
1. **Case Narrative Deficiencies**	
2. **Out of Scope Analyses**	
3. **Analyses Not Conducted**	
4. **Missing Hardcopy Deliverables**	
5. **Incorrect Hardcopy Deliverables**	
6. **Deviations from Analysis Protocol, e.g.,**	Qualifications were applied for lead detected below the reporting limit.
Holding Times	
GC/MS Tune/Inst. Performance	
Calibrations	
Blanks	
Surrogates	
Matrix Spike/Dup LCS	
Field QC	
Internal Standard Performance	
Compound Identification and Quantitation	
System Performance	

COMMENTS[b]	

[a] Subcontracted analytical laboratory is not meeting contract and/or method requirements.
[b] Differences in protocol have been adopted by the laboratory but no action against the laboratory is required.

DATA VALIDATION REPORT

NPDES
Monitoring

ANALYSIS: METALS

SAMPLE DELIVERY GROUPS: IOA0458, IOA0460, IOA0464, & IOA0466

Prepared by

AMEC—Denver Operations
550 South Wadsworth Boulevard, Suite 500
Lakewood, Colorado 80226

1. INTRODUCTION

Task Order Title:	NPDES Monitoring
Contract Task Order #:	313150010
SDG#:	IOA0458, IOA0460, IOA0464, & IOA0466
Project Manager:	B. McIlvaine
Matrix:	Water
Analysis:	Metals
QC Level:	Level IV
No. of Samples:	4
No. of Reanalyses/Dilutions:	0
Reviewer:	K. Okonzak-Lowry
Date of Review:	February 02, 2005

The samples listed in Table 1 were validated based on the guidelines outlined in the *AMEC Data Validation Procedure for Levels III and IV ICP-MS Metals, (DVP-5-A, Rev.0), AMEC Data Validation Procedure for Levels III and IV ICP Metals* (DVP-5, Rev. 0), SW-846 *Method 6020B for Inductively Coupled Plasma – Mass Spectrometry*, SW-846 *Method 6010B for Inductively Coupled Plasma* , SW-846 *Method 7471A for Mercury (Manual Cold-Vapor Technique)*, and validation guidelines outlined in the USEPA CLP *National Functional Guidelines for Inorganic Data Review* (2/94). Any deviations from these procedures and guidelines are documented herein. Qualifiers were applied in cases where the data did not meet the required QC criteria or where special consideration by the data user is required. Data qualifiers were placed on Form Is with the associated qualification codes. Analytes that were rejected for any reason are denoted on the Form I as having only the "R" data qualifier and associated qualification code(s) denoting the reason for rejection. Any additional problems with the data that may have resulted in an estimated value were not denoted by a qualification code since the data had already been rejected.

Table 1. Sample identification

Client ID	EPA ID	Laboratory ID	Matrix	COC Method
Outfall 006	Outfall 006	IOA0458-01	water	ILM04
Outfall 004	Outfall 004	IOA0460-01	water	ILM04
Outfall 005	Outfall 005	IOA0464-01	water	ILM04
Outfall 003	Outfall 003	IOA0466-01	water	ILM04

2. DATA VALIDATION FINDINGS

2.1 SAMPLE MANAGEMENT

Following are findings associated with sample management:

2.1.1 Sample Preservation, Handling, and Transport

The samples in these SDGs were received at the laboratory within the temperature limits of 4°C ±2°C. No sample preservation, handling, or transport problems were noted, and no qualifications were necessary.

2.1.2 Chain of Custody

The COCs were signed and dated by field and laboratory personnel. The COCs listed duplicate samples for all samples; however, duplicate analyses were not required. No sample qualifications were required.

2.1.3 Holding Times

The dates of collection recorded on the COCs and the dates of analyses recorded in the raw data, documented that the sample analyses were performed within the specified holding times of six months for the ICP/MS metals. No qualifications were required.

2.2 ICP-MS TUNING

A precalibration routine must be completed prior to calibrating the instrument, which consists of analyzing a tuning solution to verify resolution, mass calibration, and thermal stability. The solution must be analyzed a minimum of five times and must contain isotopes representing all mass regions of interest. The laboratory performed the required tune solution analyses but did not report %RSDs. The laboratory SOP states that to be acceptable, the %RSD must be less than 5%. The mass calibrations were within 0.1 amu of the true mass and an the instrument resolutions were less than 0.9 amu at 10 percent peak height for all analytes in the tune solution. No site sample qualifications were required.

2.3 CALIBRATION

The ICV and CCV results showed acceptable recoveries, 90-110% for the ICP/MS. The reporting limit check standards were recovered within the AMEC control limits of 70-130%. No qualifications were required.

2.4 BLANKS

Lead was not detected in any of the method blanks or CCBs associated with the samples in these SDGs. No qualifications were required.

2.5 ICP INTERFERENCE CHECK SAMPLE (ICS A/AB)

No ICPMS interference check samples were analyzed in association with the samples in these SDGs; therefore, no assessment was made with respect to this criterion.

2.6 BLANK SPIKES AND LABORATORY CONTROL SAMPLES

The ICP/MS LCS samples were identified as 5A10077-BS1 and 5A11081-BS1. The LCS results on the summary forms and in the raw data were within the laboratory-established ICP/MS control limits of 85-115%. No qualifications were required.

2.7 LABORATORY DUPLICATES

No MS/MSD or duplicate analyses were performed in association with the samples in these SDGs; therefore, no assessment was made with respect to this criterion.

2.8 MATRIX SPIKE

No MS/MSD analyses were performed in association with the samples in these SDGs; therefore, no assessment was made with respect to this criterion.

2.9 FURNACE ATOMIC ABSORPTION QC

Furnace atomic absorption was not utilized for the analysis of these samples; therefore, furnace atomic absorption QC is not applicable.

2.10 ICP/MS SERIAL DILUTION

No serial dilution analysis was performed in association with the samples in these SDGs; therefore, no assessment was made with respect to this criterion.

2.11 INTERNAL STANDARDS PERFORMANCE

The ICP-MS internal standard recoveries for the site samples and associated QC sample analyses were within the 60-125% control limits and no qualifications were required.

2.12 SAMPLE RESULT VERIFICATION

A Level IV review was performed for the samples in these data packages. Calculations were verified, and the sample results reported on the Form Is were verified against the raw data. No transcription errors or calculation errors were noted. Lead detected below the reporting limit were qualified as estimated, "J." No further qualifications were required.

2.13 FIELD QC SAMPLES

Field QC samples are evaluated, and if necessary, qualified based only on laboratory blanks. Any remaining detects are used to evaluate the associated samples.

2.13.1 Field Blanks and Equipment Rinsates

The samples in these SDGs had no associated field QC samples. No qualifications were required.

2.13.2 Field Duplicates

There were no field duplicate analyses performed in association with the site samples.

Del Mar Analytical

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 005

Report Number: IOA0464

Sampled: 01/10/05
Received: 01/10/05

DRAFT: METALS

Analyte	Method	Batch	MDL	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers Rev Qual	Qual Code
Sample ID: IOA0464-01 (DRAFT: Outfall 005 - Water)										
Reporting Units: ug/l										
Lead	EPA 200.8	5A11081	0.13	1.0	**0.36**	1	01/11/05	01/11/05	J	DNQ

AMEC VALIDATED

LEVEL IV

KMR 2/03/05

DRAFT REPORT
DRAFT REPORT
DATA SUBJECT TO CHANGE

The results pertain only to the samples tested in the laboratory. This report shall not be reproduced, except in full, without written permission from Del Mar Analytical.

Del Mar Analytical

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LABORATORY REPORT

Prepared For: MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project: Routine Outfall 005

Sampled: 01/10/05
Received: 01/10/05
Issued: 02/22/05 11:57

NELAP #01108CA California ELAP#1197 CSDLAC #10117

The results listed within this Laboratory Report pertain only to the samples tested in the laboratory. The analyses contained in this report were performed in accordance with the applicable certifications as noted. All soil samples are reported on a wet weight basis unless otherwise noted in the report. This Laboratory Report is confidential and is intended for the sole use of Del Mar Analytical and its client. This report shall not be reproduced, except in full, without written permission from Del Mar Analytical. The Chain of Custody, 1 page, is included and is an integral part of this report.
This entire report was reviewed and approved for release.

SAMPLE CROSS REFERENCE

SUBCONTRACTED: Refer to the last page for specific subcontract laboratory information included in this report.

LABORATORY ID	CLIENT ID	MATRIX
IOA0464-01	Outfall 005	Water

Reviewed By:

Michele Harper

Del Mar Analytical, Irvine
Michele Harper
Project Manager

Del Mar Analytical

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 005
Report Number: IOA0464

Sampled: 01/10/05
Received: 01/10/05

METALS

Analyte	Method	Batch	MDL Limit	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA0464-01 (Outfall 005 - Water)									
Reporting Units: ug/l									
Antimony	EPA 200.8	5A11081	0.18	2.0	**0.31**	1	01/11/05	01/11/05	J
Cadmium	EPA 200.8	5A11081	0.015	1.0	**0.017**	1	01/11/05	01/11/05	J
Copper	EPA 200.8	5A11081	0.49	2.0	**1.0**	1	01/11/05	01/11/05	J
Lead	EPA 200.8	5A11081	0.13	1.0	**0.36**	1	01/11/05	01/11/05	J
Mercury	EPA 245.1	5A12047	0.063	0.20	**0.12**	1	01/12/05	01/12/05	J

Del Mar Analytical, Irvine
Michele Harper
Project Manager

The results pertain only to the samples tested in the laboratory. This report shall not be reproduced, except in full, without written permission from Del Mar Analytical.

Del Mar Analytical

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 005
Report Number: IOA0464

Sampled: 01/10/05
Received: 01/10/05

INORGANICS

Analyte	Method	Batch	MDL Limit	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA0464-01 (Outfall 005 - Water) - cont.									
Reporting Units: mg/l									
Chloride	EPA 300.0	5A10035	0.26	0.50	**1.3**	1	01/10/05	01/10/05	
Nitrate/Nitrite-N	EPA 300.0	5A10035	0.072	0.26	**3.3**	1	01/10/05	01/10/05	
Oil & Grease	EPA 413.1	5A12061	0.94	5.0	**7.0**	1	01/12/05	01/12/05	B
Sulfate	EPA 300.0	5A10035	0.18	0.50	**2.5**	1	01/10/05	01/10/05	
Total Dissolved Solids	SM2540C	5A11087	10	10	**68**	1	01/11/05	01/11/05	

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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2520 E. Sunset Rd. #3, Las Vegas, NV 89120 (702) 798-3620 FAX (702) 798-3621

MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 005

Report Number: IOA0464

Sampled: 01/10/05
Received: 01/10/05

SHORT HOLD TIME DETAIL REPORT

	Hold Time (in days)	Date/Time Sampled	Date/Time Received	Date/Time Extracted	Date/Time Analyzed
Sample ID: Outfall 005 (IOA0464-01) - Water					
EPA 300.0	2	01/10/2005 10:58	01/10/2005 16:20	01/10/2005 21:30	01/10/2005 22:34

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 005

Report Number: IOA0464

Sampled: 01/10/05
Received: 01/10/05

METHOD BLANK/QC DATA

METALS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A11081 Extracted: 01/11/05											
Blank Analyzed: 01/11/2005 (5A11081-BLK1)											
Antimony	ND	2.0	0.18	ug/l							
Cadmium	ND	1.0	0.015	ug/l							
Copper	ND	2.0	0.49	ug/l							
Lead	ND	1.0	0.13	ug/l							
LCS Analyzed: 01/11/2005 (5A11081-BS1)											
Antimony	91.6	2.0	0.18	ug/l	80.0		114	85-115			
Cadmium	81.3	1.0	0.015	ug/l	80.0		102	85-115			
Copper	81.3	2.0	0.49	ug/l	80.0		102	85-115			
Lead	84.3	1.0	0.13	ug/l	80.0		105	85-115			
Matrix Spike Analyzed: 01/11/2005 (5A11081-MS1)						**Source: IOA0495-01**					
Antimony	92.9	2.0	0.18	ug/l	80.0	ND	116	70-130			
Cadmium	81.9	1.0	0.015	ug/l	80.0	0.033	102	70-130			
Copper	79.1	2.0	0.49	ug/l	80.0	1.1	98	70-130			
Lead	82.0	1.0	0.13	ug/l	80.0	0.25	102	70-130			
Matrix Spike Dup Analyzed: 01/11/2005 (5A11081-MSD1)						**Source: IOA0495-01**					
Antimony	90.1	2.0	0.18	ug/l	80.0	ND	113	70-130	3	20	
Cadmium	79.7	1.0	0.015	ug/l	80.0	0.033	100	70-130	3	20	
Copper	76.9	2.0	0.49	ug/l	80.0	1.1	95	70-130	3	20	
Lead	80.2	1.0	0.13	ug/l	80.0	0.25	100	70-130	2	20	
Batch: 5A12047 Extracted: 01/12/05											
Blank Analyzed: 01/12/2005 (5A12047-BLK1)											
Mercury	ND	0.20	0.063	ug/l							

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 005
Report Number: IOA0464

Sampled: 01/10/05
Received: 01/10/05

METHOD BLANK/QC DATA

METALS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A12047 Extracted: 01/12/05											
LCS Analyzed: 01/12/2005 (5A12047-BS1)											
Mercury	8.12	0.20	0.063	ug/l	8.00		102	85-115			
Matrix Spike Analyzed: 01/12/2005 (5A12047-MS1)						**Source: IOA0483-01**					
Mercury	8.00	0.20	0.063	ug/l	8.00	ND	100	70-130			
Matrix Spike Dup Analyzed: 01/12/2005 (5A12047-MSD1)						**Source: IOA0483-01**					
Mercury	8.26	0.20	0.063	ug/l	8.00	ND	103	70-130	3	20	

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 005
Report Number: IOA0464

Sampled: 01/10/05
Received: 01/10/05

METHOD BLANK/QC DATA

INORGANICS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A10035 Extracted: 01/10/05											
Blank Analyzed: 01/10/2005 (5A10035-BLK1)											
Chloride	ND	0.50	0.26	mg/l							
Nitrate/Nitrite-N	ND	0.26	0.072	mg/l							
Sulfate	ND	0.50	0.18	mg/l							
LCS Analyzed: 01/10/2005 (5A10035-BS1)											
Chloride	4.85	0.50	0.26	mg/l	5.00		97	90-110			
Sulfate	10.2	0.50	0.18	mg/l	10.0		102	90-110			
Matrix Spike Analyzed: 01/10/2005 (5A10035-MS1)						**Source: IOA0441-01**					
Chloride	22.1	2.5	1.3	mg/l	5.00	17	102	80-120			
Sulfate	60.2	2.5	0.90	mg/l	10.0	49	112	80-120			
Matrix Spike Dup Analyzed: 01/10/2005 (5A10035-MSD1)						**Source: IOA0441-01**					
Chloride	22.0	2.5	1.3	mg/l	5.00	17	100	80-120	1	20	
Sulfate	60.7	2.5	0.90	mg/l	10.0	49	117	80-120	1	20	
Batch: 5A11087 Extracted: 01/11/05											
Blank Analyzed: 01/11/2005 (5A11087-BLK1)											
Total Dissolved Solids	ND	10	10	mg/l							
LCS Analyzed: 01/11/2005 (5A11087-BS1)											
Total Dissolved Solids	978	10	10	mg/l	1000		98	90-110			
Duplicate Analyzed: 01/11/2005 (5A11087-DUP1)						**Source: IOA0364-01**					
Total Dissolved Solids	ND	10	10	mg/l		ND				10	

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 005
Report Number: IOA0464

Sampled: 01/10/05
Received: 01/10/05

METHOD BLANK/QC DATA

INORGANICS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A12061 Extracted: 01/12/05											
Blank Analyzed: 01/12/2005 (5A12061-BLK1)											
Oil & Grease	1.60	5.0	0.94	mg/l							*J*
LCS Analyzed: 01/12/2005 (5A12061-BS1)											**M-NR1**
Oil & Grease	21.2	5.0	0.94	mg/l	20.0		106	65-120			
LCS Dup Analyzed: 01/12/2005 (5A12061-BSD1)											
Oil & Grease	20.8	5.0	0.94	mg/l	20.0		104	65-120	2	20	

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 005
Report Number: IOA0464

Sampled: 01/10/05
Received: 01/10/05

Compliance Check

The results obtained from the analytical testing of this data set were checked against compliance limits received from the client. Any results at or above the compliance limits appear in bold on this page.

LabNumber	Analysis	Analyte	Units	Result	MRL	Compliance Limit
IOA0464-01	413.1 Oil and Grease	Oil & Grease	mg/l	7.00	5.0	15
IOA0464-01	Antimony-200.8	Antimony	ug/l	0.31	2.0	6.00
IOA0464-01	Cadmium-200.8	Cadmium	ug/l	0.017	1.0	4.00
IOA0464-01	Chloride - 300.0	Chloride	mg/l	1.30	0.50	150
IOA0464-01	Copper-200.8	Copper	ug/l	1.00	2.0	14
IOA0464-01	Mercury - 245.1	Mercury	ug/l	0.12	0.20	0.20
IOA0464-01	Nitrogen, NO3+NO2 -N	Nitrate/Nitrite-N	mg/l	3.30	0.26	10.00
IOA0464-01	Sulfate-300.0	Sulfate	mg/l	2.50	0.50	250
IOA0464-01	TDS - SM 2540C	Total Dissolved Solids	mg/l	68	10	850

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300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 005

Report Number: IOA0464

Sampled: 01/10/05
Received: 01/10/05

DATA QUALIFIERS AND DEFINITIONS

B	Analyte was detected in the associated Method Blank.
J	Estimated value. Analyte detected at a level less than the Reporting Limit (RL) and greater than or equal to the Method Detection Limit (MDL). The user of this data should be aware that this data is of unknown quality.
M-NR1	There was no MS/MSD analyzed with this batch due to insufficient sample volume. See Blank Spike/Blank Spike Duplicate.
ND	Analyte NOT DETECTED at or above the reporting limit or MDL, if MDL is specified.
RPD	Relative Percent Difference

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 005

Report Number: IOA0464

Sampled: 01/10/05
Received: 01/10/05

Certification Summary

Del Mar Analytical, Irvine

Method	Matrix	Nelac	California
EPA 200.8	Water	X	X
EPA 245.1	Water	X	X
EPA 300.0	Water	X	X
EPA 413.1	Water	X	X
SM2540C	Water	X	X

Nevada and NELAP provide analyte specific accreditations. Analyte specific information for Del Mar Analytical may be obtained by contacting the laboratory or visiting our website at www.dmalabs.com.

Subcontracted Laboratories

Pace Analytical, MN- SUB

1700 Elm Street, Ste 200 - Minneapolis, MN 55414

Analysis Performed: 1613-Dioxin-HR
Samples: IOA0464-01

Analysis Performed: EDD + Level 4
Samples: IOA0464-01

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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IOA0464

Del Mar Analytical Version 5 8/12/04 CHAIN OF CUSTODY FORM

Client Name/Address:	Project:
MWH-Pasadena 300 North Lake Avenue, Suite 1200 Pasadena, CA 91101	Boeing-SSFL NPDES **Routine Outfall 005** Stormwater at FSDF-1
Project Manager: Bronwyn Kelly Sampler: Pollock	Phone Number: (626) 568-6691 Fax Number: (626) 568-6515

Sample Description	Sample Matrix	Container Type	# of Cont.	Sampling Date/Time	Preservative	Bottle * #	ANALYSIS REQUIRED: Total Recoverable Metals: Sb, Cd, Cu, Pb, Hg	TCDD (and all congeners)	Oil & Grease (EPA 413.1)	Cl-, SO4, NO3+NO2-N	TDS					Field readings: / Comments
Outfall 005	W	Poly-1L	1	1-10-05 10:58	HNO3	1A	X									Temp = 57.7 pH= 6.9
Outfall 005-Dup	W	Poly-1L	1		HNO3	1B	X									
Outfall 005	W	Glass-Amber	2		None	2A, 2B		X								
Outfall 005	W	Glass-Amber	2		HCl	3A, 3B			X							
Outfall 005	W	Poly-500 ml	2		None	4A, 4B				X						
Outfall 005	W	Poly-500 ml	2		None	5A, 5B					X					

Relinquished By	Date/Time:	Received By	Date/Time:
	1-10-05 1250		1/10/05 1250
Relinquished By	Date/Time:	Received By	Date/Time:
	1/10/05 1620		1/10/05 1620
Relinquished By	Date/Time:	Received By	Date/Time:

Turn around Time: (check)
24 Hours _____ 5 Days _____
48 Hours _____ 10 Days _____
72 Hours _____ Normal ✓
Perchlorate Only 72 Hours _____
Metals Only 72 Hours _____
Sample Integrity: (Check)
Intact ✓ On Ice: ✓ 4°C

Del Mar Analytical

2852 Alton Ave., Irvine CA 92606 (949) 261-1022 FAX (949) 261-1228
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2520 E. Sunset Rd. #3, Las Vegas, NV 89120 (702) 798-3620 FAX (702) 798-3621

February 7, 2005

MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, Ca.91101

Attention: Bronwyn Kelly

Project: Routine Outfall 005
Sampled: 01/10/05
Del Mar Analytical Number: IOA0464

Dear Ms. Kelly:

Pace Analytical performed Method 1613B analysis for the project referenced above. Please use the following cross-reference table when reviewing your results.

MWH ID	DEL MAR ID	Pace ID
Outfall 005	IOA0464-01	106052001

Attached is the original report from the subcontract laboratory. If you have any questions or require further assistance, please do not hesitate to contact me.

Sincerely yours,
DEL MAR ANALYTICAL

Michele Harper
Project Manager

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Pace Analytical™

Method 1613B Analysis Results

Client - Del Mar Analytical

Client's Sample ID	IOA0464-01		
Lab Sample ID	106052001		
Filename	F50127B_11		
Injected By	MRO		
Total Amount Extracted	1040 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	01/10/2005
ICAL Date	11/29/2004	Received	01/12/2005
CCal Filename(s)	F50127A_13	Extracted	01/24/2005
Method Blank ID	BLANK-6202	Analyzed	01/28/2005 05:20

Native Isomers	Conc pg/L	EMPC pg/L	LOD pg/L		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	2.20		2,3,7,8-TCDF-13C	2.00	61
Total TCDF	ND	-----	2.20		2,3,7,8-TCDD-13C	2.00	73
					1,2,3,7,8-PeCDF-13C	2.00	84
2,3,7,8-TCDD	ND	-----	3.00		2,3,4,7,8-PeCDF-13C	2.00	80
Total TCDD	ND	-----	3.00		1,2,3,7,8-PeCDD-13C	2.00	93
					1,2,3,4,7,8-HxCDF-13C	2.00	75
1,2,3,7,8-PeCDF	ND	-----	1.90		1,2,3,6,7,8-HxCDF-13C	2.00	100
2,3,4,7,8-PeCDF	ND	-----	1.40		2,3,4,6,7,8-HxCDF-13C	2.00	88
Total PeCDF	ND	-----	1.70		1,2,3,7,8,9-HxCDF-13C	2.00	80
					1,2,3,4,7,8-HxCDD-13C	2.00	69
1,2,3,7,8-PeCDD	ND	-----	2.20		1,2,3,6,7,8-HxCDD-13C	2.00	94
Total PeCDD	ND	-----	2.20		1,2,3,4,6,7,8-HpCDF-13C	2.00	81
					1,2,3,4,7,8,9-HpCDF-13C	2.00	71
1,2,3,4,7,8-HxCDF	ND	-----	1.60		1,2,3,4,6,7,8-HpCDD-13C	2.00	94
1,2,3,6,7,8-HxCDF	ND	-----	0.94		OCDD-13C	4.00	85
2,3,4,6,7,8-HxCDF	ND	-----	1.00				
1,2,3,7,8,9-HxCDF	ND	-----	1.10		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	-----	1.20		1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	1.50		2,3,7,8-TCDD-37Cl4	0.20	67
1,2,3,6,7,8-HxCDD	ND	-----	1.40				
1,2,3,7,8,9-HxCDD	ND	-----	1.50				
Total HxCDD	3.2	-----	1.50	J			
1,2,3,4,6,7,8-HpCDF	ND	-----	1.20				
1,2,3,4,7,8,9-HpCDF	ND	-----	1.70				
Total HpCDF	2.8	-----	1.40	J			
1,2,3,4,6,7,8-HpCDD	7.8	-----	1.70	BJ			
Total HpCDD	15.0	-----	1.70	BJ			
OCDF	-----	4.0	2.20	I			
OCDD	260.0	-----	2.30				

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection. Totals are averages of individual isomer LODs.
D = Result obtained from analysis of diluted sample
B = Less than 10 times higher than method blank level
P = Recovery outside of method 1613 control limits
J = Concentration detected is below the calibration range
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....106052

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Pace Analytical™

Method 1613B Blank Analysis Results

Client - Del Mar Analytical

Lab Sample ID	BLANK-6202	Matrix	Water
Filename	F50127A_06	Dilution	NA
Total Amount Extracted	982 mL	Extracted	01/24/2005
ICAL Date	11/29/2004	Analyzed	01/27/2005 14:13
CCal Filename(s)	F50127A_02	Injected By	MRO

Native Isomers	Conc pg/L	EMPC pg/L	LOD pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	4.7	2,3,7,8-TCDF-13C	2.00	33
Total TCDF	ND	-----	-----	2,3,7,8-TCDD-13C	2.00	45
				1,2,3,7,8-PeCDF-13C	2.00	68
2,3,7,8-TCDD	ND	-----	5.1	2,3,4,7,8-PeCDF-13C	2.00	70
Total TCDD	ND	-----	-----	1,2,3,7,8-PeCDD-13C	2.00	81
				1,2,3,4,7,8-HxCDF-13C	2.00	75
1,2,3,7,8-PeCDF	ND	-----	2.2	1,2,3,6,7,8-HxCDF-13C	2.00	95
2,3,4,7,8-PeCDF	ND	-----	1.5	2,3,4,6,7,8-HxCDF-13C	2.00	98
Total PeCDF	ND	-----	-----	1,2,3,7,8,9-HxCDF-13C	2.00	85
				1,2,3,4,7,8-HxCDD-13C	2.00	78
1,2,3,7,8-PeCDD	ND	-----	1.6	1,2,3,6,7,8-HxCDD-13C	2.00	94
Total PeCDD	ND	-----	-----	1,2,3,4,6,7,8-HpCDF-13C	2.00	85
				1,2,3,4,7,8,9-HpCDF-13C	2.00	78
1,2,3,4,7,8-HxCDF	ND	-----	1.6	1,2,3,4,6,7,8-HpCDD-13C	2.00	99
1,2,3,6,7,8-HxCDF	ND	-----	1.4	OCDD-13C	4.00	97
2,3,4,6,7,8-HxCDF	ND	-----	1.1			
1,2,3,7,8,9-HxCDF	ND	-----	1.6	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	-----	-----	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	1.6	2,3,7,8-TCDD-37Cl4	0.20	40
1,2,3,6,7,8-HxCDD	ND	-----	1.2			
1,2,3,7,8,9-HxCDD	ND	-----	1.7			
Total HxCDD	ND	-----	-----			
1,2,3,4,6,7,8-HpCDF	ND	-----	1.5			
1,2,3,4,7,8,9-HpCDF	ND	-----	1.4			
Total HpCDF	ND	-----	-----			
1,2,3,4,6,7,8-HpCDD	1.9	-----	1.3 J			
Total HpCDD	1.9	-----	----- J			
OCDF	8.3	-----	1.9 J			
OCDD	26.0	-----	2.3 J			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection. Totals are averages of individual isomer LODs.
A = Limit of Detection based on signal to noise
P = Recovery outside of method 1613 control limits
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....105645

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Pace Analytical™

Method 1613B Laboratory Control Spike Results

Client - Del Mar Analytical

Lab Sample ID	LCS-6203		
Filename	F50127A_03	Matrix	Water
Total Amount Extracted	1030 mL	Dilution	NA
ICAL Date	11/29/2004	Extracted	01/24/2005
CCal Filename	F50127A_02	Analyzed	01/27/2005 11:44
Method Blank ID	BLANK-6202	Injected By	MRO

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDF	10	10.2	7.5	15.8	102
2,3,7,8-TCDD	10	9.0	6.7	15.8	90
1,2,3,7,8-PeCDF	50	50.1	40.0	67.0	100
2,3,4,7,8-PeCDF	50	48.4	34.0	80.0	97
1,2,3,7,8-PeCDD	50	43.4	35.0	71.0	87
1,2,3,4,7,8-HxCDF	50	44.8	36.0	67.0	90
1,2,3,6,7,8-HxCDF	50	48.0	42.0	65.0	96
2,3,4,6,7,8-HxCDF	50	48.6	35.0	78.0	97
1,2,3,7,8,9-HxCDF	50	46.4	39.0	65.0	93
1,2,3,4,7,8-HxCDD	50	50.0	35.0	82.0	100
1,2,3,6,7,8-HxCDD	50	51.7	38.0	67.0	103
1,2,3,7,8,9-HxCDD	50	48.5	32.0	81.0	97
1,2,3,4,6,7,8-HpCDF	50	51.4	41.0	61.0	103
1,2,3,4,7,8,9-HpCDF	50	52.3	39.0	69.0	105
1,2,3,4,6,7,8-HpCDD	50	43.4	35.0	70.0	87
OCDF	100	89.5	63.0	170.0	90
OCDD	100	96.9	78.0	144.0	97
2,3,7,8-TCDD-37Cl4	10	6.2	3.1	19.1	62
2,3,7,8-TCDF-13C	100	49.8	22.0	152.0	50
2,3,7,8-TCDD-13C	100	65.8	20.0	175.0	66
1,2,3,7,8-PeCDF-13C	100	75.7	21.0	192.0	76
2,3,4,7,8-PeCDF-13C	100	76.9	13.0	328.0	77
1,2,3,7,8-PeCDD-13C	100	93.4	21.0	227.0	93
1,2,3,4,7,8-HxCDF-13C	100	78.9	19.0	202.0	79
1,2,3,6,7,8-HxCDF-13C	100	89.8	21.0	159.0	90
2,3,4,6,7,8-HxCDF-13C	100	88.2	22.0	176.0	88
1,2,3,7,8,9-HxCDF-13C	100	81.5	17.0	205.0	81
1,2,3,4,7,8-HxCDD-13C	100	82.2	21.0	193.0	82
1,2,3,6,7,8-HxCDD-13C	100	95.2	25.0	163.0	95
1,2,3,4,6,7,8-HpCDF-13C	100	86.3	21.0	158.0	86
1,2,3,4,7,8,9-HpCDF-13C	100	75.6	20.0	186.0	76
1,2,3,4,6,7,8-HpCDD-13C	100	102.9	26.0	166.0	103
OCDD-13C	200	195.1	26.0	397.0	98

Cs = Concentration Spiked (ng/mL)
Cr = Concentration Recovered (ng/mL)
Rec. = Recovery (Expressed as Percent)
Control Limit Reference: Method 1613, Table 6, 10/94 Revision
X = Background subtracted value
P = Recovery outside of control limits
Nn = Value obtained from additional analysis
* = See Discussion

Report No.....105645

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1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Pace Analytical™

Method 1613B Laboratory Control Spike Results

Client - Del Mar Analytical

Lab Sample ID	LCSD-6204		
Filename	F50127A_04	Matrix	Water
Total Amount Extracted	1000 mL	Dilution	NA
ICAL Date	11/29/2004	Extracted	01/24/2005
CCal Filename	F50127A_02	Analyzed	01/27/2005 12:32
Method Blank ID	BLANK-6202	Injected By	MRO

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDF	10	9.9	7.5	15.8	99
2,3,7,8-TCDD	10	8.8	6.7	15.8	88
1,2,3,7,8-PeCDF	50	49.8	40.0	67.0	100
2,3,4,7,8-PeCDF	50	47.6	34.0	80.0	95
1,2,3,7,8-PeCDD	50	41.4	35.0	71.0	83
1,2,3,4,7,8-HxCDF	50	46.6	36.0	67.0	93
1,2,3,6,7,8-HxCDF	50	44.0	42.0	65.0	88
2,3,4,6,7,8-HxCDF	50	47.2	35.0	78.0	94
1,2,3,7,8,9-HxCDF	50	44.8	39.0	65.0	90
1,2,3,4,7,8-HxCDD	50	46.5	35.0	82.0	93
1,2,3,6,7,8-HxCDD	50	48.9	38.0	67.0	98
1,2,3,7,8,9-HxCDD	50	46.7	32.0	81.0	93
1,2,3,4,6,7,8-HpCDF	50	48.7	41.0	61.0	97
1,2,3,4,7,8,9-HpCDF	50	49.9	39.0	69.0	100
1,2,3,4,6,7,8-HpCDD	50	42.7	35.0	70.0	85
OCDF	100	84.8	63.0	170.0	85
OCDD	100	92.5	78.0	144.0	92
2,3,7,8-TCDD-37Cl4	10	7.5	3.1	19.1	75
2,3,7,8-TCDF-13C	100	65.7	22.0	152.0	66
2,3,7,8-TCDD-13C	100	83.8	20.0	175.0	84
1,2,3,7,8-PeCDF-13C	100	84.9	21.0	192.0	85
2,3,4,7,8-PeCDF-13C	100	85.6	13.0	328.0	86
1,2,3,7,8-PeCDD-13C	100	105.3	21.0	227.0	105
1,2,3,4,7,8-HxCDF-13C	100	82.6	19.0	202.0	83
1,2,3,6,7,8-HxCDF-13C	100	96.7	21.0	159.0	97
2,3,4,6,7,8-HxCDF-13C	100	92.3	22.0	176.0	92
1,2,3,7,8,9-HxCDF-13C	100	84.5	17.0	205.0	84
1,2,3,4,7,8-HxCDD-13C	100	81.9	21.0	193.0	82
1,2,3,6,7,8-HxCDD-13C	100	102.0	25.0	163.0	102
1,2,3,4,6,7,8-HpCDF-13C	100	90.1	21.0	158.0	90
1,2,3,4,7,8,9-HpCDF-13C	100	78.6	20.0	186.0	79
1,2,3,4,6,7,8-HpCDD-13C	100	106.1	26.0	166.0	106
OCDD-13C	200	196.4	26.0	397.0	98

Cs = Concentration Spiked (ng/mL)
Cr = Concentration Recovered (ng/mL)
Rec. = Recovery (Expressed as Percent)
Control Limit Reference: Method 1613, Table 6, 10/94 Revision
X = Background subtracted value
P = Recovery outside of control limits
Nn = Value obtained from additional analysis
* = See Discussion

Report No.....105645

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Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444

SPIKE RECOVERY RELATIVE PERCENT DIFFERENCE (RPD) RESULTS

Client..... Del Mar Analytical

SPIKE 1 ID..... LCS-6203
SPIKE 1 Filename..... F50127A_03
SPIKE 2 ID..... LCSD-6204
SPIKE 2 Filename..... F50127A_04

COMPOUND	SPIKE 1 REC,%	SPIKE 2 REC,%	RPD,%
2378-TCDF	102	99	3.0
2378-TCDD	90	88	2.2
12378-PeCDF	100	100	0.0
23478-PeCDF	97	95	2.1
12378-PeCDD	87	83	4.7
123478-HxCDF	90	93	3.3
123678-HxCDF	96	88	8.7
234678-HxCDF	97	94	3.1
123789-HxCDF	93	90	3.3
123478-HxCDD	100	93	7.3
123678-HxCDD	103	98	5.0
123789-HxCDD	97	93	4.2
1234678-HpCDF	103	97	6.0
1234789-HpCDF	105	100	4.9
1234678-HpCDD	87	85	2.3
OCDF	90	85	5.7
OCDD	97	92	5.3

REC = Percent Recovered
RPD = The difference between the two values divided by the average.
NA = Not Applicable

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TABLE 1. 2,3,7,8-TCDD Equivalency Factors (TEFs) for the Polychlorinated Dibenzo-p-dioxins and Dibenzofurans

Number	Compound(s)	TEF
1	2,3,7,8-TCDD	1.00
2	1,2,3,7,8-PeCDD	0.50
3	1,2,3,6,7,8-HxCDD	0.1
4	1,2,3,7,8,9-HxCDD	0.1
5	1,2,3,4,7,8-HxCDD	0.1
6	1,2,3,4,6,7,8-HpCDD	0.01
7	OCDD	0.001
8	* Total - TCDD	0.0
9	* Total - PeCDD	0.0
10	* Total - HxCDD	0.0
11	* Total - HpCDD	0.0
12	2,3,7,8-TCDF	0.10
13	1,2,3,7,8-PeCDF	0.05
14	2,3,4,7,8-PeCDF	0.5
15	1,2,3,6,7,8-HxCDF	0.1
16	1,2,3,7,8,9-HxCDF	0.1
17	1,2,3,4,7,8-HxCDF	0.1
18	2,3,4,6,7,8-HxCDF	0.1
19	1,2,3,4,6,7,8-HpCDF	0.01
20	1,2,3,4,7,8,9-HpCDF	0.01
21	OCDF	0.001
22	* Total - TCDF	0.0
23	* Total - PeCDF	0.0
24	* Total - HxCDF	0.0
25	* Total - HpCDF	0.0

*Excluding the 2,3,7,8-substituted congeners.

Reference: 1989 ITEFs

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Del Mar Analytical

17461 Derian Ave. Suite 100, Irvine, CA 92614 Ph (949) 261-1022 Fax (949) 261-1228
1014 E. Cooley Dr., Suite A, Colton, CA 92324 Ph (909) 370-4667 Fax (909) 370-1046
9484 Chesapeake Drive, Suite 805, San Diego, CA 92123 Ph (619) 505-9596 Fax (619) 505-9689
9830 South 51st Street, Suite B-120, Phoenix, AZ 85044 Ph (480) 785-0043 Fax (480) 785-0851
2520 E. Sunset Rd., Suite #3, Las Vegas, NV 89120 Ph (702) 798-3620 Fax (702) 798-3621

SUBCONTRACT ORDER - PROJECT # IOA0464 106052

SENDING LABORATORY:
Del Mar Analytical, Irvine
17461 Derian Avenue. Suite 100
Irvine, CA 92614
Phone: (949) 261-1022
Fax: (949) 261-1228
Project Manager: Michele Harper

RECEIVING LABORATORY:
Pace Analytical, MN- SUB
1700 Elm Street, Ste 200
Minneapolis, MN 55414
Phone :(612) 607-1700
Fax: (612) 607-6444

Standard TAT is requested unless specific due date is requested => Due Date:_____ Initials:_____

Analysis	Expiration	Comments
Sample ID: IOA0464-01 Water	**Sampled: 01/10/05 10:58**	106052001
1613-Dioxin-HR	01/17/05 10:58	J flags, 17 congeners, no TEQ, sub to Pace-MN
EDD + Level 4	02/07/05 10:58	Excel EDD email to pm,Include Std logs for Lvl IV

Containers Supplied:
1 L Amber (IOA0464-01C)
1 L Amber (IOA0464-01D)

SAMPLE INTEGRITY:

All containers intact: ☒ Yes ☐ No | Sample labels/COC agree: ☒ Yes ☐ No | Samples Received On Ice:: ☒ Yes ☐ No
Custody Seals Present: ☐ Yes ☒ No | Samples Preserved Properly: ☒ Yes ☐ No | Samples Received at (temp): 3°c

Released By	Date	Time	Received By	Date	Time
	1/11/05				
Released By	Date	Time	Received By	Date	Time
				01/12/05	10:15

CONTRACT COMPLIANCE SCREENING FORM FOR HARDCOPY DATA

AMEC Earth & Environmental
550 South Wadsworth Boulevard
Suite 500
Lakewood, CO 80226

Package ID T711DF33
Task Order 313150010
SDG No. Multiple
No. of Analyses 3

Laboratory Pace
Reviewer K. Shadowlight
Analysis/Method Dioxins

Date: March 18, 2005
Reviewer's Signature K. Shadowlight

ACTION ITEMS[a]	
1. **Case Narrative Deficiencies**	
2. **Out of Scope Analyses**	
3. **Analyses Not Conducted**	
4. **Missing Hardcopy Deliverables**	
5. **Incorrect Hardcopy Deliverables**	
6. **Deviations from Analysis Protocol, e.g.,**	Qualifications were assigned for the following:
Holding Times	* Method blank contamination
GC/MS Tune/Inst. Performance	* Internal standard recovery outliers
Calibration	* Detects below the lower method calibration level
Method blanks	
Surrogates	
Matrix Spike/Dup LCS	
Field QC	
Internal Standard Performance	
Compound Identification and Quantitation	
System Performance	
COMMENTS[b]	

[a] Subcontracted analytical laboratory is not meeting contract and/or method requirements.
[b] Differences in protocol have been adopted by the laboratory but no action against the laboratory is required.

DATA VALIDATION REPORT

NPDES
Monitoring

ANALYSIS: DIOXINS/FURANS

SAMPLE DELIVERY GROUPS: IOA1674, IOA1803, IOA1804

Prepared by

AMEC—Denver Operations
550 South Wadsworth Boulevard, Suite 500
Lakewood, Colorado 80226

1. INTRODUCTION

Task Order Title:	NPDES Monitoring
Contract Task Order #:	313150010
Sample Delivery Group #:	IOA1674, IOA1803, IOA1804
Project Manager:	B. McIlvaine
Matrix:	Water
Analysis:	Dioxins/Furans
QC Level:	Level IV
No. of Samples:	3
No. of Reanalyses/Dilutions:	0
Reviewer:	K. Shadowlight
Date of Review:	March 18, 2005

The samples listed in Table 1 were validated based on the guidelines outlined in the *AMEC Data Validation Procedure for Dioxins and Furans (DVP-19, Rev. 1), EPA Method 1613, and the National National Functional Guidelines For Chlorinated Dioxin/Furan Data Review* (8/02). Any deviations from these procedures and guidelines are documented herein. Qualifiers were applied in cases where the data did not meet the required QC criteria or where special consideration by the data user is required. Data qualifiers were placed on Form Is with the associated qualification codes. Analytes that were rejected for any reason are denoted on the Form I as having only the "R" data qualifier and associated qualification code(s) denoting the reason for rejection. Any additional problems with the data that may have resulted in an estimated value were not denoted by a qualification code since the data had already been rejected.

Table 1. Sample Identification

Client ID	Laboratory ID (Del Mar)	Laboratory ID (Pace)	Matrix	COC Method
Outfall 004	IOA1804-01	106983001	water	1613
Outfall 005	IOA1674-01	106914001	water	1613
Outfall 006	IOA1803-01	106982001	water	1613

2. DATA VALIDATION FINDINGS

2.1 SAMPLE MANAGEMENT

Following are findings associated with sample management:

2.1.1 Sample Preservation, Handling, and Transport

The samples in these SDGs were received at Del Mar Analytical within the temperature limits of 4°C ±2°C. The samples were subcontracted to Pace Analytical for the dioxin/furan analyses. Sample Outfall 005 was received at Pace below the temperature limits of 4°C ± 2°C, at 1.2°C; however, as the sample was not noted to have been frozen or damaged, no qualifications were required. The remaining samples in these SDGs were received at Pace Analytical Services within the temperature limits of 4°C ± 2°C. No qualifications were required.

2.1.2 Chain of Custody

The COCs and transfer COCs were signed by the appropriate field and laboratory personnel. The samples and analyses were accounted for on both the original COCs and transfer COCs. As the samples were couriered directly to the laboratory (Del Mar Analytical), custody seals were not required. There was no information regarding custody seals upon receipt at Pace. No qualifications were required.

2.1.3 Holding Times

The samples were extracted and analyzed within one year of collection. No qualifications were required.

2.2 INSTRUMENT PERFORMANCE

Following are findings associated with instrument performance:

2.2.1 GC Column Performance

A column performance standard was combined with the daily calibration verification and analyzed at the beginning of each analytical sequence. The GC column performance was acceptable with the chromatographic separation of 2,3,7,8-TCDD and other TCDD isomers resolved with a valley of ≤25%. No qualifications were required.

2.2.2 Mass Spectrometer Performance

The mass spectrometer performance could not be evaluated as the laboratory did not provide selected ion current profiles for the lock-mass ions. No qualifications were required.

2.3 CALIBRATION

2.3.1 Initial Calibration

There was one initial calibration, analyzed 11/29/04 on instrument 10MSHR05. The calibration consisted of five concentration level standards (CS1 through CS5) analyzed to verify instrument linearity. The initial calibration was acceptable with %RSDs ≤20% for the 15 native compounds (calibration by isotope dilution) and ≤35% for the 2 native and all labeled compounds (calibration by internal standard). The relative retention times and ion abundance ratios were within the QC limits listed in Method 1613 for all standards. A representative number of %RSDs were verified from the raw data, and no calculation or transcription errors were noted. No qualifications were required.

2.3.2 Continuing Calibration

Calibration verification (VER) consisted of a mid-level standard (CS3) analyzed at the beginning of each analytical sequence. The VER was acceptable with the concentrations within the acceptance criteria listed in the Table 6 of the EPA Method 1613. The ion abundance ratios and relative retention times were within the method QC limits. A representative number of %Ds were verified from the raw data, and no calculation or transcription errors were noted. No qualifications were required.

2.4 BLANKS

One method blank (Blank-6264) was extracted and analyzed with the samples in these SDGs. Target compounds 1,2,3,4,6,7,8-HpCDF, total HpCDF, and OCDF were reported in the method blank at concentrations below the lower method calibration limit. Any detects for the aforementioned target compounds reported at concentrations <5× the concentrations reported in the method blank were qualified as estimated nondetects "UJ," at the levels of interference in the samples of these SDGs. The detect for total HpCDF was qualified as estimated, "J," in sample Outfall 006, as only a portion of the total concentration was attributed to method blank contamination. Target compound OCDD was reported as an EMPC in the method blank. A review of the method blank raw data and chromatograms indicated no false negatives or false positives. No further qualifications were required.

2.5 BLANK SPIKES AND LABORATORY CONTROL SAMPLES

One LCS/LCSD pair (LCS-6265/LCSD-6266) was extracted and analyzed with the samples in these SDGs. All recoveries were within the acceptance criteria listed in Table 6 of the Method 1613. There are no method QC limits established for RPDs. The reported RPDs were within ±20%. No qualifications were required.

2.6 MATRIX SPIKE/MATRIX SPIKE DUPLICATE

MS/MSD analyses were not performed in these SDGs. Evaluation of method accuracy and precision was based on the LCS/LCSD results. No qualifications were required.

2.7 FIELD QC SAMPLES

Following are findings associated with field QC:

2.7.1 Field Blanks and Equipment Rinsates

The samples in these SDGs had no associated field QC samples. No qualifications were required.

2.7.2 Field Duplicates

No field duplicate samples were identified for these SDGs.

2.8 INTERNAL STANDARDS

Internal standard 2,3,7,8-TCDF-13C was recovered below QC limits at 22% and 8% in samples Outfall 004 and Outfall 005, respectively. Internal standard 2,3,7,8-TCDD-13C was recovered below QC limits in Oufall 005, and cleanup standard 2,3,7,8-37Cl4 was recovered below QC limits in both samples Outfall 004 and Outfall 005. The samples were re-extracted and reanalyzed; however, according to laboratory personnel, the re-extracted analyses were affected by cross-contamination and were not reported by the laboratory. The nondetect results for 2,3,7,8-TCDF and total TCDF were rejected, "R," in sample Outfall 005. Nondetect results for 2,3,7,8-TCDD and total TCDD were qualified as estimated, "UJ," in Outfall 004 and nondetects for 2,3,7,8-TCDD and total TCDD were qualified as estimated, "UJ," in sample Outfall 005. As the cleanup standard was recovered below QC limits in samples Outfall 004 and Outfall 005, the results for all target compounds were qualified as estimated, "J," for detects and "UJ," for nondetects in both samples, unless otherwise rejected. The remaining labeled standard recoveries were within the acceptance criteria listed in Table 7 of Method 1613. No further qualifications were required.

2.9 COMPOUND IDENTIFICATION

The laboratory analyzed for polychlorinated dioxins/furans by EPA Method 1613. The compound identifications were verified from the raw data and no false negatives or positives were noted. No qualifications were required.

2.10 COMPOUND QUANTIFICATION AND REPORTED DETECTION LIMITS

Compound quantitation was verified from the raw data. The laboratory calculated and reported compound-specific detection limits. Any detects below the lower method calibration limit (MCL) were qualified as estimated, "J." No further qualifications were required.

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 1613B Analysis Results

Client - Del Mar Analytical

Client's Sample ID	IOA1674-01 Outfall 005		
Lab Sample ID	106914001		
Filename	F50209B_10		
Injected By	MRO		
Total Amount Extracted	1030 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	01/27/2005
ICAL Date	11/29/2004	Received	01/29/2005
CCal Filename(s)	F50209A_13	Extracted	02/04/2005
Method Blank ID	BLANK-6264	Analyzed	02/10/2005 02:46

Rev Qual	Qual Code	Native Isomers	Conc pg/L	EMPC pg/L	LOD pg/L	Internal Standards	ng's Added	Percent Recovery
R	I	2,3,7,8-TCDF	ND	-----	12.0	2,3,7,8-TCDF-13C	2.00	8 P
R	I	Total TCDF	ND	-----	12.0	2,3,7,8-TCDD-13C	2.00	13 P
						1,2,3,7,8-PeCDF-13C	2.00	29
UJ	I	2,3,7,8-TCDD	ND	-----	10.0	2,3,4,7,8-PeCDF-13C	2.00	38
	I	Total TCDD	ND	-----	10.0	1,2,3,7,8-PeCDD-13C	2.00	48
						1,2,3,4,7,8-HxCDF-13C	2.00	54
		1,2,3,7,8-PeCDF	ND	-----	3.4	1,2,3,6,7,8-HxCDF-13C	2.00	58
		2,3,4,7,8-PeCDF	ND	-----	1.9	2,3,4,6,7,8-HxCDF-13C	2.00	66
		Total PeCDF	ND	-----	2.6	1,2,3,7,8,9-HxCDF-13C	2.00	61
						1,2,3,4,7,8-HxCDD-13C	2.00	59
		1,2,3,7,8-PeCDD	ND	-----	2.7	1,2,3,6,7,8-HxCDD-13C	2.00	64
		Total PeCDD	ND	-----	2.7	1,2,3,4,6,7,8-HpCDF-13C	2.00	63
						1,2,3,4,7,8,9-HpCDF-13C	2.00	60
		1,2,3,4,7,8-HxCDF	ND	-----	1.5	1,2,3,4,6,7,8-HpCDD-13C	2.00	76
		1,2,3,6,7,8-HxCDF	ND	-----	1.4	OCDD-13C	4.00	81
		2,3,4,6,7,8-HxCDF	ND	-----	1.2			
		1,2,3,7,8,9-HxCDF	ND	-----	1.0	1,2,3,4-TCDD-13C	2.00	NA
		Total HxCDF	ND	-----	1.3	1,2,3,7,8,9-HxCDD-13C	2.00	NA
		1,2,3,4,7,8-HxCDD	ND	-----	1.7	2,3,7,8-TCDD-37Cl4	0.20	15 P
		1,2,3,6,7,8-HxCDD	ND	-----	1.6			
		1,2,3,7,8,9-HxCDD	ND	-----	1.4			
		Total HxCDD	ND	-----	1.6			
		1,2,3,4,6,7,8-HpCDF	ND	-----	1.0			
		1,2,3,4,7,8,9-HpCDF	ND	-----	1.7			
		Total HpCDF	ND	-----	1.4			
J	DNQ, I	1,2,3,4,6,7,8-HpCDD	2.8	-----	1.5 J			
J	DNQ, I	Total HpCDD	7.1	-----	1.5 J			
UJ	B, I	OCDF	4.4	-----	1.2 BJ			
J	DNQ, I	OCDD	29.0	-----	1.7 J			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection. Totals are averages of individual isomer LODs.
D = Result obtained from analysis of diluted sample
B = Less than 10 times higher than method blank level
P = Recovery outside of method 1613 control limits
J = Concentration detected is below the calibration range
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....106914

REPORT OF LABORATORY ANALYSIS

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AMEC VALIDATED LEVEL IV

CONTRACT COMPLIANCE SCREENING FORM FOR HARDCOPY DATA

AMEC Earth & Environmental
550 South Wadsworth Boulevard
Suite 500
Lakewood, CO 80226

Package ID T711MT35
Task Order 313150010
SDG No. IOA1674
No. of Analyses 1

Laboratory Del Mar Analytical
Reviewer K. Okonzak
Analysis/Method Metals

Date: 3/15/05
Reviewer's Signature

ACTION ITEMS[a]	
1. **Case Narrative Deficiencies**	
2. **Out of Scope Analyses**	
3. **Analyses Not Conducted**	
4. **Missing Hardcopy Deliverables**	
5. **Incorrect Hardcopy Deliverables**	
6. **Deviations from Analysis Protocol, e.g.,**	Qualifications applied for:
Holding Times	Lead detected below the reporting limit was qualified as estimated, "J."
GC/MS Tune/Inst. Perform	
Calibrations	
Blanks	
Surrogates	
Matrix Spike/Dup LCS	
Field QC	
Internal Standard Performance	
Compound Identification and Quantitation	
System Performance	
COMMENTS[b]	

[a] Subcontracted analytical laboratory is not meeting contract and/or method requirements.

[b] Differences in protocol have been adopted by the laboratory but no action against the laboratory is required.

Data Qualifier Reference Table

Qualifier	Organics	Inorganics
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.	The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.	The associated value is an estimated quantity.
N	The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification."	Not applicable.
NJ	The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.	Not applicable.
UJ	The analyte was not deemed above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.	The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.
R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and to meet quality control criteria. The presence or absence of the analyte cannot be verified.	The data are unusable. (Note: Analyte may or may not be present).

Qualification Code Reference Table

Qualifier	Organics	Inorganics
H	Holding times were exceeded.	Holding times were exceeded.
S	Surrogate recovery was outside QC limits.	The sequence or number of standards used for the calibration was incorrect
C	Calibration %RSD or %D were noncompliant.	Correlation coefficient is <0.995.
R	Calibration RRF was <0.05.	%R for calibration is not within control limits.
B	Presumed contamination from preparation (method) blank.	Presumed contamination from preparation (method) or calibration blank.
L	Laboratory Blank Spike/Blank Spike Duplicate %R was not within control limits.	Laboratory Control Sample %R was not within control limits.
Q	MS/MSD recovery was poor or RPD high.	MS recovery was poor.
E	Not applicable.	Duplicates showed poor agreement.
I	Internal standard performance was unsatisfactory.	ICP ICS results were unsatisfactory.
A	Not applicable.	ICP Serial Dilution %D were not within control limits.
M	Tuning (BFB or DFTPP) was noncompliant.	Not applicable.
T	Presumed contamination from trip blank.	Not applicable.
+	False positive – reported compound was not present. Not applicable.	
-	False negative – compound was present but not reported.	Not applicable.
F	Presumed contamination from FB, or ER.	Presumed contamination from FB or ER.
$	Reported result or other information was incorrect.	Reported result or other information was incorrect.
?	TIC identity or reported retention time has been changed.	Not applicable.
D	The analysis with this flag should not be used because another more technically sound analysis is available.	The analysis with this flag should not be used because another more technically sound analysis is available.
P	Instrument performance for pesticides was poor.	Post Digestion Spike recovery was not within control limits.
DNQ	The compound was detected between the MDL and the RL and, by definition, is considered an estimated value.	The compound was detected between the MDL and the RL and, by definition, is considered an estimated value.

*#	Unusual problems found with the data that have been described in Section 2.#, "Data Validation Findings." The number following the asterisk (*) will indicate the subsection where a description of the problem can be found (eg. *1 would indicate a sample was not within temperature limits).	Unusual problems found with the data that have been described in Section 2.#, "Data Validation Findings." The number following the asterisk (*) will indicate the subsection where a description of the problem can be found (eg. *1 would indicate a sample was not within temperature limits).

DATA VALIDATION REPORT

NPDES
Monitoring

ANALYSIS: METALS

SAMPLE DELIVERY GROUPS: IOA1674

Prepared by

AMEC—Denver Operations
550 South Wadsworth Boulevard, Suite 500
Lakewood, Colorado 80226

1. INTRODUCTION

Task Order Title:	NPDES Monitoring
Contract Task Order #:	313150010
SDG#:	IOA1674
Project Manager:	B. McIlvaine
Matrix:	Water
Analysis:	Metals
QC Level:	Level IV
No. of Samples:	1
No. of Reanalyses/Dilutions:	0
Reviewer:	K. Okonzak-Lowry
Date of Review:	March 15, 2005

The samples listed in Table 1 were validated based on the guidelines outlined in the *AMEC Data Validation Procedure for Levels III and IV ICP-MS Metals, (DVP-5-A, Rev.0), AMEC Data Validation Procedure for Levels III and IV ICP Metals* (DVP-5, Rev. 0), SW-846 *Method 6020B for Inductively Coupled Plasma – Mass Spectrometry*, SW-846 *Method 6010B for Inductively Coupled Plasma* , SW-846 *Method 7471A for Mercury (Manual Cold-Vapor Technique)*, and validation guidelines outlined in the USEPA CLP *National Functional Guidelines for Inorganic Data Review* (2/94). Any deviations from these procedures and guidelines are documented herein. Qualifiers were applied in cases where the data did not meet the required QC criteria or where special consideration by the data user is required. Data qualifiers were placed on Form Is with the associated qualification codes. Analytes that were rejected for any reason are denoted on the Form I as having only the "R" data qualifier and associated qualification code(s) denoting the reason for rejection. Any additional problems with the data that may have resulted in an estimated value were not denoted by a qualification code since the data had already been rejected.

Table 1. Sample identification

Client ID	EPA ID	Laboratory ID	Matrix	COC Method
Outfall 005	Outfall 005	IOA1674-01	water	ILM04

2. DATA VALIDATION FINDINGS

2.1 SAMPLE MANAGEMENT

Following are findings associated with sample management:

2.1.1 Sample Preservation, Handling, and Transport

The sample in this SDG was received at the laboratory within the temperature limits of 4°C ±2°C. No sample preservation, handling, or transport problems were noted, and no qualifications were necessary.

2.1.2 Chain of Custody

The COC was signed and dated by field and laboratory personnel. The COC listed a duplicate aliquot for sample Outfall 005; however, duplicate analyses were not required. No sample qualifications were required.

2.1.3 Holding Times

The date of collection recorded on the COC and the date of analysis recorded in the raw data, documented that the sample analysis was performed within the specified holding times of six months for the ICP/MS metals. No qualifications were required.

2.2 ICP-MS TUNING

A precalibration routine must be completed prior to calibrating the instrument, which consists of analyzing a tuning solution to verify resolution, mass calibration, and thermal stability. The solution must be analyzed a minimum of five times and must contain isotopes representing all mass regions of interest. The laboratory performed the required tune solution analyses. The %RSDs for the tune were all within the 5% control limit. The mass calibrations were within 0.1 amu of the true mass and the instrument resolutions were less than 0.75 amu at 5 percent peak height for all analytes in the tune solution. No site sample qualifications were required.

2.3 CALIBRATION

The ICV and CCV results showed acceptable recoveries, 90-110% for the ICP/MS. The applicable reporting limit check standards were recovered within the AMEC control limits of 70-130%. No qualifications were required.

2.4 BLANKS

The method blanks and bracketing ICBs/CCBs associated with sample Outfall 005 were nondetected at the laboratory's MDL for lead. No sample qualifications were required.

2.5 ICP INTERFERENCE CHECK SAMPLE (ICS A/AB)

Results were not provided for ICP-MS spiked interferents sulfur, phosphorus, carbon, titanium, and chloride. The results for potassium were above the calibration range of the instrument in both the ICSA and ICSAB analyses. The results for aluminum were low in both the ICSA and ICSAB analyses with recoveries of 72.4% and 70.%, respectively. Lead was not spiked into the ICSAB solution. The validator reviewed the raw data for the site sample ICP/MS analyses for the level of reported interferents, Al, Ca, Fe, and Mg, and determined that the concentration of interferents was not high enough to cause matrix affects. No assessment could be made with respect to possible interference from sulfur, phosphorus, carbon, and chloride. No qualifications were required.

2.6 BLANK SPIKES AND LABORATORY CONTROL SAMPLES

The ICP/MS LCS sample was identified as 5B02059-BS1. The LCS result on the summary form and in the raw data was within the laboratory-established ICP/MS control limits of 85-115%. No qualifications were required.

2.7 LABORATORY DUPLICATES

MS/MSD analyses were performed on Outfall 005. The RPD for lead was less than the control limit of 20% and no qualifications were required.

2.8 MATRIX SPIKE

MS/MSD analyses were performed on Outfall 005. The recoveries for lead were within the AMEC control limits of 75-125% and no qualifications were required.

2.9 FURNACE ATOMIC ABSORPTION QC

Furnace atomic absorption was not utilized for the analysis of this sample; therefore, furnace atomic absorption QC is not applicable.

2.10 ICP/MS SERIAL DILUTION

No serial dilution analysis was performed in association with the sample in this SDG; therefore, no assessment was made with respect to this criterion.

2.11 INTERNAL STANDARDS PERFORMANCE

The ICP-MS internal standard recoveries for terbium, associated with the site sample and associated QC sample analyses for lead, were within the 60-125% control limits and no qualifications were required.

2.12 SAMPLE RESULT VERIFICATION

A Level IV review was performed for the sample in this data package. Calculations were verified, and the sample result reported on the Form I was verified against the raw data. No transcription errors or calculation errors were noted. The lead detected below the reporting limit in sample Outfall 005 was qualified as estimated, "J." No qualifications were required.

The calibration curve and initial QC samples, ICB, ICV, and ICSA/AB, applicable to sample Outfall 005 were not documented on the run log accompanying the ICP/MS raw data. The applicable QC was run on 2/05/02 between 23:08 and 23:44. This time period is unaccounted for on the run log, paginated page 27. The raw data for these QC samples was included in the ICP/MS data package and no sample qualifications were applied.

2.13 FIELD QC SAMPLES

Field QC samples are evaluated, and if necessary, qualified based only on laboratory blanks. Any remaining detects are used to evaluate the associated samples.

2.13.1 Field Blanks and Equipment Rinsates

The sample in this SDG had no associated field QC samples. No qualifications were required.

2.13.2 Field Duplicates

There were no field duplicate analyses performed in association with the site sample.

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 005
Report Number: IOA1674

Sampled: 01/27/05
Received: 01/27/05

DRAFT: METALS

Analyte	Method	Batch	MDL Limit	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers	Rev Qual	Qual Code
Sample ID: IOA1674-01 (DRAFT: Outfall 005 - Water)											
Reporting Units: ug/l											
Lead	EPA 200.8	5B02059	0.13	1.0	**0.32**	1	02/02/05	02/03/05	J	J	DNQ

AMEC VALIDATED

Level IV

DRAFT REPORT
DRAFT REPORT
DATA SUBJECT TO CHANGE

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LABORATORY REPORT

Prepared For: MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project: Routine Outfall 005

Sampled: 01/27/05
Received: 01/27/05
Issued: 03/18/05 14:38

NELAP #01108CA California ELAP#1197 CSDLAC #10117

The results listed within this Laboratory Report pertain only to the samples tested in the laboratory. The analyses contained in this report were performed in accordance with the applicable certifications as noted. All soil samples are reported on a wet weight basis unless otherwise noted in the report. This Laboratory Report is confidential and is intended for the sole use of Del Mar Analytical and its client. This report shall not be reproduced, except in full, without written permission from Del Mar Analytical. The Chain of Custody, 1 page, is included and is an integral part of this report.
This entire report was reviewed and approved for release.

SAMPLE CROSS REFERENCE

SUBCONTRACTED: Refer to the last page for specific subcontract laboratory information included in this report.

LABORATORY ID	CLIENT ID	MATRIX
IOA1674-01	Outfall 005	Water

Reviewed By:

Michele Harper

Del Mar Analytical, Irvine
Michele Harper
Project Manager

Del Mar Analytical

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 005
Report Number: IOA1674

Sampled: 01/27/05
Received: 01/27/05

METALS

Analyte	Method	Batch	MDL Limit	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA1674-01 (Outfall 005 - Water)									
Reporting Units: ug/l									
Antimony	EPA 200.8	5B02059	0.18	2.0	ND	1	02/02/05	02/03/05	
Cadmium	EPA 200.8	5B02059	0.015	1.0	ND	1	02/02/05	02/03/05	
Copper	EPA 200.8	5B02059	0.49	2.0	**0.93**	1	02/02/05	02/03/05	J
Lead	EPA 200.8	5B02059	0.13	1.0	**0.32**	1	02/02/05	02/03/05	J
Mercury	EPA 245.1	5B01042	0.063	0.20	**0.14**	1	02/01/05	02/01/05	J

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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Attention: Bronwyn Kelly

Project ID: Routine Outfall 005
Report Number: IOA1674

Sampled: 01/27/05
Received: 01/27/05

INORGANICS

Analyte	Method	Batch	MDL Limit	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA1674-01 (Outfall 005 - Water) - cont.									
Reporting Units: mg/l									
Chloride	EPA 300.0	5A28041	0.26	0.50	**0.76**	1	01/28/05	01/28/05	
Nitrate/Nitrite-N	EPA 300.0	5A28041	0.072	0.26	**1.3**	1	01/28/05	01/28/05	
Oil & Grease	EPA 413.1	5A31068	0.94	5.0	ND	1	01/31/05	01/31/05	
Sulfate	EPA 300.0	5A28041	0.18	0.50	**1.8**	1	01/28/05	01/28/05	
Total Dissolved Solids	SM2540C	5A31059	10	10	**81**	1	01/31/05	01/31/05	

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 005

Report Number: IOA1674

Sampled: 01/27/05
Received: 01/27/05

SHORT HOLD TIME DETAIL REPORT

	Hold Time (in days)	Date/Time Sampled	Date/Time Received	Date/Time Extracted	Date/Time Analyzed
Sample ID: Outfall 005 (IOA1674-01) - Water					
EPA 300.0	2	01/27/2005 09:30	01/27/2005 16:15	01/28/2005 09:00	01/28/2005 13:39

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 005

Report Number: IOA1674

Sampled: 01/27/05
Received: 01/27/05

METHOD BLANK/QC DATA

METALS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5B01042 Extracted: 02/01/05											
Blank Analyzed: 02/01/2005 (5B01042-BLK1)											
Mercury	ND	0.20	0.063	ug/l							
LCS Analyzed: 02/01/2005 (5B01042-BS1)											
Mercury	7.84	0.20	0.063	ug/l	8.00		98	85-115			
Matrix Spike Analyzed: 02/01/2005 (5B01042-MS1)						**Source: IOA1674-01**					
Mercury	7.90	0.20	0.063	ug/l	8.00	0.14	97	70-130			
Matrix Spike Dup Analyzed: 02/01/2005 (5B01042-MSD1)						**Source: IOA1674-01**					
Mercury	7.85	0.20	0.063	ug/l	8.00	0.14	96	70-130	1	20	
Batch: 5B02059 Extracted: 02/02/05											
Blank Analyzed: 02/03/2005 (5B02059-BLK1)											
Antimony	ND	2.0	0.18	ug/l							
Cadmium	ND	1.0	0.015	ug/l							
Copper	ND	2.0	0.49	ug/l							
Lead	ND	1.0	0.13	ug/l							
LCS Analyzed: 02/03/2005 (5B02059-BS1)											
Antimony	88.3	2.0	0.18	ug/l	80.0		110	85-115			
Cadmium	80.9	1.0	0.015	ug/l	80.0		101	85-115			
Copper	76.6	2.0	0.49	ug/l	80.0		96	85-115			
Lead	84.1	1.0	0.13	ug/l	80.0		105	85-115			
Matrix Spike Analyzed: 02/03/2005 (5B02059-MS1)						**Source: IOA1674-01**					
Antimony	91.1	2.0	0.18	ug/l	80.0	ND	114	70-130			
Cadmium	84.2	1.0	0.015	ug/l	80.0	ND	105	70-130			
Copper	81.6	2.0	0.49	ug/l	80.0	0.93	101	70-130			
Lead	85.2	1.0	0.13	ug/l	80.0	0.32	106	70-130			

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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2520 E. Sunset Rd. #3, Las Vegas, NV 89120 (702) 798-3620 FAX (702) 798-3621

MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 005

Report Number: IOA1674

Sampled: 01/27/05
Received: 01/27/05

METHOD BLANK/QC DATA

METALS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5B02059 Extracted: 02/02/05											
Matrix Spike Dup Analyzed: 02/03/2005 (5B02059-MSD1)						**Source: IOA1674-01**					
Antimony	93.0	2.0	0.18	ug/l	80.0	ND	116	70-130	2	20	
Cadmium	85.0	1.0	0.015	ug/l	80.0	ND	106	70-130	1	20	
Copper	77.0	2.0	0.49	ug/l	80.0	0.93	95	70-130	6	20	
Lead	85.1	1.0	0.13	ug/l	80.0	0.32	106	70-130	0	20	

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Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 005

Report Number: IOA1674

Sampled: 01/27/05
Received: 01/27/05

METHOD BLANK/QC DATA

INORGANICS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A28041 Extracted: 01/28/05											
Blank Analyzed: 01/28/2005 (5A28041-BLK1)											
Chloride	ND	0.50	0.26	mg/l							
Nitrate/Nitrite-N	ND	0.26	0.072	mg/l							
Sulfate	ND	0.50	0.18	mg/l							
LCS Analyzed: 01/28/2005 (5A28041-BS1)											
Chloride	4.90	0.50	0.26	mg/l	5.00		98	90-110			
Sulfate	9.96	0.50	0.18	mg/l	10.0		100	90-110			
Matrix Spike Analyzed: 01/28/2005 (5A28041-MS1)						**Source: IOA1674-01**					
Chloride	5.86	0.50	0.26	mg/l	5.00	0.76	102	80-120			
Sulfate	12.2	0.50	0.18	mg/l	10.0	1.8	104	80-120			
Matrix Spike Dup Analyzed: 01/28/2005 (5A28041-MSD1)						**Source: IOA1674-01**					
Chloride	5.85	0.50	0.26	mg/l	5.00	0.76	102	80-120	0	20	
Sulfate	12.2	0.50	0.18	mg/l	10.0	1.8	104	80-120	0	20	
Batch: 5A31059 Extracted: 01/31/05											
Blank Analyzed: 01/31/2005 (5A31059-BLK1)											
Total Dissolved Solids	ND	10	10	mg/l							
LCS Analyzed: 01/31/2005 (5A31059-BS1)											
Total Dissolved Solids	986	10	10	mg/l	1000		99	90-110			
Duplicate Analyzed: 01/31/2005 (5A31059-DUP1)						**Source: IOA1571-04**					
Total Dissolved Solids	798	10	10	mg/l		800			0	10	

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 005

Report Number: IOA1674

Sampled: 01/27/05
Received: 01/27/05

METHOD BLANK/QC DATA

INORGANICS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A31068 Extracted: 01/31/05											
Blank Analyzed: 01/31/2005 (5A31068-BLK1)											
Oil & Grease	ND	5.0	0.94	mg/l							
LCS Analyzed: 01/31/2005 (5A31068-BS1)											**M-NR1**
Oil & Grease	17.0	5.0	0.94	mg/l	20.0		85	65-120			
LCS Dup Analyzed: 01/31/2005 (5A31068-BSD1)											
Oil & Grease	19.6	5.0	0.94	mg/l	20.0		98	65-120	14	20	

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 005

Report Number: IOA1674

Sampled: 01/27/05
Received: 01/27/05

Compliance Check

The results obtained from the analytical testing of this data set were checked against compliance limits received from the client. Any results at or above the compliance limits appear in bold on this page.

LabNumber	Analysis	Analyte	Units	Result	MRL	Compliance Limit
IOA1674-01	413.1 Oil and Grease	Oil & Grease	mg/l	0.095	5.0	15
IOA1674-01	Antimony-200.8	Antimony	ug/l	0	2.0	6.00
IOA1674-01	Cadmium-200.8	Cadmium	ug/l	0.00100	1.0	4.00
IOA1674-01	Chloride - 300.0	Chloride	mg/l	0.76	0.50	150
IOA1674-01	Copper-200.8	Copper	ug/l	0.93	2.0	14
IOA1674-01	Mercury - 245.1	Mercury	ug/l	0.14	0.20	0.20
IOA1674-01	Nitrogen, NO3+NO2 -N	Nitrate/Nitrite-N	mg/l	1.30	0.26	10.00
IOA1674-01	Sulfate-300.0	Sulfate	mg/l	1.80	0.50	250
IOA1674-01	TDS - SM 2540C	Total Dissolved Solids	mg/l	81	10	850

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Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 005

Report Number: IOA1674

Sampled: 01/27/05
Received: 01/27/05

DATA QUALIFIERS AND DEFINITIONS

J	Estimated value. Analyte detected at a level less than the Reporting Limit (RL) and greater than or equal to the Method Detection Limit (MDL). The user of this data should be aware that this data is of unknown quality.
M-NR1	There was no MS/MSD analyzed with this batch due to insufficient sample volume. See Blank Spike/Blank Spike Duplicate.
ND	Analyte NOT DETECTED at or above the reporting limit or MDL, if MDL is specified.
RPD	Relative Percent Difference

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 005

Report Number: IOA1674

Sampled: 01/27/05
Received: 01/27/05

Certification Summary

Del Mar Analytical, Irvine

Method	Matrix	Nelac	California
EPA 200.8	Water	X	X
EPA 245.1	Water	X	X
EPA 300.0	Water	X	X
EPA 413.1	Water	X	X
SM2540C	Water	X	X

Nevada and NELAP provide analyte specific accreditations. Analyte specific information for Del Mar Analytical may be obtained by contacting the laboratory or visiting our website at www.dmalabs.com.

Subcontracted Laboratories

Pace Analytical, MN- SUB

1700 Elm Street, Ste 200 - Minneapolis, MN 55414

Analysis Performed: 1613-Dioxin-HR
Samples: IOA1674-01

Analysis Performed: EDD + Level 4
Samples: IOA1674-01

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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(236)

Del Mar Analytical Version 5 8/12/04 CHAIN OF CUSTODY FORM

Client Name/Address:	Project:
MWH-Pasadena 300 North Lake Avenue, Suite 1200 Pasadena, CA 91101	Boeing-SSFL NPDES **Routine Outfall 005** Stormwater at FSDF-1
Project Manager: Bronwyn Kelly Sampler: Pollock	Phone Number: (626) 568-6691 Fax Number: (626) 568-6515

Sample Description	Sample Matrix	Container Type	# of Cont.	Sampling Date/Time	Preservative	Bottle * #	Total Reoverable Metals: Sb, Cd, Cu, Pb, Hg	TCDD (and all congeners) ✓	Oil & Grease (EPA 413.1) ✓	Cl-, SO4, NO3+NO2-N	TDS					Field readings: JQA1674 Temp = 53.4 pH= 7.4 **Comments**
Outfall 005	W	Poly-1L	1	1-27-05 09:2	HNO3	1A	X									
Outfall 005-Dup	W	Poly-1L	1		HNO3	1B	X									
Outfall 005	W	Glass-Amber	2		None	2A, 2B		X								
Outfall 005	W	Glass-Amber	2		HCl	3A, 3B			X							
Outfall 005	W	Poly-500 ml	2		None	4A, 4B				X						
Outfall 005	W	Poly-500 ml	2		None	5A, 5B					X					

Relinquished By	Date/Time:	Received By	Date/Time:
	1-2205 1343		1-27-05 17:43
	1-27-05 1615		1/27/05 1615
	Date/Time:		Date/Time:

Turn around Time: (check)
24 Hours _____ 5 Days _____
48 Hours _____ 10 Days _____
72 Hours _____ Normal _____
Perchlorate Only 72 Hours_____
Metals Only 72 Hours_____
Sample Integrity: (Check)
Intact X On Ice: 5°C

(4)

Del Mar Analytical

2852 Alton Ave., Irvine CA 92606 (949) 261-1022 FAX (949) 261-1228
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March 17, 2005

MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, Ca.91101

Attention: Bronwyn Kelly

Project: Routine Outfall 005
Sampled: 01/27/05
Del Mar Analytical Number: IOA1674

Dear Ms. Kelly:

Pace Analytical performed Method 1613B analysis for the project referenced above. Please use the following cross-reference table when reviewing your results.

MWH ID	DEL MAR ID	Pace ID
Outfall 005	IOA1674-01	106914001

Attached is the original report from the subcontract laboratory. If you have any questions or require further assistance, please do not hesitate to contact me.

Sincerely yours,
DEL MAR ANALYTICAL

Michele Harper
Project Manager

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Pace Analytical™

Method 1613B Analysis Results

Client - Del Mar Analytical

Client's Sample ID	IOA1674-01		
Lab Sample ID	106914001		
Filename	F50209B_10		
Injected By	MRO		
Total Amount Extracted	1030 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	01/27/2005
ICAL Date	11/29/2004	Received	01/29/2005
CCal Filename(s)	F50209A_13	Extracted	02/04/2005
Method Blank ID	BLANK-6264	Analyzed	02/10/2005 02:46

Native Isomers	Conc pg/L	EMPC pg/L	LOD pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	12.0	2,3,7,8-TCDF-13C	2.00	8 P
Total TCDF	ND	-----	12.0	2,3,7,8-TCDD-13C	2.00	13 P
				1,2,3,7,8-PeCDF-13C	2.00	29
2,3,7,8-TCDD	ND	-----	10.0	2,3,4,7,8-PeCDF-13C	2.00	38
Total TCDD	ND	-----	10.0	1,2,3,7,8-PeCDD-13C	2.00	48
				1,2,3,4,7,8-HxCDF-13C	2.00	54
1,2,3,7,8-PeCDF	ND	-----	3.4	1,2,3,6,7,8-HxCDF-13C	2.00	58
2,3,4,7,8-PeCDF	ND	-----	1.9	2,3,4,6,7,8-HxCDF-13C	2.00	66
Total PeCDF	ND	-----	2.6	1,2,3,7,8,9-HxCDF-13C	2.00	61
				1,2,3,4,7,8-HxCDD-13C	2.00	59
1,2,3,7,8-PeCDD	ND	-----	2.7	1,2,3,6,7,8-HxCDD-13C	2.00	64
Total PeCDD	ND	-----	2.7	1,2,3,4,6,7,8-HpCDF-13C	2.00	63
				1,2,3,4,7,8,9-HpCDF-13C	2.00	60
1,2,3,4,7,8-HxCDF	ND	-----	1.5	1,2,3,4,6,7,8-HpCDD-13C	2.00	76
1,2,3,6,7,8-HxCDF	ND	-----	1.4	OCDD-13C	4.00	81
2,3,4,6,7,8-HxCDF	ND	-----	1.2			
1,2,3,7,8,9-HxCDF	ND	-----	1.0	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	-----	1.3	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	1.7	2,3,7,8-TCDD-37Cl4	0.20	15 P
1,2,3,6,7,8-HxCDD	ND	-----	1.6			
1,2,3,7,8,9-HxCDD	ND	-----	1.4			
Total HxCDD	ND	-----	1.6			
1,2,3,4,6,7,8-HpCDF	ND	-----	1.0			
1,2,3,4,7,8,9-HpCDF	ND	-----	1.7			
Total HpCDF	ND	-----	1.4			
1,2,3,4,6,7,8-HpCDD	2.8	-----	1.5 J			
Total HpCDD	7.1	-----	1.5 J			
OCDF	4.4	-----	1.2 BJ			
OCDD	29.0	-----	1.7 J			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection. Totals are averages of individual isomer LODs.
D = Result obtained from analysis of diluted sample
B = Less than 10 times higher than method blank level
P = Recovery outside of method 1613 control limits
J = Concentration detected is below the calibration range
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....106914

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Pace Analytical™

Method 1613B Blank Analysis Results

Client - Del Mar Analytical

Lab Sample ID	BLANK-6264	Matrix	Water
Filename	F50209B_05	Dilution	NA
Total Amount Extracted	929 mL	Extracted	02/04/2005
ICAL Date	11/29/2004	Analyzed	02/09/2005 22:34
CCal Filename(s)	F50209A_13	Injected By	MRO

Native Isomers	Conc pg/L	EMPC pg/L	LOD pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	11.0	2,3,7,8-TCDF-13C	2.00	9 P
Total TCDF	ND	-----	-----	2,3,7,8-TCDD-13C	2.00	14 P
				1,2,3,7,8-PeCDF-13C	2.00	26
2,3,7,8-TCDD	ND	-----	13.0	2,3,4,7,8-PeCDF-13C	2.00	35
Total TCDD	ND	-----	-----	1,2,3,7,8-PeCDD-13C	2.00	45
				1,2,3,4,7,8-HxCDF-13C	2.00	50
1,2,3,7,8-PeCDF	ND	-----	5.0	1,2,3,6,7,8-HxCDF-13C	2.00	57
2,3,4,7,8-PeCDF	ND	-----	2.5	2,3,4,6,7,8-HxCDF-13C	2.00	69
Total PeCDF	ND	-----	-----	1,2,3,7,8,9-HxCDF-13C	2.00	58
				1,2,3,4,7,8-HxCDD-13C	2.00	58
1,2,3,7,8-PeCDD	ND	-----	3.7	1,2,3,6,7,8-HxCDD-13C	2.00	63
Total PeCDD	ND	-----	-----	1,2,3,4,6,7,8-HpCDF-13C	2.00	63
				1,2,3,4,7,8,9-HpCDF-13C	2.00	60
1,2,3,4,7,8-HxCDF	ND	-----	1.8	1,2,3,4,6,7,8-HpCDD-13C	2.00	78
1,2,3,6,7,8-HxCDF	ND	-----	1.9	OCDD-13C	4.00	80
2,3,4,6,7,8-HxCDF	ND	-----	1.5			
1,2,3,7,8,9-HxCDF	ND	-----	1.9	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	-----	-----	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	2.6	2,3,7,8-TCDD-37Cl4	0.20	16 P
1,2,3,6,7,8-HxCDD	ND	-----	2.2			
1,2,3,7,8,9-HxCDD	ND	-----	2.2			
Total HxCDD	ND	-----	-----			
1,2,3,4,6,7,8-HpCDF	1.9	-----	1.8 J			
1,2,3,4,7,8,9-HpCDF	ND	-----	1.9			
Total HpCDF	1.9	-----	----- J			
1,2,3,4,6,7,8-HpCDD	ND	-----	2.0			
Total HpCDD	ND	-----	-----			
OCDF	4.8	-----	1.7 J			
OCDD	-----	8.7	3.5 I			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection. Totals are averages of individual isomer LODs.
A = Limit of Detection based on signal to noise
P = Recovery outside of method 1613 control limits
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....106914

REPORT OF LABORATORY ANALYSIS

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Tel: 612-607-1700
Fax: 612-607-6444

Pace Analytical™

Method 1613B Laboratory Control Spike Results

Client - Del Mar Analytical

Lab Sample ID	LCS-6265		
Filename	F50209B_01	Matrix	Water
Total Amount Extracted	956 mL	Dilution	NA
ICAL Date	11/29/2004	Extracted	02/04/2005
CCal Filename	F50209A_13	Analyzed	02/09/2005 19:13
Method Blank ID	BLANK-6264	Injected By	MRO

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDF	10	10.2	7.5	15.8	102
2,3,7,8-TCDD	10	9.3	6.7	15.8	93
1,2,3,7,8-PeCDF	50	51.4	40.0	67.0	103
2,3,4,7,8-PeCDF	50	48.6	34.0	80.0	97
1,2,3,7,8-PeCDD	50	43.2	35.0	71.0	86
1,2,3,4,7,8-HxCDF	50	48.1	36.0	67.0	96
1,2,3,6,7,8-HxCDF	50	47.3	42.0	65.0	95
2,3,4,6,7,8-HxCDF	50	50.1	35.0	78.0	100
1,2,3,7,8,9-HxCDF	50	46.8	39.0	65.0	94
1,2,3,4,7,8-HxCDD	50	50.3	35.0	82.0	101
1,2,3,6,7,8-HxCDD	50	51.8	38.0	67.0	104
1,2,3,7,8,9-HxCDD	50	49.8	32.0	81.0	100
1,2,3,4,6,7,8-HpCDF	50	52.1	41.0	61.0	104
1,2,3,4,7,8,9-HpCDF	50	51.9	39.0	69.0	104
1,2,3,4,6,7,8-HpCDD	50	43.8	35.0	70.0	88
OCDF	100	95.4	63.0	170.0	95
OCDD	100	96.8	78.0	144.0	97
2,3,7,8-TCDD-37Cl4	10	4.2	3.1	19.1	42
2,3,7,8-TCDF-13C	100	31.8	22.0	152.0	32
2,3,7,8-TCDD-13C	100	41.3	20.0	175.0	41
1,2,3,7,8-PeCDF-13C	100	53.7	21.0	192.0	54
2,3,4,7,8-PeCDF-13C	100	60.1	13.0	328.0	60
1,2,3,7,8-PeCDD-13C	100	71.7	21.0	227.0	72
1,2,3,4,7,8-HxCDF-13C	100	63.5	19.0	202.0	64
1,2,3,6,7,8-HxCDF-13C	100	75.5	21.0	159.0	75
2,3,4,6,7,8-HxCDF-13C	100	78.8	22.0	176.0	79
1,2,3,7,8,9-HxCDF-13C	100	69.4	17.0	205.0	69
1,2,3,4,7,8-HxCDD-13C	100	71.3	21.0	193.0	71
1,2,3,6,7,8-HxCDD-13C	100	72.9	25.0	163.0	73
1,2,3,4,6,7,8-HpCDF-13C	100	72.8	21.0	158.0	73
1,2,3,4,7,8,9-HpCDF-13C	100	68.2	20.0	186.0	68
1,2,3,4,6,7,8-HpCDD-13C	100	87.9	26.0	166.0	88
OCDD-13C	200	173.9	26.0	397.0	87

Cs = Concentration Spiked (ng/mL)
Cr = Concentration Recovered (ng/mL)
Rec. = Recovery (Expressed as Percent)
Control Limit Reference: Method 1613, Table 6, 10/94 Revision
X = Background subtracted value
P = Recovery outside of control limits
Nn = Value obtained from additional analysis
* = See Discussion

Report No.....106914

REPORT OF LABORATORY ANALYSIS

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1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Pace Analytical™

Method 1613B Laboratory Control Spike Results

Client - Del Mar Analytical

Lab Sample ID	LCSD-6266		
Filename	F50209B_02	Matrix	Water
Total Amount Extracted	983 mL	Dilution	NA
ICAL Date	11/29/2004	Extracted	02/04/2005
CCal Filename	F50209A_13	Analyzed	02/09/2005 20:04
Method Blank ID	BLANK-6264	Injected By	MRO

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDF	10	9.9	7.5	15.8	99
2,3,7,8-TCDD	10	8.9	6.7	15.8	89
1,2,3,7,8-PeCDF	50	51.6	40.0	67.0	103
2,3,4,7,8-PeCDF	50	49.3	34.0	80.0	99
1,2,3,7,8-PeCDD	50	43.1	35.0	71.0	86
1,2,3,4,7,8-HxCDF	50	46.4	36.0	67.0	93
1,2,3,6,7,8-HxCDF	50	47.6	42.0	65.0	95
2,3,4,6,7,8-HxCDF	50	49.6	35.0	78.0	99
1,2,3,7,8,9-HxCDF	50	47.0	39.0	65.0	94
1,2,3,4,7,8-HxCDD	50	50.7	35.0	82.0	101
1,2,3,6,7,8-HxCDD	50	51.4	38.0	67.0	103
1,2,3,7,8,9-HxCDD	50	49.5	32.0	81.0	99
1,2,3,4,6,7,8-HpCDF	50	51.2	41.0	61.0	102
1,2,3,4,7,8,9-HpCDF	50	52.9	39.0	69.0	106
1,2,3,4,6,7,8-HpCDD	50	43.8	35.0	70.0	88
OCDF	100	95.1	63.0	170.0	95
OCDD	100	98.2	78.0	144.0	98
2,3,7,8-TCDD-37Cl4	10	5.0	3.1	19.1	50
2,3,7,8-TCDF-13C	100	39.8	22.0	152.0	40
2,3,7,8-TCDD-13C	100	51.4	20.0	175.0	51
1,2,3,7,8-PeCDF-13C	100	61.4	21.0	192.0	61
2,3,4,7,8-PeCDF-13C	100	66.8	13.0	328.0	67
1,2,3,7,8-PeCDD-13C	100	82.2	21.0	227.0	82
1,2,3,4,7,8-HxCDF-13C	100	70.8	19.0	202.0	71
1,2,3,6,7,8-HxCDF-13C	100	79.9	21.0	159.0	80
2,3,4,6,7,8-HxCDF-13C	100	85.0	22.0	176.0	85
1,2,3,7,8,9-HxCDF-13C	100	75.4	17.0	205.0	75
1,2,3,4,7,8-HxCDD-13C	100	72.5	21.0	193.0	72
1,2,3,6,7,8-HxCDD-13C	100	82.8	25.0	163.0	83
1,2,3,4,6,7,8-HpCDF-13C	100	80.0	21.0	158.0	80
1,2,3,4,7,8,9-HpCDF-13C	100	73.7	20.0	186.0	74
1,2,3,4,6,7,8-HpCDD-13C	100	94.2	26.0	166.0	94
OCDD-13C	200	186.1	26.0	397.0	93

Cs = Concentration Spiked (ng/mL)
Cr = Concentration Recovered (ng/mL)
Rec. = Recovery (Expressed as Percent)
Control Limit Reference: Method 1613, Table 6, 10/94 Revision
X = Background subtracted value
P = Recovery outside of control limits
Nn = Value obtained from additional analysis
* = See Discussion

Report No.....106914

REPORT OF LABORATORY ANALYSIS

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Phone: 612.607.1700
Fax: 612.607.6444

SPIKE RECOVERY RELATIVE PERCENT DIFFERENCE (RPD) RESULTS

Client..... Del Mar Analytical

SPIKE 1 ID..... LCS-6265
SPIKE 1 Filename..... F50209B_01
SPIKE 2 ID..... LCSD-6266
SPIKE 2 Filename..... F50209B_02

COMPOUND	SPIKE 1 REC,%	SPIKE 2 REC,%	RPD,%
2378-TCDF	102	99	3.0
2378-TCDD	93	89	4.4
12378-PeCDF	103	103	0.0
23478-PeCDF	97	99	2.0
12378-PeCDD	86	86	0.0
123478-HxCDF	96	93	3.2
123678-HxCDF	95	95	0.0
234678-HxCDF	100	99	1.0
123789-HxCDF	94	94	0.0
123478-HxCDD	101	101	0.0
123678-HxCDD	104	103	1.0
123789-HxCDD	100	99	1.0
1234678-HpCDF	104	102	1.9
1234789-HpCDF	104	106	1.9
1234678-HpCDD	88	88	0.0
OCDF	95	95	0.0
OCDD	97	98	1.0

REC = Percent Recovered
RPD = The difference between the two values divided by the average.
NA = Not Applicable

Report No.....106914

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TABLE 1. 2,3,7,8-TCDD Equivalency Factors (TEFs) for the Polychlorinated Dibenzo-p-dioxins and Dibenzofurans

Number	Compound(s)	TEF
1	2,3,7,8-TCDD	1.00
2	1,2,3,7,8-PeCDD	0.50
3	1,2,3,6,7,8-HxCDD	0.1
4	1,2,3,7,8,9-HxCDD	0.1
5	1,2,3,4,7,8-HxCDD	0.1
6	1,2,3,4,6,7,8-HpCDD	0.01
7	OCDD	0.001
8	* Total - TCDD	0.0
9	* Total - PeCDD	0.0
10	* Total - HxCDD	0.0
11	* Total - HpCDD	0.0
12	2,3,7,8-TCDF	0.10
13	1,2,3,7,8-PeCDF	0.05
14	2,3,4,7,8-PeCDF	0.5
15	1,2,3,6,7,8-HxCDF	0.1
16	1,2,3,7,8,9-HxCDF	0.1
17	1,2,3,4,7,8-HxCDF	0.1
18	2,3,4,6,7,8-HxCDF	0.1
19	1,2,3,4,6,7,8-HpCDF	0.01
20	1,2,3,4,7,8,9-HpCDF	0.01
21	OCDF	0.001
22	* Total - TCDF	0.0
23	* Total - PeCDF	0.0
24	* Total - HxCDF	0.0
25	* Total - HpCDF	0.0

*Excluding the 2,3,7,8-substituted congeners.

Reference: 1989 ITEFs

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9484 Chesapeake Drive, Suite 805, San Diego, CA 92123 Ph (619) 505-9596 Fax (619) 505-9689
9830 South 51st Street, Suite B-120, Phoenix, AZ 85044 Ph (480) 785-0043 Fax (480) 785-0851
2520 E. Sunset Rd., Suite #3, Las Vegas, NV 89120 Ph (702) 798-3620 Fax (702) 798-3621

SUBCONTRACT ORDER - PROJECT # IOA1674

106914

SENDING LABORATORY:

Del Mar Analytical, Irvine
17461 Derian Avenue. Suite 100
Irvine, CA 92614
Phone: (949) 261-1022
Fax: (949) 261-1228
Project Manager: Michele Harper

RECEIVING LABORATORY:

Pace Analytical, MN- SUB
1700 Elm Street, Ste 200
Minneapolis, MN 55414
Phone :(612) 607-1700
Fax: (612) 607-6444

Standard TAT is requested unless specific due date is requested => Due Date:_____ **Initials:**_____

Analysis	Expiration	Comments
Sample ID: IOA1674-01 Water	**Sampled: 01/27/05 09:30**	**Instant Nofication** 106-914001
1613-Dioxin-HR	02/03/05 09:30	J flags, 17 congeners, no TEQ, sub to Pace-MN
EDD + Level 4	02/24/05 09:30	Excel EDD email to pm,Include Std logs for Lvl IV

Containers Supplied:
1 L Amber (IOA1674-01C)
1 L Amber (IOA1674-01D)

SAMPLE INTEGRITY:

All containers intact: ☐ Yes ☐ No Sample labels/COC agree: ☐ Yes ☐ No Samples Received On Ice:: ☐ Yes ☐ No
Custody Seals Present: ☐ Yes ☐ No Samples Preserved Properly: ☐ Yes ☐ No Samples Received at (temp): 1.2°C

Released By	Date	Time	Received By	Date	Time
Stacy Gunavan	1-28-05	1700	Pace	1-29-05	08:45

APPENDIX G

Section 6

January Outfall 006

AMEC Data Validation Reports

Del Mar Analytical Laboratory Reports

CONTRACT COMPLIANCE SCREENING FORM FOR HARDCOPY DATA

AMEC Earth & Environmental
550 South Wadsworth Boulevard
Suite 500
Lakewood, CO 80226

Laboratory Del Mar Analytical
Reviewer K. Okonzak
Analysis/Method metals

Package ID T711MT22
Task Order 313150012O
SDG No. IOA0027, 0028, 0029
No. of Analyses 3

Date: 2/01/05
Reviewer's Signature K. Okonzak

ACTION ITEMS[a]	
1. **Case Narrative Deficiencies**	
2. **Out of Scope Analyses**	
3. **Analyses Not Conducted**	
4. **Missing Hardcopy Deliverables**	
5. **Incorrect Hardcopy Deliverables**	
6. **Deviations from Analysis Protocol, e.g.,**	Qualifications applied for lead detected between the MDL and the reporting limit.
	The mercury reanalysis, for sample Outfall 004 was rejected, "R," and the original mercury analysis was reported for this sample. The reanalysis confirmed the original mercury detect.
Holding Times	
GC/MS Tune/Inst. Perform	
Calibrations	
Blanks	
Surrogates	
Matrix Spike/Dup LCS	
Field QC	
Internal Standard Performance	
Compound Identification and Quantitation	
System Performance	

COMMENTS[b]	

[a] Subcontracted analytical laboratory is not meeting contract and/or method requirements.
[b] Differences in protocol have been adopted by the laboratory but no action against the laboratory is required.

Data Qualifier Reference Table

Qualifier	Organics	Inorganics
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.	The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.	The associated value is an estimated quantity.
N	The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification."	Not applicable.
NJ	The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.	Not applicable.
UJ	The analyte was not deemed above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.	The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.
R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and to meet quality control criteria. The presence or absence of the analyte cannot be verified.	The data are unusable. (Note: Analyte may or may not be present).

Qualification Code Reference Table

Qualifier	Organics	Inorganics
H	Holding times were exceeded.	Holding times were exceeded.
S	Surrogate recovery was outside QC limits.	The sequence or number of standards used for the calibration was incorrect
C	Calibration %RSD or %D were noncompliant.	Correlation coefficient is <0.995.
R	Calibration RRF was <0.05.	%R for calibration is not within control limits.
B	Presumed contamination from preparation (method) blank.	Presumed contamination from preparation (method) or calibration blank.
L	Laboratory Blank Spike/Blank Spike Duplicate %R was not within control limits.	Laboratory Control Sample %R was not within control limits.
Q	MS/MSD recovery was poor or RPD high.	MS recovery was poor.
E	Not applicable.	Duplicates showed poor agreement.
I	Internal standard performance was unsatisfactory.	ICP ICS results were unsatisfactory.
A	Not applicable.	ICP Serial Dilution %D were not within control limits.
M	Tuning (BFB or DFTPP) was noncompliant.	Not applicable.
T	Presumed contamination from trip blank.	Not applicable.
+	False positive – reported compound was not present. Not applicable.	
-	False negative – compound was present but not reported.	Not applicable.
F	Presumed contamination from FB, or ER.	Presumed contamination from FB or ER.
$	Reported result or other information was incorrect.	Reported result or other information was incorrect.
?	TIC identity or reported retention time has been changed.	Not applicable.
D	The analysis with this flag should not be used because another more technically sound analysis is available.	The analysis with this flag should not be used because another more technically sound analysis is available.
P	Instrument performance for pesticides was poor.	Post Digestion Spike recovery was not within control limits.
DNQ	The compound was detected between the MDL and the RL and, by definition, is considered an estimated value.	The compound was detected between the MDL and the RL and, by definition, is considered an estimated value.

*#	Unusual problems found with the data that have been described in Section 2.#, "Data Validation Findings." The number following the asterisk (*) will indicate the subsection where a description of the problem can be found (eg. *1 would indicate a sample was not within temperature limits).	Unusual problems found with the data that have been described in Section 2.#, "Data Validation Findings." The number following the asterisk (*) will indicate the subsection where a description of the problem can be found (eg. *1 would indicate a sample was not within temperature limits).

DATA VALIDATION REPORT

NPDES
Monitoring

ANALYSIS: METALS

SAMPLE DELIVERY GROUP: IOA0027, IOA0028, IOA0029

Prepared by

AMEC—Denver Operations
550 South Wadsworth Boulevard, Suite 500
Lakewood, Colorado 80226

1. INTRODUCTION

Task Order Title:	NPDES Monitoring
Contract Task Order #:	313150010
SDG#:	IOA0027, IOA0028, IOA0029
Project Manager:	B. McIlvaine
Matrix:	Water
Analysis:	Metals
QC Level:	Level IV
No. of Samples:	3
No. of Reanalyses/Dilutions:	0
Reviewer:	K. Okonzak
Date of Review:	February 1, 2005

The samples listed in Table 1 were validated based on the guidelines outlined in the *AMEC Data Validation Procedure for Levels III and IV ICP-MS Metals, (DVP-5-A, Rev.0), AMEC Data Validation Procedure for Levels III and IV ICP Metals* (DVP-5, Rev. 0), SW-846 *Method 6020B for Inductively Coupled Plasma – Mass Spectrometry*, SW-846 *Method 7471A for Mercury (Manual Cold-Vapor Technique)*, and validation guidelines outlined in the USEPA CLP *National Functional Guidelines for Inorganic Data Review* (2/94). Any deviations from these procedures and guidelines are documented herein. Qualifiers were applied in cases where the data did not meet the required QC criteria or where special consideration by the data user is required. Data qualifiers were placed on Form Is with the associated qualification codes. Analytes that were rejected for any reason are denoted on the Form I as having only the "R" data qualifier and associated qualification code(s) denoting the reason for rejection. Any additional problems with the data that may have resulted in an estimated value were not denoted by a qualification code since the data had already been rejected.

Table 1. Sample identification

Client ID	EPA ID	Laboratory ID	Matrix	COC Method
Outfall 004	Outfall 004	IOA0027-01	water	ILM04
Outfall 005	Outfall 005	IOA0028-01	water	ILM04
Outfall 006	Outfall 006	IOA0029-01	water	ILM04

2. DATA VALIDATION FINDINGS

2.1 SAMPLE MANAGEMENT

Following are findings associated with sample management:

2.1.1 Sample Preservation, Handling, and Transport

The samples in these SDGs were received at the laboratory within the temperature limits of 4°C ±2°C. No sample preservation, handling, or transport problems were noted, and no qualifications were necessary.

2.1.2 Chain of Custody

The COCs were signed and dated by field and laboratory personnel. The COCs listed duplicate samples for metals analysis for all three site samples. A duplicate analysis, Outfall 004-RE1, was performed for mercury for sample Outfall 004 to confirm the mercury detect reported for this sample. Since the reanalysis confirmed the mercury result, the reanalysis was rejected, and the original mercury analysis was reported for sample Outfall 004. Duplicate analyses were not required for the lead results reported for the three site samples. No sample qualifications were required.

2.1.3 Holding Times

The date of collection recorded on the COCs and the dates of analysis recorded in the raw data, documented that the sample analysis was performed within the specified holding times of six months for the ICP/MS lead and 28 days for mercury. No qualifications were assigned.

2.2 ICP-MS TUNING

The ICP-MS tuning solution analyses are not included in the raw data package; therefore, the samples were not assessed for this criterion.

2.3 CALIBRATION

The ICV and CCV results showed acceptable %Rs, 90-110% for the ICP/MS and 80-120% for mercury. The ICP/MS and mercury 0.2 ppb check standards were within the laboratory-established control limits, and no sample qualifications were required due to calibration.

2.4 BLANKS

The calibration and method blanks associated with the samples in these SDGs were nondetected for mercury and lead at the laboratory MDL; therefore, no sample qualifications were required due to the blanks.

2.5 ICP INTERFERENCE CHECK SAMPLE (ICS A/AB)

Results were not provided for ICP-MS spiked interferents sulfur, phosphorus, carbon, titanium, and chloride. The results for aluminum, sodium, and potassium were above the calibration range of the instrument in both the ICSA and ICSAB analyses. Lead was not spiked into the ICSAB solution. The validator reviewed the raw data for the site sample ICP/MS analysis for the level of reported interferents, Al, Ca, Fe, and Mg, and determined that the concentration of interferents was not high enough to cause matrix affects. No assessment could be made with respect to possible interference from sulfur, phosphorus, carbon, and chloride. No qualifications were required.

2.6 BLANK SPIKES AND LABORATORY CONTROL SAMPLES

The ICP/MS LCS was identified as 5A04040-BS1, and the mercury LCS samples were identified as 5A04047-BS1 and 5A20051-BS1. The LCS results on the summary form and in the raw data were within the laboratory-established ICP/MS and mercury control limits of 85-115%. No qualifications were required.

2.7 LABORATORY DUPLICATES

The laboratory MS/MSD analyses were performed on sample Outfall 005. The precision between the MS/MSD aliquots was within the 20% RPD control limit for the lead and mercury analyses, and no sample qualifications were required.

2.8 MATRIX SPIKE

The laboratory MS/MSD analyses were performed on sample Outfall 005. The MS/MSD recoveries for lead and mercury were within the 70-130%R control limit, and no sample qualifications were required.

2.9 FURNACE ATOMIC ABSORPTION QC

Furnace atomic absorption was not utilized for the analysis of the samples; therefore, furnace atomic absorption QC is not applicable.

2.10 ICP/MS SERIAL DILUTION

No serial dilution analysis was performed in association with the samples in these data packages; therefore, no assessment was made with respect to this criterion.

2.11 INTERNAL STANDARDS PERFORMANCE

The ICP-MS internal standard recoveries for the site sample and associated QC sample analyses were within the 60-125% control limits used for validation, and no qualifications were required.

2.12 SAMPLE RESULT VERIFICATION

A Level IV review was performed for the samples in these data packages. Calculations were verified, and the sample results reported on the Form Is were verified against the raw data. No transcription errors or calculation errors were noted. Lead detected below the reporting limit in all three site samples was qualified as estimated, "J," by the laboratory. Outfall 004 was reanalyzed for mercury and reported as Outfall 004 RE1. As the original and reanalysis results were similar, the reanalysis, Outfall 004 RE1, was rejected, "R," in favor of the original result, Outfall 004. No further qualifications were required.

2.13 FIELD QC SAMPLES

Field QC samples are evaluated, and if necessary, qualified based only on laboratory blanks. Any remaining detects are used to evaluate the associated samples.

2.13.1 Field Blanks and Equipment Rinsates

The samples in these SDGs had no associated field QC samples. No qualifications were required.

2.13.2 Field Duplicates

There were no field duplicate analyses performed in association with the site samples reported in these data packages.

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 006

Report Number: IOA0029

Sampled: 01/03/05
Received: 01/03/05

DRAFT: METALS

Analyte	Method	Batch	MDL Limit	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers Rev Qual	Qual Code
Sample ID: IOA0029-01 (DRAFT: Outfall 006 - Water)										
Reporting Units: ug/l										
Lead	EPA 200.8	5A04040	0.13	1.0	**0.67**	1	01/04/05	01/04/05	J	DNQ

AMEC VALIDATED

LEVEL IV

KWL 2/01/05

DRAFT REPORT
DRAFT REPORT
DATA SUBJECT TO CHANGE

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CONTRACT COMPLIANCE SCREENING FORM FOR HARDCOPY DATA

AMEC Earth & Environmental
550 South Wadsworth Boulevard
Suite 500
Lakewood, CO 80226

Laboratory Pace
Reviewer K. Shadowlight
Analysis/Method Dioxins

Package ID T711DF19
Task Order 313150010
SDG No. IOA0029
No. of Analyses 1

Date: February 4, 2005
Reviewer's Signature K. Shadowlight

ACTION ITEMS[a]	
1. **Case Narrative Deficiencies**	
2. **Out of Scope Analyses**	
3. **Analyses Not Conducted**	
4. **Missing Hardcopy Deliverables**	
5. **Incorrect Hardcopy Deliverables**	
6. **Deviations from Analysis Protocol, e.g.,**	Qualifications were assigned for the following:
Holding Times	* Method blank contamination
GC/MS Tune/Inst. Performance	* EMPCs
Calibration	
Method blanks	
Surrogates	
Matrix Spike/Dup LCS	
Field QC	
Internal Standard Performance	
Compound Identification and Quantitation	
System Performance	

COMMENTS[b]	

[a] Subcontracted analytical laboratory is not meeting contract and/or method requirements.
[b] Differences in protocol have been adopted by the laboratory but no action against the laboratory is required.

DATA VALIDATION REPORT

NPDES
Monitoring

ANALYSIS: DIOXINS/FURANS

SAMPLE DELIVERY GROUPS: IOA0029

Prepared by

AMEC—Denver Operations
550 South Wadsworth Boulevard, Suite 500
Lakewood, Colorado 80226

1. INTRODUCTION

Task Order Title:	NPDES Monitoring
Contract Task Order #:	313150010
Sample Delivery Group #:	IOA0029
Project Manager:	B. McIlvaine
Matrix:	Water
Analysis:	Dioxins/Furans
QC Level:	Level IV
No. of Samples:	1
No. of Reanalyses/Dilutions:	0
Reviewer:	K. Shadowlight
Date of Review:	February 4, 2005

The samples listed in Table 1 were validated based on the guidelines outlined in the *AMEC Data Validation Procedure for Dioxins and Furans (DVP-19, Rev. 1), EPA Method 1613, and the National National Functional Guidelines For Chlorinated Dioxin/Furan Data Review* (8/02). Any deviations from these procedures and guidelines are documented herein. Qualifiers were applied in cases where the data did not meet the required QC criteria or where special consideration by the data user is required. Data qualifiers were placed on Form Is with the associated qualification codes. Analytes that were rejected for any reason are denoted on the Form I as having only the "R" data qualifier and associated qualification code(s) denoting the reason for rejection. Any additional problems with the data that may have resulted in an estimated value were not denoted by a qualification code since the data had already been rejected.

Table 1. Sample Identification

Client ID	Laboratory ID (Del Mar)	Laboratory ID (Pace)	Matrix	COC Method
Outfall 006	IOA0029-01	105643001	water	1613

2. DATA VALIDATION FINDINGS

2.1 SAMPLE MANAGEMENT

Following are findings associated with sample management:

2.1.1 Sample Preservation, Handling, and Transport

The sample in this SDG was received at both Del Mar and Pace Analytical Services within the temperature limits of 4°C ±2°C. The sample was received in good condition at both laboratories. No qualifications were required.

2.1.2 Chain of Custody

The COC and transfer COC were signed by the appropriate field and laboratory personnel, and the accounted for the analysis presented in this SDG. As the sample was couriered directly to the laboratory (Del Mar Analytical), custody seals were not required. There was no information regarding custody seals upon receipt at Pace. No qualifications were required.

2.1.3 Holding Times

The sample was extracted and analyzed within a year of collection. No qualifications were required.

2.2 INSTRUMENT PERFORMANCE

Following are findings associated with instrument performance:

2.2.1 GC Column Performance

A column performance standard was combined with the daily calibration verification and analyzed at the beginning of each analytical sequence. The GC column performance was acceptable with the chromatographic separation of 2,3,7,8-TCDD and other TCDD isomers resolved with a valley of ≤25%. No qualifications were required.

2.2.2 Mass Spectrometer Performance

The mass spectrometer performance could not be evaluated as the laboratory did not provide selected ion current profiles for the lock-mass ions. No qualifications were required.

2.3 CALIBRATION

2.3.1 Initial Calibration

There was one initial calibration, analyzed 11/29/04 on Instrument 10MSHR05. The calibration consisted of five concentration level standards (CS1 through CS5) analyzed to verify instrument linearity. The initial calibration was acceptable with %RSDs ≤20% for the 15 native compounds (calibration by isotope dilution) and ≤35% for the 2 native and all labeled compounds (calibration by internal standard). The relative retention times and ion abundance ratios were within the QC limits listed in Method 1613 for all standards. A representative number of %RSDs were verified from the raw data, and no calculation or transcription errors were noted. No qualifications were required.

2.3.2 Continuing Calibration

Calibration verification (VER) consisted of a mid-level standard (CS3) analyzed at the beginning of each analytical sequence. The VER was acceptable with the concentrations within the acceptance criteria listed in the Table 6 of the EPA Method 1613. The ion abundance ratios and relative retention times were within the method QC limits. A representative number of %Ds were verified from the raw data, and no calculation or transcription errors were noted. No qualifications were required.

2.4 BLANKS

One method blank (Blank-6129) was extracted and analyzed with the sample in this SDG. Target compounds 1,2,3,6,7,8-HxCDF, total HxCDF, 1,2,3,6,7,8-HxCDD, total HxCDD, 1,2,3,4,6,7,8-HpCDF, 1,2,3,4,7,8,9-HpCDF, total HpCDF, 1,2,3,4,6,7,8-HpCDD, total HpCDD, OCDF, and OCDD were reported in the method blank. The detects for 1,2,3,4,6,7,8-HpCDF, total HpCDF, 1,2,3,4,6,7,8-HpCDD, total HpCDD, OCDF, and OCDD reported in sample Outfall 006 were detected at concentrations ≤5x the concentrations reported in the method blank; therefore, the aforementioned target compounds were qualified as estimated nondetects "UJ," at the levels of interference. A review of the method blank raw data and chromatograms indicated no false negative or false positives. No further qualifications were required.

2.5 BLANK SPIKES AND LABORATORY CONTROL SAMPLES

One LCS/LCSD pair (LCS-6130/LCSD-6131) was extracted and analyzed with the samples in this SDG. All recoveries were within the acceptance criteria listed in Table 6 of the Method 1613. There were no QC limits established for RPDs. The reported RPDs were within ±20%. No qualifications were required.

2.6 MATRIX SPIKE/MATRIX SPIKE DUPLICATE

MS/MSD analyses were not performed in this SDG. Evaluation of method accuracy and precision was based on the LCS/LCSD results. No qualifications were required.

2.7 FIELD QC SAMPLES

Following are findings associated with field QC:

2.7.1 Field Blanks and Equipment Rinsates

The sample in this SDG had no associated field QC samples. No qualifications were required.

2.7.2 Field Duplicates

No field duplicate samples were identified for this SDG.

2.8 INTERNAL STANDARDS

The labeled standard recoveries were within the acceptance criteria listed in Table 7 of Method 1613. No qualifications were required.

2.9 COMPOUND IDENTIFICATION

The laboratory analyzed for polychlorinated dioxins/furans by EPA Method 1613. The compound identifications were verified from the raw data and no false negatives or positives were noted. No qualifications were required.

2.10 COMPOUND QUANTIFICATION AND REPORTED DETECTION LIMITS

Compound quantitation was verified from the raw data. The laboratory calculated and reported compound-specific detection limits. Any EMPC was qualified as an estimated nondetect, "UJ." No further qualifications were required.

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
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Method 1613B Analysis Results

Client - Del Mar Analytical

Client's Sample ID	IOA0029-01 outfall-206		
Lab Sample ID	105643001		
Filename	F50117B_09		
Injected By	MRO		
Total Amount Extracted	1030 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	01/03/2005
ICAL Date	11/29/2004	Received	01/04/2005
CCal Filename(s)	F50117B_02	Extracted	01/14/2005
Method Blank ID	BLANK-6129	Analyzed	01/17/2005 18:16

Res Qual	Qual	Native Isomers	Conc pg/L	EMPC pg/L	LOD pg/L	Internal Standards	ng's Added	Percent Recovery
U		2,3,7,8-TCDF	ND	-----	1.00	2,3,7,8-TCDF-13C	2.00	74
U		Total TCDF	ND	-----	1.00	2,3,7,8-TCDD-13C	2.00	84
						1,2,3,7,8-PeCDF-13C	2.00	84
U		2,3,7,8-TCDD	ND	-----	0.93	2,3,4,7,8-PeCDF-13C	2.00	83
U		Total TCDD	ND	-----	0.93	1,2,3,7,8-PeCDD-13C	2.00	91
						1,2,3,4,7,8-HxCDF-13C	2.00	86
U		1,2,3,7,8-PeCDF	ND	-----	0.88	1,2,3,6,7,8-HxCDF-13C	2.00	86
↓		2,3,4,7,8-PeCDF	ND	-----	0.74	2,3,4,6,7,8-HxCDF-13C	2.00	82
		Total PeCDF	ND	-----	0.81	1,2,3,7,8,9-HxCDF-13C	2.00	83
						1,2,3,4,7,8-HxCDD-13C	2.00	84
U		1,2,3,7,8-PeCDD	ND	-----	1.20	1,2,3,6,7,8-HxCDD-13C	2.00	83
U		Total PeCDD	ND	-----	1.20	1,2,3,4,6,7,8-HpCDF-13C	2.00	68
						1,2,3,4,7,8,9-HpCDF-13C	2.00	59
UJ	*10	1,2,3,4,7,8-HxCDF	----	0.96	0.83 I	1,2,3,4,6,7,8-HpCDD-13C	2.00	71
U		1,2,3,6,7,8-HxCDF	ND	-----	0.97	OCDD-13C	4.00	55
		2,3,4,6,7,8-HxCDF	ND	-----	0.94			
↓		1,2,3,7,8,9-HxCDF	ND	-----	0.73	1,2,3,4-TCDD-13C	2.00	NA
		Total HxCDF	ND	-----	0.87	1,2,3,7,8,9-HxCDD-13C	2.00	NA
U		1,2,3,4,7,8-HxCDD	ND	-----	0.73	2,3,7,8-TCDD-37Cl4	0.20	88
		1,2,3,6,7,8-HxCDD	ND	-----	1.00			
↓		1,2,3,7,8,9-HxCDD	ND	-----	1.10			
		Total HxCDD	ND	-----	0.97			
UJ	B, ~~ENG~~	1,2,3,4,6,7,8-HpCDF	1.7	-----	0.93 BJ			
U		1,2,3,4,7,8,9-HpCDF	ND	-----	0.91			
UJ	B	Total HpCDF	8.3	-----	0.92 BJ			
UJ	B	1,2,3,4,6,7,8-HpCDD	3.2	-----	1.30 BJ			
UJ	B	Total HpCDD	6.8	-----	1.30 BJ			
UJ	B	OCDF	9.0	-----	2.50 BJ			
UJ	B	OCDD	40.0	-----	2.50 BJ			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection. Totals are averages of individual isomer LODs.
D = Result obtained from analysis of diluted sample
B = Less than 10 times higher than method blank level
P = Recovery outside of method 1613 control limits
J = Concentration detected is below the calibration range
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....105643

REPORT OF LABORATORY ANALYSIS

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AMEC VALIDATED LEVEL IV

Del Mar Analytical

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LABORATORY REPORT

Prepared For: MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project: Routine Outfall 006

Sampled: 01/03/05
Received: 01/03/05
Issued: 02/08/05 11:26

NELAP #01108CA CA ELAP #1197 CSDLAC #10117

The results listed within this Laboratory Report pertain only to the samples tested in the laboratory. The analyses contained in this report were performed in accordance with the applicable certifications as noted. All soil samples are reported on a wet weight basis unless otherwise noted in the report. This Laboratory Report is confidential and is intended for the sole use of Del Mar Analytical and its client. This report shall not be reproduced, except in full, without written permission from Del Mar Analytical. The Chain of Custody, 1 page, is included and is an integral part of this report.
This entire report was reviewed and approved for release.

SAMPLE CROSS REFERENCE

SUBCONTRACTED: Refer to the last page for specific subcontract laboratory information included in this report.

LABORATORY ID	CLIENT ID	MATRIX
IOA0029-01	Outfall 006	Water

Reviewed By:

Michele Harper

Del Mar Analytical, Irvine
Michele Harper
Project Manager

Del Mar Analytical

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 006
Report Number: IOA0029

Sampled: 01/03/05
Received: 01/03/05

METALS

Analyte	Method	Batch	MDL Limit	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA0029-01 (Outfall 006 - Water)									
Reporting Units: ug/l									
Antimony	EPA 200.8	5A04040	0.18	2.0	ND	1	01/04/05	01/04/05	
Cadmium	EPA 200.8	5A04040	0.015	1.0	**0.032**	1	01/04/05	01/04/05	J
Copper	EPA 200.8	5A04040	0.49	2.0	**2.2**	1	01/04/05	01/04/05	B
Lead	EPA 200.8	5A04040	0.13	1.0	**0.67**	1	01/04/05	01/04/05	J
Mercury	EPA 245.1	5A04047	0.063	0.20	**0.18**	1	01/04/05	01/04/05	J

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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Report Number: IOA0029

Sampled: 01/03/05
Received: 01/03/05

INORGANICS

Analyte	Method	Batch	MDL Limit	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA0029-01 (Outfall 006 - Water) - cont.									
Reporting Units: mg/l									
Chloride	EPA 300.0	5A03042	0.26	0.50	**1.5**	1	01/03/05	01/03/05	
Nitrate/Nitrite-N	EPA 300.0	5A03042	0.072	0.26	**1.3**	1	01/03/05	01/03/05	
Oil & Grease	EPA 413.1	5A05068	0.94	5.0	ND	1	01/05/05	01/05/05	
Sulfate	EPA 300.0	5A03042	0.18	0.50	**1.8**	1	01/03/05	01/03/05	
Total Dissolved Solids	SM2540C	5A05071	10	10	**120**	1	01/05/05	01/05/05	

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Sampled: 01/03/05
Received: 01/03/05

SHORT HOLD TIME DETAIL REPORT

	Hold Time (in days)	Date/Time Sampled	Date/Time Received	Date/Time Extracted	Date/Time Analyzed
Sample ID: Outfall 006 (IOA0029-01) - Water					
EPA 300.0	2	01/03/2005 11:00	01/03/2005 15:00	01/03/2005 16:15	01/03/2005 17:24

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MWH-Pasadena/Boeing
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Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 006
Report Number: IOA0029

Sampled: 01/03/05
Received: 01/03/05

METHOD BLANK/QC DATA

METALS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A04040 Extracted: 01/04/05											
Blank Analyzed: 01/04/2005 (5A04040-BLK1)											
Antimony	ND	2.0	0.18	ug/l							
Cadmium	ND	1.0	0.015	ug/l							
Copper	0.492	2.0	0.49	ug/l							J
Lead	ND	1.0	0.13	ug/l							
LCS Analyzed: 01/04/2005-01/05/2005 (5A04040-BS1)											
Antimony	91.9	2.0	0.18	ug/l	80.0		115	85-115			
Cadmium	84.0	1.0	0.015	ug/l	80.0		105	85-115			
Copper	77.4	2.0	0.49	ug/l	80.0		97	85-115			
Lead	75.7	1.0	0.13	ug/l	80.0		95	85-115			
Matrix Spike Analyzed: 01/04/2005-01/05/2005 (5A04040-MS1)						**Source: IOA0028-01**					
Antimony	95.3	2.0	0.18	ug/l	80.0	ND	119	70-130			
Cadmium	84.9	1.0	0.015	ug/l	80.0	0.026	106	70-130			
Copper	77.6	2.0	0.49	ug/l	80.0	0.71	96	70-130			
Lead	78.4	1.0	0.13	ug/l	80.0	0.19	98	70-130			
Matrix Spike Dup Analyzed: 01/04/2005-01/05/2005 (5A04040-MSD1)						**Source: IOA0028-01**					
Antimony	93.3	2.0	0.18	ug/l	80.0	ND	117	70-130	2	20	
Cadmium	83.4	1.0	0.015	ug/l	80.0	0.026	104	70-130	2	20	
Copper	77.2	2.0	0.49	ug/l	80.0	0.71	96	70-130	1	20	
Lead	77.0	1.0	0.13	ug/l	80.0	0.19	96	70-130	2	20	
Batch: 5A04047 Extracted: 01/04/05											
Blank Analyzed: 01/04/2005 (5A04047-BLK1)											
Mercury	ND	0.20	0.063	ug/l							

Del Mar Analytical, Irvine
Michele Harper
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Attention: Bronwyn Kelly

Project ID: Routine Outfall 006

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Sampled: 01/03/05
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METHOD BLANK/QC DATA

METALS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A04047 Extracted: 01/04/05											
LCS Analyzed: 01/04/2005 (5A04047-BS1)											
Mercury	8.41	0.20	0.063	ug/l	8.00		105	85-115			
Matrix Spike Analyzed: 01/04/2005 (5A04047-MS1)						**Source: IOA0028-01**					
Mercury	8.10	0.20	0.063	ug/l	8.00	0.13	100	70-130			
Matrix Spike Dup Analyzed: 01/04/2005 (5A04047-MSD1)						**Source: IOA0028-01**					
Mercury	8.27	0.20	0.063	ug/l	8.00	0.13	102	70-130	2	20	

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Attention: Bronwyn Kelly

Project ID: Routine Outfall 006

Report Number: IOA0029

Sampled: 01/03/05
Received: 01/03/05

METHOD BLANK/QC DATA

INORGANICS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A03042 Extracted: 01/03/05											
Blank Analyzed: 01/03/2005 (5A03042-BLK1)											
Chloride	ND	0.50	0.26	mg/l							
Nitrate/Nitrite-N	ND	0.26	0.072	mg/l							
Sulfate	ND	0.50	0.18	mg/l							
LCS Analyzed: 01/03/2005 (5A03042-BS1)											
Chloride	4.90	0.50	0.26	mg/l	5.00		98	90-110			
Sulfate	9.85	0.50	0.18	mg/l	10.0		98	90-110			
Matrix Spike Analyzed: 01/03/2005 (5A03042-MS1)						**Source: IOA0026-01**					
Chloride	9.42	0.50	0.26	mg/l	5.00	4.5	98	80-120			
Sulfate	14.6	0.50	0.18	mg/l	10.0	4.3	103	80-120			
Matrix Spike Dup Analyzed: 01/03/2005 (5A03042-MSD1)						**Source: IOA0026-01**					
Chloride	9.36	0.50	0.26	mg/l	5.00	4.5	97	80-120	1	20	
Sulfate	15.1	0.50	0.18	mg/l	10.0	4.3	108	80-120	3	20	
Batch: 5A05068 Extracted: 01/05/05											
Blank Analyzed: 01/05/2005 (5A05068-BLK1)											
Oil & Grease	ND	5.0	0.94	mg/l							
LCS Analyzed: 01/05/2005 (5A05068-BS1)											**M-NR1**
Oil & Grease	20.1	5.0	0.94	mg/l	20.0		100	65-120			
LCS Dup Analyzed: 01/05/2005 (5A05068-BSD1)											
Oil & Grease	21.1	5.0	0.94	mg/l	20.0		106	65-120	5	20	

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 006

Report Number: IOA0029

Sampled: 01/03/05
Received: 01/03/05

METHOD BLANK/QC DATA

INORGANICS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A05071 Extracted: 01/05/05											
Blank Analyzed: 01/05/2005 (5A05071-BLK1)											
Total Dissolved Solids	ND	10	10	mg/l							
LCS Analyzed: 01/05/2005 (5A05071-BS1)											
Total Dissolved Solids	1070	10	10	mg/l	1000		107	90-110			
Duplicate Analyzed: 01/05/2005 (5A05071-DUP1)						**Source: IOA0066-02**					
Total Dissolved Solids	250	10	10	mg/l		250			0	10	

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300 North Lake Avenue, Suite 1200
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Report Number: IOA0029

Sampled: 01/03/05
Received: 01/03/05

Compliance Check

The results obtained from the analytical testing of this data set were checked against compliance limits received from the client. Any results at or above the compliance limits appear in bold on this page.

LabNumber	Analysis	Analyte	Units	Result	MRL	Compliance Limit
IOA0029-01	413.1 Oil and Grease	Oil & Grease	mg/l	0.097	5.0	15
IOA0029-01	Antimony-200.8	Antimony	ug/l	0	2.0	6.00
IOA0029-01	Cadmium-200.8	Cadmium	ug/l	0.032	1.0	4.00
IOA0029-01	Chloride - 300.0	Chloride	mg/l	1.50	0.50	150
IOA0029-01	Copper-200.8	Copper	ug/l	2.20	2.0	14
IOA0029-01	Mercury - 245.1	Mercury	ug/l	0.18	0.20	0.20
IOA0029-01	Nitrogen, NO3+NO2 -N	Nitrate/Nitrite-N	mg/l	1.30	0.26	10.00
IOA0029-01	Sulfate-300.0	Sulfate	mg/l	1.80	0.50	250
IOA0029-01	TDS - SM 2540C	Total Dissolved Solids	mg/l	120	10	850

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300 North Lake Avenue, Suite 1200
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Attention: Bronwyn Kelly

Project ID: Routine Outfall 006

Report Number: IOA0029

Sampled: 01/03/05
Received: 01/03/05

DATA QUALIFIERS AND DEFINITIONS

B	Analyte was detected in the associated Method Blank.
J	Estimated value. Analyte detected at a level less than the Reporting Limit (RL) and greater than or equal to the Method Detection Limit (MDL). The user of this data should be aware that this data is of unknown quality.
M-NR1	There was no MS/MSD analyzed with this batch due to insufficient sample volume. See Blank Spike/Blank Spike Duplicate.
ND	Analyte NOT DETECTED at or above the reporting limit or MDL, if MDL is specified.
RPD	Relative Percent Difference

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 006
Report Number: IOA0029

Sampled: 01/03/05
Received: 01/03/05

Certification Summary

Del Mar Analytical, Irvine

Method	Matrix	NELAP	CA
EPA 200.8	Water	X	X
EPA 245.1	Water	X	X
EPA 300.0	Water	X	X
EPA 413.1	Water	X	X
SM2540C	Water	X	X

NV and NELAP provide analyte specific accreditations. Analyte specific information for Del Mar Analytical may be obtained by contacting the laboratory or visiting our website at www.dmalabs.com.

Subcontracted Laboratories

Pace Analytical, MN- SUB

1700 Elm Street, Ste 200 - Minneapolis, MN 55414

Analysis Performed: 1613-Dioxin-HR
Samples: IOA0029-01

Analysis Performed: EDD + Level 4
Samples: IOA0029-01

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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1A0029

Del Mar Analytical Version 5 8/12/04 CHAIN OF CUSTODY FORM

Client Name/Address:	Project:
MWH-Pasadena 300 North Lake Avenue, Suite 1200 Pasadena, CA 91101	Boeing-SSFL NPDES **Routine Outfall 006** Stormwater at FSDF-2
Project Manager: Bronwyn Kelly Sampler: Ruben S. Barroso	Phone Number: (626) 568-6691 Fax Number: (626) 568-6515

Sample Description	Sample Matrix	Container Type	# of Cont.	Sampling Date/Time 11:00	Preservative	Bottle #	Total Recoverable Metals: Sb, Cd, Cu, Pb, Hg	TCDD (and all congeners)	Oil & Grease (EPA 413.1)	Cl-, SO4, NO3+NO2-N	TDS					Comments
Outfall 006	W	Poly-1L	1	01/03/05	HNO3	1A	X									
Outfall 006-Dup	W	Poly-1L	1		HNO3	1B	X									
Outfall 006	W	Glass-Amber	2		None	2A, 2B		X								
Outfall 006	W	Glass-Amber	2		HCl	3A, 3B			X							
Outfall 006	W	Poly-500 ml	2		None	4A, 4B				X						
Outfall 006	W	Poly-500 ml	2		None	5A, 5B					X					

ANALYSIS REQUIRED

Field readings:
Temp = 50.7
pH= 7.3

Relinquished By	Date/Time:	Received By	Date/Time:
Ruben S. Barroso	1-3-05 1300	[signature]	1-3-05 1300
[signature]	1-3-05 1500		
		[signature]	1/3/05 1500

Turn around Time: (check)
24 Hours _____ 5 Days _____
48 Hours _____ 10 Days _____
72 Hours _____ Normal X

Perchlorate Only 72 Hours_____
Metals Only 72 Hours_____
Sample Integrity: (Check)
Intact X On ice: 4°C

(21)

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January 27, 2005

MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101

Attention: Bronwyn Kelly

Project: Routine Outfall 006
Sampled: 01/03/05
Del Mar Analytical Number: IOA0029

Dear Ms. Kelly:

Pace Analytical performed the TCDD analysis by USEPA 1613 for the project referenced above. Please use the following cross-reference table when reviewing your results.

MWH ID	DEL MAR ID	Pace ID
Outfall 006	IOA0029-01	1056430001

Attached is the original report from the subcontract laboratory. If you have any questions or require further assistance, please do not hesitate to contact me.

Sincerely yours,
DEL MAR ANALYTICAL

Michele Harper
Project Manager

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www.pacelabs.com

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1700 Elm Street
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444

DETERMINATION OF PCDD/PCDF LEVELS

Prepared for:
Del Mar Analytical, Irvine
Attn: Michele Harper
17461 Derian Avenue, Suite 100
Irvine, CA 92614

ACCREDITED IN ACCORDANCE WITH nelac

The results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

Project: Chemical Analysis

Client Project Number: IOA0029

REPORT OF LABORATORY ANALYSIS

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REPORT OF: CHEMICAL ANALYSES

Pace Analytical Services, Inc.
1700 Elm Street
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444

PROJECT: **PCDD/PCDF ANALYSES**

DATE: January 21, 2005

ISSUED TO: Del Mar Analytical, Irvine
Attn: Michele Harper
17461 Derian Avenue, Suite 100
Irvine, CA 92614

REPORT NO: 05-105643

INTRODUCTION

This report presents the results from the analyses performed on one sample submitted by a representative of Del Mar Analytical. The sample was analyzed for the presence or absence of polychlorinated dibenzo-p-dioxins (PCDDs) and dibenzofurans (PCDFs) using a modified version of USEPA Method 1613B.

SAMPLE IDENTIFICATION

Client ID	Sample Type	Date Received	PACE ID
IOA0029-01	Water	01/04/05	105643001

RESULTS

The results are included in the following:

Appendix A – Documentation
Appendix B – Sample Analysis Results
Appendix C – QC and Calibration Results
Appendix D – Sample Chromatograms and Raw Data
Appendix E – Calibration Chromatograms and Raw Data
Appendix F – QC Chromatograms and Raw Data

DISCUSSION

The recoveries of the isotopically-labeled PCDD/PCDF internal standards in the sample extract ranged from 55-91%. All of the labeled standard recoveries obtained for this project were within the Method 1613B target ranges. Also, since the quantification of the native 2,3,7,8-substituted congeners was based on isotope dilution, the data were automatically corrected for variation in recovery and accurate values were obtained.

REPORT OF LABORATORY ANALYSIS

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REPORT OF: CHEMICAL ANALYSES

PROJECT: PCDD/PCDF ANALYSES **DATE:** January 21, 2005

 REPORT NO: 05-105643

DISCUSSION (Cont.)

In some cases, incorrect isotope ratios were obtained for selected congeners. The affected values were flagged "I" on the results tables.

A laboratory method blank was prepared and analyzed with the sample batch as part of our routine quality control procedures. The results, found at the beginning of Appendix C, show the blank to contain selected PCDD and PCDF congeners. These were all below the calibration range of the method. Sample levels similar to the corresponding blank levels were flagged "B" on the results table and may be, at least partially, attributed to the background. In general, levels less that ten times the background are not considered to be statistically different from the background.

Laboratory spike samples were prepared with the sample batch by extracting laboratory water that had been fortified with native standard materials. Recoveries of the native compounds in the spiked samples ranged from 96-116%, with relative percent differences of 0.0-6.1%. This indicates high degrees of accuracy and precision for these determinations.

REMARKS

The sample extract will be retained for a period of 15 days from the date of this report and then discarded unless other arrangements are made. The raw mass spectral data will be archived on magnetic tape for a period of not less than one year. Questions regarding the data contained in this report may be directed to the author at the number provided below.

Pace Analytical Services, Inc.

Scott C. Unze
Project Manager, HRMS
(612) 607-6383

REPORT OF LABORATORY ANALYSIS

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TABLE 1. 2,3,7,8-TCDD Equivalency Factors (TEFs) for the Polychlorinated Dibenzo-p-dioxins and Dibenzofurans

Number	Compound(s)	TEF
1	2,3,7,8-TCDD	1.00
2	1,2,3,7,8-PeCDD	0.50
3	1,2,3,6,7,8-HxCDD	0.1
4	1,2,3,7,8,9-HxCDD	0.1
5	1,2,3,4,7,8-HxCDD	0.1
6	1,2,3,4,6,7,8-HpCDD	0.01
7	OCDD	0.001
8	* Total - TCDD	0.0
9	* Total - PeCDD	0.0
10	* Total - HxCDD	0.0
11	* Total - HpCDD	0.0
12	2,3,7,8-TCDF	0.10
13	1,2,3,7,8-PeCDF	0.05
14	2,3,4,7,8-PeCDF	0.5
15	1,2,3,6,7,8-HxCDF	0.1
16	1,2,3,7,8,9-HxCDF	0.1
17	1,2,3,4,7,8-HxCDF	0.1
18	2,3,4,6,7,8-HxCDF	0.1
19	1,2,3,4,6,7,8-HpCDF	0.01
20	1,2,3,4,7,8,9-HpCDF	0.01
21	OCDF	0.001
22	* Total - TCDF	0.0
23	* Total - PeCDF	0.0
24	* Total - HxCDF	0.0
25	* Total - HpCDF	0.0

*Excluding the 2,3,7,8-substituted congeners.

Reference: 1989 ITEFs

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Minneapolis, MN 55414

Tel: 612-607-1700
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Pace Analytical™

Method 1613B Analysis Results

Client - Del Mar Analytical

Client's Sample ID	IOA0029-01		
Lab Sample ID	105643001		
Filename	F50117B_09		
Injected By	MRO		
Total Amount Extracted	1030 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	01/03/2005
ICAL Date	11/29/2004	Received	01/04/2005
CCal Filename(s)	F50117B_02	Extracted	01/14/2005
Method Blank ID	BLANK-6129	Analyzed	01/17/2005 18:16

Native Isomers	Conc pg/L	EMPC pg/L	LOD pg/L		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	1.00		2,3,7,8-TCDF-13C	2.00	74
Total TCDF	ND	-----	1.00		2,3,7,8-TCDD-13C	2.00	84
					1,2,3,7,8-PeCDF-13C	2.00	84
2,3,7,8-TCDD	ND	-----	0.93		2,3,4,7,8-PeCDF-13C	2.00	83
Total TCDD	ND	-----	0.93		1,2,3,7,8-PeCDD-13C	2.00	91
					1,2,3,4,7,8-HxCDF-13C	2.00	86
1,2,3,7,8-PeCDF	ND	-----	0.88		1,2,3,6,7,8-HxCDF-13C	2.00	86
2,3,4,7,8-PeCDF	ND	-----	0.74		2,3,4,6,7,8-HxCDF-13C	2.00	82
Total PeCDF	ND	-----	0.81		1,2,3,7,8,9-HxCDF-13C	2.00	83
					1,2,3,4,7,8-HxCDD-13C	2.00	84
1,2,3,7,8-PeCDD	ND	-----	1.20		1,2,3,6,7,8-HxCDD-13C	2.00	83
Total PeCDD	ND	-----	1.20		1,2,3,4,6,7,8-HpCDF-13C	2.00	68
					1,2,3,4,7,8,9-HpCDF-13C	2.00	59
1,2,3,4,7,8-HxCDF	-----	0.96	0.83	I	1,2,3,4,6,7,8-HpCDD-13C	2.00	71
1,2,3,6,7,8-HxCDF	ND	-----	0.97		OCDD-13C	4.00	55
2,3,4,6,7,8-HxCDF	ND	-----	0.94				
1,2,3,7,8,9-HxCDF	ND	-----	0.73		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	-----	0.87		1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	0.73		2,3,7,8-TCDD-37Cl4	0.20	88
1,2,3,6,7,8-HxCDD	ND	-----	1.00				
1,2,3,7,8,9-HxCDD	ND	-----	1.10				
Total HxCDD	ND	-----	0.97				
1,2,3,4,6,7,8-HpCDF	1.7	-----	0.93	BJ			
1,2,3,4,7,8,9-HpCDF	ND	-----	0.91				
Total HpCDF	8.3	-----	0.92	BJ			
1,2,3,4,6,7,8-HpCDD	3.2	-----	1.30	BJ			
Total HpCDD	6.8	-----	1.30	BJ			
OCDF	9.0	-----	2.50	BJ			
OCDD	40.0	-----	2.50	BJ			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection. Totals are averages of individual isomer LODs.
D = Result obtained from analysis of diluted sample
B = Less than 10 times higher than method blank level
P = Recovery outside of method 1613 control limits
J = Concentration detected is below the calibration range
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....105643

REPORT OF LABORATORY ANALYSIS

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Method 1613B Blank Analysis Results

Client - Del Mar Analytical

Lab Sample ID	BLANK-6129	Matrix	Water
Filename	F50117B_06	Dilution	NA
Total Amount Extracted	1000 mL	Extracted	01/14/2005
ICAL Date	11/29/2004	Analyzed	01/17/2005 15:45
CCal Filename(s)	F50117B_02	Injected By	MRO

Native Isomers	Conc pg/L	EMPC pg/L	LOD pg/L		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	1.30		2,3,7,8-TCDF-13C	2.00	48
Total TCDF	ND	-----	-----		2,3,7,8-TCDD-13C	2.00	56
					1,2,3,7,8-PeCDF-13C	2.00	62
2,3,7,8-TCDD	ND	-----	1.30		2,3,4,7,8-PeCDF-13C	2.00	67
Total TCDD	ND	-----	-----		1,2,3,7,8-PeCDD-13C	2.00	73
					1,2,3,4,7,8-HxCDF-13C	2.00	75
1,2,3,7,8-PeCDF	ND	-----	1.40		1,2,3,6,7,8-HxCDF-13C	2.00	77
2,3,4,7,8-PeCDF	-----	0.99	0.98	I	2,3,4,6,7,8-HxCDF-13C	2.00	72
Total PeCDF	ND	-----	-----		1,2,3,7,8,9-HxCDF-13C	2.00	72
					1,2,3,4,7,8-HxCDD-13C	2.00	70
1,2,3,7,8-PeCDD	ND	-----	1.30		1,2,3,6,7,8-HxCDD-13C	2.00	72
Total PeCDD	ND	-----	-----		1,2,3,4,6,7,8-HpCDF-13C	2.00	61
					1,2,3,4,7,8,9-HpCDF-13C	2.00	55
1,2,3,4,7,8-HxCDF	-----	1.90	0.94	I	1,2,3,4,6,7,8-HpCDD-13C	2.00	63
1,2,3,6,7,8-HxCDF	1.5	-----	1.10	J	OCDD-13C	4.00	56
2,3,4,6,7,8-HxCDF	-----	1.20	0.82	I			
1,2,3,7,8,9-HxCDF	1.7	-----	1.00	J	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	3.1	-----	-----	J	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	-----	1.70	1.70	I	2,3,7,8-TCDD-37Cl4	0.20	58
1,2,3,6,7,8-HxCDD	1.8	-----	0.91	J			
1,2,3,7,8,9-HxCDD	ND	-----	1.80				
Total HxCDD	1.8	-----	-----	J			
1,2,3,4,6,7,8-HpCDF	2.8	-----	1.10	J			
1,2,3,4,7,8,9-HpCDF	1.8	-----	1.70	J			
Total HpCDF	11.0	-----	-----	J			
1,2,3,4,6,7,8-HpCDD	3.7	-----	1.00	J			
Total HpCDD	3.7	-----	-----	J			
OCDF	15.0	-----	1.60	J			
OCDD	18.0	-----	2.30	J			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection. Totals are averages of individual isomer LODs.
A = Limit of Detection based on signal to noise
P = Recovery outside of method 1613 control limits
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....105643

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Pace Analytical™

Method 1613B Laboratory Control Spike Results

Client - Del Mar Analytical

Lab Sample ID	LCS-6130		
Filename	F50117B_03	Matrix	Water
Total Amount Extracted	1030 mL	Dilution	NA
ICAL Date	11/29/2004	Extracted	01/14/2005
CCal Filename	F50117B_02	Analyzed	01/17/2005 13:15
Method Blank ID	BLANK-6129	Injected By	MRO

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDF	10	11.4	7.5	15.8	114
2,3,7,8-TCDD	10	9.6	6.7	15.8	96
1,2,3,7,8-PeCDF	50	58.0	40.0	67.0	116
2,3,4,7,8-PeCDF	50	53.7	34.0	80.0	107
1,2,3,7,8-PeCDD	50	48.7	35.0	71.0	97
1,2,3,4,7,8-HxCDF	50	51.4	36.0	67.0	103
1,2,3,6,7,8-HxCDF	50	54.8	42.0	65.0	110
2,3,4,6,7,8-HxCDF	50	53.6	35.0	78.0	107
1,2,3,7,8,9-HxCDF	50	52.0	39.0	65.0	104
1,2,3,4,7,8-HxCDD	50	55.9	35.0	82.0	112
1,2,3,6,7,8-HxCDD	50	56.3	38.0	67.0	113
1,2,3,7,8,9-HxCDD	50	55.2	32.0	81.0	110
1,2,3,4,6,7,8-HpCDF	50	55.1	41.0	61.0	110
1,2,3,4,7,8,9-HpCDF	50	56.7	39.0	69.0	113
1,2,3,4,6,7,8-HpCDD	50	48.9	35.0	70.0	98
OCDF	100	115.0	63.0	170.0	115
OCDD	100	108.0	78.0	144.0	108
2,3,7,8-TCDD-37Cl4	10	5.3	3.1	19.1	53
2,3,7,8-TCDF-13C	100	38.8	22.0	152.0	39
2,3,7,8-TCDD-13C	100	49.3	20.0	175.0	49
1,2,3,7,8-PeCDF-13C	100	59.2	21.0	192.0	59
2,3,4,7,8-PeCDF-13C	100	63.9	13.0	328.0	64
1,2,3,7,8-PeCDD-13C	100	72.0	21.0	227.0	72
1,2,3,4,7,8-HxCDF-13C	100	77.0	19.0	202.0	77
1,2,3,6,7,8-HxCDF-13C	100	75.2	21.0	159.0	75
2,3,4,6,7,8-HxCDF-13C	100	74.9	22.0	176.0	75
1,2,3,7,8,9-HxCDF-13C	100	76.8	17.0	205.0	77
1,2,3,4,7,8-HxCDD-13C	100	75.0	21.0	193.0	75
1,2,3,6,7,8-HxCDD-13C	100	75.0	25.0	163.0	75
1,2,3,4,6,7,8-HpCDF-13C	100	64.3	21.0	158.0	64
1,2,3,4,7,8,9-HpCDF-13C	100	59.2	20.0	186.0	59
1,2,3,4,6,7,8-HpCDD-13C	100	68.3	26.0	166.0	68
OCDD-13C	200	119.1	26.0	397.0	60

Cs = Concentration Spiked (ng/mL)
Cr = Concentration Recovered (ng/mL)
Rec. = Recovery (Expressed as Percent)
Control Limit Reference: Method 1613, Table 6, 10/94 Revision
X = Background subtracted value
P = Recovery outside of control limits
Nn = Value obtained from additional analysis
* = See Discussion

Report No.....105643

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Pace Analytical™

Method 1613B Laboratory Control Spike Results

Client - Del Mar Analytical

Lab Sample ID	LCSD-6131		
Filename	F50118B_08	Matrix	Water
Total Amount Extracted	1030 mL	Dilution	NA
ICAL Date	11/29/2004	Extracted	01/14/2005
CCal Filename	F50118B_05	Analyzed	01/18/2005 15:28
Method Blank ID	BLANK-6129	Injected By	MRO

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDF	10	11.5	7.5	15.8	115
2,3,7,8-TCDD	10	10.2	6.7	15.8	102
1,2,3,7,8-PeCDF	50	58.1	40.0	67.0	116
2,3,4,7,8-PeCDF	50	55.0	34.0	80.0	110
1,2,3,7,8-PeCDD	50	49.1	35.0	71.0	98
1,2,3,4,7,8-HxCDF	50	51.4	36.0	67.0	103
1,2,3,6,7,8-HxCDF	50	52.9	42.0	65.0	106
2,3,4,6,7,8-HxCDF	50	53.9	35.0	78.0	108
1,2,3,7,8,9-HxCDF	50	52.4	39.0	65.0	105
1,2,3,4,7,8-HxCDD	50	55.4	35.0	82.0	111
1,2,3,6,7,8-HxCDD	50	57.3	38.0	67.0	115
1,2,3,7,8,9-HxCDD	50	56.8	32.0	81.0	114
1,2,3,4,6,7,8-HpCDF	50	56.3	41.0	61.0	113
1,2,3,4,7,8,9-HpCDF	50	57.2	39.0	69.0	114
1,2,3,4,6,7,8-HpCDD	50	50.0	35.0	70.0	100
OCDF	100	112.0	63.0	170.0	112
OCDD	100	110.8	78.0	144.0	111
2,3,7,8-TCDD-37Cl4	10	7.5	3.1	19.1	75
2,3,7,8-TCDF-13C	100	62.6	22.0	152.0	63
2,3,7,8-TCDD-13C	100	70.5	20.0	175.0	70
1,2,3,7,8-PeCDF-13C	100	83.5	21.0	192.0	84
2,3,4,7,8-PeCDF-13C	100	87.6	13.0	328.0	88
1,2,3,7,8-PeCDD-13C	100	97.8	21.0	227.0	98
1,2,3,4,7,8-HxCDF-13C	100	83.1	19.0	202.0	83
1,2,3,6,7,8-HxCDF-13C	100	80.0	21.0	159.0	80
2,3,4,6,7,8-HxCDF-13C	100	76.7	22.0	176.0	77
1,2,3,7,8,9-HxCDF-13C	100	84.5	17.0	205.0	84
1,2,3,4,7,8-HxCDD-13C	100	80.1	21.0	193.0	80
1,2,3,6,7,8-HxCDD-13C	100	75.9	25.0	163.0	76
1,2,3,4,6,7,8-HpCDF-13C	100	71.9	21.0	158.0	72
1,2,3,4,7,8,9-HpCDF-13C	100	69.1	20.0	186.0	69
1,2,3,4,6,7,8-HpCDD-13C	100	78.5	26.0	166.0	79
OCDD-13C	200	155.3	26.0	397.0	78

Cs = Concentration Spiked (ng/mL)
Cr = Concentration Recovered (ng/mL)
Rec. = Recovery (Expressed as Percent)
Control Limit Reference: Method 1613, Table 6, 10/94 Revision
X = Background subtracted value
P = Recovery outside of control limits
Nn = Value obtained from additional analysis
* = See Discussion

Report No.....105643

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Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444

SPIKE RECOVERY RELATIVE PERCENT DIFFERENCE (RPD) RESULTS

Client..... Del Mar Analytical

SPIKE 1 ID..... LCS-6130
SPIKE 1 Filename..... F50117B_03
SPIKE 2 ID..... LCSD-6131
SPIKE 2 Filename..... F50118B_08

COMPOUND	SPIKE 1 REC,%	SPIKE 2 REC,%	RPD,%
2378-TCDF	114	115	0.9
2378-TCDD	96	102	6.1
12378-PeCDF	116	116	0.0
23478-PeCDF	107	110	2.8
12378-PeCDD	97	98	1.0
123478-HxCDF	103	103	0.0
123678-HxCDF	110	106	3.7
234678-HxCDF	107	108	0.9
123789-HxCDF	104	105	1.0
123478-HxCDD	112	111	0.9
123678-HxCDD	113	115	1.8
123789-HxCDD	110	114	3.6
1234678-HpCDF	110	113	2.7
1234789-HpCDF	113	114	0.9
1234678-HpCDD	98	100	2.0
OCDF	115	112	2.6
OCDD	108	111	2.7

REC = Percent Recovered
RPD = The difference between the two values divided by the average.
NA = Not Applicable

Report No..... 105643

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ACCREDITED IN ACCORDANCE WITH nelac

Del Mar Analytical

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1014 E. Cooley Dr., Suite A, Colton, CA 92324 Ph (909) 370-4667 Fax (909) 370-1046
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9830 South 51st Street, Suite B-120, Phoenix, AZ 85044 Ph (480) 785-0043 Fax (480) 785-0851
2520 E. Sunset Rd., Suite #3, Las Vegas, NV 89120 Ph (702) 798-3620 Fax (702) 798-3621

SUBCONTRACT ORDER - PROJECT # IOA0029

10543

SENDING LABORATORY:	RECEIVING LABORATORY:
Del Mar Analytical, Irvine 17461 Derian Avenue. Suite 100 Irvine, CA 92614 Phone: (949) 261-1022 Fax: (949) 261-1228 Project Manager: Michele Harper	Pace Analytical, MN- SUB 1700 Elm Street, Ste 200 Minneapolis, MN 55414 Phone :(612) 607-1700 Fax: (612) 607-6444

Standard TAT is requested unless specific due date is requested => Due Date:_____ Initials:_____

Analysis	Expiration	Comments
Sample ID: IOA0029-01 Water	**Sampled: 01/03/05 11:00**	10543001
1613-Dioxin-HR	01/10/05 11:00	J flags, 17 congeners, no TEQ, sub to Pace-MN

Containers Supplied:
1 L Amber (IOA0029-01C)
1 L Amber (IOA0029-01D)

SAMPLE INTEGRITY:

All containers intact: ☒ Yes ☐ No Sample labels/COC agree: ☒ Yes ☐ No Samples Received On Ice:: ☒ Yes ☐ No
Custody Seals Present: ☐ Yes ☒ No Samples Preserved Properly: ☒ Yes ☐ No Samples Received at (temp): 2.0

Released By	Date	Time	Received By	Date	Time
	01-03-05	1700	PACE	1/4/05	0820

Del Mar Analytical

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9484 Chesapeake Drive, Suite 805, San Diego, CA 92123 Ph (619) 505-9596 Fax (619) 505-9689
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SUBCONTRACT ORDER - PROJECT # IOA0029

SENDING LABORATORY:
Del Mar Analytical, Irvine
17461 Derian Avenue. Suite 100
Irvine, CA 92614
Phone: (949) 261-1022
Fax: (949) 261-1228
Project Manager: Michele Harper

RECEIVING LABORATORY:
Pace Analytical, MN- SUB
1700 Elm Street, Ste 200
Minneapolis, MN 55414
Phone :(612) 607-1700
Fax: (612) 607-6444

105643

Standard TAT is requested unless specific due date is requested => Due Date:_____ Initials:_____

Analysis	Expiration	Comments
Sample ID: IOA0029-01 Water	**Sampled: 01/03/05 11:00**	
1613-Dioxin-HR	01/10/05 11:00	J flags, 17 congeners, no TEQ, sub to Pace-MN
EDD + Level 4	01/31/05 11:00	Excel EDD email to pm,Include Std logs for Lvl IV

Containers Supplied:
1 L Amber (IOA0029-01C)
1 L Amber (IOA0029-01D)

FAXED 1/5/05

SAMPLE INTEGRITY:

All containers intact: ☐ Yes ☐ No Sample labels/COC agree: ☐ Yes ☐ No Samples Received On Ice: ☐ Yes ☐ No
Custody Seals Present: ☐ Yes ☐ No Samples Preserved Properly: ☐ Yes ☐ No Samples Received at (temp): _____

Released By	Date	Time	Received By	Date	Time
[signature]	1/5/05				
Released By	Date	Time	Received By	Date	Time

CONTRACT COMPLIANCE SCREENING FORM FOR HARDCOPY DATA

AMEC Earth & Environmental
550 South Wadsworth Boulevard
Suite 500
Lakewood, CO 80226

Laboratory Alta
Reviewer K. Shadowlight
Analysis/Method Dioxins

Package ID T711DF20
Task Order 313150010
SDG No. Multiple
No. of Analyses 15

Date: February 11, 2005
Reviewer's Signature K Shadowlight

ACTION ITEMS[a]	
1. **Case Narrative Deficiencies**	
2. **Out of Scope Analyses**	
3. **Analyses Not Conducted**	
4. **Missing Hardcopy Deliverables**	
5. **Incorrect Hardcopy Deliverables**	
6. **Deviations from Analysis Protocol, e.g.,**	Qualifications were assigned for the following:
Holding Times	* Method blank contamination
GC/MS Tune/Inst. Performance	* EMPCs
Calibration	* Detects below the lower method calibration level
Method blanks	
Surrogates	
Matrix Spike/Dup LCS	
Field QC	
Internal Standard Performance	
Compound Identification and Quantitation	
System Performance	
COMMENTS[b]	Rev. 1

[a] Subcontracted analytical laboratory is not meeting contract and/or method requirements.
[b] Differences in protocol have been adopted by the laboratory but no action against the laboratory is required.

DATA VALIDATION REPORT

NPDES
Monitoring

ANALYSIS: DIOXINS/FURANS

SAMPLE DELIVERY GROUPS: Multiple SDGs

Prepared by

AMEC—Denver Operations
550 South Wadsworth Boulevard, Suite 500
Lakewood, Colorado 80226

1. INTRODUCTION

Task Order Title:	NPDES Monitoring
Contract Task Order #:	313150010
Sample Delivery Group #:	Multiple
Project Manager:	B. McIlvaine
Matrix:	Water
Analysis:	Dioxins/Furans
QC Level:	Level IV
No. of Samples:	15
No. of Reanalyses/Dilutions:	0
Reviewer:	K. Shadowlight
Date of Review:	February 11, 2005

The samples listed in Table 1 were validated based on the guidelines outlined in the *AMEC Data Validation Procedure for Dioxins and Furans (DVP-19, Rev. 1), EPA Method 1613, and the National National Functional Guidelines For Chlorinated Dioxin/Furan Data Review* (8/02). Any deviations from these procedures and guidelines are documented herein. Qualifiers were applied in cases where the data did not meet the required QC criteria or where special consideration by the data user is required. Data qualifiers were placed on Form Is with the associated qualification codes. Analytes that were rejected for any reason are denoted on the Form I as having only the "R" data qualifier and associated qualification code(s) denoting the reason for rejection. Any additional problems with the data that may have resulted in an estimated value were not denoted by a qualification code since the data had already been rejected.

Table 1. Sample Identification

Client ID	Laboratory ID (Del Mar)	Laboratory ID (Pace)	Matrix	COC Method
Outfall 003	IOA0026-01	105648001	water	1613
Outfall 004	IOA0027-01	105646001	water	1613
Outfall 005	IOA0028-01	105645001	water	1613
Outfall 007	IOA0108-01	105774001	water	1613
Outfall 008	IOA0109-01	105775001	water	1613
Outfall 009	IOA0110-01	105770001	water	1613
Outfall 010	IOA0111-01	105758001	water	1613
Outfall 001	IOA0112-01	105778001	water	1613
Outfall 002	IOA0119-01	105772001	water	1613
Outfall 018	IOA0122-01	105779001	water	1613
Outfall 011	IOA0131-01	105773001	water	1613
Outfall 006	IOA0458-01	106048001	water	1613
Outfall 004	IOA0460-01	106050001	water	1613
Outfall 005	IOA0464-01	106052001	water	1613
Outfall 003	IOA0466-01	106051001	water	1613

2. DATA VALIDATION FINDINGS

2.1 SAMPLE MANAGEMENT

Following are findings associated with sample management:

2.1.1 Sample Preservation, Handling, and Transport

All of the samples in these SDGs were received at Del Mar Analytical within the temperature limits of 4°C ±2°C. Several of the samples in these SDGs were received at Pace Analytical Services below the temperature limits of 4°C ±2°C; however, as none of the samples were noted to have been damaged, no qualifications were required. The samples were received in good condition at both laboratories. No qualifications were required.

2.1.2 Chain of Custody

The COC and transfer COC were signed by the appropriate field and laboratory personnel, and accounted for the analyses presented in these SDGs. As the samples were couriered directly to the laboratory (Del Mar Analytical), custody seals were not required. There was no information regarding custody seals upon receipt at Pace. No qualifications were required.

2.1.3 Holding Times

The samples were extracted and analyzed within a year of collection. No qualifications were required.

2.2 INSTRUMENT PERFORMANCE

Following are findings associated with instrument performance:

2.2.1 GC Column Performance

A column performance standard was combined with the daily calibration verification and analyzed at the beginning of each analytical sequence. The GC column performance was acceptable with the chromatographic separation of 2,3,7,8-TCDD and other TCDD isomers resolved with a valley of ≤25%. No qualifications were required.

2.2.2 Mass Spectrometer Performance

The mass spectrometer performance could not be evaluated as the laboratory did not provide selected ion current profiles for the lock-mass ions. No qualifications were required.

2.3 CALIBRATION

2.3.1 Initial Calibration

There was one initial calibration, analyzed 11/29/04 on Instrument 10MSHR05. The calibration consisted of five concentration level standards (CS1 through CS5) analyzed to verify instrument linearity. The initial calibration was acceptable with %RSDs ≤20% for the 15 native compounds (calibration by isotope dilution) and ≤35% for the 2 native and all labeled compounds (calibration by internal standard). The relative retention times and ion abundance ratios were within the QC limits listed in Method 1613 for all standards. A representative number of %RSDs were verified from the raw data, and no calculation or transcription errors were noted. No qualifications were required.

2.3.2 Continuing Calibration

Calibration verification (VER) consisted of a mid-level standard (CS3) analyzed at the beginning of each analytical sequence. The VER was acceptable with the concentrations within the acceptance criteria listed in the Table 6 of the EPA Method 1613. The ion abundance ratios and relative retention times were within the method QC limits. A representative number of %Ds were verified from the raw data, and no calculation or transcription errors were noted. No qualifications were required.

2.4 BLANKS

One method blank (Blank-6202) was extracted and analyzed with the samples in these SDGs. Target compounds 1,2,3,4,6,7,8-HpCDD, total HpCDD, OCDF, and OCDD were reported in the method blank. Any detects for the aforementioned target compounds reported at concentrations <5x the concentrations reported in the method blank were qualified as estimated nondetects "UJ," at the levels of interference in the samples of these SDGs. A review of the method blank raw data and chromatograms indicated no false negatives or false positives. No further qualifications were required.

2.5 BLANK SPIKES AND LABORATORY CONTROL SAMPLES

One LCS/LCSD pair (LCS-6203/LCSD-6204) was extracted and analyzed with the samples in these SDGs. All recoveries were within the acceptance criteria listed in Table 6 of the Method 1613. There were no QC limits established for RPDs. The reported RPDs were within ±20%. No qualifications were required.

2.6 MATRIX SPIKE/MATRIX SPIKE DUPLICATE

MS/MSD analyses were not performed in these SDGs. Evaluation of method accuracy and precision was based on the LCS/LCSD results. No qualifications were required.

2.7 FIELD QC SAMPLES

Following are findings associated with field QC:

2.7.1 Field Blanks and Equipment Rinsates

The samples in these SDGs had no associated field QC samples. No qualifications were required.

2.7.2 Field Duplicates

No field duplicate samples were identified for these SDGs.

2.8 INTERNAL STANDARDS

The labeled standard recoveries were within the acceptance criteria listed in Table 7 of Method 1613. No qualifications were required.

2.9 COMPOUND IDENTIFICATION

The laboratory analyzed for polychlorinated dioxins/furans by EPA Method 1613. The compound identifications were verified from the raw data and no false negatives or positives were noted. No qualifications were required.

2.10 COMPOUND QUANTIFICATION AND REPORTED DETECTION LIMITS

Compound quantitation was verified from the raw data. The laboratory calculated and reported compound-specific detection limits. Any detects below the lower method calibration limit (MCL) were qualified as estimated, "J." Any reported EMPC was qualified as an estimated nondetect, "UJ." No further qualifications were required.

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Method 1613B Analysis Results

Client - Del Mar Analytical

Client's Sample ID	IOA0458-01 Outfall 006		
Lab Sample ID	106048001		
Filename	F50127B_08		
Injected By	MRO		
Total Amount Extracted	963 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	01/10/2005
ICAL Date	11/29/2004	Received	01/12/2005
CCal Filename(s)	F50127A_13	Extracted	01/24/2005
Method Blank ID	BLANK-6202	Analyzed	01/28/2005 02:49

Native Isomers	Conc pg/L	EMPC pg/L	LOD pg/L	
2,3,7,8-TCDF	ND	-----	3.5	
Total TCDF	ND	-----	3.5	
2,3,7,8-TCDD	ND	-----	3.1	
Total TCDD	ND	-----	3.1	
1,2,3,7,8-PeCDF	ND	-----	2.3	
2,3,4,7,8-PeCDF	ND	-----	1.1	
Total PeCDF	ND	-----	1.7	
1,2,3,7,8-PeCDD	ND	-----	2.4	
Total PeCDD	ND	-----	2.4	
1,2,3,4,7,8-HxCDF	ND	-----	1.4	
1,2,3,6,7,8-HxCDF	ND	-----	1.0	
2,3,4,6,7,8-HxCDF	ND	-----	1.1	
1,2,3,7,8,9-HxCDF	ND	-----	1.3	
Total HxCDF	ND	-----	1.2	
1,2,3,4,7,8-HxCDD	ND	-----	1.6	
1,2,3,6,7,8-HxCDD	ND	-----	1.3	
1,2,3,7,8,9-HxCDD	ND	-----	1.3	
Total HxCDD	ND	-----	1.4	
1,2,3,4,6,7,8-HpCDF	ND	-----	1.7	
1,2,3,4,7,8,9-HpCDF	ND	-----	1.5	
Total HpCDF	6.4	-----	1.6	J
1,2,3,4,6,7,8-HpCDD	-----	2.8	1.7	I
Total HpCDD	ND	-----	1.7	
OCDF	9.1	-----	2.7	BJ
OCDD	29.0	-----	3.3	BJ

Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF-13C	2.00	47
2,3,7,8-TCDD-13C	2.00	59
1,2,3,7,8-PeCDF-13C	2.00	72
2,3,4,7,8-PeCDF-13C	2.00	77
1,2,3,7,8-PeCDD-13C	2.00	91
1,2,3,4,7,8-HxCDF-13C	2.00	75
1,2,3,6,7,8-HxCDF-13C	2.00	97
2,3,4,6,7,8-HxCDF-13C	2.00	89
1,2,3,7,8,9-HxCDF-13C	2.00	80
1,2,3,4,7,8-HxCDD-13C	2.00	72
1,2,3,6,7,8-HxCDD-13C	2.00	96
1,2,3,4,6,7,8-HpCDF-13C	2.00	85
1,2,3,4,7,8,9-HpCDF-13C	2.00	73
1,2,3,4,6,7,8-HpCDD-13C	2.00	98
OCDD-13C	4.00	83
1,2,3,4-TCDD-13C	2.00	NA
1,2,3,7,8,9-HxCDD-13C	2.00	NA
2,3,7,8-TCDD-37Cl4	0.20	58

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection. Totals are averages of individual isomer LODs.
D = Result obtained from analysis of diluted sample
B = Less than 10 times higher than method blank level
P = Recovery outside of method 1613 control limits
J = Concentration detected is below the calibration range
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....106048

REPORT OF LABORATORY ANALYSIS

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CONTRACT COMPLIANCE SCREENING FORM FOR HARDCOPY DATA

AMEC Earth & Environmental
550 South Wadsworth Boulevard
Suite 500
Lakewood, CO 80226

Laboratory Del Mar
Reviewer P. Meeks
Analysis/Method Metals

Package ID T711MT25
Task Order 313150010
SDG No. Multiple
No. of Analyses 4

Date: 02/03/05
Reviewer's Signature
P. Meeks For K Okuda

ACTION ITEMS[a]	
1. **Case Narrative Deficiencies**	
2. **Out of Scope Analyses**	
3. **Analyses Not Conducted**	
4. **Missing Hardcopy Deliverables**	
5. **Incorrect Hardcopy Deliverables**	
6. **Deviations from Analysis Protocol, e.g.,**	Qualifications were applied for lead detected below the reporting limit.
Holding Times	
GC/MS Tune/Inst. Performance	
Calibrations	
Blanks	
Surrogates	
Matrix Spike/Dup LCS	
Field QC	
Internal Standard Performance	
Compound Identification and Quantitation	
System Performance	

COMMENTS[b]	

[a] Subcontracted analytical laboratory is not meeting contract and/or method requirements.
[b] Differences in protocol have been adopted by the laboratory but no action against the laboratory is required.

DATA VALIDATION REPORT

NPDES
Monitoring

ANALYSIS: METALS

SAMPLE DELIVERY GROUPS: IOA0458, IOA0460, IOA0464, & IOA0466

Prepared by

AMEC—Denver Operations
550 South Wadsworth Boulevard, Suite 500
Lakewood, Colorado 80226

1. INTRODUCTION

Task Order Title:	NPDES Monitoring
Contract Task Order #:	313150010
SDG#:	IOA0458, IOA0460, IOA0464, & IOA0466
Project Manager:	B. McIlvaine
Matrix:	Water
Analysis:	Metals
QC Level:	Level IV
No. of Samples:	4
No. of Reanalyses/Dilutions:	0
Reviewer:	K. Okonzak-Lowry
Date of Review:	February 02, 2005

The samples listed in Table 1 were validated based on the guidelines outlined in the *AMEC Data Validation Procedure for Levels III and IV ICP-MS Metals, (DVP-5-A, Rev.0), AMEC Data Validation Procedure for Levels III and IV ICP Metals* (DVP-5, Rev. 0), SW-846 *Method 6020B for Inductively Coupled Plasma – Mass Spectrometry*, SW-846 *Method 6010B for Inductively Coupled Plasma* , SW-846 *Method 7471A for Mercury (Manual Cold-Vapor Technique)*, and validation guidelines outlined in the USEPA CLP *National Functional Guidelines for Inorganic Data Review* (2/94). Any deviations from these procedures and guidelines are documented herein. Qualifiers were applied in cases where the data did not meet the required QC criteria or where special consideration by the data user is required. Data qualifiers were placed on Form Is with the associated qualification codes. Analytes that were rejected for any reason are denoted on the Form I as having only the "R" data qualifier and associated qualification code(s) denoting the reason for rejection. Any additional problems with the data that may have resulted in an estimated value were not denoted by a qualification code since the data had already been rejected.

Table 1. Sample identification

Client ID	EPA ID	Laboratory ID	Matrix	COC Method
Outfall 006	Outfall 006	IOA0458-01	water	ILM04
Outfall 004	Outfall 004	IOA0460-01	water	ILM04
Outfall 005	Outfall 005	IOA0464-01	water	ILM04
Outfall 003	Outfall 003	IOA0466-01	water	ILM04

2. DATA VALIDATION FINDINGS

2.1 SAMPLE MANAGEMENT

Following are findings associated with sample management:

2.1.1 Sample Preservation, Handling, and Transport

The samples in these SDGs were received at the laboratory within the temperature limits of 4°C ±2°C. No sample preservation, handling, or transport problems were noted, and no qualifications were necessary.

2.1.2 Chain of Custody

The COCs were signed and dated by field and laboratory personnel. The COCs listed duplicate samples for all samples; however, duplicate analyses were not required. No sample qualifications were required.

2.1.3 Holding Times

The dates of collection recorded on the COCs and the dates of analyses recorded in the raw data, documented that the sample analyses were performed within the specified holding times of six months for the ICP/MS metals. No qualifications were required.

2.2 ICP-MS TUNING

A precalibration routine must be completed prior to calibrating the instrument, which consists of analyzing a tuning solution to verify resolution, mass calibration, and thermal stability. The solution must be analyzed a minimum of five times and must contain isotopes representing all mass regions of interest. The laboratory performed the required tune solution analyses but did not report %RSDs. The laboratory SOP states that to be acceptable, the %RSD must be less than 5%. The mass calibrations were within 0.1 amu of the true mass and an the instrument resolutions were less than 0.9 amu at 10 percent peak height for all analytes in the tune solution. No site sample qualifications were required.

2.3 CALIBRATION

The ICV and CCV results showed acceptable recoveries, 90-110% for the ICP/MS. The reporting limit check standards were recovered within the AMEC control limits of 70-130%. No qualifications were required.

2.4 BLANKS

Lead was not detected in any of the method blanks or CCBs associated with the samples in these SDGs. No qualifications were required.

2.5 ICP INTERFERENCE CHECK SAMPLE (ICS A/AB)

No ICPMS interference check samples were analyzed in association with the samples in these SDGs; therefore, no assessment was made with respect to this criterion.

2.6 BLANK SPIKES AND LABORATORY CONTROL SAMPLES

The ICP/MS LCS samples were identified as 5A10077-BS1 and 5A11081-BS1. The LCS results on the summary forms and in the raw data were within the laboratory-established ICP/MS control limits of 85-115%. No qualifications were required.

2.7 LABORATORY DUPLICATES

No MS/MSD or duplicate analyses were performed in association with the samples in these SDGs; therefore, no assessment was made with respect to this criterion.

2.8 MATRIX SPIKE

No MS/MSD analyses were performed in association with the samples in these SDGs; therefore, no assessment was made with respect to this criterion.

2.9 FURNACE ATOMIC ABSORPTION QC

Furnace atomic absorption was not utilized for the analysis of these samples; therefore, furnace atomic absorption QC is not applicable.

2.10 ICP/MS SERIAL DILUTION

No serial dilution analysis was performed in association with the samples in these SDGs; therefore, no assessment was made with respect to this criterion.

2.11 INTERNAL STANDARDS PERFORMANCE

The ICP-MS internal standard recoveries for the site samples and associated QC sample analyses were within the 60-125% control limits and no qualifications were required.

2.12 SAMPLE RESULT VERIFICATION

A Level IV review was performed for the samples in these data packages. Calculations were verified, and the sample results reported on the Form Is were verified against the raw data. No transcription errors or calculation errors were noted. Lead detected below the reporting limit were qualified as estimated, "J." No further qualifications were required.

2.13 FIELD QC SAMPLES

Field QC samples are evaluated, and if necessary, qualified based only on laboratory blanks. Any remaining detects are used to evaluate the associated samples.

2.13.1 Field Blanks and Equipment Rinsates

The samples in these SDGs had no associated field QC samples. No qualifications were required.

2.13.2 Field Duplicates

There were no field duplicate analyses performed in association with the site samples.

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 006

Report Number: IOA0458

Sampled: 01/10/05
Received: 01/10/05

DRAFT: METALS

Analyte	Method	Batch	MDL	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers (Res Qual / Qual Code)
Sample ID: IOA0458-01 (DRAFT: Outfall 006 - Water)									
Reporting Units: ug/l									
Lead	EPA 200.8	5A10077	0.13	1.0	**0.63**	1	01/10/05	01/11/05	J1 / DWQ

AMEC VALIDATED

LEVEL IV

1/11/05

DRAFT REPORT
DRAFT REPORT
DATA SUBJECT TO CHANGE

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LABORATORY REPORT

Prepared For: MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project: Routine Outfall 006

Sampled: 01/10/05
Received: 01/10/05
Issued: 02/22/05 11:54

NELAP #01108CA California ELAP#1197 CSDLAC #10117

The results listed within this Laboratory Report pertain only to the samples tested in the laboratory. The analyses contained in this report were performed in accordance with the applicable certifications as noted. All soil samples are reported on a wet weight basis unless otherwise noted in the report. This Laboratory Report is confidential and is intended for the sole use of Del Mar Analytical and its client. This report shall not be reproduced, except in full, without written permission from Del Mar Analytical. The Chain of Custody, 1 page, is included and is an integral part of this report.

This entire report was reviewed and approved for release.

SAMPLE CROSS REFERENCE

SUBCONTRACTED: Refer to the last page for specific subcontract laboratory information included in this report.

LABORATORY ID	CLIENT ID	MATRIX
IOA0458-01	Outfall 006	Water

Reviewed By:

Michele Harper

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 006

Report Number: IOA0458

Sampled: 01/10/05
Received: 01/10/05

METALS

Analyte	Method	Batch	MDL Limit	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA0458-01 (Outfall 006 - Water)									
Reporting Units: ug/l									
Antimony	EPA 200.8	5A10077	0.18	2.0	**1.1**	1	01/10/05	01/11/05	B, J
Cadmium	EPA 200.8	5A10077	0.015	1.0	**0.031**	1	01/10/05	01/11/05	J
Copper	EPA 200.8	5A10077	0.49	2.0	**1.9**	1	01/10/05	01/11/05	J
Lead	EPA 200.8	5A10077	0.13	1.0	**0.63**	1	01/10/05	01/11/05	J
Mercury	EPA 245.1	5A11057	0.063	0.20	**0.16**	1	01/11/05	01/11/05	J

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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Attention: Bronwyn Kelly

Project ID: Routine Outfall 006

Report Number: IOA0458

Sampled: 01/10/05
Received: 01/10/05

INORGANICS

Analyte	Method	Batch	MDL Limit	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA0458-01 (Outfall 006 - Water) - cont.									
Reporting Units: mg/l									
Chloride	EPA 300.0	5A10035	0.26	0.50	**1.1**	1	01/10/05	01/10/05	
Nitrate/Nitrite-N	EPA 300.0	5A10035	0.072	0.26	**0.59**	1	01/10/05	01/10/05	
Oil & Grease	EPA 413.1	5A12061	0.94	5.0	**3.0**	1	01/12/05	01/12/05	B, J
Sulfate	EPA 300.0	5A10035	0.18	0.50	**1.1**	1	01/10/05	01/10/05	
Total Dissolved Solids	SM2540C	5A11087	10	10	**87**	1	01/11/05	01/11/05	

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Michele Harper
Project Manager

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Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 006

Report Number: IOA0458

Sampled: 01/10/05
Received: 01/10/05

SHORT HOLD TIME DETAIL REPORT

	Hold Time (in days)	Date/Time Sampled	Date/Time Received	Date/Time Extracted	Date/Time Analyzed
Sample ID: Outfall 006 (IOA0458-01) - Water					
EPA 300.0	2	01/10/2005 10:38	01/10/2005 16:20	01/10/2005 20:00	01/10/2005 21:50

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Michele Harper
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Attention: Bronwyn Kelly

Project ID: Routine Outfall 006

Report Number: IOA0458

Sampled: 01/10/05
Received: 01/10/05

METHOD BLANK/QC DATA

METALS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A10077 Extracted: 01/10/05											
Blank Analyzed: 01/11/2005 (5A10077-BLK1)											
Antimony	0.360	2.0	0.18	ug/l							J
Cadmium	ND	1.0	0.015	ug/l							
Copper	ND	2.0	0.49	ug/l							
Lead	ND	1.0	0.13	ug/l							
LCS Analyzed: 01/11/2005 (5A10077-BS1)											
Antimony	88.4	2.0	0.18	ug/l	80.0		110	85-115			
Cadmium	77.3	1.0	0.015	ug/l	80.0		97	85-115			
Copper	80.8	2.0	0.49	ug/l	80.0		101	85-115			
Lead	79.9	1.0	0.13	ug/l	80.0		100	85-115			
Matrix Spike Analyzed: 01/11/2005 (5A10077-MS1)						**Source: IOA0418-01**					
Antimony	85.6	2.0	0.18	ug/l	80.0	0.46	106	70-130			
Cadmium	77.4	1.0	0.015	ug/l	80.0	0.020	97	70-130			
Copper	107	2.0	0.49	ug/l	80.0	29	98	70-130			
Lead	79.8	1.0	0.13	ug/l	80.0	0.60	99	70-130			
Matrix Spike Dup Analyzed: 01/11/2005 (5A10077-MSD1)						**Source: IOA0418-01**					
Antimony	88.2	2.0	0.18	ug/l	80.0	0.46	110	70-130	3	20	
Cadmium	77.0	1.0	0.015	ug/l	80.0	0.020	96	70-130	1	20	
Copper	108	2.0	0.49	ug/l	80.0	29	99	70-130	1	20	
Lead	82.4	1.0	0.13	ug/l	80.0	0.60	102	70-130	3	20	
Batch: 5A11057 Extracted: 01/11/05											
Blank Analyzed: 01/11/2005 (5A11057-BLK1)											
Mercury	ND	0.20	0.063	ug/l							

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 006

Report Number: IOA0458

Sampled: 01/10/05
Received: 01/10/05

METHOD BLANK/QC DATA

METALS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A11057 Extracted: 01/11/05											
LCS Analyzed: 01/11/2005 (5A11057-BS1)											
Mercury	8.38	0.20	0.063	ug/l	8.00		105	85-115			
Matrix Spike Analyzed: 01/11/2005 (5A11057-MS1)						**Source: IOA0471-01**					
Mercury	8.37	0.20	0.063	ug/l	8.00	ND	105	70-130			
Matrix Spike Dup Analyzed: 01/11/2005 (5A11057-MSD1)						**Source: IOA0471-01**					
Mercury	8.31	0.20	0.063	ug/l	8.00	ND	104	70-130	1	20	

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Report Number: IOA0458

Sampled: 01/10/05
Received: 01/10/05

METHOD BLANK/QC DATA

INORGANICS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A10035 Extracted: 01/10/05											
Blank Analyzed: 01/10/2005 (5A10035-BLK1)											
Chloride	ND	0.50	0.26	mg/l							
Nitrate/Nitrite-N	ND	0.26	0.072	mg/l							
Sulfate	ND	0.50	0.18	mg/l							
LCS Analyzed: 01/10/2005 (5A10035-BS1)											
Chloride	4.85	0.50	0.26	mg/l	5.00		97	90-110			
Sulfate	10.2	0.50	0.18	mg/l	10.0		102	90-110			
Matrix Spike Analyzed: 01/10/2005 (5A10035-MS1)						**Source: IOA0441-01**					
Chloride	22.1	2.5	1.3	mg/l	5.00	17	102	80-120			
Sulfate	60.2	2.5	0.90	mg/l	10.0	49	112	80-120			
Matrix Spike Dup Analyzed: 01/10/2005 (5A10035-MSD1)						**Source: IOA0441-01**					
Chloride	22.0	2.5	1.3	mg/l	5.00	17	100	80-120	1	20	
Sulfate	60.7	2.5	0.90	mg/l	10.0	49	117	80-120	1	20	
Batch: 5A11087 Extracted: 01/11/05											
Blank Analyzed: 01/11/2005 (5A11087-BLK1)											
Total Dissolved Solids	ND	10	10	mg/l							
LCS Analyzed: 01/11/2005 (5A11087-BS1)											
Total Dissolved Solids	978	10	10	mg/l	1000		98	90-110			
Duplicate Analyzed: 01/11/2005 (5A11087-DUP1)						**Source: IOA0364-01**					
Total Dissolved Solids	ND	10	10	mg/l		ND				10	

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 006

Report Number: IOA0458

Sampled: 01/10/05
Received: 01/10/05

METHOD BLANK/QC DATA

INORGANICS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A12061 Extracted: 01/12/05											
Blank Analyzed: 01/12/2005 (5A12061-BLK1)											
Oil & Grease	1.60	5.0	0.94	mg/l							*J*
LCS Analyzed: 01/12/2005 (5A12061-BS1)											**M-NR1**
Oil & Grease	21.2	5.0	0.94	mg/l	20.0		106	65-120			
LCS Dup Analyzed: 01/12/2005 (5A12061-BSD1)											
Oil & Grease	20.8	5.0	0.94	mg/l	20.0		104	65-120	2	20	

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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Del Mar Analytical

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9830 South 51st St., Suite B-120, Phoenix, AZ 85044 (480) 785-0043 FAX (480) 785-0851
2520 E. Sunset Rd. #3, Las Vegas, NV 89120 (702) 798-3620 FAX (702) 798-3621

MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 006

Report Number: IOA0458

Sampled: 01/10/05
Received: 01/10/05

Compliance Check

The results obtained from the analytical testing of this data set were checked against compliance limits received from the client. Any results at or above the compliance limits appear in bold on this page.

LabNumber	Analysis	Analyte	Units	Result	MRL	Compliance Limit
IOA0458-01	413.1 Oil and Grease	Oil & Grease	mg/l	3.00	5.0	15
IOA0458-01	Antimony-200.8	Antimony	ug/l	1.10	2.0	6.00
IOA0458-01	Cadmium-200.8	Cadmium	ug/l	0.031	1.0	4.00
IOA0458-01	Chloride - 300.0	Chloride	mg/l	1.10	0.50	150
IOA0458-01	Copper-200.8	Copper	ug/l	1.90	2.0	14
IOA0458-01	Mercury - 245.1	Mercury	ug/l	0.16	0.20	0.20
IOA0458-01	Nitrogen, NO3+NO2 -N	Nitrate/Nitrite-N	mg/l	0.59	0.26	10.00
IOA0458-01	Sulfate-300.0	Sulfate	mg/l	1.10	0.50	250
IOA0458-01	TDS - SM 2540C	Total Dissolved Solids	mg/l	87	10	850

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 006

Report Number: IOA0458

Sampled: 01/10/05
Received: 01/10/05

DATA QUALIFIERS AND DEFINITIONS

B	Analyte was detected in the associated Method Blank.
J	Estimated value. Analyte detected at a level less than the Reporting Limit (RL) and greater than or equal to the Method Detection Limit (MDL). The user of this data should be aware that this data is of unknown quality.
M-NR1	There was no MS/MSD analyzed with this batch due to insufficient sample volume. See Blank Spike/Blank Spike Duplicate.
ND	Analyte NOT DETECTED at or above the reporting limit or MDL, if MDL is specified.
RPD	Relative Percent Difference

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 006

Report Number: IOA0458

Sampled: 01/10/05
Received: 01/10/05

Certification Summary

Del Mar Analytical, Irvine

Method	Matrix	Nelac	California
EPA 200.8	Water	X	X
EPA 245.1	Water	X	X
EPA 300.0	Water	X	X
EPA 413.1	Water	X	X
SM2540C	Water	X	X

Nevada and NELAP provide analyte specific accreditations. Analyte specific information for Del Mar Analytical may be obtained by contacting the laboratory or visiting our website at www.dmalabs.com.

Subcontracted Laboratories

Pace Analytical, MN- SUB

1700 Elm Street, Ste 200 - Minneapolis, MN 55414

Analysis Performed: 1613-Dioxin-HR
Samples: IOA0458-01

Analysis Performed: EDD + Level 4
Samples: IOA0458-01

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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+ CA 90630

Del Mar Analytical Version 5 8/12/04 CHAIN OF CUSTODY FORM

Client Name/Address:	Project:
MWH-Pasadena 300 North Lake Avenue, Suite 1200 Pasadena, CA 91101	Boeing-SSFL NPDES **Routine Outfall 006** Stormwater at FSDF-2
Project Manager: Bronwyn Kelly Sampler: Pollock	Phone Number: (626) 568-6691 Fax Number: (626) 568-6515

Sample Description	Sample Matrix	Container Type	# of Cont.	Sampling Date/Time	Preservative	Bottle * #	ANALYSIS REQUIRED: Total Recoverable Metals: Sb, Cd, Cu, Pb, Hg	TCDD (and all congeners)	Oil & Grease (EPA 413.1)	Cl-, SO4, NO3+NO2-N	TDS					Field readings: / Comments
Outfall 006	W	Poly-1L	1	1-10 05 10:38	HNO3	1A	X									
Outfall 006-Dup	W	Poly-1L	1		HNO3	1B	X									
Outfall 006	W	Glass-Amber	2		None	2A, 2B		X								
Outfall 006	W	Glass-Amber	2		HCl	3A, 3B			X							
Outfall 006	W	Poly-500 ml	2		None	4A, 4B				X						
Outfall 006	W	Poly-500 ml	2		None	5A, 5B					X					

Field readings:
Temp = 5.7.6
pH= 6.8

VB

Relinquished By	Date/Time:	Received By	Date/Time:
[signature]	1-10-05 1250	[signature]	1/10/05 1250
[signature]	1/10/05 1620	[signature]	1/10/05 1620
[signature]	Date/Time:	[signature]	Date/Time:

Turn around Time: (check)
24 Hours _____ 5 Days _____
48 Hours _____ 10 Days _____
72 Hours _____ Normal ✓
Perchlorate Only 72 Hours _____
Metals Only 72 Hours _____
Sample Integrity: (Check)
Intact X On Ice: X

4°C

Del Mar Analytical

2852 Alton Ave., Irvine CA 92606 (949) 261-1022 FAX (949) 261-1228
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February 7, 2005

MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, Ca.91101

Attention: Bronwyn Kelly

Project: Routine Outfall 006
Sampled: 01/10/05
Del Mar Analytical Number: IOA0458

Dear Ms. Kelly:

Pace Analytical performed Method 1613B analysis for the project referenced above. Please use the following cross-reference table when reviewing your results.

MWH ID	DEL MAR ID	Pace ID
Outfall 006	IOA0458-01	106048001

Attached is the original report from the subcontract laboratory. If you have any questions or require further assistance, please do not hesitate to contact me.

Sincerely yours,
DEL MAR ANALYTICAL

Michele Harper
Project Manager

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Pace Analytical™

Method 1613B Analysis Results

Client - Del Mar Analytical

Client's Sample ID	IOA0458-01		
Lab Sample ID	106048001		
Filename	F50127B_08		
Injected By	MRO		
Total Amount Extracted	963 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	01/10/2005
ICAL Date	11/29/2004	Received	01/12/2005
CCal Filename(s)	F50127A_13	Extracted	01/24/2005
Method Blank ID	BLANK-6202	Analyzed	01/28/2005 02:49

Native Isomers	Conc pg/L	EMPC pg/L	LOD pg/L		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	3.5		2,3,7,8-TCDF-13C	2.00	47
Total TCDF	ND	-----	3.5		2,3,7,8-TCDD-13C	2.00	59
					1,2,3,7,8-PeCDF-13C	2.00	72
2,3,7,8-TCDD	ND	-----	3.1		2,3,4,7,8-PeCDF-13C	2.00	77
Total TCDD	ND	-----	3.1		1,2,3,7,8-PeCDD-13C	2.00	91
					1,2,3,4,7,8-HxCDF-13C	2.00	75
1,2,3,7,8-PeCDF	ND	-----	2.3		1,2,3,6,7,8-HxCDF-13C	2.00	97
2,3,4,7,8-PeCDF	ND	-----	1.1		2,3,4,6,7,8-HxCDF-13C	2.00	89
Total PeCDF	ND	-----	1.7		1,2,3,7,8,9-HxCDF-13C	2.00	80
					1,2,3,4,7,8-HxCDD-13C	2.00	72
1,2,3,7,8-PeCDD	ND	-----	2.4		1,2,3,6,7,8-HxCDD-13C	2.00	96
Total PeCDD	ND	-----	2.4		1,2,3,4,6,7,8-HpCDF-13C	2.00	85
					1,2,3,4,7,8,9-HpCDF-13C	2.00	73
1,2,3,4,7,8-HxCDF	ND	-----	1.4		1,2,3,4,6,7,8-HpCDD-13C	2.00	98
1,2,3,6,7,8-HxCDF	ND	-----	1.0		OCDD-13C	4.00	83
2,3,4,6,7,8-HxCDF	ND	-----	1.1				
1,2,3,7,8,9-HxCDF	ND	-----	1.3		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	-----	1.2		1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	1.6		2,3,7,8-TCDD-37Cl4	0.20	58
1,2,3,6,7,8-HxCDD	ND	-----	1.3				
1,2,3,7,8,9-HxCDD	ND	-----	1.3				
Total HxCDD	ND	-----	1.4				
1,2,3,4,6,7,8-HpCDF	ND	-----	1.7				
1,2,3,4,7,8,9-HpCDF	ND	-----	1.5				
Total HpCDF	6.4	-----	1.6	J			
1,2,3,4,6,7,8-HpCDD	-----	2.8	1.7	I			
Total HpCDD	ND	-----	1.7				
OCDF	9.1	-----	2.7	BJ			
OCDD	29.0	-----	3.3	BJ			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection. Totals are averages of individual isomer LODs.
D = Result obtained from analysis of diluted sample
B = Less than 10 times higher than method blank level
P = Recovery outside of method 1613 control limits
J = Concentration detected is below the calibration range
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....106048

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Pace Analytical™

Method 1613B Blank Analysis Results

Client - Del Mar Analytical

Lab Sample ID	BLANK-6202	Matrix	Water
Filename	F50127A_06	Dilution	NA
Total Amount Extracted	982 mL	Extracted	01/24/2005
ICAL Date	11/29/2004	Analyzed	01/27/2005 14:13
CCal Filename(s)	F50127A_02	Injected By	MRO

Native Isomers	Conc pg/L	EMPC pg/L	LOD pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	4.7	2,3,7,8-TCDF-13C	2.00	33
Total TCDF	ND	-----	-----	2,3,7,8-TCDD-13C	2.00	45
				1,2,3,7,8-PeCDF-13C	2.00	68
2,3,7,8-TCDD	ND	-----	5.1	2,3,4,7,8-PeCDF-13C	2.00	70
Total TCDD	ND	-----	-----	1,2,3,7,8-PeCDD-13C	2.00	81
				1,2,3,4,7,8-HxCDF-13C	2.00	75
1,2,3,7,8-PeCDF	ND	-----	2.2	1,2,3,6,7,8-HxCDF-13C	2.00	95
2,3,4,7,8-PeCDF	ND	-----	1.5	2,3,4,6,7,8-HxCDF-13C	2.00	98
Total PeCDF	ND	-----	-----	1,2,3,7,8,9-HxCDF-13C	2.00	85
				1,2,3,4,7,8-HxCDD-13C	2.00	78
1,2,3,7,8-PeCDD	ND	-----	1.6	1,2,3,6,7,8-HxCDD-13C	2.00	94
Total PeCDD	ND	-----	-----	1,2,3,4,6,7,8-HpCDF-13C	2.00	85
				1,2,3,4,7,8,9-HpCDF-13C	2.00	78
1,2,3,4,7,8-HxCDF	ND	-----	1.6	1,2,3,4,6,7,8-HpCDD-13C	2.00	99
1,2,3,6,7,8-HxCDF	ND	-----	1.4	OCDD-13C	4.00	97
2,3,4,6,7,8-HxCDF	ND	-----	1.1			
1,2,3,7,8,9-HxCDF	ND	-----	1.6	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	-----	-----	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	1.6	2,3,7,8-TCDD-37Cl4	0.20	40
1,2,3,6,7,8-HxCDD	ND	-----	1.2			
1,2,3,7,8,9-HxCDD	ND	-----	1.7			
Total HxCDD	ND	-----	-----			
1,2,3,4,6,7,8-HpCDF	ND	-----	1.5			
1,2,3,4,7,8,9-HpCDF	ND	-----	1.4			
Total HpCDF	ND	-----	-----			
1,2,3,4,6,7,8-HpCDD	1.9	-----	1.3 J			
Total HpCDD	1.9	-----	----- J			
OCDF	8.3	-----	1.9 J			
OCDD	26.0	-----	2.3 J			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection. Totals are averages of individual isomer LODs.
A = Limit of Detection based on signal to noise
P = Recovery outside of method 1613 control limits
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....105645

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 1613B Laboratory Control Spike Results

Client - Del Mar Analytical

Lab Sample ID	LCS-6203		
Filename	F50127A_03	Matrix	Water
Total Amount Extracted	1030 mL	Dilution	NA
ICAL Date	11/29/2004	Extracted	01/24/2005
CCal Filename	F50127A_02	Analyzed	01/27/2005 11:44
Method Blank ID	BLANK-6202	Injected By	MRO

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDF	10	10.2	7.5	15.8	102
2,3,7,8-TCDD	10	9.0	6.7	15.8	90
1,2,3,7,8-PeCDF	50	50.1	40.0	67.0	100
2,3,4,7,8-PeCDF	50	48.4	34.0	80.0	97
1,2,3,7,8-PeCDD	50	43.4	35.0	71.0	87
1,2,3,4,7,8-HxCDF	50	44.8	36.0	67.0	90
1,2,3,6,7,8-HxCDF	50	48.0	42.0	65.0	96
2,3,4,6,7,8-HxCDF	50	48.6	35.0	78.0	97
1,2,3,7,8,9-HxCDF	50	46.4	39.0	65.0	93
1,2,3,4,7,8-HxCDD	50	50.0	35.0	82.0	100
1,2,3,6,7,8-HxCDD	50	51.7	38.0	67.0	103
1,2,3,7,8,9-HxCDD	50	48.5	32.0	81.0	97
1,2,3,4,6,7,8-HpCDF	50	51.4	41.0	61.0	103
1,2,3,4,7,8,9-HpCDF	50	52.3	39.0	69.0	105
1,2,3,4,6,7,8-HpCDD	50	43.4	35.0	70.0	87
OCDF	100	89.5	63.0	170.0	90
OCDD	100	96.9	78.0	144.0	97
2,3,7,8-TCDD-37Cl4	10	6.2	3.1	19.1	62
2,3,7,8-TCDF-13C	100	49.8	22.0	152.0	50
2,3,7,8-TCDD-13C	100	65.8	20.0	175.0	66
1,2,3,7,8-PeCDF-13C	100	75.7	21.0	192.0	76
2,3,4,7,8-PeCDF-13C	100	76.9	13.0	328.0	77
1,2,3,7,8-PeCDD-13C	100	93.4	21.0	227.0	93
1,2,3,4,7,8-HxCDF-13C	100	78.9	19.0	202.0	79
1,2,3,6,7,8-HxCDF-13C	100	89.8	21.0	159.0	90
2,3,4,6,7,8-HxCDF-13C	100	88.2	22.0	176.0	88
1,2,3,7,8,9-HxCDF-13C	100	81.5	17.0	205.0	81
1,2,3,4,7,8-HxCDD-13C	100	82.2	21.0	193.0	82
1,2,3,6,7,8-HxCDD-13C	100	95.2	25.0	163.0	95
1,2,3,4,6,7,8-HpCDF-13C	100	86.3	21.0	158.0	86
1,2,3,4,7,8,9-HpCDF-13C	100	75.6	20.0	186.0	76
1,2,3,4,6,7,8-HpCDD-13C	100	102.9	26.0	166.0	103
OCDD-13C	200	195.1	26.0	397.0	98

Cs = Concentration Spiked (ng/mL)
Cr = Concentration Recovered (ng/mL)
Rec. = Recovery (Expressed as Percent)
Control Limit Reference: Method 1613, Table 6, 10/94 Revision
X = Background subtracted value
P = Recovery outside of control limits
Nn = Value obtained from additional analysis
* = See Discussion

Report No.....105645

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 1613B Laboratory Control Spike Results

Client - Del Mar Analytical

Lab Sample ID	LCSD-6204		
Filename	F50127A_04	Matrix	Water
Total Amount Extracted	1000 mL	Dilution	NA
ICAL Date	11/29/2004	Extracted	01/24/2005
CCal Filename	F50127A_02	Analyzed	01/27/2005 12:32
Method Blank ID	BLANK-6202	Injected By	MRO

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDF	10	9.9	7.5	15.8	99
2,3,7,8-TCDD	10	8.8	6.7	15.8	88
1,2,3,7,8-PeCDF	50	49.8	40.0	67.0	100
2,3,4,7,8-PeCDF	50	47.6	34.0	80.0	95
1,2,3,7,8-PeCDD	50	41.4	35.0	71.0	83
1,2,3,4,7,8-HxCDF	50	46.6	36.0	67.0	93
1,2,3,6,7,8-HxCDF	50	44.0	42.0	65.0	88
2,3,4,6,7,8-HxCDF	50	47.2	35.0	78.0	94
1,2,3,7,8,9-HxCDF	50	44.8	39.0	65.0	90
1,2,3,4,7,8-HxCDD	50	46.5	35.0	82.0	93
1,2,3,6,7,8-HxCDD	50	48.9	38.0	67.0	98
1,2,3,7,8,9-HxCDD	50	46.7	32.0	81.0	93
1,2,3,4,6,7,8-HpCDF	50	48.7	41.0	61.0	97
1,2,3,4,7,8,9-HpCDF	50	49.9	39.0	69.0	100
1,2,3,4,6,7,8-HpCDD	50	42.7	35.0	70.0	85
OCDF	100	84.8	63.0	170.0	85
OCDD	100	92.5	78.0	144.0	92
2,3,7,8-TCDD-37Cl4	10	7.5	3.1	19.1	75
2,3,7,8-TCDF-13C	100	65.7	22.0	152.0	66
2,3,7,8-TCDD-13C	100	83.8	20.0	175.0	84
1,2,3,7,8-PeCDF-13C	100	84.9	21.0	192.0	85
2,3,4,7,8-PeCDF-13C	100	85.6	13.0	328.0	86
1,2,3,7,8-PeCDD-13C	100	105.3	21.0	227.0	105
1,2,3,4,7,8-HxCDF-13C	100	82.6	19.0	202.0	83
1,2,3,6,7,8-HxCDF-13C	100	96.7	21.0	159.0	97
2,3,4,6,7,8-HxCDF-13C	100	92.3	22.0	176.0	92
1,2,3,7,8,9-HxCDF-13C	100	84.5	17.0	205.0	84
1,2,3,4,7,8-HxCDD-13C	100	81.9	21.0	193.0	82
1,2,3,6,7,8-HxCDD-13C	100	102.0	25.0	163.0	102
1,2,3,4,6,7,8-HpCDF-13C	100	90.1	21.0	158.0	90
1,2,3,4,7,8,9-HpCDF-13C	100	78.6	20.0	186.0	79
1,2,3,4,6,7,8-HpCDD-13C	100	106.1	26.0	166.0	106
OCDD-13C	200	196.4	26.0	397.0	98

Cs = Concentration Spiked (ng/mL)
Cr = Concentration Recovered (ng/mL)
Rec. = Recovery (Expressed as Percent)
Control Limit Reference: Method 1613, Table 6, 10/94 Revision
X = Background subtracted value
P = Recovery outside of control limits
Nn = Value obtained from additional analysis
* = See Discussion

Report No.....105645

REPORT OF LABORATORY ANALYSIS

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SPIKE RECOVERY RELATIVE PERCENT DIFFERENCE (RPD) RESULTS

Client..... Del Mar Analytical

SPIKE 1 ID..... LCS-6203
SPIKE 1 Filename..... F50127A_03
SPIKE 2 ID..... LCSD-6204
SPIKE 2 Filename..... F50127A_04

COMPOUND	SPIKE 1 REC,%	SPIKE 2 REC,%	RPD,%
2378-TCDF	102	99	3.0
2378-TCDD	90	88	2.2
12378-PeCDF	100	100	0.0
23478-PeCDF	97	95	2.1
12378-PeCDD	87	83	4.7
123478-HxCDF	90	93	3.3
123678-HxCDF	96	88	8.7
234678-HxCDF	97	94	3.1
123789-HxCDF	93	90	3.3
123478-HxCDD	100	93	7.3
123678-HxCDD	103	98	5.0
123789-HxCDD	97	93	4.2
1234678-HpCDF	103	97	6.0
1234789-HpCDF	105	100	4.9
1234678-HpCDD	87	85	2.3
OCDF	90	85	5.7
OCDD	97	92	5.3

REC = Percent Recovered
RPD = The difference between the two values divided by the average.
NA = Not Applicable

Report No..... 105645

REPORT OF LABORATORY ANALYSIS

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TABLE 1. 2,3,7,8-TCDD Equivalency Factors (TEFs) for the Polychlorinated Dibenzo-p-dioxins and Dibenzofurans

Number	Compound(s)	TEF
1	2,3,7,8-TCDD	1.00
2	1,2,3,7,8-PeCDD	0.50
3	1,2,3,6,7,8-HxCDD	0.1
4	1,2,3,7,8,9-HxCDD	0.1
5	1,2,3,4,7,8-HxCDD	0.1
6	1,2,3,4,6,7,8-HpCDD	0.01
7	OCDD	0.001
8	* Total - TCDD	0.0
9	* Total - PeCDD	0.0
10	* Total - HxCDD	0.0
11	* Total - HpCDD	0.0
12	2,3,7,8-TCDF	0.10
13	1,2,3,7,8-PeCDF	0.05
14	2,3,4,7,8-PeCDF	0.5
15	1,2,3,6,7,8-HxCDF	0.1
16	1,2,3,7,8,9-HxCDF	0.1
17	1,2,3,4,7,8-HxCDF	0.1
18	2,3,4,6,7,8-HxCDF	0.1
19	1,2,3,4,6,7,8-HpCDF	0.01
20	1,2,3,4,7,8,9-HpCDF	0.01
21	OCDF	0.001
22	* Total - TCDF	0.0
23	* Total - PeCDF	0.0
24	* Total - HxCDF	0.0
25	* Total - HpCDF	0.0

*Excluding the 2,3,7,8-substituted congeners.

Reference: 1989 ITEFs

REPORT OF LABORATORY ANALYSIS

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Del Mar Analytical

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SUBCONTRACT ORDER - PROJECT # IOA0458

106048

SENDING LABORATORY:

Del Mar Analytical, Irvine
17461 Derian Avenue. Suite 100
Irvine, CA 92614
Phone: (949) 261-1022
Fax: (949) 261-1228
Project Manager: Michele Harper

RECEIVING LABORATORY:

Pace Analytical, MN- SUB
1700 Elm Street, Ste 200
Minneapolis, MN 55414
Phone :(612) 607-1700
Fax: (612) 607-6444

Standard TAT is requested unless specific due date is requested => Due Date:_____ **Initials:**_____

Analysis	Expiration	Comments
Sample ID: IOA0458-01 Water	**Sampled: 01/10/05 10:38**	106048001
1613-Dioxin-HR	01/17/05 10:38	J flags, 17 congeners, no TEQ, sub to Pace-MN
EDD + Level 4	02/07/05 10:38	Excel EDD email to pm,Include Std logs for Lvl IV

Containers Supplied:
1 L Amber (IOA0458-01C)
1 L Amber (IOA0458-01D)

SAMPLE INTEGRITY:

All containers intact: ☐ Yes ☐ No
Custody Seals Present: ☐ Yes ☐ No
Sample labels/COC agree: ☐ Yes ☐ No
Samples Preserved Properly: ☐ Yes ☐ No
Samples Received On Ice:: ☐ Yes ☐ No
Samples Received at (temp): I=6.0

Released By	Date	Time	Received By	Date	Time
Vin Banh	1/11/05				
			Kathy Edwards	1/12/05	9:00
Released By	Date	Time	Received By	Date	Time

CONTRACT COMPLIANCE SCREENING FORM FOR HARDCOPY DATA

AMEC Earth & Environmental
550 South Wadsworth Boulevard
Suite 500
Lakewood, CO 80226

Laboratory Del Mar Analytical
Reviewer K. Okonzak
Analysis/Method Metals

Package ID T711MT33
Task Order 313150010
SDG No. IOA1803, IOA1804
No. of Analyses 2

Date: 3/14/05
Reviewer's Signature

ACTION ITEMS[a]	
1. **Case Narrative Deficiencies**	
2. **Out of Scope Analyses**	
3. **Analyses Not Conducted**	
4. **Missing Hardcopy Deliverables**	
5. **Incorrect Hardcopy Deliverables**	
6. **Deviations from Analysis Protocol, e.g.,**	Qualifications applied for:
Holding Times	Detects below the reporting limit were qualified as estimated, "J."
GC/MS Tune/Inst. Perform	
Calibrations	
Blanks	
Surrogates	
Matrix Spike/Dup LCS	
Field QC	
Internal Standard Performance	
Compound Identification and Quantitation	
System Performance	
COMMENTS[b]	

[a] Subcontracted analytical laboratory is not meeting contract and/or method requirements.
[b] Differences in protocol have been adopted by the laboratory but no action against the laboratory is required.

Data Qualifier Reference Table

Qualifier	Organics	Inorganics
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.	The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.	The associated value is an estimated quantity.
N	The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification."	Not applicable.
NJ	The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.	Not applicable.
UJ	The analyte was not deemed above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.	The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.
R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and to meet quality control criteria. The presence or absence of the analyte cannot be verified.	The data are unusable. (Note: Analyte may or may not be present).

Qualification Code Reference Table

Qualifier	Organics	Inorganics
H	Holding times were exceeded.	Holding times were exceeded.
S	Surrogate recovery was outside QC limits.	The sequence or number of standards used for the calibration was incorrect
C	Calibration %RSD or %D were noncompliant.	Correlation coefficient is <0.995.
R	Calibration RRF was <0.05.	%R for calibration is not within control limits.
B	Presumed contamination from preparation (method) blank.	Presumed contamination from preparation (method) or calibration blank.
L	Laboratory Blank Spike/Blank Spike Duplicate %R was not within control limits.	Laboratory Control Sample %R was not within control limits.
Q	MS/MSD recovery was poor or RPD high.	MS recovery was poor.
E	Not applicable.	Duplicates showed poor agreement.
I	Internal standard performance was unsatisfactory.	ICP ICS results were unsatisfactory.
A	Not applicable.	ICP Serial Dilution %D were not within control limits.
M	Tuning (BFB or DFTPP) was noncompliant.	Not applicable.
T	Presumed contamination from trip blank.	Not applicable.
+	False positive – reported compound was not present. Not applicable.	
-	False negative – compound was present but not reported.	Not applicable.
F	Presumed contamination from FB, or ER.	Presumed contamination from FB or ER.
$	Reported result or other information was incorrect.	Reported result or other information was incorrect.
?	TIC identity or reported retention time has been changed.	Not applicable.
D	The analysis with this flag should not be used because another more technically sound analysis is available.	The analysis with this flag should not be used because another more technically sound analysis is available.
P	Instrument performance for pesticides was poor.	Post Digestion Spike recovery was not within control limits.
DNQ	The compound was detected between the MDL and the RL and, by definition, is considered an estimated value.	The compound was detected between the MDL and the RL and, by definition, is considered an estimated value.

*#	Unusual problems found with the data that have been described in Section 2.#, "Data Validation Findings." The number following the asterisk (*) will indicate the subsection where a description of the problem can be found (eg. *1 would indicate a sample was not within temperature limits).	Unusual problems found with the data that have been described in Section 2.#, "Data Validation Findings." The number following the asterisk (*) will indicate the subsection where a description of the problem can be found (eg. *1 would indicate a sample was not within temperature limits).

DATA VALIDATION REPORT

NPDES
Monitoring

ANALYSIS: METALS

SAMPLE DELIVERY GROUPS: IOA1803, IOA1804

Prepared by

AMEC—Denver Operations
550 South Wadsworth Boulevard, Suite 500
Lakewood, Colorado 80226

1. INTRODUCTION

Task Order Title:	NPDES Monitoring
Contract Task Order #:	313150010
SDG#:	IOA1803, IOA1804
Project Manager:	B. McIlvaine
Matrix:	Water
Analysis:	Metals
QC Level:	Level IV
No. of Samples:	2
No. of Reanalyses/Dilutions:	0
Reviewer:	K. Okonzak-Lowry
Date of Review:	March 14, 2005

The samples listed in Table 1 were validated based on the guidelines outlined in the *AMEC Data Validation Procedure for Levels III and IV ICP-MS Metals, (DVP-5-A, Rev.0), AMEC Data Validation Procedure for Levels III and IV ICP Metals* (DVP-5, Rev. 0), SW-846 *Method 6020B for Inductively Coupled Plasma – Mass Spectrometry*, SW-846 *Method 6010B for Inductively Coupled Plasma* , SW-846 *Method 7471A for Mercury (Manual Cold-Vapor Technique)*, and validation guidelines outlined in the USEPA CLP *National Functional Guidelines for Inorganic Data Review* (2/94). Any deviations from these procedures and guidelines are documented herein. Qualifiers were applied in cases where the data did not meet the required QC criteria or where special consideration by the data user is required. Data qualifiers were placed on Form Is with the associated qualification codes. Analytes that were rejected for any reason are denoted on the Form I as having only the "R" data qualifier and associated qualification code(s) denoting the reason for rejection. Any additional problems with the data that may have resulted in an estimated value were not denoted by a qualification code since the data had already been rejected.

Table 1. Sample identification

Client ID	EPA ID	Laboratory ID	Matrix	COC Method
Outfall 006	Outfall 006	IOA1803-01	water	ILM04
Outfall 004	Outfall 004	IOA1804-01	water	ILM04

2. DATA VALIDATION FINDINGS

2.1 SAMPLE MANAGEMENT

Following are findings associated with sample management:

2.1.1 Sample Preservation, Handling, and Transport

The samples in these SDGs were received at the laboratory within the temperature limits of 4°C ±2°C. No sample preservation, handling, or transport problems were noted, and no qualifications were necessary.

2.1.2 Chain of Custody

The COCs were signed and dated by field and laboratory personnel. The COCs listed duplicate samples for both site samples; however, duplicate analyses were not required. No sample qualifications were required.

2.1.3 Holding Times

The dates of collection recorded on the COCs and the dates of analyses recorded in the raw data, documented that the sample analyses were performed within the specified holding times of six months for the ICP/MS metals. No qualifications were required.

2.2 ICP-MS TUNING

A precalibration routine must be completed prior to calibrating the instrument, which consists of analyzing a tuning solution to verify resolution, mass calibration, and thermal stability. The solution must be analyzed a minimum of five times and must contain isotopes representing all mass regions of interest. The laboratory performed the required tune solution analyses. The %RSDs for the tune were all within the 5% control limit. The mass calibrations were within 0.1 amu of the true mass and the instrument resolutions were less than 0.75 amu at 5 percent peak height for all analytes in the tune solution. No site sample qualifications were required.

2.3 CALIBRATION

The ICV and CCV results showed acceptable recoveries, 90-110% for the ICP/MS. The applicable reporting limit check standards were recovered within the AMEC control limits of 70-130%. No qualifications were required.

2.4 BLANKS

The method blanks and bracketing ICBs/CCBs associated with the samples in these SDGs were nondetected at the laboratory's MDL for lead. No sample qualifications were required.

2.5 ICP INTERFERENCE CHECK SAMPLE (ICS A/AB)

There were no ICP/MS interference check sample analyses performed in association with the site sample results reported in these data packages; therefore, the samples were not assessed for this criterion.

2.6 BLANK SPIKES AND LABORATORY CONTROL SAMPLES

The ICP/MS LCS sample was identified as 5B02059-BS1. The LCS result on the summary form and in the raw data was within the laboratory-established ICP/MS control limits of 85-115%. No qualifications were required.

2.7 LABORATORY DUPLICATES

No MS/MSD or duplicate analyses were performed in association with the samples in these SDGs; therefore, no assessment was made with respect to this criterion.

2.8 MATRIX SPIKE

No MS/MSD analyses were performed in association with the samples in these SDGs; therefore, no assessment was made with respect to this criterion. Method accuracy was evaluated based on LCS results.

2.9 FURNACE ATOMIC ABSORPTION QC

Furnace atomic absorption was not utilized for the analysis of these samples; therefore, furnace atomic absorption QC is not applicable.

2.10 ICP/MS SERIAL DILUTION

No serial dilution analysis was performed in association with the samples in these SDGs; therefore, no assessment was made with respect to this criterion.

2.11 INTERNAL STANDARDS PERFORMANCE

The ICP-MS internal standard recoveries for the site samples and associated QC sample analyses were within the 60-125% control limits and no qualifications were required.

2.12 SAMPLE RESULT VERIFICATION

A Level IV review was performed for the samples in these data packages. Calculations were verified, and the sample results reported on the Form Is were verified against the raw data. No transcription errors or calculation errors were noted. Analytes detected below the reporting limit were qualified as estimated, "J." No qualifications were required.

2.13 FIELD QC SAMPLES

Field QC samples are evaluated, and if necessary, qualified based only on laboratory blanks. Any remaining detects are used to evaluate the associated samples.

2.13.1 Field Blanks and Equipment Rinsates

The samples in these SDGs had no associated field QC samples. No qualifications were required.

2.13.2 Field Duplicates

There were no field duplicate analyses performed in association with the site samples.

Del Mar Analytical

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2520 E. Sunset Rd. #3, Las Vegas, NV 89120 (702) 798-3620 FAX (702) 798-3621

MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 006

Report Number: IOA1803

Sampled: 01/28/05
Received: 01/28/05

DRAFT: METALS

Analyte	Method	Batch	MDL	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers	Rev Qual	Qual Code
Sample ID: IOA1803-01 (DRAFT: Outfall 006 - Water)											
Reporting Units: ug/l											
Lead	EPA 200.8	5B02059	0.13	1.0	1.6	1	02/02/05	02/04/05			

AMEC TRIBUTED

Level IV

DRAFT REPORT
DRAFT REPORT
DATA SUBJECT TO CHANGE

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CONTRACT COMPLIANCE SCREENING FORM FOR HARDCOPY DATA

AMEC Earth & Environmental
550 South Wadsworth Boulevard
Suite 500
Lakewood, CO 80226

Package ID T711DF33
Task Order 313150010
SDG No. Multiple
No. of Analyses 3

Laboratory Pace
Reviewer K. Shadowlight
Analysis/Method Dioxins

Date: March 18, 2005
Reviewer's Signature K Shadowlight

ACTION ITEMS[a]	
1. **Case Narrative Deficiencies**	
2. **Out of Scope Analyses**	
3. **Analyses Not Conducted**	
4. **Missing Hardcopy Deliverables**	
5. **Incorrect Hardcopy Deliverables**	
6. **Deviations from Analysis Protocol, e.g.,**	Qualifications were assigned for the following:
Holding Times	* Method blank contamination
GC/MS Tune/Inst. Performance	* Internal standard recovery outliers
Calibration	* Detects below the lower method calibration level
Method blanks	
Surrogates	
Matrix Spike/Dup LCS	
Field QC	
Internal Standard Performance	
Compound Identification and Quantitation	
System Performance	
COMMENTS[b]	

[a] Subcontracted analytical laboratory is not meeting contract and/or method requirements.
[b] Differences in protocol have been adopted by the laboratory but no action against the laboratory is required.

DATA VALIDATION REPORT

NPDES
Monitoring

ANALYSIS: DIOXINS/FURANS

SAMPLE DELIVERY GROUPS: IOA1674, IOA1803, IOA1804

Prepared by

AMEC—Denver Operations
550 South Wadsworth Boulevard, Suite 500
Lakewood, Colorado 80226

1. INTRODUCTION

Task Order Title:	NPDES Monitoring
Contract Task Order #:	313150010
Sample Delivery Group #:	IOA1674, IOA1803, IOA1804
Project Manager:	B. McIlvaine
Matrix:	Water
Analysis:	Dioxins/Furans
QC Level:	Level IV
No. of Samples:	3
No. of Reanalyses/Dilutions:	0
Reviewer:	K. Shadowlight
Date of Review:	March 18, 2005

The samples listed in Table 1 were validated based on the guidelines outlined in the *AMEC Data Validation Procedure for Dioxins and Furans (DVP-19, Rev. 1), EPA Method 1613, and the National National Functional Guidelines For Chlorinated Dioxin/Furan Data Review* (8/02). Any deviations from these procedures and guidelines are documented herein. Qualifiers were applied in cases where the data did not meet the required QC criteria or where special consideration by the data user is required. Data qualifiers were placed on Form Is with the associated qualification codes. Analytes that were rejected for any reason are denoted on the Form I as having only the "R" data qualifier and associated qualification code(s) denoting the reason for rejection. Any additional problems with the data that may have resulted in an estimated value were not denoted by a qualification code since the data had already been rejected.

Table 1. Sample Identification

Client ID	Laboratory ID (Del Mar)	Laboratory ID (Pace)	Matrix	COC Method
Outfall 004	IOA1804-01	106983001	water	1613
Outfall 005	IOA1674-01	106914001	water	1613
Outfall 006	IOA1803-01	106982001	water	1613

2. DATA VALIDATION FINDINGS

2.1 SAMPLE MANAGEMENT

Following are findings associated with sample management:

2.1.1 Sample Preservation, Handling, and Transport

The samples in these SDGs were received at Del Mar Analytical within the temperature limits of 4°C ±2°C. The samples were subcontracted to Pace Analytical for the dioxin/furan analyses. Sample Outfall 005 was received at Pace below the temperature limits of 4°C ± 2°C, at 1.2°C; however, as the sample was not noted to have been frozen or damaged, no qualifications were required. The remaining samples in these SDGs were received at Pace Analytical Services within the temperature limits of 4°C ± 2°C. No qualifications were required.

2.1.2 Chain of Custody

The COCs and transfer COCs were signed by the appropriate field and laboratory personnel. The samples and analyses were accounted for on both the original COCs and transfer COCs. As the samples were couriered directly to the laboratory (Del Mar Analytical), custody seals were not required. There was no information regarding custody seals upon receipt at Pace. No qualifications were required.

2.1.3 Holding Times

The samples were extracted and analyzed within one year of collection. No qualifications were required.

2.2 INSTRUMENT PERFORMANCE

Following are findings associated with instrument performance:

2.2.1 GC Column Performance

A column performance standard was combined with the daily calibration verification and analyzed at the beginning of each analytical sequence. The GC column performance was acceptable with the chromatographic separation of 2,3,7,8-TCDD and other TCDD isomers resolved with a valley of ≤25%. No qualifications were required.

2.2.2 Mass Spectrometer Performance

The mass spectrometer performance could not be evaluated as the laboratory did not provide selected ion current profiles for the lock-mass ions. No qualifications were required.

2.3 CALIBRATION

2.3.1 Initial Calibration

There was one initial calibration, analyzed 11/29/04 on instrument 10MSHR05. The calibration consisted of five concentration level standards (CS1 through CS5) analyzed to verify instrument linearity. The initial calibration was acceptable with %RSDs ≤20% for the 15 native compounds (calibration by isotope dilution) and ≤35% for the 2 native and all labeled compounds (calibration by internal standard). The relative retention times and ion abundance ratios were within the QC limits listed in Method 1613 for all standards. A representative number of %RSDs were verified from the raw data, and no calculation or transcription errors were noted. No qualifications were required.

2.3.2 Continuing Calibration

Calibration verification (VER) consisted of a mid-level standard (CS3) analyzed at the beginning of each analytical sequence. The VER was acceptable with the concentrations within the acceptance criteria listed in the Table 6 of the EPA Method 1613. The ion abundance ratios and relative retention times were within the method QC limits. A representative number of %Ds were verified from the raw data, and no calculation or transcription errors were noted. No qualifications were required.

2.4 BLANKS

One method blank (Blank-6264) was extracted and analyzed with the samples in these SDGs. Target compounds 1,2,3,4,6,7,8-HpCDF, total HpCDF, and OCDF were reported in the method blank at concentrations below the lower method calibration limit. Any detects for the aforementioned target compounds reported at concentrations <5× the concentrations reported in the method blank were qualified as estimated nondetects "UJ," at the levels of interference in the samples of these SDGs. The detect for total HpCDF was qualified as estimated, "J," in sample Outfall 006, as only a portion of the total concentration was attributed to method blank contamination. Target compound OCDD was reported as an EMPC in the method blank. A review of the method blank raw data and chromatograms indicated no false negatives or false positives. No further qualifications were required.

2.5 BLANK SPIKES AND LABORATORY CONTROL SAMPLES

One LCS/LCSD pair (LCS-6265/LCSD-6266) was extracted and analyzed with the samples in these SDGs. All recoveries were within the acceptance criteria listed in Table 6 of the Method 1613. There are no method QC limits established for RPDs. The reported RPDs were within ±20%. No qualifications were required.

2.6 MATRIX SPIKE/MATRIX SPIKE DUPLICATE

MS/MSD analyses were not performed in these SDGs. Evaluation of method accuracy and precision was based on the LCS/LCSD results. No qualifications were required.

2.7 FIELD QC SAMPLES

Following are findings associated with field QC:

2.7.1 Field Blanks and Equipment Rinsates

The samples in these SDGs had no associated field QC samples. No qualifications were required.

2.7.2 Field Duplicates

No field duplicate samples were identified for these SDGs.

2.8 INTERNAL STANDARDS

Internal standard 2,3,7,8-TCDF-13C was recovered below QC limits at 22% and 8% in samples Outfall 004 and Outfall 005, respectively. Internal standard 2,3,7,8-TCDD-13C was recovered below QC limits in Oufall 005, and cleanup standard 2,3,7,8-37Cl4 was recovered below QC limits in both samples Outfall 004 and Outfall 005. The samples were re-extracted and reanalyzed; however, according to laboratory personnel, the re-extracted analyses were affected by cross-contamination and were not reported by the laboratory. The nondetect results for 2,3,7,8-TCDF and total TCDF were rejected, "R," in sample Outfall 005. Nondetect results for 2,3,7,8-TCDD and total TCDD were qualified as estimated, "UJ," in Outfall 004 and nondetects for 2,3,7,8-TCDD and total TCDD were qualified as estimated, "UJ," in sample Outfall 005. As the cleanup standard was recovered below QC limits in samples Outfall 004 and Outfall 005, the results for all target compounds were qualified as estimated, "J," for detects and "UJ," for nondetects in both samples, unless otherwise rejected. The remaining labeled standard recoveries were within the acceptance criteria listed in Table 7 of Method 1613. No further qualifications were required.

2.9 COMPOUND IDENTIFICATION

The laboratory analyzed for polychlorinated dioxins/furans by EPA Method 1613. The compound identifications were verified from the raw data and no false negatives or positives were noted. No qualifications were required.

2.10 COMPOUND QUANTIFICATION AND REPORTED DETECTION LIMITS

Compound quantitation was verified from the raw data. The laboratory calculated and reported compound-specific detection limits. Any detects below the lower method calibration limit (MCL) were qualified as estimated, "J." No further qualifications were required.

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
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Tel: 612-607-1700
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Pace Analytical™

Method 1613B Analysis Results

Client - Del Mar Analytical

Client's Sample ID	IOA1803-01 Outfall 006		
Lab Sample ID	106982001		
Filename	F50209B_11		
Injected By	MRO		
Total Amount Extracted	1020 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	01/28/2005
ICAL Date	11/29/2004	Received	02/01/2005
CCal Filename(s)	F50209A_13	Extracted	02/04/2005
Method Blank ID	BLANK-6264	Analyzed	02/10/2005 03:36

Native Isomers	Conc pg/L	EMPC pg/L	LOD pg/L		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	4.7		2,3,7,8-TCDF-13C	2.00	27
Total TCDF	ND	-----	4.7		2,3,7,8-TCDD-13C	2.00	37
					1,2,3,7,8-PeCDF-13C	2.00	50
2,3,7,8-TCDD	ND	-----	4.5		2,3,4,7,8-PeCDF-13C	2.00	56
Total TCDD	ND	-----	4.5		1,2,3,7,8-PeCDD-13C	2.00	69
					1,2,3,4,7,8-HxCDF-13C	2.00	68
1,2,3,7,8-PeCDF	ND	-----	3.8		1,2,3,6,7,8-HxCDF-13C	2.00	79
2,3,4,7,8-PeCDF	ND	-----	1.4		2,3,4,6,7,8-HxCDF-13C	2.00	83
Total PeCDF	ND	-----	2.6		1,2,3,7,8,9-HxCDF-13C	2.00	76
					1,2,3,4,7,8-HxCDD-13C	2.00	69
1,2,3,7,8-PeCDD	ND	-----	2.8		1,2,3,6,7,8-HxCDD-13C	2.00	81
Total PeCDD	ND	-----	2.8		1,2,3,4,6,7,8-HpCDF-13C	2.00	76
					1,2,3,4,7,8,9-HpCDF-13C	2.00	70
1,2,3,4,7,8-HxCDF	ND	-----	2.4		1,2,3,4,6,7,8-HpCDD-13C	2.00	89
1,2,3,6,7,8-HxCDF	ND	-----	1.6		OCDD-13C	4.00	92
2,3,4,6,7,8-HxCDF	ND	-----	1.2				
1,2,3,7,8,9-HxCDF	ND	-----	2.2		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	-----	1.9		1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	1.7		2,3,7,8-TCDD-37Cl4	0.20	35
1,2,3,6,7,8-HxCDD	ND	-----	1.7				
1,2,3,7,8,9-HxCDD	ND	-----	1.4				
Total HxCDD	ND	-----	1.6				
1,2,3,4,6,7,8-HpCDF	2.8	-----	1.6	BJ			
1,2,3,4,7,8,9-HpCDF	ND	-----	1.9				
Total HpCDF	8.7	-----	1.8	BJ			
1,2,3,4,6,7,8-HpCDD	5.0	-----	1.9	J			
Total HpCDD	13.0	-----	1.9	J			
OCDF	8.0	-----	1.7	BJ			
OCDD	55.0	-----	3.8	J			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection. Totals are averages of individual isomer LODs.
D = Result obtained from analysis of diluted sample
B = Less than 10 times higher than method blank level
P = Recovery outside of method 1613 control limits
J = Concentration detected is below the calibration range
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....106982

REPORT OF LABORATORY ANALYSIS

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AMEC VALIDATED

Del Mar Analytical

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LABORATORY REPORT

Prepared For: MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project: Routine Outfall 006

Sampled: 01/28/05
Received: 01/28/05
Issued: 03/18/05 14:39

NELAP #01108CA California ELAP#1197 CSDLAC #10117

The results listed within this Laboratory Report pertain only to the samples tested in the laboratory. The analyses contained in this report were performed in accordance with the applicable certifications as noted. All soil samples are reported on a wet weight basis unless otherwise noted in the report. This Laboratory Report is confidential and is intended for the sole use of Del Mar Analytical and its client. This report shall not be reproduced, except in full, without written permission from Del Mar Analytical. The Chain of Custody, 1 page, is included and is an integral part of this report.

This entire report was reviewed and approved for release.

SAMPLE CROSS REFERENCE

SUBCONTRACTED: Refer to the last page for specific subcontract laboratory information included in this report.

LABORATORY ID	CLIENT ID	MATRIX
IOA1803-01	Outfall 006	Water

Reviewed By:

Michele Harper

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 006

Report Number: IOA1803

Sampled: 01/28/05
Received: 01/28/05

METALS

Analyte	Method	Batch	MDL Limit	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA1803-01 (Outfall 006 - Water)									
Reporting Units: ug/l									
Antimony	EPA 200.8	5B02059	0.18	2.0	**0.20**	1	02/02/05	02/05/05	J
Cadmium	EPA 200.8	5B02059	0.015	1.0	**0.050**	1	02/02/05	02/04/05	J
Copper	EPA 200.8	5B02059	0.49	2.0	**2.6**	1	02/02/05	02/04/05	
Lead	EPA 200.8	5B02059	0.13	1.0	**1.6**	1	02/02/05	02/04/05	
Mercury	EPA 245.1	5B01042	0.063	0.20	**0.13**	1	02/01/05	02/01/05	J

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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INORGANICS

Analyte	Method	Batch	MDL Limit	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA1803-01 (Outfall 006 - Water) - cont.									
Reporting Units: mg/l									
Chloride	EPA 300.0	5A28042	0.26	0.50	ND	1	01/28/05	01/28/05	
Nitrate/Nitrite-N	EPA 300.0	5A28042	0.072	0.26	**1.2**	1	01/28/05	01/28/05	
Oil & Grease	EPA 413.1	5A31068	0.94	5.0	ND	1	01/31/05	01/31/05	
Sulfate	EPA 300.0	5A28042	0.18	0.50	**2.3**	1	01/28/05	01/28/05	
Total Dissolved Solids	SM2540C	5B03098	10	10	**85**	1	02/03/05	02/03/05	

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Report Number: IOA1803

Sampled: 01/28/05
Received: 01/28/05

SHORT HOLD TIME DETAIL REPORT

	Hold Time (in days)	Date/Time Sampled	Date/Time Received	Date/Time Extracted	Date/Time Analyzed
Sample ID: Outfall 006 (IOA1803-01) - Water					
EPA 300.0	2	01/28/2005 09:20	01/28/2005 17:00	01/28/2005 22:30	01/28/2005 22:56

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Attention: Bronwyn Kelly

Project ID: Routine Outfall 006
Report Number: IOA1803

Sampled: 01/28/05
Received: 01/28/05

METHOD BLANK/QC DATA

METALS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5B01042 Extracted: 02/01/05											
Blank Analyzed: 02/01/2005 (5B01042-BLK1)											
Mercury	ND	0.20	0.063	ug/l							
LCS Analyzed: 02/01/2005 (5B01042-BS1)											
Mercury	7.84	0.20	0.063	ug/l	8.00		98	85-115			
Matrix Spike Analyzed: 02/01/2005 (5B01042-MS1)						**Source: IOA1674-01**					
Mercury	7.90	0.20	0.063	ug/l	8.00	0.14	97	70-130			
Matrix Spike Dup Analyzed: 02/01/2005 (5B01042-MSD1)						**Source: IOA1674-01**					
Mercury	7.85	0.20	0.063	ug/l	8.00	0.14	96	70-130	1	20	
Batch: 5B02059 Extracted: 02/02/05											
Blank Analyzed: 02/03/2005 (5B02059-BLK1)											
Antimony	ND	2.0	0.18	ug/l							
Cadmium	ND	1.0	0.015	ug/l							
Copper	ND	2.0	0.49	ug/l							
Lead	ND	1.0	0.13	ug/l							
LCS Analyzed: 02/03/2005 (5B02059-BS1)											
Antimony	88.3	2.0	0.18	ug/l	80.0		110	85-115			
Cadmium	80.9	1.0	0.015	ug/l	80.0		101	85-115			
Copper	76.6	2.0	0.49	ug/l	80.0		96	85-115			
Lead	84.1	1.0	0.13	ug/l	80.0		105	85-115			
Matrix Spike Analyzed: 02/03/2005 (5B02059-MS1)						**Source: IOA1674-01**					
Antimony	91.1	2.0	0.18	ug/l	80.0	ND	114	70-130			
Cadmium	84.2	1.0	0.015	ug/l	80.0	ND	105	70-130			
Copper	81.6	2.0	0.49	ug/l	80.0	0.93	101	70-130			
Lead	85.2	1.0	0.13	ug/l	80.0	0.32	106	70-130			

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Attention: Bronwyn Kelly

Project ID: Routine Outfall 006
Report Number: IOA1803

Sampled: 01/28/05
Received: 01/28/05

METHOD BLANK/QC DATA

METALS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5B02059 Extracted: 02/02/05											
Matrix Spike Analyzed: 02/03/2005 (5B02059-MS2)						**Source: IOB0107-01**					
Antimony	86.7	2.0	0.18	ug/l	80.0	ND	108	70-130			
Cadmium	76.7	1.0	0.015	ug/l	80.0	ND	96	70-130			
Copper	75.2	2.0	0.49	ug/l	80.0	2.1	91	70-130			
Lead	79.7	1.0	0.13	ug/l	80.0	ND	100	70-130			
Matrix Spike Dup Analyzed: 02/03/2005 (5B02059-MSD1)						**Source: IOA1674-01**					
Antimony	93.0	2.0	0.18	ug/l	80.0	ND	116	70-130	2	20	
Cadmium	85.0	1.0	0.015	ug/l	80.0	ND	106	70-130	1	20	
Copper	77.0	2.0	0.49	ug/l	80.0	0.93	95	70-130	6	20	
Lead	85.1	1.0	0.13	ug/l	80.0	0.32	106	70-130	0	20	

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METHOD BLANK/QC DATA

INORGANICS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A28042 Extracted: 01/28/05											
Blank Analyzed: 01/28/2005 (5A28042-BLK1)											
Chloride	ND	0.50	0.26	mg/l							
Nitrate/Nitrite-N	ND	0.26	0.072	mg/l							
Sulfate	ND	0.50	0.18	mg/l							
LCS Analyzed: 01/28/2005 (5A28042-BS1)											
Chloride	4.91	0.50	0.26	mg/l	5.00		98	90-110			
Sulfate	10.2	0.50	0.18	mg/l	10.0		102	90-110			
Matrix Spike Analyzed: 01/28/2005 (5A28042-MS1)						**Source: IOA1608-01**					
Chloride	105	5.0	2.6	mg/l	50.0	60	90	80-120			
Sulfate	298	5.0	1.8	mg/l	100	210	88	80-120			
Matrix Spike Dup Analyzed: 01/28/2005 (5A28042-MSD1)						**Source: IOA1608-01**					
Chloride	110	5.0	2.6	mg/l	50.0	60	100	80-120	5	20	
Sulfate	301	5.0	1.8	mg/l	100	210	91	80-120	1	20	
Batch: 5A31068 Extracted: 01/31/05											
Blank Analyzed: 01/31/2005 (5A31068-BLK1)											
Oil & Grease	ND	5.0	0.94	mg/l							
LCS Analyzed: 01/31/2005 (5A31068-BS1)											**M-NR1**
Oil & Grease	17.0	5.0	0.94	mg/l	20.0		85	65-120			
LCS Dup Analyzed: 01/31/2005 (5A31068-BSD1)											
Oil & Grease	19.6	5.0	0.94	mg/l	20.0		98	65-120	14	20	

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Attention: Bronwyn Kelly

Project ID: Routine Outfall 006
Report Number: IOA1803

Sampled: 01/28/05
Received: 01/28/05

METHOD BLANK/QC DATA

INORGANICS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5B03098 Extracted: 02/03/05											
Blank Analyzed: 02/03/2005 (5B03098-BLK1)											
Total Dissolved Solids	ND	10	10	mg/l							
LCS Analyzed: 02/03/2005 (5B03098-BS1)											
Total Dissolved Solids	984	10	10	mg/l	1000		98	90-110			
Duplicate Analyzed: 02/03/2005 (5B03098-DUP1)						**Source: IOA1803-01**					
Total Dissolved Solids	79.0	10	10	mg/l		85			7	10	

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Report Number: IOA1803

Sampled: 01/28/05
Received: 01/28/05

Compliance Check

The results obtained from the analytical testing of this data set were checked against compliance limits received from the client. Any results at or above the compliance limits appear in bold on this page.

LabNumber	Analysis	Analyte	Units	Result	MRL	Compliance Limit
IOA1803-01	413.1 Oil and Grease	Oil & Grease	mg/l	0	5.0	15
IOA1803-01	Antimony-200.8	Antimony	ug/l	0.20	2.0	6.00
IOA1803-01	Cadmium-200.8	Cadmium	ug/l	0.050	1.0	4.00
IOA1803-01	Chloride - 300.0	Chloride	mg/l	0.12	0.50	150
IOA1803-01	Copper-200.8	Copper	ug/l	2.60	2.0	14
IOA1803-01	Mercury - 245.1	Mercury	ug/l	0.13	0.20	0.20
IOA1803-01	Nitrogen, NO3+NO2 -N	Nitrate/Nitrite-N	mg/l	1.20	0.26	10.00
IOA1803-01	Sulfate-300.0	Sulfate	mg/l	2.30	0.50	250
IOA1803-01	TDS - SM 2540C	Total Dissolved Solids	mg/l	85	10	850

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DATA QUALIFIERS AND DEFINITIONS

J	Estimated value. Analyte detected at a level less than the Reporting Limit (RL) and greater than or equal to the Method Detection Limit (MDL). The user of this data should be aware that this data is of unknown quality.
M-NR1	There was no MS/MSD analyzed with this batch due to insufficient sample volume. See Blank Spike/Blank Spike Duplicate.
ND	Analyte NOT DETECTED at or above the reporting limit or MDL, if MDL is specified.
RPD	Relative Percent Difference

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9484 Chesapeake Dr., Suite 805, San Diego, CA 92123 (858) 505-8596 FAX (858) 505-9689
9830 South 51st St., Suite B-120, Phoenix, AZ 85044 (480) 785-0043 FAX (480) 785-0851
2520 E. Sunset Rd. #3, Las Vegas, NV 89120 (702) 798-3620 FAX (702) 798-3621

MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 006

Report Number: IOA1803

Sampled: 01/28/05
Received: 01/28/05

Certification Summary

Del Mar Analytical, Irvine

Method	Matrix	Nelac	California
EPA 200.8	Water	X	X
EPA 245.1	Water	X	X
EPA 300.0	Water	X	X
EPA 413.1	Water	X	X
SM2540C	Water	X	X

Nevada and NELAP provide analyte specific accreditations. Analyte specific information for Del Mar Analytical may be obtained by contacting the laboratory or visiting our website at www.dmalabs.com.

Subcontracted Laboratories

Pace Analytical, MN- SUB

1700 Elm Street, Ste 200 - Minneapolis, MN 55414

Analysis Performed: 1613-Dioxin-HR
Samples: IOA1803-01

Analysis Performed: EDD + Level 4
Samples: IOA1803-01

Del Mar Analytical, Irvine
Michele Harper
Project Manager

The results pertain only to the samples tested in the laboratory. This report shall not be reproduced, except in full, without written permission from Del Mar Analytical.

1DA1803

Del Mar Analytical Version 5 8/12/04 CHAIN OF CUSTODY FORM

Client Name/Address:	Project:	ANALYSIS REQUIRED
MWH-Pasadena 300 North Lake Avenue, Suite 1200 Pasadena, CA 91101	Boeing-SSFL NPDES **Routine Outfall 006** Stormwater at FSDF-2	
Project Manager: Bronwyn Kelly Sampler: Pollock	Phone Number: (626) 568-6691 Fax Number: (626) 568-6515	

Sample Description	Sample Matrix	Container Type	# of Cont.	Sampling Date/Time	Preservative	Bottle * #	Total Reoverable Metals: Sb, Cd, Cu, Pb, Hg	TCDD (and all congeners)	Oil & Grease (EPA 413.1)	Cl-, SO4, NO3+NO2-N	TDS					Field readings: Temp = 52.7F pH= 7.7 **Comments**
Outfall 006	W	Poly-1L	1	1-28-05	HNO3	1A	X									
Outfall 006-Dup	W	Poly-1L	1	09:20	HNO3	1B	X									
Outfall 006	W	Glass-Amber	2		None	2A, 2B		X								
Outfall 006	W	Glass-Amber	2		HCl	3A, 3B			X							
Outfall 006	W	Poly-500 ml	2		None	4A, 4B				X						
Outfall 006	W	Poly-500 ml	2		None	5A, 5B					X					

Relinquished By	Date/Time:	Received By	Date/Time:
	1-28-05 10:20		1/28/05 10:20
Relinquished By	Date/Time:	Received By	Date/Time:
	1/28/05 1700		1/28/05 1700
Relinquished By	Date/Time:	Received By	Date/Time:

Turn around Time: (check)
24 Hours _____ 5 Days _____
48 Hours _____ 10 Days _____
72 Hours _____ Normal _____
Perchlorate Only 72 Hours_____
Metals Only 72 Hours_____
Sample Integrity: (Check)
Intact X On Ice: 6°C

Del Mar Analytical

2852 Alton Ave., Irvine CA 92606 (949) 261-1022 FAX (949) 261-1228
1014 E. Cooley Dr., Suite A, Colton, CA 92324 (909) 370-4667 FAX (949) 370-1046
9484 Chesapeake Dr., Suite 805, San Diego, CA 92123 (858) 505-8596 FAX (858) 505-9689
9830 South 51st St., Suite B-120, Phoenix, AZ 85044 (480) 785-0043 FAX (480) 785-0851
2520 E. Sunset Rd. #3, Las Vegas, NV 89120 (702) 798-3620 FAX (702) 798-3621

March 17, 2005

MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, Ca.91101

Attention: Bronwyn Kelly

Project: Routine Outfall 006
Sampled: 01/28/05
Del Mar Analytical Number: IOA1803

Dear Ms. Kelly:

Pace Analytical performed Method 1613B analysis for the project referenced above. Please use the following cross-reference table when reviewing your results.

MWH ID	DEL MAR ID	Pace ID
Outfall 006	IOA1803-01	106983001

Attached is the original report from the subcontract laboratory. If you have any questions or require further assistance, please do not hesitate to contact me.

Sincerely yours,
DEL MAR ANALYTICAL

Michele Harper
Project Manager

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Pace Analytical™

Method 1613B Analysis Results

Client - Del Mar Analytical

Client's Sample ID	IOA1803-01		
Lab Sample ID	106982001		
Filename	F50209B_11		
Injected By	MRO		
Total Amount Extracted	1020 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	01/28/2005
ICAL Date	11/29/2004	Received	02/01/2005
CCal Filename(s)	F50209A_13	Extracted	02/04/2005
Method Blank ID	BLANK-6264	Analyzed	02/10/2005 03:36

Native Isomers	Conc pg/L	EMPC pg/L	LOD pg/L	
2,3,7,8-TCDF	ND	-----	4.7	
Total TCDF	ND	-----	4.7	
2,3,7,8-TCDD	ND	-----	4.5	
Total TCDD	ND	-----	4.5	
1,2,3,7,8-PeCDF	ND	-----	3.8	
2,3,4,7,8-PeCDF	ND	-----	1.4	
Total PeCDF	ND	-----	2.6	
1,2,3,7,8-PeCDD	ND	-----	2.8	
Total PeCDD	ND	-----	2.8	
1,2,3,4,7,8-HxCDF	ND	-----	2.4	
1,2,3,6,7,8-HxCDF	ND	-----	1.6	
2,3,4,6,7,8-HxCDF	ND	-----	1.2	
1,2,3,7,8,9-HxCDF	ND	-----	2.2	
Total HxCDF	ND	-----	1.9	
1,2,3,4,7,8-HxCDD	ND	-----	1.7	
1,2,3,6,7,8-HxCDD	ND	-----	1.7	
1,2,3,7,8,9-HxCDD	ND	-----	1.4	
Total HxCDD	ND	-----	1.6	
1,2,3,4,6,7,8-HpCDF	2.8	-----	1.6	BJ
1,2,3,4,7,8,9-HpCDF	ND	-----	1.9	
Total HpCDF	8.7	-----	1.8	BJ
1,2,3,4,6,7,8-HpCDD	5.0	-----	1.9	J
Total HpCDD	13.0	-----	1.9	J
OCDF	8.0	-----	1.7	BJ
OCDD	55.0	-----	3.8	J

Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF-13C	2.00	27
2,3,7,8-TCDD-13C	2.00	37
1,2,3,7,8-PeCDF-13C	2.00	50
2,3,4,7,8-PeCDF-13C	2.00	56
1,2,3,7,8-PeCDD-13C	2.00	69
1,2,3,4,7,8-HxCDF-13C	2.00	68
1,2,3,6,7,8-HxCDF-13C	2.00	79
2,3,4,6,7,8-HxCDF-13C	2.00	83
1,2,3,7,8,9-HxCDF-13C	2.00	76
1,2,3,4,7,8-HxCDD-13C	2.00	69
1,2,3,6,7,8-HxCDD-13C	2.00	81
1,2,3,4,6,7,8-HpCDF-13C	2.00	76
1,2,3,4,7,8,9-HpCDF-13C	2.00	70
1,2,3,4,6,7,8-HpCDD-13C	2.00	89
OCDD-13C	4.00	92
1,2,3,4-TCDD-13C	2.00	NA
1,2,3,7,8,9-HxCDD-13C	2.00	NA
2,3,7,8-TCDD-37Cl4	0.20	35

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection. Totals are averages of individual isomer LODs.
D = Result obtained from analysis of diluted sample
B = Less than 10 times higher than method blank level
P = Recovery outside of method 1613 control limits
J = Concentration detected is below the calibration range
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....106982

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Pace Analytical™

Method 1613B Blank Analysis Results

Client - Del Mar Analytical

Lab Sample ID	BLANK-6264	Matrix	Water
Filename	F50209B_05	Dilution	NA
Total Amount Extracted	929 mL	Extracted	02/04/2005
ICAL Date	11/29/2004	Analyzed	02/09/2005 22:34
CCal Filename(s)	F50209A_13	Injected By	MRO

Native Isomers	Conc pg/L	EMPC pg/L	LOD pg/L	
2,3,7,8-TCDF	ND	-----	11.0	
Total TCDF	ND	-----	-----	
2,3,7,8-TCDD	ND	-----	13.0	
Total TCDD	ND	-----	-----	
1,2,3,7,8-PeCDF	ND	-----	5.0	
2,3,4,7,8-PeCDF	ND	-----	2.5	
Total PeCDF	ND	-----	-----	
1,2,3,7,8-PeCDD	ND	-----	3.7	
Total PeCDD	ND	-----	-----	
1,2,3,4,7,8-HxCDF	ND	-----	1.8	
1,2,3,6,7,8-HxCDF	ND	-----	1.9	
2,3,4,6,7,8-HxCDF	ND	-----	1.5	
1,2,3,7,8,9-HxCDF	ND	-----	1.9	
Total HxCDF	ND	-----	-----	
1,2,3,4,7,8-HxCDD	ND	-----	2.6	
1,2,3,6,7,8-HxCDD	ND	-----	2.2	
1,2,3,7,8,9-HxCDD	ND	-----	2.2	
Total HxCDD	ND	-----	-----	
1,2,3,4,6,7,8-HpCDF	1.9	-----	1.8	J
1,2,3,4,7,8,9-HpCDF	ND	-----	1.9	
Total HpCDF	1.9	-----	-----	J
1,2,3,4,6,7,8-HpCDD	ND	-----	2.0	
Total HpCDD	ND	-----	-----	
OCDF	4.8	-----	1.7	J
OCDD	-----	8.7	3.5	I

Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF-13C	2.00	9 P
2,3,7,8-TCDD-13C	2.00	14 P
1,2,3,7,8-PeCDF-13C	2.00	26
2,3,4,7,8-PeCDF-13C	2.00	35
1,2,3,7,8-PeCDD-13C	2.00	45
1,2,3,4,7,8-HxCDF-13C	2.00	50
1,2,3,6,7,8-HxCDF-13C	2.00	57
2,3,4,6,7,8-HxCDF-13C	2.00	69
1,2,3,7,8,9-HxCDF-13C	2.00	58
1,2,3,4,7,8-HxCDD-13C	2.00	58
1,2,3,6,7,8-HxCDD-13C	2.00	63
1,2,3,4,6,7,8-HpCDF-13C	2.00	63
1,2,3,4,7,8,9-HpCDF-13C	2.00	60
1,2,3,4,6,7,8-HpCDD-13C	2.00	78
OCDD-13C	4.00	80
1,2,3,4-TCDD-13C	2.00	NA
1,2,3,7,8,9-HxCDD-13C	2.00	NA
2,3,7,8-TCDD-37Cl4	0.20	16 P

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection. Totals are averages of individual isomer LODs.
A = Limit of Detection based on signal to noise
P = Recovery outside of method 1613 control limits
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....106914

REPORT OF LABORATORY ANALYSIS

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1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Pace Analytical™

Method 1613B Laboratory Control Spike Results

Client - Del Mar Analytical

Lab Sample ID	LCS-6265		
Filename	F50209B_01	Matrix	Water
Total Amount Extracted	956 mL	Dilution	NA
ICAL Date	11/29/2004	Extracted	02/04/2005
CCal Filename	F50209A_13	Analyzed	02/09/2005 19:13
Method Blank ID	BLANK-6264	Injected By	MRO

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDF	10	10.2	7.5	15.8	102
2,3,7,8-TCDD	10	9.3	6.7	15.8	93
1,2,3,7,8-PeCDF	50	51.4	40.0	67.0	103
2,3,4,7,8-PeCDF	50	48.6	34.0	80.0	97
1,2,3,7,8-PeCDD	50	43.2	35.0	71.0	86
1,2,3,4,7,8-HxCDF	50	48.1	36.0	67.0	96
1,2,3,6,7,8-HxCDF	50	47.3	42.0	65.0	95
2,3,4,6,7,8-HxCDF	50	50.1	35.0	78.0	100
1,2,3,7,8,9-HxCDF	50	46.8	39.0	65.0	94
1,2,3,4,7,8-HxCDD	50	50.3	35.0	82.0	101
1,2,3,6,7,8-HxCDD	50	51.8	38.0	67.0	104
1,2,3,7,8,9-HxCDD	50	49.8	32.0	81.0	100
1,2,3,4,6,7,8-HpCDF	50	52.1	41.0	61.0	104
1,2,3,4,7,8,9-HpCDF	50	51.9	39.0	69.0	104
1,2,3,4,6,7,8-HpCDD	50	43.8	35.0	70.0	88
OCDF	100	95.4	63.0	170.0	95
OCDD	100	96.8	78.0	144.0	97
2,3,7,8-TCDD-37Cl4	10	4.2	3.1	19.1	42
2,3,7,8-TCDF-13C	100	31.8	22.0	152.0	32
2,3,7,8-TCDD-13C	100	41.3	20.0	175.0	41
1,2,3,7,8-PeCDF-13C	100	53.7	21.0	192.0	54
2,3,4,7,8-PeCDF-13C	100	60.1	13.0	328.0	60
1,2,3,7,8-PeCDD-13C	100	71.7	21.0	227.0	72
1,2,3,4,7,8-HxCDF-13C	100	63.5	19.0	202.0	64
1,2,3,6,7,8-HxCDF-13C	100	75.5	21.0	159.0	75
2,3,4,6,7,8-HxCDF-13C	100	78.8	22.0	176.0	79
1,2,3,7,8,9-HxCDF-13C	100	69.4	17.0	205.0	69
1,2,3,4,7,8-HxCDD-13C	100	71.3	21.0	193.0	71
1,2,3,6,7,8-HxCDD-13C	100	72.9	25.0	163.0	73
1,2,3,4,6,7,8-HpCDF-13C	100	72.8	21.0	158.0	73
1,2,3,4,7,8,9-HpCDF-13C	100	68.2	20.0	186.0	68
1,2,3,4,6,7,8-HpCDD-13C	100	87.9	26.0	166.0	88
OCDD-13C	200	173.9	26.0	397.0	87

Cs = Concentration Spiked (ng/mL)
Cr = Concentration Recovered (ng/mL)
Rec. = Recovery (Expressed as Percent)
Control Limit Reference: Method 1613, Table 6, 10/94 Revision
X = Background subtracted value
P = Recovery outside of control limits
Nn = Value obtained from additional analysis
* = See Discussion

Report No.....106914

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Pace Analytical™

Method 1613B Laboratory Control Spike Results

Client - Del Mar Analytical

Lab Sample ID	LCSD-6266	Matrix	Water
Filename	F50209B_02	Dilution	NA
Total Amount Extracted	983 mL	Extracted	02/04/2005
ICAL Date	11/29/2004	Analyzed	02/09/2005 20:04
CCal Filename	F50209A_13	Injected By	MRO
Method Blank ID	BLANK-6264		

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDF	10	9.9	7.5	15.8	99
2,3,7,8-TCDD	10	8.9	6.7	15.8	89
1,2,3,7,8-PeCDF	50	51.6	40.0	67.0	103
2,3,4,7,8-PeCDF	50	49.3	34.0	80.0	99
1,2,3,7,8-PeCDD	50	43.1	35.0	71.0	86
1,2,3,4,7,8-HxCDF	50	46.4	36.0	67.0	93
1,2,3,6,7,8-HxCDF	50	47.6	42.0	65.0	95
2,3,4,6,7,8-HxCDF	50	49.6	35.0	78.0	99
1,2,3,7,8,9-HxCDF	50	47.0	39.0	65.0	94
1,2,3,4,7,8-HxCDD	50	50.7	35.0	82.0	101
1,2,3,6,7,8-HxCDD	50	51.4	38.0	67.0	103
1,2,3,7,8,9-HxCDD	50	49.5	32.0	81.0	99
1,2,3,4,6,7,8-HpCDF	50	51.2	41.0	61.0	102
1,2,3,4,7,8,9-HpCDF	50	52.9	39.0	69.0	106
1,2,3,4,6,7,8-HpCDD	50	43.8	35.0	70.0	88
OCDF	100	95.1	63.0	170.0	95
OCDD	100	98.2	78.0	144.0	98
2,3,7,8-TCDD-37Cl4	10	5.0	3.1	19.1	50
2,3,7,8-TCDF-13C	100	39.8	22.0	152.0	40
2,3,7,8-TCDD-13C	100	51.4	20.0	175.0	51
1,2,3,7,8-PeCDF-13C	100	61.4	21.0	192.0	61
2,3,4,7,8-PeCDF-13C	100	66.8	13.0	328.0	67
1,2,3,7,8-PeCDD-13C	100	82.2	21.0	227.0	82
1,2,3,4,7,8-HxCDF-13C	100	70.8	19.0	202.0	71
1,2,3,6,7,8-HxCDF-13C	100	79.9	21.0	159.0	80
2,3,4,6,7,8-HxCDF-13C	100	85.0	22.0	176.0	85
1,2,3,7,8,9-HxCDF-13C	100	75.4	17.0	205.0	75
1,2,3,4,7,8-HxCDD-13C	100	72.5	21.0	193.0	72
1,2,3,6,7,8-HxCDD-13C	100	82.8	25.0	163.0	83
1,2,3,4,6,7,8-HpCDF-13C	100	80.0	21.0	158.0	80
1,2,3,4,7,8,9-HpCDF-13C	100	73.7	20.0	186.0	74
1,2,3,4,6,7,8-HpCDD-13C	100	94.2	26.0	166.0	94
OCDD-13C	200	186.1	26.0	397.0	93

Cs = Concentration Spiked (ng/mL)
Cr = Concentration Recovered (ng/mL)
Rec. = Recovery (Expressed as Percent)
Control Limit Reference: Method 1613, Table 6, 10/94 Revision
X = Background subtracted value
P = Recovery outside of control limits
Nn = Value obtained from additional analysis
* = See Discussion

Report No.....106914

REPORT OF LABORATORY ANALYSIS

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1700 Elm Street
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444

SPIKE RECOVERY RELATIVE PERCENT DIFFERENCE (RPD) RESULTS

Client..... Del Mar Analytical

SPIKE 1 ID..... LCS-6265
SPIKE 1 Filename..... F50209B_01
SPIKE 2 ID..... LCSD-6266
SPIKE 2 Filename..... F50209B_02

COMPOUND	SPIKE 1 REC,%	SPIKE 2 REC,%	RPD,%
2378-TCDF	102	99	3.0
2378-TCDD	93	89	4.4
12378-PeCDF	103	103	0.0
23478-PeCDF	97	99	2.0
12378-PeCDD	86	86	0.0
123478-HxCDF	96	93	3.2
123678-HxCDF	95	95	0.0
234678-HxCDF	100	99	1.0
123789-HxCDF	94	94	0.0
123478-HxCDD	101	101	0.0
123678-HxCDD	104	103	1.0
123789-HxCDD	100	99	1.0
1234678-HpCDF	104	102	1.9
1234789-HpCDF	104	106	1.9
1234678-HpCDD	88	88	0.0
OCDF	95	95	0.0
OCDD	97	98	1.0

REC = Percent Recovered
RPD = The difference between the two values divided by the average.
NA = Not Applicable

Report No..... 106914

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Pace Analytical Services, Inc.
1700 Elm Street
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444

TABLE 1. 2,3,7,8-TCDD Equivalency Factors (TEFs) for the Polychlorinated Dibenzo-p-dioxins and Dibenzofurans

Number	Compound(s)	TEF
1	2,3,7,8-TCDD	1.00
2	1,2,3,7,8-PeCDD	0.50
3	1,2,3,6,7,8-HxCDD	0.1
4	1,2,3,7,8,9-HxCDD	0.1
5	1,2,3,4,7,8-HxCDD	0.1
6	1,2,3,4,6,7,8-HpCDD	0.01
7	OCDD	0.001
8	* Total - TCDD	0.0
9	* Total - PeCDD	0.0
10	* Total - HxCDD	0.0
11	* Total - HpCDD	0.0
12	2,3,7,8-TCDF	0.10
13	1,2,3,7,8-PeCDF	0.05
14	2,3,4,7,8-PeCDF	0.5
15	1,2,3,6,7,8-HxCDF	0.1
16	1,2,3,7,8,9-HxCDF	0.1
17	1,2,3,4,7,8-HxCDF	0.1
18	2,3,4,6,7,8-HxCDF	0.1
19	1,2,3,4,6,7,8-HpCDF	0.01
20	1,2,3,4,7,8,9-HpCDF	0.01
21	OCDF	0.001
22	* Total - TCDF	0.0
23	* Total - PeCDF	0.0
24	* Total - HxCDF	0.0
25	* Total - HpCDF	0.0

*Excluding the 2,3,7,8-substituted congeners.

Reference: 1989 ITEFs

REPORT OF LABORATORY ANALYSIS

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ACCREDITED IN ACCORDANCE WITH nelac

Del Mar Analytical

17461 Derian Ave. Suite 100, Irvine, CA 92614 Ph (949) 261-1022 Fax (949) 261-1228
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2520 E. Sunset Rd., Suite #3, Las Vegas, NV 89120 Ph (702) 798-3620 Fax (702) 798-3621

SUBCONTRACT ORDER - PROJECT # IOA1803

106982

SENDING LABORATORY:

Del Mar Analytical, Irvine
17461 Derian Avenue. Suite 100
Irvine, CA 92614
Phone: (949) 261-1022
Fax: (949) 261-1228
Project Manager: Michele Harper

RECEIVING LABORATORY:

Pace Analytical, MN- SUB
1700 Elm Street, Ste 200
Minneapolis, MN 55414
Phone :(612) 607-1700
Fax: (612) 607-6444

Standard TAT is requested unless specific due date is requested => Due Date:_____ Initials:_____

Analysis	Expiration	Comments
Sample ID: IOA1803-01 Water	**Sampled: 01/28/05 09:20**	106982001
1613-Dioxin-HR	02/04/05 09:20	J flags, 17 congeners, no TEQ, sub to Pace-MN
EDD + Level 4	02/25/05 09:20	Excel EDD email to pm,Include Std logs for Lvl IV

Containers Supplied:

1 L Amber (IOA1803-01C)
1 L Amber (IOA1803-01D)

SAMPLE INTEGRITY:

All containers intact: ☐ Yes ☐ No
Custody Seals Present: ☐ Yes ☐ No
Sample labels/COC agree: ☐ Yes ☐ No
Samples Preserved Properly: ☐ Yes ☐ No
Samples Received On Ice:: ☐ Yes ☐ No
Samples Received at (temp): 2.1°C

Released By	Date	Time	Received By	Date	Time
	1-31-05	1700	Pace	2-1-05	09:45

APPENDIX G

Section 7

January Outfall 007

AMEC Data Validation Reports

Del Mar Analytical Laboratory Reports

CONTRACT COMPLIANCE SCREENING FORM FOR HARDCOPY DATA

AMEC Earth & Environmental
550 South Wadsworth Boulevard
Suite 500
Lakewood, CO 80226

Package ID T711DF20
Task Order 313150010
SDG No. Multiple
No. of Analyses 15

Laboratory Alta
Reviewer K. Shadowlight
Analysis/Method Dioxins

Date: February 11, 2005
Reviewer's Signature K Shadowlight

ACTION ITEMS[a]	
1. **Case Narrative Deficiencies**	
2. **Out of Scope Analyses**	
3. **Analyses Not Conducted**	
4. **Missing Hardcopy Deliverables**	
5. **Incorrect Hardcopy Deliverables**	
6. **Deviations from Analysis Protocol, e.g.,**	Qualifications were assigned for the following:
Holding Times	* Method blank contamination
GC/MS Tune/Inst. Performance	* EMPCs
Calibration	* Detects below the lower method calibration level
Method blanks	
Surrogates	
Matrix Spike/Dup LCS	
Field QC	
Internal Standard Performance	
Compound Identification and Quantitation	
System Performance	
COMMENTS[b]	Rev. 1

[a] Subcontracted analytical laboratory is not meeting contract and/or method requirements.
[b] Differences in protocol have been adopted by the laboratory but no action against the laboratory is required.

DATA VALIDATION REPORT

NPDES
Monitoring

ANALYSIS: DIOXINS/FURANS

SAMPLE DELIVERY GROUPS: Multiple SDGs

Prepared by

AMEC—Denver Operations
550 South Wadsworth Boulevard, Suite 500
Lakewood, Colorado 80226

1. INTRODUCTION

Task Order Title:	NPDES Monitoring
Contract Task Order #:	313150010
Sample Delivery Group #:	Multiple
Project Manager:	B. McIlvaine
Matrix:	Water
Analysis:	Dioxins/Furans
QC Level:	Level IV
No. of Samples:	15
No. of Reanalyses/Dilutions:	0
Reviewer:	K. Shadowlight
Date of Review:	February 11, 2005

The samples listed in Table 1 were validated based on the guidelines outlined in the *AMEC Data Validation Procedure for Dioxins and Furans (DVP-19, Rev. 1), EPA Method 1613, and the National National Functional Guidelines For Chlorinated Dioxin/Furan Data Review* (8/02). Any deviations from these procedures and guidelines are documented herein. Qualifiers were applied in cases where the data did not meet the required QC criteria or where special consideration by the data user is required. Data qualifiers were placed on Form Is with the associated qualification codes. Analytes that were rejected for any reason are denoted on the Form I as having only the "R" data qualifier and associated qualification code(s) denoting the reason for rejection. Any additional problems with the data that may have resulted in an estimated value were not denoted by a qualification code since the data had already been rejected.

Table 1. Sample Identification

Client ID	Laboratory ID (Del Mar)	Laboratory ID (Pace)	Matrix	COC Method
Outfall 003	IOA0026-01	105648001	water	1613
Outfall 004	IOA0027-01	105646001	water	1613
Outfall 005	IOA0028-01	105645001	water	1613
Outfall 007	IOA0108-01	105774001	water	1613
Outfall 008	IOA0109-01	105775001	water	1613
Outfall 009	IOA0110-01	105770001	water	1613
Outfall 010	IOA0111-01	105758001	water	1613
Outfall 001	IOA0112-01	105778001	water	1613
Outfall 002	IOA0119-01	105772001	water	1613
Outfall 018	IOA0122-01	105779001	water	1613
Outfall 011	IOA0131-01	105773001	water	1613
Outfall 006	IOA0458-01	106048001	water	1613
Outfall 004	IOA0460-01	106050001	water	1613
Outfall 005	IOA0464-01	106052001	water	1613
Outfall 003	IOA0466-01	106051001	water	1613

2. DATA VALIDATION FINDINGS

2.1 SAMPLE MANAGEMENT

Following are findings associated with sample management:

2.1.1 Sample Preservation, Handling, and Transport

All of the samples in these SDGs were received at Del Mar Analytical within the temperature limits of 4°C ±2°C. Several of the samples in these SDGs were received at Pace Analytical Services below the temperature limits of 4°C ±2°C; however, as none of the samples were noted to have been damaged, no qualifications were required. The samples were received in good condition at both laboratories. No qualifications were required.

2.1.2 Chain of Custody

The COC and transfer COC were signed by the appropriate field and laboratory personnel, and accounted for the analyses presented in these SDGs. As the samples were couriered directly to the laboratory (Del Mar Analytical), custody seals were not required. There was no information regarding custody seals upon receipt at Pace. No qualifications were required.

2.1.3 Holding Times

The samples were extracted and analyzed within a year of collection. No qualifications were required.

2.2 INSTRUMENT PERFORMANCE

Following are findings associated with instrument performance:

2.2.1 GC Column Performance

A column performance standard was combined with the daily calibration verification and analyzed at the beginning of each analytical sequence. The GC column performance was acceptable with the chromatographic separation of 2,3,7,8-TCDD and other TCDD isomers resolved with a valley of ≤25%. No qualifications were required.

2.2.2 Mass Spectrometer Performance

The mass spectrometer performance could not be evaluated as the laboratory did not provide selected ion current profiles for the lock-mass ions. No qualifications were required.

2.3 CALIBRATION

2.3.1 Initial Calibration

There was one initial calibration, analyzed 11/29/04 on Instrument 10MSHR05. The calibration consisted of five concentration level standards (CS1 through CS5) analyzed to verify instrument linearity. The initial calibration was acceptable with %RSDs ≤20% for the 15 native compounds (calibration by isotope dilution) and ≤35% for the 2 native and all labeled compounds (calibration by internal standard). The relative retention times and ion abundance ratios were within the QC limits listed in Method 1613 for all standards. A representative number of %RSDs were verified from the raw data, and no calculation or transcription errors were noted. No qualifications were required.

2.3.2 Continuing Calibration

Calibration verification (VER) consisted of a mid-level standard (CS3) analyzed at the beginning of each analytical sequence. The VER was acceptable with the concentrations within the acceptance criteria listed in the Table 6 of the EPA Method 1613. The ion abundance ratios and relative retention times were within the method QC limits. A representative number of %Ds were verified from the raw data, and no calculation or transcription errors were noted. No qualifications were required.

2.4 BLANKS

One method blank (Blank-6202) was extracted and analyzed with the samples in these SDGs. Target compounds 1,2,3,4,6,7,8-HpCDD, total HpCDD, OCDF, and OCDD were reported in the method blank. Any detects for the aforementioned target compounds reported at concentrations <5x the concentrations reported in the method blank were qualified as estimated nondetects "UJ," at the levels of interference in the samples of these SDGs. A review of the method blank raw data and chromatograms indicated no false negatives or false positives. No further qualifications were required.

2.5 BLANK SPIKES AND LABORATORY CONTROL SAMPLES

One LCS/LCSD pair (LCS-6203/LCSD-6204) was extracted and analyzed with the samples in these SDGs. All recoveries were within the acceptance criteria listed in Table 6 of the Method 1613. There were no QC limits established for RPDs. The reported RPDs were within ±20%. No qualifications were required.

2.6 MATRIX SPIKE/MATRIX SPIKE DUPLICATE

MS/MSD analyses were not performed in these SDGs. Evaluation of method accuracy and precision was based on the LCS/LCSD results. No qualifications were required.

2.7 FIELD QC SAMPLES

Following are findings associated with field QC:

2.7.1 Field Blanks and Equipment Rinsates

The samples in these SDGs had no associated field QC samples. No qualifications were required.

2.7.2 Field Duplicates

No field duplicate samples were identified for these SDGs.

2.8 INTERNAL STANDARDS

The labeled standard recoveries were within the acceptance criteria listed in Table 7 of Method 1613. No qualifications were required.

2.9 COMPOUND IDENTIFICATION

The laboratory analyzed for polychlorinated dioxins/furans by EPA Method 1613. The compound identifications were verified from the raw data and no false negatives or positives were noted. No qualifications were required.

2.10 COMPOUND QUANTIFICATION AND REPORTED DETECTION LIMITS

Compound quantitation was verified from the raw data. The laboratory calculated and reported compound-specific detection limits. Any detects below the lower method calibration limit (MCL) were qualified as estimated, "J." Any reported EMPC was qualified as an estimated nondetect, "UJ." No further qualifications were required.

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 1613B Analysis Results

Client - Del Mar Analytical

Client's Sample ID	IOA0108-01 Outfall 007		
Lab Sample ID	105774001		
Filename	F50127A_12		
Injected By	MRO		
Total Amount Extracted	1040 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	01/04/2005
ICAL Date	11/29/2004	Received	01/06/2005
CCal Filename(s)	F50127A_02	Extracted	01/24/2005
Method Blank ID	BLANK-6202	Analyzed	01/27/2005 19:14

Qual	Qual Def	Native Isomers	Conc pg/L	EMPC pg/L	LOD pg/L		Internal Standards	ng's Added	Percent Recovery
U		2,3,7,8-TCDF	ND	-----	3.4		2,3,7,8-TCDF-13C	2.00	45
U		Total TCDF	ND	-----	3.4		2,3,7,8-TCDD-13C	2.00	57
							1,2,3,7,8-PeCDF-13C	2.00	77
U		2,3,7,8-TCDD	ND	-----	3.3		2,3,4,7,8-PeCDF-13C	2.00	72
U		Total TCDD	ND	-----	3.3		1,2,3,7,8-PeCDD-13C	2.00	85
							1,2,3,4,7,8-HxCDF-13C	2.00	71
U		1,2,3,7,8-PeCDF	ND	-----	2.0		1,2,3,6,7,8-HxCDF-13C	2.00	95
↓		2,3,4,7,8-PeCDF	ND	-----	1.2		2,3,4,6,7,8-HxCDF-13C	2.00	84
		Total PeCDF	ND	-----	1.6		1,2,3,7,8,9-HxCDF-13C	2.00	78
							1,2,3,4,7,8-HxCDD-13C	2.00	67
U		1,2,3,7,8-PeCDD	ND	-----	1.7		1,2,3,6,7,8-HxCDD-13C	2.00	87
U		Total PeCDD	ND	-----	1.7		1,2,3,4,6,7,8-HpCDF-13C	2.00	79
							1,2,3,4,7,8,9-HpCDF-13C	2.00	73
J	DNQ	1,2,3,4,7,8-HxCDF	1.6	-----	1.2	J	1,2,3,4,6,7,8-HpCDD-13C	2.00	96
U		1,2,3,6,7,8-HxCDF	ND	-----	1.2		OCDD-13C	4.00	94
↓		2,3,4,6,7,8-HxCDF	ND	-----	1.1				
J	DNQ	1,2,3,7,8,9-HxCDF	ND	-----	1.6		1,2,3,4-TCDD-13C	2.00	NA
	DNQ	Total HxCDF	1.6	-----	1.3	J	1,2,3,7,8,9-HxCDD-13C	2.00	NA
U		1,2,3,4,7,8-HxCDD	ND	-----	1.6		2,3,7,8-TCDD-37Cl4	0.20	57
↓		1,2,3,6,7,8-HxCDD	ND	-----	1.8				
		1,2,3,7,8,9-HxCDD	ND	-----	1.4				
		Total HxCDD	ND	-----	1.6				
J	DNQ	1,2,3,4,6,7,8-HpCDF	4.2	-----	1.2	J			
JU		1,2,3,4,7,8,9-HpCDF	ND	-----	1.6				
J	DNQ	Total HpCDF	24.0	-----	1.4	J			
UJ	B	1,2,3,4,6,7,8-HpCDD	6.4	-----	1.2	BJ			
UJ	B	Total HpCDD	6.4	-----	1.2	BJ			
UJ	B	OCDF	22.0	-----	2.6	BJ			
UJ	B	OCDD	38.0	-----	4.1	BJ			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection. Totals are averages of individual isomer LODs.
D = Result obtained from analysis of diluted sample
B = Less than 10 times higher than method blank level
P = Recovery outside of method 1613 control limits
J = Concentration detected is below the calibration range
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....105774

REPLICATED

REPORT OF LABORATORY ANALYSIS

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CONTRACT COMPLIANCE SCREENING FORM FOR HARDCOPY DATA

AMEC Earth & Environmental
550 South Wadsworth Boulevard
Suite 500
Lakewood, CO 80226

Laboratory Del Mar
Reviewer P. Meeks
Analysis/Method Metals

Package ID T711MT23
Task Order 313150010
SDG No. IOA0108, 109, 110, 111
No. of Analyses 4

Date: 02/02/05
Reviewer's Signature P. Meeks

ACTION ITEMS[a]	
1. **Case Narrative Deficiencies**	
2. **Out of Scope Analyses**	
3. **Analyses Not Conducted**	
4. **Missing Hardcopy Deliverables**	
5. **Incorrect Hardcopy Deliverables**	
6. **Deviations from Analysis Protocol, e.g.,** Holding Times, GC/MS Tune/Inst. Performance, Calibrations, Blanks, Surrogates, Matrix Spike/Dup LCS, Field QC, Internal Standard Performance, Compound Identification and Quantitation, System Performance	Qualifications were applied for: 1. Antimony check standard recovery outliers 2. Negative method blank results 3. Detects below the reporting limit 4. Antimony MDLs raised and results qualified as estimated.

COMMENTS[b]	

[a] Subcontracted analytical laboratory is not meeting contract and/or method requirements.
[b] Differences in protocol have been adopted by the laboratory but no action against the laboratory is required.

DATA VALIDATION REPORT

NPDES
Monitoring

ANALYSIS: METALS

SAMPLE DELIVERY GROUPS: IOA0108, IOA0109, IOA0110, & IOA0111

Prepared by

AMEC—Denver Operations
550 South Wadsworth Boulevard, Suite 500
Lakewood, Colorado 80226

1. INTRODUCTION

Task Order Title:	NPDES Monitoring
Contract Task Order #:	313150010
SDG#:	IOA0108, IOA0109, IOA0110, & IOA0111
Project Manager:	B. McIlvaine
Matrix:	Water
Analysis:	Metals
QC Level:	Level IV
No. of Samples:	4
No. of Reanalyses/Dilutions:	0
Reviewer:	P. Meeks
Date of Review:	February 02, 2005

The samples listed in Table 1 were validated based on the guidelines outlined in the *AMEC Data Validation Procedure for Levels III and IV ICP-MS Metals, (DVP-5-A, Rev.0), AMEC Data Validation Procedure for Levels III and IV ICP Metals* (DVP-5, Rev. 0), SW-846 *Method 6020B for Inductively Coupled Plasma – Mass Spectrometry*, SW-846 *Method 6010B for Inductively Coupled Plasma* , SW-846 *Method 7471A for Mercury (Manual Cold-Vapor Technique)*, and validation guidelines outlined in the USEPA CLP *National Functional Guidelines for Inorganic Data Review* (2/94). Any deviations from these procedures and guidelines are documented herein. Qualifiers were applied in cases where the data did not meet the required QC criteria or where special consideration by the data user is required. Data qualifiers were placed on Form Is with the associated qualification codes. Analytes that were rejected for any reason are denoted on the Form I as having only the "R" data qualifier and associated qualification code(s) denoting the reason for rejection. Any additional problems with the data that may have resulted in an estimated value were not denoted by a qualification code since the data had already been rejected.

Table 1. Sample identification

Client ID	EPA ID	Laboratory ID	Matrix	COC Method
Outfall 007	Outfall 007	IOA0108-01	water	ILM04
Outfall 008	Outfall 008	IOA0109-01	water	ILM04
Outfall 009	Outfall 009	IOA0110-01	water	ILM04
Outfall 010	Outfall 010	IOA0111-01	water	ILM04

2. DATA VALIDATION FINDINGS

2.1 SAMPLE MANAGEMENT

Following are findings associated with sample management:

2.1.1 Sample Preservation, Handling, and Transport

The samples in these SDGs were received at the laboratory within the temperature limits of 4°C ±2°C. No sample preservation, handling, or transport problems were noted, and no qualifications were necessary.

2.1.2 Chain of Custody

The COCs were signed and dated by field and laboratory personnel. The COCs listed duplicate samples for all samples; however, duplicate analyses were not required. No sample qualifications were required.

2.1.3 Holding Times

The dates of collection recorded on the COCs and the dates of analyses recorded in the raw data, documented that the sample analyses were performed within the specified holding times of six months for the ICP/MS metals and 28 days for mercury. No qualifications were required.

2.2 ICP-MS TUNING

A precalibration routine must be completed prior to calibrating the instrument, which consists of analyzing a tuning solution to verify resolution, mass calibration, and thermal stability. The solution must be analyzed a minimum of five times and must contain isotopes representing all mass regions of interest. The laboratory performed the required tune solution analyses but did not report %RSDs. The laboratory SOP states that to be acceptable, the %RSD must be less than 5%. The mass calibrations were within 0.1 amu of the true mass and an the instrument resolutions were less than 0.75 amu at 10 percent peak height for all analytes in the tune solution. No site sample qualifications were required.

2.3 CALIBRATION

The ICV and CCV results showed acceptable recoveries, 90-110% for the ICP/MS and 80-120% for mercury. Antimony was not recovered in the 1.0 ppb check standard and was recovered at 50% in the reporting limit check standard; therefore, nondetected antimony in the samples was qualified as estimated, "UJ." The remaining reporting limit check standards were recovered within the AMEC control limits of 70-130%. No further qualifications were required.

2.4 BLANKS

Antimony and cadmium were reported in the method blank at –1.52 and –0.22 µg/L, respectively; therefore, nondetected antimony in the samples was qualified as estimated, "UJ," and cadmium detected in the samples was qualified as estimated, "J." No further qualifications were required.

2.5 ICP INTERFERENCE CHECK SAMPLE (ICS A/AB)

No ICPMS interference check samples were analyzed in association with the samples in these SDGs; therefore, no assessment was made with respect to this criterion.

2.6 BLANK SPIKES AND LABORATORY CONTROL SAMPLES

The ICP/MS LCS sample was identified as 5A05052-BS1 and the mercury LCS sample was identified as 5A05061-BS1. The LCS results on the summary forms and in the raw data were within the laboratory-established ICP/MS and mercury control limits of 85-115%. No qualifications were required.

2.7 LABORATORY DUPLICATES

MS/MSD analyses were performed on Outfall 007 for lead only. The RPD was within the control limit of 20% and no qualifications were required.

2.8 MATRIX SPIKE

MS/MSD analyses were performed on Outfall 007 for lead only. Both recoveries were within the AMEC control limits of 75-125% and no qualifications were required.

2.9 FURNACE ATOMIC ABSORPTION QC

Furnace atomic absorption was not utilized for the analysis of these samples; therefore, furnace atomic absorption QC is not applicable.

2.10 ICP/MS SERIAL DILUTION

No serial dilution analysis was performed in association with the samples in these SDGs; therefore, no assessment was made with respect to this criterion.

2.11 INTERNAL STANDARDS PERFORMANCE

The ICP-MS internal standard recoveries for the site sample and associated QC sample analyses were within the 60-125% control limits and no qualifications were required.

2.12 SAMPLE RESULT VERIFICATION

A Level IV review was performed for the sample in this data package. Calculations were verified, and the sample results reported on the Form Is were verified against the raw data. No transcription errors or calculation errors were noted. Detects below the reporting limit were qualified as estimated, "J."

Antimony was not recovered in the 1.0 ppb check standard, was recovered at 50% in the 2.0 ppb reporting limit check standard, and was reported at negative values in the method blanks and all CCBs. This indicates that the laboratory was not able to detect antimony at the reported MDL of 0.18 µg/L; therefore, the reviewer raised the antimony MDLs for Outfall 008, Outfall 009, and Outfall 010 to the reporting limit, 2.0 µg/L and qualified the nondetected results as estimated, "UJ." No further qualifications were required.

2.13 FIELD QC SAMPLES

Field QC samples are evaluated, and if necessary, qualified based only on laboratory blanks. Any remaining detects are used to evaluate the associated samples.

2.13.1 Field Blanks and Equipment Rinsates

The samples in these SDGs had no associated field QC samples. No qualifications were required.

2.13.2 Field Duplicates

There were no field duplicate analyses performed in association with the site samples.

Del Mar Analytical

17461 Derian Ave., Suite 100, Irvine, CA 92614 (949) 261-1022 FAX (949) 260-3297
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2520 E. Sunset Rd. #3, Las Vegas, NV 89120 (702) 798-3620 FAX (702) 798-3621

MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 007

Report Number: IOA0108

Sampled: 01/04/05
Received: 01/04/05

DRAFT: METALS

Analyte	Method	Batch	MDL	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers: Rev Qual	Data Qualifiers: Qual Code
Sample ID: IOA0108-01 (DRAFT: Outfall 007 - Water)										
Reporting Units: ug/l										
Lead	EPA 200.8	5A05052	0.13	1.0	0.74	1	01/05/05	01/05/05	J	DNQ

PM 2/2/05

AMEC VALIDATED

LEVEL IV

DRAFT REPORT
DRAFT REPORT
DATA SUBJECT TO CHANGE

The results pertain only to the samples tested in the laboratory. This report shall not be reproduced, except in full, without written permission from Del Mar Analytical.

Del Mar Analytical

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LABORATORY REPORT

Prepared For: MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project: Routine Outfall 007

Sampled: 01/04/05
Received: 01/04/05
Issued: 02/21/05 11:45

NELAP #01108CA California ELAP#1197 CSDLAC #10117

The results listed within this Laboratory Report pertain only to the samples tested in the laboratory. The analyses contained in this report were performed in accordance with the applicable certifications as noted. All soil samples are reported on a wet weight basis unless otherwise noted in the report. This Laboratory Report is confidential and is intended for the sole use of Del Mar Analytical and its client. This report shall not be reproduced, except in full, without written permission from Del Mar Analytical. The Chain of Custody, 1 page, is included and is an integral part of this report.
This entire report was reviewed and approved for release.

SAMPLE CROSS REFERENCE

SUBCONTRACTED: Refer to the last page for specific subcontract laboratory information included in this report.

LABORATORY ID	CLIENT ID	MATRIX
IOA0108-01	Outfall 007	Water

Reviewed By:

Michele Harper

Del Mar Analytical, Irvine
Michele Harper
Project Manager

Del Mar Analytical

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 007

Report Number: IOA0108

Sampled: 01/04/05
Received: 01/04/05

METALS

Analyte	Method	Batch	MDL Limit	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA0108-01 (Outfall 007 - Water)									
Reporting Units: ug/l									
Antimony	EPA 200.8	5A05052	0.18	2.0	ND	1	01/05/05	01/05/05	
Cadmium	EPA 200.8	5A05052	0.015	1.0	**0.038**	1	01/05/05	01/05/05	J
Copper	EPA 200.8	5A05052	0.49	2.0	**3.7**	1	01/05/05	01/05/05	
Lead	EPA 200.8	5A05052	0.13	1.0	**0.74**	1	01/05/05	01/05/05	J
Mercury	EPA 245.1	5A05061	0.063	0.20	**0.18**	1	01/05/05	01/05/05	J

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Michele Harper
Project Manager

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300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 007

Report Number: IOA0108

Sampled: 01/04/05
Received: 01/04/05

INORGANICS

Analyte	Method	Batch	MDL Limit	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA0108-01 (Outfall 007 - Water) - cont.									
Reporting Units: mg/l									
Chloride	EPA 300.0	5A04042	0.26	0.50	**4.1**	1	01/04/05	01/04/05	
Nitrate/Nitrite-N	EPA 300.0	5A04042	0.072	0.26	**0.89**	1	01/04/05	01/04/05	
Oil & Grease	EPA 413.1	5A05068	0.94	5.0	**1.2**	1	01/05/05	01/05/05	J
Sulfate	EPA 300.0	5A04042	0.18	0.50	**3.7**	1	01/04/05	01/04/05	
Total Dissolved Solids	SM2540C	5A05076	10	10	**130**	1	01/05/05	01/05/05	

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 007

Report Number: IOA0108

Sampled: 01/04/05
Received: 01/04/05

SHORT HOLD TIME DETAIL REPORT

	Hold Time (in days)	Date/Time Sampled	Date/Time Received	Date/Time Extracted	Date/Time Analyzed
Sample ID: Outfall 007 (IOA0108-01) - Water					
EPA 300.0	2	01/04/2005 10:20	01/04/2005 18:30	01/04/2005 19:00	01/04/2005 19:23

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 007

Report Number: IOA0108

Sampled: 01/04/05
Received: 01/04/05

METHOD BLANK/QC DATA

METALS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A05052 Extracted: 01/05/05											
Blank Analyzed: 01/05/2005 (5A05052-BLK1)											
Antimony	ND	2.0	0.18	ug/l							
Cadmium	ND	1.0	0.015	ug/l							
Copper	ND	2.0	0.49	ug/l							
Lead	ND	1.0	0.13	ug/l							
LCS Analyzed: 01/05/2005 (5A05052-BS1)											
Antimony	80.5	2.0	0.18	ug/l	80.0		101	85-115			
Cadmium	71.5	1.0	0.015	ug/l	80.0		89	85-115			
Copper	78.3	2.0	0.49	ug/l	80.0		98	85-115			
Lead	74.5	1.0	0.13	ug/l	80.0		93	85-115			
Matrix Spike Analyzed: 01/05/2005 (5A05052-MS1)						**Source: IOA0108-01**					
Antimony	89.8	2.0	0.18	ug/l	80.0	ND	112	70-130			
Cadmium	79.0	1.0	0.015	ug/l	80.0	0.038	99	70-130			
Copper	82.4	2.0	0.49	ug/l	80.0	3.7	98	70-130			
Lead	81.4	1.0	0.13	ug/l	80.0	0.74	101	70-130			
Matrix Spike Analyzed: 01/05/2005 (5A05052-MS2)						**Source: IOA0117-01**					
Antimony	90.8	2.0	0.18	ug/l	80.0	ND	114	70-130			
Cadmium	76.7	1.0	0.015	ug/l	80.0	ND	96	70-130			
Copper	73.3	2.0	0.49	ug/l	80.0	ND	92	70-130			
Lead	77.6	1.0	0.13	ug/l	80.0	ND	97	70-130			
Matrix Spike Dup Analyzed: 01/05/2005 (5A05052-MSD1)						**Source: IOA0108-01**					
Antimony	89.5	2.0	0.18	ug/l	80.0	ND	112	70-130	0	20	
Cadmium	80.5	1.0	0.015	ug/l	80.0	0.038	101	70-130	2	20	
Copper	84.3	2.0	0.49	ug/l	80.0	3.7	101	70-130	2	20	
Lead	83.3	1.0	0.13	ug/l	80.0	0.74	103	70-130	2	20	

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 007

Report Number: IOA0108

Sampled: 01/04/05
Received: 01/04/05

METHOD BLANK/QC DATA

METALS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A05061 Extracted: 01/05/05											
Blank Analyzed: 01/05/2005 (5A05061-BLK1)											
Mercury	ND	0.20	0.063	ug/l							
LCS Analyzed: 01/05/2005 (5A05061-BS1)											
Mercury	8.18	0.20	0.063	ug/l	8.00		102	85-115			
Matrix Spike Analyzed: 01/05/2005 (5A05061-MS1)						**Source: IOA0084-01**					
Mercury	7.81	0.20	0.063	ug/l	8.00	0.086	97	70-130			
Matrix Spike Dup Analyzed: 01/05/2005 (5A05061-MSD1)						**Source: IOA0084-01**					
Mercury	7.89	0.20	0.063	ug/l	8.00	0.086	98	70-130	1	20	

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 007

Report Number: IOA0108

Sampled: 01/04/05
Received: 01/04/05

METHOD BLANK/QC DATA

INORGANICS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A04042 Extracted: 01/04/05											
Blank Analyzed: 01/04/2005 (5A04042-BLK1)											
Chloride	ND	0.50	0.26	mg/l							
Nitrate/Nitrite-N	ND	0.26	0.072	mg/l							
Sulfate	ND	0.50	0.18	mg/l							
LCS Analyzed: 01/04/2005 (5A04042-BS1)											
Chloride	4.97	0.50	0.26	mg/l	5.00		99	90-110			
Sulfate	9.93	0.50	0.18	mg/l	10.0		99	90-110			
Matrix Spike Analyzed: 01/04/2005 (5A04042-MS1)						**Source: IOA0049-01**					
Chloride	5.60	0.50	0.26	mg/l	5.00	0.51	102	80-120			
Sulfate	10.4	0.50	0.18	mg/l	10.0	0.63	98	80-120			
Matrix Spike Dup Analyzed: 01/04/2005 (5A04042-MSD1)						**Source: IOA0049-01**					
Chloride	5.72	0.50	0.26	mg/l	5.00	0.51	104	80-120	2	20	
Sulfate	10.6	0.50	0.18	mg/l	10.0	0.63	100	80-120	2	20	
Batch: 5A05068 Extracted: 01/05/05											
Blank Analyzed: 01/05/2005 (5A05068-BLK1)											
Oil & Grease	ND	5.0	0.94	mg/l							
LCS Analyzed: 01/05/2005 (5A05068-BS1)											**M-NR1**
Oil & Grease	20.1	5.0	0.94	mg/l	20.0		100	65-120			
LCS Dup Analyzed: 01/05/2005 (5A05068-BSD1)											
Oil & Grease	21.1	5.0	0.94	mg/l	20.0		106	65-120	5	20	

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Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 007

Report Number: IOA0108

Sampled: 01/04/05
Received: 01/04/05

METHOD BLANK/QC DATA

INORGANICS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A05076 Extracted: 01/05/05											
Blank Analyzed: 01/05/2005 (5A05076-BLK1)											
Total Dissolved Solids	ND	10	10	mg/l							
LCS Analyzed: 01/05/2005 (5A05076-BS1)											
Total Dissolved Solids	1080	20	20	mg/l	1000		108	90-110			
Duplicate Analyzed: 01/05/2005 (5A05076-DUP1)						**Source: IOA0066-03**					
Total Dissolved Solids	230	10	10	mg/l		230			0	10	

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Attention: Bronwyn Kelly

Project ID: Routine Outfall 007

Report Number: IOA0108

Sampled: 01/04/05
Received: 01/04/05

Compliance Check

The results obtained from the analytical testing of this data set were checked against compliance limits received from the client. Any results at or above the compliance limits appear in bold on this page.

LabNumber	Analysis	Analyte	Units	Result	MRL	Compliance Limit
IOA0108-01	413.1 Oil and Grease	Oil & Grease	mg/l	1.20	5.0	15
IOA0108-01	Antimony-200.8	Antimony	ug/l	-1	2.0	6.00
IOA0108-01	Cadmium-200.8	Cadmium	ug/l	0.038	1.0	4.00
IOA0108-01	Chloride - 300.0	Chloride	mg/l	4.10	0.50	150
IOA0108-01	Copper-200.8	Copper	ug/l	3.70	2.0	14
IOA0108-01	Mercury - 245.1	Mercury	ug/l	0.18	0.20	0.20
IOA0108-01	Nitrogen, NO3+NO2 -N	Nitrate/Nitrite-N	mg/l	0.89	0.26	10.00
IOA0108-01	Sulfate-300.0	Sulfate	mg/l	3.70	0.50	250
IOA0108-01	TDS - SM 2540C	Total Dissolved Solids	mg/l	130	10	850

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Attention: Bronwyn Kelly

Project ID: Routine Outfall 007

Report Number: IOA0108

Sampled: 01/04/05
Received: 01/04/05

DATA QUALIFIERS AND DEFINITIONS

J	Estimated value. Analyte detected at a level less than the Reporting Limit (RL) and greater than or equal to the Method Detection Limit (MDL). The user of this data should be aware that this data is of unknown quality.
M-NR1	There was no MS/MSD analyzed with this batch due to insufficient sample volume. See Blank Spike/Blank Spike Duplicate.
ND	Analyte NOT DETECTED at or above the reporting limit or MDL, if MDL is specified.
RPD	Relative Percent Difference

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 007

Report Number: IOA0108

Sampled: 01/04/05
Received: 01/04/05

Certification Summary

Del Mar Analytical, Irvine

Method	Matrix	Nelac	California
EPA 200.8	Water	X	X
EPA 245.1	Water	X	X
EPA 300.0	Water	X	X
EPA 413.1	Water	X	X
SM2540C	Water	X	X

Nevada and NELAP provide analyte specific accreditations. Analyte specific information for Del Mar Analytical may be obtained by contacting the laboratory or visiting our website at www.dmalabs.com.

Subcontracted Laboratories

Pace Analytical, MN- SUB

1700 Elm Street, Ste 200 - Minneapolis, MN 55414

Analysis Performed: 1613-Dioxin-HR
Samples: IOA0108-01

Analysis Performed: EDD + Level 4
Samples: IOA0108-01

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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10A0108

Del Mar Analytical Version 5 8/12/04

CHAIN OF CUSTODY FORM

Client Name/Address:

MWH-Pasadena
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101

Project Manager: Bronwyn Kelly

Sampler: Ruben E. Barroso

Project:
Boeing-SSFL NPDES
Routine Outfall 007
Stormwater at Building 100

Phone Number:
(626) 568-6691
Fax Number:
(626) 568-6515

ANALYSIS REQUIRED

Field readings:
Temp = 47.8°F
pH= 6.7

Sample Description	Sample Matrix	Container Type	# of Cont.	Sampling Date/Time	Preservative	Bottle * #	Total Reoverable Metals: Sb, Cd, Cu, Pb, Hg	TCDD (and all congeners)	Oil & Grease (EPA 413.1)	Cl-, SO4, NO3+NO2-N	TDS					Comments
Outfall 007	W	Poly-1L	1	1/4/5 10:20	HNO3	1A	X									
Outfall 007-Dup	W	Poly-1L	1		HNO3	1B	X									
Outfall 007	W	Glass-Amber	2		None	2A, 2B		X								
Outfall 007	W	Glass-Amber	2		HCl	3A, 3B			X							
Outfall 007	W	Poly-500 ml	2		None	4A, 4B				X						
Outfall 007	W	Poly-500 ml	2		None	5A, 5B					X					

Relinquished By	Date/Time:	Received By	Date/Time:
Ruben E. Barroso	1/4/05 1510	BD Kleeck	1/4/05 1510
BD Kleeck	1/4/05 1830	[signature]	1/4/05 1830

Turn around Time: (check)
24 Hours _____ 5 Days _____
48 Hours _____ 10 Days _____
72 Hours _____ Normal _____
Perchlorate Only 72 Hours_____
Metals Only 72 Hours_____
Sample Integrity: (Check)
Intact X On Ice: X 5°C

Del Mar Analytical

2852 Alton Ave., Irvine CA 92606 (949) 261-1022 FAX (949) 261-1228
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February 3, 2005

MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, Ca.91101

Attention: Bronwyn Kelly

Project: Routine Outfall 007
Sampled: 01/04/05
Del Mar Analytical Number: IOA0108

Dear Ms. Kelly:

Pace Analytical performed Method 1613B analysis for the project referenced above. Please use the following cross-reference table when reviewing your results.

MWH ID	DEL MAR ID	Pace ID
Outfall 007	IOA0108-01	105774001

Attached is the original report from the subcontract laboratory. If you have any questions or require further assistance, please do not hesitate to contact me.

Sincerely yours,
DEL MAR ANALYTICAL

Michele Harper
Project Manager

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 1613B Analysis Results

Client - Del Mar Analytical

Client's Sample ID	IOA0108-01		
Lab Sample ID	105774001		
Filename	F50127A_12		
Injected By	MRO		
Total Amount Extracted	1040 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	01/04/2005
ICAL Date	11/29/2004	Received	01/06/2005
CCal Filename(s)	F50127A_02	Extracted	01/24/2005
Method Blank ID	BLANK-6202	Analyzed	01/27/2005 19:14

Native Isomers	Conc pg/L	EMPC pg/L	LOD pg/L		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	3.4		2,3,7,8-TCDF-13C	2.00	45
Total TCDF	ND	-----	3.4		2,3,7,8-TCDD-13C	2.00	57
					1,2,3,7,8-PeCDF-13C	2.00	77
2,3,7,8-TCDD	ND	-----	3.3		2,3,4,7,8-PeCDF-13C	2.00	72
Total TCDD	ND	-----	3.3		1,2,3,7,8-PeCDD-13C	2.00	85
					1,2,3,4,7,8-HxCDF-13C	2.00	71
1,2,3,7,8-PeCDF	ND	-----	2.0		1,2,3,6,7,8-HxCDF-13C	2.00	95
2,3,4,7,8-PeCDF	ND	-----	1.2		2,3,4,6,7,8-HxCDF-13C	2.00	84
Total PeCDF	ND	-----	1.6		1,2,3,7,8,9-HxCDF-13C	2.00	78
					1,2,3,4,7,8-HxCDD-13C	2.00	67
1,2,3,7,8-PeCDD	ND	-----	1.7		1,2,3,6,7,8-HxCDD-13C	2.00	87
Total PeCDD	ND	-----	1.7		1,2,3,4,6,7,8-HpCDF-13C	2.00	79
					1,2,3,4,7,8,9-HpCDF-13C	2.00	73
1,2,3,4,7,8-HxCDF	1.6	-----	1.2	J	1,2,3,4,6,7,8-HpCDD-13C	2.00	96
1,2,3,6,7,8-HxCDF	ND	-----	1.2		OCDD-13C	4.00	94
2,3,4,6,7,8-HxCDF	ND	-----	1.1				
1,2,3,7,8,9-HxCDF	ND	-----	1.6		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	1.6	-----	1.3	J	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	1.6		2,3,7,8-TCDD-37Cl4	0.20	57
1,2,3,6,7,8-HxCDD	ND	-----	1.8				
1,2,3,7,8,9-HxCDD	ND	-----	1.4				
Total HxCDD	ND	-----	1.6				
1,2,3,4,6,7,8-HpCDF	4.2	-----	1.2	J			
1,2,3,4,7,8,9-HpCDF	ND	-----	1.6				
Total HpCDF	24.0	-----	1.4	J			
1,2,3,4,6,7,8-HpCDD	6.4	-----	1.2	BJ			
Total HpCDD	6.4	-----	1.2	BJ			
OCDF	22.0	-----	2.6	BJ			
OCDD	38.0	-----	4.1	BJ			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection. Totals are averages of individual isomer LODs.
D = Result obtained from analysis of diluted sample
B = Less than 10 times higher than method blank level
P = Recovery outside of method 1613 control limits
J = Concentration detected is below the calibration range
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....105774

REPORT OF LABORATORY ANALYSIS

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Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Pace Analytical™

Method 1613B Blank Analysis Results

Client - Del Mar Analytical

Lab Sample ID	BLANK-6202	Matrix	Water
Filename	F50127A_06	Dilution	NA
Total Amount Extracted	982 mL	Extracted	01/24/2005
ICAL Date	11/29/2004	Analyzed	01/27/2005 14:13
CCal Filename(s)	F50127A_02	Injected By	MRO

Native Isomers	Conc pg/L	EMPC pg/L	LOD pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	4.7	2,3,7,8-TCDF-13C	2.00	33
Total TCDF	ND	-----	-----	2,3,7,8-TCDD-13C	2.00	45
				1,2,3,7,8-PeCDF-13C	2.00	68
2,3,7,8-TCDD	ND	-----	5.1	2,3,4,7,8-PeCDF-13C	2.00	70
Total TCDD	ND	-----	-----	1,2,3,7,8-PeCDD-13C	2.00	81
				1,2,3,4,7,8-HxCDF-13C	2.00	75
1,2,3,7,8-PeCDF	ND	-----	2.2	1,2,3,6,7,8-HxCDF-13C	2.00	95
2,3,4,7,8-PeCDF	ND	-----	1.5	2,3,4,6,7,8-HxCDF-13C	2.00	98
Total PeCDF	ND	-----	-----	1,2,3,7,8,9-HxCDF-13C	2.00	85
				1,2,3,4,7,8-HxCDD-13C	2.00	78
1,2,3,7,8-PeCDD	ND	-----	1.6	1,2,3,6,7,8-HxCDD-13C	2.00	94
Total PeCDD	ND	-----	-----	1,2,3,4,6,7,8-HpCDF-13C	2.00	85
				1,2,3,4,7,8,9-HpCDF-13C	2.00	78
1,2,3,4,7,8-HxCDF	ND	-----	1.6	1,2,3,4,6,7,8-HpCDD-13C	2.00	99
1,2,3,6,7,8-HxCDF	ND	-----	1.4	OCDD-13C	4.00	97
2,3,4,6,7,8-HxCDF	ND	-----	1.1			
1,2,3,7,8,9-HxCDF	ND	-----	1.6	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	-----	-----	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	1.6	2,3,7,8-TCDD-37Cl4	0.20	40
1,2,3,6,7,8-HxCDD	ND	-----	1.2			
1,2,3,7,8,9-HxCDD	ND	-----	1.7			
Total HxCDD	ND	-----	-----			
1,2,3,4,6,7,8-HpCDF	ND	-----	1.5			
1,2,3,4,7,8,9-HpCDF	ND	-----	1.4			
Total HpCDF	ND	-----	-----			
1,2,3,4,6,7,8-HpCDD	1.9	-----	1.3 J			
Total HpCDD	1.9	-----	----- J			
OCDF	8.3	-----	1.9 J			
OCDD	26.0	-----	2.3 J			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection. Totals are averages of individual isomer LODs.
A = Limit of Detection based on signal to noise
P = Recovery outside of method 1613 control limits
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....105645

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Tel: 612-607-1700
Fax: 612-607-6444

Pace Analytical™

Method 1613B Laboratory Control Spike Results

Client - Del Mar Analytical

Lab Sample ID	LCS-6203		
Filename	F50127A_03	Matrix	Water
Total Amount Extracted	1030 mL	Dilution	NA
ICAL Date	11/29/2004	Extracted	01/24/2005
CCal Filename	F50127A_02	Analyzed	01/27/2005 11:44
Method Blank ID	BLANK-6202	Injected By	MRO

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDF	10	10.2	7.5	15.8	102
2,3,7,8-TCDD	10	9.0	6.7	15.8	90
1,2,3,7,8-PeCDF	50	50.1	40.0	67.0	100
2,3,4,7,8-PeCDF	50	48.4	34.0	80.0	97
1,2,3,7,8-PeCDD	50	43.4	35.0	71.0	87
1,2,3,4,7,8-HxCDF	50	44.8	36.0	67.0	90
1,2,3,6,7,8-HxCDF	50	48.0	42.0	65.0	96
2,3,4,6,7,8-HxCDF	50	48.6	35.0	78.0	97
1,2,3,7,8,9-HxCDF	50	46.4	39.0	65.0	93
1,2,3,4,7,8-HxCDD	50	50.0	35.0	82.0	100
1,2,3,6,7,8-HxCDD	50	51.7	38.0	67.0	103
1,2,3,7,8,9-HxCDD	50	48.5	32.0	81.0	97
1,2,3,4,6,7,8-HpCDF	50	51.4	41.0	61.0	103
1,2,3,4,7,8,9-HpCDF	50	52.3	39.0	69.0	105
1,2,3,4,6,7,8-HpCDD	50	43.4	35.0	70.0	87
OCDF	100	89.5	63.0	170.0	90
OCDD	100	96.9	78.0	144.0	97
2,3,7,8-TCDD-37Cl4	10	6.2	3.1	19.1	62
2,3,7,8-TCDF-13C	100	49.8	22.0	152.0	50
2,3,7,8-TCDD-13C	100	65.8	20.0	175.0	66
1,2,3,7,8-PeCDF-13C	100	75.7	21.0	192.0	76
2,3,4,7,8-PeCDF-13C	100	76.9	13.0	328.0	77
1,2,3,7,8-PeCDD-13C	100	93.4	21.0	227.0	93
1,2,3,4,7,8-HxCDF-13C	100	78.9	19.0	202.0	79
1,2,3,6,7,8-HxCDF-13C	100	89.8	21.0	159.0	90
2,3,4,6,7,8-HxCDF-13C	100	88.2	22.0	176.0	88
1,2,3,7,8,9-HxCDF-13C	100	81.5	17.0	205.0	81
1,2,3,4,7,8-HxCDD-13C	100	82.2	21.0	193.0	82
1,2,3,6,7,8-HxCDD-13C	100	95.2	25.0	163.0	95
1,2,3,4,6,7,8-HpCDF-13C	100	86.3	21.0	158.0	86
1,2,3,4,7,8,9-HpCDF-13C	100	75.6	20.0	186.0	76
1,2,3,4,6,7,8-HpCDD-13C	100	102.9	26.0	166.0	103
OCDD-13C	200	195.1	26.0	397.0	98

Cs = Concentration Spiked (ng/mL)
Cr = Concentration Recovered (ng/mL)
Rec. = Recovery (Expressed as Percent)
Control Limit Reference: Method 1613, Table 6, 10/94 Revision
X = Background subtracted value
P = Recovery outside of control limits
Nn = Value obtained from additional analysis
* = See Discussion

Report No.....105645

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Tel: 612-607-1700
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Method 1613B Laboratory Control Spike Results

Client - Del Mar Analytical

Lab Sample ID	LCSD-6204		
Filename	F50127A_04	Matrix	Water
Total Amount Extracted	1000 mL	Dilution	NA
ICAL Date	11/29/2004	Extracted	01/24/2005
CCal Filename	F50127A_02	Analyzed	01/27/2005 12:32
Method Blank ID	BLANK-6202	Injected By	MRO

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDF	10	9.9	7.5	15.8	99
2,3,7,8-TCDD	10	8.8	6.7	15.8	88
1,2,3,7,8-PeCDF	50	49.8	40.0	67.0	100
2,3,4,7,8-PeCDF	50	47.6	34.0	80.0	95
1,2,3,7,8-PeCDD	50	41.4	35.0	71.0	83
1,2,3,4,7,8-HxCDF	50	46.6	36.0	67.0	93
1,2,3,6,7,8-HxCDF	50	44.0	42.0	65.0	88
2,3,4,6,7,8-HxCDF	50	47.2	35.0	78.0	94
1,2,3,7,8,9-HxCDF	50	44.8	39.0	65.0	90
1,2,3,4,7,8-HxCDD	50	46.5	35.0	82.0	93
1,2,3,6,7,8-HxCDD	50	48.9	38.0	67.0	98
1,2,3,7,8,9-HxCDD	50	46.7	32.0	81.0	93
1,2,3,4,6,7,8-HpCDF	50	48.7	41.0	61.0	97
1,2,3,4,7,8,9-HpCDF	50	49.9	39.0	69.0	100
1,2,3,4,6,7,8-HpCDD	50	42.7	35.0	70.0	85
OCDF	100	84.8	63.0	170.0	85
OCDD	100	92.5	78.0	144.0	92
2,3,7,8-TCDD-37Cl4	10	7.5	3.1	19.1	75
2,3,7,8-TCDF-13C	100	65.7	22.0	152.0	66
2,3,7,8-TCDD-13C	100	83.8	20.0	175.0	84
1,2,3,7,8-PeCDF-13C	100	84.9	21.0	192.0	85
2,3,4,7,8-PeCDF-13C	100	85.6	13.0	328.0	86
1,2,3,7,8-PeCDD-13C	100	105.3	21.0	227.0	105
1,2,3,4,7,8-HxCDF-13C	100	82.6	19.0	202.0	83
1,2,3,6,7,8-HxCDF-13C	100	96.7	21.0	159.0	97
2,3,4,6,7,8-HxCDF-13C	100	92.3	22.0	176.0	92
1,2,3,7,8,9-HxCDF-13C	100	84.5	17.0	205.0	84
1,2,3,4,7,8-HxCDD-13C	100	81.9	21.0	193.0	82
1,2,3,6,7,8-HxCDD-13C	100	102.0	25.0	163.0	102
1,2,3,4,6,7,8-HpCDF-13C	100	90.1	21.0	158.0	90
1,2,3,4,7,8,9-HpCDF-13C	100	78.6	20.0	186.0	79
1,2,3,4,6,7,8-HpCDD-13C	100	106.1	26.0	166.0	106
OCDD-13C	200	196.4	26.0	397.0	98

Cs = Concentration Spiked (ng/mL)
Cr = Concentration Recovered (ng/mL)
Rec. = Recovery (Expressed as Percent)
Control Limit Reference: Method 1613, Table 6, 10/94 Revision
X = Background subtracted value
P = Recovery outside of control limits
Nn = Value obtained from additional analysis
* = See Discussion

Report No.....105645

REPORT OF LABORATORY ANALYSIS

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Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444

SPIKE RECOVERY RELATIVE PERCENT DIFFERENCE (RPD) RESULTS

Client..... Del Mar Analytical

SPIKE 1 ID.....LCS-6203
SPIKE 1 Filename..... F50127A_03
SPIKE 2 ID.....LCSD-6204
SPIKE 2 Filename..... F50127A_04

COMPOUND	SPIKE 1 REC,%	SPIKE 2 REC,%	RPD,%
2378-TCDF	102	99	3.0
2378-TCDD	90	88	2.2
12378-PeCDF	100	100	0.0
23478-PeCDF	97	95	2.1
12378-PeCDD	87	83	4.7
123478-HxCDF	90	93	3.3
123678-HxCDF	96	88	8.7
234678-HxCDF	97	94	3.1
123789-HxCDF	93	90	3.3
123478-HxCDD	100	93	7.3
123678-HxCDD	103	98	5.0
123789-HxCDD	97	93	4.2
1234678-HpCDF	103	97	6.0
1234789-HpCDF	105	100	4.9
1234678-HpCDD	87	85	2.3
OCDF	90	85	5.7
OCDD	97	92	5.3

REC = Percent Recovered
RPD = The difference between the two values divided by the average.
NA = Not Applicable

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TABLE 1. 2,3,7,8-TCDD Equivalency Factors (TEFs) for the Polychlorinated Dibenzo-p-dioxins and Dibenzofurans

Number	Compound(s)	TEF
1	2,3,7,8-TCDD	1.00
2	1,2,3,7,8-PeCDD	0.50
3	1,2,3,6,7,8-HxCDD	0.1
4	1,2,3,7,8,9-HxCDD	0.1
5	1,2,3,4,7,8-HxCDD	0.1
6	1,2,3,4,6,7,8-HpCDD	0.01
7	OCDD	0.001
8	* Total - TCDD	0.0
9	* Total - PeCDD	0.0
10	* Total - HxCDD	0.0
11	* Total - HpCDD	0.0
12	2,3,7,8-TCDF	0.10
13	1,2,3,7,8-PeCDF	0.05
14	2,3,4,7,8-PeCDF	0.5
15	1,2,3,6,7,8-HxCDF	0.1
16	1,2,3,7,8,9-HxCDF	0.1
17	1,2,3,4,7,8-HxCDF	0.1
18	2,3,4,6,7,8-HxCDF	0.1
19	1,2,3,4,6,7,8-HpCDF	0.01
20	1,2,3,4,7,8,9-HpCDF	0.01
21	OCDF	0.001
22	* Total - TCDF	0.0
23	* Total - PeCDF	0.0
24	* Total - HxCDF	0.0
25	* Total - HpCDF	0.0

*Excluding the 2,3,7,8-substituted congeners.

Reference: 1989 ITEFs

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Del Mar Analytical

17461 Derian Ave. Suite 100, Irvine, CA 92614 Ph (949) 261-1022 Fax (949) 261-1228
1014 E. Cooley Dr., Suite A, Colton, CA 92324 Ph (909) 370-4667 Fax (909) 370-1046
9484 Chesapeake Drive, Suite 805, San Diego, CA 92123 Ph (619) 505-9596 Fax (619) 505-9689
9830 South 51st Street, Suite B-120, Phoenix, AZ 85044 Ph (480) 785-0043 Fax (480) 785-0851
2520 E. Sunset Rd., Suite #3, Las Vegas, NV 89120 Ph (702) 798-3620 Fax (702) 798-3621

SUBCONTRACT ORDER - PROJECT # IOA0108

105774

SENDING LABORATORY:	RECEIVING LABORATORY:
Del Mar Analytical, Irvine 17461 Derian Avenue. Suite 100 Irvine, CA 92614 Phone: (949) 261-1022 Fax: (949) 261-1228 Project Manager: Michele Harper	Pace Analytical, MN- SUB 1700 Elm Street, Ste 200 Minneapolis, MN 55414 Phone :(612) 607-1700 Fax: (612) 607-6444

Standard TAT is requested unless specific due date is requested => Due Date:_____ Initials:_____

Analysis	Expiration	Comments
Sample ID: IOA0108-01 Water	**Sampled: 01/04/05 10:20**	**Instant Nofication**
1613-Dioxin-HR	01/11/05 10:20	J flags, 17 congeners, no TEQ, sub to Pace-MN

105774001

Containers Supplied:
1 L Amber (IOA0108-01C)
1 L Amber (IOA0108-01D)

SAMPLE INTEGRITY:

All containers intact: ☐ Yes ☐ No Sample labels/COC agree: ☐ Yes ☐ No Samples Received On Ice:: ☒ Yes ☐ No
Custody Seals Present: ☐ Yes ☐ No Samples Preserved Properly: ☐ Yes ☐ No Samples Received at (temp): 0.8

Released By	Date	Time	Received By	Date	Time
	1-5-04	1700	Bright Ferry	1/6/05	9:25
Released By	Date	Time	Received By	Date	Time

CONTRACT COMPLIANCE SCREENING FORM FOR HARDCOPY DATA

AMEC Earth & Environmental
550 South Wadsworth Boulevard
Suite 500
Lakewood, CO 80226

Laboratory Pace
Reviewer K. Shadowlight
Analysis/Method Dioxins

Package ID T711DF22
Task Order 313150010
SDG No. Multiple
No. of Analyses 9

Date: February 18, 2005
Reviewer's Signature K Shadowlight

ACTION ITEMS[a]	
1. **Case Narrative Deficiencies**	
2. **Out of Scope Analyses**	
3. **Analyses Not Conducted**	
4. **Missing Hardcopy Deliverables**	
5. **Incorrect Hardcopy Deliverables**	
6. **Deviations from Analysis Protocol, e.g.,**	Qualifications were assigned for the following:
Holding Times	* Method blank contamination
GC/MS Tune/Inst. Performance	* EMPCs
Calibration	* Detects below the lower method calibration level
Method blanks	
Surrogates	
Matrix Spike/Dup LCS	
Field QC	
Internal Standard Performance	
Compound Identification and Quantitation	
System Performance	
COMMENTS[b]	

[a] Subcontracted analytical laboratory is not meeting contract and/or method requirements.
[b] Differences in protocol have been adopted by the laboratory but no action against the laboratory is required

DATA VALIDATION REPORT

NPDES
Monitoring

ANALYSIS: DIOXINS/FURANS

SAMPLE DELIVERY GROUPS: Multiple SDGs

Prepared by

AMEC—Denver Operations
550 South Wadsworth Boulevard, Suite 500
Lakewood, Colorado 80226

1. INTRODUCTION

Task Order Title:	NPDES Monitoring
Contract Task Order #:	313150010
Sample Delivery Group #:	Multiple
Project Manager:	B. McIlvaine
Matrix:	Water
Analysis:	Dioxins/Furans
QC Level:	Level IV
No. of Samples:	9
No. of Reanalyses/Dilutions:	0
Reviewer:	K. Shadowlight
Date of Review:	February 18, 2005

The samples listed in Table 1 were validated based on the guidelines outlined in the *AMEC Data Validation Procedure for Dioxins and Furans (DVP-19, Rev. 1), EPA Method 1613, and the National National Functional Guidelines For Chlorinated Dioxin/Furan Data Review* (8/02). Any deviations from these procedures and guidelines are documented herein. Qualifiers were applied in cases where the data did not meet the required QC criteria or where special consideration by the data user is required. Data qualifiers were placed on Form Is with the associated qualification codes. Analytes that were rejected for any reason are denoted on the Form I as having only the "R" data qualifier and associated qualification code(s) denoting the reason for rejection. Any additional problems with the data that may have resulted in an estimated value were not denoted by a qualification code since the data had already been rejected.

Table 1. Sample Identification

Client ID	Laboratory ID (Del Mar)	Laboratory ID (Pace)	Matrix	COC Method
Outfall 001	IOA0551-01	106124001	water	1613
Outfall 002	IOA0550-01	106130001	water	1613
Outfall 007	IOA0556-01	106128001	water	1613
Outfall 008	IOA0553-01	106126001	water	1613
Outfall 009	IOA0554-01	106131001	water	1613
Outfall 010	IOA0555-01	106127001	water	1613
Outfall 011	IOA0549-01	106132001	water	1613
Outfall 011	IOA0567-01	106135001	water	1613
Outfall 018	IOA0552-01	106125001	water	1613

2. DATA VALIDATION FINDINGS

2.1 SAMPLE MANAGEMENT

Following are findings associated with sample management:

2.1.1 Sample Preservation, Handling, and Transport

The samples in these SDGs were received at Del Mar Analytical within the temperature limits of 4°C ±2°C. The samples were subcontracted to Pace Analytical for the dioxin/furan analyses. The samples in these SDGs were received at Pace Analytical Services within the temperature limits of 4°C ±2°C. The samples were received in good condition at both laboratories. No qualifications were required.

2.1.2 Chain of Custody

The COCs and transfer COCs were signed by the appropriate field and laboratory personnel. The samples and analyses were accounted for on both the original COCs and transfer COCs. As the samples were couriered directly to the laboratory (Del Mar Analytical), custody seals were not required. There was no information regarding custody seals upon receipt at Pace. No qualifications were required.

2.1.3 Holding Times

The samples were extracted and analyzed within a year of collection. No qualifications were required.

2.2 INSTRUMENT PERFORMANCE

Following are findings associated with instrument performance:

2.2.1 GC Column Performance

A column performance standard was combined with the daily calibration verification and analyzed at the beginning of each analytical sequence. The GC column performance was acceptable with the chromatographic separation of 2,3,7,8-TCDD and other TCDD isomers resolved with a valley of ≤25%. No qualifications were required.

2.2.2 Mass Spectrometer Performance

The mass spectrometer performance could not be evaluated as the laboratory did not provide selected ion current profiles for the lock-mass ions. No qualifications were required.

2.3 CALIBRATION

2.3.1 Initial Calibration

There was one initial calibration, analyzed 11/29/04 on Instrument 10MSHR05. The calibration consisted of five concentration level standards (CS1 through CS5) analyzed to verify instrument linearity. The initial calibration was acceptable with %RSDs ≤20% for the 15 native compounds (calibration by isotope dilution) and ≤35% for the 2 native and all labeled compounds (calibration by internal standard). The relative retention times and ion abundance ratios were within the QC limits listed in Method 1613 for all standards. A representative number of %RSDs were verified from the raw data, and no calculation or transcription errors were noted. No qualifications were required.

2.3.2 Continuing Calibration

Calibration verification (VER) consisted of a mid-level standard (CS3) analyzed at the beginning of each analytical sequence. The VER was acceptable with the concentrations within the acceptance criteria listed in the Table 6 of the EPA Method 1613. The ion abundance ratios and relative retention times were within the method QC limits. A representative number of %Ds were verified from the raw data, and no calculation or transcription errors were noted. No qualifications were required.

2.4 BLANKS

One method blank (Blank-6220) was extracted and analyzed with the samples in these SDGs. Target compounds total HpCDF, 1,2,3,4,6,7,8-HpCDF, total HpCDF, OCDF, and OCDD were reported in the method blank. Any detects for the aforementioned target compounds reported at concentrations <5× the concentrations reported in the method blank were qualified as estimated nondetects "UJ," at the levels of interference in the samples of these SDGs. A review of the method blank raw data and chromatograms indicated no false negatives or false positives. No further qualifications were required.

2.5 BLANK SPIKES AND LABORATORY CONTROL SAMPLES

One LCS/LCSD pair (LCS-6221/LCSD-6222) was extracted and analyzed with the samples in these SDGs. All recoveries were within the acceptance criteria listed in Table 6 of the Method 1613. There are no method QC limits established for RPDs. The reported RPDs were within ±20%. No qualifications were required.

2.6 MATRIX SPIKE/MATRIX SPIKE DUPLICATE

MS/MSD analyses were not performed in these SDGs. Evaluation of method accuracy and precision was based on the LCS/LCSD results. No qualifications were required.

2.7 FIELD QC SAMPLES

Following are findings associated with field QC:

2.7.1 Field Blanks and Equipment Rinsates

The samples in these SDGs had no associated field QC samples. No qualifications were required.

2.7.2 Field Duplicates

No field duplicate samples were identified for these SDGs.

2.8 INTERNAL STANDARDS

The labeled standard recoveries were within the acceptance criteria listed in Table 7 of Method 1613. No qualifications were required.

2.9 COMPOUND IDENTIFICATION

The laboratory analyzed for polychlorinated dioxins/furans by EPA Method 1613. The compound identifications were verified from the raw data and no false negatives or positives were noted. No qualifications were required.

2.10 COMPOUND QUANTIFICATION AND REPORTED DETECTION LIMITS

Compound quantitation was verified from the raw data. The laboratory calculated and reported compound-specific detection limits. Any detects below the lower method calibration limit (MCL) were qualified as estimated, "J." Any reported EMPC was qualified as an estimated nondetect, "UJ." No further qualifications were required.

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 1613B Analysis Results

Client - Del Mar Analytical

Client's Sample ID	IOA0556-01 outfall 001		
Lab Sample ID	106128001		
Filename	F50129B_11		
Injected By	BAL		
Total Amount Extracted	1040 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	01/11/2005
ICAL Date	11/29/2004	Received	01/13/2005
CCal Filename(s)	F50129B_02	Extracted	01/28/2005
Method Blank ID	BLANK-6220	Analyzed	01/30/2005 03:58

Rev Qual	Qual Code	Native Isomers	Conc pg/L	EMPC pg/L	LOD pg/L		Internal Standards	ng's Added	Percent Recovery
U		2,3,7,8-TCDF	ND	-----	1.00		2,3,7,8-TCDF-13C	2.00	64
J	DNQ	Total TCDF	1.4	-----	1.00	J	2,3,7,8-TCDD-13C	2.00	81
							1,2,3,7,8-PeCDF-13C	2.00	73
U		2,3,7,8-TCDD	ND	-----	1.10		2,3,4,7,8-PeCDF-13C	2.00	75
U		Total TCDD	ND	-----	1.10		1,2,3,7,8-PeCDD-13C	2.00	89
							1,2,3,4,7,8-HxCDF-13C	2.00	74
U		1,2,3,7,8-PeCDF	ND	-----	1.30		1,2,3,6,7,8-HxCDF-13C	2.00	86
		2,3,4,7,8-PeCDF	ND	-----	0.70		2,3,4,6,7,8-HxCDF-13C	2.00	79
↓		Total PeCDF	ND	-----	0.98		1,2,3,7,8,9-HxCDF-13C	2.00	76
							1,2,3,4,7,8-HxCDD-13C	2.00	68
U		1,2,3,7,8-PeCDD	ND	-----	0.81		1,2,3,6,7,8-HxCDD-13C	2.00	91
U		Total PeCDD	ND	-----	0.81		1,2,3,4,6,7,8-HpCDF-13C	2.00	79
							1,2,3,4,7,8,9-HpCDF-13C	2.00	68
U		1,2,3,4,7,8-HxCDF	ND	-----	0.84		1,2,3,4,6,7,8-HpCDD-13C	2.00	88
		1,2,3,6,7,8-HxCDF	ND	-----	0.83		OCDD-13C	4.00	74
		2,3,4,6,7,8-HxCDF	ND	-----	0.89				
		1,2,3,7,8,9-HxCDF	ND	-----	0.91		1,2,3,4-TCDD-13C	2.00	NA
↓		Total HxCDF	ND	-----	0.87		1,2,3,7,8,9-HxCDD-13C	2.00	NA
U		1,2,3,4,7,8-HxCDD	ND	-----	0.76		2,3,7,8-TCDD-37Cl4	0.20	81
		1,2,3,6,7,8-HxCDD	ND	-----	0.57				
↓		1,2,3,7,8,9-HxCDD	ND	-----	0.67				
J	DNQ	Total HxCDD	1.2	-----	0.67	J			
J	DNQ	1,2,3,4,6,7,8-HpCDF	2.1	-----	1.40	J			
U		1,2,3,4,7,8,9-HpCDF	ND	-----	1.80				
J	DNQ	Total HpCDF	14.0	-----	1.60	BJ			
UJ	B	1,2,3,4,6,7,8-HpCDD	4.3	-----	0.94	BJ			
J	DNQ	Total HpCDD	7.6	-----	0.94	BJ			
UJ	B	OCDF	13.0	-----	2.00	BJ			
UJ	B	OCDD	23.0	-----	3.30	BJ			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection. Totals are averages of individual isomer LODs.
D = Result obtained from analysis of diluted sample
B = Less than 10 times higher than method blank level
P = Recovery outside of method 1613 control limits
J = Concentration detected is below the calibration range
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....106128

MEC VALIDATED

REPORT OF LABORATORY ANALYSIS

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CONTRACT COMPLIANCE SCREENING FORM FOR HARDCOPY DATA

AMEC Earth & Environmental
550 South Wadsworth Boulevard
Suite 500
Lakewood, CO 80226

Laboratory Del Mar
Reviewer K. Okonzak-Lowry
Analysis/Method metals

Package ID T711MT27
Task Order 313150010
SDG No. IOA0555, IOA0556
No. of Analyses 2

Date: 2/08/05
Reviewer's Signature

ACTION ITEMS[a]	
1. **Case Narrative Deficiencies**	
2. **Out of Scope Analyses**	
3. **Analyses Not Conducted**	
4. **Missing Hardcopy Deliverables**	
5. **Incorrect Hardcopy Deliverables**	
6. **Deviations from Analysis Protocol, e.g.,**	Qualifications applied to detects below reporting limit.
	The antimony MDL for sample Outfall 010 was raised to 2.0 ug/L due to the laboratory's inability to demonstrate the instrument's ability to detect antimony below this level.
Holding Times	
GC/MS Tune/Inst. Perform	
Calibrations	
Blanks	
Surrogates	
Matrix Spike/Dup LCS	
Field QC	
Internal Standard Performance	
Compound Identification and Quantitation	
System Performance	
COMMENTS[b]	

[a] Subcontracted analytical laboratory is not meeting contract and/or method requirements.
[b] Differences in protocol have been adopted by the laboratory but no action against the laboratory is required.

Data Qualifier Reference Table

Qualifier	Organics	Inorganics
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.	The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.	The associated value is an estimated quantity.
N	The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification."	Not applicable.
NJ	The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.	Not applicable.
UJ	The analyte was not deemed above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.	The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.
R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and to meet quality control criteria. The presence or absence of the analyte cannot be verified.	The data are unusable. (Note: Analyte may or may not be present).

Qualification Code Reference Table

Qualifier	Organics	Inorganics
H	Holding times were exceeded.	Holding times were exceeded.
S	Surrogate recovery was outside QC limits.	The sequence or number of standards used for the calibration was incorrect
C	Calibration %RSD or %D were noncompliant.	Correlation coefficient is <0.995.
R	Calibration RRF was <0.05.	%R for calibration is not within control limits.
B	Presumed contamination from preparation (method) blank.	Presumed contamination from preparation (method) or calibration blank.
L	Laboratory Blank Spike/Blank Spike Duplicate %R was not within control limits.	Laboratory Control Sample %R was not within control limits.
Q	MS/MSD recovery was poor or RPD high.	MS recovery was poor.
E	Not applicable.	Duplicates showed poor agreement.
I	Internal standard performance was unsatisfactory.	ICP ICS results were unsatisfactory.
A	Not applicable.	ICP Serial Dilution %D were not within control limits.
M	Tuning (BFB or DFTPP) was noncompliant.	Not applicable.
T	Presumed contamination from trip blank.	Not applicable.
+	False positive – reported compound was not present. Not applicable.	
-	False negative – compound was present but not reported.	Not applicable.
F	Presumed contamination from FB, or ER.	Presumed contamination from FB or ER.
$	Reported result or other information was incorrect.	Reported result or other information was incorrect.
?	TIC identity or reported retention time has been changed.	Not applicable.
D	The analysis with this flag should not be used because another more technically sound analysis is available.	The analysis with this flag should not be used because another more technically sound analysis is available.
P	Instrument performance for pesticides was poor.	Post Digestion Spike recovery was not within control limits.
DNQ	The compound was detected between the MDL and the RL and, by definition, is considered an estimated value.	The compound was detected between the MDL and the RL and, by definition, is considered an estimated value.

*#	Unusual problems found with the data that have been described in Section 2.#, "Data Validation Findings." The number following the asterisk (*) will indicate the subsection where a description of the problem can be found (eg. *1 would indicate a sample was not within temperature limits).	Unusual problems found with the data that have been described in Section 2.#, "Data Validation Findings." The number following the asterisk (*) will indicate the subsection where a description of the problem can be found (eg. *1 would indicate a sample was not within temperature limits).

DATA VALIDATION REPORT

NPDES
Monitoring

ANALYSIS: METALS

SAMPLE DELIVERY GROUPS: IOA0555, IOA0556

Prepared by

AMEC—Denver Operations
550 South Wadsworth Boulevard, Suite 500
Lakewood, Colorado 80226

1. INTRODUCTION

Task Order Title:	NPDES Monitoring
Contract Task Order #:	313150010
SDG#:	IOA0555, IOA0556
Project Manager:	B. McIlvaine
Matrix:	Water
Analysis:	Metals
QC Level:	Level IV
No. of Samples:	2
No. of Reanalyses/Dilutions:	0
Reviewer:	K. Okonzak-Lowry
Date of Review:	February 08, 2005

The samples listed in Table 1 were validated based on the guidelines outlined in the *AMEC Data Validation Procedure for Levels III and IV ICP-MS Metals, (DVP-5-A, Rev.0), AMEC Data Validation Procedure for Levels III and IV ICP Metals* (DVP-5, Rev. 0), SW-846 *Method 6020B for Inductively Coupled Plasma – Mass Spectrometry*, SW-846 *Method 6010B for Inductively Coupled Plasma* , SW-846 *Method 7471A for Mercury (Manual Cold-Vapor Technique)*, and validation guidelines outlined in the USEPA CLP *National Functional Guidelines for Inorganic Data Review* (2/94). Any deviations from these procedures and guidelines are documented herein. Qualifiers were applied in cases where the data did not meet the required QC criteria or where special consideration by the data user is required. Data qualifiers were placed on Form Is with the associated qualification codes. Analytes that were rejected for any reason are denoted on the Form I as having only the "R" data qualifier and associated qualification code(s) denoting the reason for rejection. Any additional problems with the data that may have resulted in an estimated value were not denoted by a qualification code since the data had already been rejected.

Table 1. Sample identification

Client ID	EPA ID	Laboratory ID	Matrix	COC Method
Outfall 010	Outfall 010	IOA0555-01	water	ILM04
Outfall 007	Outfall 007	IOA0556-01	water	ILM04

2. DATA VALIDATION FINDINGS

2.1 SAMPLE MANAGEMENT

Following are findings associated with sample management:

2.1.1 Sample Preservation, Handling, and Transport

The samples in these SDGs were received at the laboratory within the temperature limits of 4°C ±2°C. No sample preservation, handling, or transport problems were noted, and no qualifications were necessary.

2.1.2 Chain of Custody

The COCs were signed and dated by field and laboratory personnel. The COCs listed duplicate samples for both samples; however, duplicate analyses were not required. No sample qualifications were required.

2.1.3 Holding Times

The dates of collection recorded on the COCs and the dates of analyses recorded in the raw data, documented that the sample analyses were performed within the specified holding times of six months for the ICP/MS metals and 28 days for mercury. No qualifications were required.

2.2 ICP-MS TUNING

A precalibration routine must be completed prior to calibrating the instrument, which consists of analyzing a tuning solution to verify resolution, mass calibration, and thermal stability. The solution must be analyzed a minimum of five times and must contain isotopes representing all mass regions of interest. The laboratory performed the required tune solution analyses but did not report %RSDs. The laboratory SOP states that to be acceptable, the %RSD must be less than 5%. The mass calibrations were within 0.1 amu of the true mass and an the instrument resolutions were less than 0.75 amu at 5 percent peak height for all analytes in the tune solution. No site sample qualifications were required.

2.3 CALIBRATION

The ICV and CCV results showed acceptable recoveries, 90-110% for the ICP/MS. The applicable reporting limit check standards were recovered within the AMEC control limits of 70-130%, with the exception of the antimony 0.2 μg/L standard which was not detected for antimony (MDL of 0.18 μg/L). The antimony 2.0 μg/L standard was recovered at 84.4%, but its result of 0.84442 μg/L was equivalent to the bracketing CCB antimony values of 0.81128 and 0.81093 μg/L, respectively. Therefore, it was determined that the laboratory was not able to detect antimony at the 1.0 μg/L level, and the antimony method detection limit for sample Outfall 010 was raised to 2.0 μg/L. No further qualifications were required.

2.4 BLANKS

The method blanks and bracketing ICBs/CCBs associated with the samples in these SDGs were nondetected at the laboratory's MDLs, with the exception of the CCB results for antimony which were found at above the MDL at 0.81128 and 0.81093 μg/L, respectively. The antimony method detection limit for sample Outfall 010 was raised to 2.0 μg/L, and the sample nondetect was qualified as estimated, "UJ". No further qualifications were required.

2.5 ICP INTERFERENCE CHECK SAMPLE (ICS A/AB)

No ICPMS interference check samples were analyzed in association with the samples in these SDGs; therefore, no assessment was made with respect to this criterion.

2.6 BLANK SPIKES AND LABORATORY CONTROL SAMPLES

The ICP/MS LCS sample was identified as 5A12054-BS1, and the Hg LCS sample was identified as 5A12047-BS1. The LCS results on the summary forms and in the raw data were within the laboratory-established ICP/MS and Hg control limits of 85-115%. No qualifications were required.

2.7 LABORATORY DUPLICATES

No MS/MSD or duplicate analyses were performed in association with the samples in these SDGs; therefore, no assessment was made with respect to this criterion.

2.8 MATRIX SPIKE

No MS/MSD analyses were performed in association with the samples in these SDGs; therefore, no assessment was made with respect to this criterion.

2.9 FURNACE ATOMIC ABSORPTION QC

Furnace atomic absorption was not utilized for the analysis of these samples; therefore, furnace atomic absorption QC is not applicable.

2.10 ICP/MS SERIAL DILUTION

No serial dilution analysis was performed in association with the samples in these SDGs; therefore, no assessment was made with respect to this criterion.

2.11 INTERNAL STANDARDS PERFORMANCE

The ICP-MS internal standard recoveries for the site samples and associated QC sample analyses were within the 60-125% control limits and no qualifications were required.

2.12 SAMPLE RESULT VERIFICATION

A Level IV review was performed for the samples in these data packages. Calculations were verified, and the sample results reported on the Form Is were verified against the raw data. No transcription errors or calculation errors were noted. Analytes detected below the reporting limit were qualified as estimated, "J." The antimony method detection limit for sample Outfall 010 was raised to 2.0 μg/L due to the antimony results for the reporting limit check standards and the bracketing CCBs. No further qualifications were required.

2.13 FIELD QC SAMPLES

Field QC samples are evaluated, and if necessary, qualified based only on laboratory blanks. Any remaining detects are used to evaluate the associated samples.

2.13.1 Field Blanks and Equipment Rinsates

The samples in these SDGs had no associated field QC samples. No qualifications were required.

2.13.2 Field Duplicates

There were no field duplicate analyses performed in association with the site samples.

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 007

Report Number: IOA0556

Sampled: 01/11/05
Received: 01/11/05

DRAFT: METALS

Analyte	Method	Batch	MDL	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers	Rev Qual	Qual Code
Sample ID: IOA0556-01 (DRAFT: Outfall 007 - Water)											
Reporting Units: ug/l											
Lead	EPA 200.8	5A12054	0.13	1.0	**0.46**	1	01/12/05	01/12/05	J	J	LNQ

AMEC VALIDATED

LEVEL IV

DRAFT REPORT
DRAFT REPORT
DATA SUBJECT TO CHANGE

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LABORATORY REPORT

Prepared For: MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project: Routine Outfall 007

Sampled: 01/11/05
Received: 01/11/05
Issued: 02/28/05 17:34

NELAP #01108CA California ELAP#1197 CSDLAC #10117

The results listed within this Laboratory Report pertain only to the samples tested in the laboratory. The analyses contained in this report were performed in accordance with the applicable certifications as noted. All soil samples are reported on a wet weight basis unless otherwise noted in the report. This Laboratory Report is confidential and is intended for the sole use of Del Mar Analytical and its client. This report shall not be reproduced, except in full, without written permission from Del Mar Analytical. The Chain of Custody, 1 page, is included and is an integral part of this report.

This entire report was reviewed and approved for release.

SAMPLE CROSS REFERENCE

SUBCONTRACTED: Refer to the last page for specific subcontract laboratory information included in this report.

LABORATORY ID	CLIENT ID	MATRIX
IOA0556-01	Outfall 007	Water

Reviewed By:

Michele Harper

Del Mar Analytical, Irvine
Michele Harper
Project Manager

Del Mar Analytical

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 007
Report Number: IOA0556

Sampled: 01/11/05
Received: 01/11/05

METALS

Analyte	Method	Batch	MDL Limit	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA0556-01 (Outfall 007 - Water)									
Reporting Units: ug/l									
Antimony	EPA 200.8	5A12054	0.18	2.0	**0.59**	1	01/12/05	01/12/05	J
Cadmium	EPA 200.8	5A12054	0.015	1.0	**0.037**	1	01/12/05	01/12/05	J
Copper	EPA 200.8	5A12054	0.49	2.0	**2.6**	1	01/12/05	01/12/05	
Lead	EPA 200.8	5A12054	0.13	1.0	**0.46**	1	01/12/05	01/12/05	J
Mercury	EPA 245.1	5A12047	0.063	0.20	**0.14**	1	01/12/05	01/12/05	J

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 007
Report Number: IOA0556

Sampled: 01/11/05
Received: 01/11/05

INORGANICS

Analyte	Method	Batch	MDL Limit	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA0556-01 (Outfall 007 - Water) - cont.									
Reporting Units: mg/l									
Chloride	EPA 300.0	5A11041	0.26	0.50	**3.1**	1	01/11/05	01/11/05	
Nitrate/Nitrite-N	EPA 300.0	5A11041	0.072	0.26	**0.45**	1	01/11/05	01/11/05	
Oil & Grease	EPA 413.1	5A13065	0.94	5.0	**10**	1	01/13/05	01/13/05	B
Sulfate	EPA 300.0	5A11041	0.18	0.50	**2.7**	1	01/11/05	01/11/05	
Total Dissolved Solids	SM2540C	5A13089	10	10	**110**	1	01/13/05	01/13/05	

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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2520 E. Sunset Rd. #3, Las Vegas, NV 89120 (702) 798-3620 FAX (702) 798-3621

MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 007

Report Number: IOA0556

Sampled: 01/11/05
Received: 01/11/05

SHORT HOLD TIME DETAIL REPORT

	Hold Time (in days)	Date/Time Sampled	Date/Time Received	Date/Time Extracted	Date/Time Analyzed
Sample ID: Outfall 007 (IOA0556-01) - Water					
EPA 300.0	2	01/11/2005 08:48	01/11/2005 18:50	01/11/2005 21:00	01/11/2005 23:13

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 007

Report Number: IOA0556

Sampled: 01/11/05
Received: 01/11/05

METHOD BLANK/QC DATA

METALS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A12047 Extracted: 01/12/05											
Blank Analyzed: 01/12/2005 (5A12047-BLK1)											
Mercury	ND	0.20	0.063	ug/l							
LCS Analyzed: 01/12/2005 (5A12047-BS1)											
Mercury	8.12	0.20	0.063	ug/l	8.00		102	85-115			
Matrix Spike Analyzed: 01/12/2005 (5A12047-MS1)						**Source: IOA0483-01**					
Mercury	8.00	0.20	0.063	ug/l	8.00	ND	100	70-130			
Matrix Spike Dup Analyzed: 01/12/2005 (5A12047-MSD1)						**Source: IOA0483-01**					
Mercury	8.26	0.20	0.063	ug/l	8.00	ND	103	70-130	3	20	
Batch: 5A12054 Extracted: 01/12/05											
Blank Analyzed: 01/12/2005 (5A12054-BLK1)											
Antimony	ND	2.0	0.18	ug/l							
Cadmium	ND	1.0	0.015	ug/l							
Copper	ND	2.0	0.49	ug/l							
Lead	ND	1.0	0.13	ug/l							
LCS Analyzed: 01/12/2005 (5A12054-BS1)											
Antimony	89.1	2.0	0.18	ug/l	80.0		111	85-115			
Cadmium	84.7	1.0	0.015	ug/l	80.0		106	85-115			
Copper	80.7	2.0	0.49	ug/l	80.0		101	85-115			
Lead	80.4	1.0	0.13	ug/l	80.0		100	85-115			
Matrix Spike Analyzed: 01/12/2005 (5A12054-MS1)						**Source: IOA0549-01**					
Antimony	88.7	2.0	0.18	ug/l	80.0	0.35	110	70-130			
Cadmium	85.3	1.0	0.015	ug/l	80.0	0.14	106	70-130			
Copper	83.9	2.0	0.49	ug/l	80.0	4.2	100	70-130			
Lead	81.3	1.0	0.13	ug/l	80.0	1.0	100	70-130			

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Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 007

Report Number: IOA0556

Sampled: 01/11/05
Received: 01/11/05

METHOD BLANK/QC DATA

METALS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A12054 Extracted: 01/12/05											
Matrix Spike Dup Analyzed: 01/12/2005 (5A12054-MSD1)						**Source: IOA0549-01**					
Antimony	90.1	2.0	0.18	ug/l	80.0	0.35	112	70-130	2	20	
Cadmium	86.1	1.0	0.015	ug/l	80.0	0.14	107	70-130	1	20	
Copper	83.8	2.0	0.49	ug/l	80.0	4.2	100	70-130	0	20	
Lead	80.9	1.0	0.13	ug/l	80.0	1.0	100	70-130	1	20	

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300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 007

Report Number: IOA0556

Sampled: 01/11/05
Received: 01/11/05

METHOD BLANK/QC DATA

INORGANICS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A11041 Extracted: 01/11/05											
Blank Analyzed: 01/11/2005 (5A11041-BLK1)											
Chloride	ND	0.50	0.26	mg/l							
Nitrate/Nitrite-N	ND	0.26	0.072	mg/l							
Sulfate	ND	0.50	0.18	mg/l							
LCS Analyzed: 01/11/2005 (5A11041-BS1)											
Chloride	5.00	0.50	0.26	mg/l	5.00		100	90-110			
Sulfate	10.8	0.50	0.18	mg/l	10.0		108	90-110			
Matrix Spike Analyzed: 01/11/2005 (5A11041-MS1)						**Source: IOA0551-01**					
Chloride	8.89	0.50	0.26	mg/l	5.00	4.2	94	80-120			
Sulfate	17.1	0.50	0.18	mg/l	10.0	6.8	103	80-120			
Matrix Spike Dup Analyzed: 01/11/2005 (5A11041-MSD1)						**Source: IOA0551-01**					
Chloride	9.11	0.50	0.26	mg/l	5.00	4.2	98	80-120	2	20	
Sulfate	17.2	0.50	0.18	mg/l	10.0	6.8	104	80-120	1	20	
Batch: 5A13065 Extracted: 01/13/05											
Blank Analyzed: 01/13/2005 (5A13065-BLK1)											
Oil & Grease	1.20	5.0	0.94	mg/l							*J*
LCS Analyzed: 01/13/2005 (5A13065-BS1)											**M-NR1**
Oil & Grease	18.6	5.0	0.94	mg/l	20.0		93	65-120			
LCS Dup Analyzed: 01/13/2005 (5A13065-BSD1)											
Oil & Grease	21.1	5.0	0.94	mg/l	20.0		106	65-120	13	20	

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 007

Report Number: IOA0556

Sampled: 01/11/05
Received: 01/11/05

METHOD BLANK/QC DATA

INORGANICS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A13089 Extracted: 01/13/05											
Blank Analyzed: 01/13/2005 (5A13089-BLK1)											
Total Dissolved Solids	ND	10	10	mg/l							
LCS Analyzed: 01/13/2005 (5A13089-BS1)											
Total Dissolved Solids	994	10	10	mg/l	1000		99	90-110			
Duplicate Analyzed: 01/13/2005 (5A13089-DUP1)						**Source: IOA0549-01**					
Total Dissolved Solids	92.0	10	10	mg/l		88			4	10	

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 007

Report Number: IOA0556

Sampled: 01/11/05
Received: 01/11/05

Compliance Check

The results obtained from the analytical testing of this data set were checked against compliance limits received from the client. Any results at or above the compliance limits appear in bold on this page.

LabNumber	Analysis	Analyte	Units	Result	MRL	Compliance Limit
IOA0556-01	413.1 Oil and Grease	Oil & Grease	mg/l	10.00	5.0	15
IOA0556-01	Antimony-200.8	Antimony	ug/l	0.59	2.0	6.00
IOA0556-01	Cadmium-200.8	Cadmium	ug/l	0.037	1.0	4.00
IOA0556-01	Chloride - 300.0	Chloride	mg/l	3.10	0.50	150
IOA0556-01	Copper-200.8	Copper	ug/l	2.60	2.0	14
IOA0556-01	Mercury - 245.1	Mercury	ug/l	0.14	0.20	0.20
IOA0556-01	Nitrogen, NO3+NO2 -N	Nitrate/Nitrite-N	mg/l	0.45	0.26	10.00
IOA0556-01	Sulfate-300.0	Sulfate	mg/l	2.70	0.50	250
IOA0556-01	TDS - SM 2540C	Total Dissolved Solids	mg/l	110	10	850

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300 North Lake Avenue, Suite 1200
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Attention: Bronwyn Kelly

Project ID: Routine Outfall 007

Report Number: IOA0556

Sampled: 01/11/05
Received: 01/11/05

DATA QUALIFIERS AND DEFINITIONS

B	Analyte was detected in the associated Method Blank.
J	Estimated value. Analyte detected at a level less than the Reporting Limit (RL) and greater than or equal to the Method Detection Limit (MDL). The user of this data should be aware that this data is of unknown quality.
M-NR1	There was no MS/MSD analyzed with this batch due to insufficient sample volume. See Blank Spike/Blank Spike Duplicate.
ND	Analyte NOT DETECTED at or above the reporting limit or MDL, if MDL is specified.
RPD	Relative Percent Difference

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 007

Report Number: IOA0556

Sampled: 01/11/05
Received: 01/11/05

Certification Summary

Del Mar Analytical, Irvine

Method	Matrix	Nelac	California
EPA 200.8	Water	X	X
EPA 245.1	Water	X	X
EPA 300.0	Water	X	X
EPA 413.1	Water	X	X
SM2540C	Water	X	X

Nevada and NELAP provide analyte specific accreditations. Analyte specific information for Del Mar Analytical may be obtained by contacting the laboratory or visiting our website at www.dmalabs.com.

Subcontracted Laboratories

Pace Analytical, MN- SUB

1700 Elm Street, Ste 200 - Minneapolis, MN 55414

Analysis Performed: 1613-Dioxin-HR
Samples: IOA0556-01

Analysis Performed: EDD + Level 4
Samples: IOA0556-01

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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1A0556

Del Mar Analytical Version 5 8/12/04 CHAIN OF CUSTODY FORM

Client Name/Address:	Project:	ANALYSIS REQUIRED
MWH-Pasadena 300 North Lake Avenue, Suite 1200 Pasadena, CA 91101	Boeing-SSFL NPDES **Routine Outfall 007** Stormwater at Building 100	Field readings: Temp = 52.4 pH= 6.8
Project Manager: Bronwyn Kelly Sampler: [illegible]	Phone Number: (626) 568-6691 Fax Number: (626) 568-6515	**Comments**

Sample Description	Sample Matrix	Container Type	# of Cont.	Sampling Date/Time	Preservative	Bottle * #	Total Reoverable Metals: Sb, Cd, Cu, Pb, Hg	TCDD (and all congeners)	Oil & Grease (EPA 413.1)	Cl-, SO4, NO3+NO2-N	TDS					
Outfall 007	W	Poly-1L	1	1-11-05 08:48	HNO3	1A	X									
Outfall 007-Dup	W	Poly-1L	1		HNO3	1B	X									
Outfall 007	W	Glass-Amber	2		None	2A, 2B		X								
Outfall 007	W	Glass-Amber	2		HCl	3A, 3B			X							
Outfall 007	W	Poly-500 ml	2		None	4A, 4B				X						
Outfall 007	W	Poly-500 ml	2		None	5A, 5B					X					

Relinquished By	Date/Time:	Received By	Date/Time:
[signature]	1-11-05 1528	[signature]	1/11/05 1528
[signature]	1/11/05 1850	[signature]	1/11/05 1850
Relinquished By	Date/Time:	Received By	Date/Time:

Turn around Time: (check)
24 Hours _____ 5 Days _____
48 Hours _____ 10 Days _____
72 Hours _____ Normal _____
Perchlorate Only 72 Hours_____
Metals Only 72 Hours_____
Sample Integrity: (Check)
Intact X On Ice: X 2°C

Del Mar Analytical

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2520 E. Sunset Rd. #3, Las Vegas, NV 89120 (702) 798-3620 FAX (702) 798-3621

February 25, 2005

MWH-Pasadena/Boeing
300 North Lake Avenue
Pasadena, Ca. 91101

Attention: Bronwyn Kelly

Project: Routine Outfall 007
Sampled: 01/11/05
Del Mar Analytical Number: IOA0556

Dear Ms. Kelly:

Pace Analytical performed Method 1613B analysis for the project referenced above. Please use the following cross-reference table when reviewing your results.

MWH ID	DEL MAR ID	Pace ID
Outfall 007	IOA0556-01	106128001

Attached is the original report from the subcontract laboratory. If you have any questions or require further assistance, please do not hesitate to contact me.

Sincerely yours,
DEL MAR ANALYTICAL

Michele Harper
Project Manager

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Pace Analytical™

Method 1613B Analysis Results

Client - Del Mar Analytical

Client's Sample ID	IOA0556-01		
Lab Sample ID	106128001		
Filename	F50129B_11		
Injected By	BAL		
Total Amount Extracted	1040 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	01/11/2005
ICAL Date	11/29/2004	Received	01/13/2005
CCal Filename(s)	F50129B_02	Extracted	01/28/2005
Method Blank ID	BLANK-6220	Analyzed	01/30/2005 03:58

Native Isomers	Conc pg/L	EMPC pg/L	LOD pg/L		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	1.00		2,3,7,8-TCDF-13C	2.00	64
Total TCDF	1.4	-----	1.00	J	2,3,7,8-TCDD-13C	2.00	81
					1,2,3,7,8-PeCDF-13C	2.00	73
2,3,7,8-TCDD	ND	-----	1.10		2,3,4,7,8-PeCDF-13C	2.00	75
Total TCDD	ND	-----	1.10		1,2,3,7,8-PeCDD-13C	2.00	89
					1,2,3,4,7,8-HxCDF-13C	2.00	74
1,2,3,7,8-PeCDF	ND	-----	1.30		1,2,3,6,7,8-HxCDF-13C	2.00	86
2,3,4,7,8-PeCDF	ND	-----	0.70		2,3,4,6,7,8-HxCDF-13C	2.00	79
Total PeCDF	ND	-----	0.98		1,2,3,7,8,9-HxCDF-13C	2.00	76
					1,2,3,4,7,8-HxCDD-13C	2.00	68
1,2,3,7,8-PeCDD	ND	-----	0.81		1,2,3,6,7,8-HxCDD-13C	2.00	91
Total PeCDD	ND	-----	0.81		1,2,3,4,6,7,8-HpCDF-13C	2.00	79
					1,2,3,4,7,8,9-HpCDF-13C	2.00	68
1,2,3,4,7,8-HxCDF	ND	-----	0.84		1,2,3,4,6,7,8-HpCDD-13C	2.00	88
1,2,3,6,7,8-HxCDF	ND	-----	0.83		OCDD-13C	4.00	74
2,3,4,6,7,8-HxCDF	ND	-----	0.89				
1,2,3,7,8,9-HxCDF	ND	-----	0.91		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	-----	0.87		1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	0.76		2,3,7,8-TCDD-37Cl4	0.20	81
1,2,3,6,7,8-HxCDD	ND	-----	0.57				
1,2,3,7,8,9-HxCDD	ND	-----	0.67				
Total HxCDD	1.2	-----	0.67	J			
1,2,3,4,6,7,8-HpCDF	2.1	-----	1.40	J			
1,2,3,4,7,8,9-HpCDF	ND	-----	1.80				
Total HpCDF	14.0	-----	1.60	BJ			
1,2,3,4,6,7,8-HpCDD	4.3	-----	0.94	BJ			
Total HpCDD	7.6	-----	0.94	BJ			
OCDF	13.0	-----	2.00	BJ			
OCDD	23.0	-----	3.30	BJ			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection. Totals are averages of individual isomer LODs.
D = Result obtained from analysis of diluted sample
B = Less than 10 times higher than method blank level
P = Recovery outside of method 1613 control limits
J = Concentration detected is below the calibration range
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....106128

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Pace Analytical™

Method 1613B Blank Analysis Results

Client - Del Mar Analytical

Lab Sample ID	BLANK-6220	Matrix	Water
Filename	F50129B_06	Dilution	NA
Total Amount Extracted	1020 mL	Extracted	01/28/2005
ICAL Date	11/29/2004	Analyzed	01/29/2005 23:49
CCal Filename(s)	F50129B_02	Injected By	BAL

Native Isomers	Conc pg/L	EMPC pg/L	PRL pg/L		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	1.20		2,3,7,8-TCDF-13C	2.00	58
Total TCDF	ND	-----	-----		2,3,7,8-TCDD-13C	2.00	75
					1,2,3,7,8-PeCDF-13C	2.00	65
2,3,7,8-TCDD	ND	-----	1.20		2,3,4,7,8-PeCDF-13C	2.00	67
Total TCDD	ND	-----	-----		1,2,3,7,8-PeCDD-13C	2.00	80
					1,2,3,4,7,8-HxCDF-13C	2.00	70
1,2,3,7,8-PeCDF	ND	-----	1.50		1,2,3,6,7,8-HxCDF-13C	2.00	82
2,3,4,7,8-PeCDF	ND	-----	1.20		2,3,4,6,7,8-HxCDF-13C	2.00	77
Total PeCDF	ND	-----	-----		1,2,3,7,8,9-HxCDF-13C	2.00	72
					1,2,3,4,7,8-HxCDD-13C	2.00	66
1,2,3,7,8-PeCDD	ND	-----	1.60		1,2,3,6,7,8-HxCDD-13C	2.00	88
Total PeCDD	ND	-----	-----		1,2,3,4,6,7,8-HpCDF-13C	2.00	73
					1,2,3,4,7,8,9-HpCDF-13C	2.00	63
1,2,3,4,7,8-HxCDF	ND	-----	0.75		1,2,3,4,6,7,8-HpCDD-13C	2.00	80
1,2,3,6,7,8-HxCDF	ND	-----	0.86		OCDD-13C	4.00	68
2,3,4,6,7,8-HxCDF	ND	-----	1.10				
1,2,3,7,8,9-HxCDF	ND	-----	1.20		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	-----	-----		1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	1.10		2,3,7,8-TCDD-37Cl4	0.20	73
1,2,3,6,7,8-HxCDD	ND	-----	0.99				
1,2,3,7,8,9-HxCDD	ND	-----	1.00				
Total HxCDD	ND	-----	-----				
1,2,3,4,6,7,8-HpCDF	ND	-----	2.10				
1,2,3,4,7,8,9-HpCDF	ND	-----	1.90				
Total HpCDF	2.2	-----	-----	J			
1,2,3,4,6,7,8-HpCDD	2.4	-----	1.40	J			
Total HpCDD	2.4	-----	-----	J			
OCDF	5.2	-----	1.80	J			
OCDD	5.6	-----	2.90	J			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
PRL = Pace Analytical Reporting Limit
A = Limit of Detection based on signal to noise
P = Recovery outside of method 1613 control limits
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
J = Value below calibration range
* = See Discussion

Report No.....106124

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 1613B Laboratory Control Spike Results

Client - Del Mar Analytical

Lab Sample ID	LCS-6221		
Filename	F50129B_03	Matrix	Water
Total Amount Extracted	1040 mL	Dilution	NA
ICAL Date	11/29/2004	Extracted	01/28/2005
CCal Filename	F50129B_02	Analyzed	01/29/2005 21:22
Method Blank ID	BLANK-6220	Injected By	BAL

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDF	10	9.9	7.5	15.8	99
2,3,7,8-TCDD	10	8.6	6.7	15.8	86
1,2,3,7,8-PeCDF	50	50.5	40.0	67.0	101
2,3,4,7,8-PeCDF	50	48.2	34.0	80.0	96
1,2,3,7,8-PeCDD	50	43.3	35.0	71.0	87
1,2,3,4,7,8-HxCDF	50	45.6	36.0	67.0	91
1,2,3,6,7,8-HxCDF	50	48.7	42.0	65.0	97
2,3,4,6,7,8-HxCDF	50	49.1	35.0	78.0	98
1,2,3,7,8,9-HxCDF	50	46.5	39.0	65.0	93
1,2,3,4,7,8-HxCDD	50	49.9	35.0	82.0	100
1,2,3,6,7,8-HxCDD	50	51.3	38.0	67.0	103
1,2,3,7,8,9-HxCDD	50	50.1	32.0	81.0	100
1,2,3,4,6,7,8-HpCDF	50	50.3	41.0	61.0	101
1,2,3,4,7,8,9-HpCDF	50	53.3	39.0	69.0	107
1,2,3,4,6,7,8-HpCDD	50	45.4	35.0	70.0	91
OCDF	100	95.6	63.0	170.0	96
OCDD	100	97.1	78.0	144.0	97
2,3,7,8-TCDD-37Cl4	10	6.9	3.1	19.1	69
2,3,7,8-TCDF-13C	100	51.5	22.0	152.0	52
2,3,7,8-TCDD-13C	100	67.8	20.0	175.0	68
1,2,3,7,8-PeCDF-13C	100	61.4	21.0	192.0	61
2,3,4,7,8-PeCDF-13C	100	65.9	13.0	328.0	66
1,2,3,7,8-PeCDD-13C	100	77.8	21.0	227.0	78
1,2,3,4,7,8-HxCDF-13C	100	70.2	19.0	202.0	70
1,2,3,6,7,8-HxCDF-13C	100	78.0	21.0	159.0	78
2,3,4,6,7,8-HxCDF-13C	100	74.1	22.0	176.0	74
1,2,3,7,8,9-HxCDF-13C	100	70.4	17.0	205.0	70
1,2,3,4,7,8-HxCDD-13C	100	69.0	21.0	193.0	69
1,2,3,6,7,8-HxCDD-13C	100	82.8	25.0	163.0	83
1,2,3,4,6,7,8-HpCDF-13C	100	72.1	21.0	158.0	72
1,2,3,4,7,8,9-HpCDF-13C	100	62.4	20.0	186.0	62
1,2,3,4,6,7,8-HpCDD-13C	100	80.1	26.0	166.0	80
OCDD-13C	200	135.6	26.0	397.0	68

Cs = Concentration Spiked (ng/mL)
Cr = Concentration Recovered (ng/mL)
Rec. = Recovery (Expressed as Percent)
Control Limit Reference: Method 1613, Table 6, 10/94 Revision
X = Background subtracted value
P = Recovery outside of control limits
Nn = Value obtained from additional analysis
* = See Discussion

Report No.....106124

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 1613B Laboratory Control Spike Results

Client - Del Mar Analytical

Lab Sample ID	LCSD-6222		
Filename	F50129B_04	Matrix	Water
Total Amount Extracted	1040 mL	Dilution	NA
ICAL Date	11/29/2004	Extracted	01/28/2005
CCal Filename	F50129B_02	Analyzed	01/29/2005 22:09
Method Blank ID	BLANK-6220	Injected By	BAL

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDF	10	10.6	7.5	15.8	106
2,3,7,8-TCDD	10	9.4	6.7	15.8	94
1,2,3,7,8-PeCDF	50	53.2	40.0	67.0	106
2,3,4,7,8-PeCDF	50	50.7	34.0	80.0	101
1,2,3,7,8-PeCDD	50	46.0	35.0	71.0	92
1,2,3,4,7,8-HxCDF	50	47.6	36.0	67.0	95
1,2,3,6,7,8-HxCDF	50	50.9	42.0	65.0	102
2,3,4,6,7,8-HxCDF	50	50.9	35.0	78.0	102
1,2,3,7,8,9-HxCDF	50	49.0	39.0	65.0	98
1,2,3,4,7,8-HxCDD	50	52.4	35.0	82.0	105
1,2,3,6,7,8-HxCDD	50	54.2	38.0	67.0	108
1,2,3,7,8,9-HxCDD	50	52.5	32.0	81.0	105
1,2,3,4,6,7,8-HpCDF	50	55.0	41.0	61.0	110
1,2,3,4,7,8,9-HpCDF	50	55.7	39.0	69.0	111
1,2,3,4,6,7,8-HpCDD	50	48.0	35.0	70.0	96
OCDF	100	100.6	63.0	170.0	101
OCDD	100	101.9	78.0	144.0	102
2,3,7,8-TCDD-37Cl4	10	8.7	3.1	19.1	87
2,3,7,8-TCDF-13C	100	70.4	22.0	152.0	70
2,3,7,8-TCDD-13C	100	88.6	20.0	175.0	89
1,2,3,7,8-PeCDF-13C	100	73.6	21.0	192.0	74
2,3,4,7,8-PeCDF-13C	100	79.0	13.0	328.0	79
1,2,3,7,8-PeCDD-13C	100	95.5	21.0	227.0	96
1,2,3,4,7,8-HxCDF-13C	100	84.8	19.0	202.0	85
1,2,3,6,7,8-HxCDF-13C	100	89.5	21.0	159.0	90
2,3,4,6,7,8-HxCDF-13C	100	87.2	22.0	176.0	87
1,2,3,7,8,9-HxCDF-13C	100	82.1	17.0	205.0	82
1,2,3,4,7,8-HxCDD-13C	100	80.1	21.0	193.0	80
1,2,3,6,7,8-HxCDD-13C	100	97.0	25.0	163.0	97
1,2,3,4,6,7,8-HpCDF-13C	100	84.4	21.0	158.0	84
1,2,3,4,7,8,9-HpCDF-13C	100	71.7	20.0	186.0	72
1,2,3,4,6,7,8-HpCDD-13C	100	92.4	26.0	166.0	92
OCDD-13C	200	159.2	26.0	397.0	80

Cs = Concentration Spiked (ng/mL)
Cr = Concentration Recovered (ng/mL)
Rec. = Recovery (Expressed as Percent)
Control Limit Reference: Method 1613, Table 6, 10/94 Revision
X = Background subtracted value
P = Recovery outside of control limits
Nn = Value obtained from additional analysis
* = See Discussion

Report No.....106124

REPORT OF LABORATORY ANALYSIS

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1700 Elm Street
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444

SPIKE RECOVERY RELATIVE PERCENT DIFFERENCE (RPD) RESULTS

Client..... Del Mar Analytical

SPIKE 1 ID..... LCS-6221
SPIKE 1 Filename..... F50129B_03
SPIKE 2 ID..... LCSD-6222
SPIKE 2 Filename..... F50129B_04

COMPOUND	SPIKE 1 REC,%	SPIKE 2 REC,%	RPD,%
2378-TCDF	99	106	6.8
2378-TCDD	86	94	8.9
12378-PeCDF	101	106	4.8
23478-PeCDF	96	101	5.1
12378-PeCDD	87	92	5.6
123478-HxCDF	91	95	4.3
123678-HxCDF	97	102	5.0
234678-HxCDF	98	102	4.0
123789-HxCDF	93	98	5.2
123478-HxCDD	100	105	4.9
123678-HxCDD	103	108	4.7
123789-HxCDD	100	105	4.9
1234678-HpCDF	101	110	8.5
1234789-HpCDF	107	111	3.7
1234678-HpCDD	91	96	5.3
OCDF	96	101	5.1
OCDD	97	102	5.0

REC = Percent Recovered
RPD = The difference between the two values divided by the average.
NA = Not Applicable

Report No..... 106124, 106125, 106126
106127, 106128, 106130
106131, 106132, 106135

REPORT OF LABORATORY ANALYSIS

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TABLE 1. 2,3,7,8-TCDD Equivalency Factors (TEFs) for the Polychlorinated Dibenzo-p-dioxins and Dibenzofurans

Number	Compound(s)	TEF
1	2,3,7,8-TCDD	1.00
2	1,2,3,7,8-PeCDD	0.50
3	1,2,3,6,7,8-HxCDD	0.1
4	1,2,3,7,8,9-HxCDD	0.1
5	1,2,3,4,7,8-HxCDD	0.1
6	1,2,3,4,6,7,8-HpCDD	0.01
7	OCDD	0.001
8	* Total - TCDD	0.0
9	* Total - PeCDD	0.0
10	* Total - HxCDD	0.0
11	* Total - HpCDD	0.0
12	2,3,7,8-TCDF	0.10
13	1,2,3,7,8-PeCDF	0.05
14	2,3,4,7,8-PeCDF	0.5
15	1,2,3,6,7,8-HxCDF	0.1
16	1,2,3,7,8,9-HxCDF	0.1
17	1,2,3,4,7,8-HxCDF	0.1
18	2,3,4,6,7,8-HxCDF	0.1
19	1,2,3,4,6,7,8-HpCDF	0.01
20	1,2,3,4,7,8,9-HpCDF	0.01
21	OCDF	0.001
22	* Total - TCDF	0.0
23	* Total - PeCDF	0.0
24	* Total - HxCDF	0.0
25	* Total - HpCDF	0.0

*Excluding the 2,3,7,8-substituted congeners.

Reference: 1989 ITEFs

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Del Mar Analytical

17461 Derian Ave. Suite 100, Irvine, CA 92614 Ph (949) 261-1022 Fax (949) 261-1228
1014 E. Cooley Dr., Suite A, Colton, CA 92324 Ph (909) 370-4667 Fax (909) 370-1046
9484 Chesapeake Drive, Suite 805, San Diego, CA 92123 Ph (619) 505-9596 Fax (619) 505-9689
9830 South 51st Street, Suite B-120, Phoenix, AZ 85044 Ph (480) 785-0043 Fax (480) 785-0851
2520 E. Sunset Rd., Suite #3, Las Vegas, NV 89120 Ph (702) 798-3620 Fax (702) 798-3621

SUBCONTRACT ORDER - PROJECT # IOA0556 106128

SENDING LABORATORY:

Del Mar Analytical, Irvine
17461 Derian Avenue. Suite 100
Irvine, CA 92614
Phone: (949) 261-1022
Fax: (949) 261-1228
Project Manager: Michele Harper

RECEIVING LABORATORY:

Pace Analytical, MN- SUB
1700 Elm Street, Ste 200
Minneapolis, MN 55414
Phone :(612) 607-1700
Fax: (612) 607-6444

Standard TAT is requested unless specific due date is requested => Due Date:_____ Initials:_____

Analysis	Expiration	Comments
Sample ID: IOA0556-01 Water	**Sampled: 01/11/05 08:48**	**Instant Nofication** 106128001
1613-Dioxin-HR	01/18/05 08:48	J flags, 17 congeners, no TEQ, sub to Pace-MN
EDD + Level 4	02/08/05 08:48	Excel EDD email to pm,Include Std logs for Lvl IV

Containers Supplied:

1 L Amber (IOA0556-01C)
1 L Amber (IOA0556-01D)

SAMPLE INTEGRITY:

All containers intact: ☐ Yes ☐ No Sample labels/COC agree: ☐ Yes ☐ No Samples Received On Ice:: ☐ Yes ☐ No
Custody Seals Present: ☐ Yes ☐ No Samples Preserved Properly: ☐ Yes ☐ No Samples Received at (temp): 3.0°C

Released By	Date	Time	Received By	Date	Time
Stacy Gunawan	1/12/05		[illegible]	1-13-05	09:45

APPENDIX G

Section 8

January Outfall 008

AMEC Data Validation Reports

Del Mar Analytical Laboratory Reports

CONTRACT COMPLIANCE SCREENING FORM FOR HARDCOPY DATA

AMEC Earth & Environmental
550 South Wadsworth Boulevard
Suite 500
Lakewood, CO 80226

Package ID T711DF20
Task Order 313150010
SDG No. Multiple
No. of Analyses 15

Laboratory Alta
Reviewer K. Shadowlight
Analysis/Method Dioxins

Date: February 11, 2005
Reviewer's Signature K Shadowlight

ACTION ITEMS[a]	
1. **Case Narrative** / **Deficiencies**	
2. **Out of Scope** / **Analyses**	
3. **Analyses Not Conducted**	
4. **Missing Hardcopy** / **Deliverables**	
5. **Incorrect Hardcopy** / **Deliverables**	
6. **Deviations from Analysis** / **Protocol, e.g.,**	Qualifications were assigned for the following:
Holding Times	* Method blank contamination
GC/MS Tune/Inst. Performance	* EMPCs
Calibration	* Detects below the lower method calibration level
Method blanks	
Surrogates	
Matrix Spike/Dup LCS	
Field QC	
Internal Standard Performance	
Compound Identification and	
Quantitation	
System Performance	
COMMENTS[b]	Rev. 1

[a] Subcontracted analytical laboratory is not meeting contract and/or method requirements.
[b] Differences in protocol have been adopted by the laboratory but no action against the laboratory is required.

DATA VALIDATION REPORT

NPDES
Monitoring

ANALYSIS: DIOXINS/FURANS

SAMPLE DELIVERY GROUPS: Multiple SDGs

Prepared by

AMEC—Denver Operations
550 South Wadsworth Boulevard, Suite 500
Lakewood, Colorado 80226

1. INTRODUCTION

Task Order Title:	NPDES Monitoring
Contract Task Order #:	313150010
Sample Delivery Group #:	Multiple
Project Manager:	B. McIlvaine
Matrix:	Water
Analysis:	Dioxins/Furans
QC Level:	Level IV
No. of Samples:	15
No. of Reanalyses/Dilutions:	0
Reviewer:	K. Shadowlight
Date of Review:	February 11, 2005

The samples listed in Table 1 were validated based on the guidelines outlined in the *AMEC Data Validation Procedure for Dioxins and Furans (DVP-19, Rev. 1), EPA Method 1613, and the National National Functional Guidelines For Chlorinated Dioxin/Furan Data Review* (8/02). Any deviations from these procedures and guidelines are documented herein. Qualifiers were applied in cases where the data did not meet the required QC criteria or where special consideration by the data user is required. Data qualifiers were placed on Form Is with the associated qualification codes. Analytes that were rejected for any reason are denoted on the Form I as having only the "R" data qualifier and associated qualification code(s) denoting the reason for rejection. Any additional problems with the data that may have resulted in an estimated value were not denoted by a qualification code since the data had already been rejected.

Table 1. Sample Identification

Client ID	Laboratory ID (Del Mar)	Laboratory ID (Pace)	Matrix	COC Method
Outfall 003	IOA0026-01	105648001	water	1613
Outfall 004	IOA0027-01	105646001	water	1613
Outfall 005	IOA0028-01	105645001	water	1613
Outfall 007	IOA0108-01	105774001	water	1613
Outfall 008	IOA0109-01	105775001	water	1613
Outfall 009	IOA0110-01	105770001	water	1613
Outfall 010	IOA0111-01	105758001	water	1613
Outfall 001	IOA0112-01	105778001	water	1613
Outfall 002	IOA0119-01	105772001	water	1613
Outfall 018	IOA0122-01	105779001	water	1613
Outfall 011	IOA0131-01	105773001	water	1613
Outfall 006	IOA0458-01	106048001	water	1613
Outfall 004	IOA0460-01	106050001	water	1613
Outfall 005	IOA0464-01	106052001	water	1613
Outfall 003	IOA0466-01	106051001	water	1613

2. DATA VALIDATION FINDINGS

2.1 SAMPLE MANAGEMENT

Following are findings associated with sample management:

2.1.1 Sample Preservation, Handling, and Transport

All of the samples in these SDGs were received at Del Mar Analytical within the temperature limits of 4°C ±2°C. Several of the samples in these SDGs were received at Pace Analytical Services below the temperature limits of 4°C ±2°C; however, as none of the samples were noted to have been damaged, no qualifications were required. The samples were received in good condition at both laboratories. No qualifications were required.

2.1.2 Chain of Custody

The COC and transfer COC were signed by the appropriate field and laboratory personnel, and accounted for the analyses presented in these SDGs. As the samples were couriered directly to the laboratory (Del Mar Analytical), custody seals were not required. There was no information regarding custody seals upon receipt at Pace. No qualifications were required.

2.1.3 Holding Times

The samples were extracted and analyzed within a year of collection. No qualifications were required.

2.2 INSTRUMENT PERFORMANCE

Following are findings associated with instrument performance:

2.2.1 GC Column Performance

A column performance standard was combined with the daily calibration verification and analyzed at the beginning of each analytical sequence. The GC column performance was acceptable with the chromatographic separation of 2,3,7,8-TCDD and other TCDD isomers resolved with a valley of ≤25%. No qualifications were required.

2.2.2 Mass Spectrometer Performance

The mass spectrometer performance could not be evaluated as the laboratory did not provide selected ion current profiles for the lock-mass ions. No qualifications were required.

2.3 CALIBRATION

2.3.1 Initial Calibration

There was one initial calibration, analyzed 11/29/04 on Instrument 10MSHR05. The calibration consisted of five concentration level standards (CS1 through CS5) analyzed to verify instrument linearity. The initial calibration was acceptable with %RSDs ≤20% for the 15 native compounds (calibration by isotope dilution) and ≤35% for the 2 native and all labeled compounds (calibration by internal standard). The relative retention times and ion abundance ratios were within the QC limits listed in Method 1613 for all standards. A representative number of %RSDs were verified from the raw data, and no calculation or transcription errors were noted. No qualifications were required.

2.3.2 Continuing Calibration

Calibration verification (VER) consisted of a mid-level standard (CS3) analyzed at the beginning of each analytical sequence. The VER was acceptable with the concentrations within the acceptance criteria listed in the Table 6 of the EPA Method 1613. The ion abundance ratios and relative retention times were within the method QC limits. A representative number of %Ds were verified from the raw data, and no calculation or transcription errors were noted. No qualifications were required.

2.4 BLANKS

One method blank (Blank-6202) was extracted and analyzed with the samples in these SDGs. Target compounds 1,2,3,4,6,7,8-HpCDD, total HpCDD, OCDF, and OCDD were reported in the method blank. Any detects for the aforementioned target compounds reported at concentrations <5x the concentrations reported in the method blank were qualified as estimated nondetects "UJ," at the levels of interference in the samples of these SDGs. A review of the method blank raw data and chromatograms indicated no false negatives or false positives. No further qualifications were required.

2.5 BLANK SPIKES AND LABORATORY CONTROL SAMPLES

One LCS/LCSD pair (LCS-6203/LCSD-6204) was extracted and analyzed with the samples in these SDGs. All recoveries were within the acceptance criteria listed in Table 6 of the Method 1613. There were no QC limits established for RPDs. The reported RPDs were within ±20%. No qualifications were required.

2.6 MATRIX SPIKE/MATRIX SPIKE DUPLICATE

MS/MSD analyses were not performed in these SDGs. Evaluation of method accuracy and precision was based on the LCS/LCSD results. No qualifications were required.

2.7 FIELD QC SAMPLES

Following are findings associated with field QC:

2.7.1 Field Blanks and Equipment Rinsates

The samples in these SDGs had no associated field QC samples. No qualifications were required.

2.7.2 Field Duplicates

No field duplicate samples were identified for these SDGs.

2.8 INTERNAL STANDARDS

The labeled standard recoveries were within the acceptance criteria listed in Table 7 of Method 1613. No qualifications were required.

2.9 COMPOUND IDENTIFICATION

The laboratory analyzed for polychlorinated dioxins/furans by EPA Method 1613. The compound identifications were verified from the raw data and no false negatives or positives were noted. No qualifications were required.

2.10 COMPOUND QUANTIFICATION AND REPORTED DETECTION LIMITS

Compound quantitation was verified from the raw data. The laboratory calculated and reported compound-specific detection limits. Any detects below the lower method calibration limit (MCL) were qualified as estimated, "J." Any reported EMPC was qualified as an estimated nondetect, "UJ." No further qualifications were required.

Pace Analytical Services, Inc.
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Tel: 612-607-1700
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Method 1613B Analysis Results

Client - Del Mar Analytical

Client's Sample ID	IOA0109-01 outfall 008		
Lab Sample ID	105775001		
Filename	F50127B_12		
Injected By	MRO		
Total Amount Extracted	1020 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	01/04/2005
ICAL Date	11/29/2004	Received	01/06/2005
CCal Filename(s)	F50127A_13	Extracted	01/24/2005
Method Blank ID	BLANK-6202	Analyzed	01/28/2005 06:11

Native Isomers	Conc pg/L	EMPC pg/L	LOD pg/L		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	3.7		2,3,7,8-TCDF-13C	2.00	50
Total TCDF	ND	-----	3.7		2,3,7,8-TCDD-13C	2.00	65
					1,2,3,7,8-PeCDF-13C	2.00	82
2,3,7,8-TCDD	ND	-----	3.3		2,3,4,7,8-PeCDF-13C	2.00	80
Total TCDD	ND	-----	3.3		1,2,3,7,8-PeCDD-13C	2.00	94
					1,2,3,4,7,8-HxCDF-13C	2.00	75
1,2,3,7,8-PeCDF	ND	-----	1.8		1,2,3,6,7,8-HxCDF-13C	2.00	100
2,3,4,7,8-PeCDF	ND	-----	1.1		2,3,4,6,7,8-HxCDF-13C	2.00	91
Total PeCDF	ND	-----	1.4		1,2,3,7,8,9-HxCDF-13C	2.00	81
					1,2,3,4,7,8-HxCDD-13C	2.00	70
1,2,3,7,8-PeCDD	ND	-----	1.7		1,2,3,6,7,8-HxCDD-13C	2.00	95
Total PeCDD	ND	-----	1.7		1,2,3,4,6,7,8-HpCDF-13C	2.00	83
					1,2,3,4,7,8,9-HpCDF-13C	2.00	73
1,2,3,4,7,8-HxCDF	ND	-----	2.5		1,2,3,4,6,7,8-HpCDD-13C	2.00	94
1,2,3,6,7,8-HxCDF	ND	-----	1.6		OCDD-13C	4.00	88
2,3,4,6,7,8-HxCDF	ND	-----	1.5				
1,2,3,7,8,9-HxCDF	ND	-----	1.5		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	-----	1.8		1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	1.3		2,3,7,8-TCDD-37Cl4	0.20	62
1,2,3,6,7,8-HxCDD	ND	-----	1.6				
1,2,3,7,8,9-HxCDD	ND	-----	1.6				
Total HxCDD	ND	-----	1.5				
1,2,3,4,6,7,8-HpCDF	ND	-----	1.9				
1,2,3,4,7,8,9-HpCDF	ND	-----	2.1				
Total HpCDF	4.3	-----	2.0	J			
1,2,3,4,6,7,8-HpCDD	2.3	-----	1.7	BJ			
Total HpCDD	4.3	-----	1.7	BJ			
OCDF	6.8	-----	1.8	BJ			
OCDD	16.0	-----	2.5	BJ			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection. Totals are averages of individual isomer LODs.
D = Result obtained from analysis of diluted sample
B = Less than 10 times higher than method blank level
P = Recovery outside of method 1613 control limits
J = Concentration detected is below the calibration range
Nn = Value obtained from additional analysis

i = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....105775

DATA VALIDATED

REPORT OF LABORATORY ANALYSIS

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CONTRACT COMPLIANCE SCREENING FORM FOR HARDCOPY DATA

AMEC Earth & Environmental
550 South Wadsworth Boulevard
Suite 500
Lakewood, CO 80226

Laboratory Del Mar
Reviewer P. Meeks
Analysis/Method Metals

Package ID T711MT23
Task Order 313150010
SDG No. IOA0108, 109, 110, 111
No. of Analyses 4

Date: 02/02/05
Reviewer's Signature P. Meeks

ACTION ITEMS[a]	
1. **Case Narrative Deficiencies**	
2. **Out of Scope Analyses**	
3. **Analyses Not Conducted**	
4. **Missing Hardcopy Deliverables**	
5. **Incorrect Hardcopy Deliverables**	
6. **Deviations from Analysis Protocol, e.g.,** Holding Times, GC/MS Tune/Inst. Performance, Calibrations, Blanks, Surrogates, Matrix Spike/Dup LCS, Field QC, Internal Standard Performance, Compound Identification and Quantitation, System Performance	Qualifications were applied for: 1. Antimony check standard recovery outliers 2. Negative method blank results 3. Detects below the reporting limit 4. Antimony MDLs raised and results qualified as estimated.
COMMENTS[b]	

[a] Subcontracted analytical laboratory is not meeting contract and/or method requirements.
[b] Differences in protocol have been adopted by the laboratory but no action against the laboratory is required.

DATA VALIDATION REPORT

NPDES
Monitoring

ANALYSIS: METALS

SAMPLE DELIVERY GROUPS: IOA0108, IOA0109, IOA0110, & IOA0111

Prepared by

AMEC—Denver Operations
550 South Wadsworth Boulevard, Suite 500
Lakewood, Colorado 80226

1. INTRODUCTION

Task Order Title:	NPDES Monitoring
Contract Task Order #:	313150010
SDG#:	IOA0108, IOA0109, IOA0110, & IOA0111
Project Manager:	B. McIlvaine
Matrix:	Water
Analysis:	Metals
QC Level:	Level IV
No. of Samples:	4
No. of Reanalyses/Dilutions:	0
Reviewer:	P. Meeks
Date of Review:	February 02, 2005

The samples listed in Table 1 were validated based on the guidelines outlined in the *AMEC Data Validation Procedure for Levels III and IV ICP-MS Metals, (DVP-5-A, Rev.0), AMEC Data Validation Procedure for Levels III and IV ICP Metals* (DVP-5, Rev. 0), SW-846 *Method 6020B for Inductively Coupled Plasma – Mass Spectrometry*, SW-846 *Method 6010B for Inductively Coupled Plasma* , SW-846 *Method 7471A for Mercury (Manual Cold-Vapor Technique)*, and validation guidelines outlined in the USEPA CLP *National Functional Guidelines for Inorganic Data Review* (2/94). Any deviations from these procedures and guidelines are documented herein. Qualifiers were applied in cases where the data did not meet the required QC criteria or where special consideration by the data user is required. Data qualifiers were placed on Form Is with the associated qualification codes. Analytes that were rejected for any reason are denoted on the Form I as having only the "R" data qualifier and associated qualification code(s) denoting the reason for rejection. Any additional problems with the data that may have resulted in an estimated value were not denoted by a qualification code since the data had already been rejected.

Table 1. Sample identification

Client ID	EPA ID	Laboratory ID	Matrix	COC Method
Outfall 007	Outfall 007	IOA0108-01	water	ILM04
Outfall 008	Outfall 008	IOA0109-01	water	ILM04
Outfall 009	Outfall 009	IOA0110-01	water	ILM04
Outfall 010	Outfall 010	IOA0111-01	water	ILM04

2. DATA VALIDATION FINDINGS

2.1 SAMPLE MANAGEMENT

Following are findings associated with sample management:

2.1.1 Sample Preservation, Handling, and Transport

The samples in these SDGs were received at the laboratory within the temperature limits of 4°C ±2°C. No sample preservation, handling, or transport problems were noted, and no qualifications were necessary.

2.1.2 Chain of Custody

The COCs were signed and dated by field and laboratory personnel. The COCs listed duplicate samples for all samples; however, duplicate analyses were not required. No sample qualifications were required.

2.1.3 Holding Times

The dates of collection recorded on the COCs and the dates of analyses recorded in the raw data, documented that the sample analyses were performed within the specified holding times of six months for the ICP/MS metals and 28 days for mercury. No qualifications were required.

2.2 ICP-MS TUNING

A precalibration routine must be completed prior to calibrating the instrument, which consists of analyzing a tuning solution to verify resolution, mass calibration, and thermal stability. The solution must be analyzed a minimum of five times and must contain isotopes representing all mass regions of interest. The laboratory performed the required tune solution analyses but did not report %RSDs. The laboratory SOP states that to be acceptable, the %RSD must be less than 5%. The mass calibrations were within 0.1 amu of the true mass and an the instrument resolutions were less than 0.75 amu at 10 percent peak height for all analytes in the tune solution. No site sample qualifications were required.

2.3 CALIBRATION

The ICV and CCV results showed acceptable recoveries, 90-110% for the ICP/MS and 80-120% for mercury. Antimony was not recovered in the 1.0 ppb check standard and was recovered at 50% in the reporting limit check standard; therefore, nondetected antimony in the samples was qualified as estimated, "UJ." The remaining reporting limit check standards were recovered within the AMEC control limits of 70-130%. No further qualifications were required.

2.4 BLANKS

Antimony and cadmium were reported in the method blank at –1.52 and –0.22 µg/L, respectively; therefore, nondetected antimony in the samples was qualified as estimated, "UJ," and cadmium detected in the samples was qualified as estimated, "J." No further qualifications were required.

2.5 ICP INTERFERENCE CHECK SAMPLE (ICS A/AB)

No ICPMS interference check samples were analyzed in association with the samples in these SDGs; therefore, no assessment was made with respect to this criterion.

2.6 BLANK SPIKES AND LABORATORY CONTROL SAMPLES

The ICP/MS LCS sample was identified as 5A05052-BS1 and the mercury LCS sample was identified as 5A05061-BS1. The LCS results on the summary forms and in the raw data were within the laboratory-established ICP/MS and mercury control limits of 85-115%. No qualifications were required.

2.7 LABORATORY DUPLICATES

MS/MSD analyses were performed on Outfall 007 for lead only. The RPD was within the control limit of 20% and no qualifications were required.

2.8 MATRIX SPIKE

MS/MSD analyses were performed on Outfall 007 for lead only. Both recoveries were within the AMEC control limits of 75-125% and no qualifications were required.

2.9 FURNACE ATOMIC ABSORPTION QC

Furnace atomic absorption was not utilized for the analysis of these samples; therefore, furnace atomic absorption QC is not applicable.

2.10 ICP/MS SERIAL DILUTION

No serial dilution analysis was performed in association with the samples in these SDGs; therefore, no assessment was made with respect to this criterion.

2.11 INTERNAL STANDARDS PERFORMANCE

The ICP-MS internal standard recoveries for the site sample and associated QC sample analyses were within the 60-125% control limits and no qualifications were required.

2.12 SAMPLE RESULT VERIFICATION

A Level IV review was performed for the sample in this data package. Calculations were verified, and the sample results reported on the Form Is were verified against the raw data. No transcription errors or calculation errors were noted. Detects below the reporting limit were qualified as estimated, "J."

Antimony was not recovered in the 1.0 ppb check standard, was recovered at 50% in the 2.0 ppb reporting limit check standard, and was reported at negative values in the method blanks and all CCBs. This indicates that the laboratory was not able to detect antimony at the reported MDL of 0.18 µg/L; therefore, the reviewer raised the antimony MDLs for Outfall 008, Outfall 009, and Outfall 010 to the reporting limit, 2.0 µg/L and qualified the nondetected results as estimated, "UJ." No further qualifications were required.

2.13 FIELD QC SAMPLES

Field QC samples are evaluated, and if necessary, qualified based only on laboratory blanks. Any remaining detects are used to evaluate the associated samples.

2.13.1 Field Blanks and Equipment Rinsates

The samples in these SDGs had no associated field QC samples. No qualifications were required.

2.13.2 Field Duplicates

There were no field duplicate analyses performed in association with the site samples.

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 008

Report Number: IOA0109

Sampled: 01/04/05
Received: 01/04/05

DRAFT: METALS

Analyte	Method	Batch	MDL	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers	Rev Qual	Qual Code
Sample ID: IOA0109-01 (DRAFT: Outfall 008 - Water)											
Reporting Units: ug/l											
Antimony	EPA 200.8	5A05052	~~0.18~~ 2.0	2.0	ND	1	01/05/05	01/05/05		UJ	B, *3, $
Cadmium	EPA 200.8	5A05052	0.015	1.0	**0.026**	1	01/05/05	01/05/05		J X	B, DNQ
Copper	EPA 200.8	5A05052	0.49	2.0	**4.0**	1	01/05/05	01/05/05			
Lead	EPA 200.8	5A05052	0.13	1.0	**2.5**	1	01/05/05	01/05/05			
Mercury	EPA 245.1	5A05061	0.063	0.20	**0.14**	1	01/05/05	01/05/05		J	DNQ

AMEC VALIDATED

LEVEL IV

DRAFT REPORT
DRAFT REPORT
DATA SUBJECT TO CHANGE

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CONTRACT COMPLIANCE SCREENING FORM FOR HARDCOPY DATA

AMEC Earth & Environmental
550 South Wadsworth Boulevard
Suite 500
Lakewood, CO 80226

Laboratory Del Mar
Reviewer P. Meeks
Analysis/Method Perchlorate

Package ID T711WC40
Task Order 313150010
SDG No. IOA0109
No. of Analyses 1

Date: 01/11/05
Reviewer's Signature P. Meeks

ACTION ITEMS[a]	
1. **Case Narrative Deficiencies**	
2. **Out of Scope Analyses**	
3. **Analyses Not Conducted**	
4. **Missing Hardcopy Deliverables**	
5. **Incorrect Hardcopy Deliverables**	
6. **Deviations from Analysis Protocol, e.g.,**	Qualifications were applied for:
	1) Confirmation spike recovery outlier;
Holding Times	2) Perchlorate detected below the reporting limit.
GC/MS Tune/Inst. Performance	
Calibrations	
Blanks	
Surrogates	
Matrix Spike/Dup LCS	
Field QC	
Internal Standard Performance	
Compound Identification and Quantitation	
System Performance	

COMMENTS[b]	

[a] Subcontracted analytical laboratory is not meeting contract and/or method requirements.
[b] Differences in protocol have been adopted by the laboratory but no action against the laboratory is required.

DATA VALIDATION REPORT

NPDES Monitoring

ANALYSIS: PERCHLORATE

SAMPLE DELIVERY GROUP: IOA0109

Prepared by

AMEC—Denver Operations
550 South Wadsworth Boulevard, Suite 500
Lakewood, Colorado 80226

1. INTRODUCTION

Task Order Title:	NPDES Monitoring
Contract Task Order #:	313150010
Sample Delivery Group #:	IOA0109
Project Manager:	B. McIlvaine
Matrix:	Water
Analysis:	Perchlorate
QC Level:	Level IV
No. of Samples:	1
Reviewer:	P. Meeks
Date of Review:	January 11, 2005

The sample listed in Table 1 was validated based on the guidelines outlined in the AMEC *Data Validation Procedures* SOP DVP-6, Rev. 2, *USEPA Methods for Chemical Analysis of Water and Wastes Method 314.0, and 120.1,* and validation guidelines outlined in the USEPA *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (2/94).* Any deviations from these procedures and guidelines are documented herein. Qualifiers were applied in cases where the data did not meet the required QC criteria or where special consideration by the data user is required. Data qualifiers were placed on Form Is with the associated qualification codes. Analytes that were rejected for any reason are denoted on the Form I as having only the "R" data qualifier and associated qualification code(s) denoting the reason for rejection. Any additional problems with the data that may have resulted in an estimated value were not denoted by a qualification code since the data had already been rejected.

Table 1. Sample identification

Client ID	EPA ID	Laboratory ID	Matrix	COC Method
Outfall 008	Outfall 008	IOA0109-01	water	Perchlorate

2. DATA VALIDATION FINDINGS

2.1 SAMPLE MANAGEMENT

Following are findings associated with sample management:

2.1.1 Sample Preservation, Handling, and Transport

The sample in this SDG was received at the laboratory within the temperature limits of 4°C ± 2°C. The analysis did not require preservation, and no preservation was noted in the field. No qualifications were required.

2.1.2 Chain of Custody

The COC was signed and dated by field and laboratory personnel, and accounted for the sample and analysis presented in this SDG. No qualifications were required.

2.1.3 Holding Times

The holding time was assessed by comparing the date of collection with the date of analysis. The 28-day analytical holding time for the perchlorate analysis was met, and no qualifications were required.

2.2 CALIBRATION

The initial calibration correlation coefficient was ≥ 0.995. The IPC-MA recovery was within the control limits of 80-120%. The ICV, ICCS, CCV, and IPC recoveries were within the control limits of 90-110%. No qualifications were required.

2.3 BLANKS

The method blank and CCB results were reported on the summary forms and in the raw data for blank analyses associated with the sample were nondetects at the reporting limit. No qualifications were required.

2.4 BLANK SPIKES AND LABORATORY CONTROL SAMPLES

The laboratory control sample recovery was within the method control limits of 85-115%. No qualifications were required.

2.5 SURROGATES RECOVERY

Surrogate recovery is not applicable to the analysis presented in this SDG.

2.6 LABORATORY DUPLICATES

No duplicate analysis was performed in association with the sample in this SDG; therefore, no assessment was made with respect to this criterion.

2.7 MATRIX SPIKE/MATRIX SPIKE DUPLICATE

No MS/MSD analyses were performed in association with the sample in this SDG; therefore, no assessment was made with respect to this criterion. A confirmation spike was performed for Outfall 008. The recovery was above the control limit at 144%; therefore, perchlorate detected in the sample was qualified as estimated, "J." No further qualifications were required.

2.8 FURNACE ATOMIC ABSORPTION QC

Furnace atomic absorption was not utilized for the analysis of this sample; therefore, furnace atomic absorption QC is not applicable.

2.9 ICP SERIAL DILUTION

ICP serial dilution is not applicable to the analysis presented in this data validation report.

2.10 SAMPLE RESULT VERIFICATION

A Level IV review was performed for the sample in this data package. Calculations were verified, and sample results reported on the Form Is were verified against the raw data. No transcription errors or calculations errors were noted. Perchlorate detected below the reporting limit was qualified as estimated, "J." No further qualifications were required.

2.11 FIELD QC SAMPLES

Field QC samples are evaluated, and if necessary, qualified based only on laboratory blanks. Any remaining detects are used to evaluate the associated samples. The following are findings associated with field QC samples:

2.11.1 Field Blanks and Equipment Rinsates

The sample in this SDG had no associated field QC samples. No qualifications were required.

2.11.2 Field Duplicates

There were no field duplicate pairs associated with this package.

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 008

Report Number: IOA0109

Sampled: 01/04/05
Received: 01/04/05

INORGANICS

Analyte	Method	Batch	MDL	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers	Rev Qual	Qual Code
Sample ID: IOA0109-01 (Outfall 008 - Water)											
Reporting Units: mg/l											
Perchlorate	EPA 314.0	5A06055	0.00080	0.0040	**0.0010**	1	01/06/05	01/06/05	J	X	Q, DNQ

AMEC VALIDATED

LEVEL IV

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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LABORATORY REPORT

Prepared For: MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project: Routine Outfall 008

Sampled: 01/04/05
Received: 01/04/05
Issued: 02/21/05 11:48

NELAP #01108CA California ELAP#1197 CSDLAC #10117

The results listed within this Laboratory Report pertain only to the samples tested in the laboratory. The analyses contained in this report were performed in accordance with the applicable certifications as noted. All soil samples are reported on a wet weight basis unless otherwise noted in the report. This Laboratory Report is confidential and is intended for the sole use of Del Mar Analytical and its client. This report shall not be reproduced, except in full, without written permission from Del Mar Analytical. The Chain of Custody, 1 page, is included and is an integral part of this report.

This entire report was reviewed and approved for release.

SAMPLE CROSS REFERENCE

SUBCONTRACTED: Refer to the last page for specific subcontract laboratory information included in this report.

LABORATORY ID	CLIENT ID	MATRIX
IOA0109-01	Outfall 008	Water

Reviewed By:

Michele Harper

Del Mar Analytical, Irvine
Michele Harper
Project Manager

Del Mar Analytical

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 008

Report Number: IOA0109

Sampled: 01/04/05
Received: 01/04/05

METALS

Analyte	Method	Batch	MDL Limit	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA0109-01 (Outfall 008 - Water)									
Reporting Units: ug/l									
Antimony	EPA 200.8	5A05052	0.18	2.0	ND	1	01/05/05	01/05/05	
Cadmium	EPA 200.8	5A05052	0.015	1.0	**0.026**	1	01/05/05	01/05/05	J
Copper	EPA 200.8	5A05052	0.49	2.0	**4.0**	1	01/05/05	01/05/05	
Lead	EPA 200.8	5A05052	0.13	1.0	**2.5**	1	01/05/05	01/05/05	
Mercury	EPA 245.1	5A05061	0.063	0.20	**0.14**	1	01/05/05	01/05/05	J

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 008

Report Number: IOA0109

Sampled: 01/04/05
Received: 01/04/05

INORGANICS

Analyte	Method	Batch	MDL Limit	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA0109-01 (Outfall 008 - Water) - cont.									
Reporting Units: mg/l									
Chloride	EPA 300.0	5A04042	0.26	0.50	**7.1**	1	01/04/05	01/04/05	
Nitrate/Nitrite-N	EPA 300.0	5A04042	0.072	0.26	**4.6**	1	01/04/05	01/04/05	
Oil & Grease	EPA 413.1	5A05068	0.94	5.0	ND	1	01/05/05	01/05/05	
Sulfate	EPA 300.0	5A04042	0.18	0.50	**6.2**	1	01/04/05	01/04/05	
Total Dissolved Solids	SM2540C	5A05076	10	10	**160**	1	01/05/05	01/05/05	
Sample ID: IOA0109-01 (Outfall 008 - Water)									
Reporting Units: ug/l									
Perchlorate	EPA 314.0	5A06055	0.80	4.0	**1.0**	1	01/06/05	01/06/05	J

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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2520 E. Sunset Rd. #3, Las Vegas, NV 89120 (702) 798-3620 FAX (702) 798-3621

MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 008

Report Number: IOA0109

Sampled: 01/04/05
Received: 01/04/05

SHORT HOLD TIME DETAIL REPORT

	Hold Time (in days)	Date/Time Sampled	Date/Time Received	Date/Time Extracted	Date/Time Analyzed
Sample ID: Outfall 008 (IOA0109-01) - Water					
EPA 300.0	2	01/04/2005 09:50	01/04/2005 18:30	01/04/2005 19:00	01/04/2005 19:38

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 008

Report Number: IOA0109

Sampled: 01/04/05
Received: 01/04/05

METHOD BLANK/QC DATA

METALS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A05052 Extracted: 01/05/05											
Blank Analyzed: 01/05/2005 (5A05052-BLK1)											
Antimony	ND	2.0	0.18	ug/l							
Cadmium	ND	1.0	0.015	ug/l							
Copper	ND	2.0	0.49	ug/l							
Lead	ND	1.0	0.13	ug/l							
LCS Analyzed: 01/05/2005 (5A05052-BS1)											
Antimony	80.5	2.0	0.18	ug/l	80.0		101	85-115			
Cadmium	71.5	1.0	0.015	ug/l	80.0		89	85-115			
Copper	78.3	2.0	0.49	ug/l	80.0		98	85-115			
Lead	74.5	1.0	0.13	ug/l	80.0		93	85-115			
Matrix Spike Analyzed: 01/05/2005 (5A05052-MS1)						**Source: IOA0108-01**					
Antimony	89.8	2.0	0.18	ug/l	80.0	ND	112	70-130			
Cadmium	79.0	1.0	0.015	ug/l	80.0	0.038	99	70-130			
Copper	82.4	2.0	0.49	ug/l	80.0	3.7	98	70-130			
Lead	81.4	1.0	0.13	ug/l	80.0	0.74	101	70-130			
Matrix Spike Analyzed: 01/05/2005 (5A05052-MS2)						**Source: IOA0117-01**					
Antimony	90.8	2.0	0.18	ug/l	80.0	ND	114	70-130			
Cadmium	76.7	1.0	0.015	ug/l	80.0	ND	96	70-130			
Copper	73.3	2.0	0.49	ug/l	80.0	ND	92	70-130			
Lead	77.6	1.0	0.13	ug/l	80.0	ND	97	70-130			
Matrix Spike Dup Analyzed: 01/05/2005 (5A05052-MSD1)						**Source: IOA0108-01**					
Antimony	89.5	2.0	0.18	ug/l	80.0	ND	112	70-130	0	20	
Cadmium	80.5	1.0	0.015	ug/l	80.0	0.038	101	70-130	2	20	
Copper	84.3	2.0	0.49	ug/l	80.0	3.7	101	70-130	2	20	
Lead	83.3	1.0	0.13	ug/l	80.0	0.74	103	70-130	2	20	

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 008

Report Number: IOA0109

Sampled: 01/04/05
Received: 01/04/05

METHOD BLANK/QC DATA

METALS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A05061 Extracted: 01/05/05											
Blank Analyzed: 01/05/2005 (5A05061-BLK1)											
Mercury	ND	0.20	0.063	ug/l							
LCS Analyzed: 01/05/2005 (5A05061-BS1)											
Mercury	8.18	0.20	0.063	ug/l	8.00		102	85-115			
Matrix Spike Analyzed: 01/05/2005 (5A05061-MS1)						**Source: IOA0084-01**					
Mercury	7.81	0.20	0.063	ug/l	8.00	0.086	97	70-130			
Matrix Spike Dup Analyzed: 01/05/2005 (5A05061-MSD1)						**Source: IOA0084-01**					
Mercury	7.89	0.20	0.063	ug/l	8.00	0.086	98	70-130	1	20	

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 008

Report Number: IOA0109

Sampled: 01/04/05
Received: 01/04/05

METHOD BLANK/QC DATA

INORGANICS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A04042 Extracted: 01/04/05											
Blank Analyzed: 01/04/2005 (5A04042-BLK1)											
Chloride	ND	0.50	0.26	mg/l							
Nitrate/Nitrite-N	ND	0.26	0.072	mg/l							
Sulfate	ND	0.50	0.18	mg/l							
LCS Analyzed: 01/04/2005 (5A04042-BS1)											
Chloride	4.97	0.50	0.26	mg/l	5.00		99	90-110			
Sulfate	9.93	0.50	0.18	mg/l	10.0		99	90-110			
Matrix Spike Analyzed: 01/04/2005 (5A04042-MS1)						**Source: IOA0049-01**					
Chloride	5.60	0.50	0.26	mg/l	5.00	0.51	102	80-120			
Sulfate	10.4	0.50	0.18	mg/l	10.0	0.63	98	80-120			
Matrix Spike Dup Analyzed: 01/04/2005 (5A04042-MSD1)						**Source: IOA0049-01**					
Chloride	5.72	0.50	0.26	mg/l	5.00	0.51	104	80-120	2	20	
Sulfate	10.6	0.50	0.18	mg/l	10.0	0.63	100	80-120	2	20	
Batch: 5A05068 Extracted: 01/05/05											
Blank Analyzed: 01/05/2005 (5A05068-BLK1)											
Oil & Grease	ND	5.0	0.94	mg/l							
LCS Analyzed: 01/05/2005 (5A05068-BS1)											**M-NR1**
Oil & Grease	20.1	5.0	0.94	mg/l	20.0		100	65-120			
LCS Dup Analyzed: 01/05/2005 (5A05068-BSD1)											
Oil & Grease	21.1	5.0	0.94	mg/l	20.0		106	65-120	5	20	

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 008

Report Number: IOA0109

Sampled: 01/04/05
Received: 01/04/05

METHOD BLANK/QC DATA

INORGANICS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A05076 Extracted: 01/05/05											
Blank Analyzed: 01/05/2005 (5A05076-BLK1)											
Total Dissolved Solids	ND	10	10	mg/l							
LCS Analyzed: 01/05/2005 (5A05076-BS1)											
Total Dissolved Solids	1080	20	20	mg/l	1000		108	90-110			
Duplicate Analyzed: 01/05/2005 (5A05076-DUP1)						**Source: IOA0066-03**					
Total Dissolved Solids	230	10	10	mg/l		230			0	10	
Batch: 5A06055 Extracted: 01/06/05											
Blank Analyzed: 01/06/2005 (5A06055-BLK1)											
Perchlorate	ND	4.0	0.80	ug/l							
LCS Analyzed: 01/06/2005 (5A06055-BS1)											
Perchlorate	51.3	4.0	0.80	ug/l	50.0		103	85-115			
Matrix Spike Analyzed: 01/06/2005 (5A06055-MS1)						**Source: IOA0122-01**					
Perchlorate	54.1	4.0	0.80	ug/l	50.0	5.8	97	80-120			
Matrix Spike Dup Analyzed: 01/06/2005 (5A06055-MSD1)						**Source: IOA0122-01**					
Perchlorate	53.2	4.0	0.80	ug/l	50.0	5.8	95	80-120	2	20	

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Michele Harper
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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 008

Report Number: IOA0109

Sampled: 01/04/05
Received: 01/04/05

Compliance Check

The results obtained from the analytical testing of this data set were checked against compliance limits received from the client. Any results at or above the compliance limits appear in bold on this page.

LabNumber	Analysis	Analyte	Units	Result	MRL	Compliance Limit
IOA0109-01	413.1 Oil and Grease	Oil & Grease	mg/l	0	5.0	15
IOA0109-01	Chloride - 300.0	Chloride	mg/l	7.10	0.50	150
IOA0109-01	Nitrogen, NO3+NO2 -N	Nitrate/Nitrite-N	mg/l	4.60	0.26	8.00
IOA0109-01	Perchlorate 314.0	Perchlorate	ug/l	1.00	4.0	6.00
IOA0109-01	Sulfate-300.0	Sulfate	mg/l	6.20	0.50	300
IOA0109-01	TDS - SM 2540C	Total Dissolved Solids	mg/l	160	10	950

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 008

Report Number: IOA0109

Sampled: 01/04/05
Received: 01/04/05

DATA QUALIFIERS AND DEFINITIONS

J	Estimated value. Analyte detected at a level less than the Reporting Limit (RL) and greater than or equal to the Method Detection Limit (MDL). The user of this data should be aware that this data is of unknown quality.
M-NR1	There was no MS/MSD analyzed with this batch due to insufficient sample volume. See Blank Spike/Blank Spike Duplicate.
ND	Analyte NOT DETECTED at or above the reporting limit or MDL, if MDL is specified.
RPD	Relative Percent Difference

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 008

Report Number: IOA0109

Sampled: 01/04/05
Received: 01/04/05

Certification Summary

Del Mar Analytical, Irvine

Method	Matrix	Nelac	California
EPA 200.8	Water	X	X
EPA 245.1	Water	X	X
EPA 300.0	Water	X	X
EPA 314.0	Water	X	X
EPA 413.1	Water	X	X
SM2540C	Water	X	X

Nevada and NELAP provide analyte specific accreditations. Analyte specific information for Del Mar Analytical may be obtained by contacting the laboratory or visiting our website at www.dmalabs.com.

Subcontracted Laboratories

Pace Analytical, MN- SUB

1700 Elm Street, Ste 200 - Minneapolis, MN 55414

Analysis Performed: 1613-Dioxin-HR
Samples: IOA0109-01

Analysis Performed: EDD + Level 4
Samples: IOA0109-01

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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1OA0108

Del Mar Analytical Version 5 8/12/04 CHAIN OF CUSTODY FORM

Client Name/Address:	Project:
MWH-Pasadena 300 North Lake Avenue, Suite 1200 Pasadena, CA 91101	Boeing-SSFL NPDES **Routine Outfall 008** Stormwater at Happy Valley
Project Manager: Bronwyn Kelly Sampler: Pollock	Phone Number: (626) 568-6691 Fax Number: (626) 568-6515

Sample Description	Sample Matrix	Container Type	# of Cont.	Sampling Date/Time	Preservative	Bottle * #	Total Recoverable Metals: Sb, Cd, Cu, Pb, Hg	Oil & Grease (EPA 413.1)	Cl-, SO4, NO3+NO2-N, Perchlorate	TDS	TCDD (and all congeners)					Field readings: / Comments
Outfall 008	W	Poly-1L	1	1-4-05 0950	HNO3	1A	X									Temp = 50.7 pH= 7.1
Outfall 008-Dup	W	Poly-1L	1		HNO3	1B	X									
Outfall 008	W	Glass-Amber	2		HCl	3A, 3B		X								
Outfall 008	W	Poly-500 ml	2		None	4A, 4B			X							
Outfall 008	W	Poly-500 ml	2		None	5A, 5B				X						
Outfall 008	W	Glass-Amber	2		None	6A, 6B					X					

DLP

Relinquished By	Date/Time:	Received By	Date/Time:
[signature]	1-4-05 1510	[signature]	1/4/05 1510
[signature]	1/4/05 1830	[signature]	1/4/05 1830
Relinquished By	Date/Time:	Received By	Date/Time:

Turn around Time: (check)
24 Hours _____ 5 Days _____
48 Hours _____ 10 Days _____
72 Hours _____ Normal _____
Perchlorate Only 72 Hours_____
Metals Only 72 Hours_____
Sample Integrity: (Check)
Intact X On Ice: X 5°C

Del Mar Analytical

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2520 E. Sunset Rd. #3, Las Vegas, NV 89120 (702) 798-3620 FAX (702) 798-3621

February 3, 2005

MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, Ca.91101

Attention: Bronwyn Kelly

Project: Routine Outfall 008
Sampled: 01/04/05
Del Mar Analytical Number: IOA0109

Dear Ms. Kelly:

Pace Analytical performed Method 1613B analysis for the project referenced above. Please use the following cross-reference table when reviewing your results.

MWH ID	DEL MAR ID	Pace ID
Outfall 008	IOA0109-01	105775001

Attached is the original report from the subcontract laboratory. If you have any questions or require further assistance, please do not hesitate to contact me.

Sincerely yours,
DEL MAR ANALYTICAL

Michele Harper
Project Manager

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 1613B Analysis Results

Client - Del Mar Analytical

Client's Sample ID	IOA0109-01		
Lab Sample ID	105775001		
Filename	F50127B_12		
Injected By	MRO		
Total Amount Extracted	1020 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	01/04/2005
ICAL Date	11/29/2004	Received	01/06/2005
CCal Filename(s)	F50127A_13	Extracted	01/24/2005
Method Blank ID	BLANK-6202	Analyzed	01/28/2005 06:11

Native Isomers	Conc pg/L	EMPC pg/L	LOD pg/L		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	3.7		2,3,7,8-TCDF-13C	2.00	50
Total TCDF	ND	-----	3.7		2,3,7,8-TCDD-13C	2.00	65
					1,2,3,7,8-PeCDF-13C	2.00	82
2,3,7,8-TCDD	ND	-----	3.3		2,3,4,7,8-PeCDF-13C	2.00	80
Total TCDD	ND	-----	3.3		1,2,3,7,8-PeCDD-13C	2.00	94
					1,2,3,4,7,8-HxCDF-13C	2.00	75
1,2,3,7,8-PeCDF	ND	-----	1.8		1,2,3,6,7,8-HxCDF-13C	2.00	100
2,3,4,7,8-PeCDF	ND	-----	1.1		2,3,4,6,7,8-HxCDF-13C	2.00	91
Total PeCDF	ND	-----	1.4		1,2,3,7,8,9-HxCDF-13C	2.00	81
					1,2,3,4,7,8-HxCDD-13C	2.00	70
1,2,3,7,8-PeCDD	ND	-----	1.7		1,2,3,6,7,8-HxCDD-13C	2.00	95
Total PeCDD	ND	-----	1.7		1,2,3,4,6,7,8-HpCDF-13C	2.00	83
					1,2,3,4,7,8,9-HpCDF-13C	2.00	73
1,2,3,4,7,8-HxCDF	ND	-----	2.5		1,2,3,4,6,7,8-HpCDD-13C	2.00	94
1,2,3,6,7,8-HxCDF	ND	-----	1.6		OCDD-13C	4.00	88
2,3,4,6,7,8-HxCDF	ND	-----	1.5				
1,2,3,7,8,9-HxCDF	ND	-----	1.5		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	-----	1.8		1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	1.3		2,3,7,8-TCDD-37Cl4	0.20	62
1,2,3,6,7,8-HxCDD	ND	-----	1.6				
1,2,3,7,8,9-HxCDD	ND	-----	1.6				
Total HxCDD	ND	-----	1.5				
1,2,3,4,6,7,8-HpCDF	ND	-----	1.9				
1,2,3,4,7,8,9-HpCDF	ND	-----	2.1				
Total HpCDF	4.3	-----	2.0	J			
1,2,3,4,6,7,8-HpCDD	2.3	-----	1.7	BJ			
Total HpCDD	4.3	-----	1.7	BJ			
OCDF	6.8	-----	1.8	BJ			
OCDD	16.0	-----	2.5	BJ			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection. Totals are averages of individual isomer LODs.
D = Result obtained from analysis of diluted sample
B = Less than 10 times higher than method blank level
P = Recovery outside of method 1613 control limits
J = Concentration detected is below the calibration range
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....105775

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 1613B Blank Analysis Results

Client - Del Mar Analytical

Lab Sample ID	BLANK-6202	Matrix	Water
Filename	F50127A_06	Dilution	NA
Total Amount Extracted	982 mL	Extracted	01/24/2005
ICAL Date	11/29/2004	Analyzed	01/27/2005 14:13
CCal Filename(s)	F50127A_02	Injected By	MRO

Native Isomers	Conc pg/L	EMPC pg/L	LOD pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	4.7	2,3,7,8-TCDF-13C	2.00	33
Total TCDF	ND	-----	-----	2,3,7,8-TCDD-13C	2.00	45
				1,2,3,7,8-PeCDF-13C	2.00	68
2,3,7,8-TCDD	ND	-----	5.1	2,3,4,7,8-PeCDF-13C	2.00	70
Total TCDD	ND	-----	-----	1,2,3,7,8-PeCDD-13C	2.00	81
				1,2,3,4,7,8-HxCDF-13C	2.00	75
1,2,3,7,8-PeCDF	ND	-----	2.2	1,2,3,6,7,8-HxCDF-13C	2.00	95
2,3,4,7,8-PeCDF	ND	-----	1.5	2,3,4,6,7,8-HxCDF-13C	2.00	98
Total PeCDF	ND	-----	-----	1,2,3,7,8,9-HxCDF-13C	2.00	85
				1,2,3,4,7,8-HxCDD-13C	2.00	78
1,2,3,7,8-PeCDD	ND	-----	1.6	1,2,3,6,7,8-HxCDD-13C	2.00	94
Total PeCDD	ND	-----	-----	1,2,3,4,6,7,8-HpCDF-13C	2.00	85
				1,2,3,4,7,8,9-HpCDF-13C	2.00	78
1,2,3,4,7,8-HxCDF	ND	-----	1.6	1,2,3,4,6,7,8-HpCDD-13C	2.00	99
1,2,3,6,7,8-HxCDF	ND	-----	1.4	OCDD-13C	4.00	97
2,3,4,6,7,8-HxCDF	ND	-----	1.1			
1,2,3,7,8,9-HxCDF	ND	-----	1.6	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	-----	-----	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	1.6	2,3,7,8-TCDD-37Cl4	0.20	40
1,2,3,6,7,8-HxCDD	ND	-----	1.2			
1,2,3,7,8,9-HxCDD	ND	-----	1.7			
Total HxCDD	ND	-----	-----			
1,2,3,4,6,7,8-HpCDF	ND	-----	1.5			
1,2,3,4,7,8,9-HpCDF	ND	-----	1.4			
Total HpCDF	ND	-----	-----			
1,2,3,4,6,7,8-HpCDD	1.9	-----	1.3 J			
Total HpCDD	1.9	-----	----- J			
OCDF	8.3	-----	1.9 J			
OCDD	26.0	-----	2.3 J			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection. Totals are averages of individual isomer LODs.
A = Limit of Detection based on signal to noise
P = Recovery outside of method 1613 control limits
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....105645

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 1613B Laboratory Control Spike Results

Client - Del Mar Analytical

Lab Sample ID	LCS-6203		
Filename	F50127A_03	Matrix	Water
Total Amount Extracted	1030 mL	Dilution	NA
ICAL Date	11/29/2004	Extracted	01/24/2005
CCal Filename	F50127A_02	Analyzed	01/27/2005 11:44
Method Blank ID	BLANK-6202	Injected By	MRO

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDF	10	10.2	7.5	15.8	102
2,3,7,8-TCDD	10	9.0	6.7	15.8	90
1,2,3,7,8-PeCDF	50	50.1	40.0	67.0	100
2,3,4,7,8-PeCDF	50	48.4	34.0	80.0	97
1,2,3,7,8-PeCDD	50	43.4	35.0	71.0	87
1,2,3,4,7,8-HxCDF	50	44.8	36.0	67.0	90
1,2,3,6,7,8-HxCDF	50	48.0	42.0	65.0	96
2,3,4,6,7,8-HxCDF	50	48.6	35.0	78.0	97
1,2,3,7,8,9-HxCDF	50	46.4	39.0	65.0	93
1,2,3,4,7,8-HxCDD	50	50.0	35.0	82.0	100
1,2,3,6,7,8-HxCDD	50	51.7	38.0	67.0	103
1,2,3,7,8,9-HxCDD	50	48.5	32.0	81.0	97
1,2,3,4,6,7,8-HpCDF	50	51.4	41.0	61.0	103
1,2,3,4,7,8,9-HpCDF	50	52.3	39.0	69.0	105
1,2,3,4,6,7,8-HpCDD	50	43.4	35.0	70.0	87
OCDF	100	89.5	63.0	170.0	90
OCDD	100	96.9	78.0	144.0	97
2,3,7,8-TCDD-37Cl4	10	6.2	3.1	19.1	62
2,3,7,8-TCDF-13C	100	49.8	22.0	152.0	50
2,3,7,8-TCDD-13C	100	65.8	20.0	175.0	66
1,2,3,7,8-PeCDF-13C	100	75.7	21.0	192.0	76
2,3,4,7,8-PeCDF-13C	100	76.9	13.0	328.0	77
1,2,3,7,8-PeCDD-13C	100	93.4	21.0	227.0	93
1,2,3,4,7,8-HxCDF-13C	100	78.9	19.0	202.0	79
1,2,3,6,7,8-HxCDF-13C	100	89.8	21.0	159.0	90
2,3,4,6,7,8-HxCDF-13C	100	88.2	22.0	176.0	88
1,2,3,7,8,9-HxCDF-13C	100	81.5	17.0	205.0	81
1,2,3,4,7,8-HxCDD-13C	100	82.2	21.0	193.0	82
1,2,3,6,7,8-HxCDD-13C	100	95.2	25.0	163.0	95
1,2,3,4,6,7,8-HpCDF-13C	100	86.3	21.0	158.0	86
1,2,3,4,7,8,9-HpCDF-13C	100	75.6	20.0	186.0	76
1,2,3,4,6,7,8-HpCDD-13C	100	102.9	26.0	166.0	103
OCDD-13C	200	195.1	26.0	397.0	98

Cs = Concentration Spiked (ng/mL)
Cr = Concentration Recovered (ng/mL)
Rec. = Recovery (Expressed as Percent)
Control Limit Reference: Method 1613, Table 6, 10/94 Revision
X = Background subtracted value
P = Recovery outside of control limits
Nn = Value obtained from additional analysis
* = See Discussion

Report No.....105645

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 1613B Laboratory Control Spike Results

Client - Del Mar Analytical

Lab Sample ID	LCSD-6204		
Filename	F50127A_04	Matrix	Water
Total Amount Extracted	1000 mL	Dilution	NA
ICAL Date	11/29/2004	Extracted	01/24/2005
CCal Filename	F50127A_02	Analyzed	01/27/2005 12:32
Method Blank ID	BLANK-6202	Injected By	MRO

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDF	10	9.9	7.5	15.8	99
2,3,7,8-TCDD	10	8.8	6.7	15.8	88
1,2,3,7,8-PeCDF	50	49.8	40.0	67.0	100
2,3,4,7,8-PeCDF	50	47.6	34.0	80.0	95
1,2,3,7,8-PeCDD	50	41.4	35.0	71.0	83
1,2,3,4,7,8-HxCDF	50	46.6	36.0	67.0	93
1,2,3,6,7,8-HxCDF	50	44.0	42.0	65.0	88
2,3,4,6,7,8-HxCDF	50	47.2	35.0	78.0	94
1,2,3,7,8,9-HxCDF	50	44.8	39.0	65.0	90
1,2,3,4,7,8-HxCDD	50	46.5	35.0	82.0	93
1,2,3,6,7,8-HxCDD	50	48.9	38.0	67.0	98
1,2,3,7,8,9-HxCDD	50	46.7	32.0	81.0	93
1,2,3,4,6,7,8-HpCDF	50	48.7	41.0	61.0	97
1,2,3,4,7,8,9-HpCDF	50	49.9	39.0	69.0	100
1,2,3,4,6,7,8-HpCDD	50	42.7	35.0	70.0	85
OCDF	100	84.8	63.0	170.0	85
OCDD	100	92.5	78.0	144.0	92
2,3,7,8-TCDD-37Cl4	10	7.5	3.1	19.1	75
2,3,7,8-TCDF-13C	100	65.7	22.0	152.0	66
2,3,7,8-TCDD-13C	100	83.8	20.0	175.0	84
1,2,3,7,8-PeCDF-13C	100	84.9	21.0	192.0	85
2,3,4,7,8-PeCDF-13C	100	85.6	13.0	328.0	86
1,2,3,7,8-PeCDD-13C	100	105.3	21.0	227.0	105
1,2,3,4,7,8-HxCDF-13C	100	82.6	19.0	202.0	83
1,2,3,6,7,8-HxCDF-13C	100	96.7	21.0	159.0	97
2,3,4,6,7,8-HxCDF-13C	100	92.3	22.0	176.0	92
1,2,3,7,8,9-HxCDF-13C	100	84.5	17.0	205.0	84
1,2,3,4,7,8-HxCDD-13C	100	81.9	21.0	193.0	82
1,2,3,6,7,8-HxCDD-13C	100	102.0	25.0	163.0	102
1,2,3,4,6,7,8-HpCDF-13C	100	90.1	21.0	158.0	90
1,2,3,4,7,8,9-HpCDF-13C	100	78.6	20.0	186.0	79
1,2,3,4,6,7,8-HpCDD-13C	100	106.1	26.0	166.0	106
OCDD-13C	200	196.4	26.0	397.0	98

Cs = Concentration Spiked (ng/mL)
Cr = Concentration Recovered (ng/mL)
Rec. = Recovery (Expressed as Percent)
Control Limit Reference: Method 1613, Table 6, 10/94 Revision
X = Background subtracted value
P = Recovery outside of control limits
Nn = Value obtained from additional analysis
* = See Discussion

Report No.....105645

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, Inc.
1700 Elm Street
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444

SPIKE RECOVERY RELATIVE PERCENT DIFFERENCE (RPD) RESULTS

Client..... Del Mar Analytical

SPIKE 1 ID..... LCS-6203
SPIKE 1 Filename..... F50127A_03
SPIKE 2 ID..... LCSD-6204
SPIKE 2 Filename..... F50127A_04

COMPOUND	SPIKE 1 REC,%	SPIKE 2 REC,%	RPD,%
2378-TCDF	102	99	3.0
2378-TCDD	90	88	2.2
12378-PeCDF	100	100	0.0
23478-PeCDF	97	95	2.1
12378-PeCDD	87	83	4.7
123478-HxCDF	90	93	3.3
123678-HxCDF	96	88	8.7
234678-HxCDF	97	94	3.1
123789-HxCDF	93	90	3.3
123478-HxCDD	100	93	7.3
123678-HxCDD	103	98	5.0
123789-HxCDD	97	93	4.2
1234678-HpCDF	103	97	6.0
1234789-HpCDF	105	100	4.9
1234678-HpCDD	87	85	2.3
OCDF	90	85	5.7
OCDD	97	92	5.3

REC = Percent Recovered
RPD = The difference between the two values divided by the average.
NA = Not Applicable

Report No..... 105645

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TABLE 1. 2,3,7,8-TCDD Equivalency Factors (TEFs) for the Polychlorinated Dibenzo-p-dioxins and Dibenzofurans

Number	Compound(s)	TEF
1	2,3,7,8-TCDD	1.00
2	1,2,3,7,8-PeCDD	0.50
3	1,2,3,6,7,8-HxCDD	0.1
4	1,2,3,7,8,9-HxCDD	0.1
5	1,2,3,4,7,8-HxCDD	0.1
6	1,2,3,4,6,7,8-HpCDD	0.01
7	OCDD	0.001
8	* Total - TCDD	0.0
9	* Total - PeCDD	0.0
10	* Total - HxCDD	0.0
11	* Total - HpCDD	0.0
12	2,3,7,8-TCDF	0.10
13	1,2,3,7,8-PeCDF	0.05
14	2,3,4,7,8-PeCDF	0.5
15	1,2,3,6,7,8-HxCDF	0.1
16	1,2,3,7,8,9-HxCDF	0.1
17	1,2,3,4,7,8-HxCDF	0.1
18	2,3,4,6,7,8-HxCDF	0.1
19	1,2,3,4,6,7,8-HpCDF	0.01
20	1,2,3,4,7,8,9-HpCDF	0.01
21	OCDF	0.001
22	* Total - TCDF	0.0
23	* Total - PeCDF	0.0
24	* Total - HxCDF	0.0
25	* Total - HpCDF	0.0

*Excluding the 2,3,7,8-substituted congeners.

Reference: 1989 ITEFs

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9830 South 51st Street, Suite B-120, Phoenix, AZ 85044 Ph (480) 785-0043 Fax (480) 785-0851
2520 E. Sunset Rd., Suite #3, Las Vegas, NV 89120 Ph (702) 798-3620 Fax (702) 798-3621

SUBCONTRACT ORDER - PROJECT # IOA0109 105775

SENDING LABORATORY:

Del Mar Analytical, Irvine
17461 Derian Avenue. Suite 100
Irvine, CA 92614
Phone: (949) 261-1022
Fax: (949) 261-1228
Project Manager: Michele Harper

RECEIVING LABORATORY:

Pace Analytical, MN- SUB
1700 Elm Street, Ste 200
Minneapolis, MN 55414
Phone :(612) 607-1700
Fax: (612) 607-6444

Standard TAT is requested unless specific due date is requested => Due Date:_____ Initials:_____

Analysis	Expiration	Comments
Sample ID: IOA0109-01 Water	**Sampled: 01/04/05 09:50**	**Instant Nofication** 105775001
1613-Dioxin-HR	01/11/05 09:50	J flags, 17 congeners, no TEQ, sub to Pace-MN

Containers Supplied:
1 L Amber (IOA0109-01C)
1 L Amber (IOA0109-01D)

SAMPLE INTEGRITY:

All containers intact: ☐ Yes ☐ No Sample labels/COC agree: ☐ Yes ☐ No Samples Received On Ice:: ☒ Yes ☐ No
Custody Seals Present: ☐ Yes ☐ No Samples Preserved Properly: ☐ Yes ☐ No Samples Received at (temp): 0

Released By	Date	Time	Received By	Date	Time
	1-5-05	1700	Bright Flexu	1/6/05	9:25
Released By	Date	Time	Received By	Date	Time

Del Mar Analytical

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LABORATORY REPORT

Prepared For: MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project: Routine Outfall 008

Sampled: 01/08/05
Received: 01/08/05
Issued: 01/10/05 18:09

NELAP #01108CA CA ELAP #1197 CSDLAC #10117

The results listed within this Laboratory Report pertain only to the samples tested in the laboratory. The analyses contained in this report were performed in accordance with the applicable certifications as noted. All soil samples are reported on a wet weight basis unless otherwise noted in the report. This Laboratory Report is confidential and is intended for the sole use of Del Mar Analytical and its client. This report shall not be reproduced, except in full, without written permission from Del Mar Analytical. The Chain of Custody, 1 page, is included and is an integral part of this report.

This entire report was reviewed and approved for release.

SAMPLE CROSS REFERENCE

LABORATORY ID	CLIENT ID	MATRIX
IOA0426-01	Outfall 008	Water

Reviewed By:

Michele Harper

Del Mar Analytical, Irvine
Michele Harper
Project Manager

Del Mar Analytical

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 008
Report Number: IOA0426

Sampled: 01/08/05
Received: 01/08/05

INORGANICS

Analyte	Method	Batch	MDL Limit	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA0426-01 (Outfall 008 - Water)									
Reporting Units: mg/l									
Perchlorate	EPA 314.0	5A10034	0.00080	0.0040	**0.00091**	1	01/10/05	01/10/05	J

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 008

Report Number: IOA0426

Sampled: 01/08/05
Received: 01/08/05

METHOD BLANK/QC DATA

INORGANICS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A10034 Extracted: 01/10/05											
Blank Analyzed: 01/10/2005 (5A10034-BLK1)											
Perchlorate	ND	0.0040	0.00080	mg/l							
LCS Analyzed: 01/10/2005 (5A10034-BS1)											
Perchlorate	0.0511	0.0040	0.00080	mg/l	0.0500		102	85-115			
Matrix Spike Analyzed: 01/10/2005 (5A10034-MS1)						**Source: IOA0329-02**					
Perchlorate	0.0558	0.0040	0.00080	mg/l	0.0500	0.0016	108	80-120			
Matrix Spike Dup Analyzed: 01/10/2005 (5A10034-MSD1)						**Source: IOA0329-02**					
Perchlorate	0.0540	0.0040	0.00080	mg/l	0.0500	0.0016	105	80-120	3	20	

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Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 008

Report Number: IOA0426

Sampled: 01/08/05
Received: 01/08/05

Compliance Check

The results obtained from the analytical testing of this data set were checked against compliance limits received from the client. Any results at or above the compliance limits appear in bold on this page.

LabNumber	Analysis	Analyte	Units	Result	MRL	Compliance Limit
IOA0426-01	Perchlorate 314.0	Perchlorate	mg/l	0.00091	0.0040	0.0060

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 008

Report Number: IOA0426

Sampled: 01/08/05
Received: 01/08/05

DATA QUALIFIERS AND DEFINITIONS

J Estimated value. Analyte detected at a level less than the Reporting Limit (RL) and greater than or equal to the Method Detection Limit (MDL). The user of this data should be aware that this data is of unknown quality.

ND Analyte NOT DETECTED at or above the reporting limit or MDL, if MDL is specified.

RPD Relative Percent Difference

Del Mar Analytical, Irvine
Michele Harper
Project Manager

The results pertain only to the samples tested in the laboratory. This report shall not be reproduced, except in full, without written permission from Del Mar Analytical.

Del Mar Analytical

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9830 South 51st St., Suite B-120, Phoenix, AZ 85044 (480) 785-0043 FAX (480) 785-0851
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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 008

Report Number: IOA0426

Sampled: 01/08/05
Received: 01/08/05

Certification Summary

Del Mar Analytical, Irvine

Method	Matrix	NELAP	CA
EPA 314.0	Water	N/A	X

NV and NELAP provide analyte specific accreditations. Analyte specific information for Del Mar Analytical may be obtained by contacting the laboratory or visiting our website at www.dmalabs.com.

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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2520 E. Sunset Rd. #3, Las Vegas, NV 89120 (702) 798-3620 FAX (702) 798-3621

CHAIN OF CUSTODY FORM

Client Name/Address: MWH
BOEING ROCKETDYNE

P.O. #:

Project: NPDES Permitting and Compliance

Project Manager/Phone Number: Glenn Jaffe/ Bronwyn Kelly

Phone Number:

Sampler: Pat Pollock

Fax Number:

ANALYSIS REQUIRED

Sample Description	Sample Matrix	Container Type	# of Containers	Sampling Date/Time	Preservation	Perchlorate	Special Instructions
Outfall 008	W	500ml poly	1	1-8-05 1055	NA	X	10A0426

DBP

Relinquished By	Date/Time:	Received By	Date/Time:
[signature]	1-8-05/1340		
Relinquished By	Date/Time:	Received By	Date/Time:
Relinquished By	Date/Time:	Received By [signature]	Date/Time: 1/8/05 13:40

Turnaround Time: (check)
Same Day ____ 72 Hours ____
24 Hours X 5 days ____
48 hours ____ normal ____
Sample Integrity: (Check)
Intact X On Ice: 7°C

CONTRACT COMPLIANCE SCREENING FORM FOR HARDCOPY DATA

AMEC Earth & Environmental
550 South Wadsworth Boulevard
Suite 500
Lakewood, CO 80226

Package ID T711DF22
Task Order 313150010
SDG No. Multiple
No. of Analyses 9

Laboratory Pace
Reviewer K. Shadowlight
Analysis/Method Dioxins

Date: February 18, 2005
Reviewer's Signature K Shadowlight

ACTION ITEMS[a]	
1. **Case Narrative Deficiencies**	
2. **Out of Scope Analyses**	
3. **Analyses Not Conducted**	
4. **Missing Hardcopy Deliverables**	
5. **Incorrect Hardcopy Deliverables**	
6. **Deviations from Analysis Protocol, e.g.,**	Qualifications were assigned for the following:
Holding Times	* Method blank contamination
GC/MS Tune/Inst. Performance	* EMPCs
Calibration	* Detects below the lower method calibration level
Method blanks	
Surrogates	
Matrix Spike/Dup LCS	
Field QC	
Internal Standard Performance	
Compound Identification and Quantitation	
System Performance	
COMMENTS[b]	

[a] Subcontracted analytical laboratory is not meeting contract and/or method requirements.
[b] Differences in protocol have been adopted by the laboratory but no action against the laboratory is required.

DATA VALIDATION REPORT

NPDES
Monitoring

ANALYSIS: DIOXINS/FURANS

SAMPLE DELIVERY GROUPS: Multiple SDGs

Prepared by

AMEC—Denver Operations
550 South Wadsworth Boulevard, Suite 500
Lakewood, Colorado 80226

1. INTRODUCTION

Task Order Title:	NPDES Monitoring
Contract Task Order #:	313150010
Sample Delivery Group #:	Multiple
Project Manager:	B. McIlvaine
Matrix:	Water
Analysis:	Dioxins/Furans
QC Level:	Level IV
No. of Samples:	9
No. of Reanalyses/Dilutions:	0
Reviewer:	K. Shadowlight
Date of Review:	February 18, 2005

The samples listed in Table 1 were validated based on the guidelines outlined in the *AMEC Data Validation Procedure for Dioxins and Furans (DVP-19, Rev. 1), EPA Method 1613, and the National National Functional Guidelines For Chlorinated Dioxin/Furan Data Review* (8/02). Any deviations from these procedures and guidelines are documented herein. Qualifiers were applied in cases where the data did not meet the required QC criteria or where special consideration by the data user is required. Data qualifiers were placed on Form Is with the associated qualification codes. Analytes that were rejected for any reason are denoted on the Form I as having only the "R" data qualifier and associated qualification code(s) denoting the reason for rejection. Any additional problems with the data that may have resulted in an estimated value were not denoted by a qualification code since the data had already been rejected.

Table 1. Sample Identification

Client ID	Laboratory ID (Del Mar)	Laboratory ID (Pace)	Matrix	COC Method
Outfall 001	IOA0551-01	106124001	water	1613
Outfall 002	IOA0550-01	106130001	water	1613
Outfall 007	IOA0556-01	106128001	water	1613
Outfall 008	IOA0553-01	106126001	water	1613
Outfall 009	IOA0554-01	106131001	water	1613
Outfall 010	IOA0555-01	106127001	water	1613
Outfall 011	IOA0549-01	106132001	water	1613
Outfall 011	IOA0567-01	106135001	water	1613
Outfall 018	IOA0552-01	106125001	water	1613

2. DATA VALIDATION FINDINGS

2.1 SAMPLE MANAGEMENT

Following are findings associated with sample management:

2.1.1 Sample Preservation, Handling, and Transport

The samples in these SDGs were received at Del Mar Analytical within the temperature limits of 4°C ±2°C. The samples were subcontracted to Pace Analytical for the dioxin/furan analyses. The samples in these SDGs were received at Pace Analytical Services within the temperature limits of 4°C ±2°C. The samples were received in good condition at both laboratories. No qualifications were required.

2.1.2 Chain of Custody

The COCs and transfer COCs were signed by the appropriate field and laboratory personnel. The samples and analyses were accounted for on both the original COCs and transfer COCs. As the samples were couriered directly to the laboratory (Del Mar Analytical), custody seals were not required. There was no information regarding custody seals upon receipt at Pace. No qualifications were required.

2.1.3 Holding Times

The samples were extracted and analyzed within a year of collection. No qualifications were required.

2.2 INSTRUMENT PERFORMANCE

Following are findings associated with instrument performance:

2.2.1 GC Column Performance

A column performance standard was combined with the daily calibration verification and analyzed at the beginning of each analytical sequence. The GC column performance was acceptable with the chromatographic separation of 2,3,7,8-TCDD and other TCDD isomers resolved with a valley of ≤25%. No qualifications were required.

2.2.2 Mass Spectrometer Performance

The mass spectrometer performance could not be evaluated as the laboratory did not provide selected ion current profiles for the lock-mass ions. No qualifications were required.

2.3 CALIBRATION

2.3.1 Initial Calibration

There was one initial calibration, analyzed 11/29/04 on Instrument 10MSHR05. The calibration consisted of five concentration level standards (CS1 through CS5) analyzed to verify instrument linearity. The initial calibration was acceptable with %RSDs ≤20% for the 15 native compounds (calibration by isotope dilution) and ≤35% for the 2 native and all labeled compounds (calibration by internal standard). The relative retention times and ion abundance ratios were within the QC limits listed in Method 1613 for all standards. A representative number of %RSDs were verified from the raw data, and no calculation or transcription errors were noted. No qualifications were required.

2.3.2 Continuing Calibration

Calibration verification (VER) consisted of a mid-level standard (CS3) analyzed at the beginning of each analytical sequence. The VER was acceptable with the concentrations within the acceptance criteria listed in the Table 6 of the EPA Method 1613. The ion abundance ratios and relative retention times were within the method QC limits. A representative number of %Ds were verified from the raw data, and no calculation or transcription errors were noted. No qualifications were required.

2.4 BLANKS

One method blank (Blank-6220) was extracted and analyzed with the samples in these SDGs. Target compounds total HpCDF, 1,2,3,4,6,7,8-HpCDF, total HpCDF, OCDF, and OCDD were reported in the method blank. Any detects for the aforementioned target compounds reported at concentrations <5× the concentrations reported in the method blank were qualified as estimated nondetects "UJ," at the levels of interference in the samples of these SDGs. A review of the method blank raw data and chromatograms indicated no false negatives or false positives. No further qualifications were required.

2.5 BLANK SPIKES AND LABORATORY CONTROL SAMPLES

One LCS/LCSD pair (LCS-6221/LCSD-6222) was extracted and analyzed with the samples in these SDGs. All recoveries were within the acceptance criteria listed in Table 6 of the Method 1613. There are no method QC limits established for RPDs. The reported RPDs were within ±20%. No qualifications were required.

2.6 MATRIX SPIKE/MATRIX SPIKE DUPLICATE

MS/MSD analyses were not performed in these SDGs. Evaluation of method accuracy and precision was based on the LCS/LCSD results. No qualifications were required.

2.7 FIELD QC SAMPLES

Following are findings associated with field QC:

2.7.1 Field Blanks and Equipment Rinsates

The samples in these SDGs had no associated field QC samples. No qualifications were required.

2.7.2 Field Duplicates

No field duplicate samples were identified for these SDGs.

2.8 INTERNAL STANDARDS

The labeled standard recoveries were within the acceptance criteria listed in Table 7 of Method 1613. No qualifications were required.

2.9 COMPOUND IDENTIFICATION

The laboratory analyzed for polychlorinated dioxins/furans by EPA Method 1613. The compound identifications were verified from the raw data and no false negatives or positives were noted. No qualifications were required.

2.10 COMPOUND QUANTIFICATION AND REPORTED DETECTION LIMITS

Compound quantitation was verified from the raw data. The laboratory calculated and reported compound-specific detection limits. Any detects below the lower method calibration limit (MCL) were qualified as estimated, "J." Any reported EMPC was qualified as an estimated nondetect, "UJ." No further qualifications were required.

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 1613B Analysis Results

Client - Del Mar Analytical

Client's Sample ID	IOA0553-01 outfall 002		
Lab Sample ID	106126001		
Filename	F50129B_09		
Injected By	BAL		
Total Amount Extracted	1010 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	01/11/2005
ICAL Date	11/29/2004	Received	01/13/2005
CCal Filename(s)	F50129B_02	Extracted	01/28/2005
Method Blank ID	BLANK-6220	Analyzed	01/30/2005 02:18

Native Isomers	Conc pg/L	EMPC pg/L	LOD pg/L		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	0.98		2,3,7,8-TCDF-13C	2.00	68
Total TCDF	1.30	-----	0.98	J	2,3,7,8-TCDD-13C	2.00	85
					1,2,3,7,8-PeCDF-13C	2.00	75
2,3,7,8-TCDD	ND	-----	0.96		2,3,4,7,8-PeCDF-13C	2.00	79
Total TCDD	ND	-----	0.96		1,2,3,7,8-PeCDD-13C	2.00	95
					1,2,3,4,7,8-HxCDF-13C	2.00	76
1,2,3,7,8-PeCDF	ND	-----	1.20		1,2,3,6,7,8-HxCDF-13C	2.00	95
2,3,4,7,8-PeCDF	ND	-----	0.86		2,3,4,6,7,8-HxCDF-13C	2.00	86
Total PeCDF	ND	-----	1.10		1,2,3,7,8,9-HxCDF-13C	2.00	79
					1,2,3,4,7,8-HxCDD-13C	2.00	75
1,2,3,7,8-PeCDD	ND	-----	0.78		1,2,3,6,7,8-HxCDD-13C	2.00	95
Total PeCDD	ND	-----	0.78		1,2,3,4,6,7,8-HpCDF-13C	2.00	84
					1,2,3,4,7,8,9-HpCDF-13C	2.00	72
1,2,3,4,7,8-HxCDF	ND	-----	0.80		1,2,3,4,6,7,8-HpCDD-13C	2.00	93
1,2,3,6,7,8-HxCDF	ND	-----	0.74		OCDD-13C	4.00	80
2,3,4,6,7,8-HxCDF	ND	-----	0.81				
1,2,3,7,8,9-HxCDF	ND	-----	1.00		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	0.95	-----	0.84	J	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	0.79		2,3,7,8-TCDD-37Cl4	0.20	84
1,2,3,6,7,8-HxCDD	ND	-----	0.94				
1,2,3,7,8,9-HxCDD	ND	-----	0.93				
Total HxCDD	ND	-----	0.89				
1,2,3,4,6,7,8-HpCDF	ND	-----	1.30				
1,2,3,4,7,8,9-HpCDF	ND	-----	1.20				
Total HpCDF	ND	-----	1.20				
1,2,3,4,6,7,8-HpCDD	2.20	-----	1.30	BJ			
Total HpCDD	4.40	-----	1.30	BJ			
OCDF	5.20	-----	1.50	BJ			
OCDD	18.00	-----	2.50	BJ			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection. Totals are averages of individual isomer LODs.
D = Result obtained from analysis of diluted sample
B = Less than 10 times higher than method blank level
P = Recovery outside of method 1613 control limits
J = Concentration detected is below the calibration range
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....106126

REPORT OF LABORATORY ANALYSIS

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CONTRACT COMPLIANCE SCREENING FORM FOR HARDCOPY DATA

AMEC Earth & Environmental
550 South Wadsworth Boulevard
Suite 500
Lakewood, CO 80226

Package ID T711MT30
Task Order 313150010
SDG No. IOA0554, IOA0553
No. of Analyses 2

Laboratory Del Mar Analytical
Reviewer K. Okonzak
Analysis/Method Metals

Date: 2/24/05
Reviewer's Signature

ACTION ITEMS[a]	
1. **Case Narrative Deficiencies**	
2. **Out of Scope Analyses**	
3. **Analyses Not Conducted**	
4. **Missing Hardcopy Deliverables**	
5. **Incorrect Hardcopy Deliverables**	
6. **Deviations from Analysis Protocol, e.g.,**	Qualifications applied for:
Holding Times	Detects below the reporting limit were qualfieid as estimated, "J."
GC/MS Tune/Inst. Perform	The Sb MDL was raised to 2.0 ug/L and the Sb nondetects were qualified as estimated "UJ," due to the CRDL standard and bracketing CCB results.
Calibrations	
Blanks	
Surrogates	
Matrix Spike/Dup LCS	
Field QC	
Internal Standard Performance	
Compound Identification and Quantitation	
System Performance	

COMMENTS[b]	

[a] Subcontracted analytical laboratory is not meeting contract and/or method requirements.
[b] Differences in protocol have been adopted by the laboratory but no action against the laboratory is required.

Data Qualifier Reference Table

Qualifier	Organics	Inorganics
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.	The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.	The associated value is an estimated quantity.
N	The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification."	Not applicable.
NJ	The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.	Not applicable.
UJ	The analyte was not deemed above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.	The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.
R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and to meet quality control criteria. The presence or absence of the analyte cannot be verified.	The data are unusable. (Note: Analyte may or may not be present).

Qualification Code Reference Table

Qualifier	Organics	Inorganics
H	Holding times were exceeded.	Holding times were exceeded.
S	Surrogate recovery was outside QC limits.	The sequence or number of standards used for the calibration was incorrect
C	Calibration %RSD or %D were noncompliant.	Correlation coefficient is <0.995.
R	Calibration RRF was <0.05.	%R for calibration is not within control limits.
B	Presumed contamination from preparation (method) blank.	Presumed contamination from preparation (method) or calibration blank.
L	Laboratory Blank Spike/Blank Spike Duplicate %R was not within control limits.	Laboratory Control Sample %R was not within control limits.
Q	MS/MSD recovery was poor or RPD high.	MS recovery was poor.
E	Not applicable.	Duplicates showed poor agreement.
I	Internal standard performance was unsatisfactory.	ICP ICS results were unsatisfactory.
A	Not applicable.	ICP Serial Dilution %D were not within control limits.
M	Tuning (BFB or DFTPP) was noncompliant.	Not applicable.
T	Presumed contamination from trip blank.	Not applicable.
+	False positive – reported compound was not present. Not applicable.	
-	False negative – compound was present but not reported.	Not applicable.
F	Presumed contamination from FB, or ER.	Presumed contamination from FB or ER.
$	Reported result or other information was incorrect.	Reported result or other information was incorrect.
?	TIC identity or reported retention time has been changed.	Not applicable.
D	The analysis with this flag should not be used because another more technically sound analysis is available.	The analysis with this flag should not be used because another more technically sound analysis is available.
P	Instrument performance for pesticides was poor.	Post Digestion Spike recovery was not within control limits.
DNQ	The compound was detected between the MDL and the RL and, by definition, is considered an estimated value.	The compound was detected between the MDL and the RL and, by definition, is considered an estimated value.

*#	Unusual problems found with the data that have been described in Section 2.#, "Data Validation Findings." The number following the asterisk (*) will indicate the subsection where a description of the problem can be found (eg. *1 would indicate a sample was not within temperature limits).	Unusual problems found with the data that have been described in Section 2.#, "Data Validation Findings." The number following the asterisk (*) will indicate the subsection where a description of the problem can be found (eg. *1 would indicate a sample was not within temperature limits).

DATA VALIDATION REPORT

NPDES
Monitoring

ANALYSIS: METALS

SAMPLE DELIVERY GROUPS: IOA0554, IOA0553

Prepared by

AMEC—Denver Operations
550 South Wadsworth Boulevard, Suite 500
Lakewood, Colorado 80226

1. INTRODUCTION

Task Order Title:	NPDES Monitoring
Contract Task Order #:	313150010
SDG#:	IOA0554, IOA0553
Project Manager:	B. McIlvaine
Matrix:	Water
Analysis:	Metals
QC Level:	Level IV
No. of Samples:	2
No. of Reanalyses/Dilutions:	0
Reviewer:	K. Okonzak-Lowry
Date of Review:	February 24, 2005

The samples listed in Table 1 were validated based on the guidelines outlined in the *AMEC Data Validation Procedure for Levels III and IV ICP-MS Metals, (DVP-5-A, Rev.0), AMEC Data Validation Procedure for Levels III and IV ICP Metals* (DVP-5, Rev. 0), SW-846 *Method 6020B for Inductively Coupled Plasma – Mass Spectrometry*, SW-846 *Method 6010B for Inductively Coupled Plasma* , SW-846 *Method 7471A for Mercury (Manual Cold-Vapor Technique)*, and validation guidelines outlined in the USEPA CLP *National Functional Guidelines for Inorganic Data Review* (2/94). Any deviations from these procedures and guidelines are documented herein. Qualifiers were applied in cases where the data did not meet the required QC criteria or where special consideration by the data user is required. Data qualifiers were placed on Form Is with the associated qualification codes. Analytes that were rejected for any reason are denoted on the Form I as having only the "R" data qualifier and associated qualification code(s) denoting the reason for rejection. Any additional problems with the data that may have resulted in an estimated value were not denoted by a qualification code since the data had already been rejected.

Table 1. Sample identification

Client ID	EPA ID	Laboratory ID	Matrix	COC Method
Outfall 008	Outfall 008	IOA0553-01	water	ILM04
Outfall 009	Outfall 009	IOA0554-01	water	ILM04

2. DATA VALIDATION FINDINGS

2.1 SAMPLE MANAGEMENT

Following are findings associated with sample management:

2.1.1 Sample Preservation, Handling, and Transport

The samples in these SDGs were received at the laboratory within the temperature limits of 4°C ±2°C. No sample preservation, handling, or transport problems were noted, and no qualifications were necessary.

2.1.2 Chain of Custody

The COCs were signed and dated by field and laboratory personnel. The COCs listed duplicate samples for both samples; however, duplicate analyses were not required. No sample qualifications were required.

2.1.3 Holding Times

The dates of collection recorded on the COCs and the dates of analyses recorded in the raw data, documented that the sample analyses were performed within the specified holding times of six months for the ICP/MS metals and 28 days for mercury. No qualifications were required.

2.2 ICP-MS TUNING

A precalibration routine must be completed prior to calibrating the instrument, which consists of analyzing a tuning solution to verify resolution, mass calibration, and thermal stability. The solution must be analyzed a minimum of five times and must contain isotopes representing all mass regions of interest. The laboratory performed the required tune solution analyses but did not report %RSDs. The laboratory SOP states that to be acceptable, the %RSD must be less than 5%. The mass calibrations were within 0.1 amu of the true mass and the instrument resolutions were less than 0.75 amu at 5 percent peak height for all analytes in the tune solution. No site sample qualifications were required.

2.3 CALIBRATION

The ICV and CCV results showed acceptable recoveries, 90-110% for the ICP/MS and 80-120% for Hg. The applicable reporting limit check standards were recovered within the AMEC control limits of 70-130%, with the exception of the antimony 0.2 µg/L standard which was not detected for antimony (MDL of 0.18 µg/L). The antimony 1.0 µg/L standard was recovered at 84.4%, but its result of 0.84442 µg/L was equivalent to the bracketing CCB antimony values of 0.81128 and 0.81093 µg/L, respectively. Therefore, it was determined that the laboratory was not able to detect antimony at the 1.0 µg/L level, and the antimony method detection limit for samples Outfall 008 and Outfall 009 was raised to 2.0 µg/L. No qualifications were required.

2.4 BLANKS

The method blanks and bracketing ICBs/CCBs associated with the samples in these SDGs were nondetected at the laboratory's MDLs, with the exception of the CCB results for antimony which were found at above the MDL at 0.81128 and 0.81093 µg/L, respectively. The antimony method detection limit for samples Outfall 008 and Outfall 009 was raised to 2.0 µg/L, and the sample nondetects were qualified as estimated, "UJ." No further qualifications were required.

2.5 ICP INTERFERENCE CHECK SAMPLE (ICS A/AB)

No ICPMS interference check samples were analyzed in association with the samples in these SDGs; therefore, no assessment was made with respect to this criterion.

2.6 BLANK SPIKES AND LABORATORY CONTROL SAMPLES

The ICP/MS LCS sample was identified as 5A12054-BS1, and the Hg LCS sample was identified as 5A12047-BS1. The LCS results on the summary forms and in the raw data were within the laboratory-established ICP/MS and Hg control limits of 85-115%. No qualifications were required.

2.7 LABORATORY DUPLICATES

No MS/MSD or duplicate analyses were performed in association with the samples in these SDGs; therefore, no assessment was made with respect to this criterion.

2.8 MATRIX SPIKE

No MS/MSD analyses were performed in association with the samples in these SDGs; therefore, no assessment was made with respect to this criterion. Method accuracy was evaluated based on LCS results.

2.9 FURNACE ATOMIC ABSORPTION QC

Furnace atomic absorption was not utilized for the analysis of these samples; therefore, furnace atomic absorption QC is not applicable.

2.10 ICP/MS SERIAL DILUTION

No serial dilution analysis was performed in association with the samples in these SDGs; therefore, no assessment was made with respect to this criterion.

2.11 INTERNAL STANDARDS PERFORMANCE

The ICP-MS internal standard recoveries for the site samples and associated QC sample analyses were within the 60-125% control limits and no qualifications were required.

2.12 SAMPLE RESULT VERIFICATION

A Level IV review was performed for the samples in these data packages. Calculations were verified, and the sample results reported on the Form Is were verified against the raw data. No transcription errors or calculation errors were noted. Analytes detected below the reporting limit were qualified as estimated, "J." The antimony method detection limit for samples Outfall 008 and Outfall 009 was raised to 2.0 µg/L due to the antimony results for the reporting limit check standards and the bracketing CCBs. No further qualifications were required.

2.13 FIELD QC SAMPLES

Field QC samples are evaluated, and if necessary, qualified based only on laboratory blanks. Any remaining detects are used to evaluate the associated samples.

2.13.1 Field Blanks and Equipment Rinsates

The samples in these SDGs had no associated field QC samples. No qualifications were required.

2.13.2 Field Duplicates

There were no field duplicate analyses performed in association with the site samples.

Del Mar Analytical

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 008

Report Number: IOA0553

Sampled: 01/11/05
Received: 01/11/05

DRAFT: METALS

Analyte	Method	Batch	MDL	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Rev Qual	Data Qual	Qual Code
Sample ID: IOA0553-01 (DRAFT: Outfall 008 - Water)											
Reporting Units: ug/l											
Antimony	EPA 200.8	5A12054	~~0.18~~ 2.0	2.0	ND	1	01/12/05	01/12/05	UJ		S,B,*3
Cadmium	EPA 200.8	5A12054	0.015	1.0	0.032	1	01/12/05	01/12/05	J	J	DNQ
Copper	EPA 200.8	5A12054	0.49	2.0	2.6	1	01/12/05	01/12/05			
Lead	EPA 200.8	5A12054	0.13	1.0	0.82	1	01/12/05	01/12/05	J	J	DNQ
Mercury	EPA 245.1	5A12047	0.063	0.20	0.12	1	01/12/05	01/12/05	J	J	DNQ

KM 2/24/05

AMEC VALIDATED

LEVEL IV

DRAFT REPORT
DRAFT REPORT
DATA SUBJECT TO CHANGE

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LABORATORY REPORT

Prepared For: MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project: Routine Outfall 008

Sampled: 01/11/05
Received: 01/11/05
Issued: 02/28/05 17:27

NELAP #01108CA California ELAP#1197 CSDLAC #10117

The results listed within this Laboratory Report pertain only to the samples tested in the laboratory. The analyses contained in this report were performed in accordance with the applicable certifications as noted. All soil samples are reported on a wet weight basis unless otherwise noted in the report. This Laboratory Report is confidential and is intended for the sole use of Del Mar Analytical and its client. This report shall not be reproduced, except in full, without written permission from Del Mar Analytical. The Chain of Custody, 1 page, is included and is an integral part of this report.
This entire report was reviewed and approved for release.

SAMPLE CROSS REFERENCE

SUBCONTRACTED: Refer to the last page for specific subcontract laboratory information included in this report.

LABORATORY ID	CLIENT ID	MATRIX
IOA0553-01	Outfall 008	Water

Reviewed By:

Michele Harper

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 008

Report Number: IOA0553

Sampled: 01/11/05
Received: 01/11/05

METALS

Analyte	Method	Batch	MDL Limit	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA0553-01 (Outfall 008 - Water)									
Reporting Units: ug/l									
Antimony	EPA 200.8	5A12054	0.18	2.0	ND	1	01/12/05	01/12/05	
Cadmium	EPA 200.8	5A12054	0.015	1.0	**0.032**	1	01/12/05	01/12/05	J
Copper	EPA 200.8	5A12054	0.49	2.0	**2.6**	1	01/12/05	01/12/05	
Lead	EPA 200.8	5A12054	0.13	1.0	**0.82**	1	01/12/05	01/12/05	J
Mercury	EPA 245.1	5A12047	0.063	0.20	**0.12**	1	01/12/05	01/12/05	J

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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Attention: Bronwyn Kelly

Project ID: Routine Outfall 008

Report Number: IOA0553

Sampled: 01/11/05
Received: 01/11/05

INORGANICS

Analyte	Method	Batch	MDL Limit	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA0553-01 (Outfall 008 - Water) - cont.									
Reporting Units: mg/l									
Chloride	EPA 300.0	5A11041	0.26	0.50	**4.8**	1	01/11/05	01/11/05	
Nitrate/Nitrite-N	EPA 300.0	5A11041	0.072	0.26	**2.2**	1	01/11/05	01/11/05	
Oil & Grease	EPA 413.1	5A13065	0.94	5.0	**13**	1	01/13/05	01/13/05	
Sulfate	EPA 300.0	5A11041	0.18	0.50	**4.2**	1	01/11/05	01/11/05	
Total Dissolved Solids	SM2540C	5A13089	10	10	**130**	1	01/13/05	01/13/05	
Sample ID: IOA0553-01 (Outfall 008 - Water)									
Reporting Units: ug/l									
Perchlorate	EPA 314.0	5A13051	0.80	4.0	ND	1	01/13/05	01/13/05	

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Attention: Bronwyn Kelly

Project ID: Routine Outfall 008

Report Number: IOA0553

Sampled: 01/11/05
Received: 01/11/05

SHORT HOLD TIME DETAIL REPORT

	Hold Time (in days)	Date/Time Sampled	Date/Time Received	Date/Time Extracted	Date/Time Analyzed
Sample ID: Outfall 008 (IOA0553-01) - Water					
EPA 300.0	2	01/11/2005 11:08	01/11/2005 18:50	01/11/2005 21:00	01/11/2005 23:00

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300 North Lake Avenue, Suite 1200
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Attention: Bronwyn Kelly

Project ID: Routine Outfall 008

Report Number: IOA0553

Sampled: 01/11/05
Received: 01/11/05

METHOD BLANK/QC DATA

METALS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A12047 Extracted: 01/12/05											
Blank Analyzed: 01/12/2005 (5A12047-BLK1)											
Mercury	ND	0.20	0.063	ug/l							
LCS Analyzed: 01/12/2005 (5A12047-BS1)											
Mercury	8.12	0.20	0.063	ug/l	8.00		102	85-115			
Matrix Spike Analyzed: 01/12/2005 (5A12047-MS1)						**Source: IOA0483-01**					
Mercury	8.00	0.20	0.063	ug/l	8.00	ND	100	70-130			
Matrix Spike Dup Analyzed: 01/12/2005 (5A12047-MSD1)						**Source: IOA0483-01**					
Mercury	8.26	0.20	0.063	ug/l	8.00	ND	103	70-130	3	20	
Batch: 5A12054 Extracted: 01/12/05											
Blank Analyzed: 01/12/2005 (5A12054-BLK1)											
Antimony	ND	2.0	0.18	ug/l							
Cadmium	ND	1.0	0.015	ug/l							
Copper	ND	2.0	0.49	ug/l							
Lead	ND	1.0	0.13	ug/l							
LCS Analyzed: 01/12/2005 (5A12054-BS1)											
Antimony	89.1	2.0	0.18	ug/l	80.0		111	85-115			
Cadmium	84.7	1.0	0.015	ug/l	80.0		106	85-115			
Copper	80.7	2.0	0.49	ug/l	80.0		101	85-115			
Lead	80.4	1.0	0.13	ug/l	80.0		100	85-115			
Matrix Spike Analyzed: 01/12/2005 (5A12054-MS1)						**Source: IOA0549-01**					
Antimony	88.7	2.0	0.18	ug/l	80.0	0.35	110	70-130			
Cadmium	85.3	1.0	0.015	ug/l	80.0	0.14	106	70-130			
Copper	83.9	2.0	0.49	ug/l	80.0	4.2	100	70-130			
Lead	81.3	1.0	0.13	ug/l	80.0	1.0	100	70-130			

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Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 008

Report Number: IOA0553

Sampled: 01/11/05
Received: 01/11/05

METHOD BLANK/QC DATA

METALS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A12054 Extracted: 01/12/05											
Matrix Spike Dup Analyzed: 01/12/2005 (5A12054-MSD1)						**Source: IOA0549-01**					
Antimony	90.1	2.0	0.18	ug/l	80.0	0.35	112	70-130	2	20	
Cadmium	86.1	1.0	0.015	ug/l	80.0	0.14	107	70-130	1	20	
Copper	83.8	2.0	0.49	ug/l	80.0	4.2	100	70-130	0	20	
Lead	80.9	1.0	0.13	ug/l	80.0	1.0	100	70-130	1	20	

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Sampled: 01/11/05
Received: 01/11/05

METHOD BLANK/QC DATA

INORGANICS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A11041 Extracted: 01/11/05											
Blank Analyzed: 01/11/2005 (5A11041-BLK1)											
Chloride	ND	0.50	0.26	mg/l							
Nitrate/Nitrite-N	ND	0.26	0.072	mg/l							
Sulfate	ND	0.50	0.18	mg/l							
LCS Analyzed: 01/11/2005 (5A11041-BS1)											
Chloride	5.00	0.50	0.26	mg/l	5.00		100	90-110			
Sulfate	10.8	0.50	0.18	mg/l	10.0		108	90-110			
Matrix Spike Analyzed: 01/11/2005 (5A11041-MS1)						**Source: IOA0551-01**					
Chloride	8.89	0.50	0.26	mg/l	5.00	4.2	94	80-120			
Sulfate	17.1	0.50	0.18	mg/l	10.0	6.8	103	80-120			
Matrix Spike Dup Analyzed: 01/11/2005 (5A11041-MSD1)						**Source: IOA0551-01**					
Chloride	9.11	0.50	0.26	mg/l	5.00	4.2	98	80-120	2	20	
Sulfate	17.2	0.50	0.18	mg/l	10.0	6.8	104	80-120	1	20	
Batch: 5A13051 Extracted: 01/13/05											
Blank Analyzed: 01/13/2005 (5A13051-BLK1)											
Perchlorate	ND	4.0	0.80	ug/l							
LCS Analyzed: 01/13/2005 (5A13051-BS1)											
Perchlorate	50.0	4.0	0.80	ug/l	50.0		100	85-115			
Matrix Spike Analyzed: 01/13/2005 (5A13051-MS1)						**Source: IOA0417-02**					
Perchlorate	49.6	4.0	0.80	ug/l	50.0	0.93	97	80-120			

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Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 008

Report Number: IOA0553

Sampled: 01/11/05
Received: 01/11/05

METHOD BLANK/QC DATA

INORGANICS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A13051 Extracted: 01/13/05											
Matrix Spike Dup Analyzed: 01/13/2005 (5A13051-MSD1)						**Source: IOA0417-02**					
Perchlorate	50.7	4.0	0.80	ug/l	50.0	0.93	100	80-120	2	20	
Batch: 5A13065 Extracted: 01/13/05											
Blank Analyzed: 01/13/2005 (5A13065-BLK1)											
Oil & Grease	1.20	5.0	0.94	mg/l							*J*
LCS Analyzed: 01/13/2005 (5A13065-BS1)											**M-NR1**
Oil & Grease	18.6	5.0	0.94	mg/l	20.0		93	65-120			
LCS Dup Analyzed: 01/13/2005 (5A13065-BSD1)											
Oil & Grease	21.1	5.0	0.94	mg/l	20.0		106	65-120	13	20	
Batch: 5A13089 Extracted: 01/13/05											
Blank Analyzed: 01/13/2005 (5A13089-BLK1)											
Total Dissolved Solids	ND	10	10	mg/l							
LCS Analyzed: 01/13/2005 (5A13089-BS1)											
Total Dissolved Solids	994	10	10	mg/l	1000		99	90-110			
Duplicate Analyzed: 01/13/2005 (5A13089-DUP1)						**Source: IOA0549-01**					
Total Dissolved Solids	92.0	10	10	mg/l		88			4	10	

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Sampled: 01/11/05
Received: 01/11/05

Compliance Check

The results obtained from the analytical testing of this data set were checked against compliance limits received from the client. Any results at or above the compliance limits appear in bold on this page.

LabNumber	Analysis	Analyte	Units	Result	MRL	Compliance Limit
IOA0553-01	413.1 Oil and Grease	Oil & Grease	mg/l	13	5.0	15
IOA0553-01	Chloride - 300.0	Chloride	mg/l	4.80	0.50	150
IOA0553-01	Nitrogen, NO3+NO2 -N	Nitrate/Nitrite-N	mg/l	2.20	0.26	8.00
IOA0553-01	Perchlorate 314.0	Perchlorate	ug/l	0	4.0	6.00
IOA0553-01	Sulfate-300.0	Sulfate	mg/l	4.20	0.50	300
IOA0553-01	TDS - SM 2540C	Total Dissolved Solids	mg/l	130	10	950

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Report Number: IOA0553

Sampled: 01/11/05
Received: 01/11/05

DATA QUALIFIERS AND DEFINITIONS

J	Estimated value. Analyte detected at a level less than the Reporting Limit (RL) and greater than or equal to the Method Detection Limit (MDL). The user of this data should be aware that this data is of unknown quality.
M-NR1	There was no MS/MSD analyzed with this batch due to insufficient sample volume. See Blank Spike/Blank Spike Duplicate.
ND	Analyte NOT DETECTED at or above the reporting limit or MDL, if MDL is specified.
RPD	Relative Percent Difference

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Michele Harper
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Project ID: Routine Outfall 008

Report Number: IOA0553

Sampled: 01/11/05
Received: 01/11/05

Certification Summary

Del Mar Analytical, Irvine

Method	Matrix	Nelac	California
EPA 200.8	Water	X	X
EPA 245.1	Water	X	X
EPA 300.0	Water	X	X
EPA 314.0	Water	X	X
EPA 413.1	Water	X	X
SM2540C	Water	X	X

Nevada and NELAP provide analyte specific accreditations. Analyte specific information for Del Mar Analytical may be obtained by contacting the laboratory or visiting our website at www.dmalabs.com.

Subcontracted Laboratories

Pace Analytical, MN- SUB

1700 Elm Street, Ste 200 - Minneapolis, MN 55414

Analysis Performed: 1613-Dioxin-HR
Samples: IOA0553-01

Analysis Performed: EDD + Level 4
Samples: IOA0553-01

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Project Manager

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1QA0553

Del Mar Analytical Version 5 8/12/04 CHAIN OF CUSTODY FORM

Client Name/Address:	Project:
MWH-Pasadena 300 North Lake Avenue, Suite 1200 Pasadena, CA 91101	Boeing-SSFL NPDES **Routine Outfall 008** Stormwater at Happy Valley
Project Manager: Bronwyn Kelly Sampler: Pollock	Phone Number: (626) 568-6691 Fax Number: (626) 568-6515

Sample Description	Sample Matrix	Container Type	# of Cont.	Sampling Date/Time	Preservative	Bottle * #	ANALYSIS REQUIRED: Total Reoverable Metals: Sb, Cd, Cu, Pb, Hg	Oil & Grease (EPA 413.1)	Cl-, SO4, NO3+NO2-N, Perchlorate	TDS	TCDD (and all congeners)					Field readings: / Comments
Outfall 008	W	Poly-1L	1	1-11-05 11:08	HNO3	1A	X									Temp = 54.3 pH= 6.9
Outfall 008-Dup	W	Poly-1L	1		HNO3	1B	X									
Outfall 008	W	Glass-Amber	2		HCl	3A, 3B		X								
Outfall 008	W	Poly-500 ml	2		None	4A, 4B			X							
Outfall 008	W	Poly-500 ml	2		None	5A, 5B				X						
Outfall 008	W	Glass-Amber	2		None	6A, 6B					X					

89

Relinquished By	Date/Time:	Received By	Date/Time:
	1-11-05 1435		1/11/05 1435
	1/11/05 1850		1/11/05 1852

Turn around Time: (check)
24 Hours _____ 5 Days _____
48 Hours _____ 10 Days _____
72 Hours _____ Normal _____
Perchlorate Only 72 Hours _____
Metals Only 72 Hours _____
Sample Integrity: (Check)
Intact X On Ice: X 2C

Del Mar Analytical

2852 Alton Ave., Irvine CA 92606 (949) 261-1022 FAX (949) 261-1228
1014 E. Cooley Dr., Suite A, Colton, CA 92324 (909) 370-4667 FAX (949) 370-1046
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2520 E. Sunset Rd. #3, Las Vegas, NV 89120 (702) 798-3620 FAX (702) 798-3621

February 25, 2005

MWH-Pasadena/Boeing
300 North Lake Avenue
Pasadena, Ca. 91101

Attention: Bronwyn Kelly

Project: Routine Outfall 008
Sampled: 01/11/05
Del Mar Analytical Number: IOA0553

Dear Ms. Kelly:

Pace Analytical performed Method 1613B analysis for the project referenced above. Please use the following cross-reference table when reviewing your results.

MWH ID	DEL MAR ID	Pace ID
Outfall 008	IOA0553-01	106126001

Attached is the original report from the subcontract laboratory. If you have any questions or require further assistance, please do not hesitate to contact me.

Sincerely yours,
DEL MAR ANALYTICAL

Michele Harper
Project Manager

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Pace Analytical™

Method 1613B Analysis Results

Client - Del Mar Analytical

Client's Sample ID	IOA0553-01		
Lab Sample ID	106126001		
Filename	F50129B_09		
Injected By	BAL		
Total Amount Extracted	1010 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	01/11/2005
ICAL Date	11/29/2004	Received	01/13/2005
CCal Filename(s)	F50129B_02	Extracted	01/28/2005
Method Blank ID	BLANK-6220	Analyzed	01/30/2005 02:18

Native Isomers	Conc pg/L	EMPC pg/L	LOD pg/L		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	0.98		2,3,7,8-TCDF-13C	2.00	68
Total TCDF	1.30	-----	0.98	J	2,3,7,8-TCDD-13C	2.00	85
					1,2,3,7,8-PeCDF-13C	2.00	75
2,3,7,8-TCDD	ND	-----	0.96		2,3,4,7,8-PeCDF-13C	2.00	79
Total TCDD	ND	-----	0.96		1,2,3,7,8-PeCDD-13C	2.00	95
					1,2,3,4,7,8-HxCDF-13C	2.00	76
1,2,3,7,8-PeCDF	ND	-----	1.20		1,2,3,6,7,8-HxCDF-13C	2.00	95
2,3,4,7,8-PeCDF	ND	-----	0.86		2,3,4,6,7,8-HxCDF-13C	2.00	86
Total PeCDF	ND	-----	1.10		1,2,3,7,8,9-HxCDF-13C	2.00	79
					1,2,3,4,7,8-HxCDD-13C	2.00	75
1,2,3,7,8-PeCDD	ND	-----	0.78		1,2,3,6,7,8-HxCDD-13C	2.00	95
Total PeCDD	ND	-----	0.78		1,2,3,4,6,7,8-HpCDF-13C	2.00	84
					1,2,3,4,7,8,9-HpCDF-13C	2.00	72
1,2,3,4,7,8-HxCDF	ND	-----	0.80		1,2,3,4,6,7,8-HpCDD-13C	2.00	93
1,2,3,6,7,8-HxCDF	ND	-----	0.74		OCDD-13C	4.00	80
2,3,4,6,7,8-HxCDF	ND	-----	0.81				
1,2,3,7,8,9-HxCDF	ND	-----	1.00		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	0.95	-----	0.84	J	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	0.79		2,3,7,8-TCDD-37Cl4	0.20	84
1,2,3,6,7,8-HxCDD	ND	-----	0.94				
1,2,3,7,8,9-HxCDD	ND	-----	0.93				
Total HxCDD	ND	-----	0.89				
1,2,3,4,6,7,8-HpCDF	ND	-----	1.30				
1,2,3,4,7,8,9-HpCDF	ND	-----	1.20				
Total HpCDF	ND	-----	1.20				
1,2,3,4,6,7,8-HpCDD	2.20	-----	1.30	BJ			
Total HpCDD	4.40	-----	1.30	BJ			
OCDF	5.20	-----	1.50	BJ			
OCDD	18.00	-----	2.50	BJ			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection. Totals are averages of individual isomer LODs.
D = Result obtained from analysis of diluted sample
B = Less than 10 times higher than method blank level
P = Recovery outside of method 1613 control limits
J = Concentration detected is below the calibration range
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....106126

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Pace Analytical™

Method 1613B Blank Analysis Results

Client - Del Mar Analytical

Lab Sample ID	BLANK-6220	Matrix	Water
Filename	F50129B_06	Dilution	NA
Total Amount Extracted	1020 mL	Extracted	01/28/2005
ICAL Date	11/29/2004	Analyzed	01/29/2005 23:49
CCal Filename(s)	F50129B_02	Injected By	BAL

Native Isomers	Conc pg/L	EMPC pg/L	PRL pg/L		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	1.20		2,3,7,8-TCDF-13C	2.00	58
Total TCDF	ND	-----	-----		2,3,7,8-TCDD-13C	2.00	75
					1,2,3,7,8-PeCDF-13C	2.00	65
2,3,7,8-TCDD	ND	-----	1.20		2,3,4,7,8-PeCDF-13C	2.00	67
Total TCDD	ND	-----	-----		1,2,3,7,8-PeCDD-13C	2.00	80
					1,2,3,4,7,8-HxCDF-13C	2.00	70
1,2,3,7,8-PeCDF	ND	-----	1.50		1,2,3,6,7,8-HxCDF-13C	2.00	82
2,3,4,7,8-PeCDF	ND	-----	1.20		2,3,4,6,7,8-HxCDF-13C	2.00	77
Total PeCDF	ND	-----	-----		1,2,3,7,8,9-HxCDF-13C	2.00	72
					1,2,3,4,7,8-HxCDD-13C	2.00	66
1,2,3,7,8-PeCDD	ND	-----	1.60		1,2,3,6,7,8-HxCDD-13C	2.00	88
Total PeCDD	ND	-----	-----		1,2,3,4,6,7,8-HpCDF-13C	2.00	73
					1,2,3,4,7,8,9-HpCDF-13C	2.00	63
1,2,3,4,7,8-HxCDF	ND	-----	0.75		1,2,3,4,6,7,8-HpCDD-13C	2.00	80
1,2,3,6,7,8-HxCDF	ND	-----	0.86		OCDD-13C	4.00	68
2,3,4,6,7,8-HxCDF	ND	-----	1.10				
1,2,3,7,8,9-HxCDF	ND	-----	1.20		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	-----	-----		1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	1.10		2,3,7,8-TCDD-37Cl4	0.20	73
1,2,3,6,7,8-HxCDD	ND	-----	0.99				
1,2,3,7,8,9-HxCDD	ND	-----	1.00				
Total HxCDD	ND	-----	-----				
1,2,3,4,6,7,8-HpCDF	ND	-----	2.10				
1,2,3,4,7,8,9-HpCDF	ND	-----	1.90				
Total HpCDF	2.2	-----	-----	J			
1,2,3,4,6,7,8-HpCDD	2.4	-----	1.40	J			
Total HpCDD	2.4	-----	-----	J			
OCDF	5.2	-----	1.80	J			
OCDD	5.6	-----	2.90	J			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
PRL = Pace Analytical Reporting Limit
A = Limit of Detection based on signal to noise
P = Recovery outside of method 1613 control limits
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
J = Value below calibration range
* = See Discussion

Report No.....106124

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 1613B Laboratory Control Spike Results

Client - Del Mar Analytical

Lab Sample ID	LCS-6221		
Filename	F50129B_03	Matrix	Water
Total Amount Extracted	1040 mL	Dilution	NA
ICAL Date	11/29/2004	Extracted	01/28/2005
CCal Filename	F50129B_02	Analyzed	01/29/2005 21:22
Method Blank ID	BLANK-6220	Injected By	BAL

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDF	10	9.9	7.5	15.8	99
2,3,7,8-TCDD	10	8.6	6.7	15.8	86
1,2,3,7,8-PeCDF	50	50.5	40.0	67.0	101
2,3,4,7,8-PeCDF	50	48.2	34.0	80.0	96
1,2,3,7,8-PeCDD	50	43.3	35.0	71.0	87
1,2,3,4,7,8-HxCDF	50	45.6	36.0	67.0	91
1,2,3,6,7,8-HxCDF	50	48.7	42.0	65.0	97
2,3,4,6,7,8-HxCDF	50	49.1	35.0	78.0	98
1,2,3,7,8,9-HxCDF	50	46.5	39.0	65.0	93
1,2,3,4,7,8-HxCDD	50	49.9	35.0	82.0	100
1,2,3,6,7,8-HxCDD	50	51.3	38.0	67.0	103
1,2,3,7,8,9-HxCDD	50	50.1	32.0	81.0	100
1,2,3,4,6,7,8-HpCDF	50	50.3	41.0	61.0	101
1,2,3,4,7,8,9-HpCDF	50	53.3	39.0	69.0	107
1,2,3,4,6,7,8-HpCDD	50	45.4	35.0	70.0	91
OCDF	100	95.6	63.0	170.0	96
OCDD	100	97.1	78.0	144.0	97
2,3,7,8-TCDD-37Cl4	10	6.9	3.1	19.1	69
2,3,7,8-TCDF-13C	100	51.5	22.0	152.0	52
2,3,7,8-TCDD-13C	100	67.8	20.0	175.0	68
1,2,3,7,8-PeCDF-13C	100	61.4	21.0	192.0	61
2,3,4,7,8-PeCDF-13C	100	65.9	13.0	328.0	66
1,2,3,7,8-PeCDD-13C	100	77.8	21.0	227.0	78
1,2,3,4,7,8-HxCDF-13C	100	70.2	19.0	202.0	70
1,2,3,6,7,8-HxCDF-13C	100	78.0	21.0	159.0	78
2,3,4,6,7,8-HxCDF-13C	100	74.1	22.0	176.0	74
1,2,3,7,8,9-HxCDF-13C	100	70.4	17.0	205.0	70
1,2,3,4,7,8-HxCDD-13C	100	69.0	21.0	193.0	69
1,2,3,6,7,8-HxCDD-13C	100	82.8	25.0	163.0	83
1,2,3,4,6,7,8-HpCDF-13C	100	72.1	21.0	158.0	72
1,2,3,4,7,8,9-HpCDF-13C	100	62.4	20.0	186.0	62
1,2,3,4,6,7,8-HpCDD-13C	100	80.1	26.0	166.0	80
OCDD-13C	200	135.6	26.0	397.0	68

Cs = Concentration Spiked (ng/mL)
Cr = Concentration Recovered (ng/mL)
Rec. = Recovery (Expressed as Percent)
Control Limit Reference: Method 1613, Table 6, 10/94 Revision
X = Background subtracted value
P = Recovery outside of control limits
Nn = Value obtained from additional analysis
* = See Discussion

Report No.....106124

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 1613B Laboratory Control Spike Results

Client - Del Mar Analytical

Lab Sample ID	LCSD-6222		
Filename	F50129B_04	Matrix	Water
Total Amount Extracted	1040 mL	Dilution	NA
ICAL Date	11/29/2004	Extracted	01/28/2005
CCal Filename	F50129B_02	Analyzed	01/29/2005 22:09
Method Blank ID	BLANK-6220	Injected By	BAL

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDF	10	10.6	7.5	15.8	106
2,3,7,8-TCDD	10	9.4	6.7	15.8	94
1,2,3,7,8-PeCDF	50	53.2	40.0	67.0	106
2,3,4,7,8-PeCDF	50	50.7	34.0	80.0	101
1,2,3,7,8-PeCDD	50	46.0	35.0	71.0	92
1,2,3,4,7,8-HxCDF	50	47.6	36.0	67.0	95
1,2,3,6,7,8-HxCDF	50	50.9	42.0	65.0	102
2,3,4,6,7,8-HxCDF	50	50.9	35.0	78.0	102
1,2,3,7,8,9-HxCDF	50	49.0	39.0	65.0	98
1,2,3,4,7,8-HxCDD	50	52.4	35.0	82.0	105
1,2,3,6,7,8-HxCDD	50	54.2	38.0	67.0	108
1,2,3,7,8,9-HxCDD	50	52.5	32.0	81.0	105
1,2,3,4,6,7,8-HpCDF	50	55.0	41.0	61.0	110
1,2,3,4,7,8,9-HpCDF	50	55.7	39.0	69.0	111
1,2,3,4,6,7,8-HpCDD	50	48.0	35.0	70.0	96
OCDF	100	100.6	63.0	170.0	101
OCDD	100	101.9	78.0	144.0	102
2,3,7,8-TCDD-37Cl4	10	8.7	3.1	19.1	87
2,3,7,8-TCDF-13C	100	70.4	22.0	152.0	70
2,3,7,8-TCDD-13C	100	88.6	20.0	175.0	89
1,2,3,7,8-PeCDF-13C	100	73.6	21.0	192.0	74
2,3,4,7,8-PeCDF-13C	100	79.0	13.0	328.0	79
1,2,3,7,8-PeCDD-13C	100	95.5	21.0	227.0	96
1,2,3,4,7,8-HxCDF-13C	100	84.8	19.0	202.0	85
1,2,3,6,7,8-HxCDF-13C	100	89.5	21.0	159.0	90
2,3,4,6,7,8-HxCDF-13C	100	87.2	22.0	176.0	87
1,2,3,7,8,9-HxCDF-13C	100	82.1	17.0	205.0	82
1,2,3,4,7,8-HxCDD-13C	100	80.1	21.0	193.0	80
1,2,3,6,7,8-HxCDD-13C	100	97.0	25.0	163.0	97
1,2,3,4,6,7,8-HpCDF-13C	100	84.4	21.0	158.0	84
1,2,3,4,7,8,9-HpCDF-13C	100	71.7	20.0	186.0	72
1,2,3,4,6,7,8-HpCDD-13C	100	92.4	26.0	166.0	92
OCDD-13C	200	159.2	26.0	397.0	80

Cs = Concentration Spiked (ng/mL)
Cr = Concentration Recovered (ng/mL)
Rec. = Recovery (Expressed as Percent)
Control Limit Reference: Method 1613, Table 6, 10/94 Revision
X = Background subtracted value
P = Recovery outside of control limits
Nn = Value obtained from additional analysis
* = See Discussion

Report No.....106124

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1700 Elm Street
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444

SPIKE RECOVERY RELATIVE PERCENT DIFFERENCE (RPD) RESULTS

Client..... Del Mar Analytical

SPIKE 1 ID..... LCS-6221
SPIKE 1 Filename..... F50129B_03
SPIKE 2 ID..... LCSD-6222
SPIKE 2 Filename..... F50129B_04

COMPOUND	SPIKE 1 REC,%	SPIKE 2 REC,%	RPD,%
2378-TCDF	99	106	6.8
2378-TCDD	86	94	8.9
12378-PeCDF	101	106	4.8
23478-PeCDF	96	101	5.1
12378-PeCDD	87	92	5.6
123478-HxCDF	91	95	4.3
123678-HxCDF	97	102	5.0
234678-HxCDF	98	102	4.0
123789-HxCDF	93	98	5.2
123478-HxCDD	100	105	4.9
123678-HxCDD	103	108	4.7
123789-HxCDD	100	105	4.9
1234678-HpCDF	101	110	8.5
1234789-HpCDF	107	111	3.7
1234678-HpCDD	91	96	5.3
OCDF	96	101	5.1
OCDD	97	102	5.0

REC = Percent Recovered
RPD = The difference between the two values divided by the average.
NA = Not Applicable

Report No..... 106124, 106125, 106126
106127, 106128, 106130
106131, 106132, 106135

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nelac

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Phone: 612.607.1700
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TABLE 1. 2,3,7,8-TCDD Equivalency Factors (TEFs) for the Polychlorinated Dibenzo-p-dioxins and Dibenzofurans

Number	Compound(s)	TEF
1	2,3,7,8-TCDD	1.00
2	1,2,3,7,8-PeCDD	0.50
3	1,2,3,6,7,8-HxCDD	0.1
4	1,2,3,7,8,9-HxCDD	0.1
5	1,2,3,4,7,8-HxCDD	0.1
6	1,2,3,4,6,7,8-HpCDD	0.01
7	OCDD	0.001
8	* Total - TCDD	0.0
9	* Total - PeCDD	0.0
10	* Total - HxCDD	0.0
11	* Total - HpCDD	0.0
12	2,3,7,8-TCDF	0.10
13	1,2,3,7,8-PeCDF	0.05
14	2,3,4,7,8-PeCDF	0.5
15	1,2,3,6,7,8-HxCDF	0.1
16	1,2,3,7,8,9-HxCDF	0.1
17	1,2,3,4,7,8-HxCDF	0.1
18	2,3,4,6,7,8-HxCDF	0.1
19	1,2,3,4,6,7,8-HpCDF	0.01
20	1,2,3,4,7,8,9-HpCDF	0.01
21	OCDF	0.001
22	* Total - TCDF	0.0
23	* Total - PeCDF	0.0
24	* Total - HxCDF	0.0
25	* Total - HpCDF	0.0

*Excluding the 2,3,7,8-substituted congeners.

Reference: 1989 ITEFs

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ACCREDITED IN ACCORDANCE WITH nelac

Del Mar Analytical

17461 Derian Ave. Suite 100, Irvine, CA 92614 Ph (949) 261-1022 Fax (949) 261-1228
1014 E. Cooley Dr., Suite A, Colton, CA 92324 Ph (909) 370-4667 Fax (909) 370-1046
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9830 South 51st Street, Suite B-120, Phoenix, AZ 85044 Ph (480) 785-0043 Fax (480) 785-0851
2520 E. Sunset Rd., Suite #3, Las Vegas, NV 89120 Ph (702) 798-3620 Fax (702) 798-3621

SUBCONTRACT ORDER - PROJECT # IOA0553

106126

SENDING LABORATORY:	RECEIVING LABORATORY:
Del Mar Analytical, Irvine 17461 Derian Avenue. Suite 100 Irvine, CA 92614 Phone: (949) 261-1022 Fax: (949) 261-1228 Project Manager: Michele Harper	Pace Analytical, MN- SUB 1700 Elm Street, Ste 200 Minneapolis, MN 55414 Phone :(612) 607-1700 Fax: (612) 607-6444

Standard TAT is requested unless specific due date is requested => Due Date:_____ Initials:_____

Analysis	Expiration	Comments
Sample ID: IOA0553-01 Water	**Sampled: 01/11/05 11:08**	106126001
1613-Dioxin-HR	01/18/05 11:08	J flags, 17 congeners, no TEQ, sub to Pace-MN
EDD + Level 4	02/08/05 11:08	Excel EDD email to pm,Include Std logs for Lvl IV

Containers Supplied:
1 L Amber (IOA0553-01I)
1 L Amber (IOA0553-01J)

SAMPLE INTEGRITY:

All containers intact: ☐ Yes ☐ No Sample labels/COC agree: ☐ Yes ☐ No Samples Received On Ice:: ☐ Yes ☐ No
Custody Seals Present: ☐ Yes ☐ No Samples Preserved Properly: ☐ Yes ☐ No Samples Received at (temp): 3.0

Released By	Date	Time	Received By	Date	Time
Stacy Gunawan	1/12/05		Pace	1-13-05	09:45

CONTRACT COMPLIANCE SCREENING FORM FOR HARDCOPY DATA

AMEC Earth & Environmental
550 South Wadsworth Boulevard
Suite 500
Lakewood, CO 80226

Package ID T711DF24
Task Order 313150010
SDG No. Multiple
No. of Analyses 7

Laboratory Pace
Reviewer K. Shadowlight
Analysis/Method Dioxins

Date: February 18, 2005
Reviewer's Signature K Shadowlight

ACTION ITEMS[a]	
1. **Case Narrative Deficiencies**	
2. **Out of Scope Analyses**	
3. **Analyses Not Conducted**	
4. **Missing Hardcopy Deliverables**	
5. **Incorrect Hardcopy Deliverables**	
6. **Deviations from Analysis Protocol, e.g.,**	Qualifications were assigned for the following:
Holding Times	* Method blank contamination
GC/MS Tune/Inst. Performance	* EMPCs
Calibration	* Detects below the lower method calibration level
Method blanks	
Surrogates	
Matrix Spike/Dup LCS	
Field QC	
Internal Standard Performance	
Compound Identification and Quantitation	
System Performance	
COMMENTS[b]	

[a] Subcontracted analytical laboratory is not meeting contract and/or method requirements.
[b] Differences in protocol have been adopted by the laboratory but no action against the laboratory is required.

DATA VALIDATION REPORT

NPDES
Monitoring

ANALYSIS: DIOXINS/FURANS

SAMPLE DELIVERY GROUPS: Multiple SDGs

Prepared by

AMEC—Denver Operations
550 South Wadsworth Boulevard, Suite 500
Lakewood, Colorado 80226

1. INTRODUCTION

Task Order Title:	NPDES Monitoring
Contract Task Order #:	313150010
Sample Delivery Group #:	Multiple
Project Manager:	B. McIlvaine
Matrix:	Water
Analysis:	Dioxins/Furans
QC Level:	Level IV
No. of Samples:	7
No. of Reanalyses/Dilutions:	0
Reviewer:	K. Shadowlight
Date of Review:	February 21, 2005

The samples listed in Table 1 were validated based on the guidelines outlined in the *AMEC Data Validation Procedure for Dioxins and Furans (DVP-19, Rev. 1), EPA Method 1613, and the National National Functional Guidelines For Chlorinated Dioxin/Furan Data Review* (8/02). Any deviations from these procedures and guidelines are documented herein. Qualifiers were applied in cases where the data did not meet the required QC criteria or where special consideration by the data user is required. Data qualifiers were placed on Form Is with the associated qualification codes. Analytes that were rejected for any reason are denoted on the Form I as having only the "R" data qualifier and associated qualification code(s) denoting the reason for rejection. Any additional problems with the data that may have resulted in an estimated value were not denoted by a qualification code since the data had already been rejected.

Table 1. Sample Identification

Client ID	Laboratory ID (Del Mar)	Laboratory ID (Pace)	Matrix	COC Method
Outfall 001	IOA0997-01	106475001	water	1613
Outfall 001	IOA1551-01	106840001	water	1613
Outfall 002	IOA0999-01	106478001	water	1613
Outfall 002	IOA1553-01	106871001	water	1613
Outfall 003	IOA1556-01	106869001	water	1613
Outfall 008	IOA1555-01	10687001	water	1613
Outfall 009	IOA1554-01	106842001	water	1613

2. DATA VALIDATION FINDINGS

2.1 SAMPLE MANAGEMENT

Following are findings associated with sample management:

2.1.1 Sample Preservation, Handling, and Transport

The samples in these SDGs were received at Del Mar Analytical within the temperature limits of 4°C ±2°C. The samples were subcontracted to Pace Analytical for the dioxin/furan analyses. The samples in these SDGs were received at Pace Analytical Services below the temperature limits of 4°C ± 2°C, at 1.8°C; however, as the samples were not noted to have been frozen or damaged, no qualifications were required. No qualifications were required.

2.1.2 Chain of Custody

The COCs and transfer COCs were signed by the appropriate field and laboratory personnel. The samples and analyses were accounted for on both the original COCs and transfer COCs. As the samples were couriered directly to the laboratory (Del Mar Analytical), custody seals were not required. There was no information regarding custody seals upon receipt at Pace. No qualifications were required.

2.1.3 Holding Times

The samples were extracted and analyzed within a year of collection. No qualifications were required.

2.2 INSTRUMENT PERFORMANCE

Following are findings associated with instrument performance:

2.2.1 GC Column Performance

A column performance standard was combined with the daily calibration verification and analyzed at the beginning of each analytical sequence. The GC column performance was acceptable with the chromatographic separation of 2,3,7,8-TCDD and other TCDD isomers resolved with a valley of ≤25%. No qualifications were required.

2.2.2 Mass Spectrometer Performance

The mass spectrometer performance could not be evaluated as the laboratory did not provide selected ion current profiles for the lock-mass ions. No qualifications were required.

2.3 CALIBRATION

2.3.1 Initial Calibration

There were two initial calibrations, analyzed 11/29/04 on instrument 10MSHR05 and 01/26/05 on instrument 10MSHR06. The calibrations consisted of five concentration level standards (CS1 through CS5) analyzed to verify instrument linearity. The initial calibrations were acceptable with %RSDs ≤20% for the 15 native compounds (calibration by isotope dilution) and ≤35% for the 2 native and all labeled compounds (calibration by internal standard). The relative retention times and ion abundance ratios were within the QC limits listed in Method 1613 for all standards. A representative number of %RSDs were verified from the raw data, and no calculation or transcription errors were noted. No qualifications were required.

2.3.2 Continuing Calibration

Calibration verification (VER) consisted of a mid-level standard (CS3) analyzed at the beginning of each analytical sequence. The VER was acceptable with the concentrations within the acceptance criteria listed in the Table 6 of the EPA Method 1613. The ion abundance ratios and relative retention times were within the method QC limits. A representative number of %Ds were verified from the raw data, and no calculation or transcription errors were noted. No qualifications were required.

2.4 BLANKS

One method blank (Blank-6241) was extracted and analyzed with the samples in these SDGs. Target compounds 1,2,3,6,7,8-HxCDF, total HxCDF, total HpCDF, 1,2,3,4,6,7,8-HpCDD, total HpCDD, and OCDF were reported in the method blank. Any detects for the aforementioned target compounds reported at concentrations <5× the concentrations reported in the method blank were qualified as estimated nondetects "UJ," at the levels of interference in the samples of these SDGs. The detect for total TCDF was qualified as estimated, "J," in sample Outfall 002 (IOA0999-01), as a portion of the total concentration was attributed to method blank contamination. Target compounds 1,2,3,4,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, and OCDD were reported as EMPCs in the method blank. A review of the method blank raw data and chromatograms indicated no false negatives or false positives. No further qualifications were required.

2.5 BLANK SPIKES AND LABORATORY CONTROL SAMPLES

One LCS/LCSD pair (LCS-6242/LCSD-6243) was extracted and analyzed with the samples in these SDGs. All recoveries were within the acceptance criteria listed in Table 6 of the Method 1613. There are no method QC limits established for RPDs. The reported RPDs were within ±20%. No qualifications were required.

2.6 MATRIX SPIKE/MATRIX SPIKE DUPLICATE

MS/MSD analyses were not performed in these SDGs. Evaluation of method accuracy and precision was based on the LCS/LCSD results. No qualifications were required.

2.7 FIELD QC SAMPLES

Following are findings associated with field QC:

2.7.1 Field Blanks and Equipment Rinsates

The samples in these SDGs had no associated field QC samples. No qualifications were required.

2.7.2 Field Duplicates

No field duplicate samples were identified for these SDGs.

2.8 INTERNAL STANDARDS

The labeled standard recoveries were within the acceptance criteria listed in Table 7 of Method 1613. No qualifications were required.

2.9 COMPOUND IDENTIFICATION

The laboratory analyzed for polychlorinated dioxins/furans by EPA Method 1613. The compound identifications were verified from the raw data and no false negatives or positives were noted. No qualifications were required.

2.10 COMPOUND QUANTIFICATION AND REPORTED DETECTION LIMITS

Compound quantitation was verified from the raw data. The laboratory calculated and reported compound-specific detection limits. Any detects below the lower method calibration limit (MCL) were qualified as estimated, "J." Any reported EMPC was qualified as an estimated nondetect, "UJ." No further qualifications were required.

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
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Method 1613B Analysis Results

Client - Del Mar Analytical

Client's Sample ID	IOA1555-01 Outfall 008		
Lab Sample ID	106870001		
Filename	F50204A_06		
Injected By	MRO		
Total Amount Extracted	1040 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	01/26/2005
ICAL Date	11/29/2004	Received	01/28/2005
CCal Filename(s)	F50203A_20	Extracted	01/31/2005
Method Blank ID	BLANK-6241	Analyzed	02/04/2005 14:09

Rec Qual	Qual Code	Native Isomers	Conc pg/L	EMPC pg/L	LOD pg/L		Internal Standards	ng's Added	Percent Recovery
U		2,3,7,8-TCDF	ND	-----	0.87		2,3,7,8-TCDF-13C	2.00	78
U		Total TCDF	ND	-----	0.87		2,3,7,8-TCDD-13C	2.00	86
							1,2,3,7,8-PeCDF-13C	2.00	87
U		2,3,7,8-TCDD	ND	-----	0.91		2,3,4,7,8-PeCDF-13C	2.00	101
U		Total TCDD	ND	-----	0.91		1,2,3,7,8-PeCDD-13C	2.00	109
							1,2,3,4,7,8-HxCDF-13C	2.00	83
U		1,2,3,7,8-PeCDF	ND	-----	0.62		1,2,3,6,7,8-HxCDF-13C	2.00	94
↓		2,3,4,7,8-PeCDF	ND	-----	0.57		2,3,4,6,7,8-HxCDF-13C	2.00	84
		Total PeCDF	ND	-----	0.60		1,2,3,7,8,9-HxCDF-13C	2.00	89
							1,2,3,4,7,8-HxCDD-13C	2.00	84
U		1,2,3,7,8-PeCDD	ND	-----	0.79		1,2,3,6,7,8-HxCDD-13C	2.00	85
U		Total PeCDD	ND	-----	0.79		1,2,3,4,6,7,8-HpCDF-13C	2.00	81
							1,2,3,4,7,8,9-HpCDF-13C	2.00	80
U		1,2,3,4,7,8-HxCDF	ND	-----	0.56		1,2,3,4,6,7,8-HpCDD-13C	2.00	95
		1,2,3,6,7,8-HxCDF	ND	-----	0.50		OCDD-13C	4.00	94
		2,3,4,6,7,8-HxCDF	ND	-----	0.61				
		1,2,3,7,8,9-HxCDF	ND	-----	0.60		1,2,3,4-TCDD-13C	2.00	NA
↓		Total HxCDF	ND	-----	0.57		1,2,3,7,8,9-HxCDD-13C	2.00	NA
U		1,2,3,4,7,8-HxCDD	ND	-----	0.73		2,3,7,8-TCDD-37Cl4	0.20	78
		1,2,3,6,7,8-HxCDD	ND	-----	0.80				
		1,2,3,7,8,9-HxCDD	ND	-----	0.87				
↓		Total HxCDD	ND	-----	0.80				
U		1,2,3,4,6,7,8-HpCDF	ND	-----	0.54				
↓		1,2,3,4,7,8,9-HpCDF	ND	-----	0.84				
		Total HpCDF	ND	-----	0.69				
UJ	* 10	1,2,3,4,6,7,8-HpCDD	-----	3.0	0.59	I			
J	DN2	Total HpCDD	1.5	-----	0.59	J			
UJ	* 10	OCDF	-----	4.7	0.77	I			
J	DN2	OCDD	19.0	-----	0.95	J			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection. Totals are averages of individual isomer LODs.
D = Result obtained from analysis of diluted sample
B = Less than 10 times higher than method blank level
P = Recovery outside of method 1613 control limits
J = Concentration detected is below the calibration range
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....106870

REPORT OF LABORATORY ANALYSIS

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EVALUATED EVAL IV

CONTRACT COMPLIANCE SCREENING FORM FOR HARDCOPY DATA

AMEC Earth & Environmental
550 South Wadsworth Boulevard
Suite 500

Lakewood, CO 80226

Laboratory Del Mar Analytical
Reviewer K. Okonzak
Analysis/Method Metals

Package ID T711MT31
Task Order 313150010
SDG No. IOA1554, IOA1555, IOA1556
No. of Analyses 3

Date: 3/07/05
Reviewer's Signature

ACTION ITEMS[a]	
1. **Case Narrative Deficiencies**	
2. **Out of Scope Analyses**	
3. **Analyses Not Conducted**	
4. **Missing Hardcopy Deliverables**	
5. **Incorrect Hardcopy Deliverables**	
6. **Deviations from Analysis Protocol, e.g.,**	Qualifications applied for:
Holding Times	Detects below the reporting limit were qualified as estimated, "J."
	Detects were qualified as estimated, "UJ" due to detects in the associated method blank or CCBs.
GC/MS Tune/Inst. Perform	
Calibrations	
Blanks	
Surrogates	
Matrix Spike/Dup LCS	
Field QC	
Internal Standard Performance	
Compound Identification and Quantitation	
System Performance	

COMMENTS[b]	

[a] Subcontracted analytical laboratory is not meeting contract and/or method requirements.
[b] Differences in protocol have been adopted by the laboratory but no action against the laboratory is required.

Data Qualifier Reference Table

Qualifier	Organics	Inorganics
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.	The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.	The associated value is an estimated quantity.
N	The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification."	Not applicable.
NJ	The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.	Not applicable.
UJ	The analyte was not deemed above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.	The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.
R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and to meet quality control criteria. The presence or absence of the analyte cannot be verified.	The data are unusable. (Note: Analyte may or may not be present).

Qualification Code Reference Table

Qualifier	Organics	Inorganics
H	Holding times were exceeded.	Holding times were exceeded.
S	Surrogate recovery was outside QC limits.	The sequence or number of standards used for the calibration was incorrect
C	Calibration %RSD or %D were noncompliant.	Correlation coefficient is <0.995.
R	Calibration RRF was <0.05.	%R for calibration is not within control limits.
B	Presumed contamination from preparation (method) blank.	Presumed contamination from preparation (method) or calibration blank.
L	Laboratory Blank Spike/Blank Spike Duplicate %R was not within control limits.	Laboratory Control Sample %R was not within control limits.
Q	MS/MSD recovery was poor or RPD high.	MS recovery was poor.
E	Not applicable.	Duplicates showed poor agreement.
I	Internal standard performance was unsatisfactory.	ICP ICS results were unsatisfactory.
A	Not applicable.	ICP Serial Dilution %D were not within control limits.
M	Tuning (BFB or DFTPP) was noncompliant.	Not applicable.
T	Presumed contamination from trip blank.	Not applicable.
+	False positive – reported compound was not present. Not applicable.	
-	False negative – compound was present but not reported.	Not applicable.
F	Presumed contamination from FB, or ER.	Presumed contamination from FB or ER.
$	Reported result or other information was incorrect.	Reported result or other information was incorrect.
?	TIC identity or reported retention time has been changed.	Not applicable.
D	The analysis with this flag should not be used because another more technically sound analysis is available.	The analysis with this flag should not be used because another more technically sound analysis is available.
P	Instrument performance for pesticides was poor.	Post Digestion Spike recovery was not within control limits.
DNQ	The compound was detected between the MDL and the RL and, by definition, is considered an estimated value.	The compound was detected between the MDL and the RL and, by definition, is considered an estimated value.

*#	Unusual problems found with the data that have been described in Section 2.#, "Data Validation Findings." The number following the asterisk (*) will indicate the subsection where a description of the problem can be found (eg. *1 would indicate a sample was not within temperature limits).	Unusual problems found with the data that have been described in Section 2.#, "Data Validation Findings." The number following the asterisk (*) will indicate the subsection where a description of the problem can be found (eg. *1 would indicate a sample was not within temperature limits).

DATA VALIDATION REPORT

NPDES
Monitoring

ANALYSIS: METALS

SAMPLE DELIVERY GROUPS: IOA1554, IOA1555, IOA1556

Prepared by

AMEC—Denver Operations
550 South Wadsworth Boulevard, Suite 500
Lakewood, Colorado 80226

1. INTRODUCTION

Task Order Title:	NPDES Monitoring
Contract Task Order #:	313150010
SDG#:	IOA1554, IOA1555, IOA1556
Project Manager:	B. McIlvaine
Matrix:	Water
Analysis:	Metals
QC Level:	Level IV
No. of Samples:	3
No. of Reanalyses/Dilutions:	0
Reviewer:	K. Okonzak-Lowry
Date of Review:	March 7, 2005

The samples listed in Table 1 were validated based on the guidelines outlined in the *AMEC Data Validation Procedure for Levels III and IV ICP-MS Metals, (DVP-5-A, Rev.0), AMEC Data Validation Procedure for Levels III and IV ICP Metals* (DVP-5, Rev. 0), SW-846 *Method 6020B for Inductively Coupled Plasma – Mass Spectrometry*, SW-846 *Method 6010B for Inductively Coupled Plasma* , SW-846 *Method 7471A for Mercury (Manual Cold-Vapor Technique)*, and validation guidelines outlined in the USEPA CLP *National Functional Guidelines for Inorganic Data Review* (2/94). Any deviations from these procedures and guidelines are documented herein. Qualifiers were applied in cases where the data did not meet the required QC criteria or where special consideration by the data user is required. Data qualifiers were placed on Form Is with the associated qualification codes. Analytes that were rejected for any reason are denoted on the Form I as having only the "R" data qualifier and associated qualification code(s) denoting the reason for rejection. Any additional problems with the data that may have resulted in an estimated value were not denoted by a qualification code since the data had already been rejected.

Table 1. Sample identification

Client ID	EPA ID	Laboratory ID	Matrix	COC Method
Outfall 009	Outfall 009	IOA1554-01	water	ILM04
Outfall 008	Outfall 008	IOA1555-01	water	ILM04
Outfall 003	Outfall 003	IOA1556-01	water	ILM04

2. DATA VALIDATION FINDINGS

2.1 SAMPLE MANAGEMENT

Following are findings associated with sample management:

2.1.1 Sample Preservation, Handling, and Transport

The samples in these SDGs were received at the laboratory within the temperature limits of 4°C ±2°C. No sample preservation, handling, or transport problems were noted, and no qualifications were necessary.

2.1.2 Chain of Custody

The COCs were signed and dated by field and laboratory personnel. The COCs listed duplicate samples for all three samples; however, duplicate analyses were not required. No sample qualifications were required.

2.1.3 Holding Times

The dates of collection recorded on the COCs and the dates of analyses recorded in the raw data, documented that the sample analyses were performed within the specified holding times of six months for the ICP/MS metals and 28 days for mercury. No qualifications were required.

2.2 ICP-MS TUNING

A precalibration routine must be completed prior to calibrating the instrument, which consists of analyzing a tuning solution to verify resolution, mass calibration, and thermal stability. The solution must be analyzed a minimum of five times and must contain isotopes representing all mass regions of interest. The laboratory performed the required tune solution analyses but did not report %RSDs, with the exception of the ICP/MS run analyzed on 2/02/05 for which copper was reported for sample Outfall 009. The %RSDs for this tune were all within the 5% control limit. The laboratory SOP states that to be acceptable, the %RSD must be less than 5%. The mass calibrations were within 0.1 amu of the true mass and the instrument resolutions were less than 0.75 amu at 5 percent peak height for all analytes in the tune solution. No site sample qualifications were required.

2.3 CALIBRATION

The ICV and CCV results showed acceptable recoveries, 90-110% for the ICP/MS and 80-120% for Hg. The applicable reporting limit check standards were recovered within the AMEC control limits of 70-130%, No qualifications were required.

2.4 BLANKS

The method blanks and bracketing ICBs/CCBs associated with the samples in these SDGs were nondetected at the laboratory's MDLs, with the following exceptions: copper was detected in MB 5A29039-BLK1 at 0.555 µg/L; therefore, copper detected in sample Outfall 008 was qualified as estimated, "UJ," cadmium was detected in CCB1 and CCB2 at 0.026 and 0.033 µg/L; therefore cadmium detected in sample Outfall 008 was qualified as estimated, "UJ," and antimony was detected in CCB1 and CCB2 at 0.58 and 0.82 µg/L, respectively; therefore, the antimony detected in sample Outfall 009 was qualified as estimated, "UJ." No further qualifications were required.

2.5 ICP INTERFERENCE CHECK SAMPLE (ICS A/AB)

Results were not provided for ICP-MS spiked interferents sulfur, phosphorus, carbon, titanium, and chloride. The results for sodium and potassium were above the calibration range of the instrument in both the ICSA and ICSAB analyses. Lead was not spiked into the ICSAB solution. The validator reviewed the raw data for the site sample ICP/MS analyses for the level of reported interferents, Al, Ca, Fe, and Mg, and determined that the concentration of interferents was not high enough to cause matrix affects. No assessment could be made with respect to possible interference from sulfur, phosphorus, carbon, and chloride. No qualifications were required.

2.6 BLANK SPIKES AND LABORATORY CONTROL SAMPLES

The ICP/MS LCS samples were identified as 5A29041-BS1 and 5A29039-BS1, and the mercury LCS sample was identified as 5A31050-BS1. The LCS results on the summary forms and in the raw data were within the laboratory-established ICP/MS and mercury control limits of 85-115%. No qualifications were required.

2.7 LABORATORY DUPLICATES

No MS/MSD or duplicate analyses were performed in association with the samples in these SDGs; therefore, no assessment was made with respect to this criterion.

2.8 MATRIX SPIKE

No MS/MSD analyses were performed in association with the samples in these SDGs; therefore, no assessment was made with respect to this criterion. Method accuracy was evaluated based on LCS results.

2.9 FURNACE ATOMIC ABSORPTION QC

Furnace atomic absorption was not utilized for the analysis of these samples; therefore, furnace atomic absorption QC is not applicable.

2.10 ICP/MS SERIAL DILUTION

No serial dilution analysis was performed in association with the samples in these SDGs; therefore, no assessment was made with respect to this criterion.

2.11 INTERNAL STANDARDS PERFORMANCE

The ICP-MS internal standard recoveries for the site samples and associated QC sample analyses were within the 60-125% control limits and no qualifications were required.

2.12 SAMPLE RESULT VERIFICATION

A Level IV review was performed for the samples in these data packages. Calculations were verified, and the sample results reported on the Form Is were verified against the raw data. No transcription errors or calculation errors were noted. Analytes detected below the reporting limit were qualified as estimated, "J." No qualifications were required.

2.13 FIELD QC SAMPLES

Field QC samples are evaluated, and if necessary, qualified based only on laboratory blanks. Any remaining detects are used to evaluate the associated samples.

2.13.1 Field Blanks and Equipment Rinsates

The samples in these SDGs had no associated field QC samples. No qualifications were required.

2.13.2 Field Duplicates

There were no field duplicate analyses performed in association with the site samples.

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2520 E. Sunset Rd. #3, Las Vegas, NV 89120 (702) 798-3620 FAX (702) 798-3621

MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 008

Report Number: IOA1555

Sampled: 01/26/05
Received: 01/26/05

DRAFT: METALS

Analyte	Method	Batch	MDL Limit	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers	Rev Qual	Qual Code
Sample ID: IOA1555-01 (DRAFT: Outfall 008 - Water)											
Reporting Units: ug/l											
Antimony	EPA 200.8	5A29039	0.18	2.0	ND	1	01/29/05	01/31/05	U		
Cadmium	EPA 200.8	5A29039	0.015	1.0	**0.016**	1	01/29/05	01/31/05	UJ	J	B
Copper	EPA 200.8	5A29039	0.49	2.0	**2.3**	1	01/29/05	01/31/05	UJ	B	B
Lead	EPA 200.8	5A29039	0.13	1.0	**0.17**	1	01/29/05	01/31/05	J	J	DNQ
Mercury	EPA 245.1	5A31050	0.063	0.20	**0.085**	1	01/31/05	01/31/05	J	J	DNQ

AMEC VALIDATED

Level IV

DRAFT REPORT
DRAFT REPORT
DATA SUBJECT TO CHANGE

The results pertain only to the samples tested in the laboratory. This report shall not be reproduced, except in full, without written permission from Del Mar Analytical.

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2520 E. Sunset Rd. #3, Las Vegas, NV 89120 (702) 798-3620 FAX (702) 798-3621

LABORATORY REPORT

Prepared For: MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project: Routine Outfall 008

Sampled: 01/26/05
Received: 01/26/05
Issued: 03/19/05 18:19

NELAP #01108CA California ELAP#1197 CSDLAC #10117

The results listed within this Laboratory Report pertain only to the samples tested in the laboratory. The analyses contained in this report were performed in accordance with the applicable certifications as noted. All soil samples are reported on a wet weight basis unless otherwise noted in the report. This Laboratory Report is confidential and is intended for the sole use of Del Mar Analytical and its client. This report shall not be reproduced, except in full, without written permission from Del Mar Analytical. The Chain of Custody, 1 page, is included and is an integral part of this report.
This entire report was reviewed and approved for release.

SAMPLE CROSS REFERENCE

SUBCONTRACTED: Refer to the last page for specific subcontract laboratory information included in this report.

LABORATORY ID	CLIENT ID	MATRIX
IOA1555-01	Outfall 008	Water

Reviewed By:

Michele Harper

Del Mar Analytical, Irvine
Michele Harper
Project Manager

Del Mar Analytical

17461Derian Ave., Suite 100, Irvine, CA 92614 (949) 261-1022 FAX (949) 260-3297
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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 008

Report Number: IOA1555

Sampled: 01/26/05
Received: 01/26/05

METALS

Analyte	Method	Batch	MDL Limit	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA1555-01 (Outfall 008 - Water)									
Reporting Units: ug/l									
Antimony	EPA 200.8	5A29039	0.18	2.0	ND	1	01/29/05	01/31/05	
Cadmium	EPA 200.8	5A29039	0.015	1.0	**0.016**	1	01/29/05	01/31/05	J
Copper	EPA 200.8	5A29039	0.49	2.0	**2.3**	1	01/29/05	01/31/05	B
Lead	EPA 200.8	5A29039	0.13	1.0	**0.17**	1	01/29/05	01/31/05	J
Mercury	EPA 245.1	5A31050	0.063	0.20	**0.085**	1	01/31/05	01/31/05	J

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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Attention: Bronwyn Kelly

Project ID: Routine Outfall 008

Report Number: IOA1555

Sampled: 01/26/05
Received: 01/26/05

INORGANICS

Analyte	Method	Batch	MDL Limit	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA1555-01 (Outfall 008 - Water) - cont.									
Reporting Units: mg/l									
Chloride	EPA 300.0	5A26051	0.26	0.50	**14**	1	01/26/05	01/27/05	
Nitrate/Nitrite-N	EPA 300.0	5A26051	0.072	0.26	**0.72**	1	01/26/05	01/27/05	
Oil & Grease	EPA 413.1	5A31068	0.94	5.0	ND	1	01/31/05	01/31/05	
Sulfate	EPA 300.0	5A26051	0.18	0.50	**6.3**	1	01/26/05	01/27/05	
Total Dissolved Solids	SM2540C	5A28091	10	10	**120**	1	01/28/05	01/28/05	
Sample ID: IOA1555-01 (Outfall 008 - Water)									
Reporting Units: ug/l									
Perchlorate	EPA 314.0	5A30022	0.80	4.0	ND	1	01/30/05	01/30/05	

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Project Manager

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300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 008

Report Number: IOA1555

Sampled: 01/26/05
Received: 01/26/05

SHORT HOLD TIME DETAIL REPORT

	Hold Time (in days)	Date/Time Sampled	Date/Time Received	Date/Time Extracted	Date/Time Analyzed
Sample ID: Outfall 008 (IOA1555-01) - Water					
EPA 300.0	2	01/26/2005 13:39	01/26/2005 17:05	01/26/2005 23:30	01/27/2005 09:30

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Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 008

Report Number: IOA1555

Sampled: 01/26/05
Received: 01/26/05

METHOD BLANK/QC DATA

METALS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A29039 Extracted: 01/29/05											
Blank Analyzed: 01/31/2005 (5A29039-BLK1)											
Antimony	ND	2.0	0.18	ug/l							
Cadmium	ND	1.0	0.015	ug/l							
Copper	0.555	2.0	0.49	ug/l							J
Lead	ND	1.0	0.13	ug/l							
LCS Analyzed: 01/31/2005 (5A29039-BS1)											
Antimony	86.5	2.0	0.18	ug/l	80.0		108	85-115			
Cadmium	78.7	1.0	0.015	ug/l	80.0		98	85-115			
Copper	76.2	2.0	0.49	ug/l	80.0		95	85-115			
Lead	79.9	1.0	0.13	ug/l	80.0		100	85-115			
Matrix Spike Analyzed: 01/31/2005 (5A29039-MS1)						**Source: IOA1457-01**					
Antimony	88.6	2.0	0.18	ug/l	80.0	0.67	110	70-130			
Cadmium	77.9	1.0	0.015	ug/l	80.0	0.080	97	70-130			
Copper	77.4	2.0	0.49	ug/l	80.0	4.9	91	70-130			
Lead	80.3	1.0	0.13	ug/l	80.0	0.94	99	70-130			
Matrix Spike Dup Analyzed: 01/31/2005 (5A29039-MSD1)						**Source: IOA1457-01**					
Antimony	92.5	2.0	0.18	ug/l	80.0	0.67	115	70-130	4	20	
Cadmium	81.4	1.0	0.015	ug/l	80.0	0.080	102	70-130	4	20	
Copper	80.1	2.0	0.49	ug/l	80.0	4.9	94	70-130	3	20	
Lead	80.2	1.0	0.13	ug/l	80.0	0.94	99	70-130	0	20	
Batch: 5A31050 Extracted: 01/31/05											
Blank Analyzed: 01/31/2005 (5A31050-BLK1)											
Mercury	ND	0.20	0.063	ug/l							

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Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 008

Report Number: IOA1555

Sampled: 01/26/05
Received: 01/26/05

METHOD BLANK/QC DATA

METALS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A31050 Extracted: 01/31/05											
LCS Analyzed: 01/31/2005 (5A31050-BS1)											
Mercury	8.24	0.20	0.063	ug/l	8.00		103	85-115			
Matrix Spike Analyzed: 01/31/2005 (5A31050-MS1)						**Source: IOA1690-21**					
Mercury	9.46	0.20	0.063	ug/l	8.00	1.4	101	70-130			
Matrix Spike Dup Analyzed: 01/31/2005 (5A31050-MSD1)						**Source: IOA1690-21**					
Mercury	9.39	0.20	0.063	ug/l	8.00	1.4	100	70-130	1	20	

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Attention: Bronwyn Kelly

Project ID: Routine Outfall 008

Report Number: IOA1555

Sampled: 01/26/05
Received: 01/26/05

METHOD BLANK/QC DATA

INORGANICS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A26051 Extracted: 01/26/05											
Blank Analyzed: 01/26/2005 (5A26051-BLK1)											
Chloride	ND	0.50	0.26	mg/l							
Nitrate/Nitrite-N	ND	0.26	0.072	mg/l							
Sulfate	ND	0.50	0.18	mg/l							
LCS Analyzed: 01/26/2005 (5A26051-BS1)											
Chloride	4.65	0.50	0.26	mg/l	5.00		93	90-110			
Sulfate	9.60	0.50	0.18	mg/l	10.0		96	90-110			
Matrix Spike Analyzed: 01/26/2005 (5A26051-MS1)						**Source: IOA1551-01**					
Chloride	23.7	0.50	0.26	mg/l	5.00	19	94	80-120			
Sulfate	37.9	0.50	0.18	mg/l	10.0	28	99	80-120			
Matrix Spike Dup Analyzed: 01/26/2005 (5A26051-MSD1)						**Source: IOA1551-01**					
Chloride	23.4	0.50	0.26	mg/l	5.00	19	88	80-120	1	20	
Sulfate	38.1	0.50	0.18	mg/l	10.0	28	101	80-120	1	20	
Batch: 5A28091 Extracted: 01/28/05											
Blank Analyzed: 01/28/2005 (5A28091-BLK1)											
Total Dissolved Solids	ND	10	10	mg/l							
LCS Analyzed: 01/28/2005 (5A28091-BS1)											
Total Dissolved Solids	908	10	10	mg/l	1000		91	90-110			
Duplicate Analyzed: 01/28/2005 (5A28091-DUP1)						**Source: IOA1548-02**					
Total Dissolved Solids	586	10	10	mg/l		590			1	10	

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 008

Report Number: IOA1555

Sampled: 01/26/05
Received: 01/26/05

METHOD BLANK/QC DATA

INORGANICS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A30022 Extracted: 01/30/05											
Blank Analyzed: 01/30/2005 (5A30022-BLK1)											
Perchlorate	ND	4.0	0.80	ug/l							
LCS Analyzed: 01/30/2005 (5A30022-BS1)											
Perchlorate	54.1	4.0	0.80	ug/l	50.0		108	85-115			
Matrix Spike Analyzed: 01/30/2005 (5A30022-MS1)						**Source: IOA1744-02**					
Perchlorate	58.9	4.0	0.80	ug/l	50.0	0.87	116	80-120			
Matrix Spike Dup Analyzed: 01/30/2005 (5A30022-MSD1)						**Source: IOA1744-02**					
Perchlorate	54.3	4.0	0.80	ug/l	50.0	0.87	107	80-120	8	20	
Batch: 5A31068 Extracted: 01/31/05											
Blank Analyzed: 01/31/2005 (5A31068-BLK1)											
Oil & Grease	ND	5.0	0.94	mg/l							
LCS Analyzed: 01/31/2005 (5A31068-BS1)											**M-NR1**
Oil & Grease	17.0	5.0	0.94	mg/l	20.0		85	65-120			
LCS Dup Analyzed: 01/31/2005 (5A31068-BSD1)											
Oil & Grease	19.6	5.0	0.94	mg/l	20.0		98	65-120	14	20	

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Attention: Bronwyn Kelly

Project ID: Routine Outfall 008

Report Number: IOA1555

Sampled: 01/26/05
Received: 01/26/05

Compliance Check

The results obtained from the analytical testing of this data set were checked against compliance limits received from the client. Any results at or above the compliance limits appear in bold on this page.

LabNumber	Analysis	Analyte	Units	Result	MRL	Compliance Limit
IOA1555-01	413.1 Oil and Grease	Oil & Grease	mg/l	-1	5.0	15
IOA1555-01	Chloride - 300.0	Chloride	mg/l	14	0.50	150
IOA1555-01	Nitrogen, NO3+NO2 -N	Nitrate/Nitrite-N	mg/l	0.72	0.26	8.00
IOA1555-01	Perchlorate 314.0	Perchlorate	ug/l	0	4.0	6.00
IOA1555-01	Sulfate-300.0	Sulfate	mg/l	6.30	0.50	300
IOA1555-01	TDS - SM 2540C	Total Dissolved Solids	mg/l	120	10	950

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Michele Harper
Project Manager

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Attention: Bronwyn Kelly

Project ID: Routine Outfall 008

Report Number: IOA1555

Sampled: 01/26/05
Received: 01/26/05

DATA QUALIFIERS AND DEFINITIONS

B	Analyte was detected in the associated Method Blank.
J	Estimated value. Analyte detected at a level less than the Reporting Limit (RL) and greater than or equal to the Method Detection Limit (MDL). The user of this data should be aware that this data is of unknown quality.
M-NR1	There was no MS/MSD analyzed with this batch due to insufficient sample volume. See Blank Spike/Blank Spike Duplicate.
ND	Analyte NOT DETECTED at or above the reporting limit or MDL, if MDL is specified.
RPD	Relative Percent Difference

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 008

Report Number: IOA1555

Sampled: 01/26/05
Received: 01/26/05

Certification Summary

Del Mar Analytical, Irvine

Method	Matrix	Nelac	California
EPA 200.8	Water	X	X
EPA 245.1	Water	X	X
EPA 300.0	Water	X	X
EPA 314.0	Water	X	X
EPA 413.1	Water	X	X
SM2540C	Water	X	X

Nevada and NELAP provide analyte specific accreditations. Analyte specific information for Del Mar Analytical may be obtained by contacting the laboratory or visiting our website at www.dmalabs.com.

Subcontracted Laboratories

Pace Analytical, MN- SUB

1700 Elm Street, Ste 200 - Minneapolis, MN 55414

Analysis Performed: 1613-Dioxin-HR
Samples: IOA1555-01

Analysis Performed: EDD + Level 4
Samples: IOA1555-01

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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Del Mar Analytical Version 5 8/12/04 CHAIN OF CUSTODY FORM

IOA1555

Client Name/Address:

MWH-Pasadena
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101

Project Manager: Bronwyn Kelly

Sampler: Pollock

Project:
Boeing-SSFL NPDES
Routine Outfall 008
Stormwater at Happy Valley

Phone Number:
(626) 568-6691
Fax Number:
(626) 568-6515

ANALYSIS REQUIRED

Field readings:
Temp = 55.8°
pH= 7.0

Sample Description	Sample Matrix	Container Type	# of Cont.	Sampling Date/Time	Preservative	Bottle #	Total Reoverable Metals: Sb, Cd, Cu, Pb, Hg	Oil & Grease (EPA 413.1)	Cl-, SO4, NO3+NO2-N, Perchlorate	TDS	TCDD (and all congeners)					Comments
Outfall 008	W	Poly-1L	1	1-26-05 13:39	HNO3	1A	X									
Outfall 008-Dup	W	Poly-1L	1		HNO3	1B	X									
Outfall 008	W	Glass-Amber	2		HCl	3A, 3B		X								
Outfall 008	W	Poly-500 ml	2		None	4A, 4B			X							
Outfall 008	W	Poly-500 ml	2		None	5A, 5B				X						
Outfall 008	W	Glass-Amber	2		None	6A, 6B					X					

Relinquished By	Date/Time:	Received By	Date/Time:
[signature]	1-26-05 1415	[signature]	1/26/05 1415
[signature]	1/26/05 1705	[signature]	1/26/05 1705
Relinquished By	Date/Time:	Received By	Date/Time:

Turn around Time: (check)
24 Hours _____ 5 Days _____
48 Hours _____ 10 Days _____
72 Hours _____ Normal _____
Perchlorate Only 72 Hours_____
Metals Only 72 Hours_____
Sample Integrity: (Check)
Intact X On Ice: X 3°C

Del Mar Analytical

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March 10, 2005

MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, Ca.91101

Attention: Bronwyn Kelly

Project: Routine Outfall 008
Sampled: 01/26/05
Del Mar Analytical Number: IOA1555

Dear Ms. Kelly:

Pace Analytical performed Method 1613B analysis for the project referenced above. Please use the following cross-reference table when reviewing your results.

MWH ID	DEL MAR ID	Pace ID
Outfall 008	IOA1555-01	106870001

Attached is the original report from the subcontract laboratory. If you have any questions or require further assistance, please do not hesitate to contact me.

Sincerely yours,
DEL MAR ANALYTICAL

Michele Harper
Project Manager

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 1613B Analysis Results

Client - Del Mar Analytical

Client's Sample ID	IOA1555-01		
Lab Sample ID	106870001		
Filename	F50204A_06		
Injected By	MRO		
Total Amount Extracted	1040 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	01/26/2005
ICAL Date	11/29/2004	Received	01/28/2005
CCal Filename(s)	F50203A_20	Extracted	01/31/2005
Method Blank ID	BLANK-6241	Analyzed	02/04/2005 14:09

Native Isomers	Conc pg/L	EMPC pg/L	LOD pg/L		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	0.87		2,3,7,8-TCDF-13C	2.00	78
Total TCDF	ND	-----	0.87		2,3,7,8-TCDD-13C	2.00	86
					1,2,3,7,8-PeCDF-13C	2.00	87
2,3,7,8-TCDD	ND	-----	0.91		2,3,4,7,8-PeCDF-13C	2.00	101
Total TCDD	ND	-----	0.91		1,2,3,7,8-PeCDD-13C	2.00	109
					1,2,3,4,7,8-HxCDF-13C	2.00	83
1,2,3,7,8-PeCDF	ND	-----	0.62		1,2,3,6,7,8-HxCDF-13C	2.00	94
2,3,4,7,8-PeCDF	ND	-----	0.57		2,3,4,6,7,8-HxCDF-13C	2.00	84
Total PeCDF	ND	-----	0.60		1,2,3,7,8,9-HxCDF-13C	2.00	89
					1,2,3,4,7,8-HxCDD-13C	2.00	84
1,2,3,7,8-PeCDD	ND	-----	0.79		1,2,3,6,7,8-HxCDD-13C	2.00	85
Total PeCDD	ND	-----	0.79		1,2,3,4,6,7,8-HpCDF-13C	2.00	81
					1,2,3,4,7,8,9-HpCDF-13C	2.00	80
1,2,3,4,7,8-HxCDF	ND	-----	0.56		1,2,3,4,6,7,8-HpCDD-13C	2.00	95
1,2,3,6,7,8-HxCDF	ND	-----	0.50		OCDD-13C	4.00	94
2,3,4,6,7,8-HxCDF	ND	-----	0.61				
1,2,3,7,8,9-HxCDF	ND	-----	0.60		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	-----	0.57		1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	0.73		2,3,7,8-TCDD-37Cl4	0.20	78
1,2,3,6,7,8-HxCDD	ND	-----	0.80				
1,2,3,7,8,9-HxCDD	ND	-----	0.87				
Total HxCDD	ND	-----	0.80				
1,2,3,4,6,7,8-HpCDF	ND	-----	0.54				
1,2,3,4,7,8,9-HpCDF	ND	-----	0.84				
Total HpCDF	ND	-----	0.69				
1,2,3,4,6,7,8-HpCDD	-----	3.0	0.59	I			
Total HpCDD	1.5	-----	0.59	J			
OCDF	-----	4.7	0.77	I			
OCDD	19.0	-----	0.95	J			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection. Totals are averages of individual isomer LODs.
D = Result obtained from analysis of diluted sample
B = Less than 10 times higher than method blank level
P = Recovery outside of method 1613 control limits
J = Concentration detected is below the calibration range
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....106870

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 1613B Blank Analysis Results

Client - Del Mar Analytical

Lab Sample ID	BLANK-6241	Matrix	Water
Filename	U50202B_06	Dilution	NA
Total Amount Extracted	1040 mL	Extracted	01/31/2005
ICAL Date	01/26/2005	Analyzed	02/02/2005 23:46
CCal Filename(s)	U50202B_01	Injected By	SMT

Native Isomers	Conc pg/L	EMPC pg/L	LOD pg/L		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	0.59		2,3,7,8-TCDF-13C	2.00	86
Total TCDF	1.10	-----	-----	J	2,3,7,8-TCDD-13C	2.00	86
					1,2,3,7,8-PeCDF-13C	2.00	92
2,3,7,8-TCDD	ND	-----	1.30		2,3,4,7,8-PeCDF-13C	2.00	98
Total TCDD	ND	-----	-----		1,2,3,7,8-PeCDD-13C	2.00	105
					1,2,3,4,7,8-HxCDF-13C	2.00	83
1,2,3,7,8-PeCDF	-----	0.73	0.53	I	1,2,3,6,7,8-HxCDF-13C	2.00	76
2,3,4,7,8-PeCDF	ND	-----	0.63		2,3,4,6,7,8-HxCDF-13C	2.00	79
Total PeCDF	ND	-----	-----		1,2,3,7,8,9-HxCDF-13C	2.00	82
					1,2,3,4,7,8-HxCDD-13C	2.00	82
1,2,3,7,8-PeCDD	ND	-----	1.10		1,2,3,6,7,8-HxCDD-13C	2.00	66
Total PeCDD	ND	-----	-----		1,2,3,4,6,7,8-HpCDF-13C	2.00	75
					1,2,3,4,7,8,9-HpCDF-13C	2.00	69
1,2,3,4,7,8-HxCDF	-----	1.30	0.26	E	1,2,3,4,6,7,8-HpCDD-13C	2.00	77
1,2,3,6,7,8-HxCDF	-----	0.75	0.29	E	OCDD-13C	4.00	79
2,3,4,6,7,8-HxCDF	-----	0.71	0.31	I			
1,2,3,7,8,9-HxCDF	-----	1.00	0.41	E	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	0.34	-----	-----	J	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	1.10		2,3,7,8-TCDD-37Cl4	0.20	89
1,2,3,6,7,8-HxCDD	ND	-----	0.69				
1,2,3,7,8,9-HxCDD	ND	-----	0.95				
Total HxCDD	ND	-----	-----				
1,2,3,4,6,7,8-HpCDF	1.20	-----	0.71	J			
1,2,3,4,7,8,9-HpCDF	ND	-----	0.99				
Total HpCDF	4.30	-----	-----	J			
1,2,3,4,6,7,8-HpCDD	-----	1.60	0.86	I			
Total HpCDD	ND	-----	-----				
OCDF	6.50	-----	1.20	J			
OCDD	-----	8.30	0.74	I			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection. Totals are averages of individual isomer LODs.
A = Limit of Detection based on signal to noise
P = Recovery outside of method 1613 control limits
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....106475

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 1613B Laboratory Control Spike Results

Client - Del Mar Analytical

Lab Sample ID	LCS-6242		
Filename	U50202B_02	Matrix	Water
Total Amount Extracted	1040 mL	Dilution	NA
ICAL Date	01/26/2005	Extracted	01/31/2005
CCal Filename	U50202B_01	Analyzed	02/02/2005 20:28
Method Blank ID	BLANK-6241	Injected By	SMT

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDF	10	8.8	7.5	15.8	88
2,3,7,8-TCDD	10	8.6	6.7	15.8	86
1,2,3,7,8-PeCDF	50	43.6	40.0	67.0	87
2,3,4,7,8-PeCDF	50	42.3	34.0	80.0	85
1,2,3,7,8-PeCDD	50	38.0	35.0	71.0	76
1,2,3,4,7,8-HxCDF	50	39.1	36.0	67.0	78
1,2,3,6,7,8-HxCDF	50	42.0	42.0	65.0	84
2,3,4,6,7,8-HxCDF	50	40.4	35.0	78.0	81
1,2,3,7,8,9-HxCDF	50	39.6	39.0	65.0	79
1,2,3,4,7,8-HxCDD	50	43.2	35.0	82.0	86
1,2,3,6,7,8-HxCDD	50	42.9	38.0	67.0	86
1,2,3,7,8,9-HxCDD	50	45.4	32.0	81.0	91
1,2,3,4,6,7,8-HpCDF	50	44.2	41.0	61.0	88
1,2,3,4,7,8,9-HpCDF	50	46.8	39.0	69.0	94
1,2,3,4,6,7,8-HpCDD	50	41.4	35.0	70.0	83
OCDF	100	79.6	63.0	170.0	80
OCDD	100	85.8	78.0	144.0	86
2,3,7,8-TCDD-37Cl4	10	7.8	3.1	19.1	78
2,3,7,8-TCDF-13C	100	85.1	22.0	152.0	85
2,3,7,8-TCDD-13C	100	80.0	20.0	175.0	80
1,2,3,7,8-PeCDF-13C	100	90.8	21.0	192.0	91
2,3,4,7,8-PeCDF-13C	100	94.3	13.0	328.0	94
1,2,3,7,8-PeCDD-13C	100	102.1	21.0	227.0	102
1,2,3,4,7,8-HxCDF-13C	100	81.8	19.0	202.0	82
1,2,3,6,7,8-HxCDF-13C	100	78.8	21.0	159.0	79
2,3,4,6,7,8-HxCDF-13C	100	83.3	22.0	176.0	83
1,2,3,7,8,9-HxCDF-13C	100	85.0	17.0	205.0	85
1,2,3,4,7,8-HxCDD-13C	100	83.5	21.0	193.0	83
1,2,3,6,7,8-HxCDD-13C	100	71.7	25.0	163.0	72
1,2,3,4,6,7,8-HpCDF-13C	100	76.4	21.0	158.0	76
1,2,3,4,7,8,9-HpCDF-13C	100	67.0	20.0	186.0	67
1,2,3,4,6,7,8-HpCDD-13C	100	73.0	26.0	166.0	73
OCDD-13C	200	148.7	26.0	397.0	74

Cs = Concentration Spiked (ng/mL)
Cr = Concentration Recovered (ng/mL)
Rec. = Recovery (Expressed as Percent)
Control Limit Reference: Method 1613, Table 6, 10/94 Revision
X = Background subtracted value
P = Recovery outside of control limits
Nn = Value obtained from additional analysis
* = See Discussion

Report No.....106475

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 1613B Laboratory Control Spike Results

Client - Del Mar Analytical

Lab Sample ID	LCSD-6243		
Filename	U50202B_03	Matrix	Water
Total Amount Extracted	1030 mL	Dilution	NA
ICAL Date	01/26/2005	Extracted	01/31/2005
CCal Filename	U50202B_01	Analyzed	02/02/2005 21:15
Method Blank ID	BLANK-6241	Injected By	SMT

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDF	10	9.7	7.5	15.8	97
2,3,7,8-TCDD	10	9.4	6.7	15.8	94
1,2,3,7,8-PeCDF	50	46.8	40.0	67.0	94
2,3,4,7,8-PeCDF	50	44.6	34.0	80.0	89
1,2,3,7,8-PeCDD	50	40.7	35.0	71.0	81
1,2,3,4,7,8-HxCDF	50	41.3	36.0	67.0	83
1,2,3,6,7,8-HxCDF	50	44.5	42.0	65.0	89
2,3,4,6,7,8-HxCDF	50	43.6	35.0	78.0	87
1,2,3,7,8,9-HxCDF	50	42.2	39.0	65.0	84
1,2,3,4,7,8-HxCDD	50	49.1	35.0	82.0	98
1,2,3,6,7,8-HxCDD	50	45.6	38.0	67.0	91
1,2,3,7,8,9-HxCDD	50	51.3	32.0	81.0	103
1,2,3,4,6,7,8-HpCDF	50	47.5	41.0	61.0	95
1,2,3,4,7,8,9-HpCDF	50	50.1	39.0	69.0	100
1,2,3,4,6,7,8-HpCDD	50	44.5	35.0	70.0	89
OCDF	100	89.7	63.0	170.0	90
OCDD	100	91.5	78.0	144.0	92
2,3,7,8-TCDD-37Cl4	10	9.3	3.1	19.1	93
2,3,7,8-TCDF-13C	100	100.2	22.0	152.0	100
2,3,7,8-TCDD-13C	100	97.2	20.0	175.0	97
1,2,3,7,8-PeCDF-13C	100	109.5	21.0	192.0	109
2,3,4,7,8-PeCDF-13C	100	114.8	13.0	328.0	115
1,2,3,7,8-PeCDD-13C	100	124.2	21.0	227.0	124
1,2,3,4,7,8-HxCDF-13C	100	93.9	19.0	202.0	94
1,2,3,6,7,8-HxCDF-13C	100	88.8	21.0	159.0	89
2,3,4,6,7,8-HxCDF-13C	100	89.8	22.0	176.0	90
1,2,3,7,8,9-HxCDF-13C	100	96.4	17.0	205.0	96
1,2,3,4,7,8-HxCDD-13C	100	86.2	21.0	193.0	86
1,2,3,6,7,8-HxCDD-13C	100	80.0	25.0	163.0	80
1,2,3,4,6,7,8-HpCDF-13C	100	85.0	21.0	158.0	85
1,2,3,4,7,8,9-HpCDF-13C	100	80.0	20.0	186.0	80
1,2,3,4,6,7,8-HpCDD-13C	100	81.7	26.0	166.0	82
OCDD-13C	200	177.3	26.0	397.0	89

Cs = Concentration Spiked (ng/mL)
Cr = Concentration Recovered (ng/mL)
Rec. = Recovery (Expressed as Percent)
Control Limit Reference: Method 1613, Table 6, 10/94 Revision
X = Background subtracted value
P = Recovery outside of control limits
Nn = Value obtained from additional analysis
* = See Discussion

Report No.....106475

REPORT OF LABORATORY ANALYSIS

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Phone: 612.607.1700
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SPIKE RECOVERY RELATIVE PERCENT DIFFERENCE (RPD) RESULTS

Client..... Del Mar Analytical

SPIKE 1 ID..... LCS-6242
SPIKE 1 Filename..... U50202B_02
SPIKE 2 ID..... LCSD-6243
SPIKE 2 Filename..... U50202B_03

COMPOUND	SPIKE 1 REC,%	SPIKE 2 REC,%	RPD,%
2378-TCDF	88	97	9.7
2378-TCDD	86	94	8.9
12378-PeCDF	87	94	7.7
23478-PeCDF	85	89	4.6
12378-PeCDD	76	81	6.4
123478-HxCDF	78	83	6.2
123678-HxCDF	84	89	5.8
234678-HxCDF	81	87	7.1
123789-HxCDF	79	84	6.1
123478-HxCDD	86	98	13.0
123678-HxCDD	86	91	5.6
123789-HxCDD	91	103	12.4
1234678-HpCDF	88	95	7.7
1234789-HpCDF	94	100	6.2
1234678-HpCDD	83	89	7.0
OCDF	80	90	11.8
OCDD	86	92	6.7

REC = Percent Recovered
RPD = The difference between the two values divided by the average.
NA = Not Applicable

Report No..... 106475

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TABLE 1. 2,3,7,8-TCDD Equivalency Factors (TEFs) for the Polychlorinated Dibenzo-p-dioxins and Dibenzofurans

Number	Compound(s)	TEF
1	2,3,7,8-TCDD	1.00
2	1,2,3,7,8-PeCDD	0.50
3	1,2,3,6,7,8-HxCDD	0.1
4	1,2,3,7,8,9-HxCDD	0.1
5	1,2,3,4,7,8-HxCDD	0.1
6	1,2,3,4,6,7,8-HpCDD	0.01
7	OCDD	0.001
8	* Total - TCDD	0.0
9	* Total - PeCDD	0.0
10	* Total - HxCDD	0.0
11	* Total - HpCDD	0.0
12	2,3,7,8-TCDF	0.10
13	1,2,3,7,8-PeCDF	0.05
14	2,3,4,7,8-PeCDF	0.5
15	1,2,3,6,7,8-HxCDF	0.1
16	1,2,3,7,8,9-HxCDF	0.1
17	1,2,3,4,7,8-HxCDF	0.1
18	2,3,4,6,7,8-HxCDF	0.1
19	1,2,3,4,6,7,8-HpCDF	0.01
20	1,2,3,4,7,8,9-HpCDF	0.01
21	OCDF	0.001
22	* Total - TCDF	0.0
23	* Total - PeCDF	0.0
24	* Total - HxCDF	0.0
25	* Total - HpCDF	0.0

*Excluding the 2,3,7,8-substituted congeners.

Reference: 1989 ITEFs

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Del Mar Analytical

17461 Derian Ave, Suite 100, Irvine, CA 92614 Ph (949) 261-1022 Fax (949) 261-1228
1014 E. Cooley Dr., Suite A, Colton, CA 92324 Ph (909) 370-4667 Fax (909) 370-1046
9484 Chesapeake Drive, Suite 805, San Diego, CA 92123 Ph (619) 505-9596 Fax (619) 505-9689
9830 South 51st Street, Suite B-120, Phoenix, AZ 85044 Ph (480) 785-0043 Fax (480) 785-0851
2520 E. Sunset Rd., Suite #3, Las Vegas, NV 89120 Ph (702) 798-3620 Fax (702) 798-3621

SUBCONTRACT ORDER - PROJECT # IOA1555

106870

SENDING LABORATORY:	RECEIVING LABORATORY:
Del Mar Analytical, Irvine 17461 Derian Avenue. Suite 100 Irvine, CA 92614 Phone: (949) 261-1022 Fax: (949) 261-1228 Project Manager: Michele Harper	Pace Analytical, MN- SUB 1700 Elm Street, Ste 200 Minneapolis, MN 55414 Phone :(612) 607-1700 Fax: (612) 607-6444

Standard TAT is requested unless specific due date is requested => Due Date:_____ Initials:_____

Analysis	Expiration	Comments
Sample ID: IOA1555-01 Water	**Sampled: 01/26/05 13:39**	106870001
1613-Dioxin-HR	02/02/05 13:39	J flags, 17 congeners, no TEQ, sub to Pace-MN
EDD + Level 4	02/23/05 13:39	Excel EDD email to pm,Include Std logs for Lvl IV

Containers Supplied:
1 L Amber (IOA1555-01I)
1 L Amber (IOA1555-01J)

SAMPLE INTEGRITY:

All containers intact: ☐ Yes ☐ No Sample labels/COC agree: ☐ Yes ☐ No Samples Received On Ice:: ☐ Yes ☐ No
Custody Seals Present: ☐ Yes ☐ No Samples Preserved Properly: ☐ Yes ☐ No Samples Received at (temp): 2.7°C

Released By	Date	Time	Received By	Date	Time
	1-27-05	1700		1.28.05	09:30

APPENDIX G

Section 9

January Outfall 009

AMEC Data Validation Reports

Del Mar Analytical Laboratory Reports

CONTRACT COMPLIANCE SCREENING FORM FOR HARDCOPY DATA

AMEC Earth & Environmental
550 South Wadsworth Boulevard
Suite 500
Lakewood, CO 80226

Package ID T711DF20
Task Order 313150010
SDG No. Multiple
No. of Analyses 15

Laboratory Alta
Reviewer K. Shadowlight
Analysis/Method Dioxins

Date: February 11, 2005
Reviewer's Signature K Shadowlight

ACTION ITEMS[a]	
1. **Case Narrative Deficiencies**	
2. **Out of Scope Analyses**	
3. **Analyses Not Conducted**	
4. **Missing Hardcopy Deliverables**	
5. **Incorrect Hardcopy Deliverables**	
6. **Deviations from Analysis Protocol, e.g.,**	Qualifications were assigned for the following:
Holding Times	* Method blank contamination
GC/MS Tune/Inst. Performance	* EMPCs
Calibration	* Detects below the lower method calibration level
Method blanks	
Surrogates	
Matrix Spike/Dup LCS	
Field QC	
Internal Standard Performance	
Compound Identification and Quantitation	
System Performance	
COMMENTS[b]	Rev. 1

[a] Subcontracted analytical laboratory is not meeting contract and/or method requirements.
[b] Differences in protocol have been adopted by the laboratory but no action against the laboratory is required.

DATA VALIDATION REPORT

NPDES
Monitoring

ANALYSIS: DIOXINS/FURANS

SAMPLE DELIVERY GROUPS: Multiple SDGs

Prepared by

AMEC—Denver Operations
550 South Wadsworth Boulevard, Suite 500
Lakewood, Colorado 80226

1. INTRODUCTION

Task Order Title:	NPDES Monitoring
Contract Task Order #:	313150010
Sample Delivery Group #:	Multiple
Project Manager:	B. McIlvaine
Matrix:	Water
Analysis:	Dioxins/Furans
QC Level:	Level IV
No. of Samples:	15
No. of Reanalyses/Dilutions:	0
Reviewer:	K. Shadowlight
Date of Review:	February 11, 2005

The samples listed in Table 1 were validated based on the guidelines outlined in the *AMEC Data Validation Procedure for Dioxins and Furans (DVP-19, Rev. 1), EPA Method 1613, and the National National Functional Guidelines For Chlorinated Dioxin/Furan Data Review* (8/02). Any deviations from these procedures and guidelines are documented herein. Qualifiers were applied in cases where the data did not meet the required QC criteria or where special consideration by the data user is required. Data qualifiers were placed on Form Is with the associated qualification codes. Analytes that were rejected for any reason are denoted on the Form I as having only the "R" data qualifier and associated qualification code(s) denoting the reason for rejection. Any additional problems with the data that may have resulted in an estimated value were not denoted by a qualification code since the data had already been rejected.

Table 1. Sample Identification

Client ID	Laboratory ID (Del Mar)	Laboratory ID (Pace)	Matrix	COC Method
Outfall 003	IOA0026-01	105648001	water	1613
Outfall 004	IOA0027-01	105646001	water	1613
Outfall 005	IOA0028-01	105645001	water	1613
Outfall 007	IOA0108-01	105774001	water	1613
Outfall 008	IOA0109-01	105775001	water	1613
Outfall 009	IOA0110-01	105770001	water	1613
Outfall 010	IOA0111-01	105758001	water	1613
Outfall 001	IOA0112-01	105778001	water	1613
Outfall 002	IOA0119-01	105772001	water	1613
Outfall 018	IOA0122-01	105779001	water	1613
Outfall 011	IOA0131-01	105773001	water	1613
Outfall 006	IOA0458-01	106048001	water	1613
Outfall 004	IOA0460-01	106050001	water	1613
Outfall 005	IOA0464-01	106052001	water	1613
Outfall 003	IOA0466-01	106051001	water	1613

2. DATA VALIDATION FINDINGS

2.1 SAMPLE MANAGEMENT

Following are findings associated with sample management:

2.1.1 Sample Preservation, Handling, and Transport

All of the samples in these SDGs were received at Del Mar Analytical within the temperature limits of 4°C ±2°C. Several of the samples in these SDGs were received at Pace Analytical Services below the temperature limits of 4°C ±2°C; however, as none of the samples were noted to have been damaged, no qualifications were required. The samples were received in good condition at both laboratories. No qualifications were required.

2.1.2 Chain of Custody

The COC and transfer COC were signed by the appropriate field and laboratory personnel, and accounted for the analyses presented in these SDGs. As the samples were couriered directly to the laboratory (Del Mar Analytical), custody seals were not required. There was no information regarding custody seals upon receipt at Pace. No qualifications were required.

2.1.3 Holding Times

The samples were extracted and analyzed within a year of collection. No qualifications were required.

2.2 INSTRUMENT PERFORMANCE

Following are findings associated with instrument performance:

2.2.1 GC Column Performance

A column performance standard was combined with the daily calibration verification and analyzed at the beginning of each analytical sequence. The GC column performance was acceptable with the chromatographic separation of 2,3,7,8-TCDD and other TCDD isomers resolved with a valley of ≤25%. No qualifications were required.

2.2.2 Mass Spectrometer Performance

The mass spectrometer performance could not be evaluated as the laboratory did not provide selected ion current profiles for the lock-mass ions. No qualifications were required.

2.3 CALIBRATION

2.3.1 Initial Calibration

There was one initial calibration, analyzed 11/29/04 on Instrument 10MSHR05. The calibration consisted of five concentration level standards (CS1 through CS5) analyzed to verify instrument linearity. The initial calibration was acceptable with %RSDs ≤20% for the 15 native compounds (calibration by isotope dilution) and ≤35% for the 2 native and all labeled compounds (calibration by internal standard). The relative retention times and ion abundance ratios were within the QC limits listed in Method 1613 for all standards. A representative number of %RSDs were verified from the raw data, and no calculation or transcription errors were noted. No qualifications were required.

2.3.2 Continuing Calibration

Calibration verification (VER) consisted of a mid-level standard (CS3) analyzed at the beginning of each analytical sequence. The VER was acceptable with the concentrations within the acceptance criteria listed in the Table 6 of the EPA Method 1613. The ion abundance ratios and relative retention times were within the method QC limits. A representative number of %Ds were verified from the raw data, and no calculation or transcription errors were noted. No qualifications were required.

2.4 BLANKS

One method blank (Blank-6202) was extracted and analyzed with the samples in these SDGs. Target compounds 1,2,3,4,6,7,8-HpCDD, total HpCDD, OCDF, and OCDD were reported in the method blank. Any detects for the aforementioned target compounds reported at concentrations <5x the concentrations reported in the method blank were qualified as estimated nondetects "UJ," at the levels of interference in the samples of these SDGs. A review of the method blank raw data and chromatograms indicated no false negatives or false positives. No further qualifications were required.

2.5 BLANK SPIKES AND LABORATORY CONTROL SAMPLES

One LCS/LCSD pair (LCS-6203/LCSD-6204) was extracted and analyzed with the samples in these SDGs. All recoveries were within the acceptance criteria listed in Table 6 of the Method 1613. There were no QC limits established for RPDs. The reported RPDs were within ±20%. No qualifications were required.

2.6 MATRIX SPIKE/MATRIX SPIKE DUPLICATE

MS/MSD analyses were not performed in these SDGs. Evaluation of method accuracy and precision was based on the LCS/LCSD results. No qualifications were required.

2.7 FIELD QC SAMPLES

Following are findings associated with field QC:

2.7.1 Field Blanks and Equipment Rinsates

The samples in these SDGs had no associated field QC samples. No qualifications were required.

2.7.2 Field Duplicates

No field duplicate samples were identified for these SDGs.

2.8 INTERNAL STANDARDS

The labeled standard recoveries were within the acceptance criteria listed in Table 7 of Method 1613. No qualifications were required.

2.9 COMPOUND IDENTIFICATION

The laboratory analyzed for polychlorinated dioxins/furans by EPA Method 1613. The compound identifications were verified from the raw data and no false negatives or positives were noted. No qualifications were required.

2.10 COMPOUND QUANTIFICATION AND REPORTED DETECTION LIMITS

Compound quantitation was verified from the raw data. The laboratory calculated and reported compound-specific detection limits. Any detects below the lower method calibration limit (MCL) were qualified as estimated, "J." Any reported EMPC was qualified as an estimated nondetect, "UJ." No further qualifications were required.

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 1613B Analysis Results

Client - Del Mar Analytical

Client's Sample ID	IOA0110-01 Outfall 009		
Lab Sample ID	105770001		
Filename	F50127B_13		
Injected By	MRO		
Total Amount Extracted	1020 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	01/04/2005
ICAL Date	11/29/2004	Received	01/06/2005
CCal Filename(s)	F50127A_13	Extracted	01/24/2005
Method Blank ID	BLANK-6202	Analyzed	01/28/2005 07:01

Rev Qual	Qual	Native Isomers	Conc pg/L	EMPC pg/L	LOD pg/L	Internal Standards	ng's Added	Percent Recovery
U		2,3,7,8-TCDF	ND	-----	1.50	2,3,7,8-TCDF-13C	2.00	64
U		Total TCDF	ND	-----	1.50	2,3,7,8-TCDD-13C	2.00	76
U		2,3,7,8-TCDD	ND	-----	1.30	1,2,3,7,8-PeCDF-13C	2.00	98
U		Total TCDD	ND	-----	1.30	2,3,4,7,8-PeCDF-13C	2.00	92
						1,2,3,7,8-PeCDD-13C	2.00	107
U		1,2,3,7,8-PeCDF	ND	-----	1.20	1,2,3,4,7,8-HxCDF-13C	2.00	80
↓		2,3,4,7,8-PeCDF	ND	-----	0.95	1,2,3,6,7,8-HxCDF-13C	2.00	93
		Total PeCDF	ND	-----	1.10	2,3,4,6,7,8-HxCDF-13C	2.00	90
						1,2,3,7,8,9-HxCDF-13C	2.00	83
U		1,2,3,7,8-PeCDD	ND	-----	1.40	1,2,3,4,7,8-HxCDD-13C	2.00	78
U		Total PeCDD	ND	-----	1.40	1,2,3,6,7,8-HxCDD-13C	2.00	93
						1,2,3,4,6,7,8-HpCDF-13C	2.00	82
U		1,2,3,4,7,8-HxCDF	ND	-----	0.93	1,2,3,4,7,8,9-HpCDF-13C	2.00	73
↓		1,2,3,6,7,8-HxCDF	ND	-----	0.65	1,2,3,4,6,7,8-HpCDD-13C	2.00	98
		2,3,4,6,7,8-HxCDF	ND	-----	0.80	OCDD-13C	4.00	84
↓		1,2,3,7,8,9-HxCDF	ND	-----	0.93			
		Total HxCDF	ND	-----	0.83	1,2,3,4-TCDD-13C	2.00	NA
						1,2,3,7,8,9-HxCDD-13C	2.00	NA
U		1,2,3,4,7,8-HxCDD	ND	-----	1.10			
↓		1,2,3,6,7,8-HxCDD	ND	-----	0.97	2,3,7,8-TCDD-37Cl4	0.20	70
		1,2,3,7,8,9-HxCDD	ND	-----	1.10			
		Total HxCDD	ND	-----	1.10			
~~U~~		1,2,3,4,6,7,8-HpCDF	59	-----	1.80			
U		1,2,3,4,7,8,9-HpCDF	ND	-----	2.10			
		Total HpCDF	500	-----	2.00			
		1,2,3,4,6,7,8-HpCDD	76	-----	2.10			
		Total HpCDD	130	-----	2.10			
		OCDF	1600	-----	2.80			
		OCDD	2100	-----	4.50			

KS 01/31/05

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection. Totals are averages of individual isomer LODs.
D = Result obtained from analysis of diluted sample
B = Less than 10 times higher than method blank level
P = Recovery outside of method 1613 control limits
J = Concentration detected is below the calibration range
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....105770

DATA VALIDATED

REPORT OF LABORATORY ANALYSIS

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CONTRACT COMPLIANCE SCREENING FORM FOR HARDCOPY DATA

AMEC Earth & Environmental
550 South Wadsworth Boulevard
Suite 500
Lakewood, CO 80226

Laboratory Del Mar
Reviewer P. Meeks
Analysis/Method Metals

Package ID T711MT23
Task Order 313150010
SDG No. IOA0108, 109, 110, 111
No. of Analyses 4

Date: 02/02/05
Reviewer's Signature P. Meeks

ACTION ITEMS[a]	
1. **Case Narrative Deficiencies**	
2. **Out of Scope Analyses**	
3. **Analyses Not Conducted**	
4. **Missing Hardcopy Deliverables**	
5. **Incorrect Hardcopy Deliverables**	
6. **Deviations from Analysis Protocol, e.g.,** Holding Times; GC/MS Tune/Inst. Performance; Calibrations; Blanks; Surrogates; Matrix Spike/Dup LCS; Field QC; Internal Standard Performance; Compound Identification and Quantitation; System Performance	Qualifications were applied for: 1. Antimony check standard recovery outliers 2. Negative method blank results 3. Detects below the reporting limit 4. Antimony MDLs raised and results qualified as estimated.

COMMENTS[b]	

[a] Subcontracted analytical laboratory is not meeting contract and/or method requirements.
[b] Differences in protocol have been adopted by the laboratory but no action against the laboratory is required.

DATA VALIDATION REPORT

NPDES
Monitoring

ANALYSIS: METALS

SAMPLE DELIVERY GROUPS: IOA0108, IOA0109, IOA0110, & IOA0111

Prepared by

AMEC—Denver Operations
550 South Wadsworth Boulevard, Suite 500
Lakewood, Colorado 80226

1. INTRODUCTION

Task Order Title:	NPDES Monitoring
Contract Task Order #:	313150010
SDG#:	IOA0108, IOA0109, IOA0110, & IOA0111
Project Manager:	B. McIlvaine
Matrix:	Water
Analysis:	Metals
QC Level:	Level IV
No. of Samples:	4
No. of Reanalyses/Dilutions:	0
Reviewer:	P. Meeks
Date of Review:	February 02, 2005

The samples listed in Table 1 were validated based on the guidelines outlined in the *AMEC Data Validation Procedure for Levels III and IV ICP-MS Metals, (DVP-5-A, Rev.0), AMEC Data Validation Procedure for Levels III and IV ICP Metals* (DVP-5, Rev. 0), SW-846 *Method 6020B for Inductively Coupled Plasma – Mass Spectrometry*, SW-846 *Method 6010B for Inductively Coupled Plasma* , SW-846 *Method 7471A for Mercury (Manual Cold-Vapor Technique)*, and validation guidelines outlined in the USEPA CLP *National Functional Guidelines for Inorganic Data Review* (2/94). Any deviations from these procedures and guidelines are documented herein. Qualifiers were applied in cases where the data did not meet the required QC criteria or where special consideration by the data user is required. Data qualifiers were placed on Form Is with the associated qualification codes. Analytes that were rejected for any reason are denoted on the Form I as having only the "R" data qualifier and associated qualification code(s) denoting the reason for rejection. Any additional problems with the data that may have resulted in an estimated value were not denoted by a qualification code since the data had already been rejected.

Table 1. Sample identification

Client ID	EPA ID	Laboratory ID	Matrix	COC Method
Outfall 007	Outfall 007	IOA0108-01	water	ILM04
Outfall 008	Outfall 008	IOA0109-01	water	ILM04
Outfall 009	Outfall 009	IOA0110-01	water	ILM04
Outfall 010	Outfall 010	IOA0111-01	water	ILM04

2. DATA VALIDATION FINDINGS

2.1 SAMPLE MANAGEMENT

Following are findings associated with sample management:

2.1.1 Sample Preservation, Handling, and Transport

The samples in these SDGs were received at the laboratory within the temperature limits of 4°C ±2°C. No sample preservation, handling, or transport problems were noted, and no qualifications were necessary.

2.1.2 Chain of Custody

The COCs were signed and dated by field and laboratory personnel. The COCs listed duplicate samples for all samples; however, duplicate analyses were not required. No sample qualifications were required.

2.1.3 Holding Times

The dates of collection recorded on the COCs and the dates of analyses recorded in the raw data, documented that the sample analyses were performed within the specified holding times of six months for the ICP/MS metals and 28 days for mercury. No qualifications were required.

2.2 ICP-MS TUNING

A precalibration routine must be completed prior to calibrating the instrument, which consists of analyzing a tuning solution to verify resolution, mass calibration, and thermal stability. The solution must be analyzed a minimum of five times and must contain isotopes representing all mass regions of interest. The laboratory performed the required tune solution analyses but did not report %RSDs. The laboratory SOP states that to be acceptable, the %RSD must be less than 5%. The mass calibrations were within 0.1 amu of the true mass and an the instrument resolutions were less than 0.75 amu at 10 percent peak height for all analytes in the tune solution. No site sample qualifications were required.

2.3 CALIBRATION

The ICV and CCV results showed acceptable recoveries, 90-110% for the ICP/MS and 80-120% for mercury. Antimony was not recovered in the 1.0 ppb check standard and was recovered at 50% in the reporting limit check standard; therefore, nondetected antimony in the samples was qualified as estimated, "UJ." The remaining reporting limit check standards were recovered within the AMEC control limits of 70-130%. No further qualifications were required.

2.4 BLANKS

Antimony and cadmium were reported in the method blank at –1.52 and –0.22 µg/L, respectively; therefore, nondetected antimony in the samples was qualified as estimated, "UJ," and cadmium detected in the samples was qualified as estimated, "J." No further qualifications were required.

2.5 ICP INTERFERENCE CHECK SAMPLE (ICS A/AB)

No ICPMS interference check samples were analyzed in association with the samples in these SDGs; therefore, no assessment was made with respect to this criterion.

2.6 BLANK SPIKES AND LABORATORY CONTROL SAMPLES

The ICP/MS LCS sample was identified as 5A05052-BS1 and the mercury LCS sample was identified as 5A05061-BS1. The LCS results on the summary forms and in the raw data were within the laboratory-established ICP/MS and mercury control limits of 85-115%. No qualifications were required.

2.7 LABORATORY DUPLICATES

MS/MSD analyses were performed on Outfall 007 for lead only. The RPD was within the control limit of 20% and no qualifications were required.

2.8 MATRIX SPIKE

MS/MSD analyses were performed on Outfall 007 for lead only. Both recoveries were within the AMEC control limits of 75-125% and no qualifications were required.

2.9 FURNACE ATOMIC ABSORPTION QC

Furnace atomic absorption was not utilized for the analysis of these samples; therefore, furnace atomic absorption QC is not applicable.

2.10 ICP/MS SERIAL DILUTION

No serial dilution analysis was performed in association with the samples in these SDGs; therefore, no assessment was made with respect to this criterion.

2.11 INTERNAL STANDARDS PERFORMANCE

The ICP-MS internal standard recoveries for the site sample and associated QC sample analyses were within the 60-125% control limits and no qualifications were required.

2.12 SAMPLE RESULT VERIFICATION

A Level IV review was performed for the sample in this data package. Calculations were verified, and the sample results reported on the Form Is were verified against the raw data. No transcription errors or calculation errors were noted. Detects below the reporting limit were qualified as estimated, "J."

Antimony was not recovered in the 1.0 ppb check standard, was recovered at 50% in the 2.0 ppb reporting limit check standard, and was reported at negative values in the method blanks and all CCBs. This indicates that the laboratory was not able to detect antimony at the reported MDL of 0.18 µg/L; therefore, the reviewer raised the antimony MDLs for Outfall 008, Outfall 009, and Outfall 010 to the reporting limit, 2.0 µg/L and qualified the nondetected results as estimated, "UJ." No further qualifications were required.

2.13 FIELD QC SAMPLES

Field QC samples are evaluated, and if necessary, qualified based only on laboratory blanks. Any remaining detects are used to evaluate the associated samples.

2.13.1 Field Blanks and Equipment Rinsates

The samples in these SDGs had no associated field QC samples. No qualifications were required.

2.13.2 Field Duplicates

There were no field duplicate analyses performed in association with the site samples.

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 009

Report Number: IOA0110

Sampled: 01/04/05
Received: 01/04/05

DRAFT: METALS

Analyte	Method	Batch	MDL	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Rev Qual	Data Qual Code
Sample ID: IOA0110-01 (DRAFT: Outfall 009 - Water)										
Reporting Units: ug/l										
Antimony	EPA 200.8	5A05052	~~0.18~~ 2.0	2.0	ND	1	01/05/05	01/05/05	UJ	B, ↓3, 8
Cadmium	EPA 200.8	5A05052	0.015	1.0	**0.061**	1	01/05/05	01/05/05	J ↓	B
Copper	EPA 200.8	5A05052	0.49	2.0	**4.9**	1	01/05/05	01/05/05		
Lead	EPA 200.8	5A05052	0.13	1.0	**1.7**	1	01/05/05	01/05/05		
Mercury	EPA 245.1	5A05061	0.063	0.20	**0.20**	1	01/05/05	01/05/05		

DM 2/2/05

AMEC VALIDATED

LEVEL IV

DRAFT REPORT
DRAFT REPORT
DATA SUBJECT TO CHANGE

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LABORATORY REPORT

Prepared For: MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project: Routine Outfall 009

Sampled: 01/04/05
Received: 01/04/05
Issued: 02/21/05 11:50

NELAP #01108CA California ELAP#1197 CSDLAC #10117

The results listed within this Laboratory Report pertain only to the samples tested in the laboratory. The analyses contained in this report were performed in accordance with the applicable certifications as noted. All soil samples are reported on a wet weight basis unless otherwise noted in the report. This Laboratory Report is confidential and is intended for the sole use of Del Mar Analytical and its client. This report shall not be reproduced, except in full, without written permission from Del Mar Analytical. The Chain of Custody, 1 page, is included and is an integral part of this report.
This entire report was reviewed and approved for release.

SAMPLE CROSS REFERENCE

SUBCONTRACTED: Refer to the last page for specific subcontract laboratory information included in this report.

LABORATORY ID	CLIENT ID	MATRIX
IOA0110-01	Outfall 009	Water

Reviewed By:

Michele Harper

Del Mar Analytical, Irvine
Michele Harper
Project Manager

Del Mar Analytical

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 009
Report Number: IOA0110

Sampled: 01/04/05
Received: 01/04/05

METALS

Analyte	Method	Batch	MDL Limit	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA0110-01 (Outfall 009 - Water)									
Reporting Units: ug/l									
Antimony	EPA 200.8	5A05052	0.18	2.0	ND	1	01/05/05	01/05/05	
Cadmium	EPA 200.8	5A05052	0.015	1.0	**0.061**	1	01/05/05	01/05/05	J
Copper	EPA 200.8	5A05052	0.49	2.0	**4.9**	1	01/05/05	01/05/05	
Lead	EPA 200.8	5A05052	0.13	1.0	**1.7**	1	01/05/05	01/05/05	
Mercury	EPA 245.1	5A05061	0.063	0.20	**0.20**	1	01/05/05	01/05/05	

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 009

Report Number: IOA0110

Sampled: 01/04/05
Received: 01/04/05

INORGANICS

Analyte	Method	Batch	MDL Limit	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA0110-01 (Outfall 009 - Water) - cont.									
Reporting Units: mg/l									
Chloride	EPA 300.0	5A04042	0.26	0.50	**6.2**	1	01/04/05	01/04/05	
Nitrate/Nitrite-N	EPA 300.0	5A04042	0.072	0.26	**3.0**	1	01/04/05	01/04/05	
Oil & Grease	EPA 413.1	5A05068	0.94	5.0	ND	1	01/05/05	01/05/05	
Sulfate	EPA 300.0	5A04042	0.18	0.50	**8.2**	1	01/04/05	01/04/05	
Total Dissolved Solids	SM2540C	5A05076	10	10	**120**	1	01/05/05	01/05/05	

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 009

Report Number: IOA0110

Sampled: 01/04/05
Received: 01/04/05

SHORT HOLD TIME DETAIL REPORT

	Hold Time (in days)	Date/Time Sampled	Date/Time Received	Date/Time Extracted	Date/Time Analyzed
Sample ID: Outfall 009 (IOA0110-01) - Water					
EPA 300.0	2	01/04/2005 10:20	01/04/2005 18:25	01/04/2005 19:00	01/04/2005 19:53

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 009

Report Number: IOA0110

Sampled: 01/04/05
Received: 01/04/05

METHOD BLANK/QC DATA

METALS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A05052 Extracted: 01/05/05											
Blank Analyzed: 01/05/2005 (5A05052-BLK1)											
Antimony	ND	2.0	0.18	ug/l							
Cadmium	ND	1.0	0.015	ug/l							
Copper	ND	2.0	0.49	ug/l							
Lead	ND	1.0	0.13	ug/l							
LCS Analyzed: 01/05/2005 (5A05052-BS1)											
Antimony	80.5	2.0	0.18	ug/l	80.0		101	85-115			
Cadmium	71.5	1.0	0.015	ug/l	80.0		89	85-115			
Copper	78.3	2.0	0.49	ug/l	80.0		98	85-115			
Lead	74.5	1.0	0.13	ug/l	80.0		93	85-115			
Matrix Spike Analyzed: 01/05/2005 (5A05052-MS1)						**Source: IOA0108-01**					
Antimony	89.8	2.0	0.18	ug/l	80.0	ND	112	70-130			
Cadmium	79.0	1.0	0.015	ug/l	80.0	0.038	99	70-130			
Copper	82.4	2.0	0.49	ug/l	80.0	3.7	98	70-130			
Lead	81.4	1.0	0.13	ug/l	80.0	0.74	101	70-130			
Matrix Spike Analyzed: 01/05/2005 (5A05052-MS2)						**Source: IOA0117-01**					
Antimony	90.8	2.0	0.18	ug/l	80.0	ND	114	70-130			
Cadmium	76.7	1.0	0.015	ug/l	80.0	ND	96	70-130			
Copper	73.3	2.0	0.49	ug/l	80.0	ND	92	70-130			
Lead	77.6	1.0	0.13	ug/l	80.0	ND	97	70-130			
Matrix Spike Dup Analyzed: 01/05/2005 (5A05052-MSD1)						**Source: IOA0108-01**					
Antimony	89.5	2.0	0.18	ug/l	80.0	ND	112	70-130	0	20	
Cadmium	80.5	1.0	0.015	ug/l	80.0	0.038	101	70-130	2	20	
Copper	84.3	2.0	0.49	ug/l	80.0	3.7	101	70-130	2	20	
Lead	83.3	1.0	0.13	ug/l	80.0	0.74	103	70-130	2	20	

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300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 009

Report Number: IOA0110

Sampled: 01/04/05
Received: 01/04/05

METHOD BLANK/QC DATA

METALS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A05061 Extracted: 01/05/05											
Blank Analyzed: 01/05/2005 (5A05061-BLK1)											
Mercury	ND	0.20	0.063	ug/l							
LCS Analyzed: 01/05/2005 (5A05061-BS1)											
Mercury	8.18	0.20	0.063	ug/l	8.00		102	85-115			
Matrix Spike Analyzed: 01/05/2005 (5A05061-MS1)						**Source: IOA0084-01**					
Mercury	7.81	0.20	0.063	ug/l	8.00	0.086	97	70-130			
Matrix Spike Dup Analyzed: 01/05/2005 (5A05061-MSD1)						**Source: IOA0084-01**					
Mercury	7.89	0.20	0.063	ug/l	8.00	0.086	98	70-130	1	20	

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300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 009

Report Number: IOA0110

Sampled: 01/04/05
Received: 01/04/05

METHOD BLANK/QC DATA

INORGANICS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A04042 Extracted: 01/04/05											
Blank Analyzed: 01/04/2005 (5A04042-BLK1)											
Chloride	ND	0.50	0.26	mg/l							
Nitrate/Nitrite-N	ND	0.26	0.072	mg/l							
Sulfate	ND	0.50	0.18	mg/l							
LCS Analyzed: 01/04/2005 (5A04042-BS1)											
Chloride	4.97	0.50	0.26	mg/l	5.00		99	90-110			
Sulfate	9.93	0.50	0.18	mg/l	10.0		99	90-110			
Matrix Spike Analyzed: 01/04/2005 (5A04042-MS1)						**Source: IOA0049-01**					
Chloride	5.60	0.50	0.26	mg/l	5.00	0.51	102	80-120			
Sulfate	10.4	0.50	0.18	mg/l	10.0	0.63	98	80-120			
Matrix Spike Dup Analyzed: 01/04/2005 (5A04042-MSD1)						**Source: IOA0049-01**					
Chloride	5.72	0.50	0.26	mg/l	5.00	0.51	104	80-120	2	20	
Sulfate	10.6	0.50	0.18	mg/l	10.0	0.63	100	80-120	2	20	
Batch: 5A05068 Extracted: 01/05/05											
Blank Analyzed: 01/05/2005 (5A05068-BLK1)											
Oil & Grease	ND	5.0	0.94	mg/l							
LCS Analyzed: 01/05/2005 (5A05068-BS1)											**M-NR1**
Oil & Grease	20.1	5.0	0.94	mg/l	20.0		100	65-120			
LCS Dup Analyzed: 01/05/2005 (5A05068-BSD1)											
Oil & Grease	21.1	5.0	0.94	mg/l	20.0		106	65-120	5	20	

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 009

Report Number: IOA0110

Sampled: 01/04/05
Received: 01/04/05

METHOD BLANK/QC DATA

INORGANICS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A05076 Extracted: 01/05/05											
Blank Analyzed: 01/05/2005 (5A05076-BLK1)											
Total Dissolved Solids	ND	10	10	mg/l							
LCS Analyzed: 01/05/2005 (5A05076-BS1)											
Total Dissolved Solids	1080	20	20	mg/l	1000		108	90-110			
Duplicate Analyzed: 01/05/2005 (5A05076-DUP1)						**Source: IOA0066-03**					
Total Dissolved Solids	230	10	10	mg/l		230			0	10	

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 009

Report Number: IOA0110

Sampled: 01/04/05
Received: 01/04/05

Compliance Check

The results obtained from the analytical testing of this data set were checked against compliance limits received from the client. Any results at or above the compliance limits appear in bold on this page.

LabNumber	Analysis	Analyte	Units	Result	MRL	Compliance Limit
IOA0110-01	413.1 Oil and Grease	Oil & Grease	mg/l	0.80	5.0	15
IOA0110-01	Chloride - 300.0	Chloride	mg/l	6.20	0.50	150
IOA0110-01	Nitrogen, NO3+NO2 -N	Nitrate/Nitrite-N	mg/l	3.00	0.26	10.00
IOA0110-01	Sulfate-300.0	Sulfate	mg/l	8.20	0.50	250
IOA0110-01	TDS - SM 2540C	Total Dissolved Solids	mg/l	120	10	850

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 009

Report Number: IOA0110

Sampled: 01/04/05
Received: 01/04/05

DATA QUALIFIERS AND DEFINITIONS

J	Estimated value. Analyte detected at a level less than the Reporting Limit (RL) and greater than or equal to the Method Detection Limit (MDL). The user of this data should be aware that this data is of unknown quality.
M-NR1	There was no MS/MSD analyzed with this batch due to insufficient sample volume. See Blank Spike/Blank Spike Duplicate.
ND	Analyte NOT DETECTED at or above the reporting limit or MDL, if MDL is specified.
RPD	Relative Percent Difference

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 009

Report Number: IOA0110

Sampled: 01/04/05
Received: 01/04/05

Certification Summary

Del Mar Analytical, Irvine

Method	Matrix	Nelac	California
EPA 200.8	Water	X	X
EPA 245.1	Water	X	X
EPA 300.0	Water	X	X
EPA 413.1	Water	X	X
SM2540C	Water	X	X

Nevada and NELAP provide analyte specific accreditations. Analyte specific information for Del Mar Analytical may be obtained by contacting the laboratory or visiting our website at www.dmalabs.com.

Subcontracted Laboratories

Pace Analytical, MN- SUB

1700 Elm Street, Ste 200 - Minneapolis, MN 55414

Analysis Performed: 1613-Dioxin-HR
Samples: IOA0110-01

Analysis Performed: EDD + Level 4
Samples: IOA0110-01

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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IDH0110

Del Mar Analytical Version 5 8/12/04 CHAIN OF CUSTODY FORM

Client Name/Address:	Project:
MWH-Pasadena 300 North Lake Avenue, Suite 1200 Pasadena, CA 91101	Boeing-SSFL NPDES **Routine Outfall 009** Stormwater at WS-13
Project Manager: Bronwyn Kelly Sampler: Pollock	Phone Number: (626) 568-6691 Fax Number: (626) 568-6515

Sample Description	Sample Matrix	Container Type	# of Cont.	Sampling Date/Time	Preservative	Bottle * #	Total Recoverable Metals: Sb, Cd, Cu, Pb, Hg	TCDD (and all congeners)	Oil & Grease (EPA 413.1)	Cl-, SO4, NO3+NO2-N	TDS					Field readings: Temp = 52.0 F pH= 7.0 **Comments**
Outfall 009	W	Poly-1L	1	1-04 10:20	HNO3	1A	X									
Outfall 009-Dup	W	Poly-1L	1		HNO3	1B	X									
Outfall 009	W	Glass-Amber	2		None	2A, 2B		X								
Outfall 009	W	Glass-Amber	2		HCl	3A, 3B			X							
Outfall 009	W	Poly-500 ml	2		None	4A,4B				X						
Outfall 009	W	Poly-500 ml	2		None	5A, 5B					X					

Relinquished By	Date/Time:	Received By	Date/Time:
	1-4-05 15:10		1/4/05 15:10
Relinquished By	Date/Time:	Received By	Date/Time:
	1/4/05 1825		1/4/05 1825
Relinquished By	Date/Time:	Received By	Date/Time:

Turn around Time: (check)
24 Hours _____ 5 Days _____
48 Hours _____ 10 Days _____
72 Hours _____ Normal _____
Perchlorate Only 72 Hours_____
Metals Only 72 Hours_____
Sample Integrity: (Check)
Intact X On Ice: X 5°C

Del Mar Analytical

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February 3, 2005

MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, Ca.91101

Attention: Bronwyn Kelly

Project: Routine Outfall 009
Sampled: 01/04/05
Del Mar Analytical Number: IOA0110

Dear Ms. Kelly:

Pace Analytical performed Method 1613B analysis for the project referenced above. Please use the following cross-reference table when reviewing your results.

MWH ID	DEL MAR ID	Pace ID
Outfall 009	IOA0110-01	105770001

Attached is the original report from the subcontract laboratory. If you have any questions or require further assistance, please do not hesitate to contact me.

Sincerely yours,
DEL MAR ANALYTICAL

Michele Harper
Project Manager

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Pace Analytical™

Method 1613B Analysis Results

Client - Del Mar Analytical

Client's Sample ID	IOA0110-01		
Lab Sample ID	105770001		
Filename	F50127B_13		
Injected By	MRO		
Total Amount Extracted	1020 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	01/04/2005
ICAL Date	11/29/2004	Received	01/06/2005
CCal Filename(s)	F50127A_13	Extracted	01/24/2005
Method Blank ID	BLANK-6202	Analyzed	01/28/2005 07:01

Native Isomers	Conc pg/L	EMPC pg/L	LOD pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	1.50	2,3,7,8-TCDF-13C	2.00	64
Total TCDF	ND	-----	1.50	2,3,7,8-TCDD-13C	2.00	76
				1,2,3,7,8-PeCDF-13C	2.00	98
2,3,7,8-TCDD	ND	-----	1.30	2,3,4,7,8-PeCDF-13C	2.00	92
Total TCDD	ND	-----	1.30	1,2,3,7,8-PeCDD-13C	2.00	107
				1,2,3,4,7,8-HxCDF-13C	2.00	80
1,2,3,7,8-PeCDF	ND	-----	1.20	1,2,3,6,7,8-HxCDF-13C	2.00	93
2,3,4,7,8-PeCDF	ND	-----	0.95	2,3,4,6,7,8-HxCDF-13C	2.00	90
Total PeCDF	ND	-----	1.10	1,2,3,7,8,9-HxCDF-13C	2.00	83
				1,2,3,4,7,8-HxCDD-13C	2.00	78
1,2,3,7,8-PeCDD	ND	-----	1.40	1,2,3,6,7,8-HxCDD-13C	2.00	93
Total PeCDD	ND	-----	1.40	1,2,3,4,6,7,8-HpCDF-13C	2.00	82
				1,2,3,4,7,8,9-HpCDF-13C	2.00	73
1,2,3,4,7,8-HxCDF	ND	-----	0.93	1,2,3,4,6,7,8-HpCDD-13C	2.00	98
1,2,3,6,7,8-HxCDF	ND	-----	0.65	OCDD-13C	4.00	84
2,3,4,6,7,8-HxCDF	ND	-----	0.80			
1,2,3,7,8,9-HxCDF	ND	-----	0.93	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	-----	0.83	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	1.10	2,3,7,8-TCDD-37Cl4	0.20	70
1,2,3,6,7,8-HxCDD	ND	-----	0.97			
1,2,3,7,8,9-HxCDD	ND	-----	1.10			
Total HxCDD	ND	-----	1.10			
1,2,3,4,6,7,8-HpCDF	59	-----	1.80			
1,2,3,4,7,8,9-HpCDF	ND	-----	2.10			
Total HpCDF	500	-----	2.00			
1,2,3,4,6,7,8-HpCDD	76	-----	2.10			
Total HpCDD	130	-----	2.10			
OCDF	1600	-----	2.80			
OCDD	2100	-----	4.50			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection. Totals are averages of individual isomer LODs.
D = Result obtained from analysis of diluted sample
B = Less than 10 times higher than method blank level
P = Recovery outside of method 1613 control limits
J = Concentration detected is below the calibration range
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....105770

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Pace Analytical™

Method 1613B Blank Analysis Results

Client - Del Mar Analytical

Lab Sample ID	BLANK-6202	Matrix	Water
Filename	F50127A_06	Dilution	NA
Total Amount Extracted	982 mL	Extracted	01/24/2005
ICAL Date	11/29/2004	Analyzed	01/27/2005 14:13
CCal Filename(s)	F50127A_02	Injected By	MRO

Native Isomers	Conc pg/L	EMPC pg/L	LOD pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	4.7	2,3,7,8-TCDF-13C	2.00	33
Total TCDF	ND	-----	-----	2,3,7,8-TCDD-13C	2.00	45
				1,2,3,7,8-PeCDF-13C	2.00	68
2,3,7,8-TCDD	ND	-----	5.1	2,3,4,7,8-PeCDF-13C	2.00	70
Total TCDD	ND	-----	-----	1,2,3,7,8-PeCDD-13C	2.00	81
				1,2,3,4,7,8-HxCDF-13C	2.00	75
1,2,3,7,8-PeCDF	ND	-----	2.2	1,2,3,6,7,8-HxCDF-13C	2.00	95
2,3,4,7,8-PeCDF	ND	-----	1.5	2,3,4,6,7,8-HxCDF-13C	2.00	98
Total PeCDF	ND	-----	-----	1,2,3,7,8,9-HxCDF-13C	2.00	85
				1,2,3,4,7,8-HxCDD-13C	2.00	78
1,2,3,7,8-PeCDD	ND	-----	1.6	1,2,3,6,7,8-HxCDD-13C	2.00	94
Total PeCDD	ND	-----	-----	1,2,3,4,6,7,8-HpCDF-13C	2.00	85
				1,2,3,4,7,8,9-HpCDF-13C	2.00	78
1,2,3,4,7,8-HxCDF	ND	-----	1.6	1,2,3,4,6,7,8-HpCDD-13C	2.00	99
1,2,3,6,7,8-HxCDF	ND	-----	1.4	OCDD-13C	4.00	97
2,3,4,6,7,8-HxCDF	ND	-----	1.1			
1,2,3,7,8,9-HxCDF	ND	-----	1.6	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	-----	-----	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	1.6	2,3,7,8-TCDD-37Cl4	0.20	40
1,2,3,6,7,8-HxCDD	ND	-----	1.2			
1,2,3,7,8,9-HxCDD	ND	-----	1.7			
Total HxCDD	ND	-----	-----			
1,2,3,4,6,7,8-HpCDF	ND	-----	1.5			
1,2,3,4,7,8,9-HpCDF	ND	-----	1.4			
Total HpCDF	ND	-----	-----			
1,2,3,4,6,7,8-HpCDD	1.9	-----	1.3 J			
Total HpCDD	1.9	-----	----- J			
OCDF	8.3	-----	1.9 J			
OCDD	26.0	-----	2.3 J			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection. Totals are averages of individual isomer LODs.
A = Limit of Detection based on signal to noise
P = Recovery outside of method 1613 control limits
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....105645

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 1613B Laboratory Control Spike Results

Client - Del Mar Analytical

Lab Sample ID	LCS-6203		
Filename	F50127A_03	Matrix	Water
Total Amount Extracted	1030 mL	Dilution	NA
ICAL Date	11/29/2004	Extracted	01/24/2005
CCal Filename	F50127A_02	Analyzed	01/27/2005 11:44
Method Blank ID	BLANK-6202	Injected By	MRO

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDF	10	10.2	7.5	15.8	102
2,3,7,8-TCDD	10	9.0	6.7	15.8	90
1,2,3,7,8-PeCDF	50	50.1	40.0	67.0	100
2,3,4,7,8-PeCDF	50	48.4	34.0	80.0	97
1,2,3,7,8-PeCDD	50	43.4	35.0	71.0	87
1,2,3,4,7,8-HxCDF	50	44.8	36.0	67.0	90
1,2,3,6,7,8-HxCDF	50	48.0	42.0	65.0	96
2,3,4,6,7,8-HxCDF	50	48.6	35.0	78.0	97
1,2,3,7,8,9-HxCDF	50	46.4	39.0	65.0	93
1,2,3,4,7,8-HxCDD	50	50.0	35.0	82.0	100
1,2,3,6,7,8-HxCDD	50	51.7	38.0	67.0	103
1,2,3,7,8,9-HxCDD	50	48.5	32.0	81.0	97
1,2,3,4,6,7,8-HpCDF	50	51.4	41.0	61.0	103
1,2,3,4,7,8,9-HpCDF	50	52.3	39.0	69.0	105
1,2,3,4,6,7,8-HpCDD	50	43.4	35.0	70.0	87
OCDF	100	89.5	63.0	170.0	90
OCDD	100	96.9	78.0	144.0	97
2,3,7,8-TCDD-37Cl4	10	6.2	3.1	19.1	62
2,3,7,8-TCDF-13C	100	49.8	22.0	152.0	50
2,3,7,8-TCDD-13C.	100	65.8	20.0	175.0	66
1,2,3,7,8-PeCDF-13C	100	75.7	21.0	192.0	76
2,3,4,7,8-PeCDF-13C	100	76.9	13.0	328.0	77
1,2,3,7,8-PeCDD-13C	100	93.4	21.0	227.0	93
1,2,3,4,7,8-HxCDF-13C	100	78.9	19.0	202.0	79
1,2,3,6,7,8-HxCDF-13C	100	89.8	21.0	159.0	90
2,3,4,6,7,8-HxCDF-13C	100	88.2	22.0	176.0	88
1,2,3,7,8,9-HxCDF-13C	100	81.5	17.0	205.0	81
1,2,3,4,7,8-HxCDD-13C	100	82.2	21.0	193.0	82
1,2,3,6,7,8-HxCDD-13C	100	95.2	25.0	163.0	95
1,2,3,4,6,7,8-HpCDF-13C	100	86.3	21.0	158.0	86
1,2,3,4,7,8,9-HpCDF-13C	100	75.6	20.0	186.0	76
1,2,3,4,6,7,8-HpCDD-13C	100	102.9	26.0	166.0	103
OCDD-13C	200	195.1	26.0	397.0	98

Cs = Concentration Spiked (ng/mL)
Cr = Concentration Recovered (ng/mL)
Rec. = Recovery (Expressed as Percent)
Control Limit Reference: Method 1613, Table 6, 10/94 Revision
X = Background subtracted value
P = Recovery outside of control limits
Nn = Value obtained from additional analysis
* = See Discussion

Report No.....105645

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 1613B Laboratory Control Spike Results

Client - Del Mar Analytical

Lab Sample ID	LCSD-6204		
Filename	F50127A_04	Matrix	Water
Total Amount Extracted	1000 mL	Dilution	NA
ICAL Date	11/29/2004	Extracted	01/24/2005
CCal Filename	F50127A_02	Analyzed	01/27/2005 12:32
Method Blank ID	BLANK-6202	Injected By	MRO

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDF	10	9.9	7.5	15.8	99
2,3,7,8-TCDD	10	8.8	6.7	15.8	88
1,2,3,7,8-PeCDF	50	49.8	40.0	67.0	100
2,3,4,7,8-PeCDF	50	47.6	34.0	80.0	95
1,2,3,7,8-PeCDD	50	41.4	35.0	71.0	83
1,2,3,4,7,8-HxCDF	50	46.6	36.0	67.0	93
1,2,3,6,7,8-HxCDF	50	44.0	42.0	65.0	88
2,3,4,6,7,8-HxCDF	50	47.2	35.0	78.0	94
1,2,3,7,8,9-HxCDF	50	44.8	39.0	65.0	90
1,2,3,4,7,8-HxCDD	50	46.5	35.0	82.0	93
1,2,3,6,7,8-HxCDD	50	48.9	38.0	67.0	98
1,2,3,7,8,9-HxCDD	50	46.7	32.0	81.0	93
1,2,3,4,6,7,8-HpCDF	50	48.7	41.0	61.0	97
1,2,3,4,7,8,9-HpCDF	50	49.9	39.0	69.0	100
1,2,3,4,6,7,8-HpCDD	50	42.7	35.0	70.0	85
OCDF	100	84.8	63.0	170.0	85
OCDD	100	92.5	78.0	144.0	92
2,3,7,8-TCDD-37Cl4	10	7.5	3.1	19.1	75
2,3,7,8-TCDF-13C	100	65.7	22.0	152.0	66
2,3,7,8-TCDD-13C	100	83.8	20.0	175.0	84
1,2,3,7,8-PeCDF-13C	100	84.9	21.0	192.0	85
2,3,4,7,8-PeCDF-13C	100	85.6	13.0	328.0	86
1,2,3,7,8-PeCDD-13C	100	105.3	21.0	227.0	105
1,2,3,4,7,8-HxCDF-13C	100	82.6	19.0	202.0	83
1,2,3,6,7,8-HxCDF-13C	100	96.7	21.0	159.0	97
2,3,4,6,7,8-HxCDF-13C	100	92.3	22.0	176.0	92
1,2,3,7,8,9-HxCDF-13C	100	84.5	17.0	205.0	84
1,2,3,4,7,8-HxCDD-13C	100	81.9	21.0	193.0	82
1,2,3,6,7,8-HxCDD-13C	100	102.0	25.0	163.0	102
1,2,3,4,6,7,8-HpCDF-13C	100	90.1	21.0	158.0	90
1,2,3,4,7,8,9-HpCDF-13C	100	78.6	20.0	186.0	79
1,2,3,4,6,7,8-HpCDD-13C	100	106.1	26.0	166.0	106
OCDD-13C	200	196.4	26.0	397.0	98

Cs = Concentration Spiked (ng/mL)
Cr = Concentration Recovered (ng/mL)
Rec. = Recovery (Expressed as Percent)
Control Limit Reference: Method 1613, Table 6, 10/94 Revision
X = Background subtracted value
P = Recovery outside of control limits
Nn = Value obtained from additional analysis
* = See Discussion

Report No.....105645

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, Inc.
1700 Elm Street
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444

SPIKE RECOVERY RELATIVE PERCENT DIFFERENCE (RPD) RESULTS

Client..... Del Mar Analytical

SPIKE 1 ID.....LCS-6203
SPIKE 1 Filename..... F50127A_03
SPIKE 2 ID.....LCSD-6204
SPIKE 2 Filename..... F50127A_04

COMPOUND	SPIKE 1 REC,%	SPIKE 2 REC,%	RPD,%
2378-TCDF	102	99	3.0
2378-TCDD	90	88	2.2
12378-PeCDF	100	100	0.0
23478-PeCDF	97	95	2.1
12378-PeCDD	87	83	4.7
123478-HxCDF	90	93	3.3
123678-HxCDF	96	88	8.7
234678-HxCDF	97	94	3.1
123789-HxCDF	93	90	3.3
123478-HxCDD	100	93	7.3
123678-HxCDD	103	98	5.0
123789-HxCDD	97	93	4.2
1234678-HpCDF	103	97	6.0
1234789-HpCDF	105	100	4.9
1234678-HpCDD	87	85	2.3
OCDF	90	85	5.7
OCDD	97	92	5.3

REC = Percent Recovered
RPD = The difference between the two values divided by the average.
NA = Not Applicable

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1700 Elm Street
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TABLE 1. 2,3,7,8-TCDD Equivalency Factors (TEFs) for the Polychlorinated Dibenzo-p-dioxins and Dibenzofurans

Number	Compound(s)	TEF
1	2,3,7,8-TCDD	1.00
2	1,2,3,7,8-PeCDD	0.50
3	1,2,3,6,7,8-HxCDD	0.1
4	1,2,3,7,8,9-HxCDD	0.1
5	1,2,3,4,7,8-HxCDD	0.1
6	1,2,3,4,6,7,8-HpCDD	0.01
7	OCDD	0.001
8	* Total - TCDD	0.0
9	* Total - PeCDD	0.0
10	* Total - HxCDD	0.0
11	* Total - HpCDD	0.0
12	2,3,7,8-TCDF	0.10
13	1,2,3,7,8-PeCDF	0.05
14	2,3,4,7,8-PeCDF	0.5
15	1,2,3,6,7,8-HxCDF	0.1
16	1,2,3,7,8,9-HxCDF	0.1
17	1,2,3,4,7,8-HxCDF	0.1
18	2,3,4,6,7,8-HxCDF	0.1
19	1,2,3,4,6,7,8-HpCDF	0.01
20	1,2,3,4,7,8,9-HpCDF	0.01
21	OCDF	0.001
22	* Total - TCDF	0.0
23	* Total - PeCDF	0.0
24	* Total - HxCDF	0.0
25	* Total - HpCDF	0.0

*Excluding the 2,3,7,8-substituted congeners.

Reference: 1989 ITEFs

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Del Mar Analytical

17461 Derian Ave. Suite 100, Irvine, CA 92614 Ph (949) 261-1022 Fax (949) 261-1228
1014 E. Cooley Dr., Suite A, Colton, CA 92324 Ph (909) 370-4667 Fax (909) 370-1046
9484 Chesapeake Drive, Suite 805, San Diego, CA 92123 Ph (619) 505-9596 Fax (619) 505-9689
9830 South 51st Street, Suite B-120, Phoenix, AZ 85044 Ph (480) 785-0043 Fax (480) 785-0851
2520 E. Sunset Rd., Suite #3, Las Vegas, NV 89120 Ph (702) 798-3620 Fax (702) 798-3621

SUBCONTRACT ORDER - PROJECT # IOA0110

105770

SENDING LABORATORY:

Del Mar Analytical, Irvine
17461 Derian Avenue. Suite 100
Irvine, CA 92614
Phone: (949) 261-1022
Fax: (949) 261-1228
Project Manager: Michele Harper

RECEIVING LABORATORY:

Pace Analytical, MN- SUB
1700 Elm Street, Ste 200
Minneapolis, MN 55414
Phone :(612) 607-1700
Fax: (612) 607-6444

Standard TAT is requested unless specific due date is requested => Due Date:_____ Initials:_____

Analysis	Expiration	Comments
Sample ID: IOA0110-01 Water	**Sampled: 01/04/05 10:20**	**Instant Nofication**
1613-Dioxin-HR	01/11/05 10:20	J flags, 17 congeners, no TEQ, sub to Pace-MN

105770001

Containers Supplied:
1 L Amber (IOA0110-01C)
1 L Amber (IOA0110-01D)

SAMPLE INTEGRITY:

All containers intact: ☐ Yes ☐ No Sample labels/COC agree: ☐ Yes ☐ No Samples Received On Ice:: ☑ Yes ☐ No
Custody Seals Present: ☐ Yes ☐ No Samples Preserved Properly: ☐ Yes ☐ No Samples Received at (temp): 4°

Released By	Date	Time	Received By	Date	Time
	1-5-05	1700	Bright Fleru	1-6-05	09:25

CONTRACT COMPLIANCE SCREENING FORM FOR HARDCOPY DATA

AMEC Earth & Environmental
550 South Wadsworth Boulevard
Suite 500
Lakewood, CO 80226

Package ID T711DF22
Task Order 313150010
SDG No. Multiple
No. of Analyses 9

Laboratory Pace
Reviewer K. Shadowlight
Analysis/Method Dioxins

Date: February 18, 2005
Reviewer's Signature K Shadowlight

ACTION ITEMS[a]	
1. **Case Narrative Deficiencies**	
2. **Out of Scope Analyses**	
3. **Analyses Not Conducted**	
4. **Missing Hardcopy Deliverables**	
5. **Incorrect Hardcopy Deliverables**	
6. **Deviations from Analysis Protocol, e.g.,**	Qualifications were assigned for the following:
Holding Times	* Method blank contamination
GC/MS Tune/Inst. Performance	* EMPCs
Calibration	* Detects below the lower method calibration level
Method blanks	
Surrogates	
Matrix Spike/Dup LCS	
Field QC	
Internal Standard Performance	
Compound Identification and Quantitation	
System Performance	
COMMENTS[b]	

[a] Subcontracted analytical laboratory is not meeting contract and/or method requirements.
[b] Differences in protocol have been adopted by the laboratory but no action against the laboratory is required.

DATA VALIDATION REPORT

NPDES
Monitoring

ANALYSIS: DIOXINS/FURANS

SAMPLE DELIVERY GROUPS: Multiple SDGs

Prepared by

AMEC—Denver Operations
550 South Wadsworth Boulevard, Suite 500
Lakewood, Colorado 80226

1. INTRODUCTION

Task Order Title:	NPDES Monitoring
Contract Task Order #:	313150010
Sample Delivery Group #:	Multiple
Project Manager:	B. McIlvaine
Matrix:	Water
Analysis:	Dioxins/Furans
QC Level:	Level IV
No. of Samples:	9
No. of Reanalyses/Dilutions:	0
Reviewer:	K. Shadowlight
Date of Review:	February 18, 2005

The samples listed in Table 1 were validated based on the guidelines outlined in the *AMEC Data Validation Procedure for Dioxins and Furans (DVP-19, Rev. 1), EPA Method 1613, and the National National Functional Guidelines For Chlorinated Dioxin/Furan Data Review* (8/02). Any deviations from these procedures and guidelines are documented herein. Qualifiers were applied in cases where the data did not meet the required QC criteria or where special consideration by the data user is required. Data qualifiers were placed on Form Is with the associated qualification codes. Analytes that were rejected for any reason are denoted on the Form I as having only the "R" data qualifier and associated qualification code(s) denoting the reason for rejection. Any additional problems with the data that may have resulted in an estimated value were not denoted by a qualification code since the data had already been rejected.

Table 1. Sample Identification

Client ID	Laboratory ID (Del Mar)	Laboratory ID (Pace)	Matrix	COC Method
Outfall 001	IOA0551-01	106124001	water	1613
Outfall 002	IOA0550-01	106130001	water	1613
Outfall 007	IOA0556-01	106128001	water	1613
Outfall 008	IOA0553-01	106126001	water	1613
Outfall 009	IOA0554-01	106131001	water	1613
Outfall 010	IOA0555-01	106127001	water	1613
Outfall 011	IOA0549-01	106132001	water	1613
Outfall 011	IOA0567-01	106135001	water	1613
Outfall 018	IOA0552-01	106125001	water	1613

2. DATA VALIDATION FINDINGS

2.1 SAMPLE MANAGEMENT

Following are findings associated with sample management:

2.1.1 Sample Preservation, Handling, and Transport

The samples in these SDGs were received at Del Mar Analytical within the temperature limits of 4°C ±2°C. The samples were subcontracted to Pace Analytical for the dioxin/furan analyses. The samples in these SDGs were received at Pace Analytical Services within the temperature limits of 4°C ±2°C. The samples were received in good condition at both laboratories. No qualifications were required.

2.1.2 Chain of Custody

The COCs and transfer COCs were signed by the appropriate field and laboratory personnel. The samples and analyses were accounted for on both the original COCs and transfer COCs. As the samples were couriered directly to the laboratory (Del Mar Analytical), custody seals were not required. There was no information regarding custody seals upon receipt at Pace. No qualifications were required.

2.1.3 Holding Times

The samples were extracted and analyzed within a year of collection. No qualifications were required.

2.2 INSTRUMENT PERFORMANCE

Following are findings associated with instrument performance:

2.2.1 GC Column Performance

A column performance standard was combined with the daily calibration verification and analyzed at the beginning of each analytical sequence. The GC column performance was acceptable with the chromatographic separation of 2,3,7,8-TCDD and other TCDD isomers resolved with a valley of ≤25%. No qualifications were required.

2.2.2 Mass Spectrometer Performance

The mass spectrometer performance could not be evaluated as the laboratory did not provide selected ion current profiles for the lock-mass ions. No qualifications were required.

2.3 CALIBRATION

2.3.1 Initial Calibration

There was one initial calibration, analyzed 11/29/04 on Instrument 10MSHR05. The calibration consisted of five concentration level standards (CS1 through CS5) analyzed to verify instrument linearity. The initial calibration was acceptable with %RSDs ≤20% for the 15 native compounds (calibration by isotope dilution) and ≤35% for the 2 native and all labeled compounds (calibration by internal standard). The relative retention times and ion abundance ratios were within the QC limits listed in Method 1613 for all standards. A representative number of %RSDs were verified from the raw data, and no calculation or transcription errors were noted. No qualifications were required.

2.3.2 Continuing Calibration

Calibration verification (VER) consisted of a mid-level standard (CS3) analyzed at the beginning of each analytical sequence. The VER was acceptable with the concentrations within the acceptance criteria listed in the Table 6 of the EPA Method 1613. The ion abundance ratios and relative retention times were within the method QC limits. A representative number of %Ds were verified from the raw data, and no calculation or transcription errors were noted. No qualifications were required.

2.4 BLANKS

One method blank (Blank-6220) was extracted and analyzed with the samples in these SDGs. Target compounds total HpCDF, 1,2,3,4,6,7,8-HpCDF, total HpCDF, OCDF, and OCDD were reported in the method blank. Any detects for the aforementioned target compounds reported at concentrations <5× the concentrations reported in the method blank were qualified as estimated nondetects "UJ," at the levels of interference in the samples of these SDGs. A review of the method blank raw data and chromatograms indicated no false negatives or false positives. No further qualifications were required.

2.5 BLANK SPIKES AND LABORATORY CONTROL SAMPLES

One LCS/LCSD pair (LCS-6221/LCSD-6222) was extracted and analyzed with the samples in these SDGs. All recoveries were within the acceptance criteria listed in Table 6 of the Method 1613. There are no method QC limits established for RPDs. The reported RPDs were within ±20%. No qualifications were required.

2.6 MATRIX SPIKE/MATRIX SPIKE DUPLICATE

MS/MSD analyses were not performed in these SDGs. Evaluation of method accuracy and precision was based on the LCS/LCSD results. No qualifications were required.

2.7 FIELD QC SAMPLES

Following are findings associated with field QC:

2.7.1 Field Blanks and Equipment Rinsates

The samples in these SDGs had no associated field QC samples. No qualifications were required.

2.7.2 Field Duplicates

No field duplicate samples were identified for these SDGs.

2.8 INTERNAL STANDARDS

The labeled standard recoveries were within the acceptance criteria listed in Table 7 of Method 1613. No qualifications were required.

2.9 COMPOUND IDENTIFICATION

The laboratory analyzed for polychlorinated dioxins/furans by EPA Method 1613. The compound identifications were verified from the raw data and no false negatives or positives were noted. No qualifications were required.

2.10 COMPOUND QUANTIFICATION AND REPORTED DETECTION LIMITS

Compound quantitation was verified from the raw data. The laboratory calculated and reported compound-specific detection limits. Any detects below the lower method calibration limit (MCL) were qualified as estimated, "J." Any reported EMPC was qualified as an estimated nondetect, "UJ." No further qualifications were required.

Pace Analytical Services, Inc.
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Tel: 612-607-1700
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Method 1613B Analysis Results

Client - Del Mar Analytical

Client's Sample ID	IOA0554-01		
Lab Sample ID	106131001		
Filename	F50129B_13		
Injected By	BAL		
Total Amount Extracted	1040 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	01/11/2005
ICAL Date	11/29/2004	Received	01/13/2005
CCal Filename(s)	F50129B_02	Extracted	01/28/2005
Method Blank ID	BLANK-6220	Analyzed	01/30/2005 05:38

Raw Qual	Qual Code	Native Isomers	Conc pg/L	EMPC pg/L	LOD pg/L		Internal Standards	ng's Added	Percent Recovery
U		2,3,7,8-TCDF	ND	-----	0.85		2,3,7,8-TCDF-13C	2.00	71
J	DNQ	Total TCDF	1.2	-----	0.85	J	2,3,7,8-TCDD-13C	2.00	88
							1,2,3,7,8-PeCDF-13C	2.00	78
U		2,3,7,8-TCDD	ND	-----	1.30		2,3,4,7,8-PeCDF-13C	2.00	80
U		Total TCDD	ND	-----	1.30		1,2,3,7,8-PeCDD-13C	2.00	95
							1,2,3,4,7,8-HxCDF-13C	2.00	80
U		1,2,3,7,8-PeCDF	ND	-----	1.20		1,2,3,6,7,8-HxCDF-13C	2.00	91
		2,3,4,7,8-PeCDF	ND	-----	0.73		2,3,4,6,7,8-HxCDF-13C	2.00	85
↓		Total PeCDF	ND	-----	0.94		1,2,3,7,8,9-HxCDF-13C	2.00	81
							1,2,3,4,7,8-HxCDD-13C	2.00	74
U		1,2,3,7,8-PeCDD	ND	-----	0.83		1,2,3,6,7,8-HxCDD-13C	2.00	95
U		Total PeCDD	ND	-----	0.83		1,2,3,4,6,7,8-HpCDF-13C	2.00	83
							1,2,3,4,7,8,9-HpCDF-13C	2.00	72
U		1,2,3,4,7,8-HxCDF	ND	-----	0.82		1,2,3,4,6,7,8-HpCDD-13C	2.00	92
		1,2,3,6,7,8-HxCDF	ND	-----	0.68		OCDD-13C	4.00	81
		2,3,4,6,7,8-HxCDF	ND	-----	0.86				
		1,2,3,7,8,9-HxCDF	ND	-----	0.72		1,2,3,4-TCDD-13C	2.00	NA
↓		Total HxCDF	ND	-----	0.77		1,2,3,7,8,9-HxCDD-13C	2.00	NA
U		1,2,3,4,7,8-HxCDD	ND	-----	0.83		2,3,7,8-TCDD-37Cl4	0.20	86
		1,2,3,6,7,8-HxCDD	ND	-----	0.74				
		1,2,3,7,8,9-HxCDD	ND	-----	0.62				
↓		Total HxCDD	ND	-----	0.73				
UJ	*10	1,2,3,4,6,7,8-HpCDF	-----	1.1	0.94	I			
U		1,2,3,4,7,8,9-HpCDF	ND	-----	1.40				
UJ	B	Total HpCDF	5.4	-----	1.10	BJ			
UJ	B	1,2,3,4,6,7,8-HpCDD	3.0	-----	1.20	BJ			
J	DNQ	Total HpCDD	7.4	-----	1.20	BJ			
UJ	B								
UJ	B	OCDF	7.7	-----	1.30	BJ			
		OCDD	26.0	-----	1.50	BJ			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection. Totals are averages of individual isomer LODs.
D = Result obtained from analysis of diluted sample
B = Less than 10 times higher than method blank level
P = Recovery outside of method 1613 control limits
J = Concentration detected is below the calibration range
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....106131

AMEC VALIDATED LEVEL E

REPORT OF LABORATORY ANALYSIS

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CONTRACT COMPLIANCE SCREENING FORM FOR HARDCOPY DATA

AMEC Earth & Environmental
550 South Wadsworth Boulevard
Suite 500
Lakewood, CO 80226

Package ID T711MT30
Task Order 313150010
SDG No. IOA0554, IOA0553
No. of Analyses 2

Laboratory Del Mar Analytical
Reviewer K. Okonzak
Analysis/Method Metals

Date: 2/24/05
Reviewer's Signature

ACTION ITEMS[a]	
1. **Case Narrative Deficiencies**	
2. **Out of Scope Analyses**	
3. **Analyses Not Conducted**	
4. **Missing Hardcopy Deliverables**	
5. **Incorrect Hardcopy Deliverables**	
6. **Deviations from Analysis Protocol, e.g.,**	Qualifications applied for:
Holding Times	Detects below the reporting limit were qualfieid as estimated, "J."
GC/MS Tune/Inst. Perform	The Sb MDL was raised to 2.0 ug/L and the Sb nondetects were qualified as estimated "UJ," due to the CRDL standard and bracketing CCB results.
Calibrations	
Blanks	
Surrogates	
Matrix Spike/Dup LCS	
Field QC	
Internal Standard Performance	
Compound Identification and Quantitation	
System Performance	

COMMENTS[b]

[a] Subcontracted analytical laboratory is not meeting contract and/or method requirements.
[b] Differences in protocol have been adopted by the laboratory but no action against the laboratory is required.

Data Qualifier Reference Table

Qualifier	Organics	Inorganics
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.	The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.	The associated value is an estimated quantity.
N	The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification."	Not applicable.
NJ	The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.	Not applicable.
UJ	The analyte was not deemed above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.	The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.
R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and to meet quality control criteria. The presence or absence of the analyte cannot be verified.	The data are unusable. (Note: Analyte may or may not be present).

Qualification Code Reference Table

Qualifier	Organics	Inorganics
H	Holding times were exceeded.	Holding times were exceeded.
S	Surrogate recovery was outside QC limits.	The sequence or number of standards used for the calibration was incorrect
C	Calibration %RSD or %D were noncompliant.	Correlation coefficient is <0.995.
R	Calibration RRF was <0.05.	%R for calibration is not within control limits.
B	Presumed contamination from preparation (method) blank.	Presumed contamination from preparation (method) or calibration blank.
L	Laboratory Blank Spike/Blank Spike Duplicate %R was not within control limits.	Laboratory Control Sample %R was not within control limits.
Q	MS/MSD recovery was poor or RPD high.	MS recovery was poor.
E	Not applicable.	Duplicates showed poor agreement.
I	Internal standard performance was unsatisfactory.	ICP ICS results were unsatisfactory.
A	Not applicable.	ICP Serial Dilution %D were not within control limits.
M	Tuning (BFB or DFTPP) was noncompliant.	Not applicable.
T	Presumed contamination from trip blank.	Not applicable.
+	False positive – reported compound was not present. Not applicable.	
-	False negative – compound was present but not reported.	Not applicable.
F	Presumed contamination from FB, or ER.	Presumed contamination from FB or ER.
$	Reported result or other information was incorrect.	Reported result or other information was incorrect.
?	TIC identity or reported retention time has been changed.	Not applicable.
D	The analysis with this flag should not be used because another more technically sound analysis is available.	The analysis with this flag should not be used because another more technically sound analysis is available.
P	Instrument performance for pesticides was poor.	Post Digestion Spike recovery was not within control limits.
DNQ	The compound was detected between the MDL and the RL and, by definition, is considered an estimated value.	The compound was detected between the MDL and the RL and, by definition, is considered an estimated value.

*#	Unusual problems found with the data that have been described in Section 2.#, "Data Validation Findings." The number following the asterisk (*) will indicate the subsection where a description of the problem can be found (eg. *1 would indicate a sample was not within temperature limits).	Unusual problems found with the data that have been described in Section 2.#, "Data Validation Findings." The number following the asterisk (*) will indicate the subsection where a description of the problem can be found (eg. *1 would indicate a sample was not within temperature limits).

DATA VALIDATION REPORT

NPDES
Monitoring

ANALYSIS: METALS

SAMPLE DELIVERY GROUPS: IOA0554, IOA0553

Prepared by

AMEC—Denver Operations
550 South Wadsworth Boulevard, Suite 500
Lakewood, Colorado 80226

1. INTRODUCTION

Task Order Title:	NPDES Monitoring
Contract Task Order #:	313150010
SDG#:	IOA0554, IOA0553
Project Manager:	B. McIlvaine
Matrix:	Water
Analysis:	Metals
QC Level:	Level IV
No. of Samples:	2
No. of Reanalyses/Dilutions:	0
Reviewer:	K. Okonzak-Lowry
Date of Review:	February 24, 2005

The samples listed in Table 1 were validated based on the guidelines outlined in the *AMEC Data Validation Procedure for Levels III and IV ICP-MS Metals, (DVP-5-A, Rev.0), AMEC Data Validation Procedure for Levels III and IV ICP Metals* (DVP-5, Rev. 0), SW-846 *Method 6020B for Inductively Coupled Plasma – Mass Spectrometry*, SW-846 *Method 6010B for Inductively Coupled Plasma* , SW-846 *Method 7471A for Mercury (Manual Cold-Vapor Technique)*, and validation guidelines outlined in the USEPA CLP *National Functional Guidelines for Inorganic Data Review* (2/94). Any deviations from these procedures and guidelines are documented herein. Qualifiers were applied in cases where the data did not meet the required QC criteria or where special consideration by the data user is required. Data qualifiers were placed on Form Is with the associated qualification codes. Analytes that were rejected for any reason are denoted on the Form I as having only the "R" data qualifier and associated qualification code(s) denoting the reason for rejection. Any additional problems with the data that may have resulted in an estimated value were not denoted by a qualification code since the data had already been rejected.

Table 1. Sample identification

Client ID	EPA ID	Laboratory ID	Matrix	COC Method
Outfall 008	Outfall 008	IOA0553-01	water	ILM04
Outfall 009	Outfall 009	IOA0554-01	water	ILM04

2. DATA VALIDATION FINDINGS

2.1 SAMPLE MANAGEMENT

Following are findings associated with sample management:

2.1.1 Sample Preservation, Handling, and Transport

The samples in these SDGs were received at the laboratory within the temperature limits of 4°C ±2°C. No sample preservation, handling, or transport problems were noted, and no qualifications were necessary.

2.1.2 Chain of Custody

The COCs were signed and dated by field and laboratory personnel. The COCs listed duplicate samples for both samples; however, duplicate analyses were not required. No sample qualifications were required.

2.1.3 Holding Times

The dates of collection recorded on the COCs and the dates of analyses recorded in the raw data, documented that the sample analyses were performed within the specified holding times of six months for the ICP/MS metals and 28 days for mercury. No qualifications were required.

2.2 ICP-MS TUNING

A precalibration routine must be completed prior to calibrating the instrument, which consists of analyzing a tuning solution to verify resolution, mass calibration, and thermal stability. The solution must be analyzed a minimum of five times and must contain isotopes representing all mass regions of interest. The laboratory performed the required tune solution analyses but did not report %RSDs. The laboratory SOP states that to be acceptable, the %RSD must be less than 5%. The mass calibrations were within 0.1 amu of the true mass and the instrument resolutions were less than 0.75 amu at 5 percent peak height for all analytes in the tune solution. No site sample qualifications were required.

2.3 CALIBRATION

The ICV and CCV results showed acceptable recoveries, 90-110% for the ICP/MS and 80-120% for Hg. The applicable reporting limit check standards were recovered within the AMEC control limits of 70-130%, with the exception of the antimony 0.2 µg/L standard which was not detected for antimony (MDL of 0.18 µg/L). The antimony 1.0 µg/L standard was recovered at 84.4%, but its result of 0.84442 µg/L was equivalent to the bracketing CCB antimony values of 0.81128 and 0.81093 µg/L, respectively. Therefore, it was determined that the laboratory was not able to detect antimony at the 1.0 µg/L level, and the antimony method detection limit for samples Outfall 008 and Outfall 009 was raised to 2.0 µg/L. No qualifications were required.

2.4 BLANKS

The method blanks and bracketing ICBs/CCBs associated with the samples in these SDGs were nondetected at the laboratory's MDLs, with the exception of the CCB results for antimony which were found at above the MDL at 0.81128 and 0.81093 µg/L, respectively. The antimony method detection limit for samples Outfall 008 and Outfall 009 was raised to 2.0 µg/L, and the sample nondetects were qualified as estimated, "UJ." No further qualifications were required.

2.5 ICP INTERFERENCE CHECK SAMPLE (ICS A/AB)

No ICPMS interference check samples were analyzed in association with the samples in these SDGs; therefore, no assessment was made with respect to this criterion.

2.6 BLANK SPIKES AND LABORATORY CONTROL SAMPLES

The ICP/MS LCS sample was identified as 5A12054-BS1, and the Hg LCS sample was identified as 5A12047-BS1. The LCS results on the summary forms and in the raw data were within the laboratory-established ICP/MS and Hg control limits of 85-115%. No qualifications were required.

2.7 LABORATORY DUPLICATES

No MS/MSD or duplicate analyses were performed in association with the samples in these SDGs; therefore, no assessment was made with respect to this criterion.

2.8 MATRIX SPIKE

No MS/MSD analyses were performed in association with the samples in these SDGs; therefore, no assessment was made with respect to this criterion. Method accuracy was evaluated based on LCS results.

2.9 FURNACE ATOMIC ABSORPTION QC

Furnace atomic absorption was not utilized for the analysis of these samples; therefore, furnace atomic absorption QC is not applicable.

2.10 ICP/MS SERIAL DILUTION

No serial dilution analysis was performed in association with the samples in these SDGs; therefore, no assessment was made with respect to this criterion.

2.11 INTERNAL STANDARDS PERFORMANCE

The ICP-MS internal standard recoveries for the site samples and associated QC sample analyses were within the 60-125% control limits and no qualifications were required.

2.12 SAMPLE RESULT VERIFICATION

A Level IV review was performed for the samples in these data packages. Calculations were verified, and the sample results reported on the Form Is were verified against the raw data. No transcription errors or calculation errors were noted. Analytes detected below the reporting limit were qualified as estimated, "J." The antimony method detection limit for samples Outfall 008 and Outfall 009 was raised to 2.0 µg/L due to the antimony results for the reporting limit check standards and the bracketing CCBs. No further qualifications were required.

2.13 FIELD QC SAMPLES

Field QC samples are evaluated, and if necessary, qualified based only on laboratory blanks. Any remaining detects are used to evaluate the associated samples.

2.13.1 Field Blanks and Equipment Rinsates

The samples in these SDGs had no associated field QC samples. No qualifications were required.

2.13.2 Field Duplicates

There were no field duplicate analyses performed in association with the site samples.

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2520 E. Sunset Rd. #3, Las Vegas, NV 89120 (702) 798-3620 FAX (702) 798-3621

MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 009

Report Number: IOA0554

Sampled: 01/11/05
Received: 01/11/05

DRAFT: METALS

Analyte	Method	Batch	MDL	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Rev Qual	Data Qualifiers	Qual Code
Sample ID: IOA0554-01 (DRAFT: Outfall 009 - Water)											
Reporting Units: ug/l											
Antimony	EPA 200.8	5A12054	~~0.18~~ 2.0	2.0	ND	1	01/12/05	01/12/05	UJ		6, 6, *3
Cadmium	EPA 200.8	5A12054	0.015	1.0	0.032	1	01/12/05	01/12/05	J	J	DNQ
Copper	EPA 200.8	5A12054	0.49	2.0	1.8	1	01/12/05	01/12/05	J	J	
Lead	EPA 200.8	5A12054	0.13	1.0	0.34	1	01/12/05	01/12/05	J	J	
Mercury	EPA 245.1	5A12047	0.063	0.20	0.12	1	01/12/05	01/12/05	J	J	

RWQCB 2/24/05

AMEC VALIDATED

LEVEL IV

DRAFT REPORT
DRAFT REPORT
DATA SUBJECT TO CHANGE

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CONTRACT COMPLIANCE SCREENING FORM FOR HARDCOPY DATA

AMEC Earth & Environmental
550 South Wadsworth Boulevard
Suite 500
Lakewood, CO 80226

Package ID T711WC77
Task Order 313150010
SDG No. IOA0554
No. of Analyses 2

Laboratory Del Mar
Reviewer P. Meeks
Analysis/Method General Minerals

Date: 03/10/05
Reviewer's Signature P. Mee

ACTION ITEMS[a]	
1. **Case Narrative Deficiencies**	
2. **Out of Scope Analyses**	
3. **Analyses Not Conducted**	
4. **Missing Hardcopy Deliverables**	
5. **Incorrect Hardcopy Deliverables**	
6. **Deviations from Analysis Protocol, e.g.,**	
Holding Times	
GC/MS Tune/Inst. Performance	
Calibrations	
Blanks	
Surrogates	
Matrix Spike/Dup LCS	
Field QC	
Internal Standard Performance	
Compound Identification and Quantitation	
System Performance	

COMMENTS[b]	Acceptable as reviewed.

[a] Subcontracted analytical laboratory is not meeting contract and/or method requirements.
[b] Differences in protocol have been adopted by the laboratory but no action against the laboratory is required.

Data Qualifier Reference Table

Qualifier	Organics	Inorganics
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.	The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.	The associated value is an estimated quantity.
N	The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification."	Not applicable.
NJ	The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.	Not applicable.
UJ	The analyte was not deemed above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.	The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.
R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and to meet quality control criteria. The presence or absence of the analyte cannot be verified.	The data are unusable. (Note: Analyte may or may not be present).

Qualification Code Reference Table

Qualifier	Organics	Inorganics
H	Holding times were exceeded.	Holding times were exceeded.
S	Surrogate recovery was outside QC limits.	The sequence or number of standards used for the calibration was incorrect
C	Calibration %RSD or %D were noncompliant.	Correlation coefficient is <0.995.
R	Calibration RRF was <0.05.	%R for calibration is not within control limits.
B	Presumed contamination from preparation (method) blank.	Presumed contamination from preparation (method) or calibration blank.
L	Laboratory Blank Spike/Blank Spike Duplicate %R was not within control limits.	Laboratory Control Sample %R was not within control limits.
Q	MS/MSD recovery was poor or RPD high.	MS recovery was poor.
E	Not applicable.	Duplicates showed poor agreement.
I	Internal standard performance was unsatisfactory.	ICP ICS results were unsatisfactory.
A	Not applicable.	ICP Serial Dilution %D were not within control limits.
M	Tuning (BFB or DFTPP) was noncompliant.	Not applicable.
T	Presumed contamination from trip blank.	Not applicable.
+	False positive – reported compound was not present. Not applicable.	
-	False negative – compound was present but not reported.	Not applicable.
F	Presumed contamination from FB, or ER.	Presumed contamination from FB or ER.
$	Reported result or other information was incorrect.	Reported result or other information was incorrect.
?	TIC identity or reported retention time has been changed.	Not applicable.
D	The analysis with this flag should not be used because another more technically sound analysis is available.	The analysis with this flag should not be used because another more technically sound analysis is available.
P	Instrument performance for pesticides was poor.	Post Digestion Spike recovery was not within control limits.
DNQ	The compound was detected between the MDL and the RL and, by definition, is considered an estimated value.	The compound was detected between the MDL and the RL and, by definition, is considered an estimated value.

*#	Unusual problems found with the data that have been described in Section 2.#, "Data Validation Findings." The number following the asterisk (*) will indicate the subsection where a description of the problem can be found (eg. *1 would indicate a sample was not within temperature limits).	Unusual problems found with the data that have been described in Section 2.#, "Data Validation Findings." The number following the asterisk (*) will indicate the subsection where a description of the problem can be found (eg. *1 would indicate a sample was not within temperature limits).

DATA VALIDATION REPORT

NPDES Monitoring

ANALYSIS: GENERAL MINERALS

SAMPLE DELIVERY GROUP: IOA0554

Prepared by

AMEC—Denver Operations
550 South Wadsworth Boulevard, Suite 500
Lakewood, Colorado 80226

1. INTRODUCTION

Task Order Title:	NPDES Monitoring
Contract Task Order #:	313150010
Sample Delivery Group #:	IOA0554
Project Manager:	B. McIlvaine
Matrix:	Water
Analysis:	General Minerals
QC Level:	Level IV
No. of Samples:	1
Reviewer:	P. Meeks
Date of Review:	March 10, 2005

The sample listed in Table 1 was validated based on the guidelines outlined in the AMEC *Data Validation Procedures* SOP DVP-6, Rev. 2, *USEPA Methods for Chemical Analysis of Water and Wastes Method 413.1,* and validation guidelines outlined in the USEPA *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (2/94).* Any deviations from these procedures and guidelines are documented herein. Qualifiers were applied in cases where the data did not meet the required QC criteria or where special consideration by the data user is required. Data qualifiers were placed on Form Is with the associated qualification codes. Analytes that were rejected for any reason are denoted on the Form I as having only the "R" data qualifier and associated qualification code(s) denoting the reason for rejection. Any additional problems with the data that may have resulted in an estimated value were not denoted by a qualification code since the data had already been rejected.

Table 1. Sample identification

Client ID	EPA ID	Laboratory ID	Matrix	COC Method
Outfall 009	Outfall 009	IOA0554-01	water	413.1

2. DATA VALIDATION FINDINGS

2.1 SAMPLE MANAGEMENT

Following are findings associated with sample management:

2.1.1 Sample Preservation, Handling, and Transport

The sample in this SDG was received at the laboratory within the temperature limits of 4°C ± 2°C. No preservation problems were noted by the laboratory. No qualifications were required.

2.1.2 Chain of Custody

The COC was signed and dated by field and laboratory personnel and accounted for the sample and analysis presented in this SDG. No sample qualifications were required.

2.1.3 Holding Times

The holding time was assessed by comparing the date of collection with the date of analysis. The 28-day analytical holding time for oil and grease was met were met. No qualifications were required.

2.2 CALIBRATION

Balance calibration logs were not provided by the laboratory; however, the LCS/LCSD results were within the CCV control limits of 90-110%. No qualifications were required.

2.3 BLANKS

Oil and grease was detected in the associated method blank, but not at sufficient concentration to qualify the site sample. No further qualifications were required.

2.4 BLANK SPIKES AND LABORATORY CONTROL SAMPLES

The laboratory control sample and laboratory control sample duplicate recoveries were within the laboratory-established control limits and the recovery was less than the control limit of ±20%. No qualifications were required.

2.5 SURROGATES RECOVERY

Surrogate recovery is not applicable to the analyses presented in this SDG.

2.6 LABORATORY DUPLICATES

No MS/MSD or duplicate analyses were performed in association with the sample in this SDG; therefore, no assessment was made with respect to this criterion. Method precision was evaluated based on LCS/LCSD results.

2.7 MATRIX SPIKE/MATRIX SPIKE DUPLICATE

No MS/MSD or duplicate analyses were performed in association with the sample in this SDG; therefore, no assessment was made with respect to this criterion. Method accuracy was evaluated based on LCS/LCSD results.

2.8 FURNACE ATOMIC ABSORPTION QC

Furnace atomic absorption was not utilized for the analysis of this sample; therefore, furnace atomic absorption QC is not applicable.

2.9 ICP SERIAL DILUTION

ICP serial dilution is not applicable to the analysis presented in this data validation report.

2.10 SAMPLE RESULT VERIFICATION

A Level IV review was performed for the sample in this data package. Calculations were verified, and the sample results reported on the Form I was verified against the raw data. No transcription errors or calculation errors were noted. No qualifications were required.

2.11 FIELD QC SAMPLES

Field QC samples are evaluated, and if necessary, qualified based only on laboratory blanks. Any remaining detects are used to evaluate the associated samples. The following are findings associated with field QC samples:

2.11.1 Field Blanks and Equipment Rinsates

The sample in this SDG had no associated field QC samples. No qualifications were required.

2.11.2 Field Duplicates

There were no field duplicate pairs associated with this SDG.

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 009

Report Number: IOA0554

Sampled: 01/11/05
Received: 01/11/05

INORGANICS

Analyte	Method	Batch	MDL Limit	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers Rev Qual	Qual Code
Sample ID: IOA0554-01 (Outfall 009 - Water) - cont.										
Reporting Units: mg/l										
Oil & Grease	EPA 413.1	5A13065	0.94	5.0	16 17	1	01/13/05	01/13/05		4

AJ 5.12.05

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LEVEL IV

Del Mar Analytical, Irvine
Wendy Kirkeeng For Michele Harper
Project Manager

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LABORATORY REPORT

Prepared For: MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project: Routine Outfall 009

Sampled: 01/11/05
Received: 01/11/05
Issued: 02/28/05 17:30

NELAP #01108CA California ELAP#1197 CSDLAC #10117

The results listed within this Laboratory Report pertain only to the samples tested in the laboratory. The analyses contained in this report were performed in accordance with the applicable certifications as noted. All soil samples are reported on a wet weight basis unless otherwise noted in the report. This Laboratory Report is confidential and is intended for the sole use of Del Mar Analytical and its client. This report shall not be reproduced, except in full, without written permission from Del Mar Analytical. The Chain of Custody, 1 page, is included and is an integral part of this report.

This entire report was reviewed and approved for release.

SAMPLE CROSS REFERENCE

SUBCONTRACTED: Refer to the last page for specific subcontract laboratory information included in this report.

LABORATORY ID	CLIENT ID	MATRIX
IOA0554-01	Outfall 009	Water

Reviewed By:

Michele Harper

Del Mar Analytical, Irvine
Michele Harper
Project Manager

Del Mar Analytical

17461Derian Ave., Suite 100, Irvine, CA 92614 (949) 261-1022 FAX (949) 260-3297
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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 009

Report Number: IOA0554

Sampled: 01/11/05
Received: 01/11/05

METALS

Analyte	Method	Batch	MDL Limit	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA0554-01 (Outfall 009 - Water)									
Reporting Units: ug/l									
Antimony	EPA 200.8	5A12054	0.18	2.0	ND	1	01/12/05	01/12/05	
Cadmium	EPA 200.8	5A12054	0.015	1.0	**0.032**	1	01/12/05	01/12/05	J
Copper	EPA 200.8	5A12054	0.49	2.0	**1.8**	1	01/12/05	01/12/05	J
Lead	EPA 200.8	5A12054	0.13	1.0	**0.34**	1	01/12/05	01/12/05	J
Mercury	EPA 245.1	5A12047	0.063	0.20	**0.12**	1	01/12/05	01/12/05	J

Del Mar Analytical, Irvine
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INORGANICS

Analyte	Method	Batch	MDL	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA0554-01 (Outfall 009 - Water) - cont.									
Reporting Units: mg/l									
Chloride	EPA 300.0	5A11040	0.26	0.50	**6.1**	1	01/11/05	01/11/05	
Nitrate/Nitrite-N	EPA 300.0	5A11040	0.072	0.26	**2.6**	1	01/11/05	01/11/05	
Oil & Grease	EPA 413.1	5A13065	0.94	5.0	**17**	1	01/13/05	01/13/05	
Sulfate	EPA 300.0	5A11040	0.18	0.50	**8.1**	1	01/11/05	01/11/05	
Total Dissolved Solids	SM2540C	5A13089	10	10	**140**	1	01/13/05	01/13/05	

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Attention: Bronwyn Kelly

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Sampled: 01/11/05
Received: 01/11/05

SHORT HOLD TIME DETAIL REPORT

	Hold Time (in days)	Date/Time Sampled	Date/Time Received	Date/Time Extracted	Date/Time Analyzed
Sample ID: Outfall 009 (IOA0554-01) - Water					
EPA 300.0	2	01/11/2005 13:10	01/11/2005 18:50	01/11/2005 21:00	01/11/2005 21:57

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Attention: Bronwyn Kelly

Project ID: Routine Outfall 009

Report Number: IOA0554

Sampled: 01/11/05
Received: 01/11/05

METHOD BLANK/QC DATA

METALS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A12047 Extracted: 01/12/05											
Blank Analyzed: 01/12/2005 (5A12047-BLK1)											
Mercury	ND	0.20	0.063	ug/l							
LCS Analyzed: 01/12/2005 (5A12047-BS1)											
Mercury	8.12	0.20	0.063	ug/l	8.00		102	85-115			
Matrix Spike Analyzed: 01/12/2005 (5A12047-MS1)						**Source: IOA0483-01**					
Mercury	8.00	0.20	0.063	ug/l	8.00	ND	100	70-130			
Matrix Spike Dup Analyzed: 01/12/2005 (5A12047-MSD1)						**Source: IOA0483-01**					
Mercury	8.26	0.20	0.063	ug/l	8.00	ND	103	70-130	3	20	
Batch: 5A12054 Extracted: 01/12/05											
Blank Analyzed: 01/12/2005 (5A12054-BLK1)											
Antimony	ND	2.0	0.18	ug/l							
Cadmium	ND	1.0	0.015	ug/l							
Copper	ND	2.0	0.49	ug/l							
Lead	ND	1.0	0.13	ug/l							
LCS Analyzed: 01/12/2005 (5A12054-BS1)											
Antimony	89.1	2.0	0.18	ug/l	80.0		111	85-115			
Cadmium	84.7	1.0	0.015	ug/l	80.0		106	85-115			
Copper	80.7	2.0	0.49	ug/l	80.0		101	85-115			
Lead	80.4	1.0	0.13	ug/l	80.0		100	85-115			
Matrix Spike Analyzed: 01/12/2005 (5A12054-MS1)						**Source: IOA0549-01**					
Antimony	88.7	2.0	0.18	ug/l	80.0	0.35	110	70-130			
Cadmium	85.3	1.0	0.015	ug/l	80.0	0.14	106	70-130			
Copper	83.9	2.0	0.49	ug/l	80.0	4.2	100	70-130			
Lead	81.3	1.0	0.13	ug/l	80.0	1.0	100	70-130			

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 009

Report Number: IOA0554

Sampled: 01/11/05
Received: 01/11/05

METHOD BLANK/QC DATA

METALS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A12054 Extracted: 01/12/05											
Matrix Spike Dup Analyzed: 01/12/2005 (5A12054-MSD1)						**Source: IOA0549-01**					
Antimony	90.1	2.0	0.18	ug/l	80.0	0.35	112	70-130	2	20	
Cadmium	86.1	1.0	0.015	ug/l	80.0	0.14	107	70-130	1	20	
Copper	83.8	2.0	0.49	ug/l	80.0	4.2	100	70-130	0	20	
Lead	80.9	1.0	0.13	ug/l	80.0	1.0	100	70-130	1	20	

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Sampled: 01/11/05
Received: 01/11/05

METHOD BLANK/QC DATA

INORGANICS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A11040 Extracted: 01/11/05											
Blank Analyzed: 01/11/2005 (5A11040-BLK1)											
Chloride	ND	0.50	0.26	mg/l							
Nitrate/Nitrite-N	ND	0.26	0.072	mg/l							
Sulfate	ND	0.50	0.18	mg/l							
LCS Analyzed: 01/11/2005 (5A11040-BS1)											
Chloride	4.84	0.50	0.26	mg/l	5.00		97	90-110			
Sulfate	10.1	0.50	0.18	mg/l	10.0		101	90-110			
Matrix Spike Analyzed: 01/11/2005 (5A11040-MS1)						**Source: IOA0494-01**					
Chloride	24.1	2.5	1.3	mg/l	5.00	20	82	80-120			
Sulfate	38.6	2.5	0.90	mg/l	10.0	29	96	80-120			
Matrix Spike Dup Analyzed: 01/11/2005 (5A11040-MSD1)						**Source: IOA0494-01**					
Chloride	24.1	2.5	1.3	mg/l	5.00	20	82	80-120	0	20	
Sulfate	38.8	2.5	0.90	mg/l	10.0	29	98	80-120	1	20	
Batch: 5A13065 Extracted: 01/13/05											
Blank Analyzed: 01/13/2005 (5A13065-BLK1)											
Oil & Grease	1.20	5.0	0.94	mg/l							*J*
LCS Analyzed: 01/13/2005 (5A13065-BS1)											**M-NR1**
Oil & Grease	18.6	5.0	0.94	mg/l	20.0		93	65-120			
LCS Dup Analyzed: 01/13/2005 (5A13065-BSD1)											
Oil & Grease	21.1	5.0	0.94	mg/l	20.0		106	65-120	13	20	

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 009

Report Number: IOA0554

Sampled: 01/11/05
Received: 01/11/05

METHOD BLANK/QC DATA

INORGANICS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A13089 Extracted: 01/13/05											
Blank Analyzed: 01/13/2005 (5A13089-BLK1)											
Total Dissolved Solids	ND	10	10	mg/l							
LCS Analyzed: 01/13/2005 (5A13089-BS1)											
Total Dissolved Solids	994	10	10	mg/l	1000		99	90-110			
Duplicate Analyzed: 01/13/2005 (5A13089-DUP1)						**Source: IOA0549-01**					
Total Dissolved Solids	92.0	10	10	mg/l		88			4	10	

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Attention: Bronwyn Kelly

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Report Number: IOA0554

Sampled: 01/11/05
Received: 01/11/05

Compliance Check

The results obtained from the analytical testing of this data set were checked against compliance limits received from the client. Any results at or above the compliance limits appear in bold on this page.

LabNumber	Analysis	Analyte	Units	Result	MRL	Compliance Limit
IOA0554-01	**413.1 Oil and Grease**	**Oil & Grease**	**mg/l**	**17**	**5.0**	**15**
IOA0554-01	Chloride - 300.0	Chloride	mg/l	6.10	0.50	150
IOA0554-01	Nitrogen, NO3+NO2 -N	Nitrate/Nitrite-N	mg/l	2.60	0.26	10.00
IOA0554-01	Sulfate-300.0	Sulfate	mg/l	8.10	0.50	250
IOA0554-01	TDS - SM 2540C	Total Dissolved Solids	mg/l	140	10	850

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Report Number: IOA0554

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DATA QUALIFIERS AND DEFINITIONS

J	Estimated value. Analyte detected at a level less than the Reporting Limit (RL) and greater than or equal to the Method Detection Limit (MDL). The user of this data should be aware that this data is of unknown quality.
M-NR1	There was no MS/MSD analyzed with this batch due to insufficient sample volume. See Blank Spike/Blank Spike Duplicate.
ND	Analyte NOT DETECTED at or above the reporting limit or MDL, if MDL is specified.
RPD	Relative Percent Difference

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Report Number: IOA0554

Sampled: 01/11/05
Received: 01/11/05

Certification Summary

Del Mar Analytical, Irvine

Method	Matrix	Nelac	California
EPA 200.8	Water	X	X
EPA 245.1	Water	X	X
EPA 300.0	Water	X	X
EPA 413.1	Water	X	X
SM2540C	Water	X	X

Nevada and NELAP provide analyte specific accreditations. Analyte specific information for Del Mar Analytical may be obtained by contacting the laboratory or visiting our website at www.dmalabs.com.

Subcontracted Laboratories

Pace Analytical, MN- SUB

1700 Elm Street, Ste 200 - Minneapolis, MN 55414

Analysis Performed: 1613-Dioxin-HR
Samples: IOA0554-01

Analysis Performed: EDD + Level 4
Samples: IOA0554-01

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Michele Harper
Project Manager

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IOA0554

Del Mar Analytical Version 5 8/12/04 CHAIN OF CUSTODY FORM

Client Name/Address:	Project:
MWH-Pasadena 300 North Lake Avenue, Suite 1200 Pasadena, CA 91101	Boeing-SSFL NPDES **Routine Outfall 009** Stormwater at WS-13
Project Manager: Bronwyn Kelly Sampler: Pollock	Phone Number: (626) 568-6691 Fax Number: (626) 568-6515

Sample Description	Sample Matrix	Container Type	# of Cont.	Sampling Date/Time	Preservative	Bottle #	Total Recoverable Metals: Sb, Cd, Cu, Pb, Hg	TCDD (and all congeners)	Oil & Grease (EPA 413.1)	Cl-, SO4, NO3+NO2-N	TDS					Field readings: / Comments
Outfall 009	W	Poly-1L	1	1-11-05 13:10	HNO3	1A	X									Field readings: Temp = 52.3 F; pH= 7.0
Outfall 009-Dup	W	Poly-1L	1		HNO3	1B	X									Comments
Outfall 009	W	Glass-Amber	2		None	2A, 2B		X								
Outfall 009	W	Glass-Amber	2		HCl	3A, 3B			X							
Outfall 009	W	Poly-500 ml	2		None	4A,4B				X						
Outfall 009	W	Poly-500 ml	2		None	5A, 5B					X					

Relinquished By	Date/Time:	Received By	Date/Time:
[signature]	1-11-05 1435	[signature]	1-11-05 1435
[signature]	1-11-05 1850	[signature]	1/11/05 1850
Relinquished By	Date/Time:	Received By	Date/Time:

Turn around Time: (check)
24 Hours _____ 5 Days _____
48 Hours _____ 10 Days _____
72 Hours _____ Normal _____
Perchlorate Only 72 Hours_____
Metals Only 72 Hours_____
Sample Integrity: (Check)
Intact X On Ice: X 2°C

Del Mar Analytical

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February 25, 2005

MWH-Pasadena/Boeing
300 North Lake Avenue
Pasadena, Ca. 91101

Attention: Bronwyn Kelly

Project: Routine Outfall 009
Sampled: 01/11/05
Del Mar Analytical Number: IOA0554

Dear Ms. Kelly:

Pace Analytical performed Method 1613B analysis for the project referenced above. Please use the following cross-reference table when reviewing your results.

MWH ID	DEL MAR ID	Pace ID
Outfall 009	IOA0554-01	106131001

Attached is the original report from the subcontract laboratory. If you have any questions or require further assistance, please do not hesitate to contact me.

Sincerely yours,
DEL MAR ANALYTICAL

Michele Harper
Project Manager

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Pace Analytical™

Method 1613B Analysis Results

Client - Del Mar Analytical

Client's Sample ID	IOA0554-01		
Lab Sample ID	106131001		
Filename	F50129B_13		
Injected By	BAL		
Total Amount Extracted	1040 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	01/11/2005
ICAL Date	11/29/2004	Received	01/13/2005
CCal Filename(s)	F50129B_02	Extracted	01/28/2005
Method Blank ID	BLANK-6220	Analyzed	01/30/2005 05:38

Native Isomers	Conc pg/L	EMPC pg/L	LOD pg/L		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	0.85		2,3,7,8-TCDF-13C	2.00	71
Total TCDF	1.2	-----	0.85	J	2,3,7,8-TCDD-13C	2.00	88
					1,2,3,7,8-PeCDF-13C	2.00	78
2,3,7,8-TCDD	ND	-----	1.30		2,3,4,7,8-PeCDF-13C	2.00	80
Total TCDD	ND	-----	1.30		1,2,3,7,8-PeCDD-13C	2.00	95
					1,2,3,4,7,8-HxCDF-13C	2.00	80
1,2,3,7,8-PeCDF	ND	-----	1.20		1,2,3,6,7,8-HxCDF-13C	2.00	91
2,3,4,7,8-PeCDF	ND	-----	0.73		2,3,4,6,7,8-HxCDF-13C	2.00	85
Total PeCDF	ND	-----	0.94		1,2,3,7,8,9-HxCDF-13C	2.00	81
					1,2,3,4,7,8-HxCDD-13C	2.00	74
1,2,3,7,8-PeCDD	ND	-----	0.83		1,2,3,6,7,8-HxCDD-13C	2.00	95
Total PeCDD	ND	-----	0.83		1,2,3,4,6,7,8-HpCDF-13C	2.00	83
					1,2,3,4,7,8,9-HpCDF-13C	2.00	72
1,2,3,4,7,8-HxCDF	ND	-----	0.82		1,2,3,4,6,7,8-HpCDD-13C	2.00	92
1,2,3,6,7,8-HxCDF	ND	-----	0.68		OCDD-13C	4.00	81
2,3,4,6,7,8-HxCDF	ND	-----	0.86				
1,2,3,7,8,9-HxCDF	ND	-----	0.72		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	-----	0.77		1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	0.83		2,3,7,8-TCDD-37Cl4	0.20	86
1,2,3,6,7,8-HxCDD	ND	-----	0.74				
1,2,3,7,8,9-HxCDD	ND	-----	0.62				
Total HxCDD	ND	-----	0.73				
1,2,3,4,6,7,8-HpCDF	-----	1.1	0.94	I			
1,2,3,4,7,8,9-HpCDF	ND	-----	1.40				
Total HpCDF	5.4	-----	1.10	BJ			
1,2,3,4,6,7,8-HpCDD	3.0	-----	1.20	BJ			
Total HpCDD	7.4	-----	1.20	BJ			
OCDF	7.7	-----	1.30	BJ			
OCDD	26.0	-----	1.50	BJ			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection. Totals are averages of individual isomer LODs.
D = Result obtained from analysis of diluted sample
B = Less than 10 times higher than method blank level
P = Recovery outside of method 1613 control limits
J = Concentration detected is below the calibration range
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....106131

REPORT OF LABORATORY ANALYSIS

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1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Pace Analytical™

Method 1613B Blank Analysis Results

Client - Del Mar Analytical

Lab Sample ID	BLANK-6220	Matrix	Water
Filename	F50129B_06	Dilution	NA
Total Amount Extracted	1020 mL	Extracted	01/28/2005
ICAL Date	11/29/2004	Analyzed	01/29/2005 23:49
CCal Filename(s)	F50129B_02	Injected By	BAL

Native Isomers	Conc pg/L	EMPC pg/L	PRL pg/L		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	1.20		2,3,7,8-TCDF-13C	2.00	58
Total TCDF	ND	-----	-----		2,3,7,8-TCDD-13C	2.00	75
					1,2,3,7,8-PeCDF-13C	2.00	65
2,3,7,8-TCDD	ND	-----	1.20		2,3,4,7,8-PeCDF-13C	2.00	67
Total TCDD	ND	-----	-----		1,2,3,7,8-PeCDD-13C	2.00	80
					1,2,3,4,7,8-HxCDF-13C	2.00	70
1,2,3,7,8-PeCDF	ND	-----	1.50		1,2,3,6,7,8-HxCDF-13C	2.00	82
2,3,4,7,8-PeCDF	ND	-----	1.20		2,3,4,6,7,8-HxCDF-13C	2.00	77
Total PeCDF	ND	-----	-----		1,2,3,7,8,9-HxCDF-13C	2.00	72
					1,2,3,4,7,8-HxCDD-13C	2.00	66
1,2,3,7,8-PeCDD	ND	-----	1.60		1,2,3,6,7,8-HxCDD-13C	2.00	88
Total PeCDD	ND	-----	-----		1,2,3,4,6,7,8-HpCDF-13C	2.00	73
					1,2,3,4,7,8,9-HpCDF-13C	2.00	63
1,2,3,4,7,8-HxCDF	ND	-----	0.75		1,2,3,4,6,7,8-HpCDD-13C	2.00	80
1,2,3,6,7,8-HxCDF	ND	-----	0.86		OCDD-13C	4.00	68
2,3,4,6,7,8-HxCDF	ND	-----	1.10				
1,2,3,7,8,9-HxCDF	ND	-----	1.20		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	-----	-----		1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	1.10		2,3,7,8-TCDD-37Cl4	0.20	73
1,2,3,6,7,8-HxCDD	ND	-----	0.99				
1,2,3,7,8,9-HxCDD	ND	-----	1.00				
Total HxCDD	ND	-----	-----				
1,2,3,4,6,7,8-HpCDF	ND	-----	2.10				
1,2,3,4,7,8,9-HpCDF	ND	-----	1.90				
Total HpCDF	2.2	-----	-----	J			
1,2,3,4,6,7,8-HpCDD	2.4	-----	1.40	J			
Total HpCDD	2.4	-----	-----	J			
OCDF	5.2	-----	1.80	J			
OCDD	5.6	-----	2.90	J			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
PRL = Pace Analytical Reporting Limit
A = Limit of Detection based on signal to noise
P = Recovery outside of method 1613 control limits
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
J = Value below calibration range
* = See Discussion

Report No.....106124

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 1613B Laboratory Control Spike Results

Client - Del Mar Analytical

Lab Sample ID	LCS-6221		
Filename	F50129B_03	Matrix	Water
Total Amount Extracted	1040 mL	Dilution	NA
ICAL Date	11/29/2004	Extracted	01/28/2005
CCal Filename	F50129B_02	Analyzed	01/29/2005 21:22
Method Blank ID	BLANK-6220	Injected By	BAL

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDF	10	9.9	7.5	15.8	99
2,3,7,8-TCDD	10	8.6	6.7	15.8	86
1,2,3,7,8-PeCDF	50	50.5	40.0	67.0	101
2,3,4,7,8-PeCDF	50	48.2	34.0	80.0	96
1,2,3,7,8-PeCDD	50	43.3	35.0	71.0	87
1,2,3,4,7,8-HxCDF	50	45.6	36.0	67.0	91
1,2,3,6,7,8-HxCDF	50	48.7	42.0	65.0	97
2,3,4,6,7,8-HxCDF	50	49.1	35.0	78.0	98
1,2,3,7,8,9-HxCDF	50	46.5	39.0	65.0	93
1,2,3,4,7,8-HxCDD	50	49.9	35.0	82.0	100
1,2,3,6,7,8-HxCDD	50	51.3	38.0	67.0	103
1,2,3,7,8,9-HxCDD	50	50.1	32.0	81.0	100
1,2,3,4,6,7,8-HpCDF	50	50.3	41.0	61.0	101
1,2,3,4,7,8,9-HpCDF	50	53.3	39.0	69.0	107
1,2,3,4,6,7,8-HpCDD	50	45.4	35.0	70.0	91
OCDF	100	95.6	63.0	170.0	96
OCDD	100	97.1	78.0	144.0	97
2,3,7,8-TCDD-37Cl4	10	6.9	3.1	19.1	69
2,3,7,8-TCDF-13C	100	51.5	22.0	152.0	52
2,3,7,8-TCDD-13C	100	67.8	20.0	175.0	68
1,2,3,7,8-PeCDF-13C	100	61.4	21.0	192.0	61
2,3,4,7,8-PeCDF-13C	100	65.9	13.0	328.0	66
1,2,3,7,8-PeCDD-13C	100	77.8	21.0	227.0	78
1,2,3,4,7,8-HxCDF-13C	100	70.2	19.0	202.0	70
1,2,3,6,7,8-HxCDF-13C	100	78.0	21.0	159.0	78
2,3,4,6,7,8-HxCDF-13C	100	74.1	22.0	176.0	74
1,2,3,7,8,9-HxCDF-13C	100	70.4	17.0	205.0	70
1,2,3,4,7,8-HxCDD-13C	100	69.0	21.0	193.0	69
1,2,3,6,7,8-HxCDD-13C	100	82.8	25.0	163.0	83
1,2,3,4,6,7,8-HpCDF-13C	100	72.1	21.0	158.0	72
1,2,3,4,7,8,9-HpCDF-13C	100	62.4	20.0	186.0	62
1,2,3,4,6,7,8-HpCDD-13C	100	80.1	26.0	166.0	80
OCDD-13C	200	135.6	26.0	397.0	68

Cs = Concentration Spiked (ng/mL)
Cr = Concentration Recovered (ng/mL)
Rec. = Recovery (Expressed as Percent)
Control Limit Reference: Method 1613, Table 6, 10/94 Revision
X = Background subtracted value
P = Recovery outside of control limits
Nn = Value obtained from additional analysis
* = See Discussion

Report No.....106124

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 1613B Laboratory Control Spike Results

Client - Del Mar Analytical

Lab Sample ID	LCSD-6222		
Filename	F50129B_04	Matrix	Water
Total Amount Extracted	1040 mL	Dilution	NA
ICAL Date	11/29/2004	Extracted	01/28/2005
CCal Filename	F50129B_02	Analyzed	01/29/2005 22:09
Method Blank ID	BLANK-6220	Injected By	BAL

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDF	10	10.6	7.5	15.8	106
2,3,7,8-TCDD	10	9.4	6.7	15.8	94
1,2,3,7,8-PeCDF	50	53.2	40.0	67.0	106
2,3,4,7,8-PeCDF	50	50.7	34.0	80.0	101
1,2,3,7,8-PeCDD	50	46.0	35.0	71.0	92
1,2,3,4,7,8-HxCDF	50	47.6	36.0	67.0	95
1,2,3,6,7,8-HxCDF	50	50.9	42.0	65.0	102
2,3,4,6,7,8-HxCDF	50	50.9	35.0	78.0	102
1,2,3,7,8,9-HxCDF	50	49.0	39.0	65.0	98
1,2,3,4,7,8-HxCDD	50	52.4	35.0	82.0	105
1,2,3,6,7,8-HxCDD	50	54.2	38.0	67.0	108
1,2,3,7,8,9-HxCDD	50	52.5	32.0	81.0	105
1,2,3,4,6,7,8-HpCDF	50	55.0	41.0	61.0	110
1,2,3,4,7,8,9-HpCDF	50	55.7	39.0	69.0	111
1,2,3,4,6,7,8-HpCDD	50	48.0	35.0	70.0	96
OCDF	100	100.6	63.0	170.0	101
OCDD	100	101.9	78.0	144.0	102
2,3,7,8-TCDD-37Cl4	10	8.7	3.1	19.1	87
2,3,7,8-TCDF-13C	100	70.4	22.0	152.0	70
2,3,7,8-TCDD-13C	100	88.6	20.0	175.0	89
1,2,3,7,8-PeCDF-13C	100	73.6	21.0	192.0	74
2,3,4,7,8-PeCDF-13C	100	79.0	13.0	328.0	79
1,2,3,7,8-PeCDD-13C	100	95.5	21.0	227.0	96
1,2,3,4,7,8-HxCDF-13C	100	84.8	19.0	202.0	85
1,2,3,6,7,8-HxCDF-13C	100	89.5	21.0	159.0	90
2,3,4,6,7,8-HxCDF-13C	100	87.2	22.0	176.0	87
1,2,3,7,8,9-HxCDF-13C	100	82.1	17.0	205.0	82
1,2,3,4,7,8-HxCDD-13C	100	80.1	21.0	193.0	80
1,2,3,6,7,8-HxCDD-13C	100	97.0	25.0	163.0	97
1,2,3,4,6,7,8-HpCDF-13C	100	84.4	21.0	158.0	84
1,2,3,4,7,8,9-HpCDF-13C	100	71.7	20.0	186.0	72
1,2,3,4,6,7,8-HpCDD-13C	100	92.4	26.0	166.0	92
OCDD-13C	200	159.2	26.0	397.0	80

Cs = Concentration Spiked (ng/mL)
Cr = Concentration Recovered (ng/mL)
Rec. = Recovery (Expressed as Percent)
Control Limit Reference: Method 1613, Table 6, 10/94 Revision
X = Background subtracted value
P = Recovery outside of control limits
Nn = Value obtained from additional analysis
* = See Discussion

Report No.....106124

REPORT OF LABORATORY ANALYSIS

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Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444

SPIKE RECOVERY RELATIVE PERCENT DIFFERENCE (RPD) RESULTS

Client..... Del Mar Analytical

SPIKE 1 ID..... LCS-6221
SPIKE 1 Filename..... F50129B_03
SPIKE 2 ID..... LCSD-6222
SPIKE 2 Filename..... F50129B_04

COMPOUND	SPIKE 1 REC,%	SPIKE 2 REC,%	RPD,%
2378-TCDF	99	106	6.8
2378-TCDD	86	94	8.9
12378-PeCDF	101	106	4.8
23478-PeCDF	96	101	5.1
12378-PeCDD	87	92	5.6
123478-HxCDF	91	95	4.3
123678-HxCDF	97	102	5.0
234678-HxCDF	98	102	4.0
123789-HxCDF	93	98	5.2
123478-HxCDD	100	105	4.9
123678-HxCDD	103	108	4.7
123789-HxCDD	100	105	4.9
1234678-HpCDF	101	110	8.5
1234789-HpCDF	107	111	3.7
1234678-HpCDD	91	96	5.3
OCDF	96	101	5.1
OCDD	97	102	5.0

REC = Percent Recovered
RPD = The difference between the two values divided by the average.
NA = Not Applicable

Report No..... 106124, 106125, 106126
106127, 106128, 106130
106131, 106132, 106135

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TABLE 1. 2,3,7,8-TCDD Equivalency Factors (TEFs) for the Polychlorinated Dibenzo-p-dioxins and Dibenzofurans

Number	Compound(s)	TEF
1	2,3,7,8-TCDD	1.00
2	1,2,3,7,8-PeCDD	0.50
3	1,2,3,6,7,8-HxCDD	0.1
4	1,2,3,7,8,9-HxCDD	0.1
5	1,2,3,4,7,8-HxCDD	0.1
6	1,2,3,4,6,7,8-HpCDD	0.01
7	OCDD	0.001
8	* Total - TCDD	0.0
9	* Total - PeCDD	0.0
10	* Total - HxCDD	0.0
11	* Total - HpCDD	0.0
12	2,3,7,8-TCDF	0.10
13	1,2,3,7,8-PeCDF	0.05
14	2,3,4,7,8-PeCDF	0.5
15	1,2,3,6,7,8-HxCDF	0.1
16	1,2,3,7,8,9-HxCDF	0.1
17	1,2,3,4,7,8-HxCDF	0.1
18	2,3,4,6,7,8-HxCDF	0.1
19	1,2,3,4,6,7,8-HpCDF	0.01
20	1,2,3,4,7,8,9-HpCDF	0.01
21	OCDF	0.001
22	* Total - TCDF	0.0
23	* Total - PeCDF	0.0
24	* Total - HxCDF	0.0
25	* Total - HpCDF	0.0

*Excluding the 2,3,7,8-substituted congeners.

Reference: 1989 ITEFs

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Del Mar Analytical

17461 Derian Ave. Suite 100, Irvine, CA 92614 Ph (949) 261-1022 Fax (949) 261-1228
1014 E. Cooley Dr., Suite A, Colton, CA 92324 Ph (909) 370-4667 Fax (909) 370-1046
9484 Chesapeake Drive, Suite 805, San Diego, CA 92123 Ph (619) 505-9596 Fax (619) 505-9689
9830 South 51st Street, Suite B-120, Phoenix, AZ 85044 Ph (480) 785-0043 Fax (480) 785-0851
2520 E. Sunset Rd., Suite #3, Las Vegas, NV 89120 Ph (702) 798-3620 Fax (702) 798-3621

SUBCONTRACT ORDER - PROJECT # IOA0554 106131

SENDING LABORATORY:
Del Mar Analytical, Irvine
17461 Derian Avenue. Suite 100
Irvine, CA 92614
Phone: (949) 261-1022
Fax: (949) 261-1228
Project Manager: Michele Harper

RECEIVING LABORATORY:
Pace Analytical, MN- SUB
1700 Elm Street, Ste 200
Minneapolis, MN 55414
Phone :(612) 607-1700
Fax: (612) 607-6444

Standard TAT is requested unless specific due date is requested => Due Date:_____ Initials:_____

Analysis	Expiration	Comments
Sample ID: IOA0554-01 Water	**Sampled: 01/11/05 13:10**	**Instant Nofication** 106131001
1613-Dioxin-HR	01/18/05 13:10	J flags, 17 congeners, no TEQ, sub to Pace-MN
EDD + Level 4	02/08/05 13:10	Excel EDD email to pm,Include Std logs for Lvl IV

Containers Supplied:
1 L Amber (IOA0554-01C)
1 L Amber (IOA0554-01D)

SAMPLE INTEGRITY:

All containers intact: ☐ Yes ☐ No Sample labels/COC agree: ☐ Yes ☐ No Samples Received On Ice:: ☐ Yes ☐ No
Custody Seals Present: ☐ Yes ☐ No Samples Preserved Properly: ☐ Yes ☐ No Samples Received at (temp): 3.0

Released By	Date	Time	Received By	Date	Time
Stacy Sunawan	1/12/05		Jim C. Hug	01/13/05	9:45

CONTRACT COMPLIANCE SCREENING FORM FOR HARDCOPY DATA

AMEC Earth & Environmental
550 South Wadsworth Boulevard
Suite 500
Lakewood, CO 80226

Package ID T711DF24
Task Order 313150010
SDG No. Multiple
No. of Analyses 7

Laboratory Pace
Reviewer K. Shadowlight
Analysis/Method Dioxins

Date: February 18, 2005
Reviewer's Signature K. Shadowlight

ACTION ITEMS[a]	
1. **Case Narrative Deficiencies**	
2. **Out of Scope Analyses**	
3. **Analyses Not Conducted**	
4. **Missing Hardcopy Deliverables**	
5. **Incorrect Hardcopy Deliverables**	
6. **Deviations from Analysis Protocol, e.g.,**	Qualifications were assigned for the following:
Holding Times	* Method blank contamination
GC/MS Tune/Inst. Performance	* EMPCs
Calibration	* Detects below the lower method calibration level
Method blanks	
Surrogates	
Matrix Spike/Dup LCS	
Field QC	
Internal Standard Performance	
Compound Identification and Quantitation	
System Performance	
COMMENTS[b]	

[a] Subcontracted analytical laboratory is not meeting contract and/or method requirements.
[b] Differences in protocol have been adopted by the laboratory but no action against the laboratory is required.

DATA VALIDATION REPORT

NPDES
Monitoring

ANALYSIS: DIOXINS/FURANS

SAMPLE DELIVERY GROUPS: Multiple SDGs

Prepared by

AMEC—Denver Operations
550 South Wadsworth Boulevard, Suite 500
Lakewood, Colorado 80226

1. INTRODUCTION

Task Order Title:	NPDES Monitoring
Contract Task Order #:	313150010
Sample Delivery Group #:	Multiple
Project Manager:	B. McIlvaine
Matrix:	Water
Analysis:	Dioxins/Furans
QC Level:	Level IV
No. of Samples:	7
No. of Reanalyses/Dilutions:	0
Reviewer:	K. Shadowlight
Date of Review:	February 21, 2005

The samples listed in Table 1 were validated based on the guidelines outlined in the *AMEC Data Validation Procedure for Dioxins and Furans (DVP-19, Rev. 1), EPA Method 1613, and the National National Functional Guidelines For Chlorinated Dioxin/Furan Data Review* (8/02). Any deviations from these procedures and guidelines are documented herein. Qualifiers were applied in cases where the data did not meet the required QC criteria or where special consideration by the data user is required. Data qualifiers were placed on Form Is with the associated qualification codes. Analytes that were rejected for any reason are denoted on the Form I as having only the "R" data qualifier and associated qualification code(s) denoting the reason for rejection. Any additional problems with the data that may have resulted in an estimated value were not denoted by a qualification code since the data had already been rejected.

Table 1. Sample Identification

Client ID	Laboratory ID (Del Mar)	Laboratory ID (Pace)	Matrix	COC Method
Outfall 001	IOA0997-01	106475001	water	1613
Outfall 001	IOA1551-01	106840001	water	1613
Outfall 002	IOA0999-01	106478001	water	1613
Outfall 002	IOA1553-01	106871001	water	1613
Outfall 003	IOA1556-01	106869001	water	1613
Outfall 008	IOA1555-01	10687001	water	1613
Outfall 009	IOA1554-01	106842001	water	1613

2. DATA VALIDATION FINDINGS

2.1 SAMPLE MANAGEMENT

Following are findings associated with sample management:

2.1.1 Sample Preservation, Handling, and Transport

The samples in these SDGs were received at Del Mar Analytical within the temperature limits of 4°C ±2°C. The samples were subcontracted to Pace Analytical for the dioxin/furan analyses. The samples in these SDGs were received at Pace Analytical Services below the temperature limits of 4°C ± 2°C, at 1.8°C; however, as the samples were not noted to have been frozen or damaged, no qualifications were required. No qualifications were required.

2.1.2 Chain of Custody

The COCs and transfer COCs were signed by the appropriate field and laboratory personnel. The samples and analyses were accounted for on both the original COCs and transfer COCs. As the samples were couriered directly to the laboratory (Del Mar Analytical), custody seals were not required. There was no information regarding custody seals upon receipt at Pace. No qualifications were required.

2.1.3 Holding Times

The samples were extracted and analyzed within a year of collection. No qualifications were required.

2.2 INSTRUMENT PERFORMANCE

Following are findings associated with instrument performance:

2.2.1 GC Column Performance

A column performance standard was combined with the daily calibration verification and analyzed at the beginning of each analytical sequence. The GC column performance was acceptable with the chromatographic separation of 2,3,7,8-TCDD and other TCDD isomers resolved with a valley of ≤25%. No qualifications were required.

2.2.2 Mass Spectrometer Performance

The mass spectrometer performance could not be evaluated as the laboratory did not provide selected ion current profiles for the lock-mass ions. No qualifications were required.

2.3 CALIBRATION

2.3.1 Initial Calibration

There were two initial calibrations, analyzed 11/29/04 on instrument 10MSHR05 and 01/26/05 on instrument 10MSHR06. The calibrations consisted of five concentration level standards (CS1 through CS5) analyzed to verify instrument linearity. The initial calibrations were acceptable with %RSDs ≤20% for the 15 native compounds (calibration by isotope dilution) and ≤35% for the 2 native and all labeled compounds (calibration by internal standard). The relative retention times and ion abundance ratios were within the QC limits listed in Method 1613 for all standards. A representative number of %RSDs were verified from the raw data, and no calculation or transcription errors were noted. No qualifications were required.

2.3.2 Continuing Calibration

Calibration verification (VER) consisted of a mid-level standard (CS3) analyzed at the beginning of each analytical sequence. The VER was acceptable with the concentrations within the acceptance criteria listed in the Table 6 of the EPA Method 1613. The ion abundance ratios and relative retention times were within the method QC limits. A representative number of %Ds were verified from the raw data, and no calculation or transcription errors were noted. No qualifications were required.

2.4 BLANKS

One method blank (Blank-6241) was extracted and analyzed with the samples in these SDGs. Target compounds 1,2,3,6,7,8-HxCDF, total HxCDF, total HpCDF, 1,2,3,4,6,7,8-HpCDD, total HpCDD, and OCDF were reported in the method blank. Any detects for the aforementioned target compounds reported at concentrations <5× the concentrations reported in the method blank were qualified as estimated nondetects "UJ," at the levels of interference in the samples of these SDGs. The detect for total TCDF was qualified as estimated, "J," in sample Outfall 002 (IOA0999-01), as a portion of the total concentration was attributed to method blank contamination. Target compounds 1,2,3,4,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, and OCDD were reported as EMPCs in the method blank. A review of the method blank raw data and chromatograms indicated no false negatives or false positives. No further qualifications were required.

2.5 BLANK SPIKES AND LABORATORY CONTROL SAMPLES

One LCS/LCSD pair (LCS-6242/LCSD-6243) was extracted and analyzed with the samples in these SDGs. All recoveries were within the acceptance criteria listed in Table 6 of the Method 1613. There are no method QC limits established for RPDs. The reported RPDs were within ±20%. No qualifications were required.

2.6 MATRIX SPIKE/MATRIX SPIKE DUPLICATE

MS/MSD analyses were not performed in these SDGs. Evaluation of method accuracy and precision was based on the LCS/LCSD results. No qualifications were required.

2.7 FIELD QC SAMPLES

Following are findings associated with field QC:

2.7.1 Field Blanks and Equipment Rinsates

The samples in these SDGs had no associated field QC samples. No qualifications were required.

2.7.2 Field Duplicates

No field duplicate samples were identified for these SDGs.

2.8 INTERNAL STANDARDS

The labeled standard recoveries were within the acceptance criteria listed in Table 7 of Method 1613. No qualifications were required.

2.9 COMPOUND IDENTIFICATION

The laboratory analyzed for polychlorinated dioxins/furans by EPA Method 1613. The compound identifications were verified from the raw data and no false negatives or positives were noted. No qualifications were required.

2.10 COMPOUND QUANTIFICATION AND REPORTED DETECTION LIMITS

Compound quantitation was verified from the raw data. The laboratory calculated and reported compound-specific detection limits. Any detects below the lower method calibration limit (MCL) were qualified as estimated, "J." Any reported EMPC was qualified as an estimated nondetect, "UJ." No further qualifications were required.

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1700 Elm Street - Suite 200
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Pace Analytical™

Method 1613B Analysis Results

Client - Del Mar Analytical

Client's Sample ID	IOA1554-01 Outfall 009		
Lab Sample ID	106842001		
Filename	F50204A_04		
Injected By	MRO		
Total Amount Extracted	1010 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	01/26/2004
ICAL Date	11/29/2004	Received	01/28/2005
CCal Filename(s)	F50203A_20	Extracted	01/31/2005
Method Blank ID	BLANK-6241	Analyzed	02/04/2005 12:28

Rev Qual	Qual Code	Native Isomers	Conc pg/L	EMPC pg/L	LOD pg/L		Internal Standards	ng's Added	Percent Recovery
U		2,3,7,8-TCDF	ND	-----	1.20		2,3,7,8-TCDF-13C	2.00	82
U		Total TCDF	ND	-----	1.20		2,3,7,8-TCDD-13C	2.00	88
							1,2,3,7,8-PeCDF-13C	2.00	94
U		2,3,7,8-TCDD	ND	-----	1.40		2,3,4,7,8-PeCDF-13C	2.00	103
U		Total TCDD	ND	-----	1.40		1,2,3,7,8-PeCDD-13C	2.00	112
							1,2,3,4,7,8-HxCDF-13C	2.00	89
U		1,2,3,7,8-PeCDF	ND	-----	1.10		1,2,3,6,7,8-HxCDF-13C	2.00	95
		2,3,4,7,8-PeCDF	ND	-----	0.72		2,3,4,6,7,8-HxCDF-13C	2.00	90
↓		Total PeCDF	ND	-----	0.91		1,2,3,7,8,9-HxCDF-13C	2.00	91
							1,2,3,4,7,8-HxCDD-13C	2.00	92
U		1,2,3,7,8-PeCDD	ND	-----	1.10		1,2,3,6,7,8-HxCDD-13C	2.00	88
U		Total PeCDD	ND	-----	1.10		1,2,3,4,6,7,8-HpCDF-13C	2.00	84
							1,2,3,4,7,8,9-HpCDF-13C	2.00	82
J	DNQ	1,2,3,4,7,8-HxCDF	1.1	-----	0.75	J	1,2,3,4,6,7,8-HpCDD-13C	2.00	96
U		1,2,3,6,7,8-HxCDF	ND	-----	0.78		OCDD-13C	4.00	98
		2,3,4,6,7,8-HxCDF	ND	-----	0.70				
↓		1,2,3,7,8,9-HxCDF	ND	-----	0.87		1,2,3,4-TCDD-13C	2.00	NA
J	DNQ	Total HxCDF	1.1	-----	0.78	BJ	1,2,3,7,8,9-HxCDD-13C	2.00	NA
U		1,2,3,4,7,8-HxCDD	ND	-----	1.10		2,3,7,8-TCDD-37Cl4	0.20	81
		1,2,3,6,7,8-HxCDD	ND	-----	0.60				
		1,2,3,7,8,9-HxCDD	ND	-----	0.83				
↓		Total HxCDD	ND	-----	0.85				
U		1,2,3,4,6,7,8-HpCDF	ND	-----	0.65				
U		1,2,3,4,7,8,9-HpCDF	ND	-----	0.73				
UJ	B	Total HpCDF	2.3	-----	0.69	BJ			
J	DNQ	1,2,3,4,6,7,8-HpCDD	2.3	-----	0.76	J			
J	DNQ	Total HpCDD	4.5	-----	0.76	J			
UJ	B	OCDF	4.4	-----	0.69	BJ			
J	DNQ	OCDD	20.0	-----	1.50	J			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection. Totals are averages of individual isomer LODs.
D = Result obtained from analysis of diluted sample
B = Less than 10 times higher than method blank level
P = Recovery outside of method 1613 control limits
J = Concentration detected is below the calibration range
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....106842

REPORT OF LABORATORY ANALYSIS

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MANUALLY VALIDATED LEVEL IV

CONTRACT COMPLIANCE SCREENING FORM FOR HARDCOPY DATA

AMEC Earth & Environmental
550 South Wadsworth Boulevard
Suite 500

Lakewood, CO 80226

Package ID T711MT31
Task Order 313150010
SDG No. IOA1554, IOA1555, IOA1556
No. of Analyses 3

Laboratory Del Mar Analytical
Reviewer K. Okonzak
Analysis/Method Metals

Date: 3/07/05
Reviewer's Signature

ACTION ITEMS[a]	
1. **Case Narrative Deficiencies**	
2. **Out of Scope Analyses**	
3. **Analyses Not Conducted**	
4. **Missing Hardcopy Deliverables**	
5. **Incorrect Hardcopy Deliverables**	
6. **Deviations from Analysis Protocol, e.g.,**	Qualifications applied for:
Holding Times	Detects below the reporting limit were qualified as estimated, "J."
	Detects were qualified as estimated, "UJ" due to detects in the associated method blank or CCBs.
GC/MS Tune/Inst. Perform	
Calibrations	
Blanks	
Surrogates	
Matrix Spike/Dup LCS	
Field QC	
Internal Standard Performance	
Compound Identification and Quantitation	
System Performance	

COMMENTS[b]	

[a] Subcontracted analytical laboratory is not meeting contract and/or method requirements.
[b] Differences in protocol have been adopted by the laboratory but no action against the laboratory is required.

Data Qualifier Reference Table

Qualifier	Organics	Inorganics
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.	The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.	The associated value is an estimated quantity.
N	The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification."	Not applicable.
NJ	The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.	Not applicable.
UJ	The analyte was not deemed above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.	The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.
R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and to meet quality control criteria. The presence or absence of the analyte cannot be verified.	The data are unusable. (Note: Analyte may or may not be present).

Qualification Code Reference Table

Qualifier	Organics	Inorganics
H	Holding times were exceeded.	Holding times were exceeded.
S	Surrogate recovery was outside QC limits.	The sequence or number of standards used for the calibration was incorrect
C	Calibration %RSD or %D were noncompliant.	Correlation coefficient is <0.995.
R	Calibration RRF was <0.05.	%R for calibration is not within control limits.
B	Presumed contamination from preparation (method) blank.	Presumed contamination from preparation (method) or calibration blank.
L	Laboratory Blank Spike/Blank Spike Duplicate %R was not within control limits.	Laboratory Control Sample %R was not within control limits.
Q	MS/MSD recovery was poor or RPD high.	MS recovery was poor.
E	Not applicable.	Duplicates showed poor agreement.
I	Internal standard performance was unsatisfactory.	ICP ICS results were unsatisfactory.
A	Not applicable.	ICP Serial Dilution %D were not within control limits.
M	Tuning (BFB or DFTPP) was noncompliant.	Not applicable.
T	Presumed contamination from trip blank.	Not applicable.
+	False positive – reported compound was not present. Not applicable.	
-	False negative – compound was present but not reported.	Not applicable.
F	Presumed contamination from FB, or ER.	Presumed contamination from FB or ER.
$	Reported result or other information was incorrect.	Reported result or other information was incorrect.
?	TIC identity or reported retention time has been changed.	Not applicable.
D	The analysis with this flag should not be used because another more technically sound analysis is available.	The analysis with this flag should not be used because another more technically sound analysis is available.
P	Instrument performance for pesticides was poor.	Post Digestion Spike recovery was not within control limits.
DNQ	The compound was detected between the MDL and the RL and, by definition, is considered an estimated value.	The compound was detected between the MDL and the RL and, by definition, is considered an estimated value.

*#	Unusual problems found with the data that have been described in Section 2.#, "Data Validation Findings." The number following the asterisk (*) will indicate the subsection where a description of the problem can be found (eg. *1 would indicate a sample was not within temperature limits).	Unusual problems found with the data that have been described in Section 2.#, "Data Validation Findings." The number following the asterisk (*) will indicate the subsection where a description of the problem can be found (eg. *1 would indicate a sample was not within temperature limits).

DATA VALIDATION REPORT

NPDES
Monitoring

ANALYSIS: METALS

SAMPLE DELIVERY GROUPS: IOA1554, IOA1555, IOA1556

Prepared by

AMEC—Denver Operations
550 South Wadsworth Boulevard, Suite 500
Lakewood, Colorado 80226

1. INTRODUCTION

Task Order Title:	NPDES Monitoring
Contract Task Order #:	313150010
SDG#:	IOA1554, IOA1555, IOA1556
Project Manager:	B. McIlvaine
Matrix:	Water
Analysis:	Metals
QC Level:	Level IV
No. of Samples:	3
No. of Reanalyses/Dilutions:	0
Reviewer:	K. Okonzak-Lowry
Date of Review:	March 7, 2005

The samples listed in Table 1 were validated based on the guidelines outlined in the *AMEC Data Validation Procedure for Levels III and IV ICP-MS Metals, (DVP-5-A, Rev.0), AMEC Data Validation Procedure for Levels III and IV ICP Metals* (DVP-5, Rev. 0), SW-846 *Method 6020B for Inductively Coupled Plasma – Mass Spectrometry*, SW-846 *Method 6010B for Inductively Coupled Plasma* , SW-846 *Method 7471A for Mercury (Manual Cold-Vapor Technique)*, and validation guidelines outlined in the USEPA CLP *National Functional Guidelines for Inorganic Data Review* (2/94). Any deviations from these procedures and guidelines are documented herein. Qualifiers were applied in cases where the data did not meet the required QC criteria or where special consideration by the data user is required. Data qualifiers were placed on Form Is with the associated qualification codes. Analytes that were rejected for any reason are denoted on the Form I as having only the "R" data qualifier and associated qualification code(s) denoting the reason for rejection. Any additional problems with the data that may have resulted in an estimated value were not denoted by a qualification code since the data had already been rejected.

Table 1. Sample identification

Client ID	EPA ID	Laboratory ID	Matrix	COC Method
Outfall 009	Outfall 009	IOA1554-01	water	ILM04
Outfall 008	Outfall 008	IOA1555-01	water	ILM04
Outfall 003	Outfall 003	IOA1556-01	water	ILM04

2. DATA VALIDATION FINDINGS

2.1 SAMPLE MANAGEMENT

Following are findings associated with sample management:

2.1.1 Sample Preservation, Handling, and Transport

The samples in these SDGs were received at the laboratory within the temperature limits of 4°C ±2°C. No sample preservation, handling, or transport problems were noted, and no qualifications were necessary.

2.1.2 Chain of Custody

The COCs were signed and dated by field and laboratory personnel. The COCs listed duplicate samples for all three samples; however, duplicate analyses were not required. No sample qualifications were required.

2.1.3 Holding Times

The dates of collection recorded on the COCs and the dates of analyses recorded in the raw data, documented that the sample analyses were performed within the specified holding times of six months for the ICP/MS metals and 28 days for mercury. No qualifications were required.

2.2 ICP-MS TUNING

A precalibration routine must be completed prior to calibrating the instrument, which consists of analyzing a tuning solution to verify resolution, mass calibration, and thermal stability. The solution must be analyzed a minimum of five times and must contain isotopes representing all mass regions of interest. The laboratory performed the required tune solution analyses but did not report %RSDs, with the exception of the ICP/MS run analyzed on 2/02/05 for which copper was reported for sample Outfall 009. The %RSDs for this tune were all within the 5% control limit. The laboratory SOP states that to be acceptable, the %RSD must be less than 5%. The mass calibrations were within 0.1 amu of the true mass and the instrument resolutions were less than 0.75 amu at 5 percent peak height for all analytes in the tune solution. No site sample qualifications were required.

2.3 CALIBRATION

The ICV and CCV results showed acceptable recoveries, 90-110% for the ICP/MS and 80-120% for Hg. The applicable reporting limit check standards were recovered within the AMEC control limits of 70-130%, No qualifications were required.

2.4 BLANKS

The method blanks and bracketing ICBs/CCBs associated with the samples in these SDGs were nondetected at the laboratory's MDLs, with the following exceptions: copper was detected in MB 5A29039-BLK1 at 0.555 µg/L; therefore, copper detected in sample Outfall 008 was qualified as estimated, "UJ," cadmium was detected in CCB1 and CCB2 at 0.026 and 0.033 µg/L; therefore cadmium detected in sample Outfall 008 was qualified as estimated, "UJ," and antimony was detected in CCB1 and CCB2 at 0.58 and 0.82 µg/L, respectively; therefore, the antimony detected in sample Outfall 009 was qualified as estimated, "UJ." No further qualifications were required.

2.5 ICP INTERFERENCE CHECK SAMPLE (ICS A/AB)

Results were not provided for ICP-MS spiked interferents sulfur, phosphorus, carbon, titanium, and chloride. The results for sodium and potassium were above the calibration range of the instrument in both the ICSA and ICSAB analyses. Lead was not spiked into the ICSAB solution. The validator reviewed the raw data for the site sample ICP/MS analyses for the level of reported interferents, Al, Ca, Fe, and Mg, and determined that the concentration of interferents was not high enough to cause matrix affects. No assessment could be made with respect to possible interference from sulfur, phosphorus, carbon, and chloride. No qualifications were required.

2.6 BLANK SPIKES AND LABORATORY CONTROL SAMPLES

The ICP/MS LCS samples were identified as 5A29041-BS1 and 5A29039-BS1, and the mercury LCS sample was identified as 5A31050-BS1. The LCS results on the summary forms and in the raw data were within the laboratory-established ICP/MS and mercury control limits of 85-115%. No qualifications were required.

2.7 LABORATORY DUPLICATES

No MS/MSD or duplicate analyses were performed in association with the samples in these SDGs; therefore, no assessment was made with respect to this criterion.

2.8 MATRIX SPIKE

No MS/MSD analyses were performed in association with the samples in these SDGs; therefore, no assessment was made with respect to this criterion. Method accuracy was evaluated based on LCS results.

2.9 FURNACE ATOMIC ABSORPTION QC

Furnace atomic absorption was not utilized for the analysis of these samples; therefore, furnace atomic absorption QC is not applicable.

2.10 ICP/MS SERIAL DILUTION

No serial dilution analysis was performed in association with the samples in these SDGs; therefore, no assessment was made with respect to this criterion.

2.11 INTERNAL STANDARDS PERFORMANCE

The ICP-MS internal standard recoveries for the site samples and associated QC sample analyses were within the 60-125% control limits and no qualifications were required.

2.12 SAMPLE RESULT VERIFICATION

A Level IV review was performed for the samples in these data packages. Calculations were verified, and the sample results reported on the Form Is were verified against the raw data. No transcription errors or calculation errors were noted. Analytes detected below the reporting limit were qualified as estimated, "J." No qualifications were required.

2.13 FIELD QC SAMPLES

Field QC samples are evaluated, and if necessary, qualified based only on laboratory blanks. Any remaining detects are used to evaluate the associated samples.

2.13.1 Field Blanks and Equipment Rinsates

The samples in these SDGs had no associated field QC samples. No qualifications were required.

2.13.2 Field Duplicates

There were no field duplicate analyses performed in association with the site samples.

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 009

Report Number: IOA1554

Sampled: 01/26/05
Received: 01/26/05

DRAFT: METALS

Analyte	Method	Batch	MDL	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers	Rev Qual	Qw Code
Sample ID: IOA1554-01 (DRAFT: Outfall 009 - Water)											
Reporting Units: ug/l											
Antimony	EPA 200.8	5A29041	0.18	2.0	**0.20**	1	01/29/05	01/31/05	J	UJ	B
Cadmium	EPA 200.8	5A29041	0.015	1.0	**0.019**	1	01/29/05	01/31/05	J	J	DN
Copper	EPA 200.8	5A29041	0.49	2.0	**1.6**	1	01/29/05	02/02/05	J	J	DN
Lead	EPA 200.8	5A29041	0.13	1.0	ND	1	01/29/05	01/31/05	U	U	
Mercury	EPA 245.1	5A31050	0.063	0.20	**0.10**	1	01/31/05	01/31/05	J	J	DN

KAR-
3/07/05

AMEC VALIDATED

Level IV

DRAFT REPORT
DRAFT REPORT
DATA SUBJECT TO CHANGE

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Del Mar Analytical

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LABORATORY REPORT

Prepared For: MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project: Routine Outfall 009

Sampled: 01/26/05
Received: 01/26/05
Issued: 03/19/05 18:18

NELAP #01108CA California ELAP#1197 CSDLAC #10117

The results listed within this Laboratory Report pertain only to the samples tested in the laboratory. The analyses contained in this report were performed in accordance with the applicable certifications as noted. All soil samples are reported on a wet weight basis unless otherwise noted in the report. This Laboratory Report is confidential and is intended for the sole use of Del Mar Analytical and its client. This report shall not be reproduced, except in full, without written permission from Del Mar Analytical. The Chain of Custody, 1 page, is included and is an integral part of this report.
This entire report was reviewed and approved for release.

SAMPLE CROSS REFERENCE

SUBCONTRACTED: Refer to the last page for specific subcontract laboratory information included in this report.

LABORATORY ID	CLIENT ID	MATRIX
IOA1554-01	Outfall 009	Water

Reviewed By:

Michele Harper

Del Mar Analytical, Irvine
Michele Harper
Project Manager

Del Mar Analytical

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 009

Report Number: IOA1554

Sampled: 01/26/05
Received: 01/26/05

METALS

Analyte	Method	Batch	MDL Limit	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA1554-01 (Outfall 009 - Water)									
Reporting Units: ug/l									
Antimony	EPA 200.8	5A29041	0.18	2.0	**0.20**	1	01/29/05	01/31/05	J
Cadmium	EPA 200.8	5A29041	0.015	1.0	**0.019**	1	01/29/05	01/31/05	J
Copper	EPA 200.8	5A29041	0.49	2.0	**1.6**	1	01/29/05	02/02/05	J
Lead	EPA 200.8	5A29041	0.13	1.0	ND	1	01/29/05	01/31/05	
Mercury	EPA 245.1	5A31050	0.063	0.20	**0.10**	1	01/31/05	01/31/05	J

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 009

Report Number: IOA1554

Sampled: 01/26/05
Received: 01/26/05

INORGANICS

Analyte	Method	Batch	MDL Limit	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA1554-01 (Outfall 009 - Water) - cont.									
Reporting Units: mg/l									
Chloride	EPA 300.0	5A26051	0.26	0.50	**26**	1	01/26/05	01/27/05	
Nitrate/Nitrite-N	EPA 300.0	5A26051	0.072	0.26	**0.51**	1	01/26/05	01/27/05	
Oil & Grease	EPA 413.1	5A28073	0.94	5.0	**1.1**	1	01/28/05	01/28/05	J
Sulfate	EPA 300.0	5A26051	0.18	0.50	**40**	1	01/26/05	01/27/05	
Total Dissolved Solids	SM2540C	5A28091	10	10	**180**	1	01/28/05	01/28/05	

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 009

Report Number: IOA1554

Sampled: 01/26/05
Received: 01/26/05

SHORT HOLD TIME DETAIL REPORT

	Hold Time (in days)	Date/Time Sampled	Date/Time Received	Date/Time Extracted	Date/Time Analyzed
Sample ID: Outfall 009 (IOA1554-01) - Water					
EPA 300.0	2	01/26/2005 12:48	01/26/2005 17:05	01/26/2005 23:30	01/27/2005 09:15

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Michele Harper
Project Manager

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300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 009

Report Number: IOA1554

Sampled: 01/26/05
Received: 01/26/05

METHOD BLANK/QC DATA

METALS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A29041 Extracted: 01/29/05											
Blank Analyzed: 01/31/2005 (5A29041-BLK1)											
Antimony	ND	2.0	0.18	ug/l							
Cadmium	ND	1.0	0.015	ug/l							
Copper	ND	2.0	0.49	ug/l							
Lead	ND	1.0	0.13	ug/l							
LCS Analyzed: 01/31/2005 (5A29041-BS1)											
Antimony	84.2	2.0	0.18	ug/l	80.0		105	85-115			
Cadmium	83.0	1.0	0.015	ug/l	80.0		104	85-115			
Copper	75.5	2.0	0.49	ug/l	80.0		94	85-115			
Lead	77.8	1.0	0.13	ug/l	80.0		97	85-115			
Matrix Spike Analyzed: 01/31/2005 (5A29041-MS1)						**Source: IOA1640-01**					
Antimony	87.7	4.0	0.36	ug/l	80.0	0.98	108	70-130			
Cadmium	82.8	2.0	0.030	ug/l	80.0	0.066	103	70-130			
Copper	76.0	4.0	0.98	ug/l	80.0	6.9	86	70-130			
Lead	72.9	2.0	0.26	ug/l	80.0	ND	91	70-130			
Matrix Spike Dup Analyzed: 01/31/2005 (5A29041-MSD1)						**Source: IOA1640-01**					
Antimony	92.4	4.0	0.36	ug/l	80.0	0.98	114	70-130	5	20	
Cadmium	84.9	2.0	0.030	ug/l	80.0	0.066	106	70-130	3	20	
Copper	77.7	4.0	0.98	ug/l	80.0	6.9	88	70-130	2	20	
Lead	73.2	2.0	0.26	ug/l	80.0	ND	92	70-130	0	20	
Batch: 5A31050 Extracted: 01/31/05											
Blank Analyzed: 01/31/2005 (5A31050-BLK1)											
Mercury	ND	0.20	0.063	ug/l							

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Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 009

Report Number: IOA1554

Sampled: 01/26/05
Received: 01/26/05

METHOD BLANK/QC DATA

METALS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A31050 Extracted: 01/31/05											
LCS Analyzed: 01/31/2005 (5A31050-BS1)											
Mercury	8.24	0.20	0.063	ug/l	8.00		103	85-115			
Matrix Spike Analyzed: 01/31/2005 (5A31050-MS1)						**Source: IOA1690-21**					
Mercury	9.46	0.20	0.063	ug/l	8.00	1.4	101	70-130			
Matrix Spike Dup Analyzed: 01/31/2005 (5A31050-MSD1)						**Source: IOA1690-21**					
Mercury	9.39	0.20	0.063	ug/l	8.00	1.4	100	70-130	1	20	

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 009

Report Number: IOA1554

Sampled: 01/26/05
Received: 01/26/05

METHOD BLANK/QC DATA

INORGANICS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A26051 Extracted: 01/26/05											
Blank Analyzed: 01/26/2005 (5A26051-BLK1)											
Chloride	ND	0.50	0.26	mg/l							
Nitrate/Nitrite-N	ND	0.26	0.072	mg/l							
Sulfate	ND	0.50	0.18	mg/l							
LCS Analyzed: 01/26/2005 (5A26051-BS1)											
Chloride	4.65	0.50	0.26	mg/l	5.00		93	90-110			
Sulfate	9.60	0.50	0.18	mg/l	10.0		96	90-110			
Matrix Spike Analyzed: 01/26/2005 (5A26051-MS1)						**Source: IOA1551-01**					
Chloride	23.7	0.50	0.26	mg/l	5.00	19	94	80-120			
Sulfate	37.9	0.50	0.18	mg/l	10.0	28	99	80-120			
Matrix Spike Dup Analyzed: 01/26/2005 (5A26051-MSD1)						**Source: IOA1551-01**					
Chloride	23.4	0.50	0.26	mg/l	5.00	19	88	80-120	1	20	
Sulfate	38.1	0.50	0.18	mg/l	10.0	28	101	80-120	1	20	
Batch: 5A28073 Extracted: 01/28/05											
Blank Analyzed: 01/28/2005 (5A28073-BLK1)											
Oil & Grease	ND	5.0	0.94	mg/l							
LCS Analyzed: 01/28/2005 (5A28073-BS1)											**M-NR1**
Oil & Grease	20.8	5.0	0.94	mg/l	20.0		104	65-120			
LCS Dup Analyzed: 01/28/2005 (5A28073-BSD1)											
Oil & Grease	19.3	5.0	0.94	mg/l	20.0		96	65-120	7	20	

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 009

Report Number: IOA1554

Sampled: 01/26/05
Received: 01/26/05

METHOD BLANK/QC DATA

INORGANICS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A28091 Extracted: 01/28/05											
Blank Analyzed: 01/28/2005 (5A28091-BLK1)											
Total Dissolved Solids	ND	10	10	mg/l							
LCS Analyzed: 01/28/2005 (5A28091-BS1)											
Total Dissolved Solids	908	10	10	mg/l	1000		91	90-110			
Duplicate Analyzed: 01/28/2005 (5A28091-DUP1)						**Source: IOA1548-02**					
Total Dissolved Solids	586	10	10	mg/l		590			1	10	

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 009

Report Number: IOA1554

Sampled: 01/26/05
Received: 01/26/05

Compliance Check

The results obtained from the analytical testing of this data set were checked against compliance limits received from the client. Any results at or above the compliance limits appear in bold on this page.

LabNumber	Analysis	Analyte	Units	Result	MRL	Compliance Limit
IOA1554-01	413.1 Oil and Grease	Oil & Grease	mg/l	1.10	5.0	15
IOA1554-01	Chloride - 300.0	Chloride	mg/l	26	0.50	150
IOA1554-01	Nitrogen, NO3+NO2 -N	Nitrate/Nitrite-N	mg/l	0.51	0.26	10.00
IOA1554-01	Sulfate-300.0	Sulfate	mg/l	40	0.50	250
IOA1554-01	TDS - SM 2540C	Total Dissolved Solids	mg/l	180	10	850

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Attention: Bronwyn Kelly

Project ID: Routine Outfall 009

Report Number: IOA1554

Sampled: 01/26/05
Received: 01/26/05

DATA QUALIFIERS AND DEFINITIONS

J	Estimated value. Analyte detected at a level less than the Reporting Limit (RL) and greater than or equal to the Method Detection Limit (MDL). The user of this data should be aware that this data is of unknown quality.
M-NR1	There was no MS/MSD analyzed with this batch due to insufficient sample volume. See Blank Spike/Blank Spike Duplicate.
ND	Analyte NOT DETECTED at or above the reporting limit or MDL, if MDL is specified.
RPD	Relative Percent Difference

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 009

Report Number: IOA1554

Sampled: 01/26/05
Received: 01/26/05

Certification Summary

Del Mar Analytical, Irvine

Method	Matrix	Nelac	California
EPA 200.8	Water	X	X
EPA 245.1	Water	X	X
EPA 300.0	Water	X	X
EPA 413.1	Water	X	X
SM2540C	Water	X	X

Nevada and NELAP provide analyte specific accreditations. Analyte specific information for Del Mar Analytical may be obtained by contacting the laboratory or visiting our website at www.dmalabs.com.

Subcontracted Laboratories

Pace Analytical, MN- SUB

1700 Elm Street, Ste 200 - Minneapolis, MN 55414

Analysis Performed: 1613-Dioxin-HR
Samples: IOA1554-01

Analysis Performed: EDD + Level 4
Samples: IOA1554-01

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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Del Mar Analytical Version 5 8/12/04 CHAIN OF CUSTODY FORM

JOA1554

Client Name/Address:	Project:	ANALYSIS REQUIRED
MWH-Pasadena 300 North Lake Avenue, Suite 1200 Pasadena, CA 91101	Boeing-SSFL NPDES **Routine Outfall 009** Stormwater at WS-13	
Project Manager: Bronwyn Kelly Sampler: Pollock	Phone Number: (626) 568-6691 Fax Number: (626) 568-6515	

Sample Description	Sample Matrix	Container Type	# of Cont.	Sampling Date/Time	Preservative	Bottle * #	Total Reoverable Metals: Sb, Cd, Cu, Pb, Hg ✓	TCDD (and all congeners) ✓	Oil & Grease (EPA 413.1) ✓	Cl-, SO4, NO3+NO2-N	TDS					Field readings: / Comments
Outfall 009	W	Poly-1L	1	1-26-05 12:48	HNO3	1A	X									Temp = 52.7°F pH= 6.9
Outfall 009-Dup	W	Poly-1L	1		HNO3	1B	X									
Outfall 009	W	Glass-Amber	2		None	2A, 2B		X								
Outfall 009	W	Glass-Amber	2		HCl	3A, 3B			X							
Outfall 009	W	Poly ~~500 ml~~ 1L	2 1		None	4A, ~~4B~~				X						
Outfall 009	W	Poly ~~500 ml~~ 1L	2 1		None	5A, ~~5B~~					X					

Relinquished By	Date/Time:	Received By	Date/Time:
[signature]	1-26-05 1400	[signature]	1/26/05 1400
[signature]	1/26/05 1705	[signature]	1/26/05 1705
Relinquished By	Date/Time:	Received By	Date/Time:

Turn around Time: (check)
24 Hours _____ 5 Days _____
48 Hours _____ 10 Days _____
72 Hours _____ Normal _____
Perchlorate Only 72 Hours_____
Metals Only 72 Hours_____
Sample Integrity: (Check)
Intact X On Ice: ✓ 3°C

Del Mar Analytical

2852 Alton Ave., Irvine CA 92606 (949) 261-1022 FAX (949) 261-1228
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March 10, 2005

MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, Ca.91101

Attention: Bronwyn Kelly

Project: Routine Outfall 009
Sampled: 01/26/05
Del Mar Analytical Number: IOA1554

Dear Ms. Kelly:

Pace Analytical performed Method 1613B analysis for the project referenced above. Please use the following cross-reference table when reviewing your results.

MWH ID	DEL MAR ID	Pace ID
Outfall 009	IOA1554-01	106842001

Attached is the original report from the subcontract laboratory. If you have any questions or require further assistance, please do not hesitate to contact me.

Sincerely yours,
DEL MAR ANALYTICAL

Michele Harper
Project Manager

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 1613B Analysis Results

Client - Del Mar Analytical

Client's Sample ID	IOA1554-01		
Lab Sample ID	106842001		
Filename	F50204A_04		
Injected By	MRO		
Total Amount Extracted	1010 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	01/26/2004
ICAL Date	11/29/2004	Received	01/28/2005
CCal Filename(s)	F50203A_20	Extracted	01/31/2005
Method Blank ID	BLANK-6241	Analyzed	02/04/2005 12:28

Native Isomers	Conc pg/L	EMPC pg/L	LOD pg/L		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	1.20		2,3,7,8-TCDF-13C	2.00	82
Total TCDF	ND	-----	1.20		2,3,7,8-TCDD-13C	2.00	88
					1,2,3,7,8-PeCDF-13C	2.00	94
2,3,7,8-TCDD	ND	-----	1.40		2,3,4,7,8-PeCDF-13C	2.00	103
Total TCDD	ND	-----	1.40		1,2,3,7,8-PeCDD-13C	2.00	112
					1,2,3,4,7,8-HxCDF-13C	2.00	89
1,2,3,7,8-PeCDF	ND	-----	1.10		1,2,3,6,7,8-HxCDF-13C	2.00	95
2,3,4,7,8-PeCDF	ND	-----	0.72		2,3,4,6,7,8-HxCDF-13C	2.00	90
Total PeCDF	ND	-----	0.91		1,2,3,7,8,9-HxCDF-13C	2.00	91
					1,2,3,4,7,8-HxCDD-13C	2.00	92
1,2,3,7,8-PeCDD	ND	-----	1.10		1,2,3,6,7,8-HxCDD-13C	2.00	88
Total PeCDD	ND	-----	1.10		1,2,3,4,6,7,8-HpCDF-13C	2.00	84
					1,2,3,4,7,8,9-HpCDF-13C	2.00	82
1,2,3,4,7,8-HxCDF	1.1	-----	0.75	J	1,2,3,4,6,7,8-HpCDD-13C	2.00	96
1,2,3,6,7,8-HxCDF	ND	-----	0.78		OCDD-13C	4.00	98
2,3,4,6,7,8-HxCDF	ND	-----	0.70				
1,2,3,7,8,9-HxCDF	ND	-----	0.87		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	1.1	-----	0.78	BJ	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	1.10		2,3,7,8-TCDD-37Cl4	0.20	81
1,2,3,6,7,8-HxCDD	ND	-----	0.60				
1,2,3,7,8,9-HxCDD	ND	-----	0.83				
Total HxCDD	ND	-----	0.85				
1,2,3,4,6,7,8-HpCDF	ND	-----	0.65				
1,2,3,4,7,8,9-HpCDF	ND	-----	0.73				
Total HpCDF	2.3	-----	0.69	BJ			
1,2,3,4,6,7,8-HpCDD	2.3	-----	0.76	J			
Total HpCDD	4.5	-----	0.76	J			
OCDF	4.4	-----	0.69	BJ			
OCDD	20.0	-----	1.50	J			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection. Totals are averages of individual isomer LODs.
D = Result obtained from analysis of diluted sample
B = Less than 10 times higher than method blank level
P = Recovery outside of method 1613 control limits
J = Concentration detected is below the calibration range
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....106842

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Pace Analytical™

Method 1613B Blank Analysis Results

Client - Del Mar Analytical

Lab Sample ID	BLANK-6241	Matrix	Water
Filename	U50202B_06	Dilution	NA
Total Amount Extracted	1040 mL	Extracted	01/31/2005
ICAL Date	01/26/2005	Analyzed	02/02/2005 23:46
CCal Filename(s)	U50202B_01	Injected By	SMT

Native Isomers	Conc pg/L	EMPC pg/L	LOD pg/L		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	0.59		2,3,7,8-TCDF-13C	2.00	86
Total TCDF	1.10	-----	-----	J	2,3,7,8-TCDD-13C	2.00	86
					1,2,3,7,8-PeCDF-13C	2.00	92
2,3,7,8-TCDD	ND	-----	1.30		2,3,4,7,8-PeCDF-13C	2.00	98
Total TCDD	ND	-----	-----		1,2,3,7,8-PeCDD-13C	2.00	105
					1,2,3,4,7,8-HxCDF-13C	2.00	83
1,2,3,7,8-PeCDF	-----	0.73	0.53	I	1,2,3,6,7,8-HxCDF-13C	2.00	76
2,3,4,7,8-PeCDF	ND	-----	0.63		2,3,4,6,7,8-HxCDF-13C	2.00	79
Total PeCDF	ND	-----	-----		1,2,3,7,8,9-HxCDF-13C	2.00	82
					1,2,3,4,7,8-HxCDD-13C	2.00	82
1,2,3,7,8-PeCDD	ND	-----	1.10		1,2,3,6,7,8-HxCDD-13C	2.00	66
Total PeCDD	ND	-----	-----		1,2,3,4,6,7,8-HpCDF-13C	2.00	75
					1,2,3,4,7,8,9-HpCDF-13C	2.00	69
1,2,3,4,7,8-HxCDF	-----	1.30	0.26	E	1,2,3,4,6,7,8-HpCDD-13C	2.00	77
1,2,3,6,7,8-HxCDF	-----	0.75	0.29	E	OCDD-13C	4.00	79
2,3,4,6,7,8-HxCDF	-----	0.71	0.31	I			
1,2,3,7,8,9-HxCDF	-----	1.00	0.41	E	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	0.34	-----	-----	J	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	1.10		2,3,7,8-TCDD-37Cl4	0.20	89
1,2,3,6,7,8-HxCDD	ND	-----	0.69				
1,2,3,7,8,9-HxCDD	ND	-----	0.95				
Total HxCDD	ND	-----	-----				
1,2,3,4,6,7,8-HpCDF	1.20	-----	0.71	J			
1,2,3,4,7,8,9-HpCDF	ND	-----	0.99				
Total HpCDF	4.30	-----	-----	J			
1,2,3,4,6,7,8-HpCDD	-----	1.60	0.86	I			
Total HpCDD	ND	-----	-----				
OCDF	6.50	-----	1.20	J			
OCDD	-----	8.30	0.74	I			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection. Totals are averages of individual isomer LODs.
A = Limit of Detection based on signal to noise
P = Recovery outside of method 1613 control limits
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....106475

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 1613B Laboratory Control Spike Results

Client - Del Mar Analytical

Lab Sample ID	LCS-6242		
Filename	U50202B_02	Matrix	Water
Total Amount Extracted	1040 mL	Dilution	NA
ICAL Date	01/26/2005	Extracted	01/31/2005
CCal Filename	U50202B_01	Analyzed	02/02/2005 20:28
Method Blank ID	BLANK-6241	Injected By	SMT

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDF	10	8.8	7.5	15.8	88
2,3,7,8-TCDD	10	8.6	6.7	15.8	86
1,2,3,7,8-PeCDF	50	43.6	40.0	67.0	87
2,3,4,7,8-PeCDF	50	42.3	34.0	80.0	85
1,2,3,7,8-PeCDD	50	38.0	35.0	71.0	76
1,2,3,4,7,8-HxCDF	50	39.1	36.0	67.0	78
1,2,3,6,7,8-HxCDF	50	42.0	42.0	65.0	84
2,3,4,6,7,8-HxCDF	50	40.4	35.0	78.0	81
1,2,3,7,8,9-HxCDF	50	39.6	39.0	65.0	79
1,2,3,4,7,8-HxCDD	50	43.2	35.0	82.0	86
1,2,3,6,7,8-HxCDD	50	42.9	38.0	67.0	86
1,2,3,7,8,9-HxCDD	50	45.4	32.0	81.0	91
1,2,3,4,6,7,8-HpCDF	50	44.2	41.0	61.0	88
1,2,3,4,7,8,9-HpCDF	50	46.8	39.0	69.0	94
1,2,3,4,6,7,8-HpCDD	50	41.4	35.0	70.0	83
OCDF	100	79.6	63.0	170.0	80
OCDD	100	85.8	78.0	144.0	86
2,3,7,8-TCDD-37Cl4	10	7.8	3.1	19.1	78
2,3,7,8-TCDF-13C	100	85.1	22.0	152.0	85
2,3,7,8-TCDD-13C	100	80.0	20.0	175.0	80
1,2,3,7,8-PeCDF-13C	100	90.8	21.0	192.0	91
2,3,4,7,8-PeCDF-13C	100	94.3	13.0	328.0	94
1,2,3,7,8-PeCDD-13C	100	102.1	21.0	227.0	102
1,2,3,4,7,8-HxCDF-13C	100	81.8	19.0	202.0	82
1,2,3,6,7,8-HxCDF-13C	100	78.8	21.0	159.0	79
2,3,4,6,7,8-HxCDF-13C	100	83.3	22.0	176.0	83
1,2,3,7,8,9-HxCDF-13C	100	85.0	17.0	205.0	85
1,2,3,4,7,8-HxCDD-13C	100	83.5	21.0	193.0	83
1,2,3,6,7,8-HxCDD-13C	100	71.7	25.0	163.0	72
1,2,3,4,6,7,8-HpCDF-13C	100	76.4	21.0	158.0	76
1,2,3,4,7,8,9-HpCDF-13C	100	67.0	20.0	186.0	67
1,2,3,4,6,7,8-HpCDD-13C	100	73.0	26.0	166.0	73
OCDD-13C	200	148.7	26.0	397.0	74

Cs = Concentration Spiked (ng/mL)
Cr = Concentration Recovered (ng/mL)
Rec. = Recovery (Expressed as Percent)
Control Limit Reference: Method 1613, Table 6, 10/94 Revision
X = Background subtracted value
P = Recovery outside of control limits
Nn = Value obtained from additional analysis
* = See Discussion

Report No.....106475

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Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 1613B Laboratory Control Spike Results

Client - Del Mar Analytical

Lab Sample ID	LCSD-6243		
Filename	U50202B_03	Matrix	Water
Total Amount Extracted	1030 mL	Dilution	NA
ICAL Date	01/26/2005	Extracted	01/31/2005
CCal Filename	U50202B_01	Analyzed	02/02/2005 21:15
Method Blank ID	BLANK-6241	Injected By	SMT

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDF	10	9.7	7.5	15.8	97
2,3,7,8-TCDD	10	9.4	6.7	15.8	94
1,2,3,7,8-PeCDF	50	46.8	40.0	67.0	94
2,3,4,7,8-PeCDF	50	44.6	34.0	80.0	89
1,2,3,7,8-PeCDD	50	40.7	35.0	71.0	81
1,2,3,4,7,8-HxCDF	50	41.3	36.0	67.0	83
1,2,3,6,7,8-HxCDF	50	44.5	42.0	65.0	89
2,3,4,6,7,8-HxCDF	50	43.6	35.0	78.0	87
1,2,3,7,8,9-HxCDF	50	42.2	39.0	65.0	84
1,2,3,4,7,8-HxCDD	50	49.1	35.0	82.0	98
1,2,3,6,7,8-HxCDD	50	45.6	38.0	67.0	91
1,2,3,7,8,9-HxCDD	50	51.3	32.0	81.0	103
1,2,3,4,6,7,8-HpCDF	50	47.5	41.0	61.0	95
1,2,3,4,7,8,9-HpCDF	50	50.1	39.0	69.0	100
1,2,3,4,6,7,8-HpCDD	50	44.5	35.0	70.0	89
OCDF	100	89.7	63.0	170.0	90
OCDD	100	91.5	78.0	144.0	92
2,3,7,8-TCDD-37Cl4	10	9.3	3.1	19.1	93
2,3,7,8-TCDF-13C	100	100.2	22.0	152.0	100
2,3,7,8-TCDD-13C	100	97.2	20.0	175.0	97
1,2,3,7,8-PeCDF-13C	100	109.5	21.0	192.0	109
2,3,4,7,8-PeCDF-13C	100	114.8	13.0	328.0	115
1,2,3,7,8-PeCDD-13C	100	124.2	21.0	227.0	124
1,2,3,4,7,8-HxCDF-13C	100	93.9	19.0	202.0	94
1,2,3,6,7,8-HxCDF-13C	100	88.8	21.0	159.0	89
2,3,4,6,7,8-HxCDF-13C	100	89.8	22.0	176.0	90
1,2,3,7,8,9-HxCDF-13C	100	96.4	17.0	205.0	96
1,2,3,4,7,8-HxCDD-13C	100	86.2	21.0	193.0	86
1,2,3,6,7,8-HxCDD-13C	100	80.0	25.0	163.0	80
1,2,3,4,6,7,8-HpCDF-13C	100	85.0	21.0	158.0	85
1,2,3,4,7,8,9-HpCDF-13C	100	80.0	20.0	186.0	80
1,2,3,4,6,7,8-HpCDD-13C	100	81.7	26.0	166.0	82
OCDD-13C	200	177.3	26.0	397.0	89

Cs = Concentration Spiked (ng/mL)
Cr = Concentration Recovered (ng/mL)
Rec. = Recovery (Expressed as Percent)
Control Limit Reference: Method 1613, Table 6, 10/94 Revision
X = Background subtracted value
P = Recovery outside of control limits
Nn = Value obtained from additional analysis
* = See Discussion

Report No.....106475

REPORT OF LABORATORY ANALYSIS

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1700 Elm Street
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444

SPIKE RECOVERY RELATIVE PERCENT DIFFERENCE (RPD) RESULTS

Client..... Del Mar Analytical

SPIKE 1 ID..... LCS-6242
SPIKE 1 Filename..... U50202B_02
SPIKE 2 ID..... LCSD-6243
SPIKE 2 Filename..... U50202B_03

COMPOUND	SPIKE 1 REC,%	SPIKE 2 REC,%	RPD,%
2378-TCDF	88	97	9.7
2378-TCDD	86	94	8.9
12378-PeCDF	87	94	7.7
23478-PeCDF	85	89	4.6
12378-PeCDD	76	81	6.4
123478-HxCDF	78	83	6.2
123678-HxCDF	84	89	5.8
234678-HxCDF	81	87	7.1
123789-HxCDF	79	84	6.1
123478-HxCDD	86	98	13.0
123678-HxCDD	86	91	5.6
123789-HxCDD	91	103	12.4
1234678-HpCDF	88	95	7.7
1234789-HpCDF	94	100	6.2
1234678-HpCDD	83	89	7.0
OCDF	80	90	11.8
OCDD	86	92	6.7

REC = Percent Recovered
RPD = The difference between the two values divided by the average.
NA = Not Applicable

Report No..... 106475

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1700 Elm Street
Minneapolis, MN 55414
Phone: 612.607.1700
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TABLE 1. 2,3,7,8-TCDD Equivalency Factors (TEFs) for the Polychlorinated Dibenzo-p-dioxins and Dibenzofurans

Number	Compound(s)	TEF
1	2,3,7,8-TCDD	1.00
2	1,2,3,7,8-PeCDD	0.50
3	1,2,3,6,7,8-HxCDD	0.1
4	1,2,3,7,8,9-HxCDD	0.1
5	1,2,3,4,7,8-HxCDD	0.1
6	1,2,3,4,6,7,8-HpCDD	0.01
7	OCDD	0.001
8	* Total - TCDD	0.0
9	* Total - PeCDD	0.0
10	* Total - HxCDD	0.0
11	* Total - HpCDD	0.0
12	2,3,7,8-TCDF	0.10
13	1,2,3,7,8-PeCDF	0.05
14	2,3,4,7,8-PeCDF	0.5
15	1,2,3,6,7,8-HxCDF	0.1
16	1,2,3,7,8,9-HxCDF	0.1
17	1,2,3,4,7,8-HxCDF	0.1
18	2,3,4,6,7,8-HxCDF	0.1
19	1,2,3,4,6,7,8-HpCDF	0.01
20	1,2,3,4,7,8,9-HpCDF	0.01
21	OCDF	0.001
22	* Total - TCDF	0.0
23	* Total - PeCDF	0.0
24	* Total - HxCDF	0.0
25	* Total - HpCDF	0.0

*Excluding the 2,3,7,8-substituted congeners.

Reference: 1989 ITEFs

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106847

Del Mar Analytical

17461 Derian Ave. Suite 100, Irvine, CA 92614 Ph (949) 261-1022 Fax (949) 261-1228
1014 E. Cooley Dr., Suite A, Colton, CA 92324 Ph (909) 370-4667 Fax (909) 370-1046
9484 Chesapeake Drive, Suite 805, San Diego, CA 92123 Ph (619) 505-9596 Fax (619) 505-9689
9830 South 51st Street, Suite B-120, Phoenix, AZ 85044 Ph (480) 785-0043 Fax (480) 785-0851
2520 E. Sunset Rd., Suite #3, Las Vegas, NV 89120 Ph (702) 798-3620 Fax (702) 798-3621

SUBCONTRACT ORDER - PROJECT # IOA1554

SENDING LABORATORY:

Del Mar Analytical, Irvine
17461 Derian Avenue. Suite 100
Irvine, CA 92614
Phone: (949) 261-1022
Fax: (949) 261-1228
Project Manager: Michele Harper

RECEIVING LABORATORY:

Pace Analytical, MN- SUB
1700 Elm Street, Ste 200
Minneapolis, MN 55414
Phone :(612) 607-1700
Fax: (612) 607-6444

Standard TAT is requested unless specific due date is requested => Due Date:_____ Initials:_____

Analysis	Expiration	Comments
Sample ID: IOA1554-01 Water	**Sampled: 01/26/05 12:48**	**Instant Nofication**
1613-Dioxin-HR	02/02/05 12:48	J flags, 17 congeners, no TEQ, sub to Pace-MN
EDD + Level 4	02/23/05 12:48	Excel EDD email to pm,Include Std logs for Lvl IV
Containers Supplied:		
1 L Amber (IOA1554-01C)		106847-001
1 L Amber (IOA1554-01D)		

SAMPLE INTEGRITY:

All containers intact: ☐ Yes ☐ No Sample labels/COC agree: ☐ Yes ☐ No Samples Received On Ice:: ☒ Yes ☐ No
Custody Seals Present: ☐ Yes ☐ No Samples Preserved Properly: ☐ Yes ☐ No Samples Received at (temp): 1.8°C

Released By	Date	Time	Received By	Date	Time
	1-27-05	1700		1/28/05	930
Released By	Date	Time	Received By	Date	Time

APPENDIX G

Section 10

January Outfall 010

AMEC Data Validation Reports

Del Mar Analytical Laboratory Reports

CONTRACT COMPLIANCE SCREENING FORM FOR HARDCOPY DATA

AMEC Earth & Environmental
550 South Wadsworth Boulevard
Suite 500
Lakewood, CO 80226

Package ID T711DF20
Task Order 313150010
SDG No. Multiple
No. of Analyses 15

Laboratory Alta
Reviewer K. Shadowlight
Analysis/Method Dioxins

Date: February 11, 2005
Reviewer's Signature K Shadowlight

ACTION ITEMS[a]	
1. **Case Narrative Deficiencies**	
2. **Out of Scope Analyses**	
3. **Analyses Not Conducted**	
4. **Missing Hardcopy Deliverables**	
5. **Incorrect Hardcopy Deliverables**	
6. **Deviations from Analysis Protocol, e.g.,**	Qualifications were assigned for the following:
Holding Times	* Method blank contamination
GC/MS Tune/Inst. Performance	* EMPCs
Calibration	* Detects below the lower method calibration level
Method blanks	
Surrogates	
Matrix Spike/Dup LCS	
Field QC	
Internal Standard Performance	
Compound Identification and Quantitation	
System Performance	
COMMENTS[b]	Rev. 1

[a] Subcontracted analytical laboratory is not meeting contract and/or method requirements.
[b] Differences in protocol have been adopted by the laboratory but no action against the laboratory is required.

DATA VALIDATION REPORT

NPDES
Monitoring

ANALYSIS: DIOXINS/FURANS

SAMPLE DELIVERY GROUPS: Multiple SDGs

Prepared by

AMEC—Denver Operations
550 South Wadsworth Boulevard, Suite 500
Lakewood, Colorado 80226

1. INTRODUCTION

Task Order Title:	NPDES Monitoring
Contract Task Order #:	313150010
Sample Delivery Group #:	Multiple
Project Manager:	B. McIlvaine
Matrix:	Water
Analysis:	Dioxins/Furans
QC Level:	Level IV
No. of Samples:	15
No. of Reanalyses/Dilutions:	0
Reviewer:	K. Shadowlight
Date of Review:	February 11, 2005

The samples listed in Table 1 were validated based on the guidelines outlined in the *AMEC Data Validation Procedure for Dioxins and Furans (DVP-19, Rev. 1), EPA Method 1613, and the National National Functional Guidelines For Chlorinated Dioxin/Furan Data Review* (8/02). Any deviations from these procedures and guidelines are documented herein. Qualifiers were applied in cases where the data did not meet the required QC criteria or where special consideration by the data user is required. Data qualifiers were placed on Form Is with the associated qualification codes. Analytes that were rejected for any reason are denoted on the Form I as having only the "R" data qualifier and associated qualification code(s) denoting the reason for rejection. Any additional problems with the data that may have resulted in an estimated value were not denoted by a qualification code since the data had already been rejected.

Table 1. Sample Identification

Client ID	Laboratory ID (Del Mar)	Laboratory ID (Pace)	Matrix	COC Method
Outfall 003	IOA0026-01	105648001	water	1613
Outfall 004	IOA0027-01	105646001	water	1613
Outfall 005	IOA0028-01	105645001	water	1613
Outfall 007	IOA0108-01	105774001	water	1613
Outfall 008	IOA0109-01	105775001	water	1613
Outfall 009	IOA0110-01	105770001	water	1613
Outfall 010	IOA0111-01	105758001	water	1613
Outfall 001	IOA0112-01	105778001	water	1613
Outfall 002	IOA0119-01	105772001	water	1613
Outfall 018	IOA0122-01	105779001	water	1613
Outfall 011	IOA0131-01	105773001	water	1613
Outfall 006	IOA0458-01	106048001	water	1613
Outfall 004	IOA0460-01	106050001	water	1613
Outfall 005	IOA0464-01	106052001	water	1613
Outfall 003	IOA0466-01	106051001	water	1613

2. DATA VALIDATION FINDINGS

2.1 SAMPLE MANAGEMENT

Following are findings associated with sample management:

2.1.1 Sample Preservation, Handling, and Transport

All of the samples in these SDGs were received at Del Mar Analytical within the temperature limits of 4°C ±2°C. Several of the samples in these SDGs were received at Pace Analytical Services below the temperature limits of 4°C ±2°C; however, as none of the samples were noted to have been damaged, no qualifications were required. The samples were received in good condition at both laboratories. No qualifications were required.

2.1.2 Chain of Custody

The COC and transfer COC were signed by the appropriate field and laboratory personnel, and accounted for the analyses presented in these SDGs. As the samples were couriered directly to the laboratory (Del Mar Analytical), custody seals were not required. There was no information regarding custody seals upon receipt at Pace. No qualifications were required.

2.1.3 Holding Times

The samples were extracted and analyzed within a year of collection. No qualifications were required.

2.2 INSTRUMENT PERFORMANCE

Following are findings associated with instrument performance:

2.2.1 GC Column Performance

A column performance standard was combined with the daily calibration verification and analyzed at the beginning of each analytical sequence. The GC column performance was acceptable with the chromatographic separation of 2,3,7,8-TCDD and other TCDD isomers resolved with a valley of ≤25%. No qualifications were required.

2.2.2 Mass Spectrometer Performance

The mass spectrometer performance could not be evaluated as the laboratory did not provide selected ion current profiles for the lock-mass ions. No qualifications were required.

2.3 CALIBRATION

2.3.1 Initial Calibration

There was one initial calibration, analyzed 11/29/04 on Instrument 10MSHR05. The calibration consisted of five concentration level standards (CS1 through CS5) analyzed to verify instrument linearity. The initial calibration was acceptable with %RSDs ≤20% for the 15 native compounds (calibration by isotope dilution) and ≤35% for the 2 native and all labeled compounds (calibration by internal standard). The relative retention times and ion abundance ratios were within the QC limits listed in Method 1613 for all standards. A representative number of %RSDs were verified from the raw data, and no calculation or transcription errors were noted. No qualifications were required.

2.3.2 Continuing Calibration

Calibration verification (VER) consisted of a mid-level standard (CS3) analyzed at the beginning of each analytical sequence. The VER was acceptable with the concentrations within the acceptance criteria listed in the Table 6 of the EPA Method 1613. The ion abundance ratios and relative retention times were within the method QC limits. A representative number of %Ds were verified from the raw data, and no calculation or transcription errors were noted. No qualifications were required.

2.4 BLANKS

One method blank (Blank-6202) was extracted and analyzed with the samples in these SDGs. Target compounds 1,2,3,4,6,7,8-HpCDD, total HpCDD, OCDF, and OCDD were reported in the method blank. Any detects for the aforementioned target compounds reported at concentrations <5x the concentrations reported in the method blank were qualified as estimated nondetects "UJ," at the levels of interference in the samples of these SDGs. A review of the method blank raw data and chromatograms indicated no false negatives or false positives. No further qualifications were required.

2.5 BLANK SPIKES AND LABORATORY CONTROL SAMPLES

One LCS/LCSD pair (LCS-6203/LCSD-6204) was extracted and analyzed with the samples in these SDGs. All recoveries were within the acceptance criteria listed in Table 6 of the Method 1613. There were no QC limits established for RPDs. The reported RPDs were within ±20%. No qualifications were required.

2.6 MATRIX SPIKE/MATRIX SPIKE DUPLICATE

MS/MSD analyses were not performed in these SDGs. Evaluation of method accuracy and precision was based on the LCS/LCSD results. No qualifications were required.

2.7 FIELD QC SAMPLES

Following are findings associated with field QC:

2.7.1 Field Blanks and Equipment Rinsates

The samples in these SDGs had no associated field QC samples. No qualifications were required.

2.7.2 Field Duplicates

No field duplicate samples were identified for these SDGs.

2.8 INTERNAL STANDARDS

The labeled standard recoveries were within the acceptance criteria listed in Table 7 of Method 1613. No qualifications were required.

2.9 COMPOUND IDENTIFICATION

The laboratory analyzed for polychlorinated dioxins/furans by EPA Method 1613. The compound identifications were verified from the raw data and no false negatives or positives were noted. No qualifications were required.

2.10 COMPOUND QUANTIFICATION AND REPORTED DETECTION LIMITS

Compound quantitation was verified from the raw data. The laboratory calculated and reported compound-specific detection limits. Any detects below the lower method calibration limit (MCL) were qualified as estimated, "J." Any reported EMPC was qualified as an estimated nondetect, "UJ." No further qualifications were required.

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 1613B Analysis Results

Client - Del Mar Analytical

Client's Sample ID	IOA0111-01 Outfall 010		
Lab Sample ID	105758001		
Filename	F50127A_07		
Injected By	MRO		
Total Amount Extracted	1040 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	01/04/2005
ICAL Date	11/29/2004	Received	01/06/2005
CCal Filename(s)	F50127A_02	Extracted	01/24/2005
Method Blank ID	BLANK-6202	Analyzed	01/27/2005 15:04

Native Isomers	Conc pg/L	EMPC pg/L	LOD pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	2.1	2,3,7,8-TCDF-13C	2.00	72
Total TCDF	2.2	-----	2.1 J	2,3,7,8-TCDD-13C	2.00	83
				1,2,3,7,8-PeCDF-13C	2.00	80
2,3,7,8-TCDD	ND	-----	2.1	2,3,4,7,8-PeCDF-13C	2.00	82
Total TCDD	ND	-----	2.1	1,2,3,7,8-PeCDD-13C	2.00	91
				1,2,3,4,7,8-HxCDF-13C	2.00	78
1,2,3,7,8-PeCDF	ND	-----	1.4	1,2,3,6,7,8-HxCDF-13C	2.00	102
2,3,4,7,8-PeCDF	ND	-----	1.2	2,3,4,6,7,8-HxCDF-13C	2.00	93
Total PeCDF	ND	-----	1.3	1,2,3,7,8,9-HxCDF-13C	2.00	82
				1,2,3,4,7,8-HxCDD-13C	2.00	75
1,2,3,7,8-PeCDD	ND	-----	1.9	1,2,3,6,7,8-HxCDD-13C	2.00	89
Total PeCDD	ND	-----	1.9	1,2,3,4,6,7,8-HpCDF-13C	2.00	83
				1,2,3,4,7,8,9-HpCDF-13C	2.00	73
1,2,3,4,7,8-HxCDF	ND	-----	2.0	1,2,3,4,6,7,8-HpCDD-13C	2.00	98
1,2,3,6,7,8-HxCDF	ND	-----	1.6	OCDD-13C	4.00	91
2,3,4,6,7,8-HxCDF	ND	-----	1.6			
1,2,3,7,8,9-HxCDF	ND	-----	1.5	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	-----	1.6	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	2.6	2,3,7,8-TCDD-37Cl4	0.20	80
1,2,3,6,7,8-HxCDD	ND	-----	2.0			
1,2,3,7,8,9-HxCDD	ND	-----	2.2			
Total HxCDD	ND	-----	2.3			
1,2,3,4,6,7,8-HpCDF	6.6	-----	1.5 J			
1,2,3,4,7,8,9-HpCDF	ND	-----	1.9			
Total HpCDF	6.6	-----	1.7 J			
1,2,3,4,6,7,8-HpCDD	20.0	-----	2.5 J			
Total HpCDD	41.0	-----	2.5 J			
OCDF	43.0	-----	2.8 BJ			
OCDD	220.0	-----	2.5 B			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection. Totals are averages of individual isomer LODs.
D = Result obtained from analysis of diluted sample
B = Less than 10 times higher than method blank level
P = Recovery outside of method 1613 control limits
J = Concentration detected is below the calibration range
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....105758

VALIDATED

REPORT OF LABORATORY ANALYSIS

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CONTRACT COMPLIANCE SCREENING FORM FOR HARDCOPY DATA

AMEC Earth & Environmental
550 South Wadsworth Boulevard
Suite 500
Lakewood, CO 80226

Laboratory Del Mar
Reviewer P. Meeks
Analysis/Method Metals

Package ID T711MT23
Task Order 313150010
SDG No. IOA0108, 109, 110, 111
No. of Analyses 4

Date: 02/02/05
Reviewer's Signature P. Meeks

ACTION ITEMS[a]	
1. **Case Narrative Deficiencies**	
2. **Out of Scope Analyses**	
3. **Analyses Not Conducted**	
4. **Missing Hardcopy Deliverables**	
5. **Incorrect Hardcopy Deliverables**	
6. **Deviations from Analysis Protocol, e.g.,**	Qualifications were applied for:
Holding Times	1. Antimony check standard recovery outliers
GC/MS Tune/Inst. Performance	2. Negative method blank results
Calibrations	3. Detects below the reporting limit
Blanks	4. Antimony MDLs raised and results qualified as estimated.
Surrogates	
Matrix Spike/Dup LCS	
Field QC	
Internal Standard Performance	
Compound Identification and Quantitation	
System Performance	

COMMENTS[b]	

[a] Subcontracted analytical laboratory is not meeting contract and/or method requirements.
[b] Differences in protocol have been adopted by the laboratory but no action against the laboratory is required.

DATA VALIDATION REPORT

NPDES
Monitoring

ANALYSIS: METALS

SAMPLE DELIVERY GROUPS: IOA0108, IOA0109, IOA0110, & IOA0111

Prepared by

AMEC—Denver Operations
550 South Wadsworth Boulevard, Suite 500
Lakewood, Colorado 80226

1. INTRODUCTION

Task Order Title:	NPDES Monitoring
Contract Task Order #:	313150010
SDG#:	IOA0108, IOA0109, IOA0110, & IOA0111
Project Manager:	B. McIlvaine
Matrix:	Water
Analysis:	Metals
QC Level:	Level IV
No. of Samples:	4
No. of Reanalyses/Dilutions:	0
Reviewer:	P. Meeks
Date of Review:	February 02, 2005

The samples listed in Table 1 were validated based on the guidelines outlined in the *AMEC Data Validation Procedure for Levels III and IV ICP-MS Metals, (DVP-5-A, Rev.0), AMEC Data Validation Procedure for Levels III and IV ICP Metals* (DVP-5, Rev. 0), SW-846 *Method 6020B for Inductively Coupled Plasma – Mass Spectrometry*, SW-846 *Method 6010B for Inductively Coupled Plasma* , SW-846 *Method 7471A for Mercury (Manual Cold-Vapor Technique)*, and validation guidelines outlined in the USEPA CLP *National Functional Guidelines for Inorganic Data Review* (2/94). Any deviations from these procedures and guidelines are documented herein. Qualifiers were applied in cases where the data did not meet the required QC criteria or where special consideration by the data user is required. Data qualifiers were placed on Form Is with the associated qualification codes. Analytes that were rejected for any reason are denoted on the Form I as having only the "R" data qualifier and associated qualification code(s) denoting the reason for rejection. Any additional problems with the data that may have resulted in an estimated value were not denoted by a qualification code since the data had already been rejected.

Table 1. Sample identification

Client ID	EPA ID	Laboratory ID	Matrix	COC Method
Outfall 007	Outfall 007	IOA0108-01	water	ILM04
Outfall 008	Outfall 008	IOA0109-01	water	ILM04
Outfall 009	Outfall 009	IOA0110-01	water	ILM04
Outfall 010	Outfall 010	IOA0111-01	water	ILM04

2. DATA VALIDATION FINDINGS

2.1 SAMPLE MANAGEMENT

Following are findings associated with sample management:

2.1.1 Sample Preservation, Handling, and Transport

The samples in these SDGs were received at the laboratory within the temperature limits of 4°C ±2°C. No sample preservation, handling, or transport problems were noted, and no qualifications were necessary.

2.1.2 Chain of Custody

The COCs were signed and dated by field and laboratory personnel. The COCs listed duplicate samples for all samples; however, duplicate analyses were not required. No sample qualifications were required.

2.1.3 Holding Times

The dates of collection recorded on the COCs and the dates of analyses recorded in the raw data, documented that the sample analyses were performed within the specified holding times of six months for the ICP/MS metals and 28 days for mercury. No qualifications were required.

2.2 ICP-MS TUNING

A precalibration routine must be completed prior to calibrating the instrument, which consists of analyzing a tuning solution to verify resolution, mass calibration, and thermal stability. The solution must be analyzed a minimum of five times and must contain isotopes representing all mass regions of interest. The laboratory performed the required tune solution analyses but did not report %RSDs. The laboratory SOP states that to be acceptable, the %RSD must be less than 5%. The mass calibrations were within 0.1 amu of the true mass and an the instrument resolutions were less than 0.75 amu at 10 percent peak height for all analytes in the tune solution. No site sample qualifications were required.

2.3 CALIBRATION

The ICV and CCV results showed acceptable recoveries, 90-110% for the ICP/MS and 80-120% for mercury. Antimony was not recovered in the 1.0 ppb check standard and was recovered at 50% in the reporting limit check standard; therefore, nondetected antimony in the samples was qualified as estimated, "UJ." The remaining reporting limit check standards were recovered within the AMEC control limits of 70-130%. No further qualifications were required.

2.4 BLANKS

Antimony and cadmium were reported in the method blank at –1.52 and –0.22 µg/L, respectively; therefore, nondetected antimony in the samples was qualified as estimated, "UJ," and cadmium detected in the samples was qualified as estimated, "J." No further qualifications were required.

2.5 ICP INTERFERENCE CHECK SAMPLE (ICS A/AB)

No ICPMS interference check samples were analyzed in association with the samples in these SDGs; therefore, no assessment was made with respect to this criterion.

2.6 BLANK SPIKES AND LABORATORY CONTROL SAMPLES

The ICP/MS LCS sample was identified as 5A05052-BS1 and the mercury LCS sample was identified as 5A05061-BS1. The LCS results on the summary forms and in the raw data were within the laboratory-established ICP/MS and mercury control limits of 85-115%. No qualifications were required.

2.7 LABORATORY DUPLICATES

MS/MSD analyses were performed on Outfall 007 for lead only. The RPD was within the control limit of 20% and no qualifications were required.

2.8 MATRIX SPIKE

MS/MSD analyses were performed on Outfall 007 for lead only. Both recoveries were within the AMEC control limits of 75-125% and no qualifications were required.

2.9 FURNACE ATOMIC ABSORPTION QC

Furnace atomic absorption was not utilized for the analysis of these samples; therefore, furnace atomic absorption QC is not applicable.

2.10 ICP/MS SERIAL DILUTION

No serial dilution analysis was performed in association with the samples in these SDGs; therefore, no assessment was made with respect to this criterion.

2.11 INTERNAL STANDARDS PERFORMANCE

The ICP-MS internal standard recoveries for the site sample and associated QC sample analyses were within the 60-125% control limits and no qualifications were required.

2.12 SAMPLE RESULT VERIFICATION

A Level IV review was performed for the sample in this data package. Calculations were verified, and the sample results reported on the Form Is were verified against the raw data. No transcription errors or calculation errors were noted. Detects below the reporting limit were qualified as estimated, "J."

Antimony was not recovered in the 1.0 ppb check standard, was recovered at 50% in the 2.0 ppb reporting limit check standard, and was reported at negative values in the method blanks and all CCBs. This indicates that the laboratory was not able to detect antimony at the reported MDL of 0.18 µg/L; therefore, the reviewer raised the antimony MDLs for Outfall 008, Outfall 009, and Outfall 010 to the reporting limit, 2.0 µg/L and qualified the nondetected results as estimated, "UJ." No further qualifications were required.

2.13 FIELD QC SAMPLES

Field QC samples are evaluated, and if necessary, qualified based only on laboratory blanks. Any remaining detects are used to evaluate the associated samples.

2.13.1 Field Blanks and Equipment Rinsates

The samples in these SDGs had no associated field QC samples. No qualifications were required.

2.13.2 Field Duplicates

There were no field duplicate analyses performed in association with the site samples.

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 010

Report Number: IOA0111

Sampled: 01/04/05
Received: 01/04/05

DRAFT: METALS

Analyte	Method	Batch	MDL	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers	Rev Qual	Qual Code
Sample ID: IOA0111-01 (DRAFT: Outfall 010 - Water)											
Reporting Units: ug/l											
Antimony	EPA 200.8	5A05052	~~0.18~~ 2.0	2.0	ND	1	01/05/05	01/05/05		UJ	B, #3, $
Cadmium	EPA 200.8	5A05052	0.015	1.0	0.054	1	01/05/05	01/05/05		J	B
Copper	EPA 200.8	5A05052	0.49	2.0	3.2	1	01/05/05	01/05/05			
Lead	EPA 200.8	5A05052	0.13	1.0	1.7	1	01/05/05	01/05/05			
Mercury	EPA 245.1	5A05061	0.063	0.20	0.24	1	01/05/05	01/05/05			

PM 2/2/05

AMEC [illegible]DATED

LEVEL IV

DRAFT REPORT
DRAFT REPORT
DATA SUBJECT TO CHANGE

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LABORATORY REPORT

Prepared For: MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project: Routine Outfall 010

Sampled: 01/04/05
Received: 01/04/05
Issued: 02/21/05 11:53

NELAP #01108CA California ELAP#1197 CSDLAC #10117

The results listed within this Laboratory Report pertain only to the samples tested in the laboratory. The analyses contained in this report were performed in accordance with the applicable certifications as noted. All soil samples are reported on a wet weight basis unless otherwise noted in the report. This Laboratory Report is confidential and is intended for the sole use of Del Mar Analytical and its client. This report shall not be reproduced, except in full, without written permission from Del Mar Analytical. The Chain of Custody, 1 page, is included and is an integral part of this report.
This entire report was reviewed and approved for release.

SAMPLE CROSS REFERENCE

SUBCONTRACTED: Refer to the last page for specific subcontract laboratory information included in this report.

LABORATORY ID	CLIENT ID	MATRIX
IOA0111-01	Outfall 010	Water

Reviewed By:

Michele Harper

Del Mar Analytical, Irvine
Michele Harper
Project Manager

Del Mar Analytical

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Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 010
Report Number: IOA0111

Sampled: 01/04/05
Received: 01/04/05

METALS

Analyte	Method	Batch	MDL Limit	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA0111-01 (Outfall 010 - Water)									
Reporting Units: ug/l									
Antimony	EPA 200.8	5A05052	0.18	2.0	ND	1	01/05/05	01/05/05	
Cadmium	EPA 200.8	5A05052	0.015	1.0	**0.054**	1	01/05/05	01/05/05	J
Copper	EPA 200.8	5A05052	0.49	2.0	**3.2**	1	01/05/05	01/05/05	
Lead	EPA 200.8	5A05052	0.13	1.0	**1.7**	1	01/05/05	01/05/05	
Mercury	EPA 245.1	5A05061	0.063	0.20	**0.24**	1	01/05/05	01/05/05	

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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Attention: Bronwyn Kelly

Project ID: Routine Outfall 010
Report Number: IOA0111

Sampled: 01/04/05
Received: 01/04/05

INORGANICS

Analyte	Method	Batch	MDL Limit	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA0111-01 (Outfall 010 - Water) - cont.									
Reporting Units: mg/l									
Chloride	EPA 300.0	5A04042	0.26	0.50	**12**	1	01/04/05	01/04/05	
Nitrate/Nitrite-N	EPA 300.0	5A04042	0.072	0.26	**1.8**	1	01/04/05	01/04/05	
Oil & Grease	EPA 413.1	5A05068	0.94	5.0	ND	1	01/05/05	01/05/05	
Sulfate	EPA 300.0	5A04042	0.18	0.50	**5.4**	1	01/04/05	01/04/05	
Total Dissolved Solids	SM2540C	5A05076	10	10	**140**	1	01/05/05	01/05/05	

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Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 010

Report Number: IOA0111

Sampled: 01/04/05
Received: 01/04/05

SHORT HOLD TIME DETAIL REPORT

	Hold Time (in days)	Date/Time Sampled	Date/Time Received	Date/Time Extracted	Date/Time Analyzed
Sample ID: Outfall 010 (IOA0111-01) - Water					
EPA 300.0	2	01/04/2005 13:30	01/04/2005 18:30	01/04/2005 19:00	01/04/2005 20:39

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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Attention: Bronwyn Kelly

Project ID: Routine Outfall 010

Report Number: IOA0111

Sampled: 01/04/05
Received: 01/04/05

METHOD BLANK/QC DATA

METALS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A05052 Extracted: 01/05/05											
Blank Analyzed: 01/05/2005 (5A05052-BLK1)											
Antimony	ND	2.0	0.18	ug/l							
Cadmium	ND	1.0	0.015	ug/l							
Copper	ND	2.0	0.49	ug/l							
Lead	ND	1.0	0.13	ug/l							
LCS Analyzed: 01/05/2005 (5A05052-BS1)											
Antimony	80.5	2.0	0.18	ug/l	80.0		101	85-115			
Cadmium	71.5	1.0	0.015	ug/l	80.0		89	85-115			
Copper	78.3	2.0	0.49	ug/l	80.0		98	85-115			
Lead	74.5	1.0	0.13	ug/l	80.0		93	85-115			
Matrix Spike Analyzed: 01/05/2005 (5A05052-MS1)						**Source: IOA0108-01**					
Antimony	89.8	2.0	0.18	ug/l	80.0	ND	112	70-130			
Cadmium	79.0	1.0	0.015	ug/l	80.0	0.038	99	70-130			
Copper	82.4	2.0	0.49	ug/l	80.0	3.7	98	70-130			
Lead	81.4	1.0	0.13	ug/l	80.0	0.74	101	70-130			
Matrix Spike Analyzed: 01/05/2005 (5A05052-MS2)						**Source: IOA0117-01**					
Antimony	90.8	2.0	0.18	ug/l	80.0	ND	114	70-130			
Cadmium	76.7	1.0	0.015	ug/l	80.0	ND	96	70-130			
Copper	73.3	2.0	0.49	ug/l	80.0	ND	92	70-130			
Lead	77.6	1.0	0.13	ug/l	80.0	ND	97	70-130			
Matrix Spike Dup Analyzed: 01/05/2005 (5A05052-MSD1)						**Source: IOA0108-01**					
Antimony	89.5	2.0	0.18	ug/l	80.0	ND	112	70-130	0	20	
Cadmium	80.5	1.0	0.015	ug/l	80.0	0.038	101	70-130	2	20	
Copper	84.3	2.0	0.49	ug/l	80.0	3.7	101	70-130	2	20	
Lead	83.3	1.0	0.13	ug/l	80.0	0.74	103	70-130	2	20	

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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Attention: Bronwyn Kelly

Project ID: Routine Outfall 010

Report Number: IOA0111

Sampled: 01/04/05
Received: 01/04/05

METHOD BLANK/QC DATA

METALS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A05061 Extracted: 01/05/05											
Blank Analyzed: 01/05/2005 (5A05061-BLK1)											
Mercury	ND	0.20	0.063	ug/l							
LCS Analyzed: 01/05/2005 (5A05061-BS1)											
Mercury	8.18	0.20	0.063	ug/l	8.00		102	85-115			
Matrix Spike Analyzed: 01/05/2005 (5A05061-MS1)						**Source: IOA0084-01**					
Mercury	7.81	0.20	0.063	ug/l	8.00	0.086	97	70-130			
Matrix Spike Dup Analyzed: 01/05/2005 (5A05061-MSD1)						**Source: IOA0084-01**					
Mercury	7.89	0.20	0.063	ug/l	8.00	0.086	98	70-130	1	20	

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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Del Mar Analytical

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2520 E. Sunset Rd. #3, Las Vegas, NV 89120 (702) 798-3620 FAX (702) 798-3621

MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 010

Report Number: IOA0111

Sampled: 01/04/05
Received: 01/04/05

METHOD BLANK/QC DATA

INORGANICS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A04042 Extracted: 01/04/05											
Blank Analyzed: 01/04/2005 (5A04042-BLK1)											
Chloride	ND	0.50	0.26	mg/l							
Nitrate/Nitrite-N	ND	0.26	0.072	mg/l							
Sulfate	ND	0.50	0.18	mg/l							
LCS Analyzed: 01/04/2005 (5A04042-BS1)											
Chloride	4.97	0.50	0.26	mg/l	5.00		99	90-110			
Sulfate	9.93	0.50	0.18	mg/l	10.0		99	90-110			
Matrix Spike Analyzed: 01/04/2005 (5A04042-MS1)						**Source: IOA0049-01**					
Chloride	5.60	0.50	0.26	mg/l	5.00	0.51	102	80-120			
Sulfate	10.4	0.50	0.18	mg/l	10.0	0.63	98	80-120			
Matrix Spike Dup Analyzed: 01/04/2005 (5A04042-MSD1)						**Source: IOA0049-01**					
Chloride	5.72	0.50	0.26	mg/l	5.00	0.51	104	80-120	2	20	
Sulfate	10.6	0.50	0.18	mg/l	10.0	0.63	100	80-120	2	20	
Batch: 5A05068 Extracted: 01/05/05											
Blank Analyzed: 01/05/2005 (5A05068-BLK1)											
Oil & Grease	ND	5.0	0.94	mg/l							
LCS Analyzed: 01/05/2005 (5A05068-BS1)											**M-NR1**
Oil & Grease	20.1	5.0	0.94	mg/l	20.0		100	65-120			
LCS Dup Analyzed: 01/05/2005 (5A05068-BSD1)											
Oil & Grease	21.1	5.0	0.94	mg/l	20.0		106	65-120	5	20	

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 010

Report Number: IOA0111

Sampled: 01/04/05
Received: 01/04/05

METHOD BLANK/QC DATA

INORGANICS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A05076 Extracted: 01/05/05											
Blank Analyzed: 01/05/2005 (5A05076-BLK1)											
Total Dissolved Solids	ND	10	10	mg/l							
LCS Analyzed: 01/05/2005 (5A05076-BS1)											
Total Dissolved Solids	1080	20	20	mg/l	1000		108	90-110			
Duplicate Analyzed: 01/05/2005 (5A05076-DUP1)						**Source: IOA0066-03**					
Total Dissolved Solids	230	10	10	mg/l		230			0	10	

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 010

Report Number: IOA0111

Sampled: 01/04/05
Received: 01/04/05

Compliance Check

The results obtained from the analytical testing of this data set were checked against compliance limits received from the client. Any results at or above the compliance limits appear in bold on this page.

LabNumber	Analysis	Analyte	Units	Result	MRL	Compliance Limit
IOA0111-01	413.1 Oil and Grease	Oil & Grease	mg/l	0.095	5.0	15
IOA0111-01	Chloride - 300.0	Chloride	mg/l	12	0.50	150
IOA0111-01	Nitrogen, NO3+NO2 -N	Nitrate/Nitrite-N	mg/l	1.80	0.26	10.00
IOA0111-01	Sulfate-300.0	Sulfate	mg/l	5.40	0.50	250
IOA0111-01	TDS - SM 2540C	Total Dissolved Solids	mg/l	140	10	850

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Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 010

Report Number: IOA0111

Sampled: 01/04/05
Received: 01/04/05

DATA QUALIFIERS AND DEFINITIONS

J	Estimated value. Analyte detected at a level less than the Reporting Limit (RL) and greater than or equal to the Method Detection Limit (MDL). The user of this data should be aware that this data is of unknown quality.
M-NR1	There was no MS/MSD analyzed with this batch due to insufficient sample volume. See Blank Spike/Blank Spike Duplicate.
ND	Analyte NOT DETECTED at or above the reporting limit or MDL, if MDL is specified.
RPD	Relative Percent Difference

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 010

Report Number: IOA0111

Sampled: 01/04/05
Received: 01/04/05

Certification Summary

Del Mar Analytical, Irvine

Method	Matrix	Nelac	California
EPA 200.8	Water	X	X
EPA 245.1	Water	X	X
EPA 300.0	Water	X	X
EPA 413.1	Water	X	X
SM2540C	Water	X	X

Nevada and NELAP provide analyte specific accreditations. Analyte specific information for Del Mar Analytical may be obtained by contacting the laboratory or visiting our website at www.dmalabs.com.

Subcontracted Laboratories

Pace Analytical, MN- SUB

1700 Elm Street, Ste 200 - Minneapolis, MN 55414

Analysis Performed: 1613-Dioxin-HR
Samples: IOA0111-01

Analysis Performed: EDD + Level 4
Samples: IOA0111-01

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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IOA0111

Del Mar Analytical Version 5 8/12/04 CHAIN OF CUSTODY FORM

Client Name/Address:

MWH-Pasadena
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101

Project Manager: Bronwyn Kelly

Sampler: Barroso

Project:
Boeing-SSFL NPDES
Routine Outfall 010
Stormwater at Building 203

Phone Number:
(626) 568-6691
Fax Number:
(626) 568-6515

ANALYSIS REQUIRED

Field readings:
Temp = 48.9°F
pH= 7.1

Sample Description	Sample Matrix	Container Type	# of Cont.	Sampling Date/Time	Preservative	Bottle #	Total Reoverable Metals: Sb, Cd, Cu, Pb, Hg	TCDD (and all congeners)	Oil & Grease (EPA 413.1)	Cl-, SO4, NO3+NO2-N	TDS					Comments
Outfall 010	W	Poly-1L	1	1-4-05 1330	HNO3	1A	X									
Outfall 010-Dup	W	Poly-1L	1		HNO3	1B	X									
Outfall 010	W	Glass-Amber	2		None	2A, 2B		X								
Outfall 010	W	Glass-Amber	2		HCl	3A, 3B			X							
Outfall 010	W	Poly-500 ml	2		None	4A, 4B				X						
Outfall 010	W	Poly-500 ml	2		None	5A, 5B					X					

Relinquished By	Date/Time:	Received By	Date/Time:
Ron E. Barroso	1-4-05 1515	BD Hoesch	1/4/05 1515
BD Hoesch	1/4/05 1830	[signature]	1/4/04 1830

Turn around Time: (check)
24 Hours _____ 5 Days _____
48 Hours _____ 10 Days _____
72 Hours _____ Normal _____
Perchlorate Only 72 Hours_____
Metals Only 72 Hours_____
Sample Integrity: (Check)
Intact X On Ice: X 5°C

Del Mar Analytical

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2520 E. Sunset Rd. #3, Las Vegas, NV 89120 (702) 798-3620 FAX (702) 798-3621

February 3, 2005

MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, Ca.91101

Attention: Bronwyn Kelly

Project: Routine Outfall 010
Sampled: 01/04/05
Del Mar Analytical Number: IOA0111

Dear Ms. Kelly:

Pace Analytical performed Method 1613B analysis for the project referenced above. Please use the following cross-reference table when reviewing your results.

MWH ID	DEL MAR ID	Pace ID
Outfall 010	IOA0111-01	105758001

Attached is the original report from the subcontract laboratory. If you have any questions or require further assistance, please do not hesitate to contact me.

Sincerely yours,
DEL MAR ANALYTICAL

Michele Harper
Project Manager

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Pace Analytical™

Method 1613B Analysis Results

Client - Del Mar Analytical

Client's Sample ID	IOA0111-01		
Lab Sample ID	105758001		
Filename	F50127A_07		
Injected By	MRO		
Total Amount Extracted	1040 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	01/04/2005
ICAL Date	11/29/2004	Received	01/06/2005
CCal Filename(s)	F50127A_02	Extracted	01/24/2005
Method Blank ID	BLANK-6202	Analyzed	01/27/2005 15:04

Native Isomers	Conc pg/L	EMPC pg/L	LOD pg/L		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	2.1		2,3,7,8-TCDF-13C	2.00	72
Total TCDF	2.2	-----	2.1	J	2,3,7,8-TCDD-13C	2.00	83
					1,2,3,7,8-PeCDF-13C	2.00	80
2,3,7,8-TCDD	ND	-----	2.1		2,3,4,7,8-PeCDF-13C	2.00	82
Total TCDD	ND	-----	2.1		1,2,3,7,8-PeCDD-13C	2.00	91
					1,2,3,4,7,8-HxCDF-13C	2.00	78
1,2,3,7,8-PeCDF	ND	-----	1.4		1,2,3,6,7,8-HxCDF-13C	2.00	102
2,3,4,7,8-PeCDF	ND	-----	1.2		2,3,4,6,7,8-HxCDF-13C	2.00	93
Total PeCDF	ND	-----	1.3		1,2,3,7,8,9-HxCDF-13C	2.00	82
					1,2,3,4,7,8-HxCDD-13C	2.00	75
1,2,3,7,8-PeCDD	ND	-----	1.9		1,2,3,6,7,8-HxCDD-13C	2.00	89
Total PeCDD	ND	-----	1.9		1,2,3,4,6,7,8-HpCDF-13C	2.00	83
					1,2,3,4,7,8,9-HpCDF-13C	2.00	73
1,2,3,4,7,8-HxCDF	ND	-----	2.0		1,2,3,4,6,7,8-HpCDD-13C	2.00	98
1,2,3,6,7,8-HxCDF	ND	-----	1.6		OCDD-13C	4.00	91
2,3,4,6,7,8-HxCDF	ND	-----	1.6				
1,2,3,7,8,9-HxCDF	ND	-----	1.5		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	-----	1.6		1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	2.6		2,3,7,8-TCDD-37Cl4	0.20	80
1,2,3,6,7,8-HxCDD	ND	-----	2.0				
1,2,3,7,8,9-HxCDD	ND	-----	2.2				
Total HxCDD	ND	-----	2.3				
1,2,3,4,6,7,8-HpCDF	6.6	-----	1.5	J			
1,2,3,4,7,8,9-HpCDF	ND	-----	1.9				
Total HpCDF	6.6	-----	1.7	J			
1,2,3,4,6,7,8-HpCDD	20.0	-----	2.5	J			
Total HpCDD	41.0	-----	2.5	J			
OCDF	43.0	-----	2.8	BJ			
OCDD	220.0	-----	2.5	B			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection. Totals are averages of individual isomer LODs.
D = Result obtained from analysis of diluted sample
B = Less than 10 times higher than method blank level
P = Recovery outside of method 1613 control limits
J = Concentration detected is below the calibration range
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....105758

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Pace Analytical™

Method 1613B Blank Analysis Results

Client - Del Mar Analytical

Lab Sample ID	BLANK-6202	Matrix	Water
Filename	F50127A_06	Dilution	NA
Total Amount Extracted	982 mL	Extracted	01/24/2005
ICAL Date	11/29/2004	Analyzed	01/27/2005 14:13
CCal Filename(s)	F50127A_02	Injected By	MRO

Native Isomers	Conc pg/L	EMPC pg/L	LOD pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	4.7	2,3,7,8-TCDF-13C	2.00	33
Total TCDF	ND	-----	-----	2,3,7,8-TCDD-13C	2.00	45
				1,2,3,7,8-PeCDF-13C	2.00	68
2,3,7,8-TCDD	ND	-----	5.1	2,3,4,7,8-PeCDF-13C	2.00	70
Total TCDD	ND	-----	-----	1,2,3,7,8-PeCDD-13C	2.00	81
				1,2,3,4,7,8-HxCDF-13C	2.00	75
1,2,3,7,8-PeCDF	ND	-----	2.2	1,2,3,6,7,8-HxCDF-13C	2.00	95
2,3,4,7,8-PeCDF	ND	-----	1.5	2,3,4,6,7,8-HxCDF-13C	2.00	98
Total PeCDF	ND	-----	-----	1,2,3,7,8,9-HxCDF-13C	2.00	85
				1,2,3,4,7,8-HxCDD-13C	2.00	78
1,2,3,7,8-PeCDD	ND	-----	1.6	1,2,3,6,7,8-HxCDD-13C	2.00	94
Total PeCDD	ND	-----	-----	1,2,3,4,6,7,8-HpCDF-13C	2.00	85
				1,2,3,4,7,8,9-HpCDF-13C	2.00	78
1,2,3,4,7,8-HxCDF	ND	-----	1.6	1,2,3,4,6,7,8-HpCDD-13C	2.00	99
1,2,3,6,7,8-HxCDF	ND	-----	1.4	OCDD-13C	4.00	97
2,3,4,6,7,8-HxCDF	ND	-----	1.1			
1,2,3,7,8,9-HxCDF	ND	-----	1.6	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	-----	-----	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	1.6	2,3,7,8-TCDD-37Cl4	0.20	40
1,2,3,6,7,8-HxCDD	ND	-----	1.2			
1,2,3,7,8,9-HxCDD	ND	-----	1.7			
Total HxCDD	ND	-----	-----			
1,2,3,4,6,7,8-HpCDF	ND	-----	1.5			
1,2,3,4,7,8,9-HpCDF	ND	-----	1.4			
Total HpCDF	ND	-----	-----			
1,2,3,4,6,7,8-HpCDD	1.9	-----	1.3 J			
Total HpCDD	1.9	-----	----- J			
OCDF	8.3	-----	1.9 J			
OCDD	26.0	-----	2.3 J			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection. Totals are averages of individual isomer LODs.
A = Limit of Detection based on signal to noise
P = Recovery outside of method 1613 control limits
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....105645

REPORT OF LABORATORY ANALYSIS

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1700 Elm Street - Suite 200
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Tel: 612-607-1700
Fax: 612-607-6444

Pace Analytical™

Method 1613B Laboratory Control Spike Results

Client - Del Mar Analytical

Lab Sample ID	LCS-6203		
Filename	F50127A_03	Matrix	Water
Total Amount Extracted	1030 mL	Dilution	NA
ICAL Date	11/29/2004	Extracted	01/24/2005
CCal Filename	F50127A_02	Analyzed	01/27/2005 11:44
Method Blank ID	BLANK-6202	Injected By	MRO

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDF	10	10.2	7.5	15.8	102
2,3,7,8-TCDD	10	9.0	6.7	15.8	90
1,2,3,7,8-PeCDF	50	50.1	40.0	67.0	100
2,3,4,7,8-PeCDF	50	48.4	34.0	80.0	97
1,2,3,7,8-PeCDD	50	43.4	35.0	71.0	87
1,2,3,4,7,8-HxCDF	50	44.8	36.0	67.0	90
1,2,3,6,7,8-HxCDF	50	48.0	42.0	65.0	96
2,3,4,6,7,8-HxCDF	50	48.6	35.0	78.0	97
1,2,3,7,8,9-HxCDF	50	46.4	39.0	65.0	93
1,2,3,4,7,8-HxCDD	50	50.0	35.0	82.0	100
1,2,3,6,7,8-HxCDD	50	51.7	38.0	67.0	103
1,2,3,7,8,9-HxCDD	50	48.5	32.0	81.0	97
1,2,3,4,6,7,8-HpCDF	50	51.4	41.0	61.0	103
1,2,3,4,7,8,9-HpCDF	50	52.3	39.0	69.0	105
1,2,3,4,6,7,8-HpCDD	50	43.4	35.0	70.0	87
OCDF	100	89.5	63.0	170.0	90
OCDD	100	96.9	78.0	144.0	97
2,3,7,8-TCDD-37Cl4	10	6.2	3.1	19.1	62
2,3,7,8-TCDF-13C	100	49.8	22.0	152.0	50
2,3,7,8-TCDD-13C	100	65.8	20.0	175.0	66
1,2,3,7,8-PeCDF-13C	100	75.7	21.0	192.0	76
2,3,4,7,8-PeCDF-13C	100	76.9	13.0	328.0	77
1,2,3,7,8-PeCDD-13C	100	93.4	21.0	227.0	93
1,2,3,4,7,8-HxCDF-13C	100	78.9	19.0	202.0	79
1,2,3,6,7,8-HxCDF-13C	100	89.8	21.0	159.0	90
2,3,4,6,7,8-HxCDF-13C	100	88.2	22.0	176.0	88
1,2,3,7,8,9-HxCDF-13C	100	81.5	17.0	205.0	81
1,2,3,4,7,8-HxCDD-13C	100	82.2	21.0	193.0	82
1,2,3,6,7,8-HxCDD-13C	100	95.2	25.0	163.0	95
1,2,3,4,6,7,8-HpCDF-13C	100	86.3	21.0	158.0	86
1,2,3,4,7,8,9-HpCDF-13C	100	75.6	20.0	186.0	76
1,2,3,4,6,7,8-HpCDD-13C	100	102.9	26.0	166.0	103
OCDD-13C	200	195.1	26.0	397.0	98

Cs = Concentration Spiked (ng/mL)
Cr = Concentration Recovered (ng/mL)
Rec. = Recovery (Expressed as Percent)
Control Limit Reference: Method 1613, Table 6, 10/94 Revision
X = Background subtracted value
P = Recovery outside of control limits
Nn = Value obtained from additional analysis
* = See Discussion

Report No.....105645

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Pace Analytical™

Method 1613B Laboratory Control Spike Results

Client - Del Mar Analytical

Lab Sample ID	LCSD-6204		
Filename	F50127A_04	Matrix	Water
Total Amount Extracted	1000 mL	Dilution	NA
ICAL Date	11/29/2004	Extracted	01/24/2005
CCal Filename	F50127A_02	Analyzed	01/27/2005 12:32
Method Blank ID	BLANK-6202	Injected By	MRO

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDF	10	9.9	7.5	15.8	99
2,3,7,8-TCDD	10	8.8	6.7	15.8	88
1,2,3,7,8-PeCDF	50	49.8	40.0	67.0	100
2,3,4,7,8-PeCDF	50	47.6	34.0	80.0	95
1,2,3,7,8-PeCDD	50	41.4	35.0	71.0	83
1,2,3,4,7,8-HxCDF	50	46.6	36.0	67.0	93
1,2,3,6,7,8-HxCDF	50	44.0	42.0	65.0	88
2,3,4,6,7,8-HxCDF	50	47.2	35.0	78.0	94
1,2,3,7,8,9-HxCDF	50	44.8	39.0	65.0	90
1,2,3,4,7,8-HxCDD	50	46.5	35.0	82.0	93
1,2,3,6,7,8-HxCDD	50	48.9	38.0	67.0	98
1,2,3,7,8,9-HxCDD	50	46.7	32.0	81.0	93
1,2,3,4,6,7,8-HpCDF	50	48.7	41.0	61.0	97
1,2,3,4,7,8,9-HpCDF	50	49.9	39.0	69.0	100
1,2,3,4,6,7,8-HpCDD	50	42.7	35.0	70.0	85
OCDF	100	84.8	63.0	170.0	85
OCDD	100	92.5	78.0	144.0	92
2,3,7,8-TCDD-37Cl4	10	7.5	3.1	19.1	75
2,3,7,8-TCDF-13C	100	65.7	22.0	152.0	66
2,3,7,8-TCDD-13C	100	83.8	20.0	175.0	84
1,2,3,7,8-PeCDF-13C	100	84.9	21.0	192.0	85
2,3,4,7,8-PeCDF-13C	100	85.6	13.0	328.0	86
1,2,3,7,8-PeCDD-13C	100	105.3	21.0	227.0	105
1,2,3,4,7,8-HxCDF-13C	100	82.6	19.0	202.0	83
1,2,3,6,7,8-HxCDF-13C	100	96.7	21.0	159.0	97
2,3,4,6,7,8-HxCDF-13C	100	92.3	22.0	176.0	92
1,2,3,7,8,9-HxCDF-13C	100	84.5	17.0	205.0	84
1,2,3,4,7,8-HxCDD-13C	100	81.9	21.0	193.0	82
1,2,3,6,7,8-HxCDD-13C	100	102.0	25.0	163.0	102
1,2,3,4,6,7,8-HpCDF-13C	100	90.1	21.0	158.0	90
1,2,3,4,7,8,9-HpCDF-13C	100	78.6	20.0	186.0	79
1,2,3,4,6,7,8-HpCDD-13C	100	106.1	26.0	166.0	106
OCDD-13C	200	196.4	26.0	397.0	98

Cs = Concentration Spiked (ng/mL)
Cr = Concentration Recovered (ng/mL)
Rec. = Recovery (Expressed as Percent)
Control Limit Reference: Method 1613, Table 6, 10/94 Revision
X = Background subtracted value
P = Recovery outside of control limits
Nn = Value obtained from additional analysis
* = See Discussion

Report No.....105645

REPORT OF LABORATORY ANALYSIS

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www.pacelabs.com

Pace Analytical Services, Inc.
1700 Elm Street
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444

SPIKE RECOVERY RELATIVE PERCENT DIFFERENCE (RPD) RESULTS

Client..... Del Mar Analytical

SPIKE 1 ID.....LCS-6203
SPIKE 1 Filename..... F50127A_03
SPIKE 2 ID.....LCSD-6204
SPIKE 2 Filename..... F50127A_04

COMPOUND	SPIKE 1 REC,%	SPIKE 2 REC,%	RPD,%
2378-TCDF	102	99	3.0
2378-TCDD	90	88	2.2
12378-PeCDF	100	100	0.0
23478-PeCDF	97	95	2.1
12378-PeCDD	87	83	4.7
123478-HxCDF	90	93	3.3
123678-HxCDF	96	88	8.7
234678-HxCDF	97	94	3.1
123789-HxCDF	93	90	3.3
123478-HxCDD	100	93	7.3
123678-HxCDD	103	98	5.0
123789-HxCDD	97	93	4.2
1234678-HpCDF	103	97	6.0
1234789-HpCDF	105	100	4.9
1234678-HpCDD	87	85	2.3
OCDF	90	85	5.7
OCDD	97	92	5.3

REC = Percent Recovered
RPD = The difference between the two values divided by the average.
NA = Not Applicable

Report No..... 105645

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Minneapolis, MN 55414
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Fax: 612.607.6444

TABLE 1. 2,3,7,8-TCDD Equivalency Factors (TEFs) for the Polychlorinated Dibenzo-p-dioxins and Dibenzofurans

Number	Compound(s)	TEF
1	2,3,7,8-TCDD	1.00
2	1,2,3,7,8-PeCDD	0.50
3	1,2,3,6,7,8-HxCDD	0.1
4	1,2,3,7,8,9-HxCDD	0.1
5	1,2,3,4,7,8-HxCDD	0.1
6	1,2,3,4,6,7,8-HpCDD	0.01
7	OCDD	0.001
8	* Total - TCDD	0.0
9	* Total - PeCDD	0.0
10	* Total - HxCDD	0.0
11	* Total - HpCDD	0.0
12	2,3,7,8-TCDF	0.10
13	1,2,3,7,8-PeCDF	0.05
14	2,3,4,7,8-PeCDF	0.5
15	1,2,3,6,7,8-HxCDF	0.1
16	1,2,3,7,8,9-HxCDF	0.1
17	1,2,3,4,7,8-HxCDF	0.1
18	2,3,4,6,7,8-HxCDF	0.1
19	1,2,3,4,6,7,8-HpCDF	0.01
20	1,2,3,4,7,8,9-HpCDF	0.01
21	OCDF	0.001
22	* Total - TCDF	0.0
23	* Total - PeCDF	0.0
24	* Total - HxCDF	0.0
25	* Total - HpCDF	0.0

*Excluding the 2,3,7,8-substituted congeners.

Reference: 1989 ITEFs

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Del Mar Analytical

17461 Derian Ave. Suite 100, Irvine, CA 92614 Ph (949) 261-1022 Fax (949) 261-1228
1014 E. Cooley Dr., Suite A, Colton, CA 92324 Ph (909) 370-4667 Fax (909) 370-1046
9484 Chesapeake Drive, Suite 805, San Diego, CA 92123 Ph (619) 505-9596 Fax (619) 505-9689
9830 South 51st Street, Suite B-120, Phoenix, AZ 85044 Ph (480) 785-0043 Fax (480) 785-0851
2520 E. Sunset Rd., Suite #3, Las Vegas, NV 89120 Ph (702) 798-3620 Fax (702) 798-3621

SUBCONTRACT ORDER - PROJECT # IOA0111

SENDING LABORATORY:

Del Mar Analytical, Irvine
17461 Derian Avenue. Suite 100
Irvine, CA 92614
Phone: (949) 261-1022
Fax: (949) 261-1228
Project Manager: Michele Harper

RECEIVING LABORATORY:

Pace Analytical, MN- SUB
1700 Elm Street, Ste 200
Minneapolis, MN 55414
Phone :(612) 607-1700
Fax: (612) 607-6444

105755

Standard TAT is requested unless specific due date is requested => Due Date:_____ Initials:_____

Analysis	Expiration	Comments
Sample ID: IOA0111-01 Water	**Sampled: 01/04/05 13:30**	**Instant Nofication**
1613-Dioxin-HR	01/11/05 13:30	J flags, 17 congeners, no TEQ, sub to Pace-MN

001

Containers Supplied:
1 L Amber (IOA0111-01C)
1 L Amber (IOA0111-01D)

SAMPLE INTEGRITY:

All containers intact: ☐ Yes ☐ No Sample labels/COC agree: ☐ Yes ☐ No Samples Received On Ice:: ☒ Yes ☐ No
Custody Seals Present: ☐ Yes ☐ No Samples Preserved Properly: ☐ Yes ☐ No Samples Received at (temp): 3.2°C

Released By	Date	Time	Received By	Date	Time
	1-05-05	1700	Brian Flores	1/6/05	9:25

CONTRACT COMPLIANCE SCREENING FORM FOR HARDCOPY DATA

AMEC Earth & Environmental
550 South Wadsworth Boulevard
Suite 500
Lakewood, CO 80226

Package ID T711DF22
Task Order 313150010
SDG No. Multiple
No. of Analyses 9

Laboratory Pace
Reviewer K. Shadowlight
Analysis/Method Dioxins

Date: February 18, 2005
Reviewer's Signature K Shadowlight

ACTION ITEMS[a]	
1. **Case Narrative Deficiencies**	
2. **Out of Scope Analyses**	
3. **Analyses Not Conducted**	
4. **Missing Hardcopy Deliverables**	
5. **Incorrect Hardcopy Deliverables**	
6. **Deviations from Analysis Protocol, e.g.,**	Qualifications were assigned for the following:
Holding Times	* Method blank contamination
GC/MS Tune/Inst. Performance	* EMPCs
Calibration	* Detects below the lower method calibration level
Method blanks	
Surrogates	
Matrix Spike/Dup LCS	
Field QC	
Internal Standard Performance	
Compound Identification and Quantitation	
System Performance	
COMMENTS[b]	

[a] Subcontracted analytical laboratory is not meeting contract and/or method requirements.
[b] Differences in protocol have been adopted by the laboratory but no action against the laboratory is required.

DATA VALIDATION REPORT

NPDES
Monitoring

ANALYSIS: DIOXINS/FURANS

SAMPLE DELIVERY GROUPS: Multiple SDGs

Prepared by

AMEC—Denver Operations
550 South Wadsworth Boulevard, Suite 500
Lakewood, Colorado 80226

1. INTRODUCTION

Task Order Title:	NPDES Monitoring
Contract Task Order #:	313150010
Sample Delivery Group #:	Multiple
Project Manager:	B. McIlvaine
Matrix:	Water
Analysis:	Dioxins/Furans
QC Level:	Level IV
No. of Samples:	9
No. of Reanalyses/Dilutions:	0
Reviewer:	K. Shadowlight
Date of Review:	February 18, 2005

The samples listed in Table 1 were validated based on the guidelines outlined in the *AMEC Data Validation Procedure for Dioxins and Furans (DVP-19, Rev. 1), EPA Method 1613, and the National National Functional Guidelines For Chlorinated Dioxin/Furan Data Review* (8/02). Any deviations from these procedures and guidelines are documented herein. Qualifiers were applied in cases where the data did not meet the required QC criteria or where special consideration by the data user is required. Data qualifiers were placed on Form Is with the associated qualification codes. Analytes that were rejected for any reason are denoted on the Form I as having only the "R" data qualifier and associated qualification code(s) denoting the reason for rejection. Any additional problems with the data that may have resulted in an estimated value were not denoted by a qualification code since the data had already been rejected.

1. INTRODUCTION

Task Order Title:	NPDES Monitoring
Contract Task Order #:	313150010
Sample Delivery Group #:	Multiple
Project Manager:	B. McIlvaine
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No. of Samples:	9
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Table 1. Sample Identification

Client ID	Laboratory ID (Del Mar)	Laboratory ID (Pace)	Matrix	COC Method
Outfall 001	IOA0551-01	106124001	water	1613
Outfall 002	IOA0550-01	106130001	water	1613
Outfall 007	IOA0556-01	106128001	water	1613
Outfall 008	IOA0553-01	106126001	water	1613
Outfall 009	IOA0554-01	106131001	water	1613
Outfall 010	IOA0555-01	106127001	water	1613
Outfall 011	IOA0549-01	106132001	water	1613
Outfall 011	IOA0567-01	106135001	water	1613
Outfall 018	IOA0552-01	106125001	water	1613

2. DATA VALIDATION FINDINGS

2.1 SAMPLE MANAGEMENT

Following are findings associated with sample management:

2.1.1 Sample Preservation, Handling, and Transport

The samples in these SDGs were received at Del Mar Analytical within the temperature limits of 4°C ±2°C. The samples were subcontracted to Pace Analytical for the dioxin/furan analyses. The samples in these SDGs were received at Pace Analytical Services within the temperature limits of 4°C ±2°C. The samples were received in good condition at both laboratories. No qualifications were required.

2.1.2 Chain of Custody

The COCs and transfer COCs were signed by the appropriate field and laboratory personnel. The samples and analyses were accounted for on both the original COCs and transfer COCs. As the samples were couriered directly to the laboratory (Del Mar Analytical), custody seals were not required. There was no information regarding custody seals upon receipt at Pace. No qualifications were required.

2.1.3 Holding Times

The samples were extracted and analyzed within a year of collection. No qualifications were required.

2.2 INSTRUMENT PERFORMANCE

Following are findings associated with instrument performance:

2.2.1 GC Column Performance

A column performance standard was combined with the daily calibration verification and analyzed at the beginning of each analytical sequence. The GC column performance was acceptable with the chromatographic separation of 2,3,7,8-TCDD and other TCDD isomers resolved with a valley of ≤25%. No qualifications were required.

2.2.2 Mass Spectrometer Performance

The mass spectrometer performance could not be evaluated as the laboratory did not provide selected ion current profiles for the lock-mass ions. No qualifications were required.

2.3 CALIBRATION

2.3.1 Initial Calibration

There was one initial calibration, analyzed 11/29/04 on Instrument 10MSHR05. The calibration consisted of five concentration level standards (CS1 through CS5) analyzed to verify instrument linearity. The initial calibration was acceptable with %RSDs ≤20% for the 15 native compounds (calibration by isotope dilution) and ≤35% for the 2 native and all labeled compounds (calibration by internal standard). The relative retention times and ion abundance ratios were within the QC limits listed in Method 1613 for all standards. A representative number of %RSDs were verified from the raw data, and no calculation or transcription errors were noted. No qualifications were required.

2.3.2 Continuing Calibration

Calibration verification (VER) consisted of a mid-level standard (CS3) analyzed at the beginning of each analytical sequence. The VER was acceptable with the concentrations within the acceptance criteria listed in the Table 6 of the EPA Method 1613. The ion abundance ratios and relative retention times were within the method QC limits. A representative number of %Ds were verified from the raw data, and no calculation or transcription errors were noted. No qualifications were required.

2.4 BLANKS

One method blank (Blank-6220) was extracted and analyzed with the samples in these SDGs. Target compounds total HpCDF, 1,2,3,4,6,7,8-HpCDF, total HpCDF, OCDF, and OCDD were reported in the method blank. Any detects for the aforementioned target compounds reported at concentrations <5× the concentrations reported in the method blank were qualified as estimated nondetects "UJ," at the levels of interference in the samples of these SDGs. A review of the method blank raw data and chromatograms indicated no false negatives or false positives. No further qualifications were required.

2.5 BLANK SPIKES AND LABORATORY CONTROL SAMPLES

One LCS/LCSD pair (LCS-6221/LCSD-6222) was extracted and analyzed with the samples in these SDGs. All recoveries were within the acceptance criteria listed in Table 6 of the Method 1613. There are no method QC limits established for RPDs. The reported RPDs were within ±20%. No qualifications were required.

2.6 MATRIX SPIKE/MATRIX SPIKE DUPLICATE

MS/MSD analyses were not performed in these SDGs. Evaluation of method accuracy and precision was based on the LCS/LCSD results. No qualifications were required.

2.7 FIELD QC SAMPLES

Following are findings associated with field QC:

2.7.1 Field Blanks and Equipment Rinsates

The samples in these SDGs had no associated field QC samples. No qualifications were required.

2.7.2 Field Duplicates

No field duplicate samples were identified for these SDGs.

2.8 INTERNAL STANDARDS

The labeled standard recoveries were within the acceptance criteria listed in Table 7 of Method 1613. No qualifications were required.

2.9 COMPOUND IDENTIFICATION

The laboratory analyzed for polychlorinated dioxins/furans by EPA Method 1613. The compound identifications were verified from the raw data and no false negatives or positives were noted. No qualifications were required.

2.10 COMPOUND QUANTIFICATION AND REPORTED DETECTION LIMITS

Compound quantitation was verified from the raw data. The laboratory calculated and reported compound-specific detection limits. Any detects below the lower method calibration limit (MCL) were qualified as estimated, "J." Any reported EMPC was qualified as an estimated nondetect, "UJ." No further qualifications were required.

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Pace Analytical™

Method 1613B Analysis Results

Client - Del Mar Analytical

Client's Sample ID	IOA0555-01 Outfall 010		
Lab Sample ID	106127001		
Filename	F50129B_10		
Injected By	BAL		
Total Amount Extracted	1010 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	01/11/2005
ICAL Date	11/29/2004	Received	01/13/2005
CCal Filename(s)	F50129B_02	Extracted	01/28/2005
Method Blank ID	BLANK-6220	Analyzed	01/30/2005 03:08

Rev Qual	Qual Code	Native Isomers	Conc pg/L	EMPC pg/L	LOD pg/L	Internal Standards	ng's Added	Percent Recovery
U		2,3,7,8-TCDF	ND	-----	0.75	2,3,7,8-TCDF-13C	2.00	61
J	DNQ	Total TCDF	2.3	-----	0.75 J	2,3,7,8-TCDD-13C	2.00	76
						1,2,3,7,8-PeCDF-13C	2.00	63
U		2,3,7,8-TCDD	ND	-----	1.00	2,3,4,7,8-PeCDF-13C	2.00	69
U		Total TCDD	ND	-----	1.00	1,2,3,7,8-PeCDD-13C	2.00	82
						1,2,3,4,7,8-HxCDF-13C	2.00	71
U		1,2,3,7,8-PeCDF	ND	-----	1.50	1,2,3,6,7,8-HxCDF-13C	2.00	74
U		2,3,4,7,8-PeCDF	ND	-----	1.00	2,3,4,6,7,8-HxCDF-13C	2.00	69
		Total PeCDF	ND	-----	1.30	1,2,3,7,8,9-HxCDF-13C	2.00	70
						1,2,3,4,7,8-HxCDD-13C	2.00	66
U		1,2,3,7,8-PeCDD	ND	-----	1.90	1,2,3,6,7,8-HxCDD-13C	2.00	82
U		Total PeCDD	ND	-----	1.90	1,2,3,4,6,7,8-HpCDF-13C	2.00	71
						1,2,3,4,7,8,9-HpCDF-13C	2.00	62
U		1,2,3,4,7,8-HxCDF	ND	-----	0.67	1,2,3,4,6,7,8-HpCDD-13C	2.00	79
		1,2,3,6,7,8-HxCDF	ND	-----	0.87	OCDD-13C	4.00	69
		2,3,4,6,7,8-HxCDF	ND	-----	0.96			
		1,2,3,7,8,9-HxCDF	ND	-----	1.10	1,2,3,4-TCDD-13C	2.00	NA
		Total HxCDF	ND	-----	0.89	1,2,3,7,8,9-HxCDD-13C	2.00	NA
U								
		1,2,3,4,7,8-HxCDD	ND	-----	1.80	2,3,7,8-TCDD-37Cl4	0.20	78
		1,2,3,6,7,8-HxCDD	ND	-----	1.40			
		1,2,3,7,8,9-HxCDD	ND	-----	1.40			
		Total HxCDD	ND	-----	1.60			
J	DNQ							
U		1,2,3,4,6,7,8-HpCDF	7.9	-----	1.10 J			
		1,2,3,4,7,8,9-HpCDF	ND	-----	1.60			
J	DNQ	Total HpCDF	7.9	-----	1.30 BJ			
J	DNQ							
		1,2,3,4,6,7,8-HpCDD	35.0	-----	1.90 J			
		Total HpCDD	66.0	-----	1.90			
J	DNQ							
		OCDF	69.0	-----	1.70 J			
		OCDD	320.0	-----	2.80			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection. Totals are averages of individual isomer LODs.
D = Result obtained from analysis of diluted sample
B = Less than 10 times higher than method blank level
P = Recovery outside of method 1613 control limits
J = Concentration detected is below the calibration range
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....106127

AMEC VALIDATED
LEVEL IV

REPORT OF LABORATORY ANALYSIS

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CONTRACT COMPLIANCE SCREENING FORM FOR HARDCOPY DATA

AMEC Earth & Environmental
550 South Wadsworth Boulevard
Suite 500
Lakewood, CO 80226

Laboratory Del Mar
Reviewer K. Okonzak-Lowry
Analysis/Method metals

Package ID T711MT27
Task Order 313150010
SDG No. IOA0555, IOA0556
No. of Analyses 2

Date: 2/08/05
Reviewer's Signature

ACTION ITEMS[a]	
1. **Case Narrative Deficiencies**	
2. **Out of Scope Analyses**	
3. **Analyses Not Conducted**	
4. **Missing Hardcopy Deliverables**	
5. **Incorrect Hardcopy Deliverables**	
6. **Deviations from Analysis Protocol, e.g.,**	Qualifications applied to detects below reporting limit.
	The antimony MDL for sample Outfall 010 was raised to 2.0 ug/L due to the laboratory's inability to demonstrate the instrument's ability to detect antimony below this level.
Holding Times	
GC/MS Tune/Inst. Perform	
Calibrations	
Blanks	
Surrogates	
Matrix Spike/Dup LCS	
Field QC	
Internal Standard Performance	
Compound Identification and Quantitation	
System Performance	

COMMENTS[b]

[a] Subcontracted analytical laboratory is not meeting contract and/or method requirements.
[b] Differences in protocol have been adopted by the laboratory but no action against the laboratory is required.

Data Qualifier Reference Table

Qualifier	Organics	Inorganics
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.	The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.	The associated value is an estimated quantity.
N	The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification."	Not applicable.
NJ	The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.	Not applicable.
UJ	The analyte was not deemed above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.	The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.
R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and to meet quality control criteria. The presence or absence of the analyte cannot be verified.	The data are unusable. (Note: Analyte may or may not be present).

Qualification Code Reference Table

Qualifier	Organics	Inorganics
H	Holding times were exceeded.	Holding times were exceeded.
S	Surrogate recovery was outside QC limits.	The sequence or number of standards used for the calibration was incorrect
C	Calibration %RSD or %D were noncompliant.	Correlation coefficient is <0.995.
R	Calibration RRF was <0.05.	%R for calibration is not within control limits.
B	Presumed contamination from preparation (method) blank.	Presumed contamination from preparation (method) or calibration blank.
L	Laboratory Blank Spike/Blank Spike Duplicate %R was not within control limits.	Laboratory Control Sample %R was not within control limits.
Q	MS/MSD recovery was poor or RPD high.	MS recovery was poor.
E	Not applicable.	Duplicates showed poor agreement.
I	Internal standard performance was unsatisfactory.	ICP ICS results were unsatisfactory.
A	Not applicable.	ICP Serial Dilution %D were not within control limits.
M	Tuning (BFB or DFTPP) was noncompliant.	Not applicable.
T	Presumed contamination from trip blank.	Not applicable.
+	False positive – reported compound was not present. Not applicable.	
-	False negative – compound was present but not reported.	Not applicable.
F	Presumed contamination from FB, or ER.	Presumed contamination from FB or ER.
$	Reported result or other information was incorrect.	Reported result or other information was incorrect.
?	TIC identity or reported retention time has been changed.	Not applicable.
D	The analysis with this flag should not be used because another more technically sound analysis is available.	The analysis with this flag should not be used because another more technically sound analysis is available.
P	Instrument performance for pesticides was poor.	Post Digestion Spike recovery was not within control limits.
DNQ	The compound was detected between the MDL and the RL and, by definition, is considered an estimated value.	The compound was detected between the MDL and the RL and, by definition, is considered an estimated value.

*#	Unusual problems found with the data that have been described in Section 2.#, "Data Validation Findings." The number following the asterisk (*) will indicate the subsection where a description of the problem can be found (eg. *1 would indicate a sample was not within temperature limits).	Unusual problems found with the data that have been described in Section 2.#, "Data Validation Findings." The number following the asterisk (*) will indicate the subsection where a description of the problem can be found (eg. *1 would indicate a sample was not within temperature limits).

DATA VALIDATION REPORT

NPDES
Monitoring

ANALYSIS: METALS

SAMPLE DELIVERY GROUPS: IOA0555, IOA0556

Prepared by

AMEC—Denver Operations
550 South Wadsworth Boulevard, Suite 500
Lakewood, Colorado 80226

1. INTRODUCTION

Task Order Title:	NPDES Monitoring
Contract Task Order #:	313150010
SDG#:	IOA0555, IOA0556
Project Manager:	B. McIlvaine
Matrix:	Water
Analysis:	Metals
QC Level:	Level IV
No. of Samples:	2
No. of Reanalyses/Dilutions:	0
Reviewer:	K. Okonzak-Lowry
Date of Review:	February 08, 2005

The samples listed in Table 1 were validated based on the guidelines outlined in the *AMEC Data Validation Procedure for Levels III and IV ICP-MS Metals, (DVP-5-A, Rev.0), AMEC Data Validation Procedure for Levels III and IV ICP Metals* (DVP-5, Rev. 0), SW-846 *Method 6020B for Inductively Coupled Plasma – Mass Spectrometry*, SW-846 *Method 6010B for Inductively Coupled Plasma* , SW-846 *Method 7471A for Mercury (Manual Cold-Vapor Technique)*, and validation guidelines outlined in the USEPA CLP *National Functional Guidelines for Inorganic Data Review* (2/94). Any deviations from these procedures and guidelines are documented herein. Qualifiers were applied in cases where the data did not meet the required QC criteria or where special consideration by the data user is required. Data qualifiers were placed on Form Is with the associated qualification codes. Analytes that were rejected for any reason are denoted on the Form I as having only the "R" data qualifier and associated qualification code(s) denoting the reason for rejection. Any additional problems with the data that may have resulted in an estimated value were not denoted by a qualification code since the data had already been rejected.

Table 1. Sample identification

Client ID	EPA ID	Laboratory ID	Matrix	COC Method
Outfall 010	Outfall 010	IOA0555-01	water	ILM04
Outfall 007	Outfall 007	IOA0556-01	water	ILM04

2. DATA VALIDATION FINDINGS

2.1 SAMPLE MANAGEMENT

Following are findings associated with sample management:

2.1.1 Sample Preservation, Handling, and Transport

The samples in these SDGs were received at the laboratory within the temperature limits of 4°C ±2°C. No sample preservation, handling, or transport problems were noted, and no qualifications were necessary.

2.1.2 Chain of Custody

The COCs were signed and dated by field and laboratory personnel. The COCs listed duplicate samples for both samples; however, duplicate analyses were not required. No sample qualifications were required.

2.1.3 Holding Times

The dates of collection recorded on the COCs and the dates of analyses recorded in the raw data, documented that the sample analyses were performed within the specified holding times of six months for the ICP/MS metals and 28 days for mercury. No qualifications were required.

2.2 ICP-MS TUNING

A precalibration routine must be completed prior to calibrating the instrument, which consists of analyzing a tuning solution to verify resolution, mass calibration, and thermal stability. The solution must be analyzed a minimum of five times and must contain isotopes representing all mass regions of interest. The laboratory performed the required tune solution analyses but did not report %RSDs. The laboratory SOP states that to be acceptable, the %RSD must be less than 5%. The mass calibrations were within 0.1 amu of the true mass and an the instrument resolutions were less than 0.75 amu at 5 percent peak height for all analytes in the tune solution. No site sample qualifications were required.

2.3 CALIBRATION

The ICV and CCV results showed acceptable recoveries, 90-110% for the ICP/MS. The applicable reporting limit check standards were recovered within the AMEC control limits of 70-130%, with the exception of the antimony 0.2 μg/L standard which was not detected for antimony (MDL of 0.18 μg/L). The antimony 2.0 μg/L standard was recovered at 84.4%, but its result of 0.84442 μg/L was equivalent to the bracketing CCB antimony values of 0.81128 and 0.81093 μg/L, respectively. Therefore, it was determined that the laboratory was not able to detect antimony at the 1.0 μg/L level, and the antimony method detection limit for sample Outfall 010 was raised to 2.0 μg/L. No further qualifications were required.

2.4 BLANKS

The method blanks and bracketing ICBs/CCBs associated with the samples in these SDGs were nondetected at the laboratory's MDLs, with the exception of the CCB results for antimony which were found at above the MDL at 0.81128 and 0.81093 μg/L, respectively. The antimony method detection limit for sample Outfall 010 was raised to 2.0 μg/L, and the sample nondetect was qualified as estimated, "UJ". No further qualifications were required.

2.5 ICP INTERFERENCE CHECK SAMPLE (ICS A/AB)

No ICPMS interference check samples were analyzed in association with the samples in these SDGs; therefore, no assessment was made with respect to this criterion.

2.6 BLANK SPIKES AND LABORATORY CONTROL SAMPLES

The ICP/MS LCS sample was identified as 5A12054-BS1, and the Hg LCS sample was identified as 5A12047-BS1. The LCS results on the summary forms and in the raw data were within the laboratory-established ICP/MS and Hg control limits of 85-115%. No qualifications were required.

2.7 LABORATORY DUPLICATES

No MS/MSD or duplicate analyses were performed in association with the samples in these SDGs; therefore, no assessment was made with respect to this criterion.

2.8 MATRIX SPIKE

No MS/MSD analyses were performed in association with the samples in these SDGs; therefore, no assessment was made with respect to this criterion.

2.9 FURNACE ATOMIC ABSORPTION QC

Furnace atomic absorption was not utilized for the analysis of these samples; therefore, furnace atomic absorption QC is not applicable.

2.10 ICP/MS SERIAL DILUTION

No serial dilution analysis was performed in association with the samples in these SDGs; therefore, no assessment was made with respect to this criterion.

2.11 INTERNAL STANDARDS PERFORMANCE

The ICP-MS internal standard recoveries for the site samples and associated QC sample analyses were within the 60-125% control limits and no qualifications were required.

2.12 SAMPLE RESULT VERIFICATION

A Level IV review was performed for the samples in these data packages. Calculations were verified, and the sample results reported on the Form Is were verified against the raw data. No transcription errors or calculation errors were noted. Analytes detected below the reporting limit were qualified as estimated, "J." The antimony method detection limit for sample Outfall 010 was raised to 2.0 µg/L due to the antimony results for the reporting limit check standards and the bracketing CCBs. No further qualifications were required.

2.13 FIELD QC SAMPLES

Field QC samples are evaluated, and if necessary, qualified based only on laboratory blanks. Any remaining detects are used to evaluate the associated samples.

2.13.1 Field Blanks and Equipment Rinsates

The samples in these SDGs had no associated field QC samples. No qualifications were required.

2.13.2 Field Duplicates

There were no field duplicate analyses performed in association with the site samples.

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 010

Report Number: IOA0555

Sampled: 01/11/05
Received: 01/11/05

DRAFT: METALS

Analyte	Method	Batch	MDL Limit	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Rev Qual	Qual Code
Sample ID: IOA0555-01 (DRAFT: Outfall 010 - Water)										
Reporting Units: ug/l										
Antimony	EPA 200.8	5A12054	~~0.18~~ 2.0	2.0	ND	1	01/12/05	01/12/05	UJ	B;*3,5
Cadmium	EPA 200.8	5A12054	0.015	1.0	**0.082**	1	01/12/05	01/12/05	J	J DNQ
Copper	EPA 200.8	5A12054	0.49	2.0	**2.5**	1	01/12/05	01/12/05		
Lead	EPA 200.8	5A12054	0.13	1.0	**1.1**	1	01/12/05	01/12/05		
Mercury	EPA 245.1	5A12047	0.063	0.20	**0.10**	1	01/12/05	01/12/05	J	J DNQ

2/08/05

AMEC VALIDATED

LEVEL IV

DRAFT REPORT
DRAFT REPORT
DATA SUBJECT TO CHANGE

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LABORATORY REPORT

Prepared For: MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project: Routine Outfall 010

Sampled: 01/11/05
Received: 01/11/05
Issued: 02/28/05 17:32

NELAP #01108CA California ELAP#1197 CSDLAC #10117

The results listed within this Laboratory Report pertain only to the samples tested in the laboratory. The analyses contained in this report were performed in accordance with the applicable certifications as noted. All soil samples are reported on a wet weight basis unless otherwise noted in the report. This Laboratory Report is confidential and is intended for the sole use of Del Mar Analytical and its client. This report shall not be reproduced, except in full, without written permission from Del Mar Analytical. The Chain of Custody, 1 page, is included and is an integral part of this report.

This entire report was reviewed and approved for release.

SAMPLE CROSS REFERENCE

SUBCONTRACTED: Refer to the last page for specific subcontract laboratory information included in this report.

LABORATORY ID	CLIENT ID	MATRIX
IOA0555-01	Outfall 010	Water

Reviewed By:

Michele Harper

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
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Attention: Bronwyn Kelly

Project ID: Routine Outfall 010
Report Number: IOA0555

Sampled: 01/11/05
Received: 01/11/05

METALS

Analyte	Method	Batch	MDL	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA0555-01 (Outfall 010 - Water)									
Reporting Units: ug/l									
Antimony	EPA 200.8	5A12054	0.18	2.0	ND	1	01/12/05	01/12/05	
Cadmium	EPA 200.8	5A12054	0.015	1.0	**0.082**	1	01/12/05	01/12/05	J
Copper	EPA 200.8	5A12054	0.49	2.0	**2.5**	1	01/12/05	01/12/05	
Lead	EPA 200.8	5A12054	0.13	1.0	**1.1**	1	01/12/05	01/12/05	
Mercury	EPA 245.1	5A12047	0.063	0.20	**0.10**	1	01/12/05	01/12/05	J

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 010
Report Number: IOA0555

Sampled: 01/11/05
Received: 01/11/05

INORGANICS

Analyte	Method	Batch	MDL Limit	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IOA0555-01 (Outfall 010 - Water) - cont.									
Reporting Units: mg/l									
Chloride	EPA 300.0	5A11040	0.26	0.50	**5.8**	1	01/11/05	01/11/05	
Nitrate/Nitrite-N	EPA 300.0	5A11040	0.072	0.26	**0.68**	1	01/11/05	01/11/05	
Oil & Grease	EPA 413.1	5A13065	0.94	5.0	**8.4**	1	01/13/05	01/13/05	B
Sulfate	EPA 300.0	5A11040	0.18	0.50	**3.4**	1	01/11/05	01/11/05	
Total Dissolved Solids	SM2540C	5A13089	10	10	**110**	1	01/13/05	01/13/05	

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MWH-Pasadena/Boeing
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Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 010
Report Number: IOA0555

Sampled: 01/11/05
Received: 01/11/05

SHORT HOLD TIME DETAIL REPORT

	Hold Time (in days)	Date/Time Sampled	Date/Time Received	Date/Time Extracted	Date/Time Analyzed
Sample ID: Outfall 010 (IOA0555-01) - Water					
EPA 300.0	2	01/11/2005 09:35	01/11/2005 18:50	01/11/2005 21:00	01/11/2005 22:41

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Attention: Bronwyn Kelly

Project ID: Routine Outfall 010
Report Number: IOA0555

Sampled: 01/11/05
Received: 01/11/05

METHOD BLANK/QC DATA

METALS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A12047 Extracted: 01/12/05											
Blank Analyzed: 01/12/2005 (5A12047-BLK1)											
Mercury	ND	0.20	0.063	ug/l							
LCS Analyzed: 01/12/2005 (5A12047-BS1)											
Mercury	8.12	0.20	0.063	ug/l	8.00		102	85-115			
Matrix Spike Analyzed: 01/12/2005 (5A12047-MS1)						**Source: IOA0483-01**					
Mercury	8.00	0.20	0.063	ug/l	8.00	ND	100	70-130			
Matrix Spike Dup Analyzed: 01/12/2005 (5A12047-MSD1)						**Source: IOA0483-01**					
Mercury	8.26	0.20	0.063	ug/l	8.00	ND	103	70-130	3	20	
Batch: 5A12054 Extracted: 01/12/05											
Blank Analyzed: 01/12/2005 (5A12054-BLK1)											
Antimony	ND	2.0	0.18	ug/l							
Cadmium	ND	1.0	0.015	ug/l							
Copper	ND	2.0	0.49	ug/l							
Lead	ND	1.0	0.13	ug/l							
LCS Analyzed: 01/12/2005 (5A12054-BS1)											
Antimony	89.1	2.0	0.18	ug/l	80.0		111	85-115			
Cadmium	84.7	1.0	0.015	ug/l	80.0		106	85-115			
Copper	80.7	2.0	0.49	ug/l	80.0		101	85-115			
Lead	80.4	1.0	0.13	ug/l	80.0		100	85-115			
Matrix Spike Analyzed: 01/12/2005 (5A12054-MS1)						**Source: IOA0549-01**					
Antimony	88.7	2.0	0.18	ug/l	80.0	0.35	110	70-130			
Cadmium	85.3	1.0	0.015	ug/l	80.0	0.14	106	70-130			
Copper	83.9	2.0	0.49	ug/l	80.0	4.2	100	70-130			
Lead	81.3	1.0	0.13	ug/l	80.0	1.0	100	70-130			

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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MWH-Pasadena/Boeing
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Attention: Bronwyn Kelly

Project ID: Routine Outfall 010
Report Number: IOA0555

Sampled: 01/11/05
Received: 01/11/05

METHOD BLANK/QC DATA

METALS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A12054 Extracted: 01/12/05											
Matrix Spike Dup Analyzed: 01/12/2005 (5A12054-MSD1)						**Source: IOA0549-01**					
Antimony	90.1	2.0	0.18	ug/l	80.0	0.35	112	70-130	2	20	
Cadmium	86.1	1.0	0.015	ug/l	80.0	0.14	107	70-130	1	20	
Copper	83.8	2.0	0.49	ug/l	80.0	4.2	100	70-130	0	20	
Lead	80.9	1.0	0.13	ug/l	80.0	1.0	100	70-130	1	20	

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MWH-Pasadena/Boeing
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Attention: Bronwyn Kelly

Project ID: Routine Outfall 010
Report Number: IOA0555

Sampled: 01/11/05
Received: 01/11/05

METHOD BLANK/QC DATA

INORGANICS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A11040 Extracted: 01/11/05											
Blank Analyzed: 01/11/2005 (5A11040-BLK1)											
Chloride	ND	0.50	0.26	mg/l							
Nitrate/Nitrite-N	ND	0.26	0.072	mg/l							
Sulfate	ND	0.50	0.18	mg/l							
LCS Analyzed: 01/11/2005 (5A11040-BS1)											
Chloride	4.84	0.50	0.26	mg/l	5.00		97	90-110			
Sulfate	10.1	0.50	0.18	mg/l	10.0		101	90-110			
Matrix Spike Analyzed: 01/11/2005 (5A11040-MS1)						**Source: IOA0494-01**					
Chloride	24.1	2.5	1.3	mg/l	5.00	20	82	80-120			
Sulfate	38.6	2.5	0.90	mg/l	10.0	29	96	80-120			
Matrix Spike Dup Analyzed: 01/11/2005 (5A11040-MSD1)						**Source: IOA0494-01**					
Chloride	24.1	2.5	1.3	mg/l	5.00	20	82	80-120	0	20	
Sulfate	38.8	2.5	0.90	mg/l	10.0	29	98	80-120	1	20	
Batch: 5A13065 Extracted: 01/13/05											
Blank Analyzed: 01/13/2005 (5A13065-BLK1)											
Oil & Grease	1.20	5.0	0.94	mg/l							*J*
LCS Analyzed: 01/13/2005 (5A13065-BS1)											**M-NR1**
Oil & Grease	18.6	5.0	0.94	mg/l	20.0		93	65-120			
LCS Dup Analyzed: 01/13/2005 (5A13065-BSD1)											
Oil & Grease	21.1	5.0	0.94	mg/l	20.0		106	65-120	13	20	

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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2520 E. Sunset Rd. #3, Las Vegas, NV 89120 (702) 798-3620 FAX (702) 798-3621

MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 010
Report Number: IOA0555

Sampled: 01/11/05
Received: 01/11/05

METHOD BLANK/QC DATA

INORGANICS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 5A13089 Extracted: 01/13/05											
Blank Analyzed: 01/13/2005 (5A13089-BLK1)											
Total Dissolved Solids	ND	10	10	mg/l							
LCS Analyzed: 01/13/2005 (5A13089-BS1)											
Total Dissolved Solids	994	10	10	mg/l	1000		99	90-110			
Duplicate Analyzed: 01/13/2005 (5A13089-DUP1)						**Source: IOA0549-01**					
Total Dissolved Solids	92.0	10	10	mg/l		88			4	10	

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 010

Report Number: IOA0555

Sampled: 01/11/05
Received: 01/11/05

Compliance Check

The results obtained from the analytical testing of this data set were checked against compliance limits received from the client. Any results at or above the compliance limits appear in bold on this page.

LabNumber	Analysis	Analyte	Units	Result	MRL	Compliance Limit
IOA0555-01	413.1 Oil and Grease	Oil & Grease	mg/l	8.40	5.0	15
IOA0555-01	Chloride - 300.0	Chloride	mg/l	5.80	0.50	150
IOA0555-01	Nitrogen, NO3+NO2 -N	Nitrate/Nitrite-N	mg/l	0.68	0.26	10.00
IOA0555-01	Sulfate-300.0	Sulfate	mg/l	3.40	0.50	250
IOA0555-01	TDS - SM 2540C	Total Dissolved Solids	mg/l	110	10	850

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Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 010
Report Number: IOA0555

Sampled: 01/11/05
Received: 01/11/05

DATA QUALIFIERS AND DEFINITIONS

B	Analyte was detected in the associated Method Blank.
J	Estimated value. Analyte detected at a level less than the Reporting Limit (RL) and greater than or equal to the Method Detection Limit (MDL). The user of this data should be aware that this data is of unknown quality.
M-NR1	There was no MS/MSD analyzed with this batch due to insufficient sample volume. See Blank Spike/Blank Spike Duplicate.
ND	Analyte NOT DETECTED at or above the reporting limit or MDL, if MDL is specified.
RPD	Relative Percent Difference

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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MWH-Pasadena/Boeing
300 North Lake Avenue, Suite 1200
Pasadena, CA 91101
Attention: Bronwyn Kelly

Project ID: Routine Outfall 010
Report Number: IOA0555

Sampled: 01/11/05
Received: 01/11/05

Certification Summary

Del Mar Analytical, Irvine

Method	Matrix	Nelac	California
EPA 200.8	Water	X	X
EPA 245.1	Water	X	X
EPA 300.0	Water	X	X
EPA 413.1	Water	X	X
SM2540C	Water	X	X

Nevada and NELAP provide analyte specific accreditations. Analyte specific information for Del Mar Analytical may be obtained by contacting the laboratory or visiting our website at www.dmalabs.com.

Subcontracted Laboratories

Pace Analytical, MN- SUB
1700 Elm Street, Ste 200 - Minneapolis, MN 55414

Analysis Performed: 1613-Dioxin-HR
Samples: IOA0555-01

Analysis Performed: EDD + Level 4
Samples: IOA0555-01

Del Mar Analytical, Irvine
Michele Harper
Project Manager

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IOA0555

Del Mar Analytical Version 5 8/12/04 CHAIN OF CUSTODY FORM

Client Name/Address:	Project:
MWH-Pasadena 300 North Lake Avenue, Suite 1200 Pasadena, CA 91101	Boeing-SSFL NPDES **Routine Outfall 010** Stormwater at Building 203
Project Manager: Bronwyn Kelly Sampler: Pollock	Phone Number: (626) 568-6691 Fax Number: (626) 568-6515

Sample Description	Sample Matrix	Container Type	# of Cont.	Sampling Date/Time	Preservative	Bottle * #	Total Reoverable Metals: Sb, Cd, Cu, Pb, Hg	TCDD (and all congeners)	Oil & Grease (EPA 413.1)	Cl-, SO4, NO3+NO2-N	TDS					Comments
							ANALYSIS REQUIRED									Field readings: Temp = 57.8 F pH= 6.8
Outfall 010	W	Poly-1L	1	1-11-05 09:35	HNO3	1A	X									
Outfall 010-Dup	W	Poly-1L	1		HNO3	1B	X									
Outfall 010	W	Glass-Amber	2		None	2A, 2B		X								
Outfall 010	W	Glass-Amber	2		HCl	3A, 3B			X							
Outfall 010	W	Poly-500 ml	2		None	4A, 4B				X						
Outfall 010	W	Poly-500 ml	2		None	5A, 5B					X					

Relinquished By	Date/Time:	Received By	Date/Time:
	1-11-05 1435		1-11-05 1435
Relinquished By	Date/Time:	Received By	Date/Time:
	1-11-05 1850		1/11/05 1850
Relinquished By	Date/Time:	Received By	Date/Time:

Turn around Time: (check)
24 Hours _____ 5 Days _____
48 Hours _____ 10 Days _____
72 Hours _____ Normal ✓
Perchlorate Only 72 Hours_____
Metals Only 72 Hours_____
Sample Integrity: (Check)
Intact X On ice: X 3°C

Del Mar Analytical

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2520 E. Sunset Rd. #3, Las Vegas, NV 89120 (702) 798-3620 FAX (702) 798-3621

February 25, 2005

MWH-Pasadena/Boeing
300 North Lake Avenue
Pasadena, Ca. 91101

Attention: Bronwyn Kelly

Project: Routine Outfall 010
Sampled: 01/11/05
Del Mar Analytical Number: IOA0555

Dear Ms. Kelly:

Pace Analytical performed Method 1613B analysis for the project referenced above. Please use the following cross-reference table when reviewing your results.

MWH ID	DEL MAR ID	Pace ID
Outfall 010	IOA0555-01	106127001

Attached is the original report from the subcontract laboratory. If you have any questions or require further assistance, please do not hesitate to contact me.

Sincerely yours,
DEL MAR ANALYTICAL

Michele Harper
Project Manager

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Pace Analytical™

Method 1613B Analysis Results

Client - Del Mar Analytical

Client's Sample ID	IOA0555-01		
Lab Sample ID	106127001		
Filename	F50129B_10		
Injected By	BAL		
Total Amount Extracted	1010 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	01/11/2005
ICAL Date	11/29/2004	Received	01/13/2005
CCal Filename(s)	F50129B_02	Extracted	01/28/2005
Method Blank ID	BLANK-6220	Analyzed	01/30/2005 03:08

Native Isomers	Conc pg/L	EMPC pg/L	LOD pg/L		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	0.75		2,3,7,8-TCDF-13C	2.00	61
Total TCDF	2.3	-----	0.75	J	2,3,7,8-TCDD-13C	2.00	76
					1,2,3,7,8-PeCDF-13C	2.00	63
2,3,7,8-TCDD	ND	-----	1.00		2,3,4,7,8-PeCDF-13C	2.00	69
Total TCDD	ND	-----	1.00		1,2,3,7,8-PeCDD-13C	2.00	82
					1,2,3,4,7,8-HxCDF-13C	2.00	71
1,2,3,7,8-PeCDF	ND	-----	1.50		1,2,3,6,7,8-HxCDF-13C	2.00	74
2,3,4,7,8-PeCDF	ND	-----	1.00		2,3,4,6,7,8-HxCDF-13C	2.00	69
Total PeCDF	ND	-----	1.30		1,2,3,7,8,9-HxCDF-13C	2.00	70
					1,2,3,4,7,8-HxCDD-13C	2.00	66
1,2,3,7,8-PeCDD	ND	-----	1.90		1,2,3,6,7,8-HxCDD-13C	2.00	82
Total PeCDD	ND	-----	1.90		1,2,3,4,6,7,8-HpCDF-13C	2.00	71
					1,2,3,4,7,8,9-HpCDF-13C	2.00	62
1,2,3,4,7,8-HxCDF	ND	-----	0.67		1,2,3,4,6,7,8-HpCDD-13C	2.00	79
1,2,3,6,7,8-HxCDF	ND	-----	0.87		OCDD-13C	4.00	69
2,3,4,6,7,8-HxCDF	ND	-----	0.96				
1,2,3,7,8,9-HxCDF	ND	-----	1.10		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	-----	0.89		1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	1.80		2,3,7,8-TCDD-37Cl4	0.20	78
1,2,3,6,7,8-HxCDD	ND	-----	1.40				
1,2,3,7,8,9-HxCDD	ND	-----	1.40				
Total HxCDD	ND	-----	1.60				
1,2,3,4,6,7,8-HpCDF	7.9	-----	1.10	J			
1,2,3,4,7,8,9-HpCDF	ND	-----	1.60				
Total HpCDF	7.9	-----	1.30	BJ			
1,2,3,4,6,7,8-HpCDD	35.0	-----	1.90	J			
Total HpCDD	66.0	-----	1.90				
OCDF	69.0	-----	1.70	J			
OCDD	320.0	-----	2.80				

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection. Totals are averages of individual isomer LODs.
D = Result obtained from analysis of diluted sample
B = Less than 10 times higher than method blank level
P = Recovery outside of method 1613 control limits
J = Concentration detected is below the calibration range
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....106127

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Pace Analytical™

Method 1613B Blank Analysis Results

Client - Del Mar Analytical

Lab Sample ID	BLANK-6220	Matrix	Water
Filename	F50129B_06	Dilution	NA
Total Amount Extracted	1020 mL	Extracted	01/28/2005
ICAL Date	11/29/2004	Analyzed	01/29/2005 23:49
CCal Filename(s)	F50129B_02	Injected By	BAL

Native Isomers	Conc pg/L	EMPC pg/L	PRL pg/L		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	1.20		2,3,7,8-TCDF-13C	2.00	58
Total TCDF	ND	-----	-----		2,3,7,8-TCDD-13C	2.00	75
					1,2,3,7,8-PeCDF-13C	2.00	65
2,3,7,8-TCDD	ND	-----	1.20		2,3,4,7,8-PeCDF-13C	2.00	67
Total TCDD	ND	-----	-----		1,2,3,7,8-PeCDD-13C	2.00	80
					1,2,3,4,7,8-HxCDF-13C	2.00	70
1,2,3,7,8-PeCDF	ND	-----	1.50		1,2,3,6,7,8-HxCDF-13C	2.00	82
2,3,4,7,8-PeCDF	ND	-----	1.20		2,3,4,6,7,8-HxCDF-13C	2.00	77
Total PeCDF	ND	-----	-----		1,2,3,7,8,9-HxCDF-13C	2.00	72
					1,2,3,4,7,8-HxCDD-13C	2.00	66
1,2,3,7,8-PeCDD	ND	-----	1.60		1,2,3,6,7,8-HxCDD-13C	2.00	88
Total PeCDD	ND	-----	-----		1,2,3,4,6,7,8-HpCDF-13C	2.00	73
					1,2,3,4,7,8,9-HpCDF-13C	2.00	63
1,2,3,4,7,8-HxCDF	ND	-----	0.75		1,2,3,4,6,7,8-HpCDD-13C	2.00	80
1,2,3,6,7,8-HxCDF	ND	-----	0.86		OCDD-13C	4.00	68
2,3,4,6,7,8-HxCDF	ND	-----	1.10				
1,2,3,7,8,9-HxCDF	ND	-----	1.20		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	-----	-----		1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	1.10		2,3,7,8-TCDD-37Cl4	0.20	73
1,2,3,6,7,8-HxCDD	ND	-----	0.99				
1,2,3,7,8,9-HxCDD	ND	-----	1.00				
Total HxCDD	ND	-----	-----				
1,2,3,4,6,7,8-HpCDF	ND	-----	2.10				
1,2,3,4,7,8,9-HpCDF	ND	-----	1.90				
Total HpCDF	2.2	-----	-----	J			
1,2,3,4,6,7,8-HpCDD	2.4	-----	1.40	J			
Total HpCDD	2.4	-----	-----	J			
OCDF	5.2	-----	1.80	J			
OCDD	5.6	-----	2.90	J			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
PRL = Pace Analytical Reporting Limit
A = Limit of Detection based on signal to noise
P = Recovery outside of method 1613 control limits
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
J = Value below calibration range
* = See Discussion

Report No.....106124

REPORT OF LABORATORY ANALYSIS

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1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Pace Analytical™

Method 1613B Laboratory Control Spike Results

Client - Del Mar Analytical

Lab Sample ID	LCS-6221		
Filename	F50129B_03	Matrix	Water
Total Amount Extracted	1040 mL	Dilution	NA
ICAL Date	11/29/2004	Extracted	01/28/2005
CCal Filename	F50129B_02	Analyzed	01/29/2005 21:22
Method Blank ID	BLANK-6220	Injected By	BAL

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDF	10	9.9	7.5	15.8	99
2,3,7,8-TCDD	10	8.6	6.7	15.8	86
1,2,3,7,8-PeCDF	50	50.5	40.0	67.0	101
2,3,4,7,8-PeCDF	50	48.2	34.0	80.0	96
1,2,3,7,8-PeCDD	50	43.3	35.0	71.0	87
1,2,3,4,7,8-HxCDF	50	45.6	36.0	67.0	91
1,2,3,6,7,8-HxCDF	50	48.7	42.0	65.0	97
2,3,4,6,7,8-HxCDF	50	49.1	35.0	78.0	98
1,2,3,7,8,9-HxCDF	50	46.5	39.0	65.0	93
1,2,3,4,7,8-HxCDD	50	49.9	35.0	82.0	100
1,2,3,6,7,8-HxCDD	50	51.3	38.0	67.0	103
1,2,3,7,8,9-HxCDD	50	50.1	32.0	81.0	100
1,2,3,4,6,7,8-HpCDF	50	50.3	41.0	61.0	101
1,2,3,4,7,8,9-HpCDF	50	53.3	39.0	69.0	107
1,2,3,4,6,7,8-HpCDD	50	45.4	35.0	70.0	91
OCDF	100	95.6	63.0	170.0	96
OCDD	100	97.1	78.0	144.0	97
2,3,7,8-TCDD-37Cl4	10	6.9	3.1	19.1	69
2,3,7,8-TCDF-13C	100	51.5	22.0	152.0	52
2,3,7,8-TCDD-13C	100	67.8	20.0	175.0	68
1,2,3,7,8-PeCDF-13C	100	61.4	21.0	192.0	61
2,3,4,7,8-PeCDF-13C	100	65.9	13.0	328.0	66
1,2,3,7,8-PeCDD-13C	100	77.8	21.0	227.0	78
1,2,3,4,7,8-HxCDF-13C	100	70.2	19.0	202.0	70
1,2,3,6,7,8-HxCDF-13C	100	78.0	21.0	159.0	78
2,3,4,6,7,8-HxCDF-13C	100	74.1	22.0	176.0	74
1,2,3,7,8,9-HxCDF-13C	100	70.4	17.0	205.0	70
1,2,3,4,7,8-HxCDD-13C	100	69.0	21.0	193.0	69
1,2,3,6,7,8-HxCDD-13C	100	82.8	25.0	163.0	83
1,2,3,4,6,7,8-HpCDF-13C	100	72.1	21.0	158.0	72
1,2,3,4,7,8,9-HpCDF-13C	100	62.4	20.0	186.0	62
1,2,3,4,6,7,8-HpCDD-13C	100	80.1	26.0	166.0	80
OCDD-13C	200	135.6	26.0	397.0	68

Cs = Concentration Spiked (ng/mL)
Cr = Concentration Recovered (ng/mL)
Rec. = Recovery (Expressed as Percent)
Control Limit Reference: Method 1613, Table 6, 10/94 Revision
X = Background subtracted value
P = Recovery outside of control limits
Nn = Value obtained from additional analysis
* = See Discussion

Report No.....106124

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Method 1613B Laboratory Control Spike Results

Client - Del Mar Analytical

Lab Sample ID	LCSD-6222		
Filename	F50129B_04	Matrix	Water
Total Amount Extracted	1040 mL	Dilution	NA
ICAL Date	11/29/2004	Extracted	01/28/2005
CCal Filename	F50129B_02	Analyzed	01/29/2005 22:09
Method Blank ID	BLANK-6220	Injected By	BAL

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDF	10	10.6	7.5	15.8	106
2,3,7,8-TCDD	10	9.4	6.7	15.8	94
1,2,3,7,8-PeCDF	50	53.2	40.0	67.0	106
2,3,4,7,8-PeCDF	50	50.7	34.0	80.0	101
1,2,3,7,8-PeCDD	50	46.0	35.0	71.0	92
1,2,3,4,7,8-HxCDF	50	47.6	36.0	67.0	95
1,2,3,6,7,8-HxCDF	50	50.9	42.0	65.0	102
2,3,4,6,7,8-HxCDF	50	50.9	35.0	78.0	102
1,2,3,7,8,9-HxCDF	50	49.0	39.0	65.0	98
1,2,3,4,7,8-HxCDD	50	52.4	35.0	82.0	105
1,2,3,6,7,8-HxCDD	50	54.2	38.0	67.0	108
1,2,3,7,8,9-HxCDD	50	52.5	32.0	81.0	105
1,2,3,4,6,7,8-HpCDF	50	55.0	41.0	61.0	110
1,2,3,4,7,8,9-HpCDF	50	55.7	39.0	69.0	111
1,2,3,4,6,7,8-HpCDD	50	48.0	35.0	70.0	96
OCDF	100	100.6	63.0	170.0	101
OCDD	100	101.9	78.0	144.0	102
2,3,7,8-TCDD-37Cl4	10	8.7	3.1	19.1	87
2,3,7,8-TCDF-13C	100	70.4	22.0	152.0	70
2,3,7,8-TCDD-13C	100	88.6	20.0	175.0	89
1,2,3,7,8-PeCDF-13C	100	73.6	21.0	192.0	74
2,3,4,7,8-PeCDF-13C	100	79.0	13.0	328.0	79
1,2,3,7,8-PeCDD-13C	100	95.5	21.0	227.0	96
1,2,3,4,7,8-HxCDF-13C	100	84.8	19.0	202.0	85
1,2,3,6,7,8-HxCDF-13C	100	89.5	21.0	159.0	90
2,3,4,6,7,8-HxCDF-13C	100	87.2	22.0	176.0	87
1,2,3,7,8,9-HxCDF-13C	100	82.1	17.0	205.0	82
1,2,3,4,7,8-HxCDD-13C	100	80.1	21.0	193.0	80
1,2,3,6,7,8-HxCDD-13C	100	97.0	25.0	163.0	97
1,2,3,4,6,7,8-HpCDF-13C	100	84.4	21.0	158.0	84
1,2,3,4,7,8,9-HpCDF-13C	100	71.7	20.0	186.0	72
1,2,3,4,6,7,8-HpCDD-13C	100	92.4	26.0	166.0	92
OCDD-13C	200	159.2	26.0	397.0	80

Cs = Concentration Spiked (ng/mL)
Cr = Concentration Recovered (ng/mL)
Rec. = Recovery (Expressed as Percent)
Control Limit Reference: Method 1613, Table 6, 10/94 Revision
X = Background subtracted value
P = Recovery outside of control limits
Nn = Value obtained from additional analysis
* = See Discussion

Report No.....106124

REPORT OF LABORATORY ANALYSIS

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SPIKE RECOVERY RELATIVE PERCENT DIFFERENCE (RPD) RESULTS

Client.....Del Mar Analytical

SPIKE 1 ID.....LCS-6221
SPIKE 1 Filename..... F50129B_03
SPIKE 2 ID.....LCSD-6222
SPIKE 2 Filename..... F50129B_04

COMPOUND	SPIKE 1 REC,%	SPIKE 2 REC,%	RPD,%
2378-TCDF	99	106	6.8
2378-TCDD	86	94	8.9
12378-PeCDF	101	106	4.8
23478-PeCDF	96	101	5.1
12378-PeCDD	87	92	5.6
123478-HxCDF	91	95	4.3
123678-HxCDF	97	102	5.0
234678-HxCDF	98	102	4.0
123789-HxCDF	93	98	5.2
123478-HxCDD	100	105	4.9
123678-HxCDD	103	108	4.7
123789-HxCDD	100	105	4.9
1234678-HpCDF	101	110	8.5
1234789-HpCDF	107	111	3.7
1234678-HpCDD	91	96	5.3
OCDF	96	101	5.1
OCDD	97	102	5.0

REC = Percent Recovered
RPD = The difference between the two values divided by the average.
NA = Not Applicable

Report No..... 106124, 106125, 106126
106127, 106128, 106130
106131, 106132, 106135

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TABLE 1. 2,3,7,8-TCDD Equivalency Factors (TEFs) for the Polychlorinated Dibenzo-p-dioxins and Dibenzofurans

Number	Compound(s)	TEF
1	2,3,7,8-TCDD	1.00
2	1,2,3,7,8-PeCDD	0.50
3	1,2,3,6,7,8-HxCDD	0.1
4	1,2,3,7,8,9-HxCDD	0.1
5	1,2,3,4,7,8-HxCDD	0.1
6	1,2,3,4,6,7,8-HpCDD	0.01
7	OCDD	0.001
8	* Total - TCDD	0.0
9	* Total - PeCDD	0.0
10	* Total - HxCDD	0.0
11	* Total - HpCDD	0.0
12	2,3,7,8-TCDF	0.10
13	1,2,3,7,8-PeCDF	0.05
14	2,3,4,7,8-PeCDF	0.5
15	1,2,3,6,7,8-HxCDF	0.1
16	1,2,3,7,8,9-HxCDF	0.1
17	1,2,3,4,7,8-HxCDF	0.1
18	2,3,4,6,7,8-HxCDF	0.1
19	1,2,3,4,6,7,8-HpCDF	0.01
20	1,2,3,4,7,8,9-HpCDF	0.01
21	OCDF	0.001
22	* Total - TCDF	0.0
23	* Total - PeCDF	0.0
24	* Total - HxCDF	0.0
25	* Total - HpCDF	0.0

*Excluding the 2,3,7,8-substituted congeners.

Reference: 1989 ITEFs

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Del Mar Analytical

17461 Derian Ave. Suite 100, Irvine, CA 92614 Ph (949) 261-1022 Fax (949) 261-1228
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2520 E. Sunset Rd., Suite #3, Las Vegas, NV 89120 Ph (702) 798-3620 Fax (702) 798-3621

SUBCONTRACT ORDER - PROJECT # IOA0555 106127

SENDING LABORATORY:	RECEIVING LABORATORY:
Del Mar Analytical, Irvine 17461 Derian Avenue. Suite 100 Irvine, CA 92614 Phone: (949) 261-1022 Fax: (949) 261-1228 Project Manager: Michele Harper	Pace Analytical, MN- SUB 1700 Elm Street, Ste 200 Minneapolis, MN 55414 Phone :(612) 607-1700 Fax: (612) 607-6444

Standard TAT is requested unless specific due date is requested => Due Date:_____ Initials:_____

Analysis	Expiration	Comments
Sample ID: IOA0555-01 Water	**Sampled: 01/11/05 09:35**	**Instant Nofication** 106127CC1
1613-Dioxin-HR	01/18/05 09:35	J flags, 17 congeners, no TEQ, sub to Pace-MN
EDD + Level 4	02/08/05 09:35	Excel EDD email to pm,Include Std logs for Lvl IV

Containers Supplied:
1 L Amber (IOA0555-01C)
1 L Amber (IOA0555-01D)

SAMPLE INTEGRITY:

All containers intact: ☐ Yes ☐ No Sample labels/COC agree: ☐ Yes ☐ No Samples Received On Ice:: ☐ Yes ☐ No
Custody Seals Present: ☐ Yes ☐ No Samples Preserved Properly: ☐ Yes ☐ No Samples Received at (temp): 3.0

Released By	Date	Time	Received By	Date	Time
[signature]	1/12/05		[signature]	1.13.05	09:45