J. Brady Crouch

ConocoPhillips Company **Risk Management & Remediation** Program Manager

600 N. Dairy Ashford EC3-06-W056 Houston, TX 77079 Phone: 832-486-3016



Mr. Randolph Bayliss, P. E. District III & IV Hydrologist New Mexico Oil Conservation Division 1220 South St. Francis Dr. Santa Fe, NM 87505

March 21, 2017

Re: NMOCD Case No. 3R-1038, 2016 Annual Groundwater Monitoring and Site **Assessment Report**

Dear Mr. Bayliss:

Enclosed is the 2016 Annual Groundwater Monitoring and Site Assessment Report for the Mangum No. 1 site. This report, prepared by GHD Services, Inc., contains the results of groundwater monitoring and site assessment activities in 2016.

Please let me know if you have any questions.

Sincerely,

Fough B. Cauch

J. Brady Crouch

Enc



2016 Well Installation and Groundwater Monitoring Report

Mangum No. 1 S27, T29N, R11W San Juan County, New Mexico API# 30-045-07835 NMOCD# 3R-1038

ConocoPhillips Company

GHD | 6121 Indian School Rd NE Suite 200 Albuquerque NM 87110 USA 11102646| Report No 4 | March 21, 2017



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1. Introduction

This report presents the results of monitoring well installation and quarterly groundwater monitoring events conducted on behalf of ConocoPhillips Company (ConocoPhillips) by GHD Services, Inc. (GHD) at the Mangum No. 1 natural gas well site (hereafter referred to as the "Site"). The Site is located on federal land in Section 27, Township 29N, Range 11W of San Juan County, New Mexico. Geographical coordinates for the Site are 36.6965°North, 107.9840°West. The Site consists of a natural gas well and associated equipment. The Site Location Map and Site Plan are presented as Figure 1 and 2, respectively.

1.1 Site History

Site remediation was performed to address soil impacts from an historical release of produced water and condensate. An excavation with dimensions of approximately 100 feet (ft) by 40 ft, from 9 ft to 17 ft deep was was dug in February 2016. Approximately 1,400 cubic yards (cy) of impacted soils were hauled away for off-Site disposal. Groundwater was encountered in the excavation at 16 ft below ground surface (bgs). Approximately 1 foot of groundwater saturated soil was removed from beneath the water table. The groundwater accumulation at the bottom of the excavation was evacuated using a vacuum truck. Groundwater was allowed to recharge overnight and was evacuated for three consecutive days. Approximately 275 barrels (bbls) of groundwater were removed and transported for off-Site disposal.

A sample was obtained from the groundwater accumulation at the bottom of the excavation. The groundwater sample was analyzed for VOCs, dissolved metals including arsenic, barium, cadmium, calcium, chromium, iron, manganese, magnesium, sodium, and zinc, and for general chemistry analytes including chloride, potassium, nitrate, sulfate, fluoride, total alkalinity, bicarbonate, total hardness, pH, and specific conductivity. The groundwater sample indicated analytical results exceeding the applicable New Mexico Water Quality Control Commission (NMWQCC) groundwater quality standards for benzene, xylenes, dissolved manganese, and sulfate. The excavation was backfilled with segregated field screened soils (i.e., below 100 parts per million (ppm) on photo-ionization detector) and clean, imported fill. A report summarizing the soil excavation and subsequent groundwater recovery and sampling activities was submitted under separate cover earlier in 2016.

In May 2016, four groundwater monitoring wells were installed at the Site to assess the extent of impacts. Following the installation and development of the new wells, groundwater samples were collected in June and again in September and November 2016. Details of the monitor well installations and quarterly groundwater sampling events are presented below.

2. Monitor Well Installation

Monitor wells MW-1 through MW-4 were installed May 25-27, 2016 by National EWP of Peralta, New Mexico. Monitor well locations were proposed in a workplan submitted to both the New Mexico Oil Conservation Division and the federal Bureau Land Management. GHD met on Site with



representatives from these agencies prior to beginning drilling to evaluate proposed locations and reach consensus based on lease access limitations.

2.1 Monitor Well Drilling and Installation

Prior to initiation of monitor well installation activities, permits were submitted to and approved by the New Mexico Office of the State Engineer and a utility clearance protocol was completed. Borings were pre-drilled to a depth of 5 feet below ground surface (ft bgs) using hydro-excavation.

Yellow Jacket Drilling Services of Gilbert, Arizona, installed the monitoring wells May 25-27, 2016. The boreholes were drilled using a CME-85 drill rig and Stratex drilling equipment to address subsurface gravels and cobbles observed during the Site excavation. Boring MW-1 was drilled through excavation backfill and encountered silty-sand fill material to 18 ft bgs where a soft, weathered shale was encountered. Borings MW-2 through MW-4 encountered poorly-graded sand to 8 to 10 ft bgs, below which a sandy gravel/cobble layer until the weathered shale was encountered generally at 18 to 19 ft bgs. Groundwater was encountered at approximately 15 ft bgs, though it was generally a thin layer of moist to wet soils from 15 to 19 ft bgs where the dry shale was encountered. The Boring Log and Well Completion Forms are included as Appendix A.

Two-inch diameter, schedule 40 PVC monitoring wells were installed in each boring. The wells were installed to depths of 18 to 20 ft bgs and constructed with 10 ft of 2-inch machine slot 0.02-inch PVC screen. The wells were completed with 2-inch diameter PVC blank casing above the screened intervals.

The annulus in each borehole was backfilled with a 10/20 silica sand pack from the bottom to approximately 2 feet above the well screen. A 2-foot thick seal of 3/8-inch hydrated bentonite chips was placed above the sand pack. The remainder of the borehole annulus in each borehole was filled with a high solids bentonite grout mix.

Monitor well MW-1 was completed with a traffic-rated flush mount well cover embedded in a 2-foot by 2-foot by 4-inch thick concrete pad. Monitor wells MW-2 through MW-4 surface completions consist of a locking, stick-up well vault placed within a 2-foot by 2-foot by 4-inch thick concrete pad.

Well development was performed by bailing and surging the wells until turbidity visibly cleared and field parameters of pH, temperature, and conductivity stabilized (within a 10% margin). Well development water was placed in the on-Site produced water tank.

3. Groundwater Monitoring

3.1 Groundwater Monitoring Results

Quarterly groundwater sampling events took place in June, September and November. Depth to groundwater was gauged at monitoring wells MW-1, MW-2, MW-3 and MW-4 using an oil/water interface probe prior to sampling. A summary of historical depths to water and groundwater elevations can be found in Table 1. Groundwater potentiometric surface maps detailing groundwater elevations and groundwater flow direction using data collected during the 2016



quarterly sampling events are presented as Figures 3, 4, and 5. Groundwater flow direction at the site varies seasonally from north to northwest.

Prior to sample collection, monitor wells MW-1, MW-2, MW-3 and MW-4 were purged of at least three casing volumes of water using a dedicated polyethylene bailer prior to sampling. Groundwater quality parameters including pH, temperature, oxidation reduction potential, total dissolved solids, and conductivity were collected using a calibrated YSI 556 Multi Parameter Sonde and were recorded on GHD groundwater sampling field forms. Field parameters collected during sampling are included in Table 2.

Groundwater samples were placed in laboratory prepared bottles, packed on ice and shipped under chain of custody documentation to Pace Analytical Laboratories (Pace) located in Lenexa, Kansas. Groundwater samples were analyzed for benzene, toluene, ethylbenzene, and xylenes (BTEX) by EPA Method 8260 (all wells) and for dissolved manganese by EPA Method 6010B, and for sulfate by EPA Method 300.0.

The benzene and dissolved manganese concentrations where above the regulatory limit across all wells and dates. The concentrations of sulfates, xylenes and ethylbenzene were sporadically above and below the regulatory limit.

A summary of historical laboratory analytical results is presented as Table 3. Groundwater laboratory analytical reports are included as Appendix B.

4. **Conclusions and Recommendations**

Based on analytical results from the groundwater samples collected from Site monitor wells to date, the following observations and recommendations are made:

- Four monitor wells were installed at the Site to assess the extent of groundwater impacts.
- Samples from the monitor wells were collected during three quarterly groundwater monitoring events in 2016.
- Concentrations of BTEX constituents and dissolved manganese and sulfates occur in Site groundwater at levels above NMWQCC standards.
- Continuation of quarterly groundwater monitoring through 2017 is recommended to verify seasonal fluctuations in groundwater flow direction and gradient.

Figures

GHD | 2016 Well Installation and Groundwater Monitoring Report | 11102646 (4)



SOURCE: USGS 7.5 MINUTE QUAD "BLOOMFIELD AND HORN CANYON, NEW MEXICO WEST"

LAT/LONG: 36.6955° NORTH, 107.9840° WEST COORDINATE: NAD83 DATUM, U.S. FOOT STATE PLANE ONE - NEW MEXICO WEST

Figure 1

SITE LOCATION MAP MANGUM #1 SAN JUAN COUNTY, NEW MEXICO *ConocoPhillips Company*



11102646-00(000)GN-DL002 FEB 25/2016



11102646-00(004)GN-DL001 JAN 25, 2017



11102646-00(004)GN-DL001 FEB 1, 2017



NDWATER ELEVATION CONTOUR MAP - SEPTEMBER 2016 MANGUM #1 SAN JUAN COUNTY, NEW MEXICO *ConocoPhillips Company*

11102646-00(004)GN-DL001 JAN 25, 2017

GHD



GROUNDWATER ELEVATION CONTOUR MAP - NOVEMBER 2016 MANGUM #1 SAN JUAN COUNTY, NEW MEXICO *ConocoPhillips Company*

11102646-00(004)GN-DL001 FEB 8, 2017

GHD



GROUNDWATER CONCENTRATIONS MAP MANGUM #1 SAN JUAN COUNTY, NEW MEXICO *ConocoPhillips Company*

11102646-00(004)GN-DL001 JAN 25, 2017

GHD

Tables

GHD | 2016 Well Installation and Groundwater Monitoring Report | 11102646 (4)

Table 1

Groundwater Elevations ConocoPhillips Company Mangum No.1 San Juan County, New Mexico

Well ID	Top of Casing (feet)	Date of Measurement	Depth to Water (feet)	Groundwater Elevation (feet)
		6/8/2016	15.12	83.85
MW-1	98.97	9/12/2016	14.75	84.22
		11/29/2016	15.06	83.91
		6/8/2016	17.49	83.56
MW-2	101.05	9/12/2016	17.28	84.07
		11/29/2016	17.62	83.43
		6/8/2016	18.47	82.88
MW-3	101.35	9/12/2016	18.41	82.94
		11/29/2016	18.84	82.51
		6/8/2016	19.72	84.04
MW-4	103.76	9/12/2016	19.43	84.33
		11/29/2016	19.62	84.14

Table 2

Field Parameters ConocoPhillips Company Mangum No.1 San Juan County, New Mexico

Well ID	Date	Temp°C	рН	TDS (g/L)	SC (µS/cm)	DO (mg/L)	ORP (mV)	Volume (gal)
MW-1	11/29/2016	16.54	7.42		2.607	1.52	-155.3	
MW-2	11/29/2016	16.04	7.2		2.299	2.21	-109.3	
MW-3	11/29/2016	15.01	7.09		3.091	2.52	-91	
	6/23/2016	15.1	7.29		2.95	1.04	-148.5	1.5
MW-4	11/29/2016	16.01	7.4		2.396	1.59	-127.5	

Notes:

TDS = total dissolved solids

SC = Soil Conductivity

DO = dissolved oxygen ORP = oxidation-reduction potential

Table 3

Groundwater Laboratory Analytical Results Summary ConocoPhillips Company Mangum No.1

San Juan	County,	New	Mexico	
----------	---------	-----	--------	--

										Total
							Xylenes		Manganese	Dissolved
Well ID	Sample ID	Date	Sample Type	Benzene	Toluene	Ethylbenzene	(Total)	Sulfate	(Dissolved)	Solids
				(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
	NMWQCC Groundwater Quality S	tandards		0.01	0.75	0.75	0.62	600	0.2	1000
	WT-11102646-060816-JWMW1	6/8/2016	(orig)	0.0388	<0.020	0.358	4.01	1170	1.69	2590
MW-1	GW-11102646-091216-CM-MW-1	9/12/2016	(orig)	0.0111	< 0.001	0.0946	0.382	577	0.925	
	GW-11102646-112916-CN-MW-1	11/29/2016	(orig)	0.0132	< 0.001	0.119	0.445	240	0.990	
	WT-11102646-060816-JW-MW-2	6/8/2016	(orig)	0.103	< 0.001	0.0072	0.0448	3.0	1.06	1580
MW-2	GW-11102646-091216-CM-MW-2	9/12/2016	(orig)	0.0647	< 0.001	0.0021	0.0032	2.8	1.73	
	GW-11102646-112916-CN-MW-2	11/29/2016	(orig)	0.0257	< 0.001	0.0021	< 0.003	2.6	1.41	
	WT-11102646-060816-JW-MW-3	6/8/2016	(orig)	2.95	<0.020	0.813	7.78	110	2.65	2190
MW-3	GW-11102646-091216-CM-MW-3	9/12/2016	(orig)	2.27	< 0.001	0.44	2.49	112	3.62	
	GW-11102646-091216-CN-MW-3	11/29/2016	(orig)	2.97	< 0.001	0.845	5.44	22.5	3.12	
MW-4	GW-11102646-062316-SP-MW-4	6/23/2016	(orig)	0.118	< 0.001	0.186	1.06	838	0.983	
	GW-11102646-091216-CM-MW-4	9/12/2016	(orig)	0.0742	< 0.001	0.114	0.803	735	1.32	
	GW-11102646-112916-CN-MW-4	11/29/2016	(orig)	0.0853	< 0.001	0.0929	0.967	382	1.26	

Notes:

NMWQCC = New Mexico Water Quality Control Commission

mg/L = milligrams per liter (parts per million)

< 0.001 = Below Laboratory Detection Limit of 0.001 mg/L, etc

-- = Not Analyzed



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Appendix A Boring Logs/Well Completion Diagrams

PROJECT NAME: Mangum No. 1 LOCATION: San Juan County, New Mexico FIELD LOGGED BY: Jeff Walker SURFACE ELEVATION (msl): No survey data available GROUNDWATER ELEVATION (msl): REMARKS: COORDINATES:			DRILL TYPE: <u>Stratex</u> <u>CME-85</u> BORE HOLE DIAMETER: 7 7/8" DRILLED BY: <u>Yellow Jacket Drilling</u> DATE/TIME HOLE STARTED: 5/26/207 DATE/TIME HOLE COMPLETED: 5/26/	16 2016			
DEPTH (bgs) - ft SAMPLE TO LAB	SAMPLE ID	STRATAGRAPHIC SEQUENCE	COMPLETION INFORMATION	CLASSIFICATION AND DESCRIPTION	(mqq)	Total BTEX (mg/kg)	Total TPH (mg/kg)
0							
				pre-cleared by air knife Silty Sand: SM: loose, greenish gray, slightly moist to moist			



PROJECT NAME: Mangum No. 1 1 LOCATION: San Juan County, New Mexico 1 FIELD LOGGED BY: Jeff Walker 1 SURFACE ELEVATION (msl): No survey data available 1 GROUNDWATER ELEVATION (msl): 1 REMARKS: 1 COORDINATES: 1			jum No. 1 County, New Mexico f Walker (msl) <u>: No survey dat</u> ATION (msl <u>):</u>	SOIL BORING NO: MW-2 DRILL TYPE: Stratex BORE HOLE DIAMETER: 7 7/8" DRILLED BY: Yellow Jacket Drilling DATE/TIME HOLE STARTED: 5/26/20 DATE/TIME HOLE COMPLETED: 5/26/	16 2016			
DEPTH (bgs) - ft	SAMPLE TO LAB	SAMPLE ID	STRATAGRAPHIC SEQUENCE	COMPLETION INFORMATION	CLASSIFICATION AND DESCRIPTION	(mqq)	Total BTEX (mg/kg)	Total TPH (mg/kg)
					pre-cleared by air knife			
-5					Sand: SP: loose, light brown, poorlry graded, fine to medium with trace coarse grains and gravel, no odor			
-10					Gravel and Sand: SP/GW: light brown gray, fine to coarse gained sand, fine to mediuam gravel, slightly moist. Dark gray with no odor at 13 feet bgs. Dark gray to black and wet at 15 feet bgs.			
-15 — - - -					Shale: soft, weathered, greenish, dry			



PROJECT NAME: Mangum No. 1 LOCATION: San Juan County, New Mexico FIELD LOGGED BY: Jeff Walker SURFACE ELEVATION (msl): No survey data available GROUNDWATER ELEVATION (msl): REMARKS: COORDINATES:					SOIL BORING NO: MW-3 DRILL TYPE: Stratex CME-85 BORE HOLE DIAMETER: 7 7/8" DRILLED BY: Yellow Jacket Drilling DATE/TIME HOLE STARTED: 5/26/20 DATE/TIME HOLE COMPLETED:5/26/	16 2016			
DEPTH (bgs) - ft	SAMPLE TO LAB	SAMPLE ID	STRATAGRAPHIC SEQUENCE	COMPLETION INFORMATION		CLASSIFICATION AND DESCRIPTION	(mqq)	Total BTEX (mg/kg)	Total TPH (mg/kg)
					Sa gra od Gr gr: sli wi	and: SP: loose, light brown, poorly aded, fine grained, slightly moist, no for			



PROJECT NAME: Mangum No. 1 LOCATION: San Juan County, New Mexico FIELD LOGGED BY: Jeff Walker SURFACE ELEVATION (msl): No survey data available GROUNDWATER ELEVATION (msl): REMARKS: COORDINATES:			SOIL BORING NO: MW-4 DRILL TYPE: Stratex CME-85 BORE HOLE DIAMETER: 7 7/8" DRILLED BY: Yellow Jacket Drilling DATE/TIME HOLE STARTED: 5/26/207 DATE/TIME HOLE COMPLETED: 5/26/	16 2016			
DEPTH (bgs) - ft SAMPLE TO LAB	SAMPLE ID	STRATAGRAPHIC SEQUENCE	COMPLETION INFORMATION	CLASSIFICATION AND DESCRIPTION	(mqq)	Total BTEX (mg/kg)	Total TPH (mg/kg)
0					1	T	
-10				pre-cleared by air knife Sand: SP: loose, light brown, poorly graded, fine to medium grained, some fine gravels, slightly moist Gravel and Sand: GW: gray, fine to coarse grained sand, fine gravel. Moist at 15 feet bgs, wet at 18 feet bgs.			



Appendix B Groundwater Laboratory Analytical Reports



Pace Analytical Services, Inc. 9608 Loiret Blvd. Lenexa, KS 66219 (913)599-5665

June 22, 2016

Jeffrey Walker GHD Services, Inc 6121 Indian School Rd NE Ste 200 Albuquerque, NM 87110

RE: Project: 11102646 COP Magnum No1 Pace Project No.: 60221153

Dear Jeffrey Walker:

Enclosed are the analytical results for sample(s) received by the laboratory on June 10, 2016. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Alice Flanazan

Alice Flanagan alice.flanagan@pacelabs.com Project Manager

Enclosures

cc: Angela Bown, GHD Services, Inc,





CERTIFICATIONS

Project: 11102646 COP Magnum No1

Pace Project No.: 60221153

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219 WY STR Certification #: 2456.01 Arkansas Certification #: 15-016-0 Illinois Certification #: 003097 Iowa Certification #: 118 Kansas/NELAP Certification #: E-10116 Louisiana Certification #: 03055 Nevada Certification #: KS000212008A Oklahoma Certification #: 9205/9935 Texas Certification #: T104704407 Utah Certification #: KS00021 Kansas Field Laboratory Accreditation: # E-92587



SAMPLE SUMMARY

Project: 11102646 COP Magnum No1

Pace Project No.: 60221153

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60221153001	WT-11102646-060816-JW-MW1	Water	06/08/16 15:35	06/10/16 10:20
60221153002	WT-11102646-060816-JW-MW2	Water	06/08/16 15:15	06/10/16 10:20
60221153003	WT-11102646-060816-JW-MW3	Water	06/08/16 14:30	06/10/16 10:20



SAMPLE ANALYTE COUNT

 Project:
 11102646 COP Magnum No1

 Pace Project No.:
 60221153

Lab ID	Sample ID	Method	Analysts	Analytes Reported
60221153001		EPA 6010	JGP	1
		EPA 5030B/8260	PGH	8
		SM 2540C	HAC	1
		EPA 300.0	OL	1
60221153002	WT-11102646-060816-JW-MW2	EPA 6010	JGP	1
		EPA 5030B/8260	PGH	8
		SM 2540C	HAC	1
		EPA 300.0	OL	1
60221153003	WT-11102646-060816-JW-MW3	EPA 6010	JGP	1
		EPA 5030B/8260	PGH	8
		SM 2540C	HAC	1
		EPA 300.0	OL	1



Project: 11102646 COP Magnum No1

Pace Project No.: 60221153

 Method:
 EPA 6010

 Description:
 6010 MET ICP, Dissolved

 Client:
 GHD Services_COP NM

 Date:
 June 22, 2016

General Information:

3 samples were analyzed for EPA 6010. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:

The samples were prepared in accordance with EPA 3010 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:



Project: 11102646 COP Magnum No1

Pace Project No.: 60221153

Method: EPA 5030B/8260

Description:8260 MSVClient:GHD Services_COP NMDate:June 22, 2016

General Information:

3 samples were analyzed for EPA 5030B/8260. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

pH: Post-analysis pH measurement indicates insufficient VOA sample preservation.

• WT-11102646-060816-JW-MW3 (Lab ID: 60221153003)

Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

Internal Standards:

All internal standards were within QC limits with any exceptions noted below.

Surrogates:

All surrogates were within QC limits with any exceptions noted below.

Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MSV/76443

A matrix spike/matrix spike duplicate was not performed due to insufficient sample volume.

QC Batch: MSV/76476

A matrix spike/matrix spike duplicate was not performed due to insufficient sample volume.

Additional Comments:



Project: 11102646 COP Magnum No1

Pace Project No.: 60221153

Method:SM 2540CDescription:2540C Total Dissolved SolidsClient:GHD Services_COP NMDate:June 22, 2016

General Information:

3 samples were analyzed for SM 2540C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:



Project: 11102646 COP Magnum No1

Pace Project No.: 60221153

 Method:
 EPA 300.0

 Description:
 300.0 IC Anions 28 Days

 Client:
 GHD Services_COP NM

 Date:
 June 22, 2016

General Information:

3 samples were analyzed for EPA 300.0. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.



ANALYTICAL RESULTS

Project: 11102646 COP Magnum No1

Pace Project No.: 60221153

Sample: WT-11102646-060816-JW- MW1	Lab ID: 60221153001		Collected: 06/08/16 15:35		5 Received: 06	/10/16 10:20 N	fatrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
6010 MET ICP, Dissolved	Analytical Meth	nod: EPA 60	010 Preparation Meth	nod: EP	A 3010				
Manganese, Dissolved	1690	ug/L	5.0	1	06/13/16 15:30	06/15/16 14:23	7439-96-5		
8260 MSV	Analytical Meth	nod: EPA 50)30B/8260						
Benzene	38.8	ug/L	20.0	20		06/16/16 17:50	71-43-2		
Ethylbenzene	358	ug/L	20.0	20		06/16/16 17:50	100-41-4		
Toluene	ND	ug/L	20.0	20		06/16/16 17:50	108-88-3		
Xylene (Total)	4010	ug/L	60.0	20		06/16/16 17:50	1330-20-7		
Surrogates		•							
4-Bromofluorobenzene (S)	99	%	77-130	20		06/16/16 17:50	460-00-4		
1,2-Dichloroethane-d4 (S)	102	%	81-127	20		06/16/16 17:50	17060-07-0		
Toluene-d8 (S)	101	%	80-120	20		06/16/16 17:50	2037-26-5		
Preservation pH	1.0		0.10	20		06/16/16 17:50			
2540C Total Dissolved Solids	Analytical Meth	nod: SM 25	40C						
Total Dissolved Solids	2590	mg/L	5.0	1		06/14/16 13:18			
300.0 IC Anions 28 Days	Analytical Meth	nod: EPA 30	0.0						
Sulfate	1170	mg/L	100	100		06/21/16 14:51	14808-79-8		



ANALYTICAL RESULTS

Project: 11102646 COP Magnum No1

Pace Project No.: 60221153

Sample: WT-11102646-060816-JW- MW2	Lab ID: 60221153002		Collected: 06/08/16 15:15		6 Received: 06	/10/16 10:20 N	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, Dissolved	Analytical Meth	od: EPA 60	010 Preparation Meth	nod: EP	A 3010			
Manganese, Dissolved	1060	ug/L	5.0	1	06/13/16 15:30	06/15/16 14:27	7439-96-5	
8260 MSV	Analytical Meth	od: EPA 50	30B/8260					
Benzene	103	ug/L	1.0	1		06/15/16 17:19	71-43-2	
Ethylbenzene	7.2	ug/L	1.0	1		06/15/16 17:19	100-41-4	
Toluene	ND	ug/L	1.0	1		06/15/16 17:19	108-88-3	
Xylene (Total)	44.8	ug/L	3.0	1		06/15/16 17:19	1330-20-7	
Surrogates		•						
4-Bromofluorobenzene (S)	104	%	77-130	1		06/15/16 17:19	460-00-4	
1,2-Dichloroethane-d4 (S)	109	%	81-127	1		06/15/16 17:19	17060-07-0	
Toluene-d8 (S)	108	%	80-120	1		06/15/16 17:19	2037-26-5	
Preservation pH	1.0		0.10	1		06/15/16 17:19		
2540C Total Dissolved Solids	Analytical Meth	od: SM 254	40C					
Total Dissolved Solids	1580	mg/L	5.0	1		06/14/16 13:19		
300.0 IC Anions 28 Days	Analytical Meth	od: EPA 30	0.0					
Sulfate	3.0	mg/L	1.0	1		06/21/16 15:06	14808-79-8	



ANALYTICAL RESULTS

Project: 11102646 COP Magnum No1

Pace Project No.: 60221153

Sample: WT-11102646-060816-JW- MW3	Lab ID: 60221153003		Collected: 06/08/16 14:30		Received: 06	/10/16 10:20 N	latrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, Dissolved	Analytical Meth	nod: EPA 60	010 Preparation Meth	od: EP/	A 3010			
Manganese, Dissolved	2650	ug/L	5.0	1	06/13/16 15:30	06/15/16 14:31	7439-96-5	
8260 MSV	Analytical Meth	nod: EPA 50	030B/8260					
Benzene	2950	ug/L	20.0	20		06/16/16 18:05	71-43-2	
Ethylbenzene	813	ug/L	20.0	20		06/16/16 18:05	100-41-4	
Toluene	ND	ug/L	20.0	20		06/16/16 18:05	108-88-3	
Xylene (Total)	7780	ug/L	60.0	20		06/16/16 18:05	1330-20-7	
Surrogates		•						
4-Bromofluorobenzene (S)	100	%	77-130	20		06/16/16 18:05	460-00-4	
1,2-Dichloroethane-d4 (S)	103	%	81-127	20		06/16/16 18:05	17060-07-0	
Toluene-d8 (S)	100	%	80-120	20		06/16/16 18:05	2037-26-5	
Preservation pH	6.0		0.10	20		06/16/16 18:05		рН
2540C Total Dissolved Solids	Analytical Meth	nod: SM 254	40C					
Total Dissolved Solids	2190	mg/L	5.0	1		06/14/16 13:20		
300.0 IC Anions 28 Days	Analytical Meth	nod: EPA 30	0.0					
Sulfate	110	mg/L	10.0	10		06/21/16 15:21	14808-79-8	



QUALITY CONTROL DATA

Project:	11102646 C	OP Magnur	n No1										
Pace Project No.:	60221153												
QC Batch:	MPRP/363	817		Analysi	Analysis Method:		PA 6010						
QC Batch Method:	EPA 3010			Analysi	s Descrip	tion: 6	6010 MET Dissolved						
Associated Lab San	nples: 602	21153001, 6	60221153002,	602211530	03								
METHOD BLANK:	1775614			Μ	latrix: Wa	iter							
Associated Lab San	nples: 602	21153001, 6	60221153002,	602211530	03								
				Blank	R	Reporting							
Paran	neter		Units	Result		Limit	Analyz	ed	Qualifiers				
Manganese, Dissolv	ved		ug/L		ND	5.0	0 06/15/16	14:42					
LABORATORY COM	NTROL SAM	PLE: 177	5615										
				Spike	LCS	3	LCS	% Re	С				
Paran	neter		Units	Conc.	Resu	ult	% Rec	Limits	sQ	ualifiers	_		
Manganese, Dissolv	ved		ug/L	1000		1010	101	80)-120				
MATRIX SPIKE & N	IATRIX SPIK	E DUPLICA	TE: 17756	16		1775617							
				MS	MSD								
_		6	0221108001	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Paramete	r	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Manganese, Dissolv	red	ug/L	0.70 mg/L	1000	1000	1700	1680	100	98	75-125	1	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.


Project: 11102646 COP Magnum No1

Pace Project No.: 60221153

QC Batch: MSV/76443 Analysis Method: EPA 5030B/8260 QC Batch Method: EPA 5030B/8260 Analysis Description: 8260 MSV Water 10 mL Purge Associated Lab Samples: 60221153002 METHOD BLANK: 1776644 Matrix: Water Associated Lab Samples: 60221153002 Blank Reporting Limit Qualifiers Parameter Units Result Analyzed Benzene ND 1.0 06/15/16 14:26 ug/L Ethylbenzene ug/L ND 1.0 06/15/16 14:26 ug/L ND Toluene 1.0 06/15/16 14:26 Xylene (Total) ug/L ND 3.0 06/15/16 14:26 1,2-Dichloroethane-d4 (S) % 101 81-127 06/15/16 14:26 4-Bromofluorobenzene (S) % 101 77-130 06/15/16 14:26 Toluene-d8 (S) % 103 80-120 06/15/16 14:26

LABORATORY CONTROL SAMPLE: 1776645

		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Benzene	ug/L	20	18.8	94	79-116	
Ethylbenzene	ug/L	20	19.5	97	80-120	
Toluene	ug/L	20	19.4	97	80-120	
Xylene (Total)	ug/L	60	58.9	98	80-120	
1,2-Dichloroethane-d4 (S)	%			103	81-127	
4-Bromofluorobenzene (S)	%			101	77-130	
Toluene-d8 (S)	%			104	80-120	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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Project: 11102646 COP Magnum No1

Pace Project No.: 60221153

1,2-Dichloroethane-d4 (S)

4-Bromofluorobenzene (S)

Toluene-d8 (S)

,						
QC Batch:	MSV/76476		Analysis Meth	nod: El	PA 5030B/8260	
QC Batch Method:	EPA 5030B/8260		Analysis Des	cription: 82	260 MSV Water 10	mL Purge
Associated Lab Sar	mples: 602211530	01, 60221153003				
METHOD BLANK:	1777507		Matrix:	Water		
Associated Lab Sar	mples: 602211530	01, 60221153003				
			Blank	Reporting		
Parar	neter	Units	Result	Limit	Analyzed	Qualifiers
Benzene		ug/L	ND	1.0	06/16/16 13:45	
Ethylbenzene		ug/L	ND	1.0	06/16/16 13:45	
Toluene		ug/L	ND	1.0	06/16/16 13:45	
Xylene (Total)		ug/L	ND	3.0	06/16/16 13:45	

99

98

100

81-127 06/16/16 13:45

77-130 06/16/16 13:45

80-120 06/16/16 13:45

LABORATORY CONTROL SAMPLE: 1777508

		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Benzene	ug/L	20	20.0	100	79-116	
Ethylbenzene	ug/L	20	19.4	97	80-120	
Toluene	ug/L	20	19.6	98	80-120	
Xylene (Total)	ug/L	60	60.1	100	80-120	
1,2-Dichloroethane-d4 (S)	%			100	81-127	
4-Bromofluorobenzene (S)	%			99	77-130	
Toluene-d8 (S)	%			100	80-120	

%

%

%

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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Project:	11102646 COP N	lagnum No1						
Pace Project No.:	60221153							
QC Batch:	WET/62374		Analysis M	ethod:	SM 2540C			
QC Batch Method:	SM 2540C		Analysis D	escription:	2540C Total Di	ssolved Solids		
Associated Lab San	nples: 60221153	3001, 6022115300	2, 60221153003					
METHOD BLANK:	1775869		Matri	x: Water				
Associated Lab San	nples: 60221153	3001, 6022115300	2, 60221153003					
			Blank	Reporting				
Paran	neter	Units	Result	Limit	Analyze	d Quali	fiers	
Total Dissolved Soli	ds	mg/L	NE		5.0 06/14/16 1	3:13		
LABORATORY COM	NTROL SAMPLE:	1775870						
Paran	neter	Linits	Spike Conc	LCS Result	LCS % Rec	% Rec	Qualifiers	
Total Dissolved Soli	ds	ma/L	1000	967	97	80-120		
SAMPLE DUPLICA	TE: 1775871							
			60220983002	Dup		Max		
Paran	neter	Units	Result	Result	RPD	RPD	Qualifiers	
Total Dissolved Soli	ds	mg/L	1050	0 10	70	2	10	
SAMPLE DUPLICA	TE: 1775872							
			60221030001	Dup		Max		
Paran	neter	Units	Result	Result	RPD	RPD	Qualifiers	
Total Dissolved Soli	ds	mg/L	338	3 3	52	4	10	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



Project:	11102646 COP Ma	agnum No1										
Pace Project No.:	60221153											
QC Batch:	WETA/40171		Analys	is Method:	E	PA 300.0						
QC Batch Method:	EPA 300.0		Analys	is Descript	ion: 3	00.0 IC Anio	ns					
Associated Lab Sar	nples: 602211530	001, 60221153002,	602211530	003								
METHOD BLANK:	1779589		Ν	Aatrix: Wat	ter							
Associated Lab Sar	nples: 602211530	001, 60221153002,	60221153	003								
			Blank	K R	eporting							
Parar	neter	Units	Resul	t	Limit	Analyz	ed	Qualifiers	_			
Sulfate		mg/L		ND	1.0	06/21/16	08:58					
LABORATORY CO	NTROL SAMPLE:	1779590										
			Spike	LCS	;	LCS	% Red	;				
Parar	neter	Units	Conc.	Resu	lt	% Rec	Limits	a Qu	ualifiers			
Sulfate		mg/L	5		5.0	99	90)-110				
MATRIX SPIKE & N	IATRIX SPIKE DUP	LICATE: 17795	91		1779592							
			MS	MSD								
		60221033002	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Paramete	er Uni	ts Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Sulfate	mg/	L 260	100	100	357	356	97	96	80-120	0	15	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



QUALIFIERS

Project: 11102646 COP Magnum No1

Pace Project No.: 60221153

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

BATCH QUALIFIERS

Batch: MSV/76443

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

Batch: MSV/76476

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

ANALYTE QUALIFIERS

pH Post-analysis pH measurement indicates insufficient VOA sample preservation.



QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project:11102646 COP Magnum No1Pace Project No.:60221153

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60221153001	WT-11102646-060816-JW-MW1	EPA 3010	MPRP/36317	EPA 6010	ICP/26473
60221153002	WT-11102646-060816-JW-MW2	EPA 3010	MPRP/36317	EPA 6010	ICP/26473
60221153003	WT-11102646-060816-JW-MW3	EPA 3010	MPRP/36317	EPA 6010	ICP/26473
60221153001	WT-11102646-060816-JW-MW1	EPA 5030B/8260	MSV/76476		
60221153002	WT-11102646-060816-JW-MW2	EPA 5030B/8260	MSV/76443		
60221153003	WT-11102646-060816-JW-MW3	EPA 5030B/8260	MSV/76476		
60221153001	WT-11102646-060816-JW-MW1	SM 2540C	WET/62374		
60221153002	WT-11102646-060816-JW-MW2	SM 2540C	WET/62374		
60221153003	WT-11102646-060816-JW-MW3	SM 2540C	WET/62374		
60221153001	WT-11102646-060816-JW-MW1	EPA 300.0	WETA/40171		
60221153002	WT-11102646-060816-JW-MW2	EPA 300.0	WETA/40171		
60221153003	WT-11102646-060816-JW-MW3	EPA 300.0	WETA/40171		

Pace Analytical Sample Cond	ition Upon Receipt	WO#:60221153
Client Name: <u><u><u></u></u><u><u></u><u></u><u><u></u><u></u><u></u><u></u><u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u></u></u></u></u>	PEX □ ECI □ Pace Shipping Label U No □ Seals intact: Y le Bags □ Foam Type of Ice: Wat Blue (circle	Pace Optional Proj Due Date: Proj Name: No None Other Samples received on ice, cooling process has begun.
Cooler Temperature: 4.1 Temperature should be above freezing to 6°C		Date and initials of person examining contents: 88 6/10/6
Chain of Custody present:	Elyes No N/A	1.
Chain of Custody filled out:	Yes No N/A	2.
Chain of Custody relinquished:	Yes No N/A	3.
Sampler name & signature on COC:	Yes No N/A	4.
Samples arrived within holding time:	Yes No N/A	5.
Short Hold Time analyses (<72hr):	Yes No N/A	6.
Rush Turn Around Time requested:		7.
Sufficient volume:	Yes DNO DN/A	8.
	Yes DNo DN/A	
	Kes No N/A	9
Containers intact:	ZYes No N/A	10
Uppreserved 5035A soils frozen w/in 48hrs?	□Yes □No ZN/A	11.
Filtered volume received for dissolved tests?		12
Sample lehele meter COC:		
		42
All containers needing preservation have been checked.		13.
All containers needing preservation are found to be in comp	pliance Ves No N/A	14
Franctional VOA Californi OSC W/I DBO (water)	The Day	Initial when Lot # of added
Trip Blank present:		completed preservative
Page Trip Plank let # (if nurshaped):		15
Headspace in VOA vials (>6mm):		16.
Project sampled in USDA Regulated Area:	Yes No N/A	17. List State:
Additional labels attached to 5035A vials in the field?		18.
Client Notification/ Resolution: C	opy COC to Client? Y /	Field Data Required? Y / N
Person Contacted:	Date/Time:	
Comments/ Resolution:		
Project Manager Review:	ll_	Date: 6/10/16

	Pace Analytical				The Ch	ain-of-Cus	tody is a	EGAI	L DOCL	UMENT	. All re	evant	fields m	lust be c	complete	d accura	itely.		-		-
ection	A	Section B	at lafarmatic	į			Sectio	on C e Informa	ation.								Pa	: ade	-	5	-
equir	ed Client Information:	Report To: (Christine Math	ews			Attenti	:uo					ŀ	t.							
ddress	6212 Indian School Rd NE \$12	Copy To:	Jeff Walker				Comp	any Jame				1					0.2		_		
Ibuqu	rque, NM 87110	Angela Bown				8	Addre	SS: 1		-								Regulat	ory sgency		
mail:	christine mathews@ghd.com	Protect Name:	074027.0	Allenath Mo.	t cop M	CALL FORT	Pace	Project Ma	anager.	alice	flanadar	@pace	abs.com			94. 19-1	10.10	State	Location		
leques	ted Due Date:	Project #:	111001	146	Cap	2	Pace	Profile #:				5							MN		
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		MATRIX CODE	=COMP)	CO	LLECTED	NC		Ľ	Preserve	atives		N/A	X	N			105		0-0-		
	SAMPLE ID	Drinking Water DW Water WT Waste Water WW Product P Soil/Solid SL Oil OL	eboo bilav ees) -O BAAD=O)	START		2	BSS SALES	n'n s		м,-	-	test a	hered filtered	0908				(N\Y) enine		120	3
# WƏTI	One Character per box. (AZ, 0-9 / , -) Sample Ids must be unique	Wipe WP Air AR Other OT Tissue TS	MATRIX CODE SAMPLE TYPE D	TIM	EDATE	TIME		H52Ot	HCI	Na2S203	Ofher Methanol	Sulfate Sulfate	-nM bevlossiQ	X318				2 Residual Chic	2	2	
-	WT-11102646-060816-	I WW - WW.	WTCh 6/8	16 153	5			-11	×	Z			\Im	X	8	250	REN	. 1	30691	7	100
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Pace Analytical Services, Inc. 9608 Loiret Blvd. Lenexa, KS 66219 (913)599-5665

July 07, 2016

Christine Mathews GHD Services, Inc. 6212 Indian School Rd. NE St2 Albuquerque, NM 87110

RE: Project: 11102646 COP Mangum No 1 Pace Project No.: 60222266

Dear Christine Mathews:

Enclosed are the analytical results for sample(s) received by the laboratory on June 27, 2016. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Alice Flanagan

Alice Flanagan alice.flanagan@pacelabs.com Project Manager

Enclosures

cc: Angela Bown, GHD Services, Inc, Jeffrey Walker, GHD Services, Inc





CERTIFICATIONS

Project: 11102646 COP Mangum No 1

Pace Project No.: 60222266

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219 WY STR Certification #: 2456.01 Arkansas Certification #: 15-016-0 Illinois Certification #: 003097 Iowa Certification #: 118 Kansas/NELAP Certification #: E-10116 Louisiana Certification #: 03055 Nevada Certification #: KS000212008A Oklahoma Certification #: 9205/9935 Texas Certification #: T104704407 Utah Certification #: KS00021 Kansas Field Laboratory Accreditation: # E-92587



SAMPLE SUMMARY

Project: 11102646 COP Mangum No 1

Pace Project No.: 60222266

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60222266001	GW-11102646-062316-SP-MW4	Water	06/23/16 12:12	06/27/16 08:30
60222266002	GW-11102646-062316-SP-DUP	Water	06/23/16 00:00	06/27/16 08:30
60222266003	TRIP BLANK	Water	06/23/16 12:12	06/27/16 08:30



SAMPLE ANALYTE COUNT

 Project:
 11102646 COP Mangum No 1

 Pace Project No.:
 60222266

Lab ID	Sample ID	Method	Analysts	Analytes Reported
60222266001	GW-11102646-062316-SP-MW4	EPA 6010	JGP	1
		EPA 8260	JDH, JTK	9
		EPA 300.0	OL	1
60222266002	GW-11102646-062316-SP-DUP	EPA 8260	JDH, JTK	9
60222266003	TRIP BLANK	EPA 8260	JTK	9



Project: 11102646 COP Mangum No 1

Pace Project No.: 60222266

 Method:
 EPA 6010

 Description:
 6010 MET ICP, Dissolved

 Client:
 GHD Services_COP NM

 Date:
 July 07, 2016

General Information:

1 sample was analyzed for EPA 6010. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:

The samples were prepared in accordance with EPA 3010 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:



Project: 11102646 COP Mangum No 1

Pace Project No.: 60222266

Method:EPA 8260Description:8260 MSV GRO and OxygenatesClient:GHD Services_COP NMDate:July 07, 2016

General Information:

3 samples were analyzed for EPA 8260. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

pH: Post-analysis pH measurement indicates insufficient VOA sample preservation.

• GW-11102646-062316-SP-DUP (Lab ID: 60222266002)

Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

Internal Standards:

All internal standards were within QC limits with any exceptions noted below.

Surrogates:

All surrogates were within QC limits with any exceptions noted below.

Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

QC Batch: MSV/76710

L0: Analyte recovery in the laboratory control sample (LCS) was outside QC limits.

- LCS (Lab ID: 1784775)
 - Benzene

Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MSV/76710

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 60222142002,60222142010

- R1: RPD value was outside control limits.
 - MSD (Lab ID: 1784777)
 - Benzene
 - Ethylbenzene
 - Toluene

Additional Comments:



Project: 11102646 COP Mangum No 1

Pace Project No.: 60222266

 Method:
 EPA 300.0

 Description:
 300.0 IC Anions 28 Days

 Client:
 GHD Services_COP NM

 Date:
 July 07, 2016

General Information:

1 sample was analyzed for EPA 300.0. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.



Project: 11102646 COP Mangum No 1

Pace Project No.: 60222266

Sample: GW-11102646-062316-SP- MW4	Lab ID: 6022	22266001	Collected: 06/23/1	6 12:12	Received: 06	6/27/16 08:30 N	latrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, Dissolved	Analytical Meth	nod: EPA 60	010 Preparation Meth	od: EP	A 3010			
Manganese, Dissolved	983	ug/L	5.0	1	06/28/16 10:45	06/29/16 09:20	7439-96-5	
8260 MSV GRO and Oxygenates	Analytical Meth	nod: EPA 82	260					
Benzene	118	ug/L	5.0	5		06/30/16 09:47	71-43-2	
Ethylbenzene	186	ug/L	5.0	5		06/30/16 09:47	100-41-4	
Toluene	ND	ug/L	1.0	1		06/29/16 01:48	108-88-3	
TPH-GRO	14500	ug/L	2500	5		06/30/16 09:47		
Xylene (Total)	1060	ug/L	15.0	5		06/30/16 09:47	1330-20-7	
Surrogates								
Toluene-d8 (S)	105	%	80-120	1		06/29/16 01:48	2037-26-5	
4-Bromofluorobenzene (S)	101	%	77-130	1		06/29/16 01:48	460-00-4	
1,2-Dichloroethane-d4 (S)	99	%	81-127	1		06/29/16 01:48	17060-07-0	
Preservation pH	1.0		0.10	1		06/29/16 01:48		
300.0 IC Anions 28 Days	Analytical Meth	nod: EPA 30	0.0					
Sulfate	838	mg/L	100	100		06/28/16 10:04	14808-79-8	



Project: 11102646 COP Mangum No 1

Pace Project No.: 60222266

Sample: GW-11102646-062316-SP- DUP	Lab ID: 60	222266002	Collected: 06/23/1	6 00:00	Received: 0	6/27/16 08:30 N	latrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV GRO and Oxygenates	Analytical Me	thod: EPA 826	0					
Benzene	119	ug/L	5.0	5		06/30/16 10:06	71-43-2	
Ethylbenzene	185	ug/L	5.0	5		06/30/16 10:06	100-41-4	
Toluene	ND	ug/L	1.0	1		06/29/16 02:03	108-88-3	
TPH-GRO	16400	ug/L	2500	5		06/30/16 10:06		
Xylene (Total)	1030	ug/L	15.0	5		06/30/16 10:06	1330-20-7	
Surrogates		-						
Toluene-d8 (S)	105	%	80-120	1		06/29/16 02:03	2037-26-5	
4-Bromofluorobenzene (S)	104	%	77-130	1		06/29/16 02:03	460-00-4	
1,2-Dichloroethane-d4 (S)	99	%	81-127	1		06/29/16 02:03	17060-07-0	
Preservation pH	4.0		0.10	1		06/29/16 02:03		рН



Project: 11102646 COP Mangum No 1

Pace Project No.: 60222266

Sample: TRIP BLANK	Lab ID: 6	0222266003	Collected: 06/23/1	6 12:12	Received: 0	6/27/16 08:30 N	latrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV GRO and Oxygenates	Analytical M	ethod: EPA 826	60					
Benzene	ND	ug/L	1.0	1		06/29/16 02:18	71-43-2	L1
Ethylbenzene	ND	ug/L	1.0	1		06/29/16 02:18	100-41-4	
Toluene	ND	ug/L	1.0	1		06/29/16 02:18	108-88-3	
TPH-GRO	ND	ug/L	500	1		06/29/16 02:18		
Xylene (Total)	ND	ug/L	3.0	1		07/05/16 14:06	1330-20-7	
Surrogates								
Toluene-d8 (S)	97	%	80-120	1		06/29/16 02:18	2037-26-5	
4-Bromofluorobenzene (S)	99	%	77-130	1		06/29/16 02:18	460-00-4	
1,2-Dichloroethane-d4 (S)	100	%	81-127	1		06/29/16 02:18	17060-07-0	
Preservation pH	1.0		0.10	1		06/29/16 02:18		



Project: 11102	646 COP Ma	ngum No 1										
Pace Project No.: 60222	266											
QC Batch: MPF	RP/36479		Analys	is Method	: E	PA 6010						
QC Batch Method: EPA	3010		Analys	is Descrip	tion: 6	010 MET Di	ssolved					
Associated Lab Samples:	602222660	001										
METHOD BLANK: 17840	29		N	latrix: Wa	ter							
Associated Lab Samples:	602222660	001										
			Blank	R	eporting							
Parameter		Units	Result	t	Limit	Analyz	zed	Qualifiers				
Manganese, Dissolved		ug/L		ND	5.0	06/29/16	09:13					
LABORATORY CONTROL	SAMPLE:	1784030										
			Spike	LCS	6	LCS	% Red	>				
Parameter		Units	Conc.	Resu	ult	% Rec	Limits	. Qi	ualifiers	_		
Manganese, Dissolved		ug/L	1000		972	97	80	-120				
MATRIX SPIKE & MATRIX	SPIKE DUP	LICATE: 17840	31		1784032							
			MS	MSD								
		60222267002	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Unit	s Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Manganese, Dissolved	ug/L	2260	1000	1000	3110	3120	85	85	75-125	0	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



Project: 11102646 COP Mangum No 1

Pace Project No.: 60222266

QC Batch:	MSV/76710
QC Batch Method:	EPA 8260

Analysis Method:

Matrix: Water

Analysis Description:

EPA 8260 8260 MSV MO GRO Oxygenates

Associated Lab Samples: 60222266001, 60222266002, 60222266003

METHOD BLANK: 1784774

Associated Lab Samples:	60222266001, 60222266002,	60222266003			
		Blank	Reporting		
Parameter	Units	Result	Limit	Analyzed	Qualifiers
Benzene	ug/L	ND	1.0	06/29/16 01:19	
Ethylbenzene	ug/L	ND	1.0	06/29/16 01:19	
Toluene	ug/L	ND	1.0	06/29/16 01:19	
TPH-GRO	ug/L	ND	500	06/29/16 01:19	
1,2-Dichloroethane-d4 (S)	%	97	81-127	06/29/16 01:19	
4-Bromofluorobenzene (S)	%	100	77-130	06/29/16 01:19	
Toluene-d8 (S)	%	95	80-120	06/29/16 01:19	

LABORATORY CONTROL SAMPLE: 1784775

Parameter	Unite	Spike Conc	LCS Result	LCS % Rec	% Rec	Qualifiers
	01113			70 IVEC		Quaimers
Benzene	ug/L	20	23.8	119	79-116 L0)
Ethylbenzene	ug/L	20	21.4	107	81-110	
Toluene	ug/L	20	21.7	108	82-111	
TPH-GRO	ug/L	4000	4960	124	58-138	
1,2-Dichloroethane-d4 (S)	%			98	81-127	
4-Bromofluorobenzene (S)	%			98	77-130	
Toluene-d8 (S)	%			96	80-120	

MATRIX SPIKE & MATRIX S	PIKE DUPLICA	TE: 178477	76		1784777							
			MS	MSD								
	60	222142002	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Benzene	ug/L	ND	20	20	20.2	12.1	98	58	37-151	50	40	R1
Ethylbenzene	ug/L	ND	20	20	17.4	10	87	50	29-151	54	45	R1
Toluene	ug/L	ND	20	20	17.5	10.2	87	51	37-147	53	43	R1
1,2-Dichloroethane-d4 (S)	%						99	99	81-127			
4-Bromofluorobenzene (S)	%						99	99	77-130			
Toluene-d8 (S)	%						95	94	80-120			
Preservation pH		11.0			11.0	11.0				0		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1784778					1784779							
	(60222142010	MS Spike	MSD Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Benzene	ug/L	 ND	20	20	16.6	13.6	78	63	37-151	20	40	
Ethylbenzene	ug/L	ND	20	20	14.1	11.1	68	53	29-151	24	45	

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REPORT OF LABORATORY ANALYSIS

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 Project:
 11102646 COP Mangum No 1

 Pace Project No.:
 60222266

MATRIX SPIKE & MATRIX SP	IKE DUPLICA	TE: 17847	78		1784779							
	6	0000140040	MS	MSD	MC	MCD	MC	MOD	0/ Dee		May	
_	0	0222142010	бріке	бріке	IVIS	NISD	IVIS	INISD	% Rec		wax	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Toluene	ug/L	ND	20	20	14.3	11.3	70	55	37-147	23	43	
1,2-Dichloroethane-d4 (S)	%						99	99	81-127			
4-Bromofluorobenzene (S)	%						98	100	77-130			
Toluene-d8 (S)	%						94	94	80-120			
Preservation pH		11.0			11.0	11.0				0		

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Project: 11102646 COP Mangum No 1

Pace Project No.: 60222266

QC Batch: MSV/76735 QC Batch Method: EPA 8260

Analysis Method:

Analysis Description:

Matrix: Water

EPA 8260

8260 MSV MO GRO Oxygenates

60222266001, 60222266002 Associated Lab Samples:

METHOD BLANK: 1785516

Associated Lab Samples: 60222266001, 60222266002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Benzene	ug/L	ND	1.0	06/30/16 05:31	
Ethylbenzene	ug/L	ND	1.0	06/30/16 05:31	
TPH-GRO	ug/L	ND	500	06/30/16 05:31	
Xylene (Total)	ug/L	ND	3.0	06/30/16 05:31	
1,2-Dichloroethane-d4 (S)	%	99	81-127	06/30/16 05:31	
4-Bromofluorobenzene (S)	%	101	77-130	06/30/16 05:31	
Toluene-d8 (S)	%	101	80-120	06/30/16 05:31	

LABORATORY CONTROL SAMPLE: 1785517

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Benzene	ug/L	20	19.1	96	79-116	
Ethylbenzene	ug/L	20	19.4	97	81-110	
TPH-GRO	ug/L	4000	4460	112	58-138	
Xylene (Total)	ug/L	60	57.6	96	80-111	
1,2-Dichloroethane-d4 (S)	%			99	81-127	
4-Bromofluorobenzene (S)	%			99	77-130	
Toluene-d8 (S)	%			101	80-120	

MATRIX SPIKE & MATRIX SPI		CATE: 17855 [,]	18		1785519							
			MS	MSD								
		60222424003	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Benzene	ug/L		20	20	19.9	18.9	88	83	37-151	5	40	
Ethylbenzene	ug/L	ND	20	20	17.3	17.7	86	88	29-151	2	45	
Xylene (Total)	ug/L	ND	60	60	52.3	52.5	87	87	27-156	0	46	
1,2-Dichloroethane-d4 (S)	%						100	100	81-127			
4-Bromofluorobenzene (S)	%						102	101	77-130			
Toluene-d8 (S)	%						100	99	80-120			

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REPORT OF LABORATORY ANALYSIS

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Project: 11102646 COP Mangum No 1

Pace Project No.:	60222266
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QC Batch:	MSV/76821		Analysis Me	ethod:	EPA 8260			
QC Batch Method:	EPA 8260		Analysis De	escription:	3260 MSV MO	GRO Oxyge	enates	
Associated Lab Sample	es: 60222266003	1						
METHOD BLANK: 17	788379		Matrix	: Water				
Associated Lab Sample	es: 60222266003	1						
			Blank	Reporting				
Paramete	er	Units	Result	Limit	Analyze	d Qu	alifiers	
Xylene (Total)		ug/L	ND	3.	0 07/05/16 1	3:51		
1,2-Dichloroethane-d4	(S)	%	100	81-12	7 07/05/16 13	3:51		
4-Bromofluorobenzene	e (S)	%	107	77-13	0 07/05/16 1	3:51		
Toluene-d8 (S)		%	97	80-12	0 07/05/16 1	3:51		
		00000						
LABORATORY CONTR	KUL SAMPLE: 17	88380	Spike	LCS	LCS	% Rec		
Deremet	~ *	Linita	Cono	Desult	0/ Dee	Limite	Qualifiara	

Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Xylene (Total)	ug/L	60	60.5	101	80-111	
1,2-Dichloroethane-d4 (S)	%			100	81-127	
4-Bromofluorobenzene (S)	%			102	77-130	
Toluene-d8 (S)	%			102	80-120	

MATRIX SPIKE & MATRIX SPI	KE DUPLIC/	ATE: 17883	81 MS	MSD	1788382							
	6	0222731006	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Xylene (Total)	ug/L	0.027 mg/L	60	60	68.4	96.3	69	115	27-156	34	46	
1,2-Dichloroethane-d4 (S)	%						102	103	81-127			
4-Bromofluorobenzene (S)	%						100	98	77-130			
Toluene-d8 (S)	%						96	100	80-120			

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REPORT OF LABORATORY ANALYSIS

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Project:	11102646 COP Ma	ingum No 1										
Pace Project No.:	60222266											
QC Batch:	WETA/40299		Analys	is Method	: E	PA 300.0						
QC Batch Method:	EPA 300.0		Analysis Description:			00.0 IC Anic	ns					
Associated Lab Sam	nples: 602222660	001										
METHOD BLANK:	1784001		N	Aatrix: Wa	iter							
Associated Lab Sam	nples: 602222660	001										
			Blank	K R	Reporting							
Param	neter	Units	Resul	t	Limit	Analyz	ed	Qualifiers				
Sulfate		mg/L		ND	1.0	06/28/16	08:56					
LABORATORY COM	ITROL SAMPLE:	1784002										
			Spike	LCS	5	LCS	% Red)				
Param	neter	Units	Conc.	Resu	ult	% Rec	Limits	; Qi	ualifiers	_		
Sulfate		mg/L	5		5.1	102	90)-110				
MATRIX SPIKE & M	ATRIX SPIKE DUP	LICATE: 17840	03		1784004							
			MS	MSD								
_		60221593005	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Paramete	r Unit	s Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Sulfate	mg/	L 79.2	25	25	106	106	109	106	80-120	1	15	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



QUALIFIERS

Project: 11102646 COP Mangum No 1

Pace Project No.: 60222266

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

- L0 Analyte recovery in the laboratory control sample (LCS) was outside QC limits.
- L1 Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results for this analyte in associated samples may be biased high.
- R1 RPD value was outside control limits.
- pH Post-analysis pH measurement indicates insufficient VOA sample preservation.



QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project:11102646 COP Mangum No 1Pace Project No.:60222266

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60222266001	GW-11102646-062316-SP-MW4	EPA 3010	MPRP/36479	EPA 6010	ICP/26591
60222266001	GW-11102646-062316-SP-MW4	EPA 8260	MSV/76710		
60222266001	GW-11102646-062316-SP-MW4	EPA 8260	MSV/76735		
60222266002	GW-11102646-062316-SP-DUP	EPA 8260	MSV/76710		
60222266002	GW-11102646-062316-SP-DUP	EPA 8260	MSV/76735		
60222266003	TRIP BLANK	EPA 8260	MSV/76710		
60222266003	TRIP BLANK	EPA 8260	MSV/76821		
60222266001	GW-11102646-062316-SP-MW4	EPA 300.0	WETA/40299		



Sample Condition Upon Receipt ESI Tech Spec Client

WO#:60222266

Client Name GHD CAP							Ontional		
		FC	чп	Pace 🗆	Other [1 Client 🗆	Proi Duo	Data:	-
Tracking #: 7834 3312 2044	lace Shi	nnina	l abel L	Isod2 Ye			Proj Due		
Custody Seal on Cooler/Box Present: Yes No		ole int	act: Y	ies 🗆		• –	li toj tvan		
Packing Material: Bubble Wrap Bubble Back	™ 3e 1s k ∐	ais int	Foam	50 <u>–</u> N		Other 🗆			
Thermometer Used: (CF -0.1) CF 0.0 T-230 / T-262 TV	pe of Ic	ersw	Blu	e None	Samp	les received or	ice, cooling	process has begu	ın.
Cooler Temperature: 21.0			(circle	e one)	Ì	Date and initia	ls of perso	n examining	
Temperature should be above freezing to 6°C				-		Lomenta.		1 lemo	_
Chain of Custody present:	Yes	No	□N/A	1. La	pulter	Completely	1 our	or remp	_
Chain of Custody filled out:	Yes	□No	□n/A	2.					
Chain of Custody relinquished:	Yes	No	□n/A	3.			_		
Sampler name & signature on COC:	Yes	No	□n/A	4.					
Samples arrived within holding time:	₽Yes	⊡ No	□n/A	5.					
Short Hold Time analyses (<72hr):	□Yes	No	□n/A	6.					
Rush Turn Around Time requested:	□Yes		□n/A	7.					
Sufficient volume:	🕅 Yes	□No	□n/A	8.					
Correct containers used:	Yes	□No	□n/A						
Pace containers used:	d Yes	□No	□n/A	9.		4			
Containers intact:	H Yes	□No		10.					
Unpreserved 5035A soils frozen w/in 48hrs?	□Yes	□No	₫n/A	11.					
Filtered volume received for dissolved tests?	Yes	□No	1 M	12.					
Sample labels match COC:	K Yes	□No	□n/A						
Includes date/time/ID/analyses Matrix:	WT			13.					
All containers needing preservation have been checked.	K Yes	□No	⊡n/A						
All containers needing preservation are found to be in compliance									
with EPA recommendation.	44			14. Initial when	n	Lot	# of added		_
Exceptions: VOA Coliform, O&G, WI-DRO (water)	LE Yes	UNo		completed		pres	servative		
	(K)Yes	□No	□n/a						
Pace Trip Blank lot # (if purchased):				15.					
	∐Yes ⊴	KINo	∐N/A						
			_	16.					_
Project sampled in USDA Regulated Area:	□ Yes	No	KIN/A	17. List S	State				
Additional labels attached to 5035A vials in the field?	QYes	No	N/A	18.					
Client Notification/ Resolution: Copy CO	C to Clie	nt?	Y / N	l F	Field Data F	Required?	(/ N		
Person Contacted: Da Comments/ Resolution: Many forward wet	ite/Time:	u (I	1271	<u>ne chu</u>	all	when un sample	og: Record packing coo temps.	start and finish time pler, if >20 min, rec	es heck
		3				Start:	630	Start:	
				1	n hi	End:	936	End:	
Project Manager Review:				Date	110	L Temp:		Temp:	
<i>p</i> ()							F-KS-C-	004-Rev.4, 30June	2015

d accurately.	Page : 1 Of		•	Regulatory Agency	State / Location	NM	(NiX) pe		Residual Chlorine (Y/N)	462(15) BEAU 2020200	200	23 (3)Dout T	5									IIME SAMPLE CONDITIONS	0870 ZLO N N Y		l on	TEMP in Keceived Custody Samples Custody (Y/N) Samples (Y/N) (Y/N)
ument complete					in i		alysis Filter											_		_	DATE -	UAIE	12		Ne Sta	6/23
cal Request Doci All relevant fields must be					lagan@pacelabs.com.	1 240 113	Cy / Requested Ani)77./ N/X	Ойлөг Analyses Test взео втех, секо 	XX. X	N X X												3 lin			DATE Signed:
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NN-OF-C nain-of-Custo								N		\backslash											dian P M	DATE	6/23/16		AND SIGNATU	of SAMPLER:
CHA The Cr	troiset Information:	Jeffrey Walker		Irder #:	ne: 11102646		-	COLLECTED COLLECTED 5 to left)	SAMPLE TYPE (G=GRAB C=C SAMPLE TYPE (G=GRAB C=C ATART TIME DAT	- 12/21 962/9 5 LM	1 1 1												Have the of 10H1		SAMPLER NAME	SIGNATURE
	Section B Required P	Report To:	Copy To:	Purchase 0	Project Nan	Project #.		CODE	iving Water DU text WT WT VT Solid SL Solid SL Solid OL e AR er OT sue TS		-Dup									1	100 No. 00 1000		<u>الا</u>			
Pace Analytical	A 4 Client Information:	y: GHD Services_COP NM	6121 Indian School Rd NE	rque, NM 87110 ioff welker@obd.com	505-377-3920 Fax:	ed Due Date:			Sample Ids must be unique to the more than the second seco	GW-11102646-062316-SP-MW4	612-11102040-062316-SP											ADDITIONAL COMMENTS	hent provided the blank		Page 2	20 of 20
	Section	Company	Address:	Albuquei Email:	Phone:	Request			# MƏTI	-	7	m	4	S	9	7	80	σ	10	11	12		C		Julia	



September 28, 2016

Christine Mathews GHD Services, Inc. 6212 Indian School Rd. NE St2 Albuquerque, NM 87110

RE: Project: 11102646 Magnum No1 Pace Project No.: 60227652

Dear Christine Mathews:

Enclosed are the analytical results for sample(s) received by the laboratory on September 14, 2016. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Alice Spiller

Alice Spiller alice.spiller@pacelabs.com Project Manager

Enclosures

cc: Angela Bown, GHD Services, Inc, Jeffrey Walker, GHD Services, Inc





CERTIFICATIONS

Project: 11102646 Magnum No1

Pace Project No.: 60227652

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219 WY STR Certification #: 2456.01 Arkansas Certification #: 15-016-0 Illinois Certification #: 003097 Iowa Certification #: 118 Kansas/NELAP Certification #: E-10116 Louisiana Certification #: 03055 Nevada Certification #: KS000212008A Oklahoma Certification #: 9205/9935 Texas Certification #: T104704407 Utah Certification #: KS00021 Kansas Field Laboratory Accreditation: # E-92587



SAMPLE SUMMARY

Project: 11102646 Magnum No1

Pace Project No.: 60227652

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60227652001	GW-11102646-091216-CM-MW-1	Water	09/12/16 14:30	09/14/16 08:50
60227652002	GW-11102646-091216-CM-MW-2	Water	09/12/16 14:45	09/14/16 08:50
60227652003	GW-11102646-091216-CM-MW-3	Water	09/12/16 15:00	09/14/16 08:50
60227652004	GW-11102646-091216-CM-MW-4	Water	09/12/16 15:10	09/14/16 08:50
60227652005	TB-11102646-091216-CM-001	Water	09/12/16 14:15	09/14/16 08:50



SAMPLE ANALYTE COUNT

 Project:
 11102646 Magnum No1

 Pace Project No.:
 60227652

Lab ID	Sample ID	Method	Analysts	Analytes Reported
60227652001		EPA 6010	TDS	1
		EPA 8260	EAG	8
		EPA 300.0	OL	1
60227652002	GW-11102646-091216-CM-MW-2	EPA 6010	TDS	1
		EPA 8260	JTK	8
		EPA 300.0	OL	1
60227652003	GW-11102646-091216-CM-MW-3	EPA 6010	TDS	1
		EPA 8260	JTK	8
		EPA 300.0	OL	1
60227652004	GW-11102646-091216-CM-MW-4	EPA 6010	TDS	1
		EPA 8260	JTK	8
		EPA 300.0	OL	1
60227652005	TB-11102646-091216-CM-001	EPA 8260	JTK	8



Project: 11102646 Magnum No1

Pace Project No.: 60227652

Method:EPA 6010Description:6010 MET ICP, DissolvedClient:GHD Services_COP NMDate:September 28, 2016

General Information:

4 samples were analyzed for EPA 6010. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:

The samples were prepared in accordance with EPA 3010 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:



Project: 11102646 Magnum No1

Pace Project No.: 60227652

Method:EPA 8260Description:8260 MSV UST, WaterClient:GHD Services_COP NMDate:September 28, 2016

General Information:

5 samples were analyzed for EPA 8260. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

Internal Standards:

All internal standards were within QC limits with any exceptions noted below.

Surrogates:

All surrogates were within QC limits with any exceptions noted below.

Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 447129

A matrix spike/matrix spike duplicate was not performed due to insufficient sample volume.

QC Batch: 447787

A matrix spike/matrix spike duplicate was not performed due to insufficient sample volume.

Additional Comments:



Project: 11102646 Magnum No1

Pace Project No.: 60227652

 Method:
 EPA 300.0

 Description:
 300.0 IC Anions 28 Days

 Client:
 GHD Services_COP NM

 Date:
 September 28, 2016

General Information:

4 samples were analyzed for EPA 300.0. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.



Project: 11102646 Magnum No1

Pace Project No.: 60227652

Sample: GW-11102646-091216-CM- MW-1	Lab ID: 602	27652001	Collected: 09/12/1	6 14:30	Received: 09	/14/16 08:50 N	latrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, Dissolved	Analytical Met	hod: EPA 60	10 Preparation Meth	nod: EP	A 3010			
Manganese, Dissolved	925	ug/L	5.0	1	09/21/16 15:55	09/22/16 12:21	7439-96-5	
8260 MSV UST, Water	Analytical Met	hod: EPA 82	60					
Benzene	11.1	ug/L	5.0	5		09/23/16 20:04	71-43-2	
Ethylbenzene	94.6	ug/L	5.0	5		09/23/16 20:04	100-41-4	
Toluene	ND	ug/L	5.0	5		09/23/16 20:04	108-88-3	
Xylene (Total)	382	ug/L	15.0	5		09/23/16 20:04	1330-20-7	
Surrogates		-						
Toluene-d8 (S)	100	%	80-120	5		09/23/16 20:04	2037-26-5	
4-Bromofluorobenzene (S)	104	%	77-130	5		09/23/16 20:04	460-00-4	
1,2-Dichloroethane-d4 (S)	100	%	81-127	5		09/23/16 20:04	17060-07-0	
Preservation pH	1.0		1.0	5		09/23/16 20:04		
300.0 IC Anions 28 Days	Analytical Met	hod: EPA 30	0.0					
Sulfate	577	mg/L	50.0	50		09/27/16 19:43	14808-79-8	


Project: 11102646 Magnum No1

Pace Project No.: 60227652

Sample: GW-11102646-091216-CM- MW-2	e: GW-11102646-091216-CM- Lab ID: 60227652002 Collecte MW-2		Collected: 09/12/1	6 14:45	Received: 09	/14/16 08:50 N	latrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, Dissolved	Analytical Met	hod: EPA 60	10 Preparation Meth	nod: EP/	A 3010			
Manganese, Dissolved	1730	ug/L	5.0	1	09/21/16 15:55	09/22/16 12:27	7439-96-5	
8260 MSV UST, Water	Analytical Met	hod: EPA 82	60					
Benzene	64.7	ug/L	1.0	1		09/21/16 06:45	71-43-2	
Ethylbenzene	2.1	ug/L	1.0	1		09/21/16 06:45	100-41-4	
Toluene	ND	ug/L	1.0	1		09/21/16 06:45	108-88-3	
Xylene (Total)	3.2	ug/L	3.0	1		09/21/16 06:45	1330-20-7	
Surrogates		-						
Toluene-d8 (S)	103	%	80-120	1		09/21/16 06:45	2037-26-5	
4-Bromofluorobenzene (S)	107	%	77-130	1		09/21/16 06:45	460-00-4	
1,2-Dichloroethane-d4 (S)	96	%	81-127	1		09/21/16 06:45	17060-07-0	
Preservation pH	1.0		1.0	1		09/21/16 06:45		
300.0 IC Anions 28 Days	Analytical Met	hod: EPA 30	0.0					
Sulfate	2.8	mg/L	1.0	1		09/27/16 19:58	14808-79-8	



Project: 11102646 Magnum No1

Pace Project No.: 60227652

Sample: GW-11102646-091216-CM- Lab ID: 60227652003 Collected: 09/12/16 15: MW-3		6 15:00	15:00 Received: 09/14/16 08:50 Matrix: Water					
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, Dissolved	Analytical Met	hod: EPA 60	10 Preparation Meth	nod: EP	A 3010			
Manganese, Dissolved	3620	ug/L	5.0	1	09/21/16 15:55	09/22/16 12:30	7439-96-5	
8260 MSV UST, Water	Analytical Met	hod: EPA 82	60					
Benzene	2270	ug/L	20.0	20		09/21/16 07:00	71-43-2	
Ethylbenzene	440	ug/L	20.0	20		09/21/16 07:00	100-41-4	
Toluene	ND	ug/L	20.0	20		09/21/16 07:00	108-88-3	
Xylene (Total)	2490	ug/L	60.0	20		09/21/16 07:00	1330-20-7	
Surrogates		-						
Toluene-d8 (S)	98	%	80-120	20		09/21/16 07:00	2037-26-5	
4-Bromofluorobenzene (S)	103	%	77-130	20		09/21/16 07:00	460-00-4	
1,2-Dichloroethane-d4 (S)	96	%	81-127	20		09/21/16 07:00	17060-07-0	
Preservation pH	1.0		1.0	20		09/21/16 07:00		
300.0 IC Anions 28 Days	Analytical Met	hod: EPA 30	0.0					
Sulfate	112	mg/L	10.0	10		09/27/16 20:12	14808-79-8	



Project: 11102646 Magnum No1

Pace Project No.: 60227652

Sample: GW-11102646-091216-CM- Lab ID: 60227652004 MW-4		27652004	Collected: 09/12/1	6 15:10	Received: 09	/14/16 08:50 N	latrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, Dissolved	Analytical Met	hod: EPA 60	10 Preparation Meth	nod: EP	A 3010			
Manganese, Dissolved	1320	ug/L	5.0	1	09/21/16 15:55	09/22/16 12:32	7439-96-5	
8260 MSV UST, Water	Analytical Met	hod: EPA 82	60					
Benzene	74.2	ug/L	5.0	5		09/21/16 07:14	71-43-2	
Ethylbenzene	114	ug/L	5.0	5		09/21/16 07:14	100-41-4	
Toluene	ND	ug/L	5.0	5		09/21/16 07:14	108-88-3	
Xylene (Total)	803	ug/L	15.0	5		09/21/16 07:14	1330-20-7	
Surrogates		0						
Toluene-d8 (S)	100	%	80-120	5		09/21/16 07:14	2037-26-5	
4-Bromofluorobenzene (S)	103	%	77-130	5		09/21/16 07:14	460-00-4	
1,2-Dichloroethane-d4 (S)	98	%	81-127	5		09/21/16 07:14	17060-07-0	
Preservation pH	1.0		1.0	5		09/21/16 07:14		
300.0 IC Anions 28 Days	Analytical Met	hod: EPA 30	0.0					
Sulfate	735	mg/L	50.0	50		09/27/16 20:26	14808-79-8	



Project: 11102646 Magnum No1

Pace Project No.: 60227652

Sample: TB-11102646-091216-CM- 001	Lab ID: (60227652005	Collected: 09/12/1	6 14:15	Received: 0	9/14/16 08:50 M	latrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV UST, Water	Analytical N	Method: EPA 826	60					
Benzene	ND	ug/L	1.0	1		09/21/16 07:29	71-43-2	
Ethylbenzene	ND	ug/L	1.0	1		09/21/16 07:29	100-41-4	
Toluene	ND	ug/L	1.0	1		09/21/16 07:29	108-88-3	
Xylene (Total)	ND	ug/L	3.0	1		09/21/16 07:29	1330-20-7	
Surrogates								
Toluene-d8 (S)	99	%	80-120	1		09/21/16 07:29	2037-26-5	
4-Bromofluorobenzene (S)	105	%	77-130	1		09/21/16 07:29	460-00-4	
1,2-Dichloroethane-d4 (S)	99	%	81-127	1		09/21/16 07:29	17060-07-0	
Preservation pH	1.0)	1.0	1		09/21/16 07:29		



Project:	11102646 Magnum	n No1										
Pace Project No.:	60227652											
QC Batch:	447446		Analysis	Method:	E	EPA 6010						
QC Batch Method:	EPA 3010		Analysis	Descript	ion: 6	6010 MET Dis	ssolved					
Associated Lab San	nples: 60227652	001, 60227652002	, 602276520	03, 60227	652004							
METHOD BLANK:	1830368		Ма	atrix: Wat	er							
Associated Lab San	nples: 60227652	001, 60227652002	, 602276520	03, 60227	652004							
			Blank	Re	eporting							
Paran	neter	Units	Result		Limit	Analyz	ed	Qualifiers				
Manganese, Dissolv	red	ug/L		ND	5.0	09/22/16	15:26					
LABORATORY CON	NTROL SAMPLE:	1830369										
			Spike	LCS		LCS	% Re	C				
Param	neter	Units	Conc.	Resu	lt	% Rec	Limits	s Qı	ualifiers			
Manganese, Dissolv	ved	ug/L	1000		996	100	80	0-120		-		
MATRIX SPIKE & M	ATRIX SPIKE DUP	LICATE: 18303	70		1830371							
			MS	MSD								
		60227652001	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Paramete	r Uni	ts Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Manganese, Dissolv	ed ug/	L 925	1000	1000	1880	1890	96	96	75-125	0	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



Project: 11102646 Magnum No1

Pace Project No.: 60227652

QC Batch:	447129	Analysis Method:	EPA 8260
QC Batch Method:	EPA 8260	Analysis Description:	8260 MSV UST-WATER
Associated Lab Samp	oles: 60227652002, 60227652003	, 60227652004, 60227652005	

 METHOD BLANK:
 1828945
 Matrix:
 Water

 Associated Lab Samples:
 60227652002, 60227652003, 60227652004, 60227652005
 60227652005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Benzene	ug/L	ND	1.0	09/21/16 06:00	
Ethylbenzene	ug/L	ND	1.0	09/21/16 06:00	
Toluene	ug/L	ND	1.0	09/21/16 06:00	
Xylene (Total)	ug/L	ND	3.0	09/21/16 06:00	
1,2-Dichloroethane-d4 (S)	%	98	81-127	09/21/16 06:00	
4-Bromofluorobenzene (S)	%	106	77-130	09/21/16 06:00	
Toluene-d8 (S)	%	99	80-120	09/21/16 06:00	

LABORATORY CONTROL SAMPLE: 1828946

		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Benzene	ug/L	20	20.5	103	79-116	
Ethylbenzene	ug/L	20	19.5	97	81-110	
Toluene	ug/L	20	19.3	96	82-111	
Xylene (Total)	ug/L	60	57.9	97	80-111	
1,2-Dichloroethane-d4 (S)	%			98	81-127	
4-Bromofluorobenzene (S)	%			102	77-130	
Toluene-d8 (S)	%			99	80-120	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



Project: 11102646 Magnum No1

Pace Project No.: 60227652

4-Bromofluorobenzene (S)

Toluene-d8 (S)

QC Batch:	447787		Analysis Meth	iod: Ef	PA 8260	
QC Batch Method:	EPA 8260		Analysis Description:		60 MSV UST-WAT	ER
Associated Lab Samp	oles: 60227652001					
METHOD BLANK: 1	831824		Matrix:	Water		
Associated Lab Samp	oles: 60227652001					
			Blank	Reporting		
Parame	eter	Units	Result	Limit	Analyzed	Qualifiers
Benzene		ug/L	ND	1.0	09/23/16 18:53	
Ethylbenzene		ug/L	ND	1.0	09/23/16 18:53	
Toluene		ug/L	ND	1.0	09/23/16 18:53	
Xylene (Total)		ug/L	ND	3.0	09/23/16 18:53	
1,2-Dichloroethane-d4	4 (S)	%	98	81-127	09/23/16 18:53	

77-130 09/23/16 18:53

80-120 09/23/16 18:53

102

99

%

%

LABORATORY CONTROL SAMPLE: 1831825

		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Benzene	ug/L	20	19.0	95	79-116	
Ethylbenzene	ug/L	20	19.0	95	81-110	
Toluene	ug/L	20	19.2	96	82-111	
Xylene (Total)	ug/L	60	58.5	97	80-111	
1,2-Dichloroethane-d4 (S)	%			98	81-127	
4-Bromofluorobenzene (S)	%			101	77-130	
Toluene-d8 (S)	%			101	80-120	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



Project:	11102646 Magnun	n No1							
Pace Project No.:	60227652								
QC Batch:	448121		Analysis	Method	1:	EPA 300.0			
QC Batch Method:	EPA 300.0		Analysis	Descrip	otion:	300.0 IC Anions	6		
Associated Lab Sar	mples: 60227652	001, 60227652002	2, 6022765200	3, 6022	27652004				
METHOD BLANK:	1833255		Mat	rix: Wa	ater				
Associated Lab Sar	mples: 60227652	001, 60227652002	2, 6022765200	3, 6022	27652004				
			Blank	F	Reporting				
Parar	neter	Units	Result		Limit	Analyzed	d Qualif	fiers	
Sulfate		mg/L	١	١D	1	.0 09/27/16 14	1:46		
		1833256							
		1000200	Spike	LC	s	LCS	% Rec		
Parar	neter	Units	Conc.	Res	ult	% Rec	Limits	Qualifiers	
Sulfate		mg/L	5		4.9	98	90-110		
MATRIX SPIKE SA	MPLE:	1833259							
		-	60227617	002	Spike	MS	MS	% Rec	
Parar	neter	Units	Result		Conc.	Result	% Rec	Limits	Qualifiers
Sulfate		mg/L		43.0	25	68.7	, 10 10	80-12	0

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



QUALIFIERS

Project: 11102646 Magnum No1

Pace Project No.: 60227652

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

BATCH QUALIFIERS

Batch: 447129

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

Batch: 447787

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.



QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project:	11102646 Magnum No1
Pace Project No .:	60227652

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60227652001	GW-11102646-091216-CM-MW-1	EPA 3010	447446	EPA 6010	447531
60227652002	GW-11102646-091216-CM-MW-2	EPA 3010	447446	EPA 6010	447531
60227652003	GW-11102646-091216-CM-MW-3	EPA 3010	447446	EPA 6010	447531
60227652004	GW-11102646-091216-CM-MW-4	EPA 3010	447446	EPA 6010	447531
60227652001	GW-11102646-091216-CM-MW-1	EPA 8260	447787		
60227652002	GW-11102646-091216-CM-MW-2	EPA 8260	447129		
60227652003	GW-11102646-091216-CM-MW-3	EPA 8260	447129		
60227652004	GW-11102646-091216-CM-MW-4	EPA 8260	447129		
60227652005	TB-11102646-091216-CM-001	EPA 8260	447129		
60227652001	GW-11102646-091216-CM-MW-1	EPA 300.0	448121		
60227652002	GW-11102646-091216-CM-MW-2	EPA 300.0	448121		
60227652003	GW-11102646-091216-CM-MW-3	EPA 300.0	448121		
60227652004	GW-11102646-091216-CM-MW-4	EPA 300.0	448121		



Sample Condition Upon Receipt ESI Tech Spec Client

WO#:60227652

Client Name: COP GHD NM							
Courier: FedEx 🗗 UPS 🗆 VIA 🗆 Clay 🗆 Pl	EX 🗆 🛛 E		Pace 🗆	Xroads i	🗆 Client 🗆	Other 🗆	
Tracking #: 8 10 5 9238 1763 Pace	Shipping La	abel Used	l? Yes □	No 😡	1		
Custody Seal on Cooler/Box Present: Yes 🌶 No 🗆	Seals intac	t: Yes 🗖	ſ No □				
Packing Material: Bubble Wrap 🖄 Bubble Bags 🗲	F	oam 🗇	None		Other 🗆		
Thermometer Used: (T-266)/ T-239 Type	e of Ice: 🕅	D Blue	None				
Cooler Temperature (°C): As-read 0.6 Corr. Facto	F CF +1.1 CF -0	1 Correct	ed 1.7		Date and examinin	initials of person ng contents:	1939
Temperature should be above freezing to 6°C					1.17		
Chain of Custody present:	Yes DN	o □N/A					
Chain of Custody relinquished:		₀ □N/A					
Samples arrived within holding time:		o □n/A					
Short Hold Time analyses (<72hr):		₀ □N/A					
Rush Turn Around Time requested:		₀ □N/A					
Sufficient volume:		₀ □N/A					
Correct containers used:		o □N/A					
Pace containers used:	ZYes DN	o □N/A					
Containers intact:		o □N/A					
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	□Yes □N						
Filtered volume received for dissolved tests?	□Yes □N						
Sample labels match COC: Date / time / ID / analyses	ZYes □N	o □N/A					
Samples contain multiple phases? Matrix: 📿 🗲 🗸	ØYes □N	o □N/A					
Containers requiring pH preservation in compliance?	Yes DN	o □N/A					
(HNO ₃ , H ₂ SO ₄ , HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide)							
Cyanide water sample checks: ØN/A							
Lead acetate strip turns dark? (Record only)	□Yes □N	o					
Potassium iodide test strip turns blue/purple? (Preserve)	□Yes □N	0					
Trip Blank present:	-7 Yes DN						
Headspace in VOA vials (>6mm):	Yes 7N						
Samples from USDA Regulated Area: State:	□Yes □N	o DN/A					
Additional labels attached to 5035A / TX1005 vials in the field?	Yes IN						
Client Notification/ Resolution: Copy COC to	Client? Y	/ 'N	Field D	ata Requir	ed?Y/	N	
Person Contacted: Date/Ti	ime:				Temp Log: R	lecord start and fin	ish times hin, recheck
Comments/ Resolution:					sample temps	3.	
					Start: 14	Start:	
					End: 14	So End:	
Project Manager Review:		Date	e: 09/15	/16	Temp:	Temp:	

Page: 1 Of 1		A STATE OF A	Regulatory Agency	Ctrates / 1 constituen	State / Locauon	No. 50 Supervised as a		Residual Chlorine (Y/N)	[(995a)](6954) ²³ 3(0094)			>	2(24)					E SAMPLE CONDITIONS	1 1 1 t 1 a	t) bles eq toqλ () () () () () () () () () () () () ()
			11 12 120			vsis Filtered (Y/N)												DATE TIM	chinthe BS	1 1
					gpacelaps com	Requested Anal	N/A	1895 7898 7897 8260 87EX Sulfate by 300.0 Dissoived Mn-field filtered	XXX	XXX	XXX	XXX	, , X					I AFFLATION	Ja	eus
ion:					ager: alice_flanagan(c R644.24	+	eservatives	Offet Mefbanol NªSSSO3 NªOH HCI	5	6	ee	3	2					ACCEPTED BY.	Mr Br	the matt
Section C Invoice Informati	Attention:	Company Name:	Address:	Pace Quole:	Pace Profile #:			НИОЗ УАМРЕЕ ТЕМР АТ СОLLECTIC 4 ОF СОИТАІИЕRS 4 ОF СОИТАІИЕRS	511	SUI	21	2	67					ATE TRAE	02h1 11/5	IGNATURE
				-	Im No1		COLLECTED	END	130 DATE TIME	20	lats		AIR	1000 1000				LATION . De	LO KHO all	AMPLER NAME AND S
oject Information:	Jeffrev Walker			der #:	e: 11102646 Magnu		s to left) (TOMP)	APTRIX CODE (see valid code: MARPLE TYPE (G=GRAB C=	KI 6 GIZIG I	IT CANIL I	W 6 9 alu 12	UTS alelle K	UT 9/13/16/10					RELINOUISHED BY / AFF	which hold	0
Section B Required Pro	Report To:	Copy To:	では、第二部で	Purchase On	Project Name	Ligeci #.	MATRIX CODE	Drinking Water Water DW Water WT Water Solics Solisolid SL Oli SL Wipe Product Air AR Air AR Cher T Tissue	-mm -m/-	C-rum-my-	E-UNU-Wy-	10 / WINNUC	100-111-0					<		
vformation:	D Saniros COP NM	21 Indian School Rd NE	87110	ar@ghd.com	5-377-3920 Fax	ate:		SAMPLE ID One Character per box. (A-Z, 0-91, -) iample lds must be unique	-111676410-0912110-	11/19/41-1911	11/102/01/02/11-1	10100 - 1710 VIII -	- 1110-2646-091311	66	P 0			ADDEFORMAL COMMENTS		
tion A uired Client I	nanv C	ress: 61	iquerque, NM	ait: jeff.walk	ne: 50	uested Due L			Lin A	X	Se .	10	19	9	0	on 5	2 1	12		Page 20

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Pace Analytical Services, LLC 9608 Loiret Blvd. Lenexa, KS 66219 (913)599-5665

December 19, 2016

Jeffrey Walker GHD Services, Inc 6121 Indian School Rd NE Ste 200 Albuquerque, NM 87110

RE: Project: 11102646 Magnum No1 Pace Project No.: 60233340

Dear Jeffrey Walker:

Enclosed are the analytical results for sample(s) received by the laboratory on December 01, 2016. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Alice Spiller

Alice Spiller alice.spiller@pacelabs.com Project Manager

Enclosures

cc: Angela Bown, GHD Services, Inc,





CERTIFICATIONS

 Project:
 11102646 Magnum No1

 Pace Project No.:
 60233340

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219 WY STR Certification #: 2456.01 Arkansas Certification #: 15-016-0 Illinois Certification #: 003097 Iowa Certification #: 118 Kansas/NELAP Certification #: E-10116 Louisiana Certification #: 03055 Nevada Certification #: KS000212008A Oklahoma Certification #: 9205/9935 Texas Certification #: T104704407 Utah Certification #: KS00021 Kansas Field Laboratory Accreditation: # E-92587 Missouri Certification: 10070



SAMPLE SUMMARY

Project: 11102646 Magnum No1

Pace Project No.: 60233340

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60233340001	GW-11102646-112916-CN-MW1	Water	11/29/16 13:00	12/01/16 08:55
60233340002	GW-11102646-112916-CN-MW2	Water	11/29/16 12:30	12/01/16 08:55
60233340003	GW-11102646-112916-CN-MW3	Water	11/29/16 12:45	12/01/16 08:55
60233340004	GW-11102646-112916-CN-MW4	Water	11/29/16 12:55	12/01/16 08:55
60233340005	TRIP BLANK	Water	11/29/16 12:30	12/01/16 08:55



SAMPLE ANALYTE COUNT

 Project:
 11102646 Magnum No1

 Pace Project No.:
 60233340

Lab ID	Sample ID	Method	Analysts	Analytes Reported
60233340001	GW-11102646-112916-CN-MW1	EPA 6010	JGP	1
		EPA 8260	EAG	8
		EPA 300.0	OL	1
60233340002	GW-11102646-112916-CN-MW2	EPA 6010	JGP	1
		EPA 8260	EAG	8
		EPA 300.0	OL	1
60233340003	GW-11102646-112916-CN-MW3	EPA 6010	JGP	1
		EPA 8260	EAG	8
		EPA 300.0	OL	1
60233340004	GW-11102646-112916-CN-MW4	EPA 6010	JGP	1
		EPA 8260	EAG	8
		EPA 300.0	OL	1
60233340005	TRIP BLANK	EPA 8260	EAG	8



PROJECT NARRATIVE

Project: 11102646 Magnum No1

Pace Project No.: 60233340

Method:EPA 6010Description:6010 MET ICP, DissolvedClient:GHD Services_COP NMDate:December 19, 2016

General Information:

4 samples were analyzed for EPA 6010. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:

The samples were prepared in accordance with EPA 3010 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:



PROJECT NARRATIVE

Project: 11102646 Magnum No1

Pace Project No.: 60233340

Method:EPA 8260Description:8260 MSV UST, WaterClient:GHD Services_COP NMDate:December 19, 2016

General Information:

5 samples were analyzed for EPA 8260. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

Internal Standards:

All internal standards were within QC limits with any exceptions noted below.

Surrogates:

All surrogates were within QC limits with any exceptions noted below.

Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 458375

A matrix spike/matrix spike duplicate was not performed due to insufficient sample volume.

Additional Comments:



PROJECT NARRATIVE

Project: 11102646 Magnum No1

Pace Project No.: 60233340

Method:EPA 300.0Description:300.0 IC Anions 28 DaysClient:GHD Services_COP NMDate:December 19, 2016

General Information:

4 samples were analyzed for EPA 300.0. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.



Project: 11102646 Magnum No1

Pace Project No.: 60233340

Sample:	GW-11102646-112916-CN- MW1	Lab ID: 602	33340001	Collected: 11/29/1	6 13:00	Received: 12	2/01/16 08:55 M	latrix: Water	
	Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET	۲ ICP, Dissolved	Analytical Meth	nod: EPA 601	0 Preparation Meth	nod: EP/	A 3010			
Mangane	se, Dissolved	990	ug/L	5.0	1	12/02/16 11:10	12/05/16 17:17	7439-96-5	
8260 MS	/ UST, Water	Analytical Meth	nod: EPA 826	0					
Benzene		13.2	ug/L	5.0	5		12/10/16 05:26	71-43-2	
Ethylbenz	ene	119	ug/L	5.0	5		12/10/16 05:26	100-41-4	
Toluene		ND	ug/L	5.0	5		12/10/16 05:26	108-88-3	
Xylene (Te	otal)	445	ug/L	15.0	5		12/10/16 05:26	1330-20-7	
Surrogat	es		0						
Toluene-d	8 (S)	104	%	80-120	5		12/10/16 05:26	2037-26-5	
4-Bromofl	uorobenzene (S)	98	%	77-130	5		12/10/16 05:26	460-00-4	
1,2-Dichlo	proethane-d4 (S)	95	%	81-127	5		12/10/16 05:26	17060-07-0	
Preservat	ion pH	1.0		1.0	5		12/10/16 05:26		
300.0 IC /	Anions 28 Days	Analytical Meth	nod: EPA 300	.0					
Sulfate		240	mg/L	20.0	20		12/17/16 17:02	14808-79-8	



Project: 11102646 Magnum No1

Pace Project No.: 60233340

Sample:	GW-11102646-112916-CN- MW2	Lab ID: 602	33340002	Collected: 11/29/1	6 12:30	Received: 12	2/01/16 08:55 N	latrix: Water	
	Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET	Γ ICP, Dissolved	Analytical Meth	nod: EPA 601	0 Preparation Meth	nod: EP/	A 3010			
Mangane	se, Dissolved	1410	ug/L	5.0	1	12/02/16 11:10	12/05/16 17:21	7439-96-5	
8260 MS	/ UST, Water	Analytical Meth	nod: EPA 826	0					
Benzene		25.7	ug/L	1.0	1		12/10/16 05:40	71-43-2	
Ethylbenz	zene	2.1	ug/L	1.0	1		12/10/16 05:40	100-41-4	
Toluene		ND	ug/L	1.0	1		12/10/16 05:40	108-88-3	
Xylene (Te	otal)	ND	ug/L	3.0	1		12/10/16 05:40	1330-20-7	
Surrogat	es		-						
Toluene-d	18 (S)	102	%	80-120	1		12/10/16 05:40	2037-26-5	
4-Bromofl	uorobenzene (S)	97	%	77-130	1		12/10/16 05:40	460-00-4	
1,2-Dichlo	proethane-d4 (S)	99	%	81-127	1		12/10/16 05:40	17060-07-0	
Preservat	ion pH	1.0		1.0	1		12/10/16 05:40		
300.0 IC /	Anions 28 Days	Analytical Meth	nod: EPA 300	.0					
Sulfate		2.6	mg/L	1.0	1		12/17/16 17:16	14808-79-8	



Project: 11102646 Magnum No1

Pace Project No.: 60233340

Sample: GW-11102646-112916-CN- MW3	Lab ID: 602	33340003	Collected: 11/29/1	6 12:45	Received: 12	2/01/16 08:55 N	latrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, Dissolved	Analytical Meth	nod: EPA 601	0 Preparation Met	nod: EP/	A 3010			
Manganese, Dissolved	3120	ug/L	5.0	1	12/02/16 11:10	12/05/16 17:25	7439-96-5	
8260 MSV UST, Water	Analytical Meth	nod: EPA 826	0					
Benzene	2970	ug/L	20.0	20		12/10/16 05:54	71-43-2	
Ethylbenzene	845	ug/L	20.0	20		12/10/16 05:54	100-41-4	
Toluene	ND	ug/L	20.0	20		12/10/16 05:54	108-88-3	
Xylene (Total)	5440	ug/L	60.0	20		12/10/16 05:54	1330-20-7	
Surrogates		-						
Toluene-d8 (S)	101	%	80-120	20		12/10/16 05:54	2037-26-5	
4-Bromofluorobenzene (S)	95	%	77-130	20		12/10/16 05:54	460-00-4	
1,2-Dichloroethane-d4 (S)	98	%	81-127	20		12/10/16 05:54	17060-07-0	
Preservation pH	1.0		1.0	20		12/10/16 05:54		
300.0 IC Anions 28 Days	Analytical Meth	nod: EPA 300	.0					
Sulfate	22.5	mg/L	2.0	2		12/17/16 18:25	14808-79-8	



Project: 11102646 Magnum No1

Pace Project No.: 60233340

Sample: GW-11102646-112916-CN- MW4	Lab ID: 602	33340004	Collected: 11/29/1	6 12:55	Received: 12	2/01/16 08:55 N	latrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, Dissolved	Analytical Meth	nod: EPA 601	0 Preparation Meth	nod: EP/	A 3010			
Manganese, Dissolved	1260	ug/L	5.0	1	12/02/16 11:10	12/05/16 17:29	7439-96-5	
8260 MSV UST, Water	Analytical Meth	nod: EPA 826	60					
Benzene	85.3	ug/L	5.0	5		12/10/16 06:08	71-43-2	
Ethylbenzene	92.9	ug/L	5.0	5		12/10/16 06:08	100-41-4	
Toluene	ND	ug/L	5.0	5		12/10/16 06:08	108-88-3	
Xylene (Total)	967	ug/L	15.0	5		12/10/16 06:08	1330-20-7	
Surrogates		Ū.						
Toluene-d8 (S)	105	%	80-120	5		12/10/16 06:08	2037-26-5	
4-Bromofluorobenzene (S)	103	%	77-130	5		12/10/16 06:08	460-00-4	
1,2-Dichloroethane-d4 (S)	98	%	81-127	5		12/10/16 06:08	17060-07-0	
Preservation pH	1.0		1.0	5		12/10/16 06:08		
300.0 IC Anions 28 Days	Analytical Mether	nod: EPA 300	0.0					
Sulfate	382	mg/L	50.0	50		12/17/16 18:39	14808-79-8	



Project: 11102646 Magnum No1

Pace Project No.: 60233340

Sample: TRIP BLANK	Lab ID: 6	0233340005	Collected: 11/29/	16 12:30	Received: 12	2/01/16 08:55 M	latrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV UST, Water	Analytical M	lethod: EPA 826	60					
Benzene	ND	ug/L	1.0	1		12/10/16 06:22	71-43-2	
Ethylbenzene	ND	ug/L	1.0	1		12/10/16 06:22	100-41-4	
Toluene	ND	ug/L	1.0	1		12/10/16 06:22	108-88-3	
Xylene (Total)	ND	ug/L	3.0	1		12/10/16 06:22	1330-20-7	
Surrogates								
Toluene-d8 (S)	101	%	80-120	1		12/10/16 06:22	2037-26-5	
4-Bromofluorobenzene (S)	96	%	77-130	1		12/10/16 06:22	460-00-4	
1,2-Dichloroethane-d4 (S)	99	%	81-127	1		12/10/16 06:22	17060-07-0	
Preservation pH	1.0		1.0	1		12/10/16 06:22		



Project:	11102646 Magnur	n No1										
Pace Project No.:	60233340											
QC Batch:	457310		Analysis	Method:	EP	PA 6010						
QC Batch Method:	EPA 3010		Analysis	Description:	60	10 MET Dis	ssolved					
Associated Lab San	nples: 60233340	001, 60233340002	, 6023334000	3, 60233340	04							
METHOD BLANK:	1872141		Mat	trix: Water								
Associated Lab San	nples: 60233340	001, 60233340002	, 6023334000	3, 60233340	04							
			Blank	Report	ng							
Paran	neter	Units	Result	Limi		Analyz	ed	Qualifiers				
Manganese, Dissolv	ved	ug/L	Ν	ND	5.0	12/05/16	16:34					
LABORATORY COM	NTROL SAMPLE:	1872142										
			Spike	LCS		LCS	% Re	с				
Paran	neter	Units	Conc.	Result	%	% Rec	Limits	s Qi	ualifiers			
Manganese, Dissolv	ved	ug/L	1000	1010)	101	80	0-120		-		
MATRIX SPIKE & M	IATRIX SPIKE DUF	PLICATE: 18721	43	187	2144							
			MS M	MSD								
		60232824001	Spike S	Spike M	S	MSD	MS	MSD	% Rec		Max	
Paramete	r Uni	ts Result	Conc. C	Conc. Re	sult	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Manganese, Dissolv	red ug/	/L 0.38 mg/L	1000	1000	1400	1390	101	101	75-125	1	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



EPA 8260

8260 MSV UST-WATER

Project: 11102646 Magnum No1

Pace Project No.: 60233340

QC Batch:	458375	Analysis Method:
QC Batch Method:	EPA 8260	Analysis Description:

Associated Lab Samples: 60233340001, 60233340002, 60233340003, 60233340004, 60233340005

METHOD BLANK: 1876626

Matrix: Water

Associated Lab Samples: 60233340001, 60233340002, 60233340003, 60233340004, 60233340005

		Blank	Reporting		
Parameter	Units	Result	Limit	Analyzed	Qualifiers
Benzene	ug/L	ND	1.0	12/10/16 02:53	
Ethylbenzene	ug/L	ND	1.0	12/10/16 02:53	
Toluene	ug/L	ND	1.0	12/10/16 02:53	
Xylene (Total)	ug/L	ND	3.0	12/10/16 02:53	
1,2-Dichloroethane-d4 (S)	%	98	81-127	12/10/16 02:53	
4-Bromofluorobenzene (S)	%	96	77-130	12/10/16 02:53	
Toluene-d8 (S)	%	102	80-120	12/10/16 02:53	

LABORATORY CONTROL SAMPLE: 1876627

		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Benzene	ug/L	20	18.4	92	79-116	
Ethylbenzene	ug/L	20	19.3	97	81-110	
Toluene	ug/L	20	18.6	93	82-111	
Xylene (Total)	ug/L	60	58.6	98	80-111	
1,2-Dichloroethane-d4 (S)	%			96	81-127	
4-Bromofluorobenzene (S)	%			94	77-130	
Toluene-d8 (S)	%			103	80-120	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



Sulfate			ma/L		1290	500	18	20	105	80-	120		
Parar	meter		Units	602335 Res	523002 Sult	Spike Conc.	MS Result	N % I	IS Rec	% Rec Limits		Qualif	iers
MATRIX SPIKE SA	MPLE:	18	378847										
Sulfate		mg/L	1450	500	500	1990	0 1980	108	107	80-120	0	15	
Paramete	er	Units	60233523001 Result	Spike Conc.	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
MATRIX SPIKE & N	<i>I</i> ATRIX	SPIKE DUPLIC	CATE: 18788	45 MS	MOD	1878846	3						
Sulfate			mg/L	Ę	5	5.0	99	90)-110				
Parar	neter		Units	Conc.	Resi	ult	% Rec	Limits	Q	ualifiers	_		
LABORATORY CO	NTROL	SAMPLE: 18	378844	Snike	1.05	3	LCS	% Rec					
Sulfate			mg/L		ND	1.	0 12/17/16	09:14					
Parar	neter		Units	Resu	lt	Limit	Analyz	zed	Qualifiers				
	npico.	0020004000	1,002000-0002	Blanl	k R	Reporting							
METHOD BLANK:	187884 moles:	43	1 60222240002	60233340	Matrix: Wa	ter							
	nples:	60233340001	1,60233340002	2,60233340	0003, 6023	3340004							
QC Batch Method:	EPA :	300.0		Analys	sis Descrip	tion:	300.0 IC Anic	ons					
QC Batch:	4589	63		Analys	sis Method	: I	EPA 300.0						
Pace Project No.:	602333	340											
Project:	111026	646 Magnum N	01										

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



QUALIFIERS

Project: 11102646 Magnum No1

Pace Project No.: 60233340

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

BATCH QUALIFIERS

Batch: 458375

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.



QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project:	11102646 Magnum No1
Pace Project No .:	60233340

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60233340001	GW-11102646-112916-CN-MW1	EPA 3010	457310	EPA 6010	457385
60233340002	GW-11102646-112916-CN-MW2	EPA 3010	457310	EPA 6010	457385
60233340003	GW-11102646-112916-CN-MW3	EPA 3010	457310	EPA 6010	457385
60233340004	GW-11102646-112916-CN-MW4	EPA 3010	457310	EPA 6010	457385
60233340001	GW-11102646-112916-CN-MW1	EPA 8260	458375		
60233340002	GW-11102646-112916-CN-MW2	EPA 8260	458375		
60233340003	GW-11102646-112916-CN-MW3	EPA 8260	458375		
60233340004	GW-11102646-112916-CN-MW4	EPA 8260	458375		
60233340005	TRIP BLANK	EPA 8260	458375		
60233340001	GW-11102646-112916-CN-MW1	EPA 300.0	458963		
60233340002	GW-11102646-112916-CN-MW2	EPA 300.0	458963		
60233340003	GW-11102646-112916-CN-MW3	EPA 300.0	458963		
60233340004	GW-11102646-112916-CN-MW4	EPA 300.0	458963		



Sample Condition Upon Receipt ESI Tech Spec Client

WO#:60233340

Courier: FedEx D UPS VIA Clay PEX ECI Pace Xroads Client Other Tracking #:	Client Name: Gro (pr NM							
Tracking # <u>A44</u> 665 L 766 - Pace Shipping Label Used?, Yes X No Custody Seal on Cooler/Box Present: Yes X No Seals intact: Yes X No Packing Material: Bubble Bags X Foam None Other Thermometer Used: <u>Date</u> Type of loc_WB Blue None Date Coler Temperature (*C): Ascread o. 6 Corr. Factor of 43 Corrected V.5 Date and initials of person 175 Temperature should be above freezing to 6°C Corr. Factor of 43 Corrected V.5 Date and initials of person 175 Chain of Custody present: Des Bive None None Date 2011/Loc Samples arrived within holding time: Dres No No No No Sufficient volume: Pfee No No No No Correct containers used: Area No No No No Containers intact: If Yes No No No No Samples contain multiple phases: Matrix Yes No No No Samples contain multiple phases: Matri	Courier: FedEx 2 UPS VIA Clay PE	EX 🗆 🛛 E		Pace 🗆 🛛	Xroads [Client	Other 🗆	
Custody Seal on Cooler/Box Present: Yes, No Beals intact: Yes, No Boals intact: Yes, No	Tracking #: 7044 6651 7687 Pace	Shipping La	abel Used?	≻⁄YesX	No 🗆			
Packing Material: Bubble Wrap: Bubble Bags Foam None Other Thermometer Used: 1230 Type of Ice-Wrap Blue None Date and initials of person //** Cooler Temperature (*C): As-read 0.6 Corr. Factor Gr +0.7 cr +0.7 c	Custody Seal on Cooler/Box Present: Yes 🖉 No 🗆	Seals intac	t: Yes 屋	No 🗆				
Thermometer Used: 11233 Type of Ice: Web Blue None Date and initials of person // // // Examining contents::::::::::::::::::::::::::::::::::	Packing Material: Bubble Wrap 🕞 Bubble Bags 🖉	F	oam 🗆	None 🗆) (Other 🗆		
Cooler Temperature (*C): As-read o. 6 Corr. Factor of +0.7 of +0.5 Corrected US Date and initials of person 1/1/2 Temperature should be above freezing to 6*C Chain of Custody present: Iffees No N/A Chain of Custody present: Iffees No N/A Chain of Custody relinquished: Iffees No N/A Samples arrived within holding time: Iffees No N/A Short Hold Time analyses (<72hr):	Thermometer Used: 1-266 / T-239 Type	of Ice; -W	D Blue	None				
Temperature should be above freezing to 6°C Chain of Custody present: Free Chain of Custody present: Free Chain of Custody present: Free Samples arrived within holding time: Free Short Hold Time analyses (<72hr):	Cooler Temperature (°C): As-read 0-6 Corr. Factor	r CF +0.7 CF -0	5Correcte	d 1.5		Date and examinin	initials of person	1/25
Chain of Custody present: If es No NiA Chain of Custody relinquished: If yes No NiA Samples arrived within holding time: If yes No NiA Short Hold Time analyses (<72hr):	Temperature should be above freezing to 6°C				-			12/112
Chain of Custody relinquished: IVes INA Samples arrived within holding time: IVes INA Short Hold Time analyses (<72hr):	Chain of Custody present:	Pres IN	D □N/A					
Samples arrived within holding time: Short Hold Time analyses (<72hr): Uves Timo NuA Rush Turn Around Time requested: Uves Timo NuA Rush Turn Around Time requested: Uves Timo NuA Correct containers used: Times INA Correct containers used: Titered volume: Filtered volume received for dissolved tests? Samples contain multiple phases? Matrix: Samples contain multiple phases? Matrix: Samples contain multiple phases? Matrix:	Chain of Custody relinguished:							
Start Hold Time analyses (<72hr):	Samples arrived within holding time:	Fives DN						
Short Hold Time analyses (<72hr):								
Rush Turn Around Time requested: IVes INo IN/A Sufficient volume: IVes INo IN/A Correct containers used: IVes INo IN/A Pace containers used: IVes INo IN/A Containers intact: IVes INo IN/A Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs? IVes INo IN/A Filtered volume received for dissolved tests? IVes INo IN/A Sample labels match COC: Date / time / ID / analyses IVes INo IVes INo Sample sontain multiple phases? Matrix: IVes INo IVes INo IVes Containers requiring pH preservation in compliance? IVes INo IVIA IVes INo Containers requiring pH preservation in compliance? IVes INo IVes INo (HNOs, H_SOs, HCIX: NOHPS Sulfide, NAOH>10 Cyanide) IVes INo IVes INo (Exceptions: VOA, Micro O&G, KS TPH, OK-DRO) IVes INo IVes INo Potassium iodide test strip turns blue/purple? (Preserve) IVes INo IVes INo <td>Short Hold Time analyses (<72hr):</td> <td>LIYes ZIN</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	Short Hold Time analyses (<72hr):	LIYes ZIN						
Sufficient volume: Image: Sum of the sum o	Rush Turn Around Time requested:		⊳ □N/A					
Correct containers used: Image: Section of the sec	Sufficient volume:		D □N/A					
Pace containers used: Image: State in the state in	Correct containers used:							
Containers intact: Image: Second Stress	Pace containers used:		D □N/A					
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs? Ives Ives<	Containers intact:	ØYes □N	D □N/A	Š.				
Filtered volume received for dissolved tests? Image: Second S	Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	□Yes □N						
Sample labels match COC: Date / time / ID / analyses If Yes No N/A If Yes Dissolved ### Mn Samples contain multiple phases? Matrix: If Yes No If N/A Containers requiring pH preservation in compliance? If Yes No If N/A Containers requiring pH preservation in compliance? If Yes No If N/A (HNO3, H2SO4, HCI<2; NaOH>9 Sulfide, NaOH>10 Cyanide) If Yes No If N/A (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO) Cyanide water sample checks: If N/A Lead acetate strip turns dark? (Record only) If Yes No Potassium iodide test strip turns blue/purple? (Preserve) If Yes No Trip Blank present: If Yes No If N/A Headspace in VOA vials (>6mm): If Yes No If N/A Samples from USDA Regulated Area: State: If Yes No If N/A Additional labels attached to 5035A / TX1005 vials in the field? If Yes No If N/A	Filtered volume received for dissolved tests?	Yes N	D □N/A	Unp	reserved	filtered	container pr	by
Samples contain multiple phases? Matrix: Image: Matrix:	Sample labels match COC: Date / time / ID / analyses		o ⊡n/A	Ę	AC T	Dissolved #	mm Mn	
Containers requiring pH preservation in compliance? (HNO ₃ , H ₂ SO ₄ , HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO) Cyanide water sample checks: MN/A Lead acetate strip turns dark? (Record only)	Samples contain multiple phases? Matrix:							
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(Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO) Cyanide water sample checks: QN/A Lead acetate strip turns dark? (Record only) Potassium iodide test strip turns blue/purple? (Preserve) Prip Blank present: Pres No Trip Blank present: Pres Pres No Meadspace in VOA vials (>6mm): Samples from USDA Regulated Area: State: Yes No Additional labels attached to 5035A / TX1005 vials in the field?	$(HNO_3, H_2SO_4, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide)$							
Cyanide water sample checks: Image: N/A Lead acetate strip turns dark? (Record only) Image: No Potassium iodide test strip turns blue/purple? (Preserve) Image: No Trip Blank present: Image: No Image: No Image: No Headspace in VOA vials (>6mm): Image: No Samples from USDA Regulated Area: State: State: Image: No Image: No Image: No Additional labels attached to 5035A / TX1005 vials in the field? Image: No	(Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)							
Potassium iodide test strip turns blue/purple? (Preserve) Image: Preserve Trip Blank present: Image: Preserve Headspace in VOA vials (>6mm): Image: Preserve Samples from USDA Regulated Area: State: Image: Preserve Image: Preserve Additional labels attached to 5035A / TX1005 vials in the field? Preserve	Cyanide water sample checks: ZN/A							
Trip Blank present: Image: Second s	Potassium iodide test strip turns blue/purple? (Preserve)							
Irip Blank present: PIYes No PINA Headspace in VOA vials (>6mm): Image: Present PresentPrese								
Headspace in VOA vials (>6mm): Yes No N/A Samples from USDA Regulated Area: State: Yes No ØN/A	I rip Blank present:							
Samples from USDA Regulated Area: State: □Yes □No ⊄N/A	Headspace in VOA vials (>6mm):		D AN/A					
Additional labels attached to 5035A / TX1005 vials in the field? Yes No. Style	Samples from USDA Regulated Area: State:	Yes N						
	Additional labels attached to 5035A / TX1005 vials in the field?	Yes N					<u></u>	
Client Notification/ Resolution: Copy COC to Client? Y / N Field Data Required? Y / N	Client Notification/ Resolution: Copy COC to C	Client? Y	/ [^] N	Field Dat	a Require	ed? Y /	N	
Person Contacted: Date/Time: Temp Log: Record start and finish times when unpacking cooler, if >20 min, recheck	Person Contacted: Date/Tir	me:		_		Temp Log: Ro when unpacking	ecord start and finis ng cooler, if >20 mi	h times n, recheck
Comments/ Resolution.						Start: (12	Ø Start:	
End: // 2 End:						End: //7	S End	
Project Manager Review: Alice Date: 12/01/16	Project Manager Review: Alice		Date:	12/01/1	6	Temp:	Temp:	

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CHAIN-OF-CUSTODY / Analytical Request Document The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

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	dress:	6121 Indian School Rd NE	Copy To:	Company Name:					1 1 1	ŋ
	puquerq	ue, NM 87110		Address:			Re	egulatory	Agency	
	mail: j	eff walker@ghd com	Purchase Order #: 34008245	Pace Quote:						l
При п	hone:	505-377-3920 Fax	Project Name: 11102646 Magnum No1	Pace Project Mar	ager alice.spiller@pacelabs.con	- <u>-</u> -		State / Lo	cation	100
	equested	d Due Date:	Project #: 11000000	Pace Profile #:	8644,24			WN		
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2 3 5:W-11(0)-640-10-340-2M-74W-3 1 1:300 1:100-640-10-340-2M-74W-3 1:200 2:30 3 5:W-11(0)-640-10-340 2:45 1 1 2:4 2:4 3 5:W-11(0)-640-10-340 2:45 1 1 2:4 4 5:W-11(0)-640 1:3916-2M-74W-3 2:45 2:4 1 5:W-11(0)-640 1:3916-2M-74W-4 2:45 2:4 1 5:W-11(0)-640 1:391 1:4 2:4 1 5:W-11(0)-640 1:391 1:4 1:4 1 1:10 8:S 1:4 1:5 2:4 1 1:10 8:S 1:4 1:5 2:4 1 1:10 8:S 1:5 2:4 2:4 1 1:10 1:5	-	016011-0401010-MG	5 - CN- MW /G. 113916 1300	A5X				206	19H) 21812	v) an
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