

EMERALD GATHERING AND TRANSMISSION, LLC

May 29, 2015

FedEx Tracking No. 8034 5784 8935

Mr. Isaac Chen
U.S. Environmental Protection Agency, Region 6
Regional Oil & Gas Coordinator
1445 Ross Avenue – Mail Code-6WQ-PP
Dallas, Texas 75202-2733

Subject: GMG290000 Permit – Produced Water and Water Based Drilling Mud Characterization Study
Emerald Gathering & Transmission – GMG290378

Dear Mr. Chen:

Per the permit requirements in Part I.B.4.c – Produced Water Characterization Study, Emerald Gathering & Transmission (Emerald), has conducted an individual study and has collected one sample from each producing lease block for which they are the designated operator. Emerald has not and will not have a drilling project within the 3-year study time frame.

The lease block area reported on is Galveston 214 – Platform A. The produced water samples were analyzed for the required metals, including:

Dissolved arsenic, dissolved cadmium, dissolved chromium (VI), dissolved copper, free cyanide, dissolved lead, dissolved mercury, dissolved nickel, dissolved selenium, dissolved silver, and dissolved zinc.

A summary of the analytical results are presented in the attached Excel worksheet and summary pages from the laboratory report. This letter and analytical summary are being submitted via hard copy and email to chen.isaac@epa.gov so that it is also available in electronic format. The complete analytical report from the laboratory can be provided upon request.

Should you have any questions, please call me or our consultant, Ms. Marsha Lutz, of J. Connor Consulting, Inc. at 281-698-8557.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Sincerely,

EMERALD GATHERING & TRANSMISSION, LLC



Douglas Schaefer
Production Supervisor

Attachment

REF: DT5510/05187

11 Greenway Plaza, Suite 2850
Houston, Texas 77046
Phone (713) 621-2242

**Produced Water Characterization Study - Sampling Results
Emerald Gathering and Transmission - GMG290378**

| Lease Block/Area | Lease No. | | Sampling Date | | |
|------------------------------------------------------------------------|---------------------------|---------------------------|---------------------------|--------------------|--------------------|
| Galveston 214 -Platform A | MF 114331 | | 2/5/2015 | | |
| Parameter *All metals analyzed for dissolved phase | Min. Conc. mg/L | Max. Conc. mg/L | Avg. Conc. mg/L | MDL mg/L | MRL mg/L |
| Arsenic | < 0.05 | < 0.05 | < 0.05 | 0.050 | 0.250 |
| Cadmium | < 0.04 | < 0.04 | < 0.04 | 0.040 | 0.100 |
| Chromium, VI | < 0.010 | < 0.010 | < 0.010 | 0.010 | 0.250 |
| Copper | < 0.035 | < 0.035 | < 0.035 | 0.035 | 0.250 |
| Free Cyanide | < 0.02 | < 0.02 | < 0.02 | 0.020 | 0.020 |
| Lead | < 0.035 | < 0.035 | < 0.035 | 0.035 | 0.250 |
| Mercury | < 0.000042 | < 0.000042 | < 0.000042 | 0.000042 | 0.000200 |
| Nickel | < 0.05 | < 0.05 | < 0.05 | 0.050 | 0.250 |
| Selenium | 0.104 J | 0.104 J | 0.104 J | 0.050 | 0.250 |
| Silver | < 0.04 | < 0.04 | < 0.04 | 0.040 | 0.250 |
| Zinc | < 0.125 | < 0.125 | < 0.125 | 0.125 | 0.250 |

MDL - Minimum Detection Limit

MRL Method Reporting Limit. Also known as:LOQ Limit of Quantitation (LOQ)

Values between the MDL and MRL are estimated (see J qualifier).

J - Analyte Detected Below Quantitation Limit

Client: Tetra Tech, Inc.
 Project: Gulf of Mexico MPWCS 212C-HN-00074, Task 01
 Sample ID: Emerald Gathering and Transmission GA-214
 Collection Date: 05-Feb-2015 06:00

ANALYTICAL REPORT
 WorkOrder:HS15020198
 Lab ID:HS15020198-01
 Matrix:Water

| ANALYSES | RESULT | QUAL | MDL | REPORT LIMIT | UNITS | DILUTION FACTOR | DATE ANALYZED |
|-------------------------------------|--------------|----------------------|-----------|----------------------------|-------|-----------------|-------------------|
| DISSOLVED METALS BY SW6020A | | Method:SW6020 | | Prep:SW3010A / 12-Feb-2015 | | Analyst: RPM | |
| Arsenic | U | | 0.0500 | 0.250 | mg/L | 50 | 13-Feb-2015 11:27 |
| Cadmium | U | | 0.0400 | 0.100 | mg/L | 50 | 13-Feb-2015 11:27 |
| Copper | U | | 0.0500 | 0.250 | mg/L | 50 | 13-Feb-2015 11:27 |
| Lead | U | | 0.0350 | 0.250 | mg/L | 50 | 13-Feb-2015 11:27 |
| Nickel | U | | 0.0500 | 0.250 | mg/L | 50 | 13-Feb-2015 11:27 |
| Selenium | 0.104 | J | 0.0500 | 0.250 | mg/L | 50 | 13-Feb-2015 11:27 |
| Silver | U | | 0.0400 | 0.250 | mg/L | 50 | 13-Feb-2015 11:27 |
| Zinc | U | | 0.125 | 0.250 | mg/L | 50 | 13-Feb-2015 11:27 |
| CYANIDE - SW9014 | | Method:SW9014 | | Prep:SW9010C / 10-Feb-2015 | | Analyst: KHT | |
| Cyanide, Dissolved | U | | 0.0200 | 0.0200 | mg/L | 1 | 10-Feb-2015 17:03 |
| DISSOLVED MERCURY BY SW7470A | | Method:SW7470 | | Prep:SW7470 / 10-Feb-2015 | | Analyst: OFO | |
| Mercury | U | | 0.0000420 | 0.000200 | mg/L | 1 | 10-Feb-2015 14:43 |
| SUBCONTRACT ANALYSIS | | Method:NA | | | | Analyst: SUB | |
| Miscellaneous Analysis | see attached | | 0 | 0 | | 1 | 19-Feb-2015 14:14 |

Note: See Qualifiers Page for a list of qualifiers and their explanation.



ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client: ALS Environmental - US
Project: HS15020198
Sample Matrix: Water
Sample Name: HS15020198-01
Lab Code: R1500906-001

Service Request: R1500906
Date Collected: 2/5/15 0600
Date Received: 2/6/15

Basis: NA

General Chemistry Parameters

| Analyte Name | Method | Result | Q | Units | MRL | Dilution Factor | Date Extracted | Date Analyzed | Note |
|---------------------------------|--------|--------|---|-------|-------|-----------------|----------------|---------------|------|
| Chromium, Hexavalent, Dissolved | 218.6 | 0.010 | U | mg/L | 0.010 | 1 | NA | 2/10/15 12:29 | |





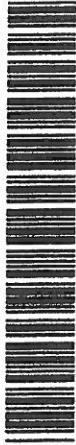
ALS Laboratory Group
10450 Stancliff Rd. #210
Houston, Texas 77099
(Tel) 281.530.5656
(Fax) 281.530.5887

Chain of Custody Form

Page 1 of 1

HS15020198

Tetra Tech, Inc.
Gulf of Mexico MPWCS 212C-HN-00074, Task 01



| Customer Information | | Project Information | | Parameter/Method Request for Analysis | | | | | | | | | | | | | |
|------------------------------------------------|-------------------------------------------|---------------------------|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|-------------------|---|---|---|---|---|---|---|---|---|---|------|
| Purchase Order | 1097177 | Project Name | Gulf of Mexico MPWCS | A | Dissolved Metals (6020/7000) As,Cd,Cu,Pb,Mi,Se,Ag,Zn,Hg | | | | | | | | | | | | |
| Work Order | | Project Number | 212C-HN-00074, Task 01 | B | Dissolved Cyanide (9014) | | | | | | | | | | | | |
| Company Name | Tetra Tech | Bill To Company | Tetra Tech | C | Dissolved Hexavalent Chromium (218.6) | | | | | | | | | | | | |
| Send Report To | June Mire | Invoice Attn. | June Mire | D | | | | | | | | | | | | | |
| Address | 1408 Pasadena Avenue | Address | 1408 Pasadena Avenue | E | | | | | | | | | | | | | |
| City/State/Zip | Metairie, LA 70001 | City/State/Zip | Metairie, LA 70001 | F | | | | | | | | | | | | | |
| Phone | 504-273-9186 | Phone | 504-273-9186 | G | | | | | | | | | | | | | |
| Fax | | Fax | | H | | | | | | | | | | | | | |
| e-Mail Address | june.mire@tetratech.com | e-Mail Address | june.mire@tetratech.com | I | | | | | | | | | | | | | |
| No. | Sample Description | Date | Time | Matrix | Pres. | # Bottles | A | B | C | D | E | F | G | H | I | J | Hold |
| 1 | Emerald Gathering and Transmission GA-214 | 2-5-15 | 06:00 | PW | | 3 | X | X | X | | | | | | | | |
| 2 | | | | | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | | | | | | |
| 7 | | | | | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | | | |
| Sampler(s): Please Print & Sign | | Shipment Method: | | Required Turnaround Time: | | Results Due Date: | | | | | | | | | | | |
| James D. Joseph | | | | <input checked="" type="checkbox"/> STD 10 Wk Days <input type="checkbox"/> 5 Wk Days <input type="checkbox"/> 2 Wk Days <input type="checkbox"/> 24 Hour <input type="checkbox"/> Other | | | | | | | | | | | | | |
| Relinquished by: | | Received by: | | Notes: | | | | | | | | | | | | | |
| James D. Joseph | | Adrienne Adams | | 2-5-15 | | | | | | | | | | | | | |
| Relinquished by: | | Received by (Laboratory): | | Cooler Temp. | | | | | | | | | | | | | |
| Adrienne Adams | | Tetra Tech | | 1505 | | | | | | | | | | | | | |
| Relinquished by (Laboratory): | | Checked by (Laboratory): | | QC Package: (Check Box Below) | | | | | | | | | | | | | |
| Tetra Tech | | Tetra Tech | | <input type="checkbox"/> Level II: Standard QC <input type="checkbox"/> Level III: Std QC + Raw Data <input checked="" type="checkbox"/> Level IV: SW846 CLP-Like <input type="checkbox"/> Other: | | | | | | | | | | | | | |
| Preservative Key: | | 7-Other: | | 9-5035 | | | | | | | | | | | | | |
| 1-HGL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 | | 8-NaHSO4 | | | | | | | | | | | | | | | |

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS Laboratory Group.

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CHAIN OF CUSTODY RECORD

Date 5 Feb 2015

COC ID 2252

Due date 19 FEB 15

| | |
|---------------------------------------------------------------------------|----------------------------|
| Subcontractor | |
| ALS 1565 Jefferson Road Building 300, Suite 360 Rochester, NY 14623 | Phone 5852885380 Fax |

R1500906 **5**

ALS Group USA, Corp.
HS15020198



| Customer Information | | Project Information | |
|----------------------|--|---------------------|------------|
| PO | | Project Name | HS15020198 |

| | | | |
|--------------|-----------------------------|--------------|-----------------------------|
| Company Name | ALS Houston | Company Name | ALS Houston |
| | | Inv Attn | Accounts Payable |
| Address | 10450 Stancliff Rd, Ste 210 | Address | 10450 Stancliff Rd, Ste 210 |
| | Houston, TX 77099 | | Houston, TX 77099 |
| Phone | 281-530-5656 | Phone | 281-530-5656 |
| Email1 | ana.spencer@alsglobal.com | Email2 | jumoke.lawal@alsglobal.com |

| Lab ID | Client Samp ID | Collection Date | Matrix | Analysis Requested |
|---------------|-------------------------------------------|--------------------|--------|---------------------|
| HS15020198-01 | Emerald Gathering and Transmission GA-214 | 05-Feb-15 06:00 am | Water | ALS-Rochester 218.6 |

Comments Please analyze for the above and send report to ana.spencer@alsglobal.com and cc to Jumoke.Lawal@alsglobal.com.

| Relinquished by: | Date/Time: | Received by: | Date/Time: | Cooler IDs: | Report/QC Level |
|------------------|----------------|---------------------|-------------|-------------|-----------------|
| <i>J. Hall</i> | 2-5-15 1800 | <i>Jumoke Lawal</i> | 2/6/15 1030 | | |
| | | | | | |



Cooler Receipt and Preservation Check Form

R1500906

5

ALS Group USA, Corp.
HS16020198



Project/Client ALS Houston Folder Number R15-906

Cooler received on 2/6/15 by: _____ COURIER: ALS UPS ~~FEDEX~~ VELOCITY CLIENT

| | | | |
|---|------------------------------------------------------|------------------------------------|-------------------------|
| 1 | Were Custody seals on outside of cooler? | <input checked="" type="radio"/> Y | <input type="radio"/> N |
| 2 | Custody papers properly completed (ink, signed)? | <input checked="" type="radio"/> Y | <input type="radio"/> N |
| 3 | Did all bottles arrive in good condition (unbroken)? | <input checked="" type="radio"/> Y | <input type="radio"/> N |
| 4 | Circle: <u>Wet Ice</u> Dry Ice Gel packs present? | <input checked="" type="radio"/> Y | <input type="radio"/> N |

| | | | | |
|----|---------------------------------------------------|-------------------------|-------------------------|---------------------------------------------|
| 5a | Perchlorate samples have required headspace? | <input type="radio"/> Y | <input type="radio"/> N | <input checked="" type="radio"/> NA |
| 5b | Did VOA vials, Alk, or Sulfide have sig* bubbles? | <input type="radio"/> Y | <input type="radio"/> N | <input checked="" type="radio"/> NA |
| 6 | Where did the bottles originate? | ALS/ROC <u>CLIENT</u> | | |
| 7 | Soil VOA received as: | Bulk | Encore | 5035set <input checked="" type="radio"/> NA |

8. Temperature Readings Date: 2/6/15 Time: 1039 ID: IR#3 IR#4 From: Temp Blank Sample Bottle

| | | | | | | | | |
|------------------------|------------------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| Observed Temp (°C) | <u>0.3</u> | | | | | | | |
| Correction Factor (°C) | <u>-</u> | | | | | | | |
| Corrected Temp (°C) | <u>0.3</u> | | | | | | | |
| Within 0-6°C? | <input checked="" type="radio"/> Y | <input type="radio"/> N | <input type="radio"/> Y | <input type="radio"/> N | <input type="radio"/> Y | <input type="radio"/> N | <input type="radio"/> Y | <input type="radio"/> N |

If out of Temperature, note packing/ice condition: _____ Ice melted _____ Poorly Packed _____ Same Day Rule _____

& Client Approval to Run Samples: _____ Standing Approval _____ Client aware at drop-off _____ Client notified by: _____

All samples held in storage location: None by ITS on 2/6/15 at 1039
5035 samples placed in storage location: _____ by _____ on _____ at _____

PC Secondary Review: JMD 2/6/15

Cooler Breakdown: Date: 2/6/15 Time: 1529 by: SW

- Were all bottle labels complete (i.e. analysis, preservation, etc.)? YES NO
- Did all bottle labels and tags agree with custody papers? YES NO
- Were correct containers used for the tests indicated? YES NO
- Air Samples: Cassettes / Tubes Intact _____ Canisters Pressurized _____ Tedlar® Bags Inflated N/A

Explain any discrepancies:

| pH | Reagent | Yes | No | Lot Received | Exp | Sample ID | Vol. Added | Lot Added | Final pH |
|-----------------------|-----------------------------------------------|-----|----|------------------------------------------------------------------------------------------------|-----|-----------|------------|-----------|----------|
| ≥12 | NaOH | | | | | | | | |
| ≤2 | HNO ₃ | | | | | | | | |
| ≤2 | H ₂ SO ₄ | | | | | | | | |
| <4 | NaHSO ₄ | | | | | | | | |
| Residual Chlorine (-) | For CN Phenol and 522 | | | If +, contact PM to add Na ₂ S ₂ O ₃ (CN), ascorbic (phenol). | | | | | |
| | Na ₂ S ₂ O ₃ | - | - | | | | | | |
| | ZnAcetate | - | - | | | | | | |
| | HCl | ** | ** | | | | | | |

Yes=All samples OK,

No=Samples were preserved at The lab as listed

PM OK to Adjust:

**Not to be tested before analysis - pH tested and recorded by VOAs on a separate worksheet

Bottle lot numbers: client
Other Comments:

PC Secondary Review: _____

*significant air bubbles: VOA > 5-6 mm : WC > 1 in. diameter

