



Remedy Selection Report

Oak Grove Steam Electric Station - FGD Ponds

Robertson County, Texas

Submitted to:

Oak Grove Management Company LLC

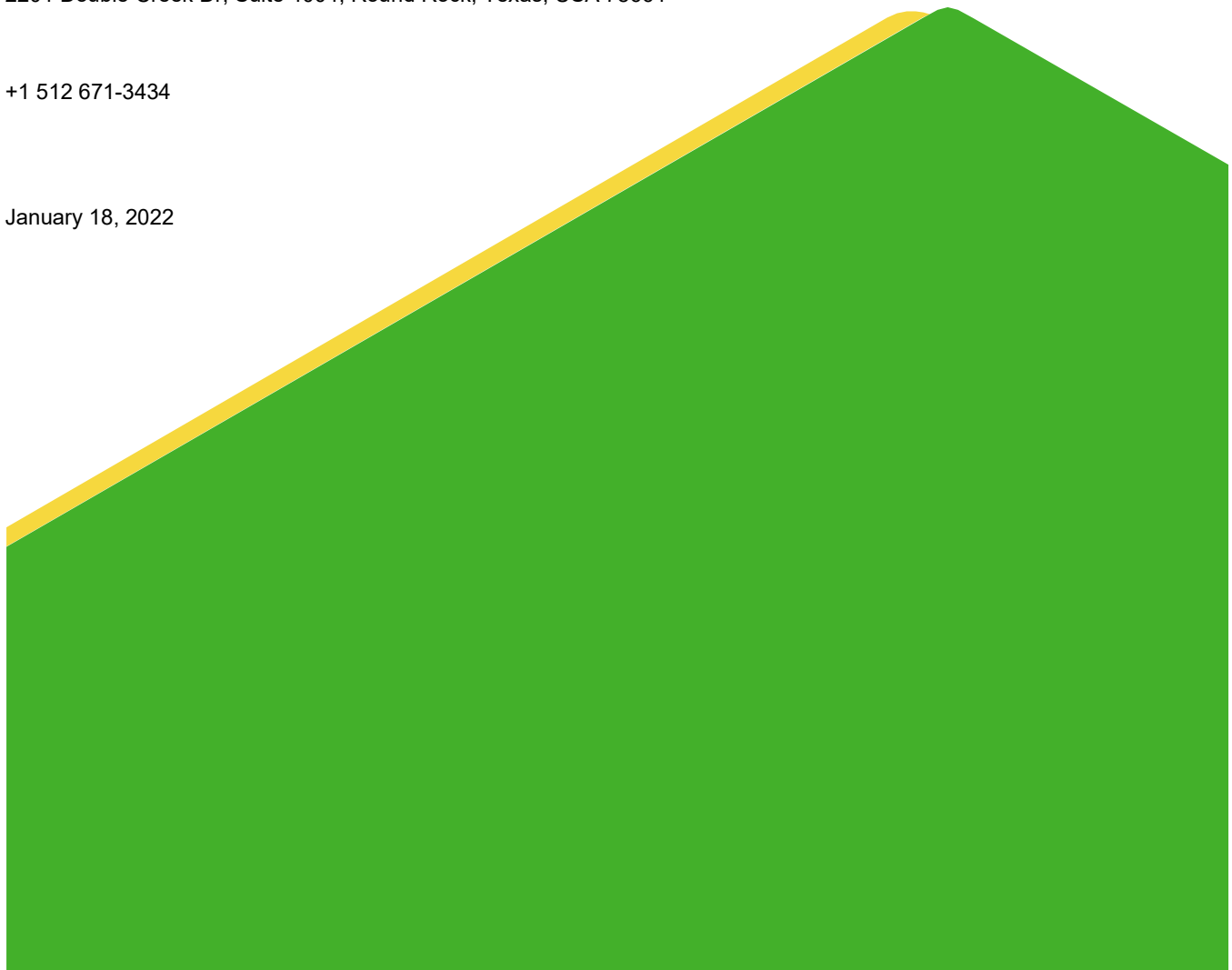
Submitted by:

Golder Associates Inc.

2201 Double Creek Dr, Suite 4004, Round Rock, Texas, USA 78664

+1 512 671-3434

January 18, 2022



PROFESSIONAL CERTIFICATION

This document and all attachments were prepared by Golder Associates Inc. 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 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 hereby certify that this Remedy Selection Report meets the requirements of 40 C.F.R. § 257.97 and 30 TAC §352.971.



Patrick J. Behling, P.E.
Principal Engineer
Golder Associates Inc.

DISTRIBUTION LIST

Renee Collins, Luminant

David Mitchell, Luminant

Eric Chavers, Luminant

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1.0 INTRODUCTION

On behalf of Oak Grove Management Company (Luminant), Golder Associates Inc. (Golder), Member of WSP, has prepared this Remedy Selection Report for FGD-A Pond, FGD-B Pond, and FGD-C Pond (collectively referred to as the “FGD Ponds”) at the Oak Grove Steam Electric Station (OGSES) in Robertson County, Texas (hereafter, the “Site”) (**Figure 1**). Luminant manages coal combustion residuals (CCR) generated from the OGSES in the FGD Ponds per the applicable requirements of 40 C.F.R. Part 257, Subpart D as amended (CCR Final Rule) and 30 TAC Chapter 352 (Texas CCR Rule). The United States Environmental Protection Agency (USEPA) published its final approval of the Texas CCR rule on June 28, 2021. See 86 Fed. Reg. 33,892 (June 28, 2021). The Texas CCR Rule became effective on July 28, 2021, and it adopts and incorporates by reference the requirements for remedy selection located at § 257.97.

Statistically significant levels (SSLs) of cobalt and lithium above groundwater protection standards (GWPSs) were detected in the uppermost aquifer hydraulically downgradient of the FGD Ponds during 2018 assessment monitoring. In response to the 2018 cobalt and lithium SSLs, an Assessment of Corrective Measures (ACM) report was completed for the FGD Ponds in September 2019 as required by § 257.96 (Golder 2019a). The ACM demonstrated that groundwater concentrations of cobalt and lithium were stable or decreasing at all wells and the extent of cobalt and lithium SSLs was delineated on-site (i.e., no offsite migration was indicated). The ACM evaluated various source control and groundwater response technologies to address the cobalt and lithium SSLs. An Alternate Source Demonstration (ASD) was completed in accordance with § 257.95(g)(3)(ii) in October 2020 (Golder 2020), which indicated that a source other than the FGD Ponds caused the lithium SSL. Lithium has therefore been eliminated as a constituent of concern at the FGD Ponds. The ACM was updated in May 2021 (Golder 2021a) to remove lithium from the list of constituents evaluated in the ACM. In addition, updated statistical analyses for cobalt that incorporated assessment monitoring data collected from 2019 to 2021 indicate that cobalt is also no longer present at SSLs above the GWPS; however, for the purposes of the ACM and remedy selection, Luminant continued to evaluate potential groundwater remedies for cobalt based on the 2018 SSL to address potential cobalt SSLs that may occur in the future.

The purpose of this selection of remedy report is to describe the selected remedy, describe how the selected remedy meets the requirements of §257.97, and provide a schedule for implementing and completing remedial activities.

2.0 SITE SETTING

The OGSES is located approximately 10 miles north of the city of Franklin in Robertson County, Texas. Construction of the OGSES began in the mid-1980s; however, plant construction was suspended in the mid-1980s prior to completion. OGSES construction resumed in 2007 and the plant was commissioned in 2010. The OGSES is expected to remain in operation for the foreseeable future, depending on future power demands. The FGD Ponds are located approximately 2,500 feet northwest of the OGSES power generation units (**Figure 1**).

FGD-A construction began in the mid-1980s, but pond construction stopped when construction of the OGSES was suspended (Golder 2016a). FGD-A construction resumed in 2007 and was completed in 2008. FGD-A covers an area of approximately 9 acres and stores CCR and other wastes generated from the OGSES prior to recycling or disposal in OGSES Ash Landfill 1. FGD-A is lined with a 3-foot thick compacted clay liner. FGD-A was removed from service prior to April 2021 and Luminant anticipates retrofit completion in 2022 with a composite liner system meeting the requirements of § 257.71(a)(1)(ii) of the CCR Rule. The retrofitted liner system will consist of a minimum 2-foot thick compacted clay liner or geosynthetic clay liner (GCL), overlain by a

60-mil HDPE geomembrane liner. The floor of the pond will be covered by a 1.5-foot thick layer of protective soil and the upper portion of the pond side slopes will be covered with concrete revetment mat.

Construction began on the FGD-B Pond in the mid-1980s during the initial OGSES construction phase for use as a storm water retention pond. Pond construction was halted in the 1980s when construction of the OGSES was suspended. The former retention pond was reconstructed in 2012 as FGD-B Pond for use in management of CCR and other wastes (Golder 2016b). FGD-B covers an area of approximately 11.2 acres and receives CCR and other wastes generated from the OGSES. FGD-B is constructed with a composite liner consisting of a minimum 2-foot thick compacted clay liner, overlain by a 60-mil HDPE geomembrane liner, overlain by a 1-foot thick layer of protective soil (Golder 2016a). The composite liner system in FGD-B complies with the requirements of §257.71(a)(1)(ii) of the CCR Rule.

FGD-C Pond construction commenced in 2015 and was completed in 2016 (Golder 2016b). FGD-C Pond is approximately 15.2 acres in size and receives CCR and other wastes generated from the OGSES. FGD-C is constructed with a composite liner consisting of a minimum 2-foot thick compacted clay liner, overlain by a 60-mil HDPE geomembrane liner, overlain by a 2-foot thick soil/ash protective layer (Golder 2016b). The composite liner system in FGD-C complies with the requirements of §257.71(a)(1)(ii) of the CCR Rule.

2.1 Site Hydrogeology and CCR Monitoring Well Network

The Site is located in the outcrop area of the Eocene-aged Wilcox Group (Barnes 1970), which is divided into three formations in the region: the Calvert Bluff, Simsboro, and Hooper Formations (in order from youngest to oldest). The FGD Ponds are completed in the Calvert Bluff Formation, which consists of unconsolidated to moderately consolidated clay and silt, with various amounts of interbedded sand and lignite.

Based on soil borings completed at the Site, the geology near the FGD Ponds generally consists of an upper zone of relatively thick, interbedded sand and clay strata underlain by a lower zone of interbedded silty to clayey sand and well sorted sand (PBW 2017). The uppermost groundwater-bearing unit (GWBU) occurs under unconfined conditions within the shallow interbedded sand units of the Calvert Bluff Formation. Groundwater elevations have generally been highest southeast of the FGD Ponds and relatively flat in the vicinity of the FGD Ponds. Since CCR monitoring began in 2015, the inferred groundwater flow direction at the Site has been to the east-northeast toward Twin Oak Reservoir, which borders the FGD Pond area to the north and east. The CCR groundwater monitoring well network at the FGD Ponds was established in 2015 using Site monitoring wells screened in the uppermost GWBU (FGD-1, FGD-2, FGD-3, FGD-4, FGD-5, FGD-6, FGD-8, FGD-11, and FGD-12). A map of the CCR groundwater monitoring network is provided on **Figure 1**.

Golder performed a survey of water supply wells located in the vicinity of the FGD Ponds in May 2019 as part of a Texas Commission on Environmental Quality (TCEQ) Texas Risk Reduction Program (TRRP) assessment of the Site. A Drinking Water Survey Report (Golder, 2019b) documenting the water well survey activities and findings was approved by the TCEQ in a letter dated August 12, 2019. No imminent threats to water wells or potentially affected drinking water wells were identified.

3.0 SOURCE CONTROL MEASURES

FGD-B and FGD-C are constructed with composite liner systems that comply with the requirements of §257.71(a)(1)(ii) of the CCR Rule and these ponds are considered lined surface impoundments under the Rule. Since the liner systems in these ponds comply with the CCR Rule, FGD-B and FGD-C provide an appropriate level of source control as currently constructed and no modifications are necessary to these ponds.

FGD-A is constructed with a clay liner and the pond is considered an unlined surface impoundment under the CCR Rule. As a result, Luminant anticipates completing the retrofit of FGD-A in 2022 with a composite liner system meeting the requirements of § 257.71(a)(1)(ii) of the CCR Rule. The retrofitted liner system will consist of a minimum 2-foot thick compacted clay liner or geosynthetic clay liner (GCL), overlain by a 60-mil HDPE geomembrane liner. The floor of the pond will be covered by a 1.5-foot thick layer of protective soil and the upper portion of the pond side slopes will be covered with concrete revetment mat. Retrofitting FGD-A with a new composite liner system will serve as the source control component of the potential corrective measures for the FGD Ponds.

4.0 POTENTIAL GROUNDWATER CORRECTIVE MEASURES

The ACM Report (Golder, 2019a), which assessed potential corrective measures, was prepared to comply with the requirements of CCR Rule § 257.96. A public meeting was held on October 29, 2019 at the Pidgeon Center in Franklin, Texas to discuss the results of the ACM in accordance with § 257.96(e). In accordance with the applicable screening criteria described in §257.96(c), potential corrective measures were evaluated based on their overall performance, reliability, ease of implementation, potential impacts of the remedy, time to begin and complete the remedy, and institutional requirements. The source control measures discussed in Section 3 are considered a component of each of the corrective measures that were evaluated. Possible corrective measures for groundwater included the following options to address groundwater impacts:

- Monitored Natural Attenuation (MNA);
- Groundwater Extraction and Treatment;
- Vertical Hydraulic Barrier;
- Permeable Reactive Barrier;
- In-situ chemical treatment; and
- Phytoremediation

MNA was identified as the most applicable groundwater remedy for further evaluation.

5.0 CCR RULE REMEDY OBJECTIVES

In accordance with §257.97(a), based on the results of the ACM, as soon as feasible a remedy should be selected for the CCR Units. Per the regulations, the remedy must prevent further releases, remediate any releases, and restore the affected area to original conditions. Specifically, under § 257.97(b) the remedy must (1) protect human health and the environment; (2) attain the groundwater protection standard as specified pursuant to § 257.95(h); (3) control the sources of releases so as to reduce or eliminate, to the maximum extent feasible, further releases of constituents in appendix IV into the environment; (4) remove from the environment as much of the contaminated material that was released from the CCR unit as is feasible, taking into account factors such as avoiding inappropriate disturbance of sensitive ecosystems; and (5) comply with any relevant standards for management of wastes as specified in § 257.98(d). The CCR Rule also specifies decision criteria to be considered by the owner or operator in selecting the most appropriate remedy. Under § 257.97(c), these criteria include: (1) Long- and short-term effectiveness and protectiveness of the potential remedy(s), along with the degree of certainty that the remedy will prove successful; (2) effectiveness of remedy in controlling the source to reduce further releases; (3) ease or difficulty of implementation; and (4) community concerns.

6.0 REMEDY SELECTION

MNA with source control measures has been selected as the remedy to address cobalt concentrations observed at SSLs. This remedy was selected over the other potential corrective measure alternatives based on its overall high performance, high reliability, ease of implementation, low potential for negative impacts, and minimal institutional requirements.

MNA refers to the reliance on natural attenuation processes (within the context of a carefully controlled and monitored approach) to achieve site-specific groundwater remediation objectives. MNA relies on a range of natural processes, including sorption, (co)precipitation, radioactive decay, dispersion, dilution, and abiotic degradation/transformation to achieve remediation objectives. MNA has been demonstrated effective in reducing cobalt concentrations in groundwater by way of cobalt being removed through adsorption to iron hydroxides and/or amorphous metals and the level of effectiveness is dependent on iron hydroxide availability as well as pH, alkalinity, and calcium levels (USEPA 2007a; ITRC 2010).

A Site-specific feasibility study to evaluate MNA as a potential groundwater remedy for the 2018 cobalt SSL at the FGD Ponds was performed in accordance with guidance and best practices promulgated by the USEPA (USEPA 2007a and 2007b) and ITRC (ITRC 2010). The overall feasibility of MNA as a groundwater response technology was evaluated based on the following multi-tiered approach:

- 1) Demonstrate active constituent removal from groundwater and dissolved plume stability (Tier I);
- 2) Determine the mechanisms and rates of the operative attenuation processes (Tier II);
- 3) Determine the long-term capacity for attenuation and the stability of immobilized constituents (Tier III); and
- 4) Prepare a long-term MNA performance monitoring plan (Tier IV).

A Tier I MNA evaluation report was completed in December 2019 (Golder 2019c) and a Tier II/III MNA evaluation report was completed in June 2021 (Golder 2021b). Based on the results of these MNA evaluations, the following was concluded regarding cobalt:

- Physical and chemical attenuation of cobalt is occurring at the Site. Cobalt levels are stable and the aquifer has adequate capacity to attenuate cobalt in a reasonable timeframe. Modeling indicates that cobalt attenuation will be efficient and stable in the long term. Cobalt in the CCR unit porewater is well below the level that is observed in groundwater, including when a periodic exceedance occurs in downgradient groundwater. Therefore, MNA would be effective in remediating cobalt in groundwater beneath and downgradient of the FGD Ponds.

Copies of the Tier I and Tier II/III MNA evaluation reports are provided in **Appendix A and B**, respectively.

The selected remedy will attain the objectives stated in §257.97 as outlined below:

(1) Long and short term effectiveness, and degree of certainty of success:

The Tier I through Tier III MNA studies completed for the Site demonstrate that physical and chemical attenuation of cobalt is occurring, that cobalt concentrations are stable, and that the aquifer has adequate capacity to attenuate cobalt in a reasonable timeframe.

(i) Magnitude of reduction of existing risks:

Source control measures are likely effective at preventing future releases, and MNA feasibility data indicate that conditions are suitable for the ongoing reduction in cobalt concentrations in groundwater to concentrations below GWPSs.

(ii) Magnitude of residual risks in terms of likelihood of further releases due to CCR remaining following implementation of a remedy:

Source control measures reduce the risk of future impacts by preventing the transport of CCR constituents to groundwater at concentrations above GWPSs.

(iii) The type and degree of long-term management required, including monitoring, operation, and maintenance:

Long-term assessment of the condition of monitoring network will be required. Maintenance of the monitoring network is anticipated to be low.

(iv) Short-term risks that might be posed to the community or the environment during implementation of such a remedy, including potential threats to human health and the environment associated with excavation, transportation, and redisposal of contaminant:

The remedy presents minimal risk of exposure. Results from the ACM nature and extent investigation indicate that Appendix IV constituents at SSLs were contained within the plant property boundary. The Drinking Water Survey Report (Golder, 2019b) indicated the CCR units pose no imminent threats to water supply wells.

(v) Time until full protection is achieved:

MNA generally requires relatively long periods of time to attenuate cobalt present at SSLs. However, cobalt is not currently present above SSLs.

(vi) Potential for exposure of humans and environmental receptors to remaining wastes, considering the potential threat to human health and the environment associated with excavation, transportation, re-disposal, or containment:

The selected remedy presents a low risk of exposure. Access to the CCR units and surrounding land are controlled by Luminant. Potential exposure to CCR will be prevented through source control measures and Site access restrictions.

(vii) Long-term reliability of the engineering and institutional controls:

Restriction of access and exposure are currently implemented and will continue. Site wells to be used in the monitoring network are secured with locks.

(viii) Potential need for replacement of the remedy:

Although unlikely, monitoring wells may need to be replaced over the monitoring period. Monitoring well replacement will be documented in the Annual Groundwater Monitoring and Corrective Action Report following well replacement activities.

(2) Effectiveness of remedy in controlling the source to reduce further releases:

Source control measures are being implemented as discussed in Section 3.0. Source control will reduce infiltration of surface water from the CCR ponds to the GWBU, preventing potential releases to the GWBU.

(i) The extent to which containment practices will reduce further releases:

Source control measures are likely effective at preventing future releases, and MNA feasibility data indicate that conditions are suitable for the ongoing reduction of cobalt concentrations in groundwater.

(ii) The extent to which treatment technologies may be used:

MNA feasibility data indicate that conditions are suitable for the ongoing reduction of cobalt concentrations in groundwater. Additional treatment technologies are not proposed.

(3) Ease or difficulty of implementation:

MNA is relatively easily implemented. The existing monitoring well network can be used for the monitoring component of the remedy. Source control measures described in Section 3.0 involve significant cost; however, these measures are being implemented to bring the FGD Ponds into compliance with §257.71(a)(1)(ii). The source control measures will also provide long-term stability to groundwater conditions and ensure long-term effectiveness of MNA as a remedy.

(i) Degree of difficulty associated with constructing the technology:

The current monitoring well network will be used to evaluate the effectiveness of the remedy. If required, additional monitoring wells can be installed relatively easily.

(ii) Expected operational reliability of the technologies:

There are no anticipated problems with the monitoring network or source control measures.

(iii) Need to coordinate with and obtain necessary approvals and permits from other agencies:

The monitoring well network is already in place at the Site. There is no anticipated need to coordinate with and obtain approvals and permits from other agencies.

(iv) Availability of necessary equipment and specialists:

Consulting and engineering firms are established that can implement the remedy. Drilling companies and drilling equipment are available in the event that additional wells need to be installed.

(v) Available capacity and location of needed treatment, storage, and disposal services:

Adequate treatment, storage, and disposal services are available at the plant or at offsite waste management facilities.

(4) Community concerns:

A public meeting was held on October 29, 2019 at the Pidgeon Center in Franklin, Texas to discuss the results of the ACM in accordance with § 257.96(e). No comments were received from the public. As indicated in Section 2.1, there are no nearby water supply wells completed within the GWBU below or downgradient of the FGD Ponds. The ACM (Golder 2019a) demonstrated that groundwater concentrations of cobalt were stable or decreasing at all wells and the extent of the cobalt SSLs was delineated on-site (i.e., no offsite migration was indicated).

7.0 SCHEDULE

Routine groundwater monitoring as part of an MNA program is required to verify that MNA is occurring. A Tier IV MNA Performance Monitoring Plan (Golder 2021c) has been prepared to describe the monitoring network, sampling and analysis methods, procedures for assessing MNA effectiveness, and reporting for an MNA program, if one is to be established at the Site. A copy of the Tier IV MNA Performance Monitoring Plan is provided in **Appendix C**. The MNA program could be implemented upon completion of the source control measures described in Section 3.0. However, as discussed previously, cobalt is not currently present at SSLs at the FGD Ponds; therefore, implementation of an MNA program or other remedy option is not currently necessary. Cobalt concentrations in groundwater will continue to be monitored in accordance with the CCR rule to confirm that cobalt concentrations remain below the GWPS. An MNA program will be implemented to address cobalt SSLs of SSLs for other constituents if they are identified in future.

8.0 REFERENCES

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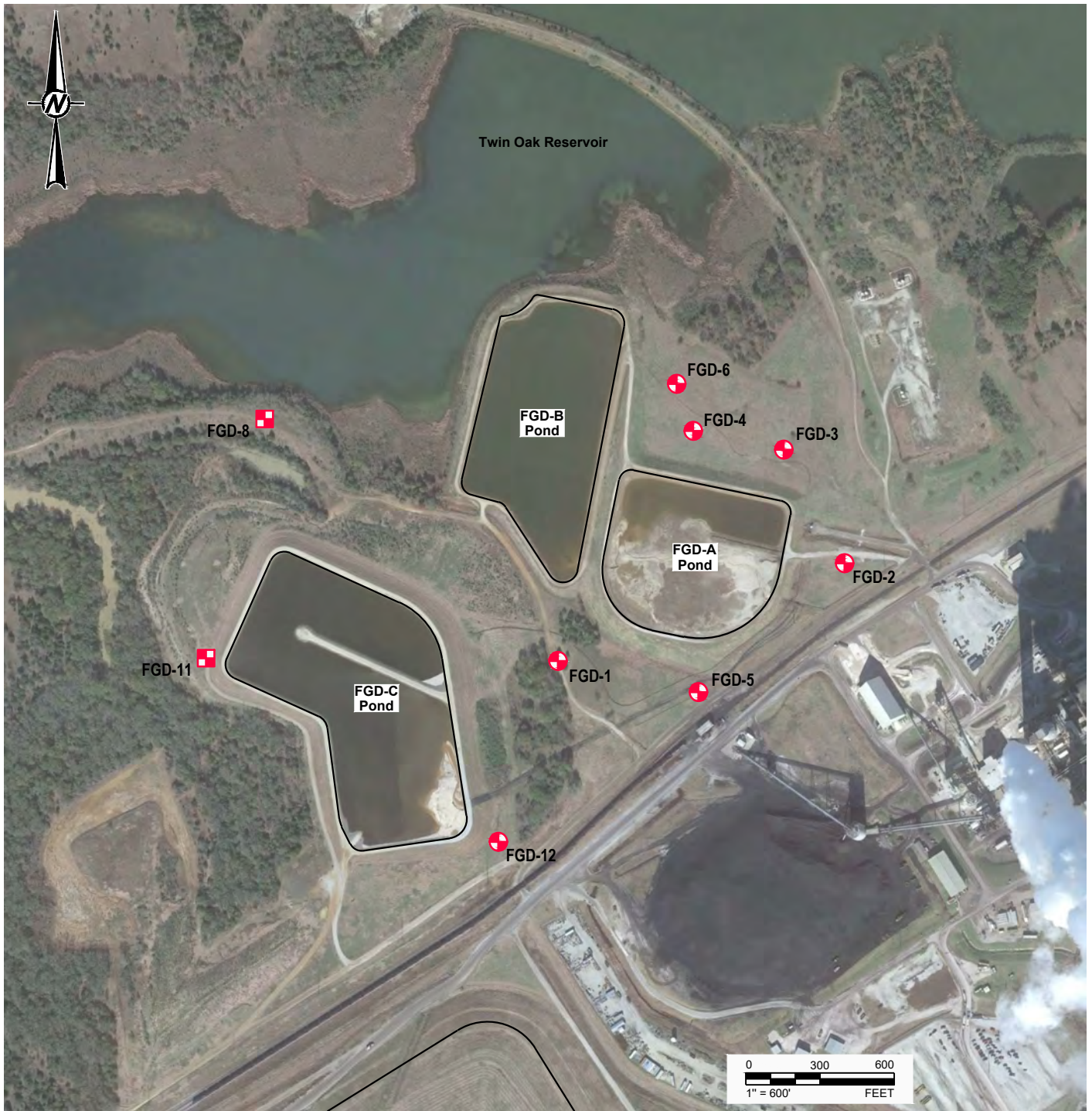
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FIGURES



LEGEND

-  DOWNGRADIENT CCR MONITORING WELL
-  BACKGROUND CCR MONITORING WELL

CLIENT
LUMINANT

PROJECT
**OAK GROVE STEAM ELECTRIC STATION
ROBERTSON COUNTY, TEXAS**

TITLE
DETAILED SITE PLAN - FGD POND AREA

CONSULTANT	YYYY-MM-DD	2020-01-23
	DESIGNED	AJD
	PREPARED	AJD
	REVIEWED	WFV
	APPROVED	WFV

REFERENCE(S)
BASE MAP TAKEN FROM GOOGLE EARTH, IMAGERY DATED 12/9/18.

PROJECT NO.
19134019

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FIGURE
1

APPENDIX A

Tier I Monitored Natural Attenuation Evaluation



DATE 12/13/2019

Project No. 19122434

TO Kim Mireles, Sr. Director - Environmental Services
Luminant Generation Company LLC

CC David Mitchell - Luminant Generation Company LLC

FROM Patrick Behling - Golder Associates, Inc.

EMAIL Patrick_Behling@Golder.com

OAK GROVE MONITORED NATURAL ATTENUATION EVALUATION

1.0 OVERVIEW

Groundwater and solid materials were evaluated to determine the feasibility of Monitored Natural Attenuation (MNA) as part of the Assessment of Corrective Measures (ACM) on behalf of Oak Grove Management Company LLC (Luminant) for FGD-A Pond, FGD-B Pond, and FGD-C Pond (collectively referred to as the “FGD Ponds”) located at the Oak Grove Steam Electric Station (OGSES) in the FGD Pond area, in Robertson County, Texas. The structure of this feasibility evaluation closely follows the United States Environmental Protection Agency (USEPA) guidance on using MNA as a remedial strategy (USEPA 2007a and 2007b) and considers best practices from the Interstate Technology Regulatory Council (ITRC) document: “A Decision Framework for Applying Monitored Natural Attenuation Processes to Metals and Radionuclides in Groundwater” (ITRC 2010).

Based on the evaluation presented in this document, cobalt and lithium are candidates for MNA at the OGSES FGD Pond area per 40 Code of Federal Regulations (CFR) Part 257 as amended (CCR Final Rule). Both constituents are subject to attenuation controls on their concentrations in downgradient groundwater and meet the initial screening criteria as part of this attenuation assessment. Further geochemical evaluation (i.e. Tier II) of MNA with institutional controls is, therefore, recommended if a future Statistically Significant Level (SSL) of either constituent is identified in groundwater.

2.0 APPROACH

To assess the feasibility of MNA at the OGSES FGD Pond area at the Tier 1 MNA screening level, samples of overburden, porewater and groundwater were collected in May 2019 and analyzed to provide a geochemical dataset that was used for a supplemental assessment in addition to previously-reported groundwater data (Golder 2019). Golder performed the supplemental assessment activities in accordance with the OGSES FGD Pond Groundwater Monitoring Program. The supplemental assessment activities included:

- Groundwater characterization to identify temporal and geographical trends, where present.
- Geochemical modeling to identify the major chemical species and evaluate saturation indices of minerals relevant to attenuation of cobalt and lithium.
- Mineralogical analysis of overburden to identify and quantify the major mineral components.

- Chemical analysis of overburden to quantify the total metal content and identify the environmentally-available fraction of metals.

Based on the results generated by this supplemental assessment, a screening-level attenuation evaluation was completed to determine the overall feasibility of MNA at the OGSES FGD Ponds.

2.1 Groundwater and Porewater Sampling and Analysis

2.1.1 Sample Collection

Golder personnel collected groundwater and porewater samples from the background wells, downgradient or “monitoring” wells, porewater, and nature and extent monitoring wells presented in Table 1. The nature and extent of the plume was fully delineated in accordance with 40 CFR §257.95(g) (Golder 2019).

2.1.2 Geochemical Analysis

Geochemical analysis of porewater and groundwater samples included the determination of field parameters and the concentrations of total metals and major cations and anions. The rationale and methods used were as follows:

Field Parameters: Parameters measured in the field included pH, dissolved oxygen, oxidation reduction potential (ORP), conductivity, and temperature. These parameters were used to determine general geochemical conditions in the groundwater and support geochemical modeling.

Metals: Analysis of Appendix III and IV metals concentrations was conducted to understand the geochemical composition of groundwater and porewater. Metals analysis allows for the delineation of a potential plume, evaluation of mineral saturation indices, development of partitioning coefficients (in conjunction with solid material analyses), and evaluation of background contributions from natural sources or anthropogenic sources.

Major Cations and Anions: Geochemical modeling of mineral solubility, metals attenuation and background contributions requires analysis of major cations and anions because they affect and participate in sorption and mineral dissolution or precipitation reactions.

The groundwater and porewater samples were analyzed using the following methods:

- pH following SW846 9040C “pH Electrometric Measurement” (USEPA 2004)
- Total dissolved solids standard method (SM) 2540C “Total Dissolved Solids Dried at 180°C” (USEPA 1993a)
- Total hardness following SM 2340B (USEPA 1997)
- Chloride and fluoride following USEPA SW846 9056A “Determination of Inorganic Anions by Ion Chromatography”, Revision 1 (USEPA 2007c)
- Nitrate and nitrite following EPA 353.2 “Determination of Nitrate-Nitrite Nitrogen by Automated Colorimetry, Revision 2.0” (USEPA 1993b)
- Alkalinity following SM 2320B “Alkalinity by Titration” (USEPA 2005a)
- Phosphorous following SM 4500-P E “Phosphorous by Ascorbic Acid Method” (USEPA 2005b)

- Total Target Analyte List (TAL) metals following USEPA SW846 6010C “Inductively Coupled Plasma-Atomic Emission Spectrometry”, Revision 3, SW846 6020B “Inductively Coupled Plasma-Mass Spectrometry”, Revision 2, and SW846 6020A “Inductively Coupled Plasma-Mass Spectrometry”, Revision 1 (USEPA 1998)

2.1.3 Geochemical Modeling Approach

Geochemical modeling was conducted to evaluate general groundwater and porewater quality, determine the potential for precipitation of sorbent media, evaluate the potential for mineral precipitation or adsorption in the aquifer, and determine the speciation of metals of interest. The geochemical computer code developed by the United States Geological Survey (USGS), PHREEQC, was used for these simulations (Parkhurst and Appelo 2013). PHREEQC version 3.4 is a general-purpose geochemical modeling code used to simulate reactions in water and between water and solid mineral phases (e.g., rocks and sediments). Reactions include aqueous equilibria, mineral dissolution and precipitation, ion exchange, surface complexation, solid solutions, gas-water equilibrium, and kinetic biogeochemical reactions. The widely-accepted thermodynamic database Minteq.v4, 2017 edition, was used as a basis for the thermodynamic constants required for modeling.

The Geochemist’s Workbench version 12 (Bethke 2015) was used to generate graphical representations of geochemical modeling outputs in the form of predominance, or Pourbaix diagrams (also known as Eh-pH diagrams) for the species of interest (i.e. barium, cobalt, lithium, selenium, and elemental radium) and trilinear plots (also known as Piper plots) displaying the relative abundance of major ions. The Minteq.v4 database was used as the basis for the Pourbaix diagrams.

The potential for mineral precipitation was assessed in PHREEQC using a saturation index (SI) calculated according to Equation 1.

$$SI = \log (IAP/K_{sp}) \quad (\text{Equation 1})$$

The saturation index is the ratio of the ion activity product (IAP) of a mineral to the solubility product (K_{sp}). An SI value greater than zero indicates that the water is supersaturated with respect to a particular mineral phase and, therefore, precipitation of the mineral may occur. An evaluation of precipitation kinetics is then required to determine whether the supersaturated mineral will indeed form. An SI value less than zero indicates the water is undersaturated with respect to a particular mineral phase. An SI value close to zero indicates equilibrium conditions exist between the mineral and the solution. SI values between -0.5 and 0.5 are referred to as ‘at equilibrium’ in this report.

2.1.4 Data Handling and Geochemical Modeling Assumptions

Assumptions related to data handling and geochemical modeling assumptions were as follows:

- **Groundwater continuity:** Groundwater quality data from a single sampling event conducted from May 16, 2019 to June 6, 2019 were evaluated. This sampling event was selected because all wells related to the FGD Ponds were sampled and analyzed for the full suite of parameters described in Section 2.1.2 and the resulting data are assumed to provide a comprehensive overview of groundwater conditions. Temporal trend analysis for cobalt and lithium made use of all available sampling events from a well (up to 11 samples from some wells), dating back to November 2015.
- **Porewater chemistry:** The porewater samples collected from FGD Pond A and FGD Pond B are assumed to be representative of porewater found in the FGD Ponds at the OGSES FGD Pond area.

- **Redox values:** ORP values measured in the field were converted to reduction potential (Eh) by adding 200 millivolts (mV) to the field-measured values as per YSI (2015).
- **Non-detect values:** Constituents with concentrations less than their respective method detection limits were assumed to have a concentration equal to the reporting limit in model simulations.
- **Total recoverable concentrations:** Total recoverable fraction results were used for geochemical modeling.
- **Charge balance:** Groundwater compositions with charge balance errors less than 10% were considered valid. Compositions with charge balance errors greater than 10% were included in the assessment but would be considered less reliable and are denoted as such.

2.2 Overburden Sampling and Analysis

2.2.1 Sample Collection

A drilling contractor collected continuous cores from two nature and extent well borings (FGD-15 and FGD-16) and one soil boring and (FGD-2019-1) located downgradient of the CCR units. Golder staff collected overburden samples from drill cores obtained at various intervals at the three locations ranging from 23' below ground surface to up to 32' below ground surface. These samples are representative of the saturated uppermost aquifer downgradient of the CCR Units, which is underlain by a confining sandy clay unit.

These samples were submitted to the laboratory for analysis under chain-of-custody procedures. The unique descriptions used to identify the samples included the overburden boring name and depth of the sample below ground surface (bgs). Sample locations and depths are described in Table 2. Boring logs are provided in Appendix A.

2.2.2 Overburden Analysis

Multiple geochemical analytical methods were used to assess the mineralogical and chemical composition of the overburden material samples. The selected geochemical test methods included:

- **Mineralogical composition:** The purpose of the mineralogical analysis was to identify and quantify the crystalline mineral phases in each sample. This information is required for geochemical modeling as the release or attenuation of constituents of interest is influenced by the mineral phase(s) present in the aquifer (Hem 1985). The mineralogical testing laboratory (SGS Minerals Services) performed the mineralogical analysis using quantitative (Rietveld) X-ray diffraction (XRD) (ME-LR-MIN-MET-MN-DO5) and a Bruker AXS D8 Advance Diffractometer.
- **Total metals:** This test was used to quantify the chemical composition of overburden materials. The total mass of metals, in combination with the results of sequential extraction testing, can be used to determine the provenance of metals and verify sequential extraction results. The laboratory analyzed a target analyte list of metals following the methods USEPA SW846 6010C "Inductively Coupled Plasma-Atomic Emission Spectrometry", Revision 3 (November 2000).
- **Sequential extraction (SEP):** This test consists of a seven-step metals extraction from solids as per Tessier et al. (1979) to identify the provenance of constituents of interest (i.e. the operationally-defined

fraction that contains the metal)¹ and determine their potential environmental mobility. For instance, metals bound in the carbonate fraction, or that are exchangeable, are much more likely to become mobile due to changes in groundwater conditions than metals bound within a sulfide or silicate fraction. The total concentration of a metal measured from all seven steps can be compared to the concentration determined from the total metal analysis for compositional accountability. The laboratory analyzed the metals content of the extracted samples using the method USEPA SW846 6020B “Inductively Coupled Plasma-Mass Spectrometry”, Revision 2 (July 2014).

3.0 GROUNDWATER AND POREWATER CHARACTERIZATION

Groundwater quality data from background wells FGD-8 and FGD-11; monitoring wells FGD-1, FGD-2, FGD-3, FGD-4, FGD-5, FGD-6, and FGD-12; nature and extent monitoring wells FGD-14, FGD-15, and FGD-16; and porewater samples FGD-A-2019-1 and FGD-B-2019-1 were used for this evaluation. The water quality monitoring data are presented in Appendices A and can be summarized as follows:

General Chemistry Parameters

- **pH:** The pH of groundwater samples collected from monitoring and nature and extent wells ranged from 6.5 to 6.9 across the site in May and June 2019. Historically, pH was lowest in June of 2018, at 5.6 in FGD-1 and the highest pH measured in groundwater was 7.1 in FGD-6 in February 2016. No geographical trend in pH was discernable in groundwater samples. The pH of porewater was approximately 6.5 in June 2019.
- **ORP (Redox):** Field-measured redox values in May and June 2019, corrected to Eh (+200mV), ranged from +144 to +181 mV in the groundwater samples in the CCR monitoring well network. The Eh of groundwater in the nature and extent monitoring wells ranged from +168 mV to +193 mV, indicating that redox conditions were similar to those in the CCR monitoring network wells. Redox measurements were not obtained for porewater.
- **Total Dissolved Solids (TDS):** Groundwater TDS concentrations were variable in May 2019 in the CCR monitoring and nature and extent well network. The lowest TDS concentrations (140 mg/L) occurred in groundwater at CCR monitoring well FGD-12. The highest measured TDS in groundwater (3970 mg/L) was observed in CCR monitoring well FGD-8. The TDS in groundwater of the nature and extent network ranged from 325 mg/L to 2,880 mg/L in wells FGD-16 and FGD-15, respectively. Geographically, the highest TDS observed in groundwater (in wells FGD-8 and FGD-15) is found on opposite sides of the FGD Pond area. The TDS of porewater is much higher than that of groundwater, ranging from 7,240 to 7,410 mg/L.

¹ Sequential extraction of metals from overburden samples consisted of seven discrete steps for this investigation:

Step 1 - Exchangeable Fraction: This extraction includes trace elements that are reversibly adsorbed to overburden minerals, amorphous solids, and/or organic material by electrostatic forces.

Step 2 - Carbonate Fraction: This extraction targets trace elements that are adsorbed or otherwise bound to carbonate minerals.

Step 3 – Non-Crystalline Materials Fraction: This extraction targets trace elements that are complexed by amorphous minerals (e.g., iron).

Step 4 - Metal Hydroxide Fraction: Trace elements bound to hydroxides of iron, manganese, and/or aluminum.

Step 5 - Organic Fraction: This extraction targets trace elements strongly bound via chemisorption to organic material.

Step 6 - Acid/Sulfide Fraction: The extraction is used to identify trace elements precipitated as sulfide minerals.

Step 7 - Residual Fraction: Trace elements remaining in the overburden after the previous extractions will be distributed between silicates, phosphates, and refractory oxides.

- **Major ion chemistry:** A Piper plot was generated for groundwater samples to facilitate the identification of water types and source contributions (Figure 1a). Generally speaking, background, downgradient, and nature and extent wells plotted in a region of the trilinear plot separate from the FGD Pond water samples. Upon further investigation of three specific ions (sulfate, magnesium, and sodium) (Figure 1b), the difference between groundwater from CCR monitoring wells and nature and extent wells and FGD Pond water becomes more apparent. Based on the molar ratios of these ions, the composition of groundwater in all wells (downgradient, background and nature and extent) is very different from that of porewater.
- **Iron:** Oxidized iron (ferric iron - Fe^{+3}) concentrations were variable, ranging from non-detect (<0.05 mg/L) to 61 mg/L in May and June of 2019 (Appendix B). Reduced iron (ferrous iron - Fe^{+2}) was non-detect (<0.05 mg/L) in all groundwater samples except for FGD-6, where it was measured at 202 mg/L. In this well, the highest trivalent iron concentration of 61 mg/L was also observed. Ferrihydrite, an oxidized iron hydroxide mineral, would likely be present based on these data, and ferrihydrite attenuation of cobalt has been well studied (Smith 1999). Ferric and ferrous iron concentrations were both below detection limits in porewater samples.
- **Nutrients:** Nitrate (nitrate as N) was present in groundwater at monitoring and nature and extent wells at variable levels, ranging from non-detect (< 0.1 mg/L as N) to 1.54 mg/L as N at FGD-2 in May 2019 (Appendix B). Nitrate was the highest in porewater, ranging from 1.87 to 3.24 mg/L in ponds A and B, respectively. Phosphate concentrations in groundwater ranged from 0.049 to 0.714 mg/L in CCR monitoring and nature and extent wells. Phosphate was not detected (<0.03 mg/L) in porewater samples. No spatial trend was apparent in the nitrate or phosphate distribution in groundwater. However, the presence of nitrate in porewater confirms a likely oxic state of porewater (not measured).

Constituents with SSL Notification:

- **Cobalt:** Cobalt concentrations in groundwater samples from nature and extent wells or CCR monitoring network wells did not exceed the GWPS (0.016 mg/L) for cobalt in May and June 2019 (Figure 2a). The cobalt concentration in groundwater collected from the downgradient nature and extent monitoring well FGD-14 was non-detect (<0.003 mg/L) in May 2019. Cobalt in groundwater across the entire monitoring network was lowest in downgradient wells; the highest concentration was measured at 0.0132 mg/L in FGD-6 in May 2019. The highest cobalt in groundwater measured in May to June 2019 was in FGD-8, an upgradient background well, at 0.0146 mg/L, but still below the GWPS. The cobalt concentration in FGD-3, where previous exceedances of the GWPS occurred, was below the GWPS in the latest samples (Figure 2a). Cobalt was not detected in the porewater of FGD Pond A or B (Appendix A). Based on historical trends, cobalt concentrations at the FGD Pond area are stable or decreasing in all wells as of May 2019 (Figure 2a). Cobalt is likely present in groundwater as the divalent cation Co^{+2} based on the pH and Eh of groundwater (Figure 3a).
- **Lithium:** Lithium concentrations in groundwater samples collected from the nature and extent and CCR monitoring well networks were all below the GWPS (0.149 mg/L) in May and June 2019 (Figure 2b). Lithium levels in nature and extent wells ranged from 0.0056 mg/L to 0.0768 mg/L in FGD-14 and FGD-15, respectively. The lithium concentration in groundwater from well FGD-14, which is the nature and extent well downgradient closest to the FGD Ponds, was just above detection limit of 0.005 mg/L at 0.0056 mg/L, and over an order of magnitude below the GWPS. The concentration in FGD-5, where historical GWPS occurrences occurred, was below the GWPS during the May 2019 sampling (Figure 2b). Lithium in

porewater ranged from 0.167 to 0.172 mg/L, only slightly above its GWPS (Appendix A). Based on historical trends, lithium in groundwater at the FGD Pond area appears to be stable or decreasing at all wells as of May 2019 (Figure 2b). Lithium is likely present in groundwater as the monovalent cation Li^+ based on the pH and Eh of groundwater (Figure 3b).

In summary, the groundwater data at the FGD Pond area show that concentrations of metals of interest in groundwater are decreasing or stable. The absence of cobalt in porewater of the FGD Ponds demonstrates that the ponds are not a likely source of cobalt to groundwater. As indicated by major ion compositions (Figures 1a and b), porewater from the FGD Ponds is substantially different than downgradient groundwater, suggesting an absence of direct interaction between porewater and groundwater.

3.1 Geochemical Modeling Results

The results of speciation modeling of groundwater at background, downgradient, nature and extent wells, and porewater are provided in Table 3. Mineral saturation plays an important role in attenuation of metals, either directly by their removal through mineral precipitation, or indirectly by providing a sorptive surface. The results can be summarized as follows:

- **Iron-bearing minerals:** Ferrihydrite [$\text{Fe}(\text{OH})_3$] was simulated to be at equilibrium or oversaturated in all groundwater samples, indicating a strong potential for ongoing precipitation of solid phase iron oxides. Thus, throughout the FGD Ponds area, the prevalence of iron oxides is assumed.
- **Other minerals:** In all groundwater samples where barium was measured, groundwater was in equilibrium with barite [BaSO_4]. Calcite [CaCO_3] was in equilibrium with groundwater at wells FGD-3, FGD-8, and FGD-11. The formation of barite and calcite can help control dissolved metal concentrations by providing both a sorptive surface for metal attenuation and through co-precipitation of COIs (Smith 1999; Zhang et al. 2014).

In summary, barite, calcite, and ferrihydrite contribute to controlling groundwater composition at some or all of the monitoring wells. Particularly in the case of ferrihydrite, the dissolved concentrations of certain COIs can be reduced through the ability of these minerals to act as a substrate for adsorption in addition to precipitation/co-precipitation.

4.0 COMPOSITIONAL ANALYSIS OF OVERBURDEN

4.1 Mineralogical Composition

Quantitative X-ray diffraction (XRD) with Rietveld refinement was used to identify and quantify minerals in three overburden samples collected during the drilling activities - one sample from each of the soil borings completed in June 2019 (FGD-15, FGD-16, and FGD-2019-1). These samples were obtained to better understand the mineralogical composition of the aquifer system and identify any minerals that would potentially influence attenuation of constituents of interest. In contrast, the presence of certain minerals could also indicate a potential for naturally-occurring release of metals into groundwater, for instance due to oxidation of sulfide minerals.

The mineralogical analysis identified the materials in boreholes samples at the FGD Ponds predominately consist of quartz with varying amounts of the silicate minerals K-feldspar, plagioclase, and muscovite. A trace amount of magnesite [MgCO_3] was encountered in one sample. Analytical reports for the XRD samples are provided in Appendix B.

4.1.1 Chemical Composition and Sequential Extraction

Chemical analysis and sequential extractions were used to determine the chemical composition of the overburden and the distribution of constituents of interest over various operationally-defined fractions comprising the overburden. This testing was completed per Table 1 on overburden from three borehole locations, (reported in Table 4).

A description of the individual fractions determined by sequential extraction is presented in Footnote 1, Section 2.2.2. Metals extracted in steps 1 through 5 are considered environmentally available, whereas metals extracted in steps 6 and 7 are present in refractory fractions and are not expected to be released under conditions typically encountered in aquifers (Tessier et al. 1979). Total metal quantities from the sequential extraction are expressed as “SEP Total” in Table 4. The sum of the sequential extraction steps is also presented for comparison but does not represent an analytically-determined value.

The results from the chemical analysis and sequential extraction can be summarized as follows:

General Soil Parameters

- **Aluminum:** Aluminum is not a constituent of interest (COI) at the site but it has been well studied as a sorbing medium in soils (e.g., Karamalidis and Dzombak 2011). Total aluminum in soils ranged from 29,890 mg/kg to 41,270 mg/kg, and the environmentally-available fraction ranged from just 690 mg/kg (FGD-15) to 1,927 mg/kg (FGD-2019-1; Figure 4). Aluminum in the soil at the site is, therefore, largely (~88% to 94%) present in the residual, or silicate-bound fraction. This fraction is likely at least partially represented by hydrous aluminum phyllosilicates minerals or clays intermixed in the silica sand matrix. Clays can represent an important sorptive reservoir for numerous trace metals and metalloids (Uddin 2017).
- **Iron:** While not a COI, iron and its minerals commonly represent one of most abundant reservoirs for metal/metalloid attenuation in soils (Dzombak and Morel 1990; Smith 1999). Iron was present in all three core samples analyzed, varying from 5,458 mg/kg (FGD-15) to 8,961 mg/kg (FGD-2019-1). In all samples, the sulfide and residual fractions accounted for the largest proportion of total iron (61% to 73%) and, as such, most of the iron is not environmentally available (Figure 5). However, the remainder of the iron in the samples is largely present in the metal hydroxide phase. This fraction, part of the labile component in steps 1 through 5, can generally be considered representative of the amount of iron in soil that may be available as a sorbing medium and can, therefore, along with aluminum be used as a proxy to determine the potential for attenuation of cobalt and lithium.

Constituents Identified with an SSL Notification

- **Cobalt:** Total cobalt in soil ranged from 1.8 mg/kg to 69.9 mg/kg while the environmentally-available fraction ranged from 1.0 mg/kg in FGD-15 to 67.6 mg/kg in FGD-2019-1, representing from 58% to 97% of total cobalt (Figure 6). Cobalt in FGD-2019-1 was well above the level that would be considered naturally occurring in typical soils and rock (Hem 1985), with almost all cobalt associated with the metal hydroxide and amorphous metal fractions. Although cobalt was present in the soil of FGD-2019-1 at higher level compared to other soils samples, cobalt concentrations in groundwater from FGD-3 and FGD-14, the closest wells next to and downgradient of FGD-2019-1, respectively, were non-detect, or just above the detection limit of 0.005 mg/L. Also, cobalt was not detected in the porewater of FGD Pond A or B.

- **Lithium:** Total lithium in soil ranged from 8.74 mg/kg to 19.9 mg/kg, of which between 76% and 97% of the lithium occurred in the non-environmentally-available fraction (Figure 7). All lithium that was environmentally available (0.27 mg/kg to 4.7 mg/kg) was present in the amorphous metal and metal hydroxide fractions. This indicates the high likelihood of the presence of naturally-occurring lithium contained within the non-environmentally available fractions and potential attenuation of lithium by amorphous and metal hydroxide minerals at the site.

Based on the above results, attenuation of both COIs is likely occurring in various soil fractions. The most pronounced attenuation is associated with amorphous metals and metal hydroxides. Clays also present a viable attenuation fraction in the soil matrix.

5.0 ATTENUATION EVALUATION

The potential for natural attenuation of cobalt and lithium was evaluated at a screening level, in accordance with recommended practices and guidance promulgated by the US EPA and the ITRC (EPA 2007a; EPA 2007b; ITRC 2010). According to EPA (2007a), the purpose of the evaluation conducted during this screening phase is to “Demonstrate that the groundwater plume is not expanding and that sorption of the contaminant onto aquifer solids is occurring where immobilization is the predominant attenuation process.” Based on this definition, the following observations support MNA as a viable corrective measure for the OGSES FGD Pond area:

- **Plume Stability:** Based on the water quality monitoring data presented in this assessment, groundwater concentrations of cobalt and lithium in groundwater at the FGD Pond area appear to be stable or decreasing at all wells. Cobalt is unlikely to originate from the FGD Ponds due to its absence in FGD porewater. It is also possible that lithium in groundwater does not originate just from the FGD Ponds given the high relative of lithium in soils/overburden in a non-environmentally available, likely naturally-occurring phase. These observations indicate that the distribution of cobalt and lithium, in the aquifer is stable and in the case of cobalt cannot be linked to the FGD Ponds.
- **Magnitude of Exceedances:** Occasional exceedances and the trend at some wells of cobalt and lithium in groundwater do not amount to levels that would be considered an SSL per the CCR Rule (Golder 2019). Levels of both cobalt and lithium in groundwater were both below their respective GWPS as of May 2019. Cobalt and lithium have only ever exceeded the GWPS in two monitoring wells, FGD-3 and FGD-5. Since February 2016, cobalt in groundwater has only exceeded the GWPS in monitoring well FGD-3, and lithium in groundwater has only exceeded the GWPS in FGD-5. In the case of cobalt, as of the most recent sampling (May 2019), the highest concentration was measured in FGD-8, a background well.
- **FGD Pond Porewater:** Historical records are not available for ash additions or porewater concentrations over the lifespan of the CCR units. However, based on recent porewater data, cobalt has not been measured in the FGD Ponds above detection limits. This indicates that the FGD Ponds are not likely to be a current source of cobalt.
- **Groundwater Chemistry:** The groundwater monitoring results, and the findings of the geochemical modeling support the potential for natural attenuation of cobalt and lithium. The major relative ion abundance of porewater compared to that of groundwater at monitoring wells indicated distinctly different composition and thus potentially no direct connection between groundwater and porewater in the FGD Ponds exists. Equilibrium of groundwater with the mineral phase ferrihydrite was indicated in all groundwater

samples. Modeling results are consistent with the results from the sequential extraction analysis, which indicated amorphous and metal hydroxide fractions sequester cobalt and lithium.

- **Confirmation of Attenuation/Immobilization:** Based on both mineralogical and chemical analysis, it is evident that attenuation that cobalt and lithium is occurring. Iron, capable of forming (hydr)oxide or amorphous phases that facilitate metals attenuation (Dzombak and Morel 1990), was identified in all overburden samples. The presence of metal hydroxides in soils also supports a strong potential for cobalt and lithium attenuation (Smith 1999), which was confirmed by the sequential extraction results. In addition, lithium in groundwater is limited in extent, and is potentially being attenuated by amorphous metals, metal hydroxides or in clays (Smith 1999), as confirmed by sequential extraction testing of soil samples. The ubiquitous presence of aluminum, both identified mineralogically in the form of clay minerals and through SEP in the silicate fraction, likely also as a hydrous aluminum phyllosilicate (clay), provides an additional well-studied attenuation reservoir (Karamalidis and Dzombak 2011; Prodromou 2016; Uddin 2017). Thus, soil samples from the FGD Pond area demonstrated a significant proportion of COIs attenuated in various phases, confirming their sequestration is occurring at the OGSES.

Based on these findings, cobalt and lithium appear to be candidates for an MNA remedy application and meet the criteria for Tier I MNA in accordance with USEPA guidance (USEPA 2007a and 2007b). Based on the results of this analysis, the feasibility of MNA at the FGD Pond area can be further evaluated with a Tier II MNA evaluation if SSLs of cobalt or lithium in groundwater are identified in the future.

6.0 CONCLUSION

The above serves as the Tier I evaluation of MNA feasibility at the OGSES Site for cobalt and lithium with respect to the FGD Pond Area. This document and evaluation have been completed in accordance with guidance and best practices promulgated by the USEPA (USEPA 2007a and 2007b) and the ITRC (ITRC 2010). Based on the findings of this evaluation, the FGD Pond area at the OGSES is a viable candidate for MNA as a corrective measure.

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Signature Page

Golder Associates Inc.



PJ Nolan, Ph.D.
Project Geochemist



Patrick Behling, P.E.
Principal Engineer

Tables

Table 1: Overview of the wells used in the MNA assessment.

19122434

Background Wells	Monitoring Wells	Nature and Extent Wells	Porewater Samples
FGD-8, FGD-11	FGD-1, FGD-2, FGD-3, FGD-4, FGD-5, FGD-6, FGD-12	FGD-14, FGD-15, FGD-16	FGD-A-2019-1, FGD-B-2019-1

Table 2: Summary of overburden samples collected

19122434

Sample Location	Core Description
Assessment boring FGD-15 (25'-27')	Silty sand (SM), fine to very fine, grayish purple with some iron staining, wet, trace clay, unconsolidated
Assessment boring FGD-16 (30'-32')	Sand (SP), red to purple gray, well sorted, wet, unconsolidated
Assessment boring FGD-2019-1 (23'-25')	Sand (SW), light tan, wet, unconsolidated

Table 3: Groundwater Geochemical Modeling Results

Parameter	Units	FGD-1	FGD-2	FGD-3	FGD-4	FGD-5	FGD-6	FGD-8	FGD-11	FGD-12	FGD-15	FGD-16	FGD-A-2019-1	FGD-B-2019-1
MINERAL PHASES - Saturation Indices														
Otavite	CdCO ₃	-3.54	-3.01	-2.61	-3.15	-3.27	-2.74	-3.37	-3.01	-3.67			-4.41	-3.44
Ferrihydrite	Fe(OH) ₃	2.41	2.26	2.31	2.08	1.66	4.03	4.90	3.44	2.69	1.69	1.89	1.77	0.64
Siderite	FeCO ₃	-2.77	-2.15	-1.86	-2.32	-2.41	-1.93	1.33	-2.05	-2.92	-2.71	-2.18	-3.54	-3.52
Melanterite	FeSO ₄ ·7H ₂ O	-7.28	-7.49	-7.22	-7.69	-7.60	-7.59	-4.21	-7.80	-7.83	-6.84	-7.98	-6.86	-6.87
Anglesite	PbSO ₄	-4.80	-5.29	-5.30	-5.48	-5.38	-5.55	-4.83	-5.41	-5.29			-3.23	-3.24
Gypsum	CaSO ₄ ·2H ₂ O	-2.15	-2.05	-1.59	-2.23	-1.86	-2.43	-1.32	-1.99	-3.17	-0.55	-2.95	-0.13	-0.17
Jarosite-H	(H ₃ O)Fe ₃ (SO ₄) ₂ (OH) ₆	-4.17	-5.82	-4.41	-5.63	-6.19	-0.66	2.95	-2.59	-4.18	-4.75	-7.62	-3.66	-6.90
Jarosite-K	KFe ₃ (SO ₄) ₂ (OH) ₆	0.99	-0.37	0.89	-0.66	-1.01	4.22	9.04	2.99	0.73	0.85	-2.13	2.85	-0.40
Jarosite-Na	NaFe ₃ (SO ₄) ₂ (OH) ₆	-1.04	-1.87	-0.46	-2.06	-2.86	3.33	7.26	1.50	-1.55	-0.61	-4.12	-0.01	-3.26
Calcite	CaCO ₃	-1.76	-0.84	-0.35	-0.97	-0.79	-0.90	0.10	-0.38	-2.39	-0.51	-1.25	-0.97	-0.97
Magnesite	MgCO ₃	-2.76	-1.96	-1.34	-2.08	-1.74	-2.14	-0.84	-1.59	-3.51	-1.63	-2.68	-1.51	-1.48
Barite	BaSO ₄	0.15	0.25	0.27	0.11	0.11	0.18	1.02	0.50	-0.45			1.11	1.12
Witherite	BaCO ₃	-4.76	-3.83	-3.78	-3.93	-4.12	-3.57	-2.86	-3.18	-4.96			-5.01	-4.96
Fluorite	CaF ₂	-2.53	-2.29	-1.62	-2.38	-1.73	-2.05	-3.09	-2.06	-3.97	-1.43	-3.24	1.05	1.06
CoCO ₃	CoCO ₃	-4.28	-3.70	-3.23	-3.88	-3.98	-2.86	-3.17	-3.62	-4.43			-5.05	-5.02
Cerussite	PbCO ₃	-2.91	-2.59	-2.56	-2.73	-2.81	-2.52	-1.92	-2.30	-3.01			-2.59	-2.56
Carbon Dioxide	pCO ₂ (g) ^(b)	-1.84	-1.62	-0.97	-1.22	-1.05	-1.38	-1.00	-1.39	-1.87	-1.38	-1.47	-1.87	-1.75

Notes:

^(a) Saturation indices between -0.5 and 0.5 identified

^(b) pCO₂(g) values presented at 10^{value} atm

Table 4. Sequential Extraction and Total Metals From Overburden

19122434

Sample Location		FGD-16	FGD-15	FGD-2019-1
Sample Depth (feet bgs)		30'-32'	25'-27'	23'-25'
Sample Date		5/23/2019	5/22/2019	5/23/2019
Analyte	SEP Step	mg/kg	mg/kg	mg/kg
Aluminum	SEP Step 1	<51 U	<52 U	<52 U
Aluminum	SEP Step 2	<38 * U	<39 * U	<39 * U
Aluminum	SEP Step 3	40	23	62
Aluminum	SEP Step 4	990	600	1800
Aluminum	SEP Step 5	90 J *	67 J *	65 J *
Aluminum	SEP Step 6	1600	1200	2600
Aluminum	SEP Step 7	39000	28000	33000
Aluminum	SEP Sum of Steps 1-7	42000	30000	38000
Aluminum	Total/NA	44000	46000	43000
Antimony	SEP Step 1	<15 U	<16 U	<16 U
Antimony	SEP Step 2	<11 U	<12 U	<12 U
Antimony	SEP Step 3	<3.8 U	<3.9 U	<3.9 U
Antimony	SEP Step 4	<3.8 U	<3.9 U	<3.9 U
Antimony	SEP Step 5	<57 U	<59 U	<58 U
Antimony	SEP Step 6	<3.8 U	<3.9 U	<3.9 U
Antimony	SEP Step 7	<3.8 U	<3.9 U	<3.9 U
Antimony	SEP Sum of Steps 1-7	<3.0 U	<3.0 U	<3.0 U
Antimony	Total/NA	<3.8 U	<3.9 U	<3.9 U
Arsenic	SEP Step 1	<2.5 U	<2.6 U	<2.6 U
Arsenic	SEP Step 2	<1.9 U	<2.0 U	<1.9 U
Arsenic	SEP Step 3	0.28 J	<0.65 U	0.3 J
Arsenic	SEP Step 4	1.1 B	0.64 J B	1.9 B
Arsenic	SEP Step 5	<9.5 U	<9.8 U	<9.7 U
Arsenic	SEP Step 6	0.69	0.62 J	1.6
Arsenic	SEP Step 7	0.47 J	0.9 J	1.2
Arsenic	SEP Sum of Steps 1-7	2.5	2.2	5
Arsenic	Total/NA	2.5	1.6	7.6
Barium	SEP Step 1	0.67 J	<13 U	0.86 J
Barium	SEP Step 2	0.55 J *	<9.8 * U	1.9 J *
Barium	SEP Step 3	6.4 B	1.4 J B	4 B
Barium	SEP Step 4	12	9.6	14
Barium	SEP Step 5	<47 * U	<49 * U	27 J *
Barium	SEP Step 6	4.2	6	35
Barium	SEP Step 7	520	510	410
Barium	SEP Sum of Steps 1-7	540	530	490
Barium	Total/NA	760	670	730
Beryllium	SEP Step 1	<1.3 U	<1.3 U	<1.3 U
Beryllium	SEP Step 2	<0.95 * U	<0.98 * U	<0.97 * U
Beryllium	SEP Step 3	0.036 J	0.02 J	0.1 J
Beryllium	SEP Step 4	0.18 J	0.12 J	0.25 J
Beryllium	SEP Step 5	<4.7 * U	<4.9 * U	<4.9 * U
Beryllium	SEP Step 6	0.056 J	0.053 J	0.074 J
Beryllium	SEP Step 7	0.59	0.48	0.39
Beryllium	SEP Sum of Steps 1-7	0.86	0.67	0.81
Beryllium	Total/NA	0.85	0.71	0.76
Boron	Total/NA	<24 U	<24 U	<24 U
Chromium	Total/NA	3.3	4.2	4.8

Table 4. Sequential Extraction and Total Metals From Overburden

19122434

Sample Location		FGD-16	FGD-15	FGD-2019-1
Sample Depth (feet bgs)		30'-32'	25'-27'	23'-25'
Sample Date		5/23/2019	5/22/2019	5/23/2019
Analyte	SEP Step	mg/kg	mg/kg	mg/kg
Cobalt	SEP Step 1	<13 U	<13 U	<13 U
Cobalt	SEP Step 2	<9.5 U	<9.8 U	<9.7 U
Cobalt	SEP Step 3	0.63 J	0.63 J	29
Cobalt	SEP Step 4	0.63 J	0.41 J	36
Cobalt	SEP Step 5	<47 * U	<49 * U	2.6 J *
Cobalt	SEP Step 6	0.32 J	0.27 J	1.6 J
Cobalt	SEP Step 7	0.62 J	0.48 J	0.7 J
Cobalt	SEP Sum of Steps 1-7	2.2 J	1.8 J	69
Cobalt	Total/NA	1.7 J	1.8 J	6.9
Iron	SEP Step 1	<25 U	<26 U	<26 U
Iron	SEP Step 2	<19 * U	<20 * U	<19 * U
Iron	SEP Step 3	31	58	61
Iron	SEP Step 4	2100	1400	3400
Iron	SEP Step 5	<95 * U	<98 * U	<97 * U
Iron	SEP Step 6	1300	1100	1100
Iron	SEP Step 7	3100	2900	4400
Iron	SEP Sum of Steps 1-7	6600	5400	9100
Iron	Total/NA	5900	5700	8400
Lead	Total/NA	3.4	3.2	6
Lithium	SEP Step 1	<13 U	<13 U	<13 U
Lithium	SEP Step 2	<9.5 U	<9.8 U	<9.7 U
Lithium	SEP Step 3	<3.2 U	<3.3 U	0.8 J
Lithium	SEP Step 4	0.27 J	0.93 J	3.9
Lithium	SEP Step 5	<47 U	<49 U	<49 U
Lithium	SEP Step 6	0.57 J	0.93 J	1.2 J
Lithium	SEP Step 7	7.9	7	14
Lithium	SEP Sum of Steps 1-7	8.7	8.9	20
Lithium	Total/NA	7.6	10	14
Manganese	SEP Step 1	0.2 J	0.47 J	0.99 J
Manganese	SEP Step 2	<2.8 U	1.4 J	<2.9 U
Manganese	SEP Step 3	4.4 B	14 B	110 B
Manganese	SEP Step 4	4.8	6.9	98
Manganese	SEP Step 5	<14 * U	<15 * U	<15 * U
Manganese	SEP Step 6	6.4	10	10
Manganese	SEP Step 7	18 B	54 B	19 B
Manganese	SEP Sum of Steps 1-7	34	88	230
Manganese	Total/NA	34	93	61
Molybdenum	SEP Step 1	<10 U	<10 U	<10 U
Molybdenum	SEP Step 2	<7.6 U	<7.8 U	<7.8 U
Molybdenum	SEP Step 3	<2.5 U	<2.6 U	<2.6 U
Molybdenum	SEP Step 4	<2.5 U	<2.6 U	0.18 J
Molybdenum	SEP Step 5	<38 U	<39 U	<39 U
Molybdenum	SEP Step 6	<2.5 U	<2.6 U	0.21 J
Molybdenum	SEP Step 7	<2.5 U	0.11 J	0.8 J
Molybdenum	SEP Sum of Steps 1-7	<2.0 U	0.11 J	1.2 J

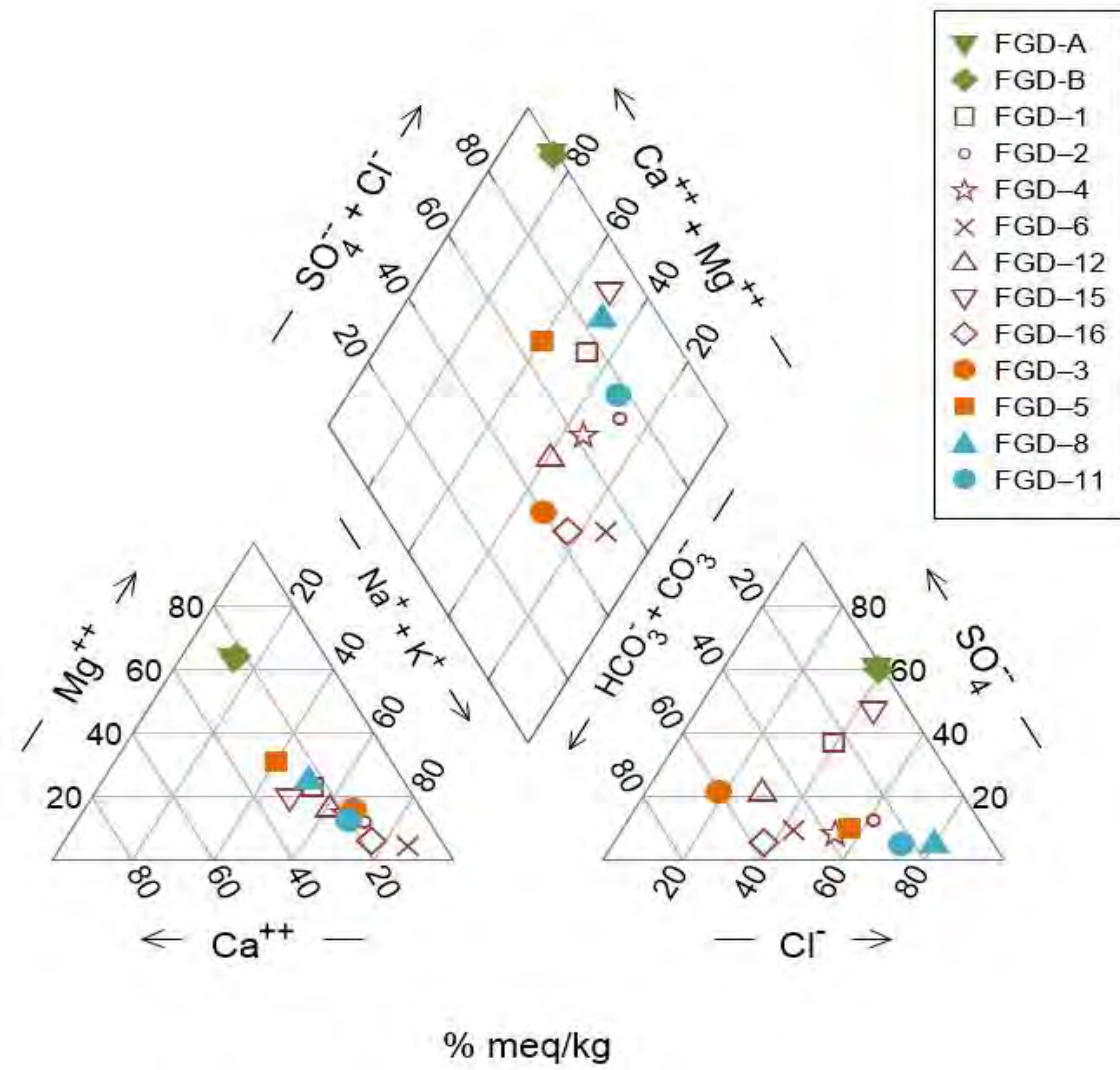
Table 4. Sequential Extraction and Total Metals From Overburden

19122434

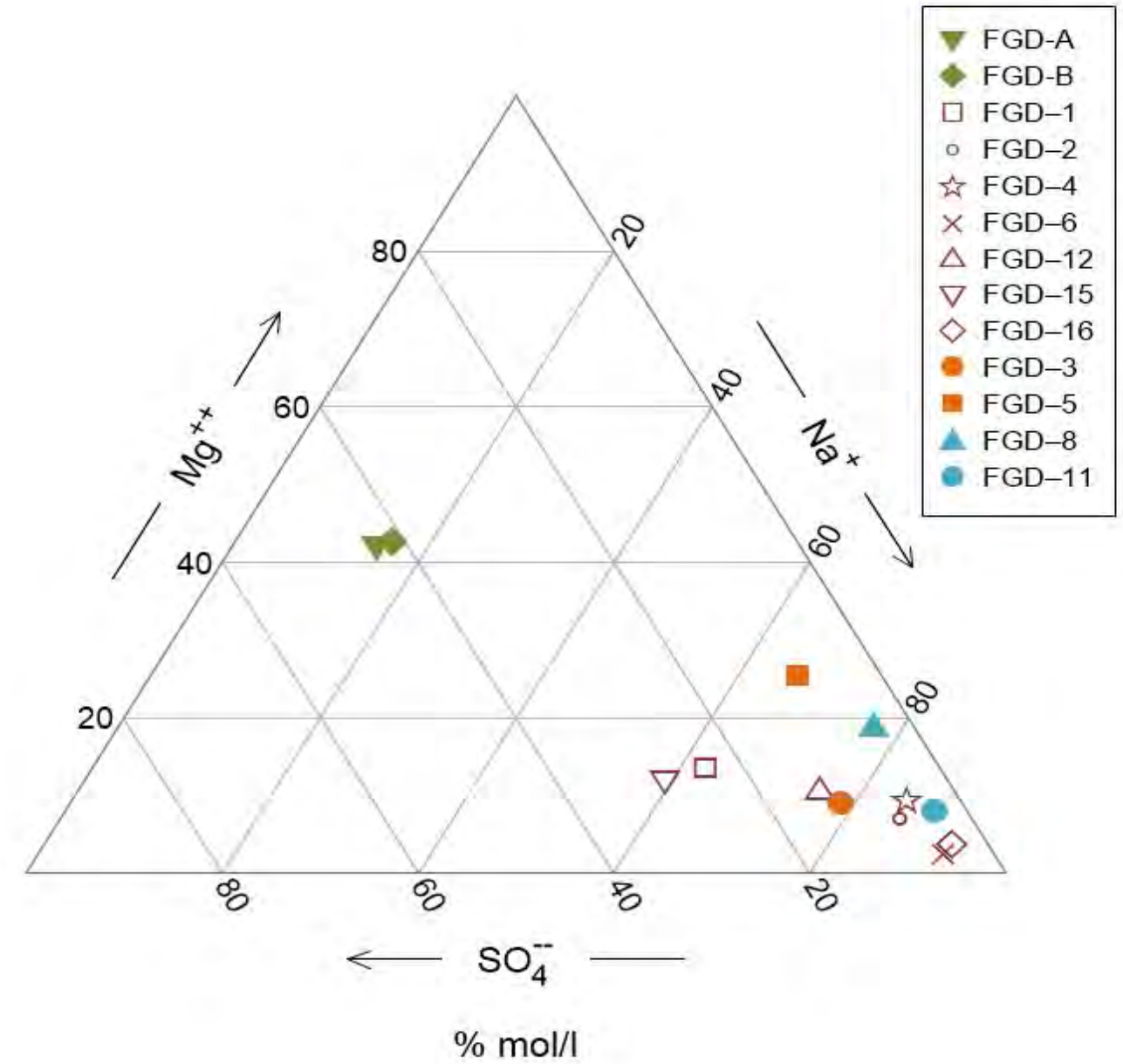
Sample Location		FGD-16	FGD-15	FGD-2019-1
Sample Depth (feet bgs)		30'-32'	25'-27'	23'-25'
Sample Date		5/23/2019	5/22/2019	5/23/2019
Analyte	SEP Step	mg/kg	mg/kg	mg/kg
Molybdenum	Total/NA	0.16 J	0.21 J	1.1 J
Selenium	SEP Step 1	<2.5 U	<2.6 U	<2.6 U
Selenium	SEP Step 2	<1.9 U	<2.0 U	0.88 J B
Selenium	SEP Step 3	<0.63 U	<0.65 U	<0.65 U
Selenium	SEP Step 4	<0.63 * U	0.65 * B	<0.65 * U
Selenium	SEP Step 5	<9.5 U	<9.8 U	<9.7 U
Selenium	SEP Step 6	<0.63 U	<0.65 U	<0.65 U
Selenium	SEP Step 7	<1.3 U	<1.3 U	<0.65 U
Selenium	SEP Sum of Steps 1-7	<0.50 U	0.65	0.88
Selenium	Total/NA	<1.3 U	<0.65 U	<0.65 U
Thallium	SEP Step 1	<8.8 U	<9.1 U	<9.1 U
Thallium	SEP Step 2	<6.6 U	<6.9 U	<6.8 U
Thallium	SEP Step 3	<2.2 U	<2.3 U	<2.3 U
Thallium	SEP Step 4	<2.2 U	<2.3 U	<2.3 U
Thallium	SEP Step 5	<33 * U	<34 * U	<34 * U
Thallium	SEP Step 6	<2.2 U	<2.3 U	<2.3 U
Thallium	SEP Step 7	0.95 J	0.59 J	<4.5 U
Thallium	SEP Sum of Steps 1-7	0.95 J	0.59 J	<1.8 U
Thallium	Total/NA	0.68 J	<4.6 U	0.85 J

Figures

(a)



(b)



CLIENT
LUMINANT
OAK GROVE SES
FGD PONDS
CONSULTANT

PROJECT
MONITORED NATURAL ATTENUATION EVALUATION
GEOCHEMICAL ASSESSMENT

TITLE
GENERALE GROUNDWATER RELATIVE ION ABUNDANCE (A)
AND SELECT ION RATIOS (B) IN GROUNDWATER



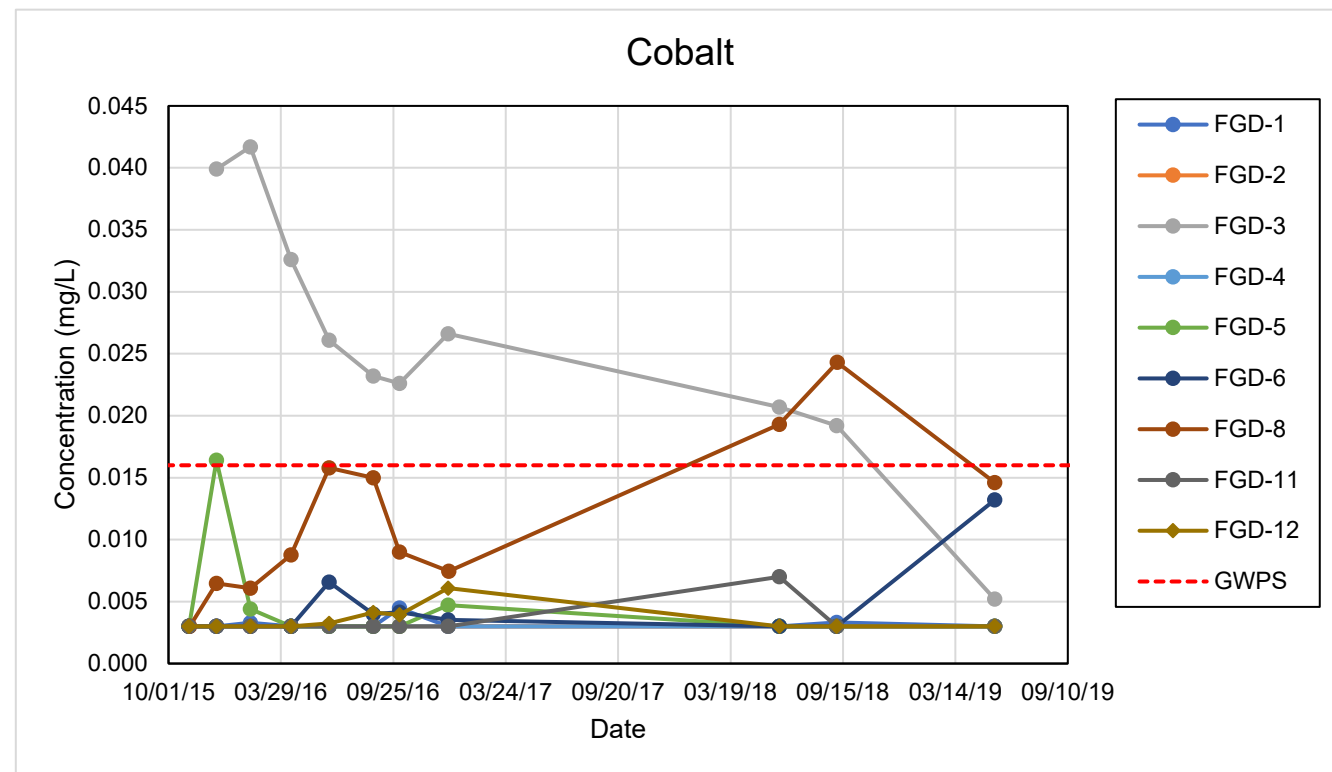
PROJECT NO.
19122434

PHASE
E

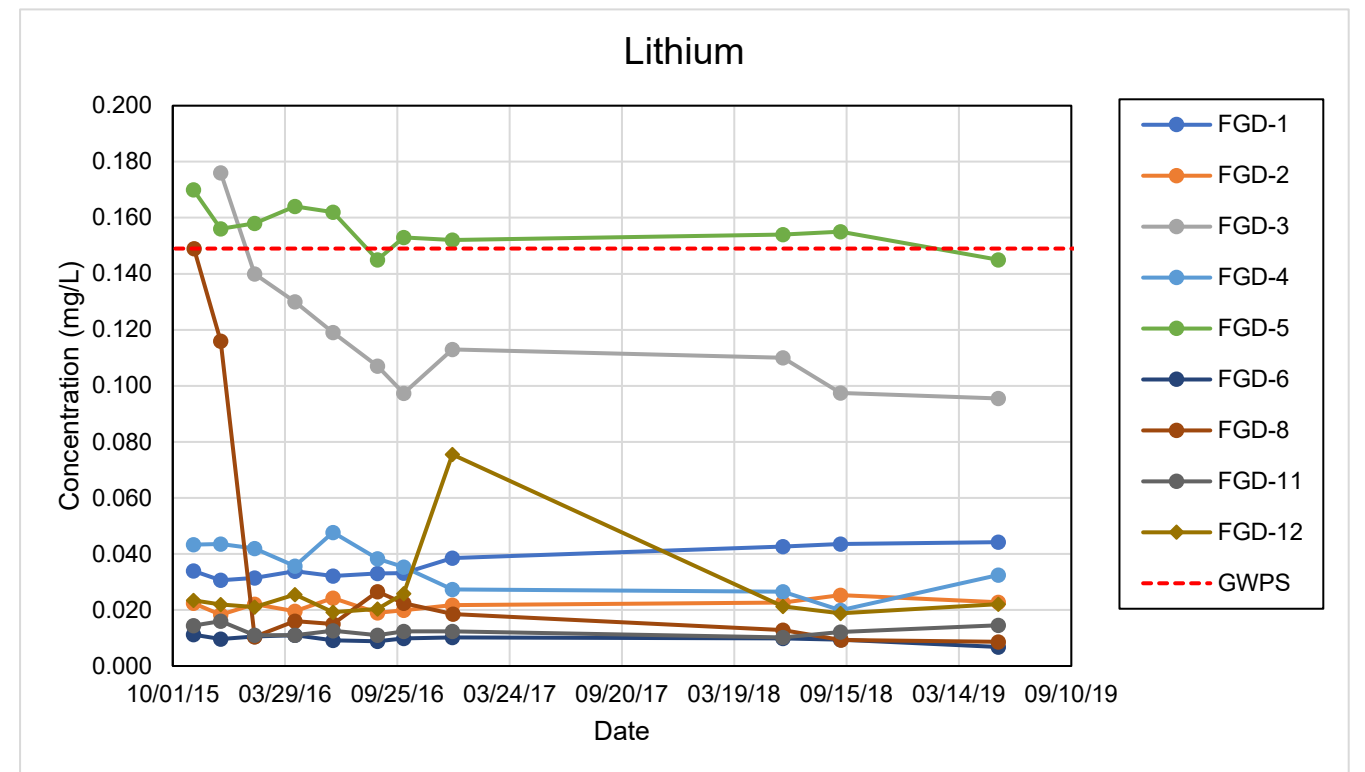
REV.
1

FIGURE
1a-b

(a)



(b)



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LUMINANT
OAK GROVE SES
FGD PONDS
CONSULTANT



PROJECT
MONITORED NATURAL ATTENUATION EVALUATION
GEOCHEMICAL ASSESSMENT

TITLE
HISTORICAL TRENDS OF COBALT (A)
AND LITHIUM (B) IN MONITORING WELLS

PROJECT NO.
19122434

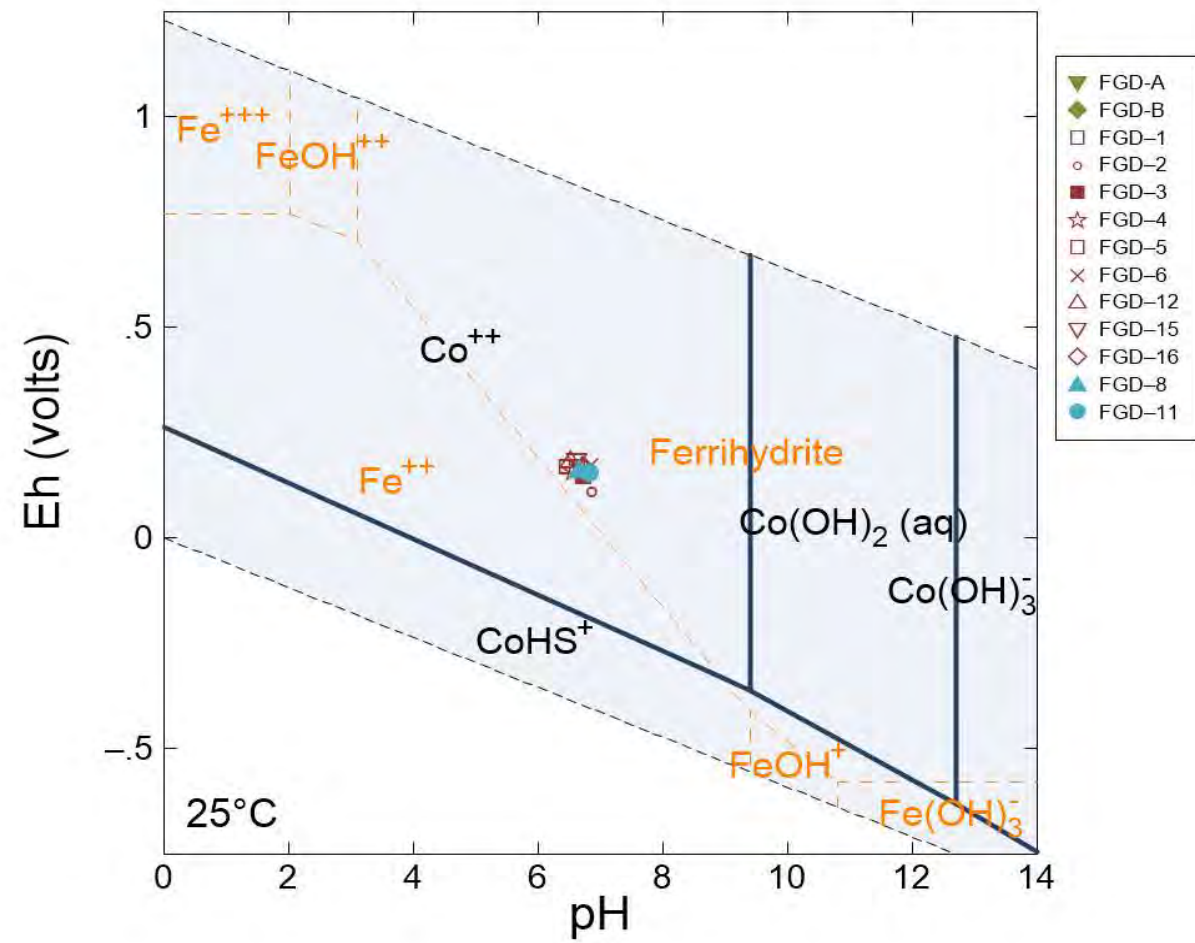
PHASE
E

REV.
1

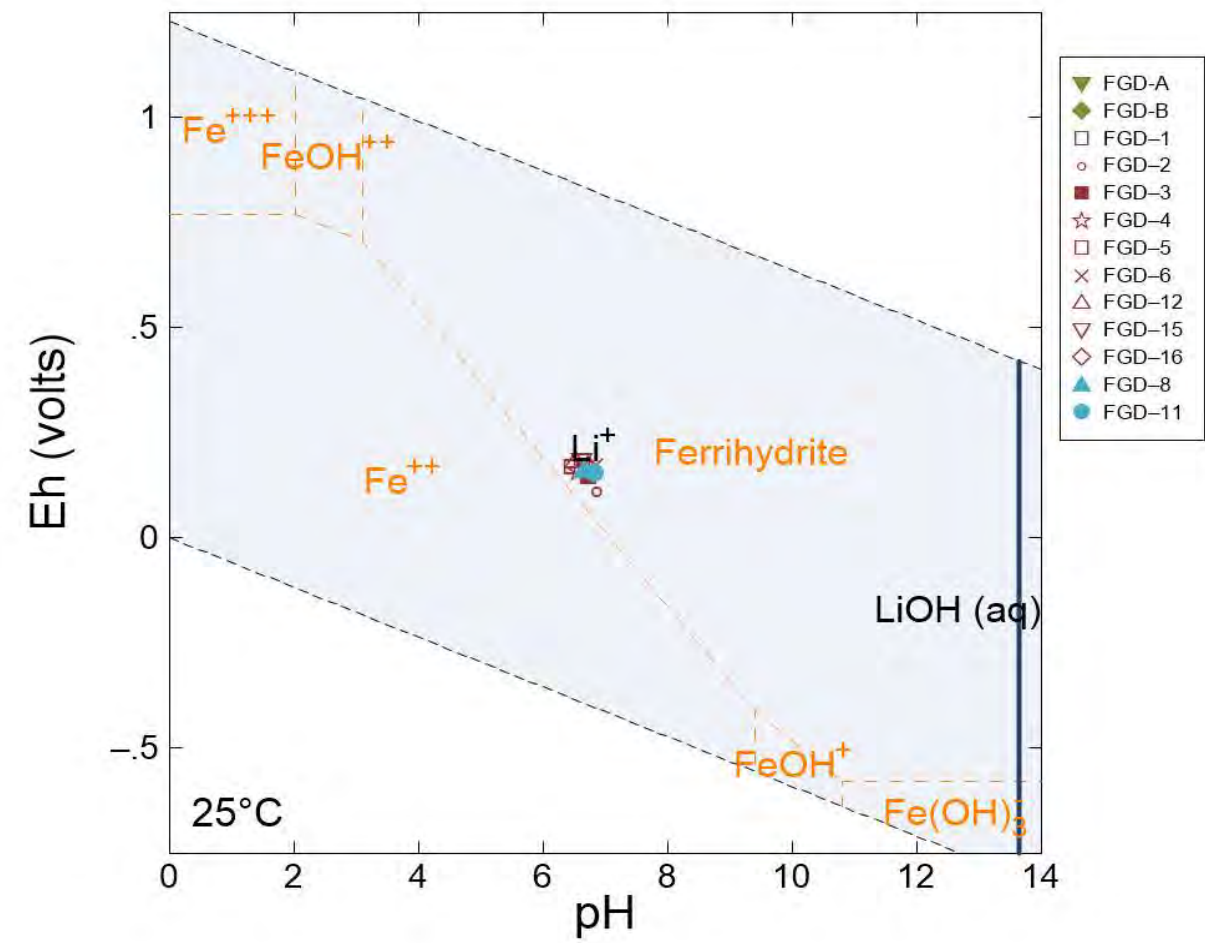
FIGURE
2a-b

1 in

(a)



(b)



CLIENT
LUMINANT
OAK GROVE SES
FGD PONDS
CONSULTANT



PROJECT
MONITORED NATURAL ATTENUATION EVALUATION
GEOCHEMICAL ASSESSMENT

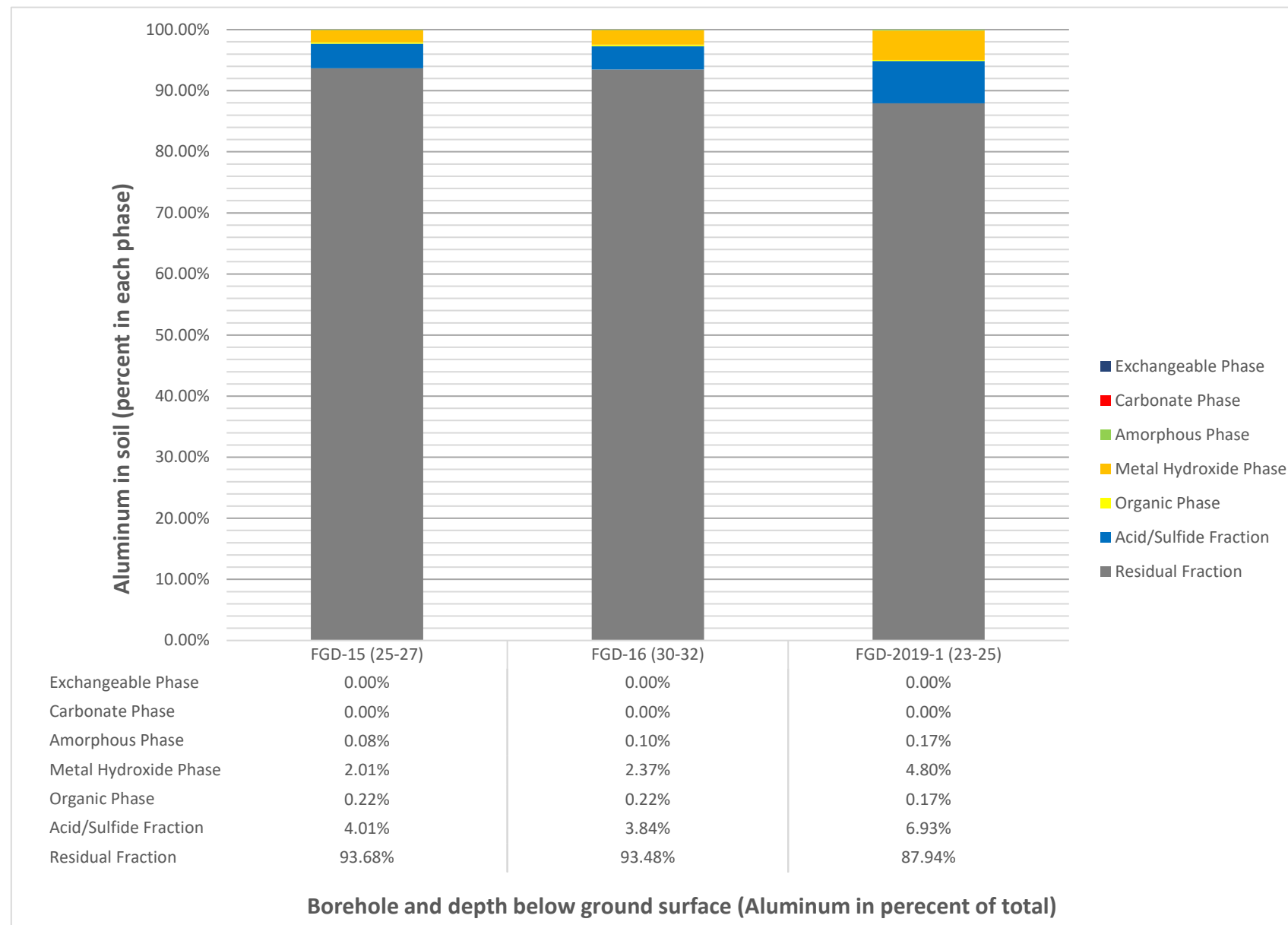
TITLE
HISTORICAL TRENDS OF COBALT (A)
AND LITHIUM (B) IN MONITORING WELLS

PROJECT NO.
19122434

PHASE
E

REV.
1

FIGURE
3a-b



CLIENT
LUMINANT
OAK GROVE SES
FGD PONDS
CONSULTANT



PROJECT
MONITORED NATURAL ATTENUATION EVALUATION
GEOCHEMICAL ASSESSMENT

TITLE
SEQUENTIAL EXTRACTION

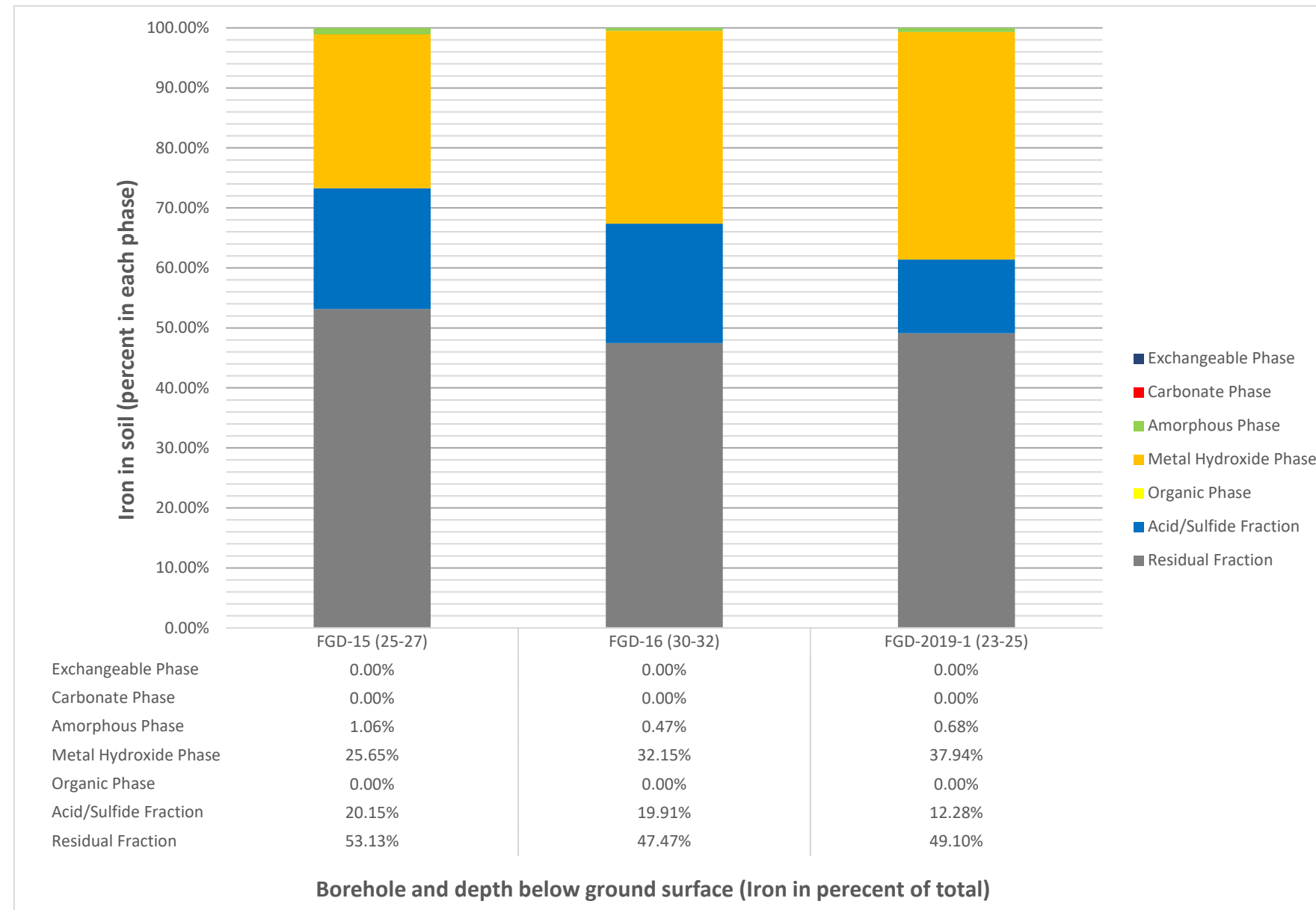
PROJECT NO.
19122434

PHASE
E

REV.
1

FIGURE
4

1 in



CLIENT
LUMINANT
OAK GROVE SES
FGD PONDS
CONSULTANT



PROJECT
MONITORED NATURAL ATTENUATION EVALUATION
GEOCHEMICAL ASSESSMENT

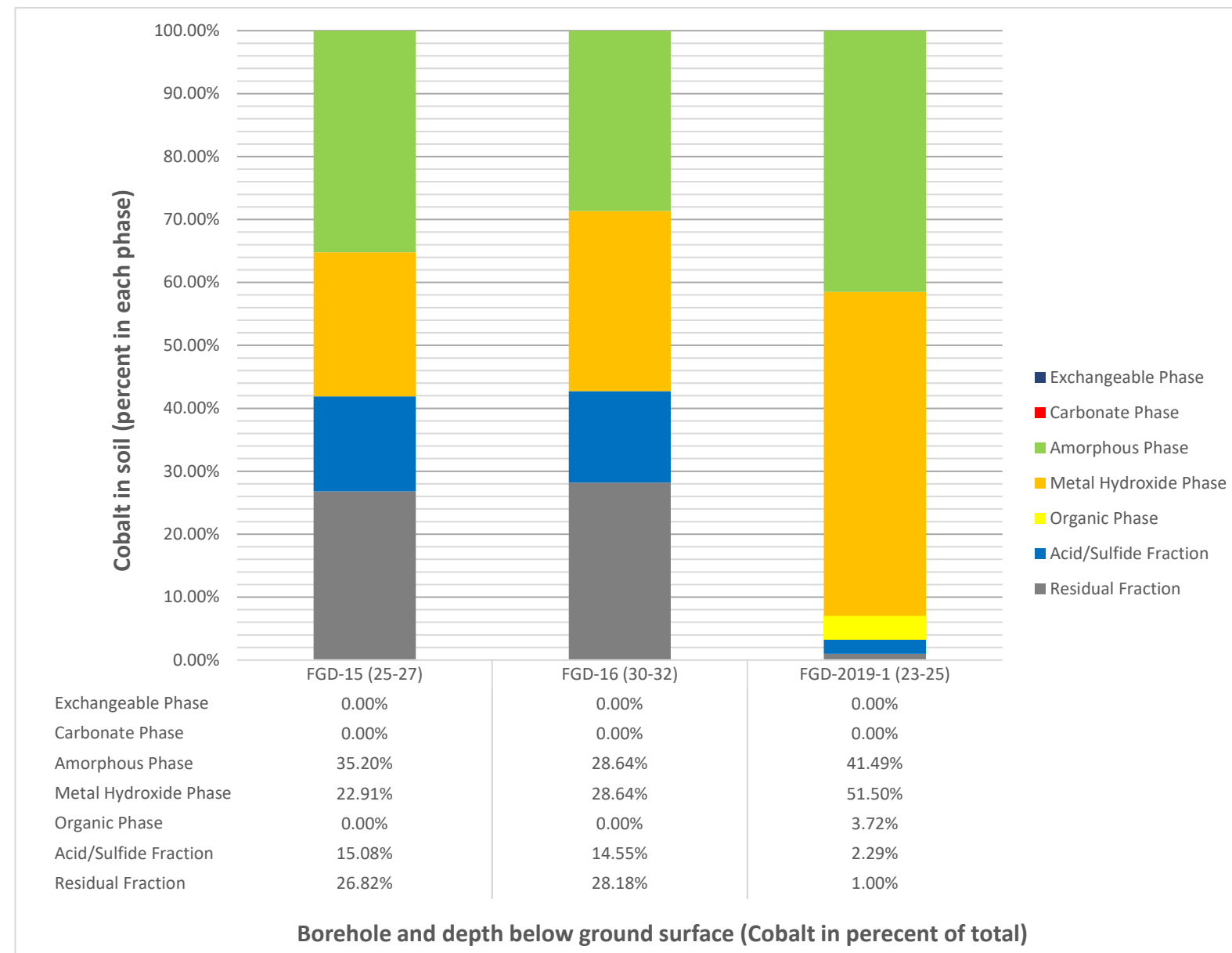
TITLE
SEQUENTIAL EXTRACTION

PROJECT NO.
19122434

PHASE
E

REV.
1

FIGURE
5



CLIENT
LUMINANT
OAK GROVE SES
FGD PONDS
CONSULTANT



PROJECT
MONITORED NATURAL ATTENUATION EVALUATION
GEOCHEMICAL ASSESSMENT

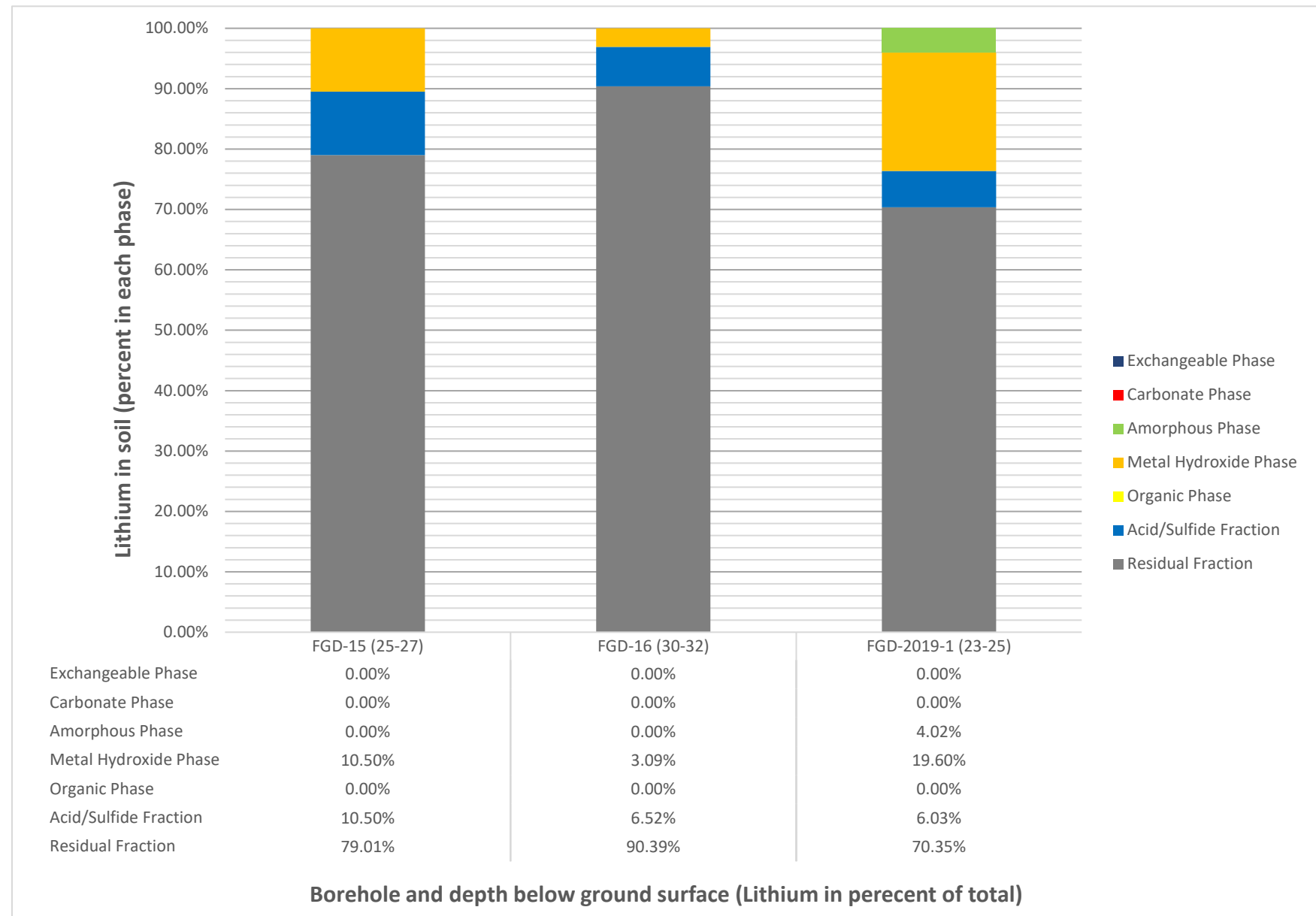
TITLE
SEQUENTIAL EXTRACTION

PROJECT NO.
19122434

PHASE
E

REV.
1

FIGURE
6



CLIENT
LUMINANT
OAK GROVE SES
FGD PONDS
CONSULTANT



PROJECT
MONITORED NATURAL ATTENUATION EVALUATION
GEOCHEMICAL ASSESSMENT

TITLE
SEQUENTIAL EXTRACTION

PROJECT NO.
19122434

PHASE
E

REV.
1

FIGURE
7

APPENDIX A

BORING LOGS

RECORD OF BOREHOLE MW-FGD-01

SHEET 1 OF 2
DATUM: LOCAL

PROJECT: OAK GROVE SES
LOCATION: FRANKLIN, TEXAS

BORING STARTED: 27-Aug-2008
BORING FINISHED: 27-Aug-2008

DRILLING EQUIPMENT: MOBILE B-57 BUGGY
DRILLING OPERATOR: Lewis Environmental Drilling

NORTHING (ft): 4549.42
EASTING (ft): 2454.41
ELEVATION (ft): 421.91

DEPTH SCALE FEET	BORING METHOD	SOIL PROFILE		SAMPLES		RECOVERY%	ROCK QUALITY DESIGNATION (RQD) %		ADDITIONAL LAB. TESTING	INSTALLATION NOTES AND GROUNDWATER OBSERVATIONS
		DESCRIPTION	STRATA PLOT	NUMBER	TYPE		BLOWS/0.5 FT	UNDRAINED SHEAR STRENGTH Cu		
		Muddy with vegetation								
0		GROUND SURFACE		421.9						
		Firm, brown to light brown, sandy CLAY, some vegetative presence, dry		0.0						
		trace red at 1.5'			SB-1	2 3 3 N6	40			
2		Hard, grayish brown with red, CLAY, with sand, dry		2.0		8 20 32 N52	67			
4		Hard, gray, trace red, silty CLAY, dry		4.0		10 14 18 N32	73			
6		red, some iron oxide at 6'								
		Compact, grayish brown, SAND, with silt, damp		7.0		7 13 14 N27	87			
8		reddish brown, some clay at 8'								
		trace red at 10'								
10										
12										
14		wet at 14'								▼ 14' 08/27/2008
16										
18										
20		some yellowish brown at 19.5'								
		-- CONTINUED NEXT PAGE --								

OAK GROVE - MW 94281GINT.GPJ GLDR HOU.GDT 10/31/08

DEPTH SCALE
1 inch to 2.5 feet



LOGGED: DH
CHECKED: BLT

RECORD OF BOREHOLE MW-FGD-01

SHEET 2 OF 2
DATUM: LOCAL

PROJECT: OAK GROVE SES
LOCATION: FRANKLIN, TEXAS

BORING STARTED: 27-Aug-2008
BORING FINISHED: 27-Aug-2008

DRILLING EQUIPMENT: MOBILE B-57 BUGGY
DRILLING OPERATOR: Lewis Environmental Drilling

NORTHING (ft): 4549.42
EASTING (ft): 2454.41
ELEVATION (ft): 421.91

DEPTH SCALE FEET	BORING METHOD	SOIL PROFILE		SAMPLES			RECOVERY%	ROCK QUALITY DESIGNATION (RQD) %				ADDITIONAL LAB. TESTING	INSTALLATION NOTES AND GROUNDWATER OBSERVATIONS			
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (ft)	NUMBER	TYPE		BLOWS/0.5 FT	WATER CONTENT PERCENT							
								UNDRAINED SHEAR STRENGTH Cu ● P.P. ⊕ Field Vane Shear ■ UU ⊕ TORV. ▲ UCS ✱								
								400	800	1200	1600	20	40	60	80	
20		--- CONTINUED FROM PREVIOUS PAGE --- very dense at 20'		20.0												
					SB-11		15 26 35 N61	87								
22		dense, grayish brown and mottled yellow at 22'			SB-12		17 21 27 N48	100								
24		very dense, moist at 24'			SB-13		18 25 35 N60	87								
26					SB-14		16 17 35 N52	93								
28					SB-15		20 35 36 N71	100								
30					SB-16		18 28 32 N60	87								
32					SB-17		21 36 50/5*	93								
34		Very dense, dark brownish gray, clayey SAND, trace iron oxide, damp		33.0												
34		BORING TERMINATED AT 34'		34.0												

OAK GROVE - MW 94281GINT.GPJ GLDR HOU.GDT 10/31/08

DEPTH SCALE
1 inch to 2.5 feet



LOGGED: DH
CHECKED: BLT

RECORD OF BOREHOLE MW-FGD-02

SHEET 1 OF 3
DATUM: LOCAL

PROJECT: OAK GROVE SES
LOCATION: FRANKLIN, TEXAS

BORING STARTED: 22-Aug-2008
BORING FINISHED: 25-Aug-2008

DRILLING EQUIPMENT: MOBILE B-57 BUGGY
DRILLING OPERATOR: Lewis Environmental Drilling

NORTHING (ft): 4261.32
EASTING (ft): 3643.72
ELEVATION (ft): 436.24

DEPTH SCALE FEET	BORING METHOD	SOIL PROFILE		SAMPLES		RECOVERY%	ROCK QUALITY DESIGNATION (RQD) %		WATER CONTENT PERCENT	ADDITIONAL LAB. TESTING	INSTALLATION NOTES AND GROUNDWATER OBSERVATIONS
		DESCRIPTION	STRATA PLOT	NUMBER	TYPE		UNDRAINED SHEAR STRENGTH Cu	PL			
		Muddy									
0		GROUND SURFACE		436.2							
		Stiff, brown with some dark brown, sandy CLAY, some gravel, damp		0.0							
2		very stiff, dark brown at 2'			SB-1	4 4 5 N9	27				
4		very stiff, brown to yellowish brown, some iron oxide traces, possible lignite traces, dry at 4'			SB-2	4 7 16 N23	47				
6		Very stiff, mottled gray and brown, CLAY, some gravel, dry		6.0	SB-3	7 10 13 N23	53				
8		Very stiff, brown, yellow, and gray, mottled, sandy CLAY		8.0	SB-4	5 13 15 N28	67				
10		hard at 10'			SB-5	5 13 16 N29	53				
12		gray at 11'			SB-6	7 13 20 N33	80				
14		Dense, light gray, fine, silty SAND, with a seam of clay, damp		12.0	SB-7	14 17 21 N38	87				
16					SB-8	10 19 27 N46	93				
18		seam of hard CLAY		17.5	SB-9	16 23 24 N47	87				
		very dense at 18'									
		seam of very hard CLAY		18.5	SB-10	10 25 36 N61	87				
				18.8							
20				19.8							
-- CONTINUED NEXT PAGE --											

OAK GROVE - MW 94281GINT.GPJ GLDR HOU.GDT 10/31/08

DEPTH SCALE
1 inch to 2.5 feet



LOGGED: DH
CHECKED: BLT

RECORD OF BOREHOLE MW-FGD-02

SHEET 2 OF 3
DATUM: LOCAL

PROJECT: OAK GROVE SES
LOCATION: FRANKLIN, TEXAS

BORING STARTED: 22-Aug-2008
BORING FINISHED: 25-Aug-2008

DRILLING EQUIPMENT: MOBILE B-57 BUGGY
DRILLING OPERATOR: Lewis Environmental Drilling

NORTHING (ft): 4261.32
EASTING (ft): 3643.72
ELEVATION (ft): 436.24

DEPTH SCALE FEET	BORING METHOD	SOIL PROFILE		SAMPLES			RECOVERY%	ROCK QUALITY DESIGNATION (RQD) %		ADDITIONAL LAB. TESTING	INSTALLATION NOTES AND GROUNDWATER OBSERVATIONS
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (ft)	NUMBER	TYPE		BLOWS/0.5 FT	20		
20		--- CONTINUED FROM PREVIOUS PAGE --- dense at 20'									
				21.0	SB-11	14 19 27 N46	92				
			seam of hard CLAY								
22			very dense at 22'								
				22.0	SB-12	13 27 37 N64	100				
24											
					SB-13	17 29 28 N57	87				
26											
					SB-14	17 25 42 N67	67				
28			yellow at 27.5'								
					SB-15	20 39 50/5"	87				
30											
					SB-16	25 45 24 N69	87				
32			gray at 30.5'								
					SB-17	4 1 2 N3	80				
34			Very loose, brown, SAND, moist								
					SB-18	7 14 14 N28	73				
36			Very stiff, brown, sandy CLAY, moist								
					SB-19	8 25 50/4"	93				
38			Hard, brown, CLAY, with silt, moist								
					SB-20	20 45 50/3"	80				
40			Very dense, brown, SAND								
			gray and yellow, mottled at 39'								
			--- CONTINUED NEXT PAGE ---								

32' 08/22/2008

OAK GROVE - MW 94281GINT.GPJ GLDR HOU.GDT 10/31/08

DEPTH SCALE
1 inch to 2.5 feet



LOGGED: DH
CHECKED: BLT

RECORD OF BOREHOLE MW-FGD-02

SHEET 3 OF 3
DATUM: LOCAL

PROJECT: OAK GROVE SES
LOCATION: FRANKLIN, TEXAS

BORING STARTED: 22-Aug-2008
BORING FINISHED: 25-Aug-2008

DRILLING EQUIPMENT: MOBILE B-57 BUGGY
DRILLING OPERATOR: Lewis Environmental Drilling

NORTHING (ft): 4261.32
EASTING (ft): 3643.72
ELEVATION (ft): 436.24

DEPTH SCALE FEET	BORING METHOD	SOIL PROFILE		SAMPLES			RECOVERY%	ROCK QUALITY DESIGNATION (RQD) %				ADDITIONAL LAB. TESTING	INSTALLATION NOTES AND GROUNDWATER OBSERVATIONS
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (ft)	NUMBER	TYPE		BLOWS/0.5 FT	WATER CONTENT PERCENT				
								UNDRAINED SHEAR STRENGTH Cu 400 800 1200 1600					
								ROCK QUALITY DESIGNATION (RQD) % 20 40 60 80 *					
								WATER CONTENT PERCENT PL W LL					
								CU - ● P.P. - ⊕ Field Vane Shear - ■ UU - ⊕ TORV. - ▲ UCS - ✱					
40		--- CONTINUED FROM PREVIOUS PAGE ---											
		brownish gray at 40'											
		gray at 41'			SB-21	24 42 50/4"	87						
		dense at 42'			SB-22	32 25 22 N47	100						
		seam of hard, yellowish gray and brown, CLAY at 43.5'											
		very dense at 44'			SB-23	18 36 50/4"	100						
					SB-24	32 45 50/3"	73						
					SB-25	24 24 50/5"	80						
					SB-26	32 45 50/3"	87						
52		BORING TERMINATED AT 52'											

OAK GROVE - MW 94281GINT.GPJ GLDR HOU.GDT 10/31/08

DEPTH SCALE
1 inch to 2.5 feet



LOGGED: DH
CHECKED: BLT

RECORD OF BOREHOLE MW-FGD-03

SHEET 1 OF 3
DATUM: LOCAL

PROJECT: OAK GROVE SES
LOCATION: FRANKLIN, TEXAS

BORING STARTED: 21-Aug-2008
BORING FINISHED: 21-Aug-2008

DRILLING EQUIPMENT: MOBILE B-57 BUGGY
DRILLING OPERATOR: Lewis Environmental Drilling

NORTHING (ft): 4780.02
EASTING (ft): 3685.25
ELEVATION (ft): 432.04

DEPTH SCALE FEET	BORING METHOD	SOIL PROFILE		SAMPLES			RECOVERY%	ROCK QUALITY DESIGNATION (RQD) %		ADDITIONAL LAB. TESTING	INSTALLATION NOTES AND GROUNDWATER OBSERVATIONS
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (ft)	NUMBER	TYPE		BLOWS/0.5 FT	UNDRAINED SHEAR STRENGTH Cu		
		Muddy									
0		GROUND SURFACE		432.0							
		Soft to firm, reddish brown, CLAY, with sand, some gravel		0.0							
2					SB-1	N22					
						N24					
4		very stiff, brown, mottled at 4'			ST-2						
6					SB-3	N5					
						N7					
						N12					
						N19					
8		Very stiff, gray, silty CLAY		7.5	SB-4	N5					
						N12					
						N15					
						N27					
10		trace brown at 10'			SB-5	N5					
						N8					
						N12					
12		stiff, light brown at 12'			SB-6	N4					
						N7					
						N9					
						N16					
14					SB-7	N3					
						N5					
						N7					
						N12					
16					SB-8	N3					
						N5					
						N6					
						N11					
18		Stiff, brown, CLAY, damp		17.0	ST-9						
20		firm to stiff at 18'			SB-10	N2					
						N3					
						N5					
						N8					
		-- CONTINUED NEXT PAGE --									

OAK GROVE - MW 94281GINT.GPJ GLDR HOU.GDT 10/31/08

DEPTH SCALE
1 inch to 2.5 feet



LOGGED: DH
CHECKED: BLT

RECORD OF BOREHOLE MW-FGD-03

SHEET 2 OF 3
DATUM: LOCAL

PROJECT: OAK GROVE SES
LOCATION: FRANKLIN, TEXAS

BORING STARTED: 21-Aug-2008
BORING FINISHED: 21-Aug-2008

DRILLING EQUIPMENT: MOBILE B-57 BUGGY
DRILLING OPERATOR: Lewis Environmental Drilling

NORTHING (ft): 4780.02
EASTING (ft): 3685.25
ELEVATION (ft): 432.04

DEPTH SCALE FEET	BORING METHOD	SOIL PROFILE		SAMPLES			RECOVERY%	ROCK QUALITY DESIGNATION (RQD) %		ADDITIONAL LAB. TESTING	INSTALLATION NOTES AND GROUNDWATER OBSERVATIONS
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (ft)	NUMBER	TYPE		BLOWS/0.5 FT	UNDRAINED SHEAR STRENGTH Cu		
								20 40 60 80	PL ——— W ——— LL		
20		--- CONTINUED FROM PREVIOUS PAGE ---									
		firm at 20'		20.0							
					SB-11	2 3 5 N5	100				
22		firm to stiff at 22'									
					SB-12	2 3 5 N8	100				
24		dark brown, some silt at 24'									
					SB-13	2 3 5 N8	87				
26		Dense, light brown, SAND, moist		26.0							▼ 26' 08/21/2008
					SB-14	12 15 30 N45	73				
28		very dense, gray at 28'									
					SB-15	12 31 30 N61	73				
30		dense, trace yellowish brown at 30'									
					SB-16	5 14 17 N31	67				
32											
					SB-17	3 13 21 N34	67				
34		Hard, brown, some mottled dark brown, CLAY, damp		33.0							
					SB-18	6 21 23 N44	67				
36											
					SB-19	5 13 20 N33	87				
38											
					SB-20	7 16 25 N41	80				
40											
		--- CONTINUED NEXT PAGE ---									

OAK GROVE - MW 94281GINT.GPJ GLDR HOU.GDT 10/31/08

DEPTH SCALE
1 inch to 2.5 feet



LOGGED: DH
CHECKED: BLT

RECORD OF BOREHOLE MW-FGD-03

SHEET 3 OF 3
DATUM: LOCAL

PROJECT: OAK GROVE SES
LOCATION: FRANKLIN, TEXAS

BORING STARTED: 21-Aug-2008
BORING FINISHED: 21-Aug-2008

DRILLING EQUIPMENT: MOBILE B-57 BUGGY
DRILLING OPERATOR: Lewis Environmental Drilling

NORTHING (ft): 4780.02
EASTING (ft): 3685.25
ELEVATION (ft): 432.04

DEPTH SCALE FEET	BORING METHOD	SOIL PROFILE		SAMPLES			RECOVERY%	ROCK QUALITY DESIGNATION (RQD) %				ADDITIONAL LAB. TESTING	INSTALLATION NOTES AND GROUNDWATER OBSERVATIONS
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (ft)	NUMBER	TYPE		BLOWS/0.5 FT	UNDRAINED SHEAR STRENGTH Cu		WATER CONTENT PERCENT		
								400 800 1200 1600		20 40 60 80			
40		--- CONTINUED FROM PREVIOUS PAGE --- trace iron oxide at 40'		40.0									
					SB-21	7 16 25 N41	80						
42					SB-22	10 19 29 N48	74						
44					ST-23		100						
46					SB-24	13 23 36 N59	73						
48		BORING TERMINATED AT 48'		48.0									
50													
52													
54													
56													
58													
60													

OAK GROVE - MW 94281GINT.GPJ GLDR HOU.GDT 10/31/08

DEPTH SCALE
1 inch to 2.5 feet



LOGGED: DH
CHECKED: BLT

RECORD OF BOREHOLE MW-FGD-04

SHEET 1 OF 3
DATUM: LOCAL

PROJECT: OAK GROVE SES
LOCATION: FRANKLIN, TEXAS

BORING STARTED: 20-Aug-2008
BORING FINISHED: 20-Aug-2008

DRILLING EQUIPMENT: MOBILE B-57 BUGGY
DRILLING OPERATOR: Lewis Environmental Drilling

NORTHING (ft): 5039.72
EASTING (ft): 3414.63
ELEVATION (ft): 429.19

DEPTH SCALE FEET	BORING METHOD	SOIL PROFILE		SAMPLES			RECOVERY%	ROCK QUALITY DESIGNATION (RQD) %		ADDITIONAL LAB. TESTING	INSTALLATION NOTES AND GROUNDWATER OBSERVATIONS
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (ft)	NUMBER	TYPE		BLOWS/0.5 FT	UNDRAINED SHEAR STRENGTH Cu		
		Muddy									
0		GROUND SURFACE		429.2							
		Brown, sandy CLAY, damp		0.0							
					ST-1		75				
2		Brown, CLAY, with silt, damp		2.0							
					ST-2		65				
4		very stiff, reddish and yellowish brown, mottled, with occasional calcareous nodules at 4'									
					SB-3	4 6 10 N16	67				
6											
					ST-4		87				
8											
		Very stiff, brown, sandy CLAY, damp with occasional coarse, angular gravel at 9.5' reddish brown at 10'		9.0							
					SB-5	9 11 14 N25	27				
10											
					SB-6	7 9 9 N18	53				
12		stiff at 12'									
					SB-7	10 5 4 N9	40				
14		Stiff, reddish brown, CLAY, with sand, damp		14.0							
					SB-8	4 6 5 N11	27				
16		Compact, brown, fine, silty SAND, damp		15.5							
		light brown at 16.25'									
		reddish brown at 17.25'									
18		Compact, reddish brown, clayey SAND, moist		18.0							
		Compact, light brown, fine, SAND, moist		19.0							
					SB-10	5 8 15 N23	87				
20											
-- CONTINUED NEXT PAGE --											

OAK GROVE - MW 94281GINT.GPJ GLDR HOU.GDT 10/31/08

DEPTH SCALE
1 inch to 2.5 feet



LOGGED: CS
CHECKED: BLT

RECORD OF BOREHOLE MW-FGD-04

SHEET 2 OF 3
DATUM: LOCAL

PROJECT: OAK GROVE SES
LOCATION: FRANKLIN, TEXAS

BORING STARTED: 20-Aug-2008
BORING FINISHED: 20-Aug-2008

DRILLING EQUIPMENT: MOBILE B-57 BUGGY
DRILLING OPERATOR: Lewis Environmental Drilling

NORTHING (ft): 5039.72
EASTING (ft): 3414.63
ELEVATION (ft): 429.19

DEPTH SCALE FEET	BORING METHOD	SOIL PROFILE		SAMPLES			RECOVERY%	ROCK QUALITY DESIGNATION (RQD) %		ADDITIONAL LAB. TESTING	INSTALLATION NOTES AND GROUNDWATER OBSERVATIONS
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (ft)	NUMBER	TYPE		BLOWS/0.5 FT	20		
20		--- CONTINUED FROM PREVIOUS PAGE --- dense, occasional seams of gray at 20'		20.0							
22		occasional streaks of yellowish brown at 22'			SB-11	6 20 20 N40	100				
24		very dense, gray with mottled reddish brown at 24'			SB-12	12 15 19 N34	93				
26		dense, mottled, reddish brown, yellowish brown, and gray at 26'			SB-13	14 28 30 N58	100				
28		very dense at 28'			SB-14	13 21 22 N43	100				
30		dense at 30'			SB-15	11 15 50 N65	87				
32					SB-16	8 15 21 N36	87				
34		very dense at 34'			SB-17	14 18 27 N45	80				
36					SB-18	20 31 35 N66	100				
38					SB-19	20 31 31 N62	100				
40					SB-20	21 42 50/5"	100				
		--- CONTINUED NEXT PAGE ---									

OAK GROVE - MW 94281GINT.GPJ GLDR HOU.GDT 10/31/08

DEPTH SCALE
1 inch to 2.5 feet



LOGGED: CS
CHECKED: BLT

RECORD OF BOREHOLE MW-FGD-04

SHEET 3 OF 3

DATUM: LOCAL

PROJECT: OAK GROVE SES
LOCATION: FRANKLIN, TEXAS

BORING STARTED: 20-Aug-2008

DRILLING EQUIPMENT: MOBILE B-57 BUGGY

NORTHING (ft): 5039.72

BORING FINISHED: 20-Aug-2008

DRILLING OPERATOR: Lewis Environmental Drilling

EASTING (ft): 3414.63

ELEVATION (ft): 429.19

DEPTH SCALE FEET	BORING METHOD	SOIL PROFILE		SAMPLES			RECOVERY%	ROCK QUALITY DESIGNATION (RQD) %		ADDITIONAL LAB. TESTING	INSTALLATION NOTES AND GROUNDWATER OBSERVATIONS
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (ft)	NUMBER	TYPE		BLOWS/0.5 FT	20		
-- CONTINUED FROM PREVIOUS PAGE --											
40				40.0							
					SB-21	18 35 33 N68	100				
42		Hard, gray, CLAY, with sand		42.0							
					SB-22	11 21 34 N55	100				
44		BORING TERMINATED AT 43.5'		43.5							
46											
48											
50											
52											
54											
56											
58											
60											

OAK GROVE - MW 94281GINT.GPJ GLDR HOU.GDT 10/31/08

DEPTH SCALE
1 inch to 2.5 feet



LOGGED: CS
CHECKED: BLT

Luminant Power

Log of Boring: FGD-5

Oak Grove Steam Electric Station
Franklin, TX

Completion Date:	3/3/10	Drilling Method:	HSA
Drilling Company:	Strata Core, Inc.	Borehole Diameter (in.):	6
Driller:	Roddy Qualls	Total Depth (ft):	50
Driller's License:	3121	Northing:	571950.33
Field Supervisor:	Chris Moore	Easting:	3200628.33
Sampling Method:	3"x5' Barrel	Ground Elev. (ft AMSL):	430.54

PBW Project No. 1602

Depth (ft)	Well Materials	Recovery (ft/ft)	USCS	Lithologic Description
0				
3.5/5.0		3.5/5.0	SM	SILTY SAND, SM, brown, moist, soft.
5				
4.0/5.0		4.0/5.0	CL	SILTY CLAY, CL, mottled yellowish brown and yellowish red, moist, firm, with sand from 6'-8'.
10				
4.0/5.0		4.0/5.0	SM	SILTY SAND, SM, banded very pale brown and brownish yellow, moist, soft to firm, laminated, very fine grained, trace thinly laminated silt lenses.
15				
4.5/5.0		4.5/5.0	SM	
20				
4.0/5.0		4.0/5.0	SM	
25				
4.5/5.0		4.5/5.0	SM	
30				
5.0/5.0		5.0/5.0	ML	SILT, ML, brown, moist to wet, very soft to soft.
35				
3.0/5.0		3.0/5.0	CL	CLAY, CL, dark gray, moist, firm to hard, with thinly laminated silt and sand lenses.
40				
3.0/5.0		3.0/5.0	SM	SILTY SAND, SM, dark gray to gray, moist, soft to firm, very fine grained, some thinly laminated silt lenses, trace thin carbonaceous lenses, wet at 40', clayey lenses at: 40.5' -41', 44'-44.5, and, 47'-48'.

PBW

Pastor, Behling & Wheeler, LLC
2201 Double Creek Dr., Suite 4004
Round Rock, TX 78664
Tel (512) 671-3434 Fax (512) 671-3446

Notes:

Initial Fluid Level (3/9/10)

▼ Depth to water: 23.67 ft BTOC

Annular Materials
(0.0 - 2.0) Concrete
(2.0 - 36.0) Cement/Bentonite Grout
(36.0 - 38.0) Bentonite Chips
(38.0 - 50.0) 12/20 Silica Sand

Well Materials
(+2.4 - 30.0) Casing, 2" Sch 40 FJT PVC
(30.0 - 40.0) Screen, 2" Sch 40 FJT PVC,
0.01 slot









Luminant Power

Log of Boring: FGD-6

Oak Grove Steam Electric Station
Franklin, TX

Completion Date:	3/4/10	Drilling Method:	HSA
Drilling Company:	Strata Core, Inc.	Borehole Diameter (in.):	6
Driller:	Roddy Qualls	Total Depth (ft):	28
Driller's License:	3121	Northing:	573195.06
Field Supervisor:	Chris Moore	Easting:	3200525.61
Sampling Method:	3"x5' Barrel	Ground Elev. (ft AMSL):	425.63

PBW Project No. 1602

Depth (ft)	Well Materials	Recovery (ft/ft)	USCS	Lithologic Description
0		4.0/5.0		FILL, sandy clay, yellowish brown, moist, soft to firm, very fine grained sand.
5		3.0/5.0		FILL, clay, olive gray, moist, firm, with concrete fragments.
10		2.0/5.0		
15		2.0/5.0		SAND, SP, yellowish brown, wet, soft, laminated, very fine grained, becomes gray at 26'.
20		3.0/5.0		
25		2.0/3.0		
30				
35				
40				

PBW

Pastor, Behling & Wheeler, LLC
2201 Double Creek Dr., Suite 4004
Round Rock, TX 78664
Tel (512) 671-3434 Fax (512) 671-3446

Notes:

Initial Fluid Level (3/9/10)

▼ Depth to water: 19.48 ft BTOC

Annular Materials
(0.0 - 2.0) Concrete
(2.0 - 14.0) Cement/Bentonite Grout
(14.0 - 16.0) Bentonite Chips
(16.0 - 28.0) 12/20 Silica Sand

Well Materials
(+3.0 - 18.0) Casing, 2" Sch 40 FJT PVC
(18.0 - 28.0) Screen, 2" Sch 40 FJT PVC,
0.01 slot

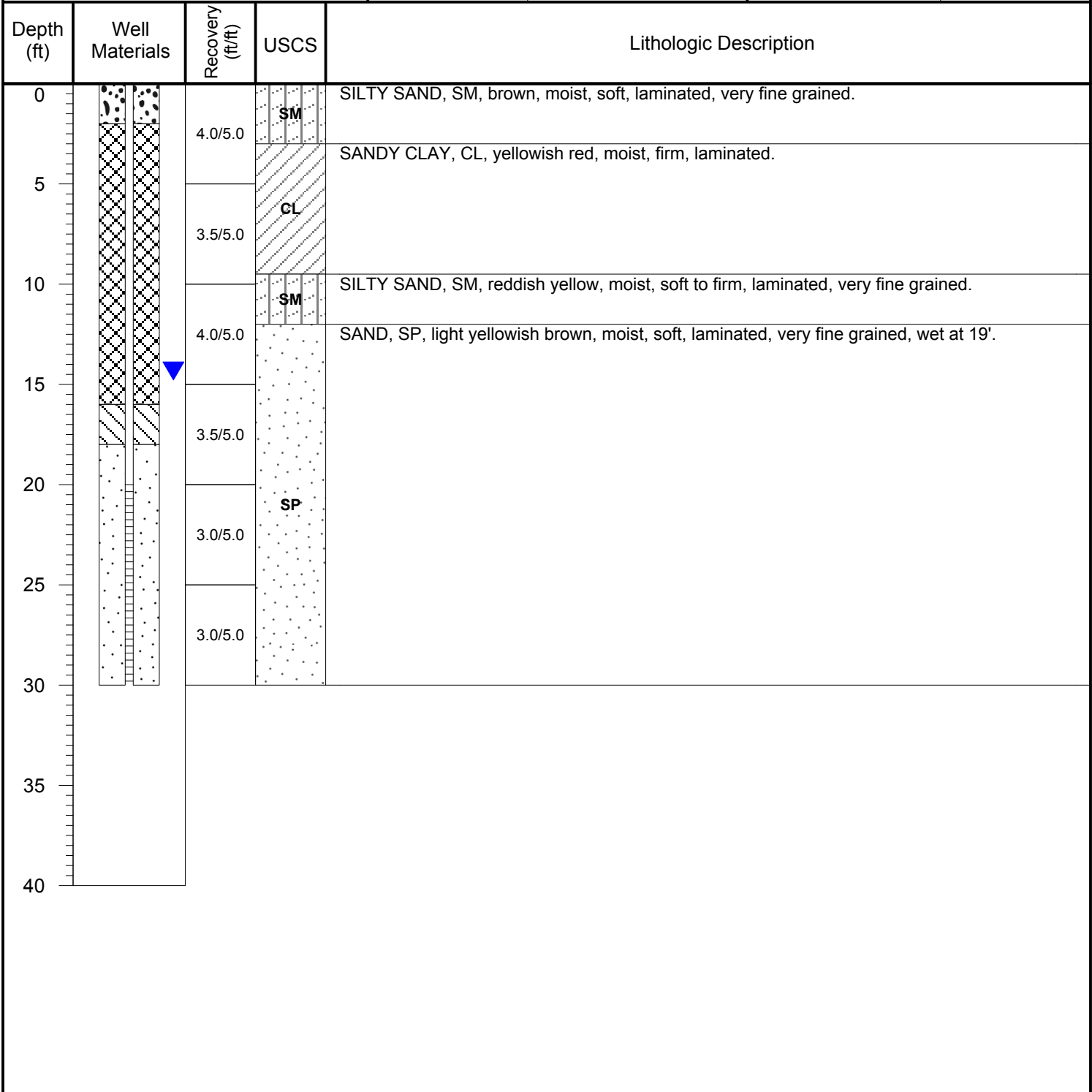
Luminant Power

Log of Boring: FGD-7

Oak Grove Steam Electric Station
Franklin, TX

Completion Date:	3/3/10	Drilling Method:	HSA
Drilling Company:	Strata Core, Inc.	Borehole Diameter (in.):	6
Driller:	Roddy Qualls	Total Depth (ft):	30
Driller's License:	3121	Northing:	572591.64
Field Supervisor:	Chris Moore	Easting:	3199761.32
Sampling Method:	3"x5' Barrel	Ground Elev. (ft AMSL):	423.6

PBW Project No. 1602



PBW

Pastor, Behling & Wheeler, LLC
2201 Double Creek Dr., Suite 4004
Round Rock, TX 78664
Tel (512) 671-3434 Fax (512) 671-3446

Notes:

Initial Fluid Level (3/9/10)
▼ Depth to water: 16.55 ft BTOC

Annular Materials
(0.0 - 2.0) Concrete
(2.0 - 16.0) Cement/Bentonite Grout
(16.0 - 18.0) Bentonite Chips
(18.0 - 30.0) 12/20 Silica Sand

Well Materials
(+2.2 - 20.0) Casing, 2" Sch 40 FJT PVC
(20.0 - 30.0) Screen, 2" Sch 40 FJT PVC,
0.01 slot

Luminant Power

Log of Boring: FGD-8

Oak Grove Steam Electric Station
Franklin, TX

Completion Date:	3/4/10	Drilling Method:	HSA
Drilling Company:	Strata Core, Inc.	Borehole Diameter (in.):	6
Driller:	Roddy Qualls	Total Depth (ft):	40
Driller's License:	3121	Northing:	573033.29
Field Supervisor:	Chris Moore	Easting:	3198862.3
Sampling Method:	3"x5' Barrel	Ground Elev. (ft AMSL):	437.06

PBW Project No. 1602

Depth (ft)	Well Materials	Recovery (ft/ft)	USCS	Lithologic Description
0				FILL, silty clay, CL, brown, moist, soft to firm.
4.5		4.5/5.0		
5			FILL	FILL, silty sand, SM, very pale brown, dry to moist, soft, very fine grained.
5.0		5.0/5.0		
10				FILL, silty clay, CL, dark gray, moist, firm, crumbles easily, some sand layers.
10		4.5/5.0		
15				SANDY, CLAY, CL, strong brown, moist, firm, laminated, very fine grained sand
15		5.0/5.0		
20				SILTY CLAY, CL, dark gray, moist, firm, with sand laminae.
20		5.0/5.0	CL	
25				SILTY CLAY, CL, mottled gray and brown, moist, firm to hard, some sand laminae, some oxidized staining.
25		5.0/5.0		
30				SAND, SP, dark gray, wet, very soft to soft, very fine grained, some silty laminae.
30		3.0/5.0		
35			SP	
35		3.5/5.0		
40				

PBW

Pastor, Behling & Wheeler, LLC
2201 Double Creek Dr., Suite 4004
Round Rock, TX 78664
Tel (512) 671-3434 Fax (512) 671-3446

Notes:

Initial Fluid Level (3/9/10)

▼ Depth to water: 29.11 ft BTOC

Annular Materials
(0.0 - 2.0) Concrete
(2.0 - 26.0) Cement/Bentonite Grout
(26.0 - 28.0) Bentonite Chips
(28.0 - 40.0) 12/20 Silica Sand

Well Materials
(+3.0 - 30.0) Casing, 2" Sch 40 FJT PVC
(30.0 - 40.0) Screen, 2" Sch 40 FJT PVC,
0.01 slot



Golder Associates

500 Century Plaza Drive, Suite 190
Houston, Texas 77073
Telephone: (281) 821-6868
Fax: (281) 821-6870

BOREHOLE FGD-11

PAGE 1 OF 2

CLIENT Luminant Power PROJECT NAME Luminant
 PROJECT NUMBER 1406296 PROJECT LOCATION Oak Grove SES
 DATE STARTED 11/25/14 COMPLETED 11/26/14 GROUND ELEVATION 448.67 ft HOLE SIZE 6 inches
 DRILLING CONTRACTOR Envirotech GROUND WATER LEVELS:
 DRILLING METHOD Auger AT TIME OF DRILLING 40 40' bgs
 LOGGED BY DMW CHECKED BY CFR AT END OF DRILLING _____
 NOTES _____ AFTER DRILLING _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲						
								20	40	60	80			
0		Firm, brown and green, CLAY, and topsoil, moist												
		Hard, brown and tan, SANDY CLAY, moist	ST	75		1.0								
			ST	50		4.5								
5			ST	54		4.5								
			SS	58	3-5-7-10 (12)									
			SS	79	6-8-8-9 (16)									
10			SS	67	5-9-10-12 (19)									
			SS	71	6-8-9-12 (17)									
15		Very stiff, red and black, CLAY, with brown sand, moist												
		Stiff, brown and tan, SANDY CLAY, moist												
		maroon, gravel sized rocks at 15.0'	SS	67	6-8-6-7 (14)									
			SS	92	5-6-8-9 (14)									
20		Compact, brown and tan, CLAYEY SAND, moist	SS	79	4-6-8-9 (14)									
		with gray and brown clay lenses at 21.0'	SS	71	6-8-7-8 (15)									
		loosely consolidated sand at 23.0'	SS	79	7-8-11-15 (19)									
25		orange mottlings at 25.0'	SS	83	9-13-17-19 (30)									
			SS	83	9-10-14-16 (24)									
30		Very stiff, gray, SAND and CLAY, moist dense at 29.5'	SS	92	8-9-18-21 (27)									

GEOTECH BH PLOTS - GINT STD US LAB.GDT - 1/23/15 10:02 - L:\14- 2014 FILE FOLDER\1406296- LUMINANT_FGD-C\1406296 LUMINANT.GPJ

(Continued Next Page)



500 Century Plaza Drive, Suite 190
Houston, Texas 77073
Telephone: (281) 821-6868
Fax: (281) 821-6870

BOREHOLE FGD-11

PAGE 2 OF 2

CLIENT Luminant Power

PROJECT NAME Luminant

PROJECT NUMBER 1406296

PROJECT LOCATION Oak Grove SES

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲				
								20	40	60	80	
								PL MC LL				
								20	40	60	80	
								□ FINES CONTENT (%) □				
								20	40	60	80	
30		Very stiff, gray, SAND and CLAY, moist (<i>continued</i>)	SS	83	9-13-17-19 (30)							
		without clay at 31.0'	SS	88	10-16-22-22 (38)							
		Dense, gray and tan, SILTY SAND, moist										
		poorly consolidated at 33.0'	SS	83	7-11-17-17 (28)							
35			SS	71	6-13-14-15 (27)							
		Very stiff, gray, SILTY CLAY, moist										
			SS	75	4-6-13-17 (19)							
		Dense, gray and tan, SILTY SAND, moist										
		moist to wet at 38.0'	SS	71	6-5-8-10 (13)							
40		Compact, gray and tan, SAND, moist to wet	SS	67	3-4-4-7 (8)							
		Compact, gray and tan, SILTY SAND, wet										
		Very stiff, gray, SILTY CLAY, moist	SS	88	7-9-10-13 (19)							
45		Dense, gray and tan, SILTY SAND, moist to wet	SS	92	3-8-24-28 (32)							
		moist at 46.0'										
		slightly wet at 48.0'	SS	83	4-8-26-40 (34)							
50		very dense at 50.0'	SS	75	14-28-29-34 (57)							
		moist at 52.0'	SS	92	9-38-50 (88)							
		moist to wet at 54.0'	SS	83	15-28-46-50 (74)							
55			SS	71	14-36-50 (86)							
			SS		21-39-48-113 (87)							

Bottom of borehole at 58.0 feet.

GEOTECH BH PLOTS - GINT STD US LAB.GDT - 1/23/15 10:02 - L:\14- 2014 FILE FOLDER\1406296- LUMINANT- FGD-C11406296 LUMINANT.GPJ



Golder Associates

500 Century Plaza Drive, Suite 190
Houston, Texas 77073
Telephone: (281) 821-6868
Fax: (281) 821-6870

BOREHOLE FGD-12

PAGE 1 OF 2

CLIENT Luminant Power PROJECT NAME Luminant
 PROJECT NUMBER 1406296 PROJECT LOCATION Oak Grove SES
 DATE STARTED 11/26/14 COMPLETED 11/26/14 GROUND ELEVATION 439.48 ft HOLE SIZE 6 inches
 DRILLING CONTRACTOR Envirotech GROUND WATER LEVELS:
 DRILLING METHOD Auger ∇ AT TIME OF DRILLING 32 32' bgs
 LOGGED BY DMW CHECKED BY CFR AT END OF DRILLING _____
 NOTES _____ AFTER DRILLING _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲			
								20	40	60	80
								PL	MC	LL	
								20	40	60	80
								□ FINES CONTENT (%) □			
								20	40	60	80
0		Firm, brown, CLAY, topsoil, moist	ST	46		1.0					
		Hard, brown, SANDY CLAY, moist	ST	63		4.5					
5			ST	42		4.5					
			SS	75	6-8-10-7 (18)						▲
		Firm, red, orange and gray, CLAY, moist, with red and orange mottling	SS	75	5-8-10-11 (18)						▲
10			SS	75	6-8-12-14 (20)						▲
		Very stiff, gray and red, SILTY CLAY, moist, silt partings	SS	71	4-8-14-15 (22)						▲
15		increasing silt at 15.0'	SS	63	8-10-19-16 (29)						▲
		decreasing silt at 16.0'	SS	75	5-9-12-16 (21)						▲
		Dense, red and gray, SANDY SILT, moist increasing silt at 17.5'	SS	79	8-14-12-8 (26)						▲
20		Compact, orange and tan, SILTY SAND, moist loosely consolidated at 19.0'	SS	63	7-5-5-6 (10)						▲
		increased clay at 20.0'	SS	83	9-12-13-15 (25)						▲
		more consolidated at 21.0'	SS		17-11-16-20 (27)						▲
25		Stiff, gray, SILTY CLAY, moist, silt partings	SS		12-18-14-15 (32)						▲
		intervals of gray sand mixed with silty clay at 25.0'	SS		9-19-19-17 (38)						▲
		Dense, gray, SAND, moist	SS								▲
		Stiff, gray, SILTY CLAY, moist	SS								▲
30		Dense, gray, SILTY SAND, with interbedded clay, moist, with red staining	SS	83							▲

GEOTECH BH PLOTS - GINT STD US LAB.GDT - 1/23/15 10:02 - L:\14- 2014 FILE FOLDER\1406296- LUMINANT_FGD-C1406296 LUMINANT.GPJ

(Continued Next Page)



500 Century Plaza Drive, Suite 190
Houston, Texas 77073
Telephone: (281) 821-6868
Fax: (281) 821-6870

BOREHOLE FGD-12

CLIENT Luminant Power

PROJECT NAME Luminant

PROJECT NUMBER 1406296

PROJECT LOCATION Oak Grove SES

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲			
								20	40	60	80
								PL — MC — LL -----●----- 20 40 60 80			
								□ FINES CONTENT (%) □			
								20	40	60	80
30		Dense, gray, SILTY SAND, with interbedded clay, moist, with red staining (<i>continued</i>)	SS	88	4-5-15-24 (20)			▲			
	▽	red to moist, turning red at 32.0'	SS	67	10-16-30-28 (46)				▲		
35		brown to gray at 34.0'	SS	63	14-24-48-42 (72)					▲	
		increasing sand at 38.0'	SS	92	8-18-32-42 (50)				▲		
40		gray and tan at 42.0'	SS	92	8-26-48-50 (74)					▲	
			SS	92	3-4-10-26 (14)			▲			
			SS	92	13-24-42-43 (66)					▲	
45			SS	92	16-30-45-50 (75)						▲
			SS	58	20-36-50 (86)						▲
50			SS	88	16-40-50 (90)						▲
			SS	71	18-26-50 (76)						▲
55			SS	63	4-30-50 (80)						▲
			SS	50	7-24-50 (74)						▲
			SS	58	22-48-50 (98)						▲
60		dark gray at 60.0'	SS	54	24-48-50 (98)						▲
			SS	46	25-48-50 (98)						▲
			SS	50	30-50						▲

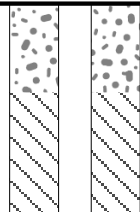
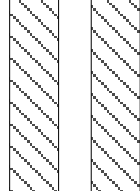
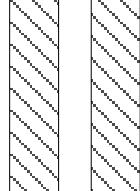
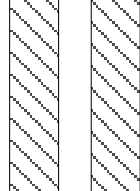
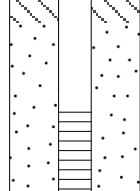
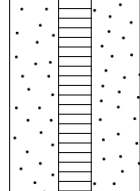
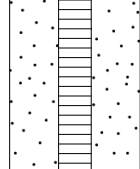
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Bottom of borehole at 64.0 feet.

Luminant

Log of Boring: FGD-14

Oak Grove Steam Electric Station Petteway, TX	Completion Date:	7/25/2016	Drilling Method:	HSA
	Drilling Company:	Sunbelt	Borehole Diameter (in.):	8.25
PBW Project No. 5244	Driller:	Raymond Alcala	Total Depth (ft):	30
	Driller's License:	59430	TOC Elevation (ft. AMSL):	428.91
	Logged By:	Sara Taube	Northing:	572912.27
	Sampling Method:	Split Spoon	Easting:	3201297.58

Depth (ft)	Well Materials	Recovery (ft/ft)	USCS	Lithologic Description
0		4.0/5.0	CL	(0 - 5) Sandy CLAY, tan/orange/red layers, dry, hard, low to no plasticity, fine grained, light brown color 0'-1', red/orange clay and light gray sand below 1', gradational basal contact.
5		2.5/5.0	GH	(5 - 9) Sandy, silty, CLAY, red/brown, moist, soft to firm, medium to high plasticity, softer with depth and more plastic, increased sand with depth, sharp basal contact.
10		2.25/5.0	SM	(9 - 20) Silty SAND, light brown/tan, moist, unconsolidated, small amount of clay, fine grain sand, slightly gray.
15		2.0/5.0		
20		2.5/5.0		
25		1.5/5.0		(20 - 30) Silty SAND, light gray with some red/brown, moist to wet, unconsolidated, no clay, saturated below 25' and light gray.
30				

PBW

Pastor, Behling & Wheeler, LLC
 2201 Double Creek Dr., Suite 4004
 Round Rock, TX 78664
 Tel (512) 671-3434 Fax (512) 671-3446

Notes:

Well Materials
 (+2.70 - 20) Casing, 2" Sch 40 FJT PVC
 (20 - 30) Screen, 2" Sch 40 FJT PVC, 0.010" slot

Annular Materials
 (0-2') Cement
 (2'-18') Bentonite chips
 (18'-30') 16/30 sand

Luminant

Log of Boring: FGD-15

Big Brown Steam Electric Station Franklin, Texas	Completion Date: 5/22/2019	Drilling Method: HSA
	Drilling Company: Vortex	Borehole Diameter (in.): 6
Golder Project No. 19122434E	Driller: Robert Joiner	Total Depth (ft): 35
	Driller's License: 54776M	TOC Elevation (ft. AMSL): 437.17
	Logged By: Sergio Ruiz	Northing: 3452427
	Sampling Method: 2"X2.5' Split Spoon	Easting: 739119.1

Depth (ft)	Well Materials	Recovery (ft/ft)	USCS	Lithologic Description
0		0.0/5.0	NR	(0 - 5) HydroVAC
5		1.2/2.5	SM	(5 - 12.8) Silty SAND, fine grained, light tan with some yellow orange, trace roots, clay lense from 7.5'-7.6', slightly moist, orange at 12.2' then back to light brown, some more cohesive, some small firm pieces
		1.2/2.5		
10		1.3/2.5		
15		1.6/2.5	CL	(12.8 - 16.5) Sandy, silty, CLAY, brownish gray, thin fine sand lenses throughout, orange color 12.9'-13.1'
		1.0/2.5	SM	(16.5 - 20.1) Silty SAND, fine grained with silt, more clay with increased depth, some Fe staining.
20		1.0/2.5		
		1.9/2.5	CL	(20.1 - 23) CLAY, brownish purple, moist to wet, firm, orange red staining at 20', fine sand lenses present
		1.5/2.5	SM	(23 - 24.5) Silty SAND, moist, soft, fine silty sand, some orange Fe staining, some clay throughout
25			CL	(24.5 - 25) CLAY, brown purple, moist, low to moderate plasticity, saturated at 25',
		1.5/2.5	SM	(25 - 35) Silty SAND, grayish purple, fine to very fine, wet, very soft, trace clay, some Fe staining
30		1.0/2.5		
		1.0/2.5		
35		2.5/2.5		



Notes:

1. This log should not be used separately from the report to which it is attached.

Well Materials

(+3 - 25) Casing, 2" Sch 40 FJT PVC
 (25 - 35) Screen, 2" Sch 40 FJT PVC, 0.010" slot

Annular Materials

(0'-2') Grout
 (2'-23') Bentonite chips
 (23'-35) 10/20 sand

Luminant

Log of Boring: FGD-16

Big Brown Steam Electric Station Franklin, Texas	Completion Date:	5/23/2019	Drilling Method:	HSA
	Drilling Company:	Vortex	Borehole Diameter (in.):	6
Golder Project No. 19122434E	Driller:	Robert Joiner	Total Depth (ft):	40
	Driller's License:	54776M	TOC Elevation (ft. AMSL):	444.3
	Logged By:	Jacob Jarvis	Northing:	3452861
	Sampling Method:	2"X2.5' Split Spoon	Easting:	739235.7

Depth (ft)	Well Materials	Recovery (ft/ft)	USCS	Lithologic Description
0		0.0/5.0	NR	(0 - 5) HydroVAC
5		1.25/5.0	SC	(5 - 7.5) Sandy CLAY, dry, soft, low plasticity, clay decreases with depth, yellow orange
10		1.2/2.5	SM	(7.5 - 10) Silty SAND, yellow orange, dry, very soft, subround, no plasticity, clay increases in bottom 3 inches
		1.75/2.5		(10 - 12.5) Silty SAND, yellow orange, dry, soft, subround, no plasticity, few clay lenses, few clean sand lenses
15		0.8/2.5	SW	(12.5 - 15) SAND, fine, well sorted, brown, very soft, dry, no plasticity, color change from brown to dark brown
		1.7/2.5	CL	(15 - 17.5) Sandy CLAY, red, dry, hard, medium plasticity, hard clay with sand throughout
20		1.25/2.5	SC	(17.5 - 18.5) Clayey SAND, dark red, hard, low plasticity, dry
25		1.5/2.5	SW	(18.5 - 40) SAND, red to purple gray, well sorted, very soft, subround, no plasticity, gradual transition to clean sand, lighter red color, clay lenses 20.0'-22.5', saturated at 30'
		1.7/2.5		
		1.4/2.5		
30		1.75/2.5		
		1.75/2.5		
35		1.75/2.5		
40		5.0/5.0		



GOLDER

2201 Double Creek Dr., Suite 4004
Round Rock, Texas 78664
O-512.671.3434 F-512.671.3446

Notes:

1. This log should not be used separately from the report to which it is attached.

Well Materials

(3 - 30) Casing, 2" Sch 40 FJT PVC
(30 - 40) Screen, 2" Sch 40 FJT PVC, 0.010" slot

Annular Materials

(0'-2') Grout
(2'-28') Bentonite chips
(28'-40') 10/20 sand

Luminant

Log of Boring: FGD-2019-1

Big Brown Steam Electric Station Franklin, TX	Completion Date:	6/3/2019	Drilling Method:	HSA
	Drilling Company:	Vortex	Borehole Diameter (in.):	6
Golder Project No. 19122434E	Driller:	Robert Joiner	Total Depth (ft):	30
	Driller's License:	54776	TOC Elevation (ft. AMSL):	
	Logged By:	Jacob Jarvis	Northing:	3452823
	Sampling Method:	2'X2.5' Split Spoon	Easting:	739015.9

Depth (ft)	Recovery (ft/ft)	USCS	Lithologic Description
0	0.0/5.0	NR	(0 - 5) HydroVAC
5	1.6/2.5	CL	(5 - 7.5) Silty Sandy CLAY, light tan, dry, firm, low to mod plasticity
	1.55/2.5	SC	(7.5 - 10) Silty SAND, yellow orange, dry, soft, few clay lenses throughout
10	2.5/2.5	CL	(10 - 12.5) Silty CLAY, light gray, dry to moist, soft, low to moderate plasticity, plasticity and silt increases with depth
	2.5/2.5	CH	(12.5 - 22) CLAY, wet, brown to dark brown, soft to firm, high plasticity
15	2/2.5		
	2.5/2.5		
20	2.1/2.5		
	2.2/2.5	SW	(22 - 25) SAND, light tan, saturated, soft, no plasticity
25	5.0/5.0		
30			



GOLDER

2201 Double Creek Dr., Suite 4004
Round Rock, Texas 78664
O-512.671.3434 F-512.671.3446

Notes:

1. This log should not be used separately from the report to which it is attached.

APPENDIX B

**LABORATORY ANALYTICAL
REPORTS**



June 05, 2019

Will Vienne
Golder
2201 Double Creek Dr #4004
Round Rock, Texas 78664
TEL: (512) 671-3434
FAX (512) 671-3446
RE: Luminant-OGSES FGD Ponds

Order No.: 1905205

Dear Will Vienne:

DHL Analytical, Inc. received 9 sample(s) on 5/17/2019 for the analyses presented in the following report.

There were no problems with the analyses and all data met requirements of NELAP except where noted in the Case Narrative. All non-NELAP methods will be identified accordingly in the case narrative and all estimated uncertainties of test results are within method or EPA specifications.

If you have any questions regarding these tests results, please feel free to call. Thank you for using DHL Analytical.

Sincerely,

A handwritten signature in red ink, appearing to read 'John DuPont', written in a cursive style.

John DuPont
General Manager

This report was performed under the accreditation of the State of Texas Laboratory Certification Number: T104704211-19-24



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2300 Double Creek Dr. ■ Round Rock, TX 78664
 Phone (512) 388-8222 ■ FAX (512) 388-8229
 Web: www.dhlanalytical.com
 E-Mail: login@dhlanalytical.com



N° 82719
 CHAIN-OF-CUSTODY

CLIENT: GOLDER
 ADDRESS: 2201 DOUBLE CREEK DR, ROUND ROCK, TX 78664
 PHONE: 512-671-3434 FAX/E-MAIL: 512-671-3442
 DATA REPORTED TO: WILL VIENNE
 ADDITIONAL REPORT COPIES TO:

DATE: 5-17-19 PAGE 1 OF 1
 PO #: _____ DHL WORK ORDER #: 1905205
 PROJECT LOCATION OR NAME: LUMINANT - OGSES FGD POND S
 CLIENT PROJECT #: 19122262-F COLLECTOR: J. BRAYTON

Authorize 5% surcharge for TRRP Report?
 Yes No

S=SOIL W=WATER P=PAINT
 A=AIR SL=SLUDGE O=OTHER
 L=LIQUID SO=SOLID
 SE=SEDIMENT

Field Sample I.D.	DHL Lab #	Date	Time	Matrix	Container Type	# of Containers	PRESERVATION			
							HCl	HNO ₃	H ₂ SO ₄	NaOH

- ANALYSES**
- BTEX MTBE (METHOD 8021)
 - TPH 1005 TPH 1006 HOLD 1006
 - GRO (METHOD 8015) DRO (METHOD 8105)
 - VOC 8260 VOC 624 VOC 8260/5035
 - SVOC 8270 PAH 8270 HOLD/PAH SVOC 623
 - 8270 PEST 625 PEST/PCB 608 PCB
 - 8270 OP PEST 8082 PCB 8270 PCB
 - 8321 HERB PHOS, AMMONIA
 - METALS 6020 METALS 2008 DISS. METALS
 - PH HEX CHROM ALKALINITY COD
 - CHLORIDE ANIONS
 - TCLP-SVOC VOC PEST HERB
 - RCRA METALS RCRA 80 TK-10 Pb
 - TDS TSS % MOISTURE DGAS
 - APPLIED III & IV
 - ALE No. 204, No. 10, MA-K
 - CERAMIC, FERRIC, CROWN

Field Sample I.D.	DHL Lab #	Date	Time	Matrix	Container Type	# of Containers	HCl	HNO ₃	H ₂ SO ₄	NaOH	UNPRESERVED	ANALYSES	FIELD NOTES
FGD-6	01	5-16-19	0920	W		7							XXX
FGD-4	02	↓	1015	W		7							XXX
FGD-3	03		1110	W		7							XXX
FGD-2	04		1200	W		7							XXX
FGD-5	05		1350	W		7							XXX
FGD-1	06		1450	W		7							XXX
FGD-1 JB	-		1450	W		7							XXX
FGD-8	07		1545	W		7							XXX
FGD-11	08		1640	W		7							XXX
FGD-12	09		1735	W		7							XXX
FGD-12 JB	-												

RELINQUISHED BY: (Signature) <u>[Signature]</u>	DATE/TIME <u>5-17-19 9:10</u>	RECEIVED BY: (Signature) <u>[Signature]</u>	TURN AROUND TIME RUSH <input type="checkbox"/> CALL FIRST 1 DAY <input type="checkbox"/> CALL FIRST 2 DAY <input type="checkbox"/> NORMAL <input checked="" type="checkbox"/> OTHER <input type="checkbox"/>	LABORATORY USE ONLY: RECEIVING TEMP: <u>0.9/0.6</u> °C THERM #: <u>78</u> CUSTODY SEALS: <input type="checkbox"/> BROKEN <input type="checkbox"/> INTACT <input checked="" type="checkbox"/> NOT USED CARRIER: <input type="checkbox"/> LONE STAR <input type="checkbox"/> FEDEX <input type="checkbox"/> UPS <input type="checkbox"/> OTHER <input checked="" type="checkbox"/> COURIER DELIVERY <input checked="" type="checkbox"/> HAND DELIVERED
RELINQUISHED BY: (Signature) <u>[Signature]</u>	DATE/TIME <u>5-17-19 11:20</u>	RECEIVED BY: (Signature) <u>[Signature]</u>		
RELINQUISHED BY: (Signature) <u>[Signature]</u>	DATE/TIME <u>5-17-19 11:20</u>	RECEIVED BY: (Signature) <u>[Signature]</u>		

Appendix III Parameters:

Metals (Ca and B)

Anions (Cl, F, and SO₄)

TDS

Appendix IV Parameters:

Metals (As, Ba, Be, Cd, Co, Cr, Hg, Li, Mo, Pb, Sb, Se, and Tl)

Ra-226

Ra-228

From: Vienne, Will [mailto:William_Vienne@golder.com]

Sent: Tuesday, April 09, 2019 12:48 PM

To: John DuPont <dupont@dhlanalytical.com>

Subject: CCR Analysis

Sample Receipt Checklist

Client Name Golder

Date Received: 5/17/2019

Work Order Number 1905205

Received by EL

Checklist completed by: Ea
Signature

5/17/2019
Date

Reviewed by: DL
Initials

5/17/2019
Date

Carrier name Hand Delivered

- Shipping container/cooler in good condition? Yes No Not Present
- Custody seals intact on shipping container/cooler? Yes No Not Present
- Custody seals intact on sample bottles? Yes No Not Present
- Chain of custody present? Yes No
- Chain of custody signed when relinquished and received? Yes No
- Chain of custody agrees with sample labels? Yes No
- Samples in proper container/bottle? Yes No
- Sample containers intact? Yes No
- Sufficient sample volume for indicated test? Yes No
- All samples received within holding time? Yes No
- Container/Temp Blank temperature in compliance? Yes No 0.9 °C
- Water - VOA vials have zero headspace? Yes No No VOA vials submitted
- Water - pH<2 acceptable upon receipt? Yes No NA LOT # 11837
- Adjusted? no Checked by EL
- Water - pH>9 (S) or pH>10 (CN) acceptable upon receipt? Yes No NA LOT #
- Adjusted? _____ Checked by _____

Any No response must be detailed in the comments section below.

Client contacted _____ Date contacted: _____ Person contacted _____

Contacted by: _____ Regarding: _____

Comments: _____

Corrective Action _____

CLIENT: Golder
Project: Luminant-OGSES FGD Ponds
Lab Order: 1905205

CASE NARRATIVE

Samples were analyzed using the methods outlined in the following references:

Method SW6020A - Metals Analysis
Method SW7470A - Mercury Analysis
Method E300 - Anions Analysis
Method M2320 B - Alkalinity Analysis
Method M3500-Fe D - Ferrous Iron Analysis (this parameter is not NELAP certified)
Method M3500-Fe D - Ferric Iron (calculation) (this calculation is not NELAP certified).
Method M4500-P E - Orthophosphate Analysis
Method M2540C - TDS Analysis
Sub-contract - Radium-228 and Radium-226 analyses by methods E904 and SM 7500 Ra B M.
Analyzed at Pace Analytical.

LOG IN

The samples were received and log-in performed on 5/17/19. A total of 9 samples were received. The samples arrived in good condition and were properly packaged.

METALS ANALYSIS

For Metals analysis performed on 5/20/19 the matrix spike and matrix spike duplicate recoveries were out of control limits for three analytes. These are flagged accordingly in the QC summary report. The sample selected for the matrix spike and matrix spike duplicate was not from this work order. The LCS was within control limits for these analytes. No further corrective actions were taken.

For Metals analysis performed on 5/22/19 the RPD for the serial dilution was slightly above control limits for Boron. This is flagged accordingly. The PDS was within control limits for this analyte. No further corrective actions were taken.

For Metals analysis performed on 5/22/19 LCVL6-190522 was above control limits for Sodium. This is flagged accordingly. The associated CCV6-190522 was within control limits for this analyte. No further corrective actions were taken.

ALKALINITY ANALYSIS

For Alkalinity analysis performed on 5/21/19 the recovery of the Initial Calibration Verification (ICV-190521) was slightly above control limits. This is flagged accordingly in the QC summary report. The remaining bracketing CCVs were within control limits. No further corrective actions were taken.

CLIENT: Golder
Project: Luminant-OGSES FGD Ponds
Lab Order: 1905205

Work Order Sample Summary

Lab Smp ID	Client Sample ID	Tag Number	Date Collected	Date Recved
1905205-01	FGD-6		05/16/19 09:20 AM	5/17/2019
1905205-02	FGD-4		05/16/19 10:15 AM	5/17/2019
1905205-03	FGD-3		05/16/19 11:10 AM	5/17/2019
1905205-04	FGD-2		05/16/19 12:00 PM	5/17/2019
1905205-05	FGD-5		05/16/19 01:50 PM	5/17/2019
1905205-06	FGD-1		05/16/19 02:50 PM	5/17/2019
1905205-07	FGD-8		05/16/19 03:45 PM	5/17/2019
1905205-08	FGD-11		05/16/19 04:40 PM	5/17/2019
1905205-09	FGD-12		05/16/19 05:35 PM	5/17/2019

Lab Order: 1905205
Client: Golder
Project: Luminant-OGSES FGD Ponds

PREP DATES REPORT

Sample ID	Client Sample ID	Collection Date	Matrix	Test Number	Test Name	Prep Date	Batch ID
1905205-01A	FGD-6	05/16/19 09:20 AM	Aqueous	M3500-Fe	Ferrous Iron Prep Water	05/21/19 04:52 PM	91028
1905205-01B	FGD-6	05/16/19 09:20 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/20/19 09:30 AM	90989
	FGD-6	05/16/19 09:20 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/20/19 09:30 AM	90989
	FGD-6	05/16/19 09:20 AM	Aqueous	SW7470A	Mercury Aq Prep	05/23/19 09:27 AM	91060
1905205-01C	FGD-6	05/16/19 09:20 AM	Aqueous	M2320 B	Alkalinity Preparation	05/21/19 09:05 AM	91010
	FGD-6	05/16/19 09:20 AM	Aqueous	E300	Anion Preparation	05/17/19 09:26 AM	90965
	FGD-6	05/16/19 09:20 AM	Aqueous	E300	Anion Preparation	05/17/19 09:26 AM	90965
	FGD-6	05/16/19 09:20 AM	Aqueous	M4500-P E	Orthophosphate Prep	05/17/19 12:01 PM	90972
	FGD-6	05/16/19 09:20 AM	Aqueous	M2540C	TDS Preparation	05/21/19 08:03 AM	91019
1905205-02A	FGD-4	05/16/19 10:15 AM	Aqueous	M3500-Fe	Ferrous Iron Prep Water	05/21/19 04:52 PM	91028
1905205-02B	FGD-4	05/16/19 10:15 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/20/19 09:30 AM	90989
	FGD-4	05/16/19 10:15 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/20/19 09:30 AM	90989
	FGD-4	05/16/19 10:15 AM	Aqueous	SW7470A	Mercury Aq Prep	05/23/19 09:27 AM	91060
1905205-02C	FGD-4	05/16/19 10:15 AM	Aqueous	M2320 B	Alkalinity Preparation	05/21/19 09:05 AM	91010
	FGD-4	05/16/19 10:15 AM	Aqueous	E300	Anion Preparation	05/17/19 09:26 AM	90965
	FGD-4	05/16/19 10:15 AM	Aqueous	E300	Anion Preparation	05/17/19 09:26 AM	90965
	FGD-4	05/16/19 10:15 AM	Aqueous	M4500-P E	Orthophosphate Prep	05/17/19 12:01 PM	90972
	FGD-4	05/16/19 10:15 AM	Aqueous	M2540C	TDS Preparation	05/21/19 08:03 AM	91019
1905205-03A	FGD-3	05/16/19 11:10 AM	Aqueous	M3500-Fe	Ferrous Iron Prep Water	05/21/19 04:52 PM	91028
1905205-03B	FGD-3	05/16/19 11:10 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/20/19 09:30 AM	90989
	FGD-3	05/16/19 11:10 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/20/19 09:30 AM	90989
	FGD-3	05/16/19 11:10 AM	Aqueous	SW7470A	Mercury Aq Prep	05/23/19 09:27 AM	91060
1905205-03C	FGD-3	05/16/19 11:10 AM	Aqueous	M2320 B	Alkalinity Preparation	05/21/19 09:05 AM	91010
	FGD-3	05/16/19 11:10 AM	Aqueous	E300	Anion Preparation	05/17/19 09:26 AM	90965
	FGD-3	05/16/19 11:10 AM	Aqueous	E300	Anion Preparation	05/17/19 09:26 AM	90965
	FGD-3	05/16/19 11:10 AM	Aqueous	M4500-P E	Orthophosphate Prep	05/17/19 12:01 PM	90972
	FGD-3	05/16/19 11:10 AM	Aqueous	M2540C	TDS Preparation	05/21/19 08:03 AM	91019
1905205-04A	FGD-2	05/16/19 12:00 PM	Aqueous	M3500-Fe	Ferrous Iron Prep Water	05/21/19 04:52 PM	91028

Lab Order: 1905205
Client: Golder
Project: Luminant-OGSES FGD Ponds

PREP DATES REPORT

Sample ID	Client Sample ID	Collection Date	Matrix	Test Number	Test Name	Prep Date	Batch ID
1905205-04B	FGD-2	05/16/19 12:00 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/20/19 09:30 AM	90989
	FGD-2	05/16/19 12:00 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/20/19 09:30 AM	90989
	FGD-2	05/16/19 12:00 PM	Aqueous	SW7470A	Mercury Aq Prep	05/23/19 09:27 AM	91060
1905205-04C	FGD-2	05/16/19 12:00 PM	Aqueous	M2320 B	Alkalinity Preparation	05/21/19 09:05 AM	91010
	FGD-2	05/16/19 12:00 PM	Aqueous	E300	Anion Preparation	05/17/19 09:26 AM	90965
	FGD-2	05/16/19 12:00 PM	Aqueous	E300	Anion Preparation	05/17/19 09:26 AM	90965
	FGD-2	05/16/19 12:00 PM	Aqueous	M4500-P E	Orthophosphate Prep	05/17/19 12:01 PM	90972
	FGD-2	05/16/19 12:00 PM	Aqueous	M2540C	TDS Preparation	05/21/19 08:03 AM	91019
1905205-05A	FGD-5	05/16/19 01:50 PM	Aqueous	M3500-Fe	Ferrous Iron Prep Water	05/21/19 04:52 PM	91028
1905205-05B	FGD-5	05/16/19 01:50 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/20/19 09:30 AM	90989
	FGD-5	05/16/19 01:50 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/20/19 09:30 AM	90989
	FGD-5	05/16/19 01:50 PM	Aqueous	SW7470A	Mercury Aq Prep	05/23/19 09:27 AM	91060
1905205-05C	FGD-5	05/16/19 01:50 PM	Aqueous	M2320 B	Alkalinity Preparation	05/21/19 09:05 AM	91010
	FGD-5	05/16/19 01:50 PM	Aqueous	M2320 B	Alkalinity Preparation	05/30/19 03:00 PM	91142
	FGD-5	05/16/19 01:50 PM	Aqueous	E300	Anion Preparation	05/17/19 09:26 AM	90965
	FGD-5	05/16/19 01:50 PM	Aqueous	E300	Anion Preparation	05/17/19 09:26 AM	90965
	FGD-5	05/16/19 01:50 PM	Aqueous	M4500-P E	Orthophosphate Prep	05/17/19 12:01 PM	90972
	FGD-5	05/16/19 01:50 PM	Aqueous	M2540C	TDS Preparation	05/21/19 08:03 AM	91019
1905205-06A	FGD-1	05/16/19 02:50 PM	Aqueous	M3500-Fe	Ferrous Iron Prep Water	05/21/19 04:52 PM	91028
1905205-06B	FGD-1	05/16/19 02:50 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/20/19 09:30 AM	90989
	FGD-1	05/16/19 02:50 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/20/19 09:30 AM	90989
	FGD-1	05/16/19 02:50 PM	Aqueous	SW7470A	Mercury Aq Prep	05/23/19 09:27 AM	91060
1905205-06C	FGD-1	05/16/19 02:50 PM	Aqueous	M2320 B	Alkalinity Preparation	05/21/19 09:05 AM	91010
	FGD-1	05/16/19 02:50 PM	Aqueous	M2320 B	Alkalinity Preparation	05/30/19 03:00 PM	91142
	FGD-1	05/16/19 02:50 PM	Aqueous	E300	Anion Preparation	05/17/19 09:26 AM	90965
	FGD-1	05/16/19 02:50 PM	Aqueous	E300	Anion Preparation	05/17/19 09:26 AM	90965
	FGD-1	05/16/19 02:50 PM	Aqueous	M4500-P E	Orthophosphate Prep	05/17/19 12:01 PM	90972
	FGD-1	05/16/19 02:50 PM	Aqueous	M2540C	TDS Preparation	05/21/19 08:03 AM	91019

Lab Order: 1905205
Client: Golder
Project: Luminant-OGSES FGD Ponds

PREP DATES REPORT

Sample ID	Client Sample ID	Collection Date	Matrix	Test Number	Test Name	Prep Date	Batch ID
1905205-07A	FGD-8	05/16/19 03:45 PM	Aqueous	M3500-Fe	Ferrous Iron Prep Water	05/21/19 04:52 PM	91028
	FGD-8	05/16/19 03:45 PM	Aqueous	M3500-Fe	Ferrous Iron Prep Water	05/21/19 04:52 PM	91028
	FGD-8	05/16/19 03:45 PM	Aqueous	M3500-Fe	Ferrous Iron Prep Water	05/21/19 04:52 PM	91028
1905205-07B	FGD-8	05/16/19 03:45 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/20/19 09:30 AM	90989
	FGD-8	05/16/19 03:45 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/20/19 09:30 AM	90989
	FGD-8	05/16/19 03:45 PM	Aqueous	SW7470A	Mercury Aq Prep	05/23/19 09:27 AM	91060
1905205-07C	FGD-8	05/16/19 03:45 PM	Aqueous	M2320 B	Alkalinity Preparation	05/21/19 09:05 AM	91010
	FGD-8	05/16/19 03:45 PM	Aqueous	E300	Anion Preparation	05/17/19 09:26 AM	90965
	FGD-8	05/16/19 03:45 PM	Aqueous	E300	Anion Preparation	05/17/19 09:26 AM	90965
	FGD-8	05/16/19 03:45 PM	Aqueous	E300	Anion Preparation	05/20/19 09:14 AM	90986
	FGD-8	05/16/19 03:45 PM	Aqueous	M4500-P E	Orthophosphate Prep	05/17/19 12:01 PM	90972
	FGD-8	05/16/19 03:45 PM	Aqueous	M2540C	TDS Preparation	05/21/19 08:03 AM	91019
1905205-08A	FGD-11	05/16/19 04:40 PM	Aqueous	M3500-Fe	Ferrous Iron Prep Water	05/21/19 04:52 PM	91028
1905205-08B	FGD-11	05/16/19 04:40 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/20/19 09:30 AM	90989
	FGD-11	05/16/19 04:40 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/20/19 09:30 AM	90989
	FGD-11	05/16/19 04:40 PM	Aqueous	SW7470A	Mercury Aq Prep	05/23/19 09:27 AM	91060
1905205-08C	FGD-11	05/16/19 04:40 PM	Aqueous	M2320 B	Alkalinity Preparation	05/21/19 09:05 AM	91010
	FGD-11	05/16/19 04:40 PM	Aqueous	E300	Anion Preparation	05/20/19 09:14 AM	90986
	FGD-11	05/16/19 04:40 PM	Aqueous	E300	Anion Preparation	05/17/19 09:26 AM	90965
	FGD-11	05/16/19 04:40 PM	Aqueous	E300	Anion Preparation	05/17/19 09:26 AM	90965
	FGD-11	05/16/19 04:40 PM	Aqueous	M4500-P E	Orthophosphate Prep	05/17/19 12:01 PM	90972
	FGD-11	05/16/19 04:40 PM	Aqueous	M2540C	TDS Preparation	05/21/19 08:03 AM	91019
1905205-09A	FGD-12	05/16/19 05:35 PM	Aqueous	M3500-Fe	Ferrous Iron Prep Water	05/21/19 04:52 PM	91028
1905205-09B	FGD-12	05/16/19 05:35 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/20/19 09:30 AM	90989
	FGD-12	05/16/19 05:35 PM	Aqueous	SW7470A	Mercury Aq Prep	05/23/19 09:27 AM	91060
1905205-09C	FGD-12	05/16/19 05:35 PM	Aqueous	M2320 B	Alkalinity Preparation	05/21/19 09:05 AM	91010
	FGD-12	05/16/19 05:35 PM	Aqueous	E300	Anion Preparation	05/17/19 09:26 AM	90965
	FGD-12	05/16/19 05:35 PM	Aqueous	E300	Anion Preparation	05/17/19 09:26 AM	90965

Lab Order: 1905205
Client: Golder
Project: Luminant-OGSES FGD Ponds

PREP DATES REPORT

Sample ID	Client Sample ID	Collection Date	Matrix	Test Number	Test Name	Prep Date	Batch ID
1905205-09C	FGD-12	05/16/19 05:35 PM	Aqueous	M4500-P E	Orthophosphate Prep	05/17/19 12:01 PM	90972
	FGD-12	05/16/19 05:35 PM	Aqueous	M2540C	TDS Preparation	05/21/19 08:03 AM	91019

Lab Order: 1905205
Client: Golder
Project: Luminant-OGSES FGD Ponds

ANALYTICAL DATES REPORT

Sample ID	Client Sample ID	Matrix	Test Number	Test Name	Batch ID	Dilution	Analysis Date	Run ID
1905205-01A	FGD-6	Aqueous	M3500-Fe D	Ferric Iron (Calculated)	91028	1	05/30/19	UV/VIS_2_190530B
	FGD-6	Aqueous	M3500-Fe D	Ferrous Iron	91028	1	05/21/19 05:41 PM	UV/VIS_2_190521B
1905205-01B	FGD-6	Aqueous	SW7470A	Mercury Total: Aqueous	91060	1	05/24/19 10:48 AM	CETAC2_HG_190524 A
	FGD-6	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	90989	1	05/22/19 03:52 PM	ICP-MS4_190522D
	FGD-6	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	90989	20	05/23/19 11:55 AM	ICP-MS4_190523A
1905205-01C	FGD-6	Aqueous	M2320 B	Alkalinity	91010	1	05/21/19 10:03 AM	TITRATOR_190521A
	FGD-6	Aqueous	E300	Anions by IC method - Water	90965	10	05/17/19 01:24 PM	IC4_190517A
	FGD-6	Aqueous	E300	Anions by IC method - Water	90965	1	05/17/19 05:56 PM	IC4_190517A
	FGD-6	Aqueous	M4500-P E	Orthophosphate	90972	1	05/17/19 12:35 PM	UV/VIS_2_190517B
	FGD-6	Aqueous	M2540C	Total Dissolved Solids	91019	1	05/21/19 10:00 AM	WC_190521C
1905205-02A	FGD-4	Aqueous	M3500-Fe D	Ferric Iron (Calculated)	91028	1	05/30/19	UV/VIS_2_190530B
	FGD-4	Aqueous	M3500-Fe D	Ferrous Iron	91028	1	05/21/19 05:42 PM	UV/VIS_2_190521B
1905205-02B	FGD-4	Aqueous	SW7470A	Mercury Total: Aqueous	91060	1	05/24/19 10:50 AM	CETAC2_HG_190524 A
	FGD-4	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	90989	1	05/22/19 03:54 PM	ICP-MS4_190522D
	FGD-4	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	90989	10	05/23/19 11:57 AM	ICP-MS4_190523A
1905205-02C	FGD-4	Aqueous	M2320 B	Alkalinity	91010	1	05/21/19 10:23 AM	TITRATOR_190521A
	FGD-4	Aqueous	E300	Anions by IC method - Water	90965	10	05/17/19 02:12 PM	IC4_190517A
	FGD-4	Aqueous	E300	Anions by IC method - Water	90965	1	05/17/19 06:12 PM	IC4_190517A
	FGD-4	Aqueous	M4500-P E	Orthophosphate	90972	1	05/17/19 12:35 PM	UV/VIS_2_190517B
	FGD-4	Aqueous	M2540C	Total Dissolved Solids	91019	1	05/21/19 10:00 AM	WC_190521C
1905205-03A	FGD-3	Aqueous	M3500-Fe D	Ferric Iron (Calculated)	91028	1	05/30/19	UV/VIS_2_190530B
	FGD-3	Aqueous	M3500-Fe D	Ferrous Iron	91028	1	05/21/19 05:42 PM	UV/VIS_2_190521B
1905205-03B	FGD-3	Aqueous	SW7470A	Mercury Total: Aqueous	91060	1	05/24/19 11:01 AM	CETAC2_HG_190524 A
	FGD-3	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	90989	20	05/23/19 11:59 AM	ICP-MS4_190523A
	FGD-3	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	90989	1	05/22/19 03:56 PM	ICP-MS4_190522D
1905205-03C	FGD-3	Aqueous	M2320 B	Alkalinity	91010	1	05/21/19 10:42 AM	TITRATOR_190521A

Lab Order: 1905205
 Client: Golder
 Project: Luminant-OGSES FGD Ponds

ANALYTICAL DATES REPORT

Sample ID	Client Sample ID	Matrix	Test Number	Test Name	Batch ID	Dilution	Analysis Date	Run ID
1905205-03C	FGD-3	Aqueous	E300	Anions by IC method - Water	90965	10	05/17/19 03:00 PM	IC4_190517A
	FGD-3	Aqueous	E300	Anions by IC method - Water	90965	1	05/17/19 06:28 PM	IC4_190517A
	FGD-3	Aqueous	M4500-P E	Orthophosphate	90972	1	05/17/19 12:35 PM	UV/VIS_2_190517B
	FGD-3	Aqueous	M2540C	Total Dissolved Solids	91019	1	05/21/19 10:00 AM	WC_190521C
1905205-04A	FGD-2	Aqueous	M3500-Fe D	Ferric Iron (Calculated)	91028	1	05/30/19	UV/VIS_2_190530B
	FGD-2	Aqueous	M3500-Fe D	Ferrous Iron	91028	1	05/21/19 05:43 PM	UV/VIS_2_190521B
1905205-04B	FGD-2	Aqueous	SW7470A	Mercury Total: Aqueous	91060	1	05/24/19 11:03 AM	CETAC2_HG_190524 A
	FGD-2	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	90989	10	05/23/19 12:01 PM	ICP-MS4_190523A
	FGD-2	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	90989	1	05/22/19 03:58 PM	ICP-MS4_190522D
1905205-04C	FGD-2	Aqueous	M2320 B	Alkalinity	91010	1	05/21/19 10:50 AM	TITRATOR_190521A
	FGD-2	Aqueous	E300	Anions by IC method - Water	90965	1	05/17/19 06:44 PM	IC4_190517A
	FGD-2	Aqueous	E300	Anions by IC method - Water	90965	10	05/17/19 03:16 PM	IC4_190517A
	FGD-2	Aqueous	M4500-P E	Orthophosphate	90972	1	05/17/19 12:37 PM	UV/VIS_2_190517B
	FGD-2	Aqueous	M2540C	Total Dissolved Solids	91019	1	05/21/19 10:00 AM	WC_190521C
1905205-05A	FGD-5	Aqueous	M3500-Fe D	Ferric Iron (Calculated)	91028	1	05/30/19	UV/VIS_2_190530B
	FGD-5	Aqueous	M3500-Fe D	Ferrous Iron	91028	1	05/21/19 05:43 PM	UV/VIS_2_190521B
1905205-05B	FGD-5	Aqueous	SW7470A	Mercury Total: Aqueous	91060	1	05/24/19 11:06 AM	CETAC2_HG_190524 A
	FGD-5	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	90989	1	05/22/19 04:00 PM	ICP-MS4_190522D
	FGD-5	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	90989	10	05/23/19 12:03 PM	ICP-MS4_190523A
1905205-05C	FGD-5	Aqueous	M2320 B	Alkalinity	91142	1	05/30/19 03:20 PM	TITRATOR_190530A
	FGD-5	Aqueous	M2320 B	Alkalinity	91010	1	05/21/19 10:54 AM	TITRATOR_190521A
	FGD-5	Aqueous	E300	Anions by IC method - Water	90965	10	05/17/19 03:32 PM	IC4_190517A
	FGD-5	Aqueous	E300	Anions by IC method - Water	90965	1	05/17/19 07:00 PM	IC4_190517A
	FGD-5	Aqueous	M4500-P E	Orthophosphate	90972	1	05/17/19 12:37 PM	UV/VIS_2_190517B
	FGD-5	Aqueous	M2540C	Total Dissolved Solids	91019	1	05/21/19 10:00 AM	WC_190521C
1905205-06A	FGD-1	Aqueous	M3500-Fe D	Ferric Iron (Calculated)	91028	1	05/30/19	UV/VIS_2_190530B
	FGD-1	Aqueous	M3500-Fe D	Ferrous Iron	91028	1	05/21/19 05:44 PM	UV/VIS_2_190521B

Lab Order: 1905205
 Client: Golder
 Project: Luminant-OGSES FGD Ponds

ANALYTICAL DATES REPORT

Sample ID	Client Sample ID	Matrix	Test Number	Test Name	Batch ID	Dilution	Analysis Date	Run ID
1905205-06B	FGD-1	Aqueous	SW7470A	Mercury Total: Aqueous	91060	1	05/24/19 11:08 AM	CETAC2_HG_190524 A
	FGD-1	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	90989	1	05/22/19 04:02 PM	ICP-MS4_190522D
	FGD-1	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	90989	10	05/23/19 12:05 PM	ICP-MS4_190523A
1905205-06C	FGD-1	Aqueous	M2320 B	Alkalinity	91010	1	05/21/19 11:03 AM	TITRATOR_190521A
	FGD-1	Aqueous	M2320 B	Alkalinity	91142	1	05/30/19 03:23 PM	TITRATOR_190530A
	FGD-1	Aqueous	E300	Anions by IC method - Water	90965	10	05/17/19 03:48 PM	IC4_190517A
	FGD-1	Aqueous	E300	Anions by IC method - Water	90965	1	05/17/19 07:16 PM	IC4_190517A
	FGD-1	Aqueous	M4500-P E	Orthophosphate	90972	1	05/17/19 12:37 PM	UV/VIS_2_190517B
	FGD-1	Aqueous	M2540C	Total Dissolved Solids	91019	1	05/21/19 10:00 AM	WC_190521C
1905205-07A	FGD-8	Aqueous	M3500-Fe D	Ferric Iron (Calculated)	91028	1	05/30/19	UV/VIS_2_190530B
	FGD-8	Aqueous	M3500-Fe D	Ferrous Iron	91028	1	05/21/19 05:44 PM	UV/VIS_2_190521B
	FGD-8	Aqueous	M3500-Fe D	Ferrous Iron	91028	100	05/21/19 05:52 PM	UV/VIS_2_190521B
	FGD-8	Aqueous	M3500-Fe D	Ferrous Iron	91028	1000	05/21/19 05:59 PM	UV/VIS_2_190521B
1905205-07B	FGD-8	Aqueous	SW7470A	Mercury Total: Aqueous	91060	1	05/24/19 11:10 AM	CETAC2_HG_190524 A
	FGD-8	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	90989	1	05/22/19 04:04 PM	ICP-MS4_190522D
	FGD-8	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	90989	50	05/23/19 12:07 PM	ICP-MS4_190523A
1905205-07C	FGD-8	Aqueous	M2320 B	Alkalinity	91010	1	05/21/19 11:30 AM	TITRATOR_190521A
	FGD-8	Aqueous	E300	Anions by IC method - Water	90965	10	05/17/19 04:04 PM	IC4_190517A
	FGD-8	Aqueous	E300	Anions by IC method - Water	90986	100	05/20/19 02:43 PM	IC4_190520A
	FGD-8	Aqueous	E300	Anions by IC method - Water	90965	1	05/17/19 07:32 PM	IC4_190517A
	FGD-8	Aqueous	M4500-P E	Orthophosphate	90972	1	05/17/19 12:40 PM	UV/VIS_2_190517B
	FGD-8	Aqueous	M2540C	Total Dissolved Solids	91019	1	05/21/19 10:00 AM	WC_190521C
1905205-08A	FGD-11	Aqueous	M3500-Fe D	Ferric Iron (Calculated)	91028	1	05/30/19	UV/VIS_2_190530B
	FGD-11	Aqueous	M3500-Fe D	Ferrous Iron	91028	1	05/21/19 05:44 PM	UV/VIS_2_190521B
1905205-08B	FGD-11	Aqueous	SW7470A	Mercury Total: Aqueous	91060	1	05/24/19 11:12 AM	CETAC2_HG_190524 A
	FGD-11	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	90989	1	05/22/19 04:06 PM	ICP-MS4_190522D

Lab Order: 1905205
 Client: Golder
 Project: Luminant-OGSES FGD Ponds

ANALYTICAL DATES REPORT

Sample ID	Client Sample ID	Matrix	Test Number	Test Name	Batch ID	Dilution	Analysis Date	Run ID
1905205-08B	FGD-11	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	90989	20	05/23/19 12:09 PM	ICP-MS4_190523A
1905205-08C	FGD-11	Aqueous	M2320 B	Alkalinity	91010	1	05/21/19 11:40 AM	TITRATOR_190521A
	FGD-11	Aqueous	E300	Anions by IC method - Water	90965	1	05/17/19 07:48 PM	IC4_190517A
	FGD-11	Aqueous	E300	Anions by IC method - Water	90986	100	05/20/19 02:59 PM	IC4_190520A
	FGD-11	Aqueous	E300	Anions by IC method - Water	90965	10	05/17/19 04:20 PM	IC4_190517A
	FGD-11	Aqueous	M4500-P E	Orthophosphate	90972	1	05/17/19 12:41 PM	UV/VIS_2_190517B
	FGD-11	Aqueous	M2540C	Total Dissolved Solids	91019	1	05/21/19 10:00 AM	WC_190521C
1905205-09A	FGD-12	Aqueous	M3500-Fe D	Ferric Iron (Calculated)	91028	1	05/30/19	UV/VIS_2_190530B
	FGD-12	Aqueous	M3500-Fe D	Ferrous Iron	91028	1	05/21/19 05:44 PM	UV/VIS_2_190521B
1905205-09B	FGD-12	Aqueous	SW7470A	Mercury Total: Aqueous	91060	1	05/24/19 11:15 AM	CETAC2_HG_190524 A
	FGD-12	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	90989	1	05/22/19 04:08 PM	ICP-MS4_190522D
1905205-09C	FGD-12	Aqueous	M2320 B	Alkalinity	91010	1	05/21/19 11:44 AM	TITRATOR_190521A
	FGD-12	Aqueous	E300	Anions by IC method - Water	90965	10	05/17/19 04:36 PM	IC4_190517A
	FGD-12	Aqueous	E300	Anions by IC method - Water	90965	1	05/17/19 08:04 PM	IC4_190517A
	FGD-12	Aqueous	M4500-P E	Orthophosphate	90972	1	05/17/19 12:41 PM	UV/VIS_2_190517B
	FGD-12	Aqueous	M2540C	Total Dissolved Solids	91019	1	05/21/19 10:00 AM	WC_190521C

DHL Analytical, Inc.

Date: 05-Jun-19

CLIENT: Golder
Project: Luminant-OGSES FGD Ponds
Project No: 19122262-F
Lab Order: 1905205

Client Sample ID: FGD-6
Lab ID: 1905205-01
Collection Date: 05/16/19 09:20 AM
Matrix: AQUEOUS

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		SW6020A			Analyst: RO		
Antimony	<0.000800	0.000800	0.00250		mg/L	1	05/22/19 03:52 PM
Arsenic	0.0294	0.00200	0.00500		mg/L	1	05/22/19 03:52 PM
Barium	0.107	0.00300	0.0100		mg/L	1	05/22/19 03:52 PM
Beryllium	<0.000300	0.000300	0.00100		mg/L	1	05/22/19 03:52 PM
Boron	0.116	0.0100	0.0300		mg/L	1	05/22/19 03:52 PM
Cadmium	<0.000300	0.000300	0.00100		mg/L	1	05/22/19 03:52 PM
Calcium	20.3	0.100	0.300		mg/L	1	05/22/19 03:52 PM
Chromium	<0.00200	0.00200	0.00500		mg/L	1	05/22/19 03:52 PM
Cobalt	0.0132	0.00300	0.00500		mg/L	1	05/22/19 03:52 PM
Iron	4.86	0.0300	0.100		mg/L	1	05/22/19 03:52 PM
Lead	<0.000300	0.000300	0.00100		mg/L	1	05/22/19 03:52 PM
Lithium	0.00679	0.00500	0.0100	J	mg/L	1	05/22/19 03:52 PM
Magnesium	6.61	0.100	0.300		mg/L	1	05/22/19 03:52 PM
Molybdenum	0.00770	0.00200	0.00500		mg/L	1	05/22/19 03:52 PM
Potassium	0.706	0.100	0.300		mg/L	1	05/22/19 03:52 PM
Selenium	<0.00200	0.00200	0.00500		mg/L	1	05/22/19 03:52 PM
Sodium	225	2.00	6.00		mg/L	20	05/23/19 11:55 AM
Thallium	<0.000500	0.000500	0.00150		mg/L	1	05/22/19 03:52 PM
MERCURY TOTAL: AQUEOUS		SW7470A			Analyst: BM		
Mercury	<0.0000800	0.0000800	0.000200		mg/L	1	05/24/19 10:48 AM
ANIONS BY IC METHOD - WATER		E300			Analyst: JL		
Chloride	170	3.00	10.0		mg/L	10	05/17/19 01:24 PM
Fluoride	0.669	0.100	0.400		mg/L	1	05/17/19 05:56 PM
Nitrate-N	<0.100	0.100	0.500		mg/L	1	05/17/19 05:56 PM
Sulfate	51.3	1.00	3.00		mg/L	1	05/17/19 05:56 PM
ALKALINITY		M2320 B			Analyst: CC		
Alkalinity, Bicarbonate (As CaCO3)	262	10.0	20.0		mg/L @ pH 4.53	1	05/21/19 10:03 AM
Alkalinity, Carbonate (As CaCO3)	<10.0	10.0	20.0		mg/L @ pH 4.53	1	05/21/19 10:03 AM
Alkalinity, Hydroxide (As CaCO3)	<10.0	10.0	20.0		mg/L @ pH 4.53	1	05/21/19 10:03 AM
Alkalinity, Total (As CaCO3)	262	20.0	20.0		mg/L @ pH 4.53	1	05/21/19 10:03 AM
FERRIC IRON (CALCULATED)		M3500-FE D			Analyst: CAC		
Iron, Ferric	4.86	0.0500	0.100	N	mg/L	1	05/30/19
FERROUS IRON		M3500-FE D			Analyst: BTJ		
Iron, Ferrous	<0.0500	0.0500	0.100	N	mg/L	1	05/21/19 05:41 PM

Qualifiers: * Value exceeds TCLP Maximum Concentration Level C Sample Result or QC discussed in the Case Narrative
 DF Dilution Factor E TPH pattern not Gas or Diesel Range Pattern
 J Analyte detected between MDL and RL MDL Method Detection Limit
 ND Not Detected at the Method Detection Limit RL Reporting Limit
 S Spike Recovery outside control limits N Parameter not NELAP certified

DHL Analytical, Inc.

Date: 05-Jun-19

CLIENT: Golder
Project: Luminant-OGSES FGD Ponds
Project No: 19122262-F
Lab Order: 1905205

Client Sample ID: FGD-6
Lab ID: 1905205-01
Collection Date: 05/16/19 09:20 AM
Matrix: AQUEOUS

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed
ORTHOPHOSPHATE							Analyst: CC
Phosphorus, Total Orthophosphate (As P)	0.714	0.0300	0.100		mg/L	1	05/17/19 12:35 PM
TOTAL DISSOLVED SOLIDS							Analyst: JS
Total Dissolved Solids (Residue, Filterable)	710	10.0	10.0		mg/L	1	05/21/19 10:00 AM

Qualifiers:	*	Value exceeds TCLP Maximum Concentration Level	C	Sample Result or QC discussed in the Case Narrative
	DF	Dilution Factor	E	TPH pattern not Gas or Diesel Range Pattern
	J	Analyte detected between MDL and RL	MDL	Method Detection Limit
	ND	Not Detected at the Method Detection Limit	RL	Reporting Limit
	S	Spike Recovery outside control limits	N	Parameter not NELAP certified

DHL Analytical, Inc.

Date: 05-Jun-19

CLIENT: Golder
Project: Luminant-OGSES FGD Ponds
Project No: 19122262-F
Lab Order: 1905205

Client Sample ID: FGD-4
Lab ID: 1905205-02
Collection Date: 05/16/19 10:15 AM
Matrix: AQUEOUS

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		SW6020A		Analyst: RO			
Antimony	<0.000800	0.000800	0.00250		mg/L	1	05/22/19 03:54 PM
Arsenic	<0.00200	0.00200	0.00500		mg/L	1	05/22/19 03:54 PM
Barium	0.117	0.00300	0.0100		mg/L	1	05/22/19 03:54 PM
Beryllium	<0.000300	0.000300	0.00100		mg/L	1	05/22/19 03:54 PM
Boron	0.0733	0.0100	0.0300		mg/L	1	05/22/19 03:54 PM
Cadmium	<0.000300	0.000300	0.00100		mg/L	1	05/22/19 03:54 PM
Calcium	41.7	1.00	3.00		mg/L	10	05/23/19 11:57 AM
Chromium	<0.00200	0.00200	0.00500		mg/L	1	05/22/19 03:54 PM
Cobalt	<0.00300	0.00300	0.00500		mg/L	1	05/22/19 03:54 PM
Iron	0.103	0.0300	0.100		mg/L	1	05/22/19 03:54 PM
Lead	<0.000300	0.000300	0.00100		mg/L	1	05/22/19 03:54 PM
Lithium	0.0325	0.00500	0.0100		mg/L	1	05/22/19 03:54 PM
Magnesium	18.6	0.100	0.300		mg/L	1	05/22/19 03:54 PM
Molybdenum	<0.00200	0.00200	0.00500		mg/L	1	05/22/19 03:54 PM
Potassium	1.62	0.100	0.300		mg/L	1	05/22/19 03:54 PM
Selenium	<0.00200	0.00200	0.00500		mg/L	1	05/22/19 03:54 PM
Sodium	160	1.00	3.00		mg/L	10	05/23/19 11:57 AM
Thallium	<0.000500	0.000500	0.00150		mg/L	1	05/22/19 03:54 PM
MERCURY TOTAL: AQUEOUS		SW7470A		Analyst: BM			
Mercury	<0.0000800	0.0000800	0.000200		mg/L	1	05/24/19 10:50 AM
ANIONS BY IC METHOD - WATER		E300		Analyst: JL			
Chloride	205	3.00	10.0		mg/L	10	05/17/19 02:12 PM
Fluoride	0.327	0.100	0.400	J	mg/L	1	05/17/19 06:12 PM
Nitrate-N	<0.100	0.100	0.500		mg/L	1	05/17/19 06:12 PM
Sulfate	41.7	1.00	3.00		mg/L	1	05/17/19 06:12 PM
ALKALINITY		M2320 B		Analyst: CC			
Alkalinity, Bicarbonate (As CaCO3)	201	10.0	20.0		mg/L @ pH 4.52	1	05/21/19 10:23 AM
Alkalinity, Carbonate (As CaCO3)	<10.0	10.0	20.0		mg/L @ pH 4.52	1	05/21/19 10:23 AM
Alkalinity, Hydroxide (As CaCO3)	<10.0	10.0	20.0		mg/L @ pH 4.52	1	05/21/19 10:23 AM
Alkalinity, Total (As CaCO3)	201	20.0	20.0		mg/L @ pH 4.52	1	05/21/19 10:23 AM
FERRIC IRON (CALCULATED)		M3500-FE D		Analyst: CAC			
Iron, Ferric	0.103	0.0500	0.100	N	mg/L	1	05/30/19
FERROUS IRON		M3500-FE D		Analyst: BTJ			
Iron, Ferrous	<0.0500	0.0500	0.100	N	mg/L	1	05/21/19 05:42 PM

Qualifiers: * Value exceeds TCLP Maximum Concentration Level C Sample Result or QC discussed in the Case Narrative
 DF Dilution Factor E TPH pattern not Gas or Diesel Range Pattern
 J Analyte detected between MDL and RL MDL Method Detection Limit
 ND Not Detected at the Method Detection Limit RL Reporting Limit
 S Spike Recovery outside control limits N Parameter not NELAP certified

DHL Analytical, Inc.

Date: 05-Jun-19

CLIENT: Golder
Project: Luminant-OGSES FGD Ponds
Project No: 19122262-F
Lab Order: 1905205

Client Sample ID: FGD-4
Lab ID: 1905205-02
Collection Date: 05/16/19 10:15 AM
Matrix: AQUEOUS

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed
ORTHOPHOSPHATE							Analyst: CC
Phosphorus, Total Orthophosphate (As P)	0.251	0.0300	0.100		mg/L	1	05/17/19 12:35 PM
TOTAL DISSOLVED SOLIDS							Analyst: JS
Total Dissolved Solids (Residue, Filterable)	651	10.0	10.0		mg/L	1	05/21/19 10:00 AM

Qualifiers:	*	Value exceeds TCLP Maximum Concentration Level	C	Sample Result or QC discussed in the Case Narrative
	DF	Dilution Factor	E	TPH pattern not Gas or Diesel Range Pattern
	J	Analyte detected between MDL and RL	MDL	Method Detection Limit
	ND	Not Detected at the Method Detection Limit	RL	Reporting Limit
	S	Spike Recovery outside control limits	N	Parameter not NELAP certified

CLIENT: Golder
Project: Luminant-OGSES FGD Ponds
Project No: 19122262-F
Lab Order: 1905205

Client Sample ID: FGD-3
Lab ID: 1905205-03
Collection Date: 05/16/19 11:10 AM
Matrix: AQUEOUS

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		SW6020A			Analyst: RO		
Antimony	<0.000800	0.000800	0.00250		mg/L	1	05/22/19 03:56 PM
Arsenic	0.00230	0.00200	0.00500	J	mg/L	1	05/22/19 03:56 PM
Barium	0.0510	0.00300	0.0100		mg/L	1	05/22/19 03:56 PM
Beryllium	<0.000300	0.000300	0.00100		mg/L	1	05/22/19 03:56 PM
Boron	0.117	0.0100	0.0300		mg/L	1	05/22/19 03:56 PM
Cadmium	<0.000300	0.000300	0.00100		mg/L	1	05/22/19 03:56 PM
Calcium	60.1	2.00	6.00		mg/L	20	05/23/19 11:59 AM
Chromium	<0.00200	0.00200	0.00500		mg/L	1	05/22/19 03:56 PM
Cobalt	0.00520	0.00300	0.00500		mg/L	1	05/22/19 03:56 PM
Iron	0.126	0.0300	0.100		mg/L	1	05/22/19 03:56 PM
Lead	<0.000300	0.000300	0.00100		mg/L	1	05/22/19 03:56 PM
Lithium	0.0570	0.00500	0.0100		mg/L	1	05/22/19 03:56 PM
Magnesium	33.6	2.00	6.00		mg/L	20	05/23/19 11:59 AM
Molybdenum	0.00311	0.00200	0.00500	J	mg/L	1	05/22/19 03:56 PM
Potassium	2.50	0.100	0.300		mg/L	1	05/22/19 03:56 PM
Selenium	0.0423	0.00200	0.00500		mg/L	1	05/22/19 03:56 PM
Sodium	277	2.00	6.00		mg/L	20	05/23/19 11:59 AM
Thallium	0.000600	0.000500	0.00150	J	mg/L	1	05/22/19 03:56 PM
MERCURY TOTAL: AQUEOUS		SW7470A			Analyst: BM		
Mercury	<0.0000800	0.0000800	0.000200		mg/L	1	05/24/19 11:01 AM
ANIONS BY IC METHOD - WATER		E300			Analyst: JL		
Chloride	117	3.00	10.0		mg/L	10	05/17/19 03:00 PM
Fluoride	0.776	0.100	0.400		mg/L	1	05/17/19 06:28 PM
Nitrate-N	1.41	0.100	0.500		mg/L	1	05/17/19 06:28 PM
Sulfate	182	10.0	30.0		mg/L	10	05/17/19 03:00 PM
ALKALINITY		M2320 B			Analyst: CC		
Alkalinity, Bicarbonate (As CaCO3)	533	10.0	20.0		mg/L @ pH 4.53	1	05/21/19 10:42 AM
Alkalinity, Carbonate (As CaCO3)	<10.0	10.0	20.0		mg/L @ pH 4.53	1	05/21/19 10:42 AM
Alkalinity, Hydroxide (As CaCO3)	<10.0	10.0	20.0		mg/L @ pH 4.53	1	05/21/19 10:42 AM
Alkalinity, Total (As CaCO3)	533	20.0	20.0		mg/L @ pH 4.53	1	05/21/19 10:42 AM
FERRIC IRON (CALCULATED)		M3500-FE D			Analyst: CAC		
Iron, Ferric	0.126	0.0500	0.100	N	mg/L	1	05/30/19
FERROUS IRON		M3500-FE D			Analyst: BTJ		
Iron, Ferrous	<0.0500	0.0500	0.100	N	mg/L	1	05/21/19 05:42 PM

Qualifiers: * Value exceeds TCLP Maximum Concentration Level C Sample Result or QC discussed in the Case Narrative
 DF Dilution Factor E TPH pattern not Gas or Diesel Range Pattern
 J Analyte detected between MDL and RL MDL Method Detection Limit
 ND Not Detected at the Method Detection Limit RL Reporting Limit
 S Spike Recovery outside control limits N Parameter not NELAP certified

DHL Analytical, Inc.

Date: 05-Jun-19

CLIENT: Golder
Project: Luminant-OGSES FGD Ponds
Project No: 19122262-F
Lab Order: 1905205

Client Sample ID: FGD-3
Lab ID: 1905205-03
Collection Date: 05/16/19 11:10 AM
Matrix: AQUEOUS

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed
ORTHOPHOSPHATE							Analyst: CC
Phosphorus, Total Orthophosphate (As P)	0.0960	0.0300	0.100	J	mg/L	1	05/17/19 12:35 PM
TOTAL DISSOLVED SOLIDS							Analyst: JS
Total Dissolved Solids (Residue, Filterable)	1100	50.0	50.0		mg/L	1	05/21/19 10:00 AM

Qualifiers:	*	Value exceeds TCLP Maximum Concentration Level	C	Sample Result or QC discussed in the Case Narrative
	DF	Dilution Factor	E	TPH pattern not Gas or Diesel Range Pattern
	J	Analyte detected between MDL and RL	MDL	Method Detection Limit
	ND	Not Detected at the Method Detection Limit	RL	Reporting Limit
	S	Spike Recovery outside control limits	N	Parameter not NELAP certified

DHL Analytical, Inc.

Date: 05-Jun-19

CLIENT: Golder
Project: Luminant-OGSES FGD Ponds
Project No: 19122262-F
Lab Order: 1905205

Client Sample ID: FGD-2
Lab ID: 1905205-04
Collection Date: 05/16/19 12:00 PM
Matrix: AQUEOUS

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		SW6020A			Analyst: RO		
Antimony	<0.000800	0.000800	0.00250		mg/L	1	05/22/19 03:58 PM
Arsenic	<0.00200	0.00200	0.00500		mg/L	1	05/22/19 03:58 PM
Barium	0.0993	0.00300	0.0100		mg/L	1	05/22/19 03:58 PM
Beryllium	<0.000300	0.000300	0.00100		mg/L	1	05/22/19 03:58 PM
Boron	0.105	0.0100	0.0300		mg/L	1	05/22/19 03:58 PM
Cadmium	<0.000300	0.000300	0.00100		mg/L	1	05/22/19 03:58 PM
Calcium	38.9	1.00	3.00		mg/L	10	05/23/19 12:01 PM
Chromium	0.00266	0.00200	0.00500	J	mg/L	1	05/22/19 03:58 PM
Cobalt	<0.00300	0.00300	0.00500		mg/L	1	05/22/19 03:58 PM
Iron	0.0799	0.0300	0.100	J	mg/L	1	05/22/19 03:58 PM
Lead	<0.000300	0.000300	0.00100		mg/L	1	05/22/19 03:58 PM
Lithium	0.0228	0.00500	0.0100		mg/L	1	05/22/19 03:58 PM
Magnesium	16.7	0.100	0.300		mg/L	1	05/22/19 03:58 PM
Molybdenum	<0.00200	0.00200	0.00500		mg/L	1	05/22/19 03:58 PM
Potassium	2.57	0.100	0.300		mg/L	1	05/22/19 03:58 PM
Selenium	0.0214	0.00200	0.00500		mg/L	1	05/22/19 03:58 PM
Sodium	198	1.00	3.00		mg/L	10	05/23/19 12:01 PM
Thallium	<0.000500	0.000500	0.00150		mg/L	1	05/22/19 03:58 PM
MERCURY TOTAL: AQUEOUS		SW7470A			Analyst: BM		
Mercury	<0.0000800	0.0000800	0.000200		mg/L	1	05/24/19 11:03 AM
ANIONS BY IC METHOD - WATER		E300			Analyst: JL		
Chloride	260	3.00	10.0		mg/L	10	05/17/19 03:16 PM
Fluoride	0.383	0.100	0.400	J	mg/L	1	05/17/19 06:44 PM
Nitrate-N	1.54	0.100	0.500		mg/L	1	05/17/19 06:44 PM
Sulfate	70.7	1.00	3.00		mg/L	1	05/17/19 06:44 PM
ALKALINITY		M2320 B			Analyst: CC		
Alkalinity, Bicarbonate (As CaCO3)	157	10.0	20.0		mg/L @ pH 4.51	1	05/21/19 10:50 AM
Alkalinity, Carbonate (As CaCO3)	<10.0	10.0	20.0		mg/L @ pH 4.51	1	05/21/19 10:50 AM
Alkalinity, Hydroxide (As CaCO3)	<10.0	10.0	20.0		mg/L @ pH 4.51	1	05/21/19 10:50 AM
Alkalinity, Total (As CaCO3)	157	20.0	20.0		mg/L @ pH 4.51	1	05/21/19 10:50 AM
FERRIC IRON (CALCULATED)		M3500-FE D			Analyst: CAC		
Iron, Ferric	0.0799	0.0500	0.100	JN	mg/L	1	05/30/19
FERROUS IRON		M3500-FE D			Analyst: BTJ		
Iron, Ferrous	<0.0500	0.0500	0.100	N	mg/L	1	05/21/19 05:43 PM

Qualifiers: * Value exceeds TCLP Maximum Concentration Level C Sample Result or QC discussed in the Case Narrative
 DF Dilution Factor E TPH pattern not Gas or Diesel Range Pattern
 J Analyte detected between MDL and RL MDL Method Detection Limit
 ND Not Detected at the Method Detection Limit RL Reporting Limit
 S Spike Recovery outside control limits N Parameter not NELAP certified

DHL Analytical, Inc.

Date: 05-Jun-19

CLIENT: Golder
Project: Luminant-OGSES FGD Ponds
Project No: 19122262-F
Lab Order: 1905205

Client Sample ID: FGD-2
Lab ID: 1905205-04
Collection Date: 05/16/19 12:00 PM
Matrix: AQUEOUS

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed
ORTHOPHOSPHATE							Analyst: CC
Phosphorus, Total Orthophosphate (As P)	0.237	0.0300	0.100		mg/L	1	05/17/19 12:37 PM
TOTAL DISSOLVED SOLIDS							Analyst: JS
Total Dissolved Solids (Residue, Filterable)	729	10.0	10.0		mg/L	1	05/21/19 10:00 AM

Qualifiers:	*	Value exceeds TCLP Maximum Concentration Level	C	Sample Result or QC discussed in the Case Narrative
	DF	Dilution Factor	E	TPH pattern not Gas or Diesel Range Pattern
	J	Analyte detected between MDL and RL	MDL	Method Detection Limit
	ND	Not Detected at the Method Detection Limit	RL	Reporting Limit
	S	Spike Recovery outside control limits	N	Parameter not NELAP certified

CLIENT: Golder
Project: Luminant-OGSES FGD Ponds
Project No: 19122262-F
Lab Order: 1905205

Client Sample ID: FGD-5
Lab ID: 1905205-05
Collection Date: 05/16/19 01:50 PM
Matrix: AQUEOUS

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		SW6020A			Analyst: RO		
Antimony	<0.000800	0.000800	0.00250		mg/L	1	05/22/19 04:00 PM
Arsenic	<0.00200	0.00200	0.00500		mg/L	1	05/22/19 04:00 PM
Barium	0.0926	0.00300	0.0100		mg/L	1	05/22/19 04:00 PM
Beryllium	<0.000300	0.000300	0.00100		mg/L	1	05/22/19 04:00 PM
Boron	0.108	0.0100	0.0300		mg/L	1	05/22/19 04:00 PM
Cadmium	<0.000300	0.000300	0.00100		mg/L	1	05/22/19 04:00 PM
Calcium	77.7	1.00	3.00		mg/L	10	05/23/19 12:03 PM
Chromium	0.0240	0.00200	0.00500		mg/L	1	05/22/19 04:00 PM
Cobalt	<0.00300	0.00300	0.00500		mg/L	1	05/22/19 04:00 PM
Iron	<0.0300	0.0300	0.100		mg/L	1	05/22/19 04:00 PM
Lead	<0.000300	0.000300	0.00100		mg/L	1	05/22/19 04:00 PM
Lithium	0.145	0.00500	0.0100		mg/L	1	05/22/19 04:00 PM
Magnesium	50.0	1.00	3.00		mg/L	10	05/23/19 12:03 PM
Molybdenum	0.00256	0.00200	0.00500	J	mg/L	1	05/22/19 04:00 PM
Potassium	3.46	0.100	0.300		mg/L	1	05/22/19 04:00 PM
Selenium	<0.00200	0.00200	0.00500		mg/L	1	05/22/19 04:00 PM
Sodium	123	1.00	3.00		mg/L	10	05/23/19 12:03 PM
Thallium	<0.000500	0.000500	0.00150		mg/L	1	05/22/19 04:00 PM
MERCURY TOTAL: AQUEOUS		SW7470A			Analyst: BM		
Mercury	<0.0000800	0.0000800	0.000200		mg/L	1	05/24/19 11:06 AM
ANIONS BY IC METHOD - WATER		E300			Analyst: JL		
Chloride	287	3.00	10.0		mg/L	10	05/17/19 03:32 PM
Fluoride	0.579	0.100	0.400		mg/L	1	05/17/19 07:00 PM
Nitrate-N	0.859	0.100	0.500		mg/L	1	05/17/19 07:00 PM
Sulfate	67.2	1.00	3.00		mg/L	1	05/17/19 07:00 PM
ALKALINITY		M2320 B			Analyst: CC		
Alkalinity, Bicarbonate (As CaCO3)	237	10.0	20.0		mg/L @ pH 4.52	1	05/30/19 03:20 PM
Alkalinity, Carbonate (As CaCO3)	<10.0	10.0	20.0		mg/L @ pH 4.52	1	05/30/19 03:20 PM
Alkalinity, Hydroxide (As CaCO3)	<10.0	10.0	20.0		mg/L @ pH 4.52	1	05/30/19 03:20 PM
Alkalinity, Total (As CaCO3)	237	20.0	20.0		mg/L @ pH 4.52	1	05/30/19 03:20 PM
FERRIC IRON (CALCULATED)		M3500-FE D			Analyst: CAC		
Iron, Ferric	<0.0500	0.0500	0.100	N	mg/L	1	05/30/19
FERROUS IRON		M3500-FE D			Analyst: BTJ		
Iron, Ferrous	<0.0500	0.0500	0.100	N	mg/L	1	05/21/19 05:43 PM

Qualifiers:

*	Value exceeds TCLP Maximum Concentration Level	C	Sample Result or QC discussed in the Case Narrative
DF	Dilution Factor	E	TPH pattern not Gas or Diesel Range Pattern
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	RL	Reporting Limit
S	Spike Recovery outside control limits	N	Parameter not NELAP certified

DHL Analytical, Inc.

Date: 05-Jun-19

CLIENT: Golder
Project: Luminant-OGSES FGD Ponds
Project No: 19122262-F
Lab Order: 1905205

Client Sample ID: FGD-5
Lab ID: 1905205-05
Collection Date: 05/16/19 01:50 PM
Matrix: AQUEOUS

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed
ORTHOPHOSPHATE							Analyst: CC
Phosphorus, Total Orthophosphate (As P)	0.176	0.0300	0.100		mg/L	1	05/17/19 12:37 PM
TOTAL DISSOLVED SOLIDS							Analyst: JS
Total Dissolved Solids (Residue, Filterable)	801	10.0	10.0		mg/L	1	05/21/19 10:00 AM

Qualifiers:

*	Value exceeds TCLP Maximum Concentration Level	C	Sample Result or QC discussed in the Case Narrative
DF	Dilution Factor	E	TPH pattern not Gas or Diesel Range Pattern
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	RL	Reporting Limit
S	Spike Recovery outside control limits	N	Parameter not NELAP certified

DHL Analytical, Inc.

Date: 05-Jun-19

CLIENT: Golder
Project: Luminant-OGSES FGD Ponds
Project No: 19122262-F
Lab Order: 1905205

Client Sample ID: FGD-1
Lab ID: 1905205-06
Collection Date: 05/16/19 02:50 PM
Matrix: AQUEOUS

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		SW6020A			Analyst: RO		
Antimony	<0.000800	0.000800	0.00250		mg/L	1	05/22/19 04:02 PM
Arsenic	<0.00200	0.00200	0.00500		mg/L	1	05/22/19 04:02 PM
Barium	0.0485	0.00300	0.0100		mg/L	1	05/22/19 04:02 PM
Beryllium	<0.000300	0.000300	0.00100		mg/L	1	05/22/19 04:02 PM
Boron	0.0803	0.0100	0.0300		mg/L	1	05/22/19 04:02 PM
Cadmium	<0.000300	0.000300	0.00100		mg/L	1	05/22/19 04:02 PM
Calcium	19.5	0.100	0.300		mg/L	1	05/22/19 04:02 PM
Chromium	<0.00200	0.00200	0.00500		mg/L	1	05/22/19 04:02 PM
Cobalt	<0.00300	0.00300	0.00500		mg/L	1	05/22/19 04:02 PM
Iron	0.186	0.0300	0.100		mg/L	1	05/22/19 04:02 PM
Lead	<0.000300	0.000300	0.00100		mg/L	1	05/22/19 04:02 PM
Lithium	0.0442	0.00500	0.0100		mg/L	1	05/22/19 04:02 PM
Magnesium	11.2	0.100	0.300		mg/L	1	05/22/19 04:02 PM
Molybdenum	<0.00200	0.00200	0.00500		mg/L	1	05/22/19 04:02 PM
Potassium	2.11	0.100	0.300		mg/L	1	05/22/19 04:02 PM
Selenium	<0.00200	0.00200	0.00500		mg/L	1	05/22/19 04:02 PM
Sodium	49.4	1.00	3.00		mg/L	10	05/23/19 12:05 PM
Thallium	<0.000500	0.000500	0.00150		mg/L	1	05/22/19 04:02 PM
MERCURY TOTAL: AQUEOUS		SW7470A			Analyst: BM		
Mercury	<0.0000800	0.0000800	0.000200		mg/L	1	05/24/19 11:08 AM
ANIONS BY IC METHOD - WATER		E300			Analyst: JL		
Chloride	62.4	3.00	10.0		mg/L	10	05/17/19 03:48 PM
Fluoride	0.362	0.100	0.400	J	mg/L	1	05/17/19 07:16 PM
Nitrate-N	<0.100	0.100	0.500		mg/L	1	05/17/19 07:16 PM
Sulfate	78.7	1.00	3.00		mg/L	1	05/17/19 07:16 PM
ALKALINITY		M2320 B			Analyst: CC		
Alkalinity, Bicarbonate (As CaCO3)	52.8	10.0	20.0		mg/L @ pH 4.5	1	05/30/19 03:23 PM
Alkalinity, Carbonate (As CaCO3)	<10.0	10.0	20.0		mg/L @ pH 4.5	1	05/30/19 03:23 PM
Alkalinity, Hydroxide (As CaCO3)	<10.0	10.0	20.0		mg/L @ pH 4.5	1	05/30/19 03:23 PM
Alkalinity, Total (As CaCO3)	52.8	20.0	20.0		mg/L @ pH 4.5	1	05/30/19 03:23 PM
FERRIC IRON (CALCULATED)		M3500-FE D			Analyst: CAC		
Iron, Ferric	0.186	0.0500	0.100	N	mg/L	1	05/30/19
FERROUS IRON		M3500-FE D			Analyst: BTJ		
Iron, Ferrous	<0.0500	0.0500	0.100	N	mg/L	1	05/21/19 05:44 PM

Qualifiers: * Value exceeds TCLP Maximum Concentration Level C Sample Result or QC discussed in the Case Narrative
 DF Dilution Factor E TPH pattern not Gas or Diesel Range Pattern
 J Analyte detected between MDL and RL MDL Method Detection Limit
 ND Not Detected at the Method Detection Limit RL Reporting Limit
 S Spike Recovery outside control limits N Parameter not NELAP certified

DHL Analytical, Inc.

Date: 05-Jun-19

CLIENT: Golder
Project: Luminant-OGSES FGD Ponds
Project No: 19122262-F
Lab Order: 1905205

Client Sample ID: FGD-1
Lab ID: 1905205-06
Collection Date: 05/16/19 02:50 PM
Matrix: AQUEOUS

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed
ORTHOPHOSPHATE							Analyst: CC
Phosphorus, Total Orthophosphate (As P)	0.473	0.0300	0.100		mg/L	1	05/17/19 12:37 PM
TOTAL DISSOLVED SOLIDS							Analyst: JS
Total Dissolved Solids (Residue, Filterable)	320	10.0	10.0		mg/L	1	05/21/19 10:00 AM

Qualifiers:

*	Value exceeds TCLP Maximum Concentration Level	C	Sample Result or QC discussed in the Case Narrative
DF	Dilution Factor	E	TPH pattern not Gas or Diesel Range Pattern
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	RL	Reporting Limit
S	Spike Recovery outside control limits	N	Parameter not NELAP certified

DHL Analytical, Inc.

Date: 05-Jun-19

CLIENT: Golder
Project: Luminant-OGSES FGD Ponds
Project No: 19122262-F
Lab Order: 1905205

Client Sample ID: FGD-8
Lab ID: 1905205-07
Collection Date: 05/16/19 03:45 PM
Matrix: AQUEOUS

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		SW6020A		Analyst: RO			
Antimony	<0.000800	0.000800	0.00250		mg/L	1	05/22/19 04:04 PM
Arsenic	0.0126	0.00200	0.00500		mg/L	1	05/22/19 04:04 PM
Barium	0.864	0.00300	0.0100		mg/L	1	05/22/19 04:04 PM
Beryllium	<0.000300	0.000300	0.00100		mg/L	1	05/22/19 04:04 PM
Boron	0.0687	0.0100	0.0300		mg/L	1	05/22/19 04:04 PM
Cadmium	<0.000300	0.000300	0.00100		mg/L	1	05/22/19 04:04 PM
Calcium	314	5.00	15.0		mg/L	50	05/23/19 12:07 PM
Chromium	0.00346	0.00200	0.00500	J	mg/L	1	05/22/19 04:04 PM
Cobalt	0.0146	0.00300	0.00500		mg/L	1	05/22/19 04:04 PM
Iron	263	1.50	5.00		mg/L	50	05/23/19 12:07 PM
Lead	0.00194	0.000300	0.00100		mg/L	1	05/22/19 04:04 PM
Lithium	0.00864	0.00500	0.0100	J	mg/L	1	05/22/19 04:04 PM
Magnesium	204	5.00	15.0		mg/L	50	05/23/19 12:07 PM
Molybdenum	<0.00200	0.00200	0.00500		mg/L	1	05/22/19 04:04 PM
Potassium	19.2	0.100	0.300		mg/L	1	05/22/19 04:04 PM
Selenium	0.00274	0.00200	0.00500	J	mg/L	1	05/22/19 04:04 PM
Sodium	792	5.00	15.0		mg/L	50	05/23/19 12:07 PM
Thallium	<0.000500	0.000500	0.00150		mg/L	1	05/22/19 04:04 PM
MERCURY TOTAL: AQUEOUS		SW7470A		Analyst: BM			
Mercury	<0.0000800	0.0000800	0.000200		mg/L	1	05/24/19 11:10 AM
ANIONS BY IC METHOD - WATER		E300		Analyst: JL			
Chloride	2040	30.0	100		mg/L	100	05/20/19 02:43 PM
Fluoride	<0.100	0.100	0.400		mg/L	1	05/17/19 07:32 PM
Nitrate-N	0.107	0.100	0.500	J	mg/L	1	05/17/19 07:32 PM
Sulfate	173	10.0	30.0		mg/L	10	05/17/19 04:04 PM
ALKALINITY		M2320 B		Analyst: CC			
Alkalinity, Bicarbonate (As CaCO3)	516	10.0	20.0		mg/L @ pH 4.54	1	05/21/19 11:30 AM
Alkalinity, Carbonate (As CaCO3)	<10.0	10.0	20.0		mg/L @ pH 4.54	1	05/21/19 11:30 AM
Alkalinity, Hydroxide (As CaCO3)	<10.0	10.0	20.0		mg/L @ pH 4.54	1	05/21/19 11:30 AM
Alkalinity, Total (As CaCO3)	516	20.0	20.0		mg/L @ pH 4.54	1	05/21/19 11:30 AM
FERRIC IRON (CALCULATED)		M3500-FE D		Analyst: CAC			
Iron, Ferric	61.0	0.0500	0.100	N	mg/L	1	05/30/19
FERROUS IRON		M3500-FE D		Analyst: BTJ			
Iron, Ferrous	202	50.0	100	N	mg/L	1000	05/21/19 05:59 PM

Qualifiers: * Value exceeds TCLP Maximum Concentration Level C Sample Result or QC discussed in the Case Narrative
 DF Dilution Factor E TPH pattern not Gas or Diesel Range Pattern
 J Analyte detected between MDL and RL MDL Method Detection Limit
 ND Not Detected at the Method Detection Limit RL Reporting Limit
 S Spike Recovery outside control limits N Parameter not NELAP certified

DHL Analytical, Inc.

Date: 05-Jun-19

CLIENT: Golder
Project: Luminant-OGSES FGD Ponds
Project No: 19122262-F
Lab Order: 1905205

Client Sample ID: FGD-8
Lab ID: 1905205-07
Collection Date: 05/16/19 03:45 PM
Matrix: AQUEOUS

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed
ORTHOPHOSPHATE							Analyst: CC
Phosphorus, Total Orthophosphate (As P)	0.219	0.0300	0.100		mg/L	1	05/17/19 12:40 PM
TOTAL DISSOLVED SOLIDS							Analyst: JS
Total Dissolved Solids (Residue, Filterable)	3970	50.0	50.0		mg/L	1	05/21/19 10:00 AM

Qualifiers:

*	Value exceeds TCLP Maximum Concentration Level	C	Sample Result or QC discussed in the Case Narrative
DF	Dilution Factor	E	TPH pattern not Gas or Diesel Range Pattern
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	RL	Reporting Limit
S	Spike Recovery outside control limits	N	Parameter not NELAP certified

CLIENT: Golder
Project: Luminant-OGSES FGD Ponds
Project No: 19122262-F
Lab Order: 1905205

Client Sample ID: FGD-11
Lab ID: 1905205-08
Collection Date: 05/16/19 04:40 PM
Matrix: AQUEOUS

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		SW6020A			Analyst: RO		
Antimony	<0.000800	0.000800	0.00250		mg/L	1	05/22/19 04:06 PM
Arsenic	<0.00200	0.00200	0.00500		mg/L	1	05/22/19 04:06 PM
Barium	0.347	0.00300	0.0100		mg/L	1	05/22/19 04:06 PM
Beryllium	<0.000300	0.000300	0.00100		mg/L	1	05/22/19 04:06 PM
Boron	0.108	0.0100	0.0300		mg/L	1	05/22/19 04:06 PM
Cadmium	<0.000300	0.000300	0.00100		mg/L	1	05/22/19 04:06 PM
Calcium	85.0	2.00	6.00		mg/L	20	05/23/19 12:09 PM
Chromium	0.0280	0.00200	0.00500		mg/L	1	05/22/19 04:06 PM
Cobalt	<0.00300	0.00300	0.00500		mg/L	1	05/22/19 04:06 PM
Iron	1.28	0.0300	0.100		mg/L	1	05/22/19 04:06 PM
Lead	0.000576	0.000300	0.00100	J	mg/L	1	05/22/19 04:06 PM
Lithium	0.0145	0.00500	0.0100		mg/L	1	05/22/19 04:06 PM
Magnesium	30.6	2.00	6.00		mg/L	20	05/23/19 12:09 PM
Molybdenum	0.00358	0.00200	0.00500	J	mg/L	1	05/22/19 04:06 PM
Potassium	4.13	0.100	0.300		mg/L	1	05/22/19 04:06 PM
Selenium	<0.00200	0.00200	0.00500		mg/L	1	05/22/19 04:06 PM
Sodium	328	2.00	6.00		mg/L	20	05/23/19 12:09 PM
Thallium	<0.000500	0.000500	0.00150		mg/L	1	05/22/19 04:06 PM
MERCURY TOTAL: AQUEOUS		SW7470A			Analyst: BM		
Mercury	<0.0000800	0.0000800	0.000200		mg/L	1	05/24/19 11:12 AM
ANIONS BY IC METHOD - WATER		E300			Analyst: JL		
Chloride	566	30.0	100		mg/L	100	05/20/19 02:59 PM
Fluoride	0.380	0.100	0.400	J	mg/L	1	05/17/19 07:48 PM
Nitrate-N	<0.100	0.100	0.500		mg/L	1	05/17/19 07:48 PM
Sulfate	50.9	1.00	3.00		mg/L	1	05/17/19 07:48 PM
ALKALINITY		M2320 B			Analyst: CC		
Alkalinity, Bicarbonate (As CaCO3)	256	10.0	20.0		mg/L @ pH 4.52	1	05/21/19 11:40 AM
Alkalinity, Carbonate (As CaCO3)	<10.0	10.0	20.0		mg/L @ pH 4.52	1	05/21/19 11:40 AM
Alkalinity, Hydroxide (As CaCO3)	<10.0	10.0	20.0		mg/L @ pH 4.52	1	05/21/19 11:40 AM
Alkalinity, Total (As CaCO3)	256	20.0	20.0		mg/L @ pH 4.52	1	05/21/19 11:40 AM
FERRIC IRON (CALCULATED)		M3500-FE D			Analyst: CAC		
Iron, Ferric	1.28	0.0500	0.100	N	mg/L	1	05/30/19
FERROUS IRON		M3500-FE D			Analyst: BTJ		
Iron, Ferrous	<0.0500	0.0500	0.100	N	mg/L	1	05/21/19 05:44 PM

Qualifiers: * Value exceeds TCLP Maximum Concentration Level C Sample Result or QC discussed in the Case Narrative
 DF Dilution Factor E TPH pattern not Gas or Diesel Range Pattern
 J Analyte detected between MDL and RL MDL Method Detection Limit
 ND Not Detected at the Method Detection Limit RL Reporting Limit
 S Spike Recovery outside control limits N Parameter not NELAP certified

DHL Analytical, Inc.

Date: 05-Jun-19

CLIENT: Golder
Project: Luminant-OGSES FGD Ponds
Project No: 19122262-F
Lab Order: 1905205

Client Sample ID: FGD-11
Lab ID: 1905205-08
Collection Date: 05/16/19 04:40 PM
Matrix: AQUEOUS

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed
ORTHOPHOSPHATE							Analyst: CC
Phosphorus, Total Orthophosphate (As P)	0.200	0.0300	0.100		mg/L	1	05/17/19 12:41 PM
TOTAL DISSOLVED SOLIDS							Analyst: JS
Total Dissolved Solids (Residue, Filterable)	1350	50.0	50.0		mg/L	1	05/21/19 10:00 AM

Qualifiers:

*	Value exceeds TCLP Maximum Concentration Level	C	Sample Result or QC discussed in the Case Narrative
DF	Dilution Factor	E	TPH pattern not Gas or Diesel Range Pattern
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	RL	Reporting Limit
S	Spike Recovery outside control limits	N	Parameter not NELAP certified

CLIENT: Golder
Project: Luminant-OGSES FGD Ponds
Project No: 19122262-F
Lab Order: 1905205

Client Sample ID: FGD-12
Lab ID: 1905205-09
Collection Date: 05/16/19 05:35 PM
Matrix: AQUEOUS

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		SW6020A			Analyst: RO		
Antimony	<0.000800	0.000800	0.00250		mg/L	1	05/22/19 04:08 PM
Arsenic	<0.00200	0.00200	0.00500		mg/L	1	05/22/19 04:08 PM
Barium	0.0474	0.00300	0.0100		mg/L	1	05/22/19 04:08 PM
Beryllium	<0.000300	0.000300	0.00100		mg/L	1	05/22/19 04:08 PM
Boron	0.0723	0.0100	0.0300		mg/L	1	05/22/19 04:08 PM
Cadmium	<0.000300	0.000300	0.00100		mg/L	1	05/22/19 04:08 PM
Calcium	6.79	0.100	0.300		mg/L	1	05/22/19 04:08 PM
Chromium	0.00295	0.00200	0.00500	J	mg/L	1	05/22/19 04:08 PM
Cobalt	<0.00300	0.00300	0.00500		mg/L	1	05/22/19 04:08 PM
Iron	0.425	0.0300	0.100		mg/L	1	05/22/19 04:08 PM
Lead	<0.000300	0.000300	0.00100		mg/L	1	05/22/19 04:08 PM
Lithium	0.0221	0.00500	0.0100		mg/L	1	05/22/19 04:08 PM
Magnesium	2.97	0.100	0.300		mg/L	1	05/22/19 04:08 PM
Molybdenum	<0.00200	0.00200	0.00500		mg/L	1	05/22/19 04:08 PM
Potassium	1.55	0.100	0.300		mg/L	1	05/22/19 04:08 PM
Selenium	<0.00200	0.00200	0.00500		mg/L	1	05/22/19 04:08 PM
Sodium	20.1	0.100	0.300		mg/L	1	05/22/19 04:08 PM
Thallium	<0.000500	0.000500	0.00150		mg/L	1	05/22/19 04:08 PM
MERCURY TOTAL: AQUEOUS		SW7470A			Analyst: BM		
Mercury	<0.0000800	0.0000800	0.000200		mg/L	1	05/24/19 11:15 AM
ANIONS BY IC METHOD - WATER		E300			Analyst: JL		
Chloride	15.6	0.300	1.00		mg/L	1	05/17/19 08:04 PM
Fluoride	<0.100	0.100	0.400		mg/L	1	05/17/19 08:04 PM
Nitrate-N	1.42	0.100	0.500		mg/L	1	05/17/19 08:04 PM
Sulfate	15.0	1.00	3.00		mg/L	1	05/17/19 08:04 PM
ALKALINITY		M2320 B			Analyst: CC		
Alkalinity, Bicarbonate (As CaCO3)	36.6	10.0	20.0		mg/L @ pH 4.49	1	05/21/19 11:44 AM
Alkalinity, Carbonate (As CaCO3)	<10.0	10.0	20.0		mg/L @ pH 4.49	1	05/21/19 11:44 AM
Alkalinity, Hydroxide (As CaCO3)	<10.0	10.0	20.0		mg/L @ pH 4.49	1	05/21/19 11:44 AM
Alkalinity, Total (As CaCO3)	36.6	20.0	20.0		mg/L @ pH 4.49	1	05/21/19 11:44 AM
FERRIC IRON (CALCULATED)		M3500-FE D			Analyst: CAC		
Iron, Ferric	0.425	0.0500	0.100	N	mg/L	1	05/30/19
FERROUS IRON		M3500-FE D			Analyst: BTJ		
Iron, Ferrous	<0.0500	0.0500	0.100	N	mg/L	1	05/21/19 05:44 PM

Qualifiers: * Value exceeds TCLP Maximum Concentration Level C Sample Result or QC discussed in the Case Narrative
 DF Dilution Factor E TPH pattern not Gas or Diesel Range Pattern
 J Analyte detected between MDL and RL MDL Method Detection Limit
 ND Not Detected at the Method Detection Limit RL Reporting Limit
 S Spike Recovery outside control limits N Parameter not NELAP certified

DHL Analytical, Inc.

Date: 05-Jun-19

CLIENT: Golder
Project: Luminant-OGSES FGD Ponds
Project No: 19122262-F
Lab Order: 1905205

Client Sample ID: FGD-12
Lab ID: 1905205-09
Collection Date: 05/16/19 05:35 PM
Matrix: AQUEOUS

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed
ORTHOPHOSPHATE							Analyst: CC
Phosphorus, Total Orthophosphate (As P)	0.168	0.0300	0.100		mg/L	1	05/17/19 12:41 PM
TOTAL DISSOLVED SOLIDS							Analyst: JS
Total Dissolved Solids (Residue, Filterable)	140	10.0	10.0		mg/L	1	05/21/19 10:00 AM

Qualifiers:	*	Value exceeds TCLP Maximum Concentration Level	C	Sample Result or QC discussed in the Case Narrative
	DF	Dilution Factor	E	TPH pattern not Gas or Diesel Range Pattern
	J	Analyte detected between MDL and RL	MDL	Method Detection Limit
	ND	Not Detected at the Method Detection Limit	RL	Reporting Limit
	S	Spike Recovery outside control limits	N	Parameter not NELAP certified

CLIENT: Golder
 Work Order: 1905205

ANALYTICAL QC SUMMARY REPORT

Project: Luminant-OGSES FGD Ponds

RunID: CETAC2_HG_190524A

The QC data in batch 91060 applies to the following samples: 1905205-01B, 1905205-02B, 1905205-03B, 1905205-04B, 1905205-05B, 1905205-06B, 1905205-07B, 1905205-08B, 1905205-09B

Sample ID	MB-91060	Batch ID:	91060	TestNo:	SW7470A	Units:	mg/L
SampType:	MBLK	Run ID:	CETAC2_HG_190524A	Analysis Date:	5/24/2019 10:41:16 AM	Prep Date:	5/23/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	<0.0000800	0.000200								

Sample ID	LCS-91060	Batch ID:	91060	TestNo:	SW7470A	Units:	mg/L
SampType:	LCS	Run ID:	CETAC2_HG_190524A	Analysis Date:	5/24/2019 10:43:31 AM	Prep Date:	5/23/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.00188	0.000200	0.00200	0	94.0	85	115			

Sample ID	LCSD-91060	Batch ID:	91060	TestNo:	SW7470A	Units:	mg/L
SampType:	LCSD	Run ID:	CETAC2_HG_190524A	Analysis Date:	5/24/2019 10:45:47 AM	Prep Date:	5/23/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.00188	0.000200	0.00200	0	94.0	85	115	0	15	

Sample ID	1905205-02B MS	Batch ID:	91060	TestNo:	SW7470A	Units:	mg/L
SampType:	MS	Run ID:	CETAC2_HG_190524A	Analysis Date:	5/24/2019 10:52:35 AM	Prep Date:	5/23/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.00183	0.000200	0.00200	0	91.5	80	120			

Sample ID	1905205-02B MSD	Batch ID:	91060	TestNo:	SW7470A	Units:	mg/L
SampType:	MSD	Run ID:	CETAC2_HG_190524A	Analysis Date:	5/24/2019 10:54:51 AM	Prep Date:	5/23/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.00186	0.000200	0.00200	0	93.0	80	120	1.63	15	

Sample ID	1905205-02B SD	Batch ID:	91060	TestNo:	SW7470A	Units:	mg/L
SampType:	SD	Run ID:	CETAC2_HG_190524A	Analysis Date:	5/24/2019 10:57:06 AM	Prep Date:	5/23/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	<0.000400	0.00100	0	0				0	10	

Sample ID	1905205-02B PDS	Batch ID:	91060	TestNo:	SW7470A	Units:	mg/L
SampType:	PDS	Run ID:	CETAC2_HG_190524A	Analysis Date:	5/24/2019 10:59:22 AM	Prep Date:	5/23/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.00233	0.000200	0.00250	0	93.2	85	115			

- Qualifiers:**
- B Analyte detected in the associated Method Blank
 - J Analyte detected between MDL and RL
 - ND Not Detected at the Method Detection Limit
 - RL Reporting Limit
 - J Analyte detected between SDL and RL
 - DF Dilution Factor
 - MDL Method Detection Limit
 - R RPD outside accepted control limits
 - S Spike Recovery outside control limits
 - N Parameter not NELAP certified

CLIENT: Golder
Work Order: 1905205
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: CETAC2_HG_190524A

Sample ID ICV-190524	Batch ID: R104261	TestNo: SW7470A	Units: mg/L
SampType: ICV	Run ID: CETAC2_HG_190524A	Analysis Date: 5/24/2019 9:24:00 AM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
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Mercury	0.00400	0.000200	0.00400	0	100	90	110			
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Sample ID CCV2-190524	Batch ID: R104261	TestNo: SW7470A	Units: mg/L
SampType: CCV	Run ID: CETAC2_HG_190524A	Analysis Date: 5/24/2019 10:36:42 AM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
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Mercury	0.00212	0.000200	0.00200	0	106	90	110			
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Sample ID CCV3-190524	Batch ID: R104261	TestNo: SW7470A	Units: mg/L
SampType: CCV	Run ID: CETAC2_HG_190524A	Analysis Date: 5/24/2019 11:19:48 AM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
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Mercury	0.00200	0.000200	0.00200	0	100	90	110			
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Qualifiers:	B Analyte detected in the associated Method Blank	DF Dilution Factor
	J Analyte detected between MDL and RL	MDL Method Detection Limit
	ND Not Detected at the Method Detection Limit	R RPD outside accepted control limits
	RL Reporting Limit	S Spike Recovery outside control limits
	J Analyte detected between SDL and RL	N Parameter not NELAP certified

CLIENT: Golder
Work Order: 1905205
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS4_190522D

The QC data in batch 90989 applies to the following samples: 1905205-01B, 1905205-02B, 1905205-03B, 1905205-04B, 1905205-05B, 1905205-06B, 1905205-07B, 1905205-08B, 1905205-09B

Sample ID: MB-90989	Batch ID: 90989	TestNo: SW6020A	Units: mg/L
SampType: MBLK	Run ID: ICP-MS4_190522D	Analysis Date: 5/22/2019 2:44:00 PM	Prep Date: 5/20/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	<0.000800	0.00250								
Arsenic	<0.00200	0.00500								
Barium	<0.00300	0.0100								
Beryllium	<0.000300	0.00100								
Boron	<0.0100	0.0300								
Cadmium	<0.000300	0.00100								
Calcium	<0.100	0.300								
Chromium	<0.00200	0.00500								
Cobalt	<0.00300	0.00500								
Iron	<0.0300	0.100								
Lead	<0.000300	0.00100								
Lithium	<0.00500	0.0100								
Magnesium	<0.100	0.300								
Molybdenum	<0.00200	0.00500								
Potassium	<0.100	0.300								
Selenium	<0.00200	0.00500								
Sodium	<0.100	0.300								
Thallium	<0.000500	0.00150								

Sample ID: LCS-90989	Batch ID: 90989	TestNo: SW6020A	Units: mg/L
SampType: LCS	Run ID: ICP-MS4_190522D	Analysis Date: 5/22/2019 2:46:00 PM	Prep Date: 5/20/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.202	0.00250	0.200	0	101	80	120			
Arsenic	0.201	0.00500	0.200	0	100	80	120			
Barium	0.198	0.0100	0.200	0	99.2	80	120			
Beryllium	0.198	0.00100	0.200	0	99.2	80	120			
Boron	0.202	0.0300	0.200	0	101	80	120			
Cadmium	0.199	0.00100	0.200	0	99.6	80	120			
Calcium	4.60	0.300	5.00	0	92.1	80	120			
Chromium	0.200	0.00500	0.200	0	99.8	80	120			
Cobalt	0.202	0.00500	0.200	0	101	80	120			
Iron	5.23	0.100	5.00	0	105	80	120			
Lead	0.184	0.00100	0.200	0	91.9	80	120			
Lithium	0.196	0.0100	0.200	0	98.0	80	120			
Magnesium	5.02	0.300	5.00	0	100	80	120			
Molybdenum	0.190	0.00500	0.200	0	95.1	80	120			
Potassium	5.06	0.300	5.00	0	101	80	120			
Selenium	0.209	0.00500	0.200	0	104	80	120			

Qualifiers:

B Analyte detected in the associated Method Blank	DF Dilution Factor
J Analyte detected between MDL and RL	MDL Method Detection Limit
ND Not Detected at the Method Detection Limit	R RPD outside accepted control limits
RL Reporting Limit	S Spike Recovery outside control limits
J Analyte detected between SDL and RL	N Parameter not NELAP certified

CLIENT: Golder
Work Order: 1905205
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS4_190522D

Sample ID LCS-90989	Batch ID: 90989	TestNo: SW6020A	Units: mg/L							
SampType: LCS	Run ID: ICP-MS4_190522D	Analysis Date: 5/22/2019 2:46:00 PM	Prep Date: 5/20/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Sodium	5.02	0.300	5.00	0	100	80	120			
Thallium	0.202	0.00150	0.200	0	101	80	120			

Sample ID LCSD-90989	Batch ID: 90989	TestNo: SW6020A	Units: mg/L							
SampType: LCSD	Run ID: ICP-MS4_190522D	Analysis Date: 5/22/2019 2:48:00 PM	Prep Date: 5/20/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.201	0.00250	0.200	0	100	80	120	0.333	15	
Arsenic	0.203	0.00500	0.200	0	101	80	120	0.942	15	
Barium	0.199	0.0100	0.200	0	99.3	80	120	0.128	15	
Beryllium	0.198	0.00100	0.200	0	99.1	80	120	0.129	15	
Boron	0.201	0.0300	0.200	0	101	80	120	0.298	15	
Cadmium	0.198	0.00100	0.200	0	99.2	80	120	0.362	15	
Calcium	4.62	0.300	5.00	0	92.4	80	120	0.325	15	
Chromium	0.199	0.00500	0.200	0	99.7	80	120	0.085	15	
Cobalt	0.203	0.00500	0.200	0	102	80	120	0.820	15	
Iron	5.15	0.100	5.00	0	103	80	120	1.50	15	
Lead	0.185	0.00100	0.200	0	92.3	80	120	0.421	15	
Lithium	0.200	0.0100	0.200	0	100	80	120	2.22	15	
Magnesium	5.07	0.300	5.00	0	101	80	120	0.937	15	
Molybdenum	0.190	0.00500	0.200	0	95.0	80	120	0.081	15	
Potassium	5.12	0.300	5.00	0	102	80	120	1.16	15	
Selenium	0.204	0.00500	0.200	0	102	80	120	2.39	15	
Sodium	5.05	0.300	5.00	0	101	80	120	0.519	15	
Thallium	0.199	0.00150	0.200	0	99.3	80	120	1.55	15	

Sample ID 1905185-06B SD	Batch ID: 90989	TestNo: SW6020A	Units: mg/L							
SampType: SD	Run ID: ICP-MS4_190522D	Analysis Date: 5/22/2019 2:54:00 PM	Prep Date: 5/20/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	<0.00400	0.0125	0	0				0	10	
Arsenic	<0.0100	0.0250	0	0				0	10	
Barium	0.0256	0.0500	0	0.0253				1.30	10	
Beryllium	<0.00150	0.00500	0	0				0	10	
Boron	0.501	0.150	0	0.449				10.8	10	R
Cadmium	<0.00150	0.00500	0	0				0	10	
Chromium	<0.0100	0.0250	0	0				0	10	
Cobalt	<0.0150	0.0250	0	0				0	10	
Iron	<0.150	0.500	0	0				0	10	
Lead	<0.00150	0.00500	0	0				0	10	
Lithium	0.109	0.0500	0	0.101				7.40	10	

Qualifiers: B Analyte detected in the associated Method Blank DF Dilution Factor
J Analyte detected between MDL and RL MDL Method Detection Limit
ND Not Detected at the Method Detection Limit R RPD outside accepted control limits
RL Reporting Limit S Spike Recovery outside control limits
J Analyte detected between SDL and RL N Parameter not NELAP certified

CLIENT: Golder
Work Order: 1905205
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS4_190522D

Sample ID 1905185-06B SD	Batch ID: 90989	TestNo: SW6020A	Units: mg/L							
SampType: SD	Run ID: ICP-MS4_190522D	Analysis Date: 5/22/2019 2:54:00 PM	Prep Date: 5/20/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Molybdenum	<0.0100	0.0250	0	0.00218				0	10	
Potassium	13.4	1.50	0	13.2				1.21	10	
Selenium	<0.0100	0.0250	0	0				0	10	
Thallium	<0.00250	0.00750	0	0				0	10	

Sample ID 1905185-06B PDS	Batch ID: 90989	TestNo: SW6020A	Units: mg/L							
SampType: PDS	Run ID: ICP-MS4_190522D	Analysis Date: 5/22/2019 3:13:00 PM	Prep Date: 5/20/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.201	0.00250	0.200	0	100	80	120			
Arsenic	0.204	0.00500	0.200	0	102	80	120			
Barium	0.218	0.0100	0.200	0.0253	96.3	80	120			
Beryllium	0.174	0.00100	0.200	0	87.2	80	120			
Boron	0.613	0.0300	0.200	0.449	81.7	80	120			
Cadmium	0.183	0.00100	0.200	0	91.4	80	120			
Chromium	0.188	0.00500	0.200	0	94.2	80	120			
Cobalt	0.193	0.00500	0.200	0	96.4	80	120			
Iron	4.70	0.100	5.00	0	94.1	80	120			
Lead	0.186	0.00100	0.200	0	93.0	80	120			
Lithium	0.265	0.0100	0.200	0.101	81.8	80	120			
Molybdenum	0.186	0.00500	0.200	0.00218	91.9	80	120			
Potassium	17.5	0.300	5.00	13.3	84.0	80	120			
Selenium	0.213	0.00500	0.200	0	106	80	120			
Thallium	0.200	0.00150	0.200	0	100	80	120			

Sample ID 1905185-06B MS	Batch ID: 90989	TestNo: SW6020A	Units: mg/L							
SampType: MS	Run ID: ICP-MS4_190522D	Analysis Date: 5/22/2019 3:15:00 PM	Prep Date: 5/20/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.202	0.00250	0.200	0	101	80	120			
Arsenic	0.208	0.00500	0.200	0	104	80	120			
Barium	0.226	0.0100	0.200	0.0253	100	80	120			
Beryllium	0.174	0.00100	0.200	0	87.0	80	120			
Boron	0.654	0.0300	0.200	0.449	103	80	120			
Cadmium	0.185	0.00100	0.200	0	92.7	80	120			
Calcium	197	0.300	5.00	194	64.2	80	120			S
Chromium	0.186	0.00500	0.200	0	93.0	80	120			
Cobalt	0.193	0.00500	0.200	0	96.7	80	120			
Iron	4.82	0.100	5.00	0	96.4	80	120			
Lead	0.187	0.00100	0.200	0	93.7	80	120			
Lithium	0.270	0.0100	0.200	0.101	84.2	80	120			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1905205
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS4_190522D

Sample ID 1905185-06B MS	Batch ID: 90989	TestNo: SW6020A	Units: mg/L							
SampType: MS	Run ID: ICP-MS4_190522D	Analysis Date: 5/22/2019 3:15:00 PM	Prep Date: 5/20/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Magnesium	128	0.300	5.00	128	-3.79	80	120			S
Molybdenum	0.195	0.00500	0.200	0.00218	96.2	80	120			
Potassium	18.5	0.300	5.00	13.3	105	80	120			
Selenium	0.214	0.00500	0.200	0	107	80	120			
Sodium	252	0.300	5.00	257	-103	80	120			S
Thallium	0.203	0.00150	0.200	0	101	80	120			

Sample ID 1905185-06B MSD	Batch ID: 90989	TestNo: SW6020A	Units: mg/L							
SampType: MSD	Run ID: ICP-MS4_190522D	Analysis Date: 5/22/2019 3:17:00 PM	Prep Date: 5/20/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.200	0.00250	0.200	0	100	80	120	0.836	15	
Arsenic	0.208	0.00500	0.200	0	104	80	120	0.067	15	
Barium	0.227	0.0100	0.200	0.0253	101	80	120	0.141	15	
Beryllium	0.174	0.00100	0.200	0	86.8	80	120	0.265	15	
Boron	0.618	0.0300	0.200	0.449	84.6	80	120	5.65	15	
Cadmium	0.184	0.00100	0.200	0	92.1	80	120	0.555	15	
Calcium	195	0.300	5.00	194	16.8	80	120	1.21	15	S
Chromium	0.187	0.00500	0.200	0	93.6	80	120	0.569	15	
Cobalt	0.192	0.00500	0.200	0	95.8	80	120	1.00	15	
Iron	4.73	0.100	5.00	0	94.7	80	120	1.78	15	
Lead	0.190	0.00100	0.200	0	94.8	80	120	1.15	15	
Lithium	0.265	0.0100	0.200	0.101	81.8	80	120	1.82	15	
Magnesium	127	0.300	5.00	128	-17.7	80	120	0.544	15	S
Molybdenum	0.197	0.00500	0.200	0.00218	97.5	80	120	1.33	15	
Potassium	18.3	0.300	5.00	13.3	100	80	120	1.25	15	
Selenium	0.213	0.00500	0.200	0	107	80	120	0.639	15	
Sodium	256	0.300	5.00	257	-34.0	80	120	1.36	15	S
Thallium	0.206	0.00150	0.200	0	103	80	120	1.46	15	

Qualifiers: B Analyte detected in the associated Method Blank
J Analyte detected between MDL and RL
ND Not Detected at the Method Detection Limit
RL Reporting Limit
J Analyte detected between SDL and RL
DF Dilution Factor
MDL Method Detection Limit
R RPD outside accepted control limits
S Spike Recovery outside control limits
N Parameter not NELAP certified

CLIENT: Golder
Work Order: 1905205
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS4_190522D

Sample ID ICV-190522	Batch ID: R104232	TestNo: SW6020A	Units: mg/L
SampType: ICV	Run ID: ICP-MS4_190522D	Analysis Date: 5/22/2019 11:38:00 AM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.101	0.00250	0.100	0	101	90	110			
Arsenic	0.102	0.00500	0.100	0	102	90	110			
Barium	0.0975	0.0100	0.100	0	97.5	90	110			
Beryllium	0.0986	0.00100	0.100	0	98.6	90	110			
Boron	0.104	0.0300	0.100	0	104	90	110			
Cadmium	0.0995	0.00100	0.100	0	99.5	90	110			
Calcium	2.35	0.300	2.50	0	94.2	90	110			
Chromium	0.104	0.00500	0.100	0	104	90	110			
Cobalt	0.105	0.00500	0.100	0	105	90	110			
Iron	2.57	0.100	2.50	0	103	90	110			
Lead	0.0926	0.00100	0.100	0	92.6	90	110			
Lithium	0.103	0.0100	0.100	0	103	90	110			
Magnesium	2.45	0.300	2.50	0	98.2	90	110			
Molybdenum	0.0911	0.00500	0.100	0	91.1	90	110			
Potassium	2.52	0.300	2.50	0	101	90	110			
Selenium	0.102	0.00500	0.100	0	102	90	110			
Sodium	2.53	0.300	2.50	0	101	90	110			
Thallium	0.0926	0.00150	0.100	0	92.6	90	110			

Sample ID LCVL-190522	Batch ID: R104232	TestNo: SW6020A	Units: mg/L
SampType: LCVL	Run ID: ICP-MS4_190522D	Analysis Date: 5/22/2019 11:43:00 AM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.00190	0.00250	0.00200	0	95.0	70	130			
Arsenic	0.00497	0.00500	0.00500	0	99.4	70	130			
Barium	0.00463	0.0100	0.00500	0	92.6	70	130			
Beryllium	0.00117	0.00100	0.00100	0	117	70	130			
Boron	0.0197	0.0300	0.0200	0	98.5	70	130			
Cadmium	0.000953	0.00100	0.00100	0	95.3	70	130			
Calcium	0.0981	0.300	0.100	0	98.1	70	130			
Chromium	0.00486	0.00500	0.00500	0	97.2	70	130			
Cobalt	0.00493	0.00500	0.00500	0	98.7	70	130			
Iron	0.111	0.100	0.100	0	111	70	130			
Lead	0.000870	0.00100	0.00100	0	87.0	70	130			
Lithium	0.00926	0.0100	0.0100	0	92.6	70	130			
Magnesium	0.0967	0.300	0.100	0	96.7	70	130			
Molybdenum	0.00458	0.00500	0.00500	0	91.5	70	130			
Potassium	0.0964	0.300	0.100	0	96.4	70	130			
Selenium	0.00494	0.00500	0.00500	0	98.8	70	130			
Sodium	0.0966	0.300	0.100	0	96.6	70	130			
Thallium	0.000843	0.00150	0.00100	0	84.3	70	130			

Qualifiers:

B Analyte detected in the associated Method Blank	DF Dilution Factor
J Analyte detected between MDL and RL	MDL Method Detection Limit
ND Not Detected at the Method Detection Limit	R RPD outside accepted control limits
RL Reporting Limit	S Spike Recovery outside control limits
J Analyte detected between SDL and RL	N Parameter not NELAP certified

CLIENT: Golder
Work Order: 1905205
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS4_190522D

Sample ID: CCV4-190522	Batch ID: R104232	TestNo: SW6020A	Units: mg/L
SampType: CCV	Run ID: ICP-MS4_190522D	Analysis Date: 5/22/2019 2:34:00 PM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.203	0.00250	0.200	0	102	90	110			
Arsenic	0.209	0.00500	0.200	0	104	90	110			
Barium	0.202	0.0100	0.200	0	101	90	110			
Beryllium	0.201	0.00100	0.200	0	100	90	110			
Boron	0.215	0.0300	0.200	0	108	90	110			
Cadmium	0.202	0.00100	0.200	0	101	90	110			
Calcium	4.66	0.300	5.00	0	93.3	90	110			
Chromium	0.203	0.00500	0.200	0	102	90	110			
Cobalt	0.208	0.00500	0.200	0	104	90	110			
Iron	5.05	0.100	5.00	0	101	90	110			
Lead	0.193	0.00100	0.200	0	96.7	90	110			
Lithium	0.195	0.0100	0.200	0	97.5	90	110			
Magnesium	5.05	0.300	5.00	0	101	90	110			
Molybdenum	0.193	0.00500	0.200	0	96.4	90	110			
Potassium	5.13	0.300	5.00	0	103	90	110			
Selenium	0.212	0.00500	0.200	0	106	90	110			
Sodium	5.03	0.300	5.00	0	101	90	110			
Thallium	0.205	0.00150	0.200	0	103	90	110			

Sample ID: LCVL4-190522	Batch ID: R104232	TestNo: SW6020A	Units: mg/L
SampType: LCVL	Run ID: ICP-MS4_190522D	Analysis Date: 5/22/2019 2:40:00 PM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.00194	0.00250	0.00200	0	96.9	70	130			
Arsenic	0.00504	0.00500	0.00500	0	101	70	130			
Barium	0.00472	0.0100	0.00500	0	94.5	70	130			
Beryllium	0.00124	0.00100	0.00100	0	124	70	130			
Boron	0.0223	0.0300	0.0200	0	111	70	130			
Cadmium	0.000955	0.00100	0.00100	0	95.5	70	130			
Calcium	0.111	0.300	0.100	0	111	70	130			
Chromium	0.00487	0.00500	0.00500	0	97.4	70	130			
Cobalt	0.00501	0.00500	0.00500	0	100	70	130			
Iron	0.114	0.100	0.100	0	114	70	130			
Lead	0.000846	0.00100	0.00100	0	84.6	70	130			
Lithium	0.00964	0.0100	0.0100	0	96.4	70	130			
Magnesium	0.101	0.300	0.100	0	101	70	130			
Molybdenum	0.00453	0.00500	0.00500	0	90.7	70	130			
Potassium	0.0997	0.300	0.100	0	99.7	70	130			
Selenium	0.00427	0.00500	0.00500	0	85.3	70	130			
Sodium	0.111	0.300	0.100	0	111	70	130			
Thallium	0.000835	0.00150	0.00100	0	83.5	70	130			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1905205
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS4_190522D

Sample ID: CCV5-190522	Batch ID: R104232	TestNo: SW6020A	Units: mg/L
SampType: CCV	Run ID: ICP-MS4_190522D	Analysis Date: 5/22/2019 3:26:00 PM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.205	0.00250	0.200	0	102	90	110			
Arsenic	0.205	0.00500	0.200	0	103	90	110			
Barium	0.200	0.0100	0.200	0	99.8	90	110			
Beryllium	0.200	0.00100	0.200	0	100	90	110			
Boron	0.220	0.0300	0.200	0	110	90	110			
Cadmium	0.202	0.00100	0.200	0	101	90	110			
Calcium	4.68	0.300	5.00	0	93.5	90	110			
Chromium	0.203	0.00500	0.200	0	101	90	110			
Cobalt	0.205	0.00500	0.200	0	102	90	110			
Iron	5.15	0.100	5.00	0	103	90	110			
Lead	0.188	0.00100	0.200	0	93.8	90	110			
Lithium	0.203	0.0100	0.200	0	102	90	110			
Magnesium	5.17	0.300	5.00	0	103	90	110			
Molybdenum	0.195	0.00500	0.200	0	97.3	90	110			
Potassium	5.20	0.300	5.00	0	104	90	110			
Selenium	0.213	0.00500	0.200	0	107	90	110			
Sodium	5.13	0.300	5.00	0	103	90	110			
Thallium	0.201	0.00150	0.200	0	101	90	110			

Sample ID: LCVL5-190522	Batch ID: R104232	TestNo: SW6020A	Units: mg/L
SampType: LCVL	Run ID: ICP-MS4_190522D	Analysis Date: 5/22/2019 3:46:00 PM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.00186	0.00250	0.00200	0	93.2	70	130			
Arsenic	0.00475	0.00500	0.00500	0	95.0	70	130			
Barium	0.00461	0.0100	0.00500	0	92.3	70	130			
Beryllium	0.000947	0.00100	0.00100	0	94.7	70	130			
Boron	0.0229	0.0300	0.0200	0	115	70	130			
Cadmium	0.000924	0.00100	0.00100	0	92.4	70	130			
Calcium	0.102	0.300	0.100	0	102	70	130			
Chromium	0.00452	0.00500	0.00500	0	90.4	70	130			
Cobalt	0.00479	0.00500	0.00500	0	95.8	70	130			
Iron	0.106	0.100	0.100	0	106	70	130			
Lead	0.000756	0.00100	0.00100	0	75.6	70	130			
Lithium	0.00948	0.0100	0.0100	0	94.8	70	130			
Magnesium	0.0981	0.300	0.100	0	98.1	70	130			
Molybdenum	0.00455	0.00500	0.00500	0	91.0	70	130			
Potassium	0.0951	0.300	0.100	0	95.1	70	130			
Selenium	0.00474	0.00500	0.00500	0	94.7	70	130			
Sodium	0.126	0.300	0.100	0	126	70	130			
Thallium	0.000763	0.00150	0.00100	0	76.3	70	130			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1905205
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS4_190522D

Sample ID: CCV6-190522	Batch ID: R104232	TestNo: SW6020A	Units: mg/L
SampType: CCV	Run ID: ICP-MS4_190522D	Analysis Date: 5/22/2019 4:12:00 PM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.208	0.00250	0.200	0	104	90	110			
Arsenic	0.211	0.00500	0.200	0	106	90	110			
Barium	0.208	0.0100	0.200	0	104	90	110			
Beryllium	0.195	0.00100	0.200	0	97.5	90	110			
Boron	0.207	0.0300	0.200	0	104	90	110			
Cadmium	0.202	0.00100	0.200	0	101	90	110			
Calcium	4.74	0.300	5.00	0	94.8	90	110			
Chromium	0.202	0.00500	0.200	0	101	90	110			
Cobalt	0.209	0.00500	0.200	0	104	90	110			
Iron	5.12	0.100	5.00	0	102	90	110			
Lead	0.192	0.00100	0.200	0	96.1	90	110			
Lithium	0.197	0.0100	0.200	0	98.7	90	110			
Magnesium	5.05	0.300	5.00	0	101	90	110			
Molybdenum	0.197	0.00500	0.200	0	98.4	90	110			
Potassium	5.17	0.300	5.00	0	103	90	110			
Selenium	0.213	0.00500	0.200	0	107	90	110			
Sodium	5.09	0.300	5.00	0	102	90	110			
Thallium	0.206	0.00150	0.200	0	103	90	110			

Sample ID: LCVL6-190522	Batch ID: R104232	TestNo: SW6020A	Units: mg/L
SampType: LCVL	Run ID: ICP-MS4_190522D	Analysis Date: 5/22/2019 4:22:00 PM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.00200	0.00250	0.00200	0	100	70	130			
Arsenic	0.00486	0.00500	0.00500	0	97.1	70	130			
Barium	0.00495	0.0100	0.00500	0	99.0	70	130			
Beryllium	0.000939	0.00100	0.00100	0	93.9	70	130			
Boron	0.0216	0.0300	0.0200	0	108	70	130			
Cadmium	0.00101	0.00100	0.00100	0	101	70	130			
Calcium	0.113	0.300	0.100	0	113	70	130			
Chromium	0.00486	0.00500	0.00500	0	97.1	70	130			
Cobalt	0.00489	0.00500	0.00500	0	97.8	70	130			
Iron	0.113	0.100	0.100	0	113	70	130			
Lead	0.000805	0.00100	0.00100	0	80.5	70	130			
Lithium	0.00903	0.0100	0.0100	0	90.3	70	130			
Magnesium	0.104	0.300	0.100	0	104	70	130			
Molybdenum	0.00464	0.00500	0.00500	0	92.8	70	130			
Potassium	0.0982	0.300	0.100	0	98.2	70	130			
Selenium	0.00531	0.00500	0.00500	0	106	70	130			
Sodium	0.147	0.300	0.100	0	147	70	130			S
Thallium	0.000807	0.00150	0.00100	0	80.7	70	130			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1905205
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS4_190523A

The QC data in batch 90989 applies to the following samples: 1905205-01B, 1905205-02B, 1905205-03B, 1905205-04B, 1905205-05B, 1905205-06B, 1905205-07B, 1905205-08B, 1905205-09B

Sample ID 1905185-06B SD	Batch ID: 90989	TestNo: SW6020A	Units: mg/L
SampType: SD	Run ID: ICP-MS4_190523A	Analysis Date: 5/23/2019 11:20:00 AM	Prep Date: 5/20/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	207	30.0	0	200				3.62	10	
Magnesium	134	30.0	0	130				2.71	10	
Sodium	266	30.0	0	265				0.189	10	

Sample ID 1905185-06B PDS	Batch ID: 90989	TestNo: SW6020A	Units: mg/L
SampType: PDS	Run ID: ICP-MS4_190523A	Analysis Date: 5/23/2019 11:40:00 AM	Prep Date: 5/20/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	295	6.00	100	200	95.2	80	120			
Magnesium	227	6.00	100	130	96.8	80	120			
Sodium	365	6.00	100	265	99.6	80	120			

<p>Qualifiers:</p> <p>B Analyte detected in the associated Method Blank</p> <p>J Analyte detected between MDL and RL</p> <p>ND Not Detected at the Method Detection Limit</p> <p>RL Reporting Limit</p> <p>J Analyte detected between SDL and RL</p>	<p>DF Dilution Factor</p> <p>MDL Method Detection Limit</p> <p>R RPD outside accepted control limits</p> <p>S Spike Recovery outside control limits</p> <p>N Parameter not NELAP certified</p>
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CLIENT: Golder
Work Order: 1905205
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS4_190523A

Sample ID ICV-190523	Batch ID: R104240	TestNo: SW6020A	Units: mg/L
SampType: ICV	Run ID: ICP-MS4_190523A	Analysis Date: 5/23/2019 11:01:00 AM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	2.39	0.300	2.50	0	95.8	90	110			
Iron	2.56	0.100	2.50	0	102	90	110			
Magnesium	2.53	0.300	2.50	0	101	90	110			
Sodium	2.56	0.300	2.50	0	102	90	110			

Sample ID LCVL-190523	Batch ID: R104240	TestNo: SW6020A	Units: mg/L
SampType: LCVL	Run ID: ICP-MS4_190523A	Analysis Date: 5/23/2019 11:09:00 AM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	0.0901	0.300	0.100	0	90.1	70	130			
Iron	0.105	0.100	0.100	0	105	70	130			
Magnesium	0.0985	0.300	0.100	0	98.5	70	130			
Sodium	0.0949	0.300	0.100	0	94.9	70	130			

Sample ID CCV1-190523	Batch ID: R104240	TestNo: SW6020A	Units: mg/L
SampType: CCV	Run ID: ICP-MS4_190523A	Analysis Date: 5/23/2019 11:42:00 AM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	4.76	0.300	5.00	0	95.2	90	110			
Iron	5.10	0.100	5.00	0	102	90	110			
Magnesium	5.21	0.300	5.00	0	104	90	110			
Sodium	5.14	0.300	5.00	0	103	90	110			

Sample ID LCVL1-190523	Batch ID: R104240	TestNo: SW6020A	Units: mg/L
SampType: LCVL	Run ID: ICP-MS4_190523A	Analysis Date: 5/23/2019 11:48:00 AM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	0.0899	0.300	0.100	0	89.9	70	130			
Iron	0.105	0.100	0.100	0	105	70	130			
Magnesium	0.0985	0.300	0.100	0	98.5	70	130			
Sodium	0.0973	0.300	0.100	0	97.3	70	130			

Sample ID CCV2-190523	Batch ID: R104240	TestNo: SW6020A	Units: mg/L
SampType: CCV	Run ID: ICP-MS4_190523A	Analysis Date: 5/23/2019 12:21:00 PM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	4.79	0.300	5.00	0	95.7	90	110			
Iron	5.15	0.100	5.00	0	103	90	110			
Magnesium	5.29	0.300	5.00	0	106	90	110			
Sodium	5.22	0.300	5.00	0	104	90	110			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1905205
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS4_190523A

Sample ID	LCVL2-190523	Batch ID:	R104240	TestNo:	SW6020A	Units:	mg/L		
SampType:	LCVL	Run ID:	ICP-MS4_190523A	Analysis Date:	5/23/2019 12:29:00 PM	Prep Date:			

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	0.101	0.300	0.100	0	101	70	130			
Iron	0.105	0.100	0.100	0	105	70	130			
Magnesium	0.0985	0.300	0.100	0	98.5	70	130			
Sodium	0.0994	0.300	0.100	0	99.4	70	130			

Qualifiers:	B Analyte detected in the associated Method Blank	DF Dilution Factor
	J Analyte detected between MDL and RL	MDL Method Detection Limit
	ND Not Detected at the Method Detection Limit	R RPD outside accepted control limits
	RL Reporting Limit	S Spike Recovery outside control limits
	J Analyte detected between SDL and RL	N Parameter not NELAP certified

CLIENT: Golder
Work Order: 1905205
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: IC4_190517A

The QC data in batch 90965 applies to the following samples: 1905205-01C, 1905205-02C, 1905205-03C, 1905205-04C, 1905205-05C, 1905205-06C, 1905205-07C, 1905205-08C, 1905205-09C

Sample ID MB-90965	Batch ID: 90965	TestNo: E300	Units: mg/L
SampType: MBLK	Run ID: IC4_190517A	Analysis Date: 5/17/2019 10:28:41 AM	Prep Date: 5/17/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	<0.300	1.00								
Fluoride	<0.100	0.400								
Nitrate-N	<0.100	0.500								
Sulfate	<1.00	3.00								

Sample ID LCS-90965	Batch ID: 90965	TestNo: E300	Units: mg/L
SampType: LCS	Run ID: IC4_190517A	Analysis Date: 5/17/2019 10:44:41 AM	Prep Date: 5/17/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	9.65	1.00	10.00	0	96.5	90	110			
Fluoride	4.17	0.400	4.000	0	104	90	110			
Nitrate-N	5.13	0.500	5.000	0	103	90	110			
Sulfate	29.8	3.00	30.00	0	99.5	90	110			

Sample ID LCS-90965	Batch ID: 90965	TestNo: E300	Units: mg/L
SampType: LCS	Run ID: IC4_190517A	Analysis Date: 5/17/2019 11:00:41 AM	Prep Date: 5/17/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	9.72	1.00	10.00	0	97.2	90	110	0.774	20	
Fluoride	4.22	0.400	4.000	0	106	90	110	1.24	20	
Nitrate-N	5.18	0.500	5.000	0	104	90	110	0.847	20	
Sulfate	30.0	3.00	30.00	0	100	90	110	0.565	20	

Sample ID 1905205-01CMS	Batch ID: 90965	TestNo: E300	Units: mg/L
SampType: MS	Run ID: IC4_190517A	Analysis Date: 5/17/2019 1:40:13 PM	Prep Date: 5/17/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	365	10.0	200.0	170.3	97.2	90	110			
Fluoride	216	4.00	200.0	0	108	90	110			
Nitrate-N	44.7	5.00	45.16	0	99.1	90	110			
Sulfate	251	30.0	200.0	49.70	101	90	110			

Sample ID 1905205-01CMSD	Batch ID: 90965	TestNo: E300	Units: mg/L
SampType: MSD	Run ID: IC4_190517A	Analysis Date: 5/17/2019 1:56:13 PM	Prep Date: 5/17/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	363	10.0	200.0	170.3	96.3	90	110	0.462	20	
Fluoride	217	4.00	200.0	0	108	90	110	0.421	20	
Nitrate-N	46.1	5.00	45.16	0	102	90	110	2.98	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1905205
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: IC4_190517A

Sample ID 1905205-01CMSD	Batch ID: 90965	TestNo: E300	Units: mg/L							
SampType: MSD	Run ID: IC4_190517A	Analysis Date: 5/17/2019 1:56:13 PM	Prep Date: 5/17/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Sulfate	251	30.0	200.0	49.70	101	90	110	0.050	20	

Sample ID 1905205-02CMS	Batch ID: 90965	TestNo: E300	Units: mg/L							
SampType: MS	Run ID: IC4_190517A	Analysis Date: 5/17/2019 2:28:13 PM	Prep Date: 5/17/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Chloride	393	10.0	200.0	204.5	94.3	90	110			
Fluoride	215	4.00	200.0	0	107	90	110			
Nitrate-N	45.4	5.00	45.16	0	100	90	110			
Sulfate	239	30.0	200.0	41.25	98.7	90	110			

Sample ID 1905205-02CMSD	Batch ID: 90965	TestNo: E300	Units: mg/L							
SampType: MSD	Run ID: IC4_190517A	Analysis Date: 5/17/2019 2:44:13 PM	Prep Date: 5/17/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Chloride	396	10.0	200.0	204.5	95.8	90	110	0.770	20	
Fluoride	218	4.00	200.0	0	109	90	110	1.50	20	
Nitrate-N	46.0	5.00	45.16	0	102	90	110	1.44	20	
Sulfate	242	30.0	200.0	41.25	100	90	110	1.42	20	

Qualifiers:

B Analyte detected in the associated Method Blank	DF Dilution Factor
J Analyte detected between MDL and RL	MDL Method Detection Limit
ND Not Detected at the Method Detection Limit	R RPD outside accepted control limits
RL Reporting Limit	S Spike Recovery outside control limits
J Analyte detected between SDL and RL	N Parameter not NELAP certified

CLIENT: Golder
Work Order: 1905205
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: IC4_190517A

Sample ID ICV-190517	Batch ID: R104153	TestNo: E300	Units: mg/L							
SampType: ICV	Run ID: IC4_190517A	Analysis Date: 5/17/2019 9:56:41 AM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	25.0	1.00	25.00	0	99.8	90	110			
Fluoride	10.2	0.400	10.00	0	102	90	110			
Nitrate-N	13.0	0.500	12.50	0	104	90	110			
Sulfate	75.7	3.00	75.00	0	101	90	110			

Sample ID CCV1-190517	Batch ID: R104153	TestNo: E300	Units: mg/L							
SampType: CCV	Run ID: IC4_190517A	Analysis Date: 5/17/2019 5:24:12 PM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	9.74	1.00	10.00	0	97.4	90	110			
Fluoride	4.33	0.400	4.000	0	108	90	110			
Nitrate-N	5.19	0.500	5.000	0	104	90	110			
Sulfate	30.1	3.00	30.00	0	100	90	110			

Sample ID CCV2-190517	Batch ID: R104153	TestNo: E300	Units: mg/L							
SampType: CCV	Run ID: IC4_190517A	Analysis Date: 5/17/2019 9:08:12 PM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	9.75	1.00	10.00	0	97.5	90	110			
Fluoride	4.40	0.400	4.000	0	110	90	110			
Nitrate-N	5.18	0.500	5.000	0	104	90	110			
Sulfate	30.1	3.00	30.00	0	100	90	110			

<p>Qualifiers:</p> <p>B Analyte detected in the associated Method Blank</p> <p>J Analyte detected between MDL and RL</p> <p>ND Not Detected at the Method Detection Limit</p> <p>RL Reporting Limit</p> <p>J Analyte detected between SDL and RL</p>	<p>DF Dilution Factor</p> <p>MDL Method Detection Limit</p> <p>R RPD outside accepted control limits</p> <p>S Spike Recovery outside control limits</p> <p>N Parameter not NELAP certified</p>
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CLIENT: Golder
Work Order: 1905205
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: IC4_190520A

The QC data in batch 90986 applies to the following samples: 1905205-07C, 1905205-08C

Sample ID MB-90986	Batch ID: 90986	TestNo: E300	Units: mg/L							
SampType: MBLK	Run ID: IC4_190520A	Analysis Date: 5/20/2019 10:20:17 AM	Prep Date: 5/20/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	<0.300	1.00								

Sample ID LCS-90986	Batch ID: 90986	TestNo: E300	Units: mg/L							
SampType: LCS	Run ID: IC4_190520A	Analysis Date: 5/20/2019 10:36:17 AM	Prep Date: 5/20/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	9.25	1.00	10.00	0	92.5	90	110			

Sample ID LCSD-90986	Batch ID: 90986	TestNo: E300	Units: mg/L							
SampType: LCSD	Run ID: IC4_190520A	Analysis Date: 5/20/2019 10:52:17 AM	Prep Date: 5/20/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	9.37	1.00	10.00	0	93.7	90	110	1.29	20	

Sample ID 1905193-02DMS	Batch ID: 90986	TestNo: E300	Units: mg/L							
SampType: MS	Run ID: IC4_190520A	Analysis Date: 5/20/2019 12:51:06 PM	Prep Date: 5/20/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	2120	100	2000	187.2	96.4	90	110			

Sample ID 1905193-02DMSD	Batch ID: 90986	TestNo: E300	Units: mg/L							
SampType: MSD	Run ID: IC4_190520A	Analysis Date: 5/20/2019 1:07:06 PM	Prep Date: 5/20/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	2130	100	2000	187.2	97.0	90	110	0.536	20	

Sample ID 1905194-01DMS	Batch ID: 90986	TestNo: E300	Units: mg/L							
SampType: MS	Run ID: IC4_190520A	Analysis Date: 5/20/2019 1:39:06 PM	Prep Date: 5/20/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	2020	100	2000	0	101	90	110			

Sample ID 1905194-01DMSD	Batch ID: 90986	TestNo: E300	Units: mg/L							
SampType: MSD	Run ID: IC4_190520A	Analysis Date: 5/20/2019 1:55:06 PM	Prep Date: 5/20/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	2020	100	2000	0	101	90	110	0.304	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1905205
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: IC4_190520A

Sample ID ICV-190520	Batch ID: R104175	TestNo: E300	Units: mg/L							
SampType: ICV	Run ID: IC4_190520A	Analysis Date: 5/20/2019 9:48:17 AM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	23.6	1.00	25.00	0	94.4	90	110			

Sample ID CCV1-190520	Batch ID: R104175	TestNo: E300	Units: mg/L							
SampType: CCV	Run ID: IC4_190520A	Analysis Date: 5/20/2019 4:03:05 PM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	9.60	1.00	10.00	0	96.0	90	110			

Qualifiers:	B Analyte detected in the associated Method Blank	DF Dilution Factor
	J Analyte detected between MDL and RL	MDL Method Detection Limit
	ND Not Detected at the Method Detection Limit	R RPD outside accepted control limits
	RL Reporting Limit	S Spike Recovery outside control limits
	J Analyte detected between SDL and RL	N Parameter not NELAP certified

CLIENT: Golder
Work Order: 1905205
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: TITRATOR_190521A

The QC data in batch 91010 applies to the following samples: 1905205-01C, 1905205-02C, 1905205-03C, 1905205-04C, 1905205-05C, 1905205-06C, 1905205-07C, 1905205-08C, 1905205-09C

Sample ID: MB-91010	Batch ID: 91010	TestNo: M2320 B	Units: mg/L @ pH 4.17
SampType: MBLK	Run ID: TITRATOR_190521A	Analysis Date: 5/21/2019 9:19:00 AM	Prep Date: 5/21/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Alkalinity, Bicarbonate (As CaCO3)	<10.0	20.0								
Alkalinity, Carbonate (As CaCO3)	<10.0	20.0								
Alkalinity, Hydroxide (As CaCO3)	<10.0	20.0								
Alkalinity, Total (As CaCO3)	<20.0	20.0								

Sample ID: LCS-91010	Batch ID: 91010	TestNo: M2320 B	Units: mg/L @ pH 3.91
SampType: LCS	Run ID: TITRATOR_190521A	Analysis Date: 5/21/2019 9:23:00 AM	Prep Date: 5/21/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	54.4	20.0	50.00	0	109	74	129			

Sample ID: LCS-91010	Batch ID: 91010	TestNo: M2320 B	Units: mg/L @ pH 3.97
SampType: LCS	Run ID: TITRATOR_190521A	Analysis Date: 5/21/2019 9:27:00 AM	Prep Date: 5/21/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	53.6	20.0	50.00	0	107	74	129	1.48	20	

Sample ID: 1905205-01C DUP	Batch ID: 91010	TestNo: M2320 B	Units: mg/L @ pH 4.53
SampType: DUP	Run ID: TITRATOR_190521A	Analysis Date: 5/21/2019 10:14:00 AM	Prep Date: 5/21/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Alkalinity, Bicarbonate (As CaCO3)	267	20.0	0	261.5				2.04	20	
Alkalinity, Carbonate (As CaCO3)	<10.0	20.0	0	0				0	20	
Alkalinity, Hydroxide (As CaCO3)	<10.0	20.0	0	0				0	20	
Alkalinity, Total (As CaCO3)	267	20.0	0	261.5				2.04	20	

Sample ID: 1905229-02B DUP	Batch ID: 91010	TestNo: M2320 B	Units: mg/L @ pH 4.53
SampType: DUP	Run ID: TITRATOR_190521A	Analysis Date: 5/21/2019 4:14:00 PM	Prep Date: 5/21/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Alkalinity, Bicarbonate (As CaCO3)	250	20.0	0	251.0				0.319	20	
Alkalinity, Carbonate (As CaCO3)	<10.0	20.0	0	0				0	20	
Alkalinity, Hydroxide (As CaCO3)	<10.0	20.0	0	0				0	20	
Alkalinity, Total (As CaCO3)	250	20.0	0	251.0				0.319	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1905205
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: TITRATOR_190521A

Sample ID ICV-190521	Batch ID: R104203	TestNo: M2320 B	Units: mg/L @ pH 4.08
SampType: ICV	Run ID: TITRATOR_190521A	Analysis Date: 5/21/2019 9:15:00 AM	Prep Date: 5/21/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Alkalinity, Bicarbonate (As CaCO3)	8.08	20.0	0							
Alkalinity, Carbonate (As CaCO3)	96.5	20.0	0							
Alkalinity, Hydroxide (As CaCO3)	<10.0	20.0	0							
Alkalinity, Total (As CaCO3)	105	20.0	100.0	0	105	98	102			S

Sample ID CCV1-190521	Batch ID: R104203	TestNo: M2320 B	Units: mg/L @ pH 4.14
SampType: CCV	Run ID: TITRATOR_190521A	Analysis Date: 5/21/2019 12:25:00 PM	Prep Date: 5/21/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Alkalinity, Bicarbonate (As CaCO3)	13.9	20.0	0							
Alkalinity, Carbonate (As CaCO3)	86.6	20.0	0							
Alkalinity, Hydroxide (As CaCO3)	<10.0	20.0	0							
Alkalinity, Total (As CaCO3)	100	20.0	100.0	0	100	90	110			

Sample ID CCV2-190521	Batch ID: R104203	TestNo: M2320 B	Units: mg/L @ pH 4.2
SampType: CCV	Run ID: TITRATOR_190521A	Analysis Date: 5/21/2019 4:19:00 PM	Prep Date: 5/21/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Alkalinity, Bicarbonate (As CaCO3)	16.2	20.0	0							
Alkalinity, Carbonate (As CaCO3)	82.9	20.0	0							
Alkalinity, Hydroxide (As CaCO3)	<10.0	20.0	0							
Alkalinity, Total (As CaCO3)	99.0	20.0	100.0	0	99.0	90	110			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1905205
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: TITRATOR_190530A

The QC data in batch 91142 applies to the following samples: 1905205-05C, 1905205-06C

Sample ID MB-91142	Batch ID: 91142	TestNo: M2320 B	Units: mg/L @ pH 4.2							
SampType: MBLK	Run ID: TITRATOR_190530A	Analysis Date: 5/30/2019 3:08:00 PM	Prep Date: 5/30/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Alkalinity, Bicarbonate (As CaCO3)	<10.0	20.0								
Alkalinity, Carbonate (As CaCO3)	<10.0	20.0								
Alkalinity, Hydroxide (As CaCO3)	<10.0	20.0								
Alkalinity, Total (As CaCO3)	<20.0	20.0								

Sample ID LCS-91142	Batch ID: 91142	TestNo: M2320 B	Units: mg/L @ pH 4.3							
SampType: LCS	Run ID: TITRATOR_190530A	Analysis Date: 5/30/2019 3:12:00 PM	Prep Date: 5/30/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Alkalinity, Total (As CaCO3)	50.5	20.0	50.00	0	101	74	129			
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Sample ID 1905205-05C DUP	Batch ID: 91142	TestNo: M2320 B	Units: mg/L @ pH 4.52							
SampType: DUP	Run ID: TITRATOR_190530A	Analysis Date: 5/30/2019 3:41:00 PM	Prep Date: 5/30/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Alkalinity, Bicarbonate (As CaCO3)	236	20.0	0	237.0				0.296	20	
Alkalinity, Carbonate (As CaCO3)	<10.0	20.0	0	0				0	20	
Alkalinity, Hydroxide (As CaCO3)	<10.0	20.0	0	0				0	20	
Alkalinity, Total (As CaCO3)	236	20.0	0	237.0				0.296	20	

Sample ID LCSD-91142	Batch ID: 91142	TestNo: M2320 B	Units: mg/L @ pH 4.18							
SampType: LCSD	Run ID: TITRATOR_190530A	Analysis Date: 5/30/2019 4:10:00 PM	Prep Date: 5/30/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Alkalinity, Total (As CaCO3)	50.9	20.0	50.00	0	102	74	129	0.789	20	
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Sample ID 1905321-02A DUP	Batch ID: 91142	TestNo: M2320 B	Units: mg/L @ pH 4.51							
SampType: DUP	Run ID: TITRATOR_190530A	Analysis Date: 5/30/2019 5:07:00 PM	Prep Date: 5/30/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Alkalinity, Bicarbonate (As CaCO3)	142	20.0	0	138.0				2.86	20	
Alkalinity, Carbonate (As CaCO3)	<10.0	20.0	0	0				0	20	
Alkalinity, Hydroxide (As CaCO3)	<10.0	20.0	0	0				0	20	
Alkalinity, Total (As CaCO3)	142	20.0	0	138.0				2.86	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1905205
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: TITRATOR_190530A

Sample ID ICV-190530	Batch ID: R104367	TestNo: M2320 B	Units: mg/L @ pH 4.31							
SampType: ICV	Run ID: TITRATOR_190530A	Analysis Date: 5/30/2019 2:50:00 PM	Prep Date: 5/30/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Alkalinity, Bicarbonate (As CaCO3)	11.8	20.0	0							
Alkalinity, Carbonate (As CaCO3)	88.0	20.0	0							
Alkalinity, Hydroxide (As CaCO3)	<10.0	20.0	0							
Alkalinity, Total (As CaCO3)	99.8	20.0	100.0	0	99.8	98	102			

Sample ID CCV1-190530	Batch ID: R104367	TestNo: M2320 B	Units: mg/L @ pH 4.27							
SampType: CCV	Run ID: TITRATOR_190530A	Analysis Date: 5/30/2019 4:23:00 PM	Prep Date: 5/30/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Alkalinity, Bicarbonate (As CaCO3)	14.6	20.0	0							
Alkalinity, Carbonate (As CaCO3)	83.2	20.0	0							
Alkalinity, Hydroxide (As CaCO3)	<10.0	20.0	0							
Alkalinity, Total (As CaCO3)	97.8	20.0	100.0	0	97.8	90	110			

Sample ID CCV2-190530	Batch ID: R104367	TestNo: M2320 B	Units: mg/L @ pH 4.5							
SampType: CCV	Run ID: TITRATOR_190530A	Analysis Date: 5/30/2019 5:10:00 PM	Prep Date: 5/30/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Alkalinity, Bicarbonate (As CaCO3)	95.8	20.0	0							
Alkalinity, Carbonate (As CaCO3)	<10.0	20.0	0							
Alkalinity, Hydroxide (As CaCO3)	<10.0	20.0	0							
Alkalinity, Total (As CaCO3)	95.8	20.0	100.0	0	95.8	90	110			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1905205
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: UV/VIS_2_190517B

The QC data in batch 90972 applies to the following samples: 1905205-01C, 1905205-02C, 1905205-03C, 1905205-04C, 1905205-05C, 1905205-06C, 1905205-07C, 1905205-08C, 1905205-09C

Sample ID MB-90972	Batch ID: 90972	TestNo: M4500-P E	Units: mg/L							
SampType: MBLK	Run ID: UV/VIS_2_190517B	Analysis Date: 5/17/2019 12:34:00 PM	Prep Date: 5/17/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Phosphorus, Total Orthophosphate (As	<0.0300	0.100								

Sample ID LCS-90972	Batch ID: 90972	TestNo: M4500-P E	Units: mg/L							
SampType: LCS	Run ID: UV/VIS_2_190517B	Analysis Date: 5/17/2019 12:34:00 PM	Prep Date: 5/17/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Phosphorus, Total Orthophosphate (As	0.520	0.100	0.5000	0	104	80	120			

Sample ID LCS-90972	Batch ID: 90972	TestNo: M4500-P E	Units: mg/L							
SampType: LCS	Run ID: UV/VIS_2_190517B	Analysis Date: 5/17/2019 12:34:00 PM	Prep Date: 5/17/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Phosphorus, Total Orthophosphate (As	0.503	0.100	0.5000	0	101	80	120	3.32	15	

Sample ID 1905205-01CMS	Batch ID: 90972	TestNo: M4500-P E	Units: mg/L							
SampType: MS	Run ID: UV/VIS_2_190517B	Analysis Date: 5/17/2019 12:42:00 PM	Prep Date: 5/17/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Phosphorus, Total Orthophosphate (As	1.61	0.200	1.000	0.7140	90.0	80	120			

Sample ID 1905205-01CMSD	Batch ID: 90972	TestNo: M4500-P E	Units: mg/L							
SampType: MSD	Run ID: UV/VIS_2_190517B	Analysis Date: 5/17/2019 12:42:00 PM	Prep Date: 5/17/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Phosphorus, Total Orthophosphate (As	1.59	0.200	1.000	0.7140	87.2	80	120	1.75	15	

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1905205
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: UV/VIS_2_190517B

Sample ID ICV-190517	Batch ID: R104132	TestNo: M4500-P E	Units: mg/L							
SampType: ICV	Run ID: UV/VIS_2_190517B	Analysis Date: 5/17/2019 12:33:00 PM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Phosphorus, Total Orthophosphate (As	0.218	0.100	0.2000	0	109	85	115			

Sample ID CCV1-190517	Batch ID: R104132	TestNo: M4500-P E	Units: mg/L							
SampType: CCV	Run ID: UV/VIS_2_190517B	Analysis Date: 5/17/2019 12:42:00 PM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Phosphorus, Total Orthophosphate (As	0.536	0.100	0.5000	0	107	85	115			

Qualifiers:

- B Analyte detected in the associated Method Blank
- J Analyte detected between MDL and RL
- ND Not Detected at the Method Detection Limit
- RL Reporting Limit
- J Analyte detected between SDL and RL

- DF Dilution Factor
- MDL Method Detection Limit
- R RPD outside accepted control limits
- S Spike Recovery outside control limits
- N Parameter not NELAP certified

CLIENT: Golder
Work Order: 1905205
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: UV/VIS_2_190521B

The QC data in batch 91028 applies to the following samples: 1905205-01A, 1905205-02A, 1905205-03A, 1905205-04A, 1905205-05A, 1905205-06A, 1905205-07A, 1905205-08A, 1905205-09A

Sample ID: MB-91028	Batch ID: 91028	TestNo: M3500-Fe D	Units: mg/L
SampType: MBLK	Run ID: UV/VIS_2_190521B	Analysis Date: 5/21/2019 5:39:00 PM	Prep Date: 5/21/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron, Ferrous	<0.0500	0.100								N

Sample ID: LCS-91028	Batch ID: 91028	TestNo: M3500-Fe D	Units: mg/L
SampType: LCS	Run ID: UV/VIS_2_190521B	Analysis Date: 5/21/2019 5:40:00 PM	Prep Date: 5/21/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron, Ferrous	0.103	0.100	0.1000	0	103	85	115			N

Sample ID: LCSD-91028	Batch ID: 91028	TestNo: M3500-Fe D	Units: mg/L
SampType: LCSD	Run ID: UV/VIS_2_190521B	Analysis Date: 5/21/2019 5:40:00 PM	Prep Date: 5/21/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron, Ferrous	0.0959	0.100	0.1000	0	95.9	85	115	7.39	15	N

Sample ID: 1905205-09AMS	Batch ID: 91028	TestNo: M3500-Fe D	Units: mg/L
SampType: MS	Run ID: UV/VIS_2_190521B	Analysis Date: 5/21/2019 5:45:00 PM	Prep Date: 5/21/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron, Ferrous	0.108	0.100	0.1000	0	108	85	115			N

Sample ID: 1905205-09AMSD	Batch ID: 91028	TestNo: M3500-Fe D	Units: mg/L
SampType: MSD	Run ID: UV/VIS_2_190521B	Analysis Date: 5/21/2019 5:45:00 PM	Prep Date: 5/21/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron, Ferrous	0.110	0.100	0.1000	0	110	85	115	2.25	15	N

<p>Qualifiers:</p> <p>B Analyte detected in the associated Method Blank</p> <p>J Analyte detected between MDL and RL</p> <p>ND Not Detected at the Method Detection Limit</p> <p>RL Reporting Limit</p> <p>J Analyte detected between SDL and RL</p>	<p>DF Dilution Factor</p> <p>MDL Method Detection Limit</p> <p>R RPD outside accepted control limits</p> <p>S Spike Recovery outside control limits</p> <p>N Parameter not NELAP certified</p>
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CLIENT: Golder
Work Order: 1905205
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: UV/VIS_2_190521B

Sample ID ICV-190521	Batch ID: R104200	TestNo: M3500-Fe D	Units: mg/L							
SampType: ICV	Run ID: UV/VIS_2_190521B	Analysis Date: 5/21/2019 5:38:00 PM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron, Ferrous	0.0971	0.100	0.1000	0	97.1	85	115			N

Sample ID CCV1-190521	Batch ID: R104200	TestNo: M3500-Fe D	Units: mg/L							
SampType: CCV	Run ID: UV/VIS_2_190521B	Analysis Date: 5/21/2019 5:46:00 PM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron, Ferrous	0.221	0.100	0.2000	0	111	85	115			N

Sample ID CCV2-190521	Batch ID: R104200	TestNo: M3500-Fe D	Units: mg/L							
SampType: CCV	Run ID: UV/VIS_2_190521B	Analysis Date: 5/21/2019 6:00:00 PM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron, Ferrous	0.212	0.100	0.2000	0	106	85	115			N

Qualifiers:	<p>B Analyte detected in the associated Method Blank</p> <p>J Analyte detected between MDL and RL</p> <p>ND Not Detected at the Method Detection Limit</p> <p>RL Reporting Limit</p> <p>J Analyte detected between SDL and RL</p>	<p>DF Dilution Factor</p> <p>MDL Method Detection Limit</p> <p>R RPD outside accepted control limits</p> <p>S Spike Recovery outside control limits</p> <p>N Parameter not NELAP certified</p>
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CLIENT: Golder
Work Order: 1905205
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: WC_190521C

The QC data in batch 91019 applies to the following samples: 1905205-01C, 1905205-02C, 1905205-03C, 1905205-04C, 1905205-05C, 1905205-06C, 1905205-07C, 1905205-08C, 1905205-09C

Sample ID MB-91019	Batch ID: 91019	TestNo: M2540C	Units: mg/L							
SampType: MBLK	Run ID: WC_190521C	Analysis Date: 5/21/2019 10:00:00 AM	Prep Date: 5/21/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera		<10.0	10.0							

Sample ID LCS-91019	Batch ID: 91019	TestNo: M2540C	Units: mg/L							
SampType: LCS	Run ID: WC_190521C	Analysis Date: 5/21/2019 10:00:00 AM	Prep Date: 5/21/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera		748	10.0	745.6	0	100	90	113		

Sample ID 1905188-01E-DUP	Batch ID: 91019	TestNo: M2540C	Units: mg/L							
SampType: DUP	Run ID: WC_190521C	Analysis Date: 5/21/2019 10:00:00 AM	Prep Date: 5/21/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera		9980	200	0	10160			1.79	5	

Sample ID 1905188-02E-DUP	Batch ID: 91019	TestNo: M2540C	Units: mg/L							
SampType: DUP	Run ID: WC_190521C	Analysis Date: 5/21/2019 10:00:00 AM	Prep Date: 5/21/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera		10800	200	0	10840			0.370	5	

Qualifiers:	<p>B Analyte detected in the associated Method Blank</p> <p>J Analyte detected between MDL and RL</p> <p>ND Not Detected at the Method Detection Limit</p> <p>RL Reporting Limit</p> <p>J Analyte detected between SDL and RL</p>	<p>DF Dilution Factor</p> <p>MDL Method Detection Limit</p> <p>R RPD outside accepted control limits</p> <p>S Spike Recovery outside control limits</p> <p>N Parameter not NELAP certified</p>
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ANALYTICAL REPORT

May 29, 2019



²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

DHL Analytical, Inc.

Sample Delivery Group: L1100949
Samples Received: 05/21/2019
Project Number: 1905205
Description:

Report To: John DuPont
2300 Double Creek Drive
Round Rock, TX 78664

Entire Report Reviewed By:

Donna Eidson
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace National is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.

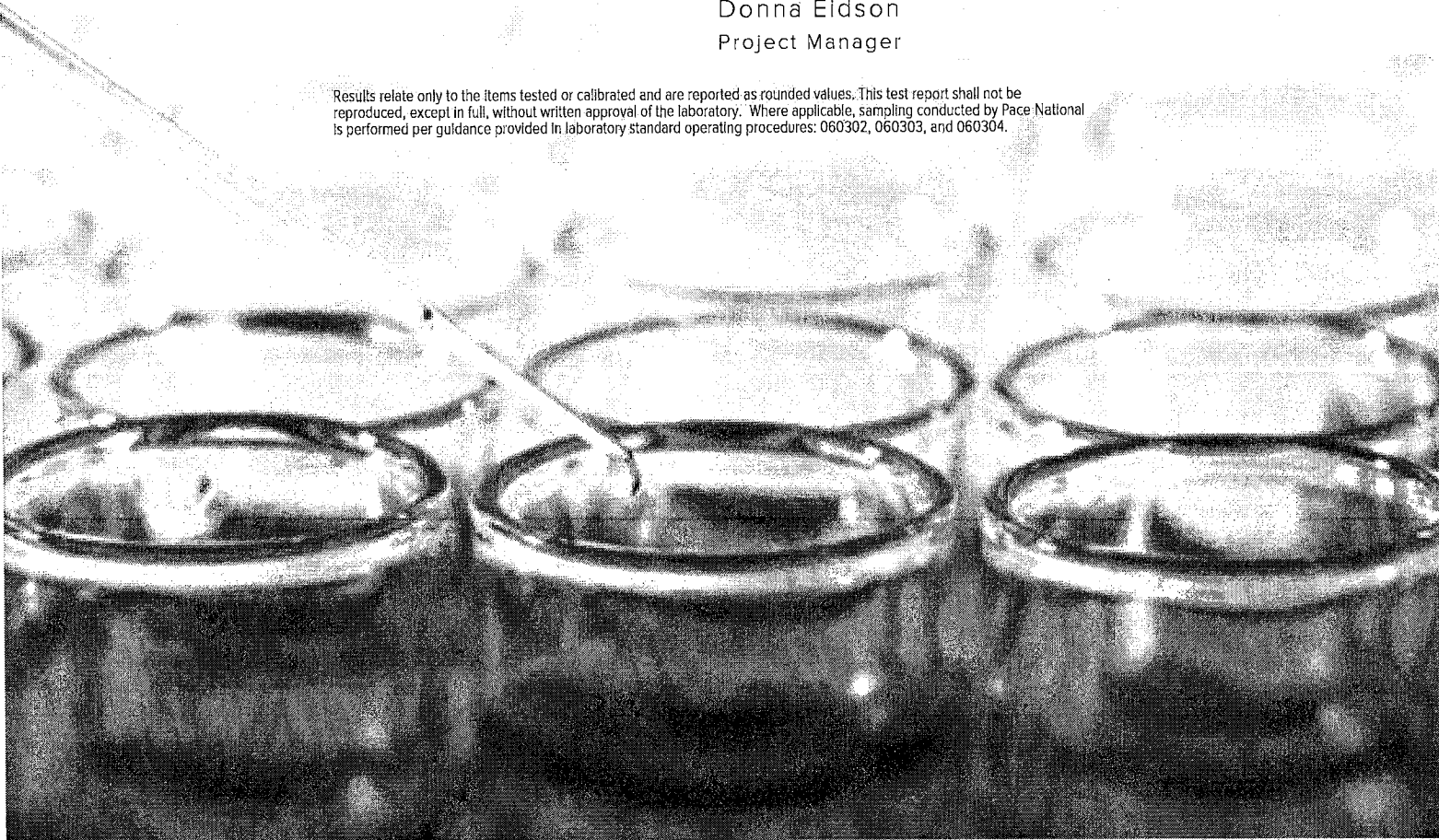


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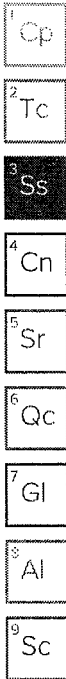
ONE LAB. NATIONWIDE.



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SAMPLE SUMMARY

ONE LAB. NATIONWIDE.



FGD-6 L1100949-01 Non-Potable Water

Collected by
05/16/19 09:20 Received date/time
05/21/19 10:10

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1284744	1	05/22/19 08:25	05/28/19 10:55	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1284773	1	05/23/19 15:02	05/28/19 10:55	RRE	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1284773	1	05/23/19 15:02	05/24/19 17:05	RRE	Mt. Juliet, TN

FGD-4 L1100949-02 Non-Potable Water

Collected by
05/16/19 10:15 Received date/time
05/21/19 10:10

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1284744	1	05/22/19 08:25	05/28/19 10:55	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1284773	1	05/23/19 15:02	05/28/19 10:55	RRE	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1284773	1	05/23/19 15:02	05/24/19 17:05	RRE	Mt. Juliet, TN

FGD-3 L1100949-03 Non-Potable Water

Collected by
05/16/19 11:10 Received date/time
05/21/19 10:10

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1284744	1	05/22/19 08:25	05/28/19 14:05	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1284773	1	05/23/19 15:02	05/28/19 14:05	RRE	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1284773	1	05/23/19 15:02	05/24/19 17:05	RRE	Mt. Juliet, TN

FGD-2 L1100949-04 Non-Potable Water

Collected by
05/16/19 12:00 Received date/time
05/21/19 10:10

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1284744	1	05/22/19 08:25	05/28/19 14:05	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1284773	1	05/23/19 15:02	05/28/19 14:05	RRE	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1284773	1	05/23/19 15:02	05/24/19 17:18	RRE	Mt. Juliet, TN

FGD-5 L1100949-05 Non-Potable Water

Collected by
05/16/19 13:50 Received date/time
05/21/19 10:10

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1284744	1	05/22/19 08:25	05/28/19 14:05	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1284773	1	05/23/19 15:02	05/28/19 14:05	RRE	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1284773	1	05/23/19 15:02	05/24/19 17:18	RRE	Mt. Juliet, TN

FGD-1 L1100949-06 Non-Potable Water

Collected by
05/16/19 14:50 Received date/time
05/21/19 10:10

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1284744	1	05/22/19 08:25	05/28/19 14:05	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1284773	1	05/23/19 15:02	05/28/19 14:05	RRE	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1284773	1	05/23/19 15:02	05/24/19 17:18	RRE	Mt. Juliet, TN

SAMPLE SUMMARY

ONE LAB. NATIONWIDE.

FGD-8 L1100949-07 Non-Potable Water

Collected by
05/16/19 15:45
Received date/time
05/21/19 10:10

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1284744	1	05/22/19 08:25	05/28/19 14:05	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1284773	1	05/23/19 15:02	05/28/19 14:05	RRE	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1284773	1	05/23/19 15:02	05/24/19 17:18	RRE	Mt. Juliet, TN

1
Cp

2
Tc

3
Ss

FGD-11 L1100949-08 Non-Potable Water

Collected by
05/16/19 16:40
Received date/time
05/21/19 10:10

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1284744	1	05/22/19 08:25	05/28/19 14:05	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1284773	1	05/23/19 15:02	05/28/19 14:05	RRE	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1284773	1	05/23/19 15:02	05/24/19 17:18	RRE	Mt. Juliet, TN

4
Cn

5
Sr

6
Qc

7
Gl

FGD-12 L1100949-09 Non-Potable Water

Collected by
05/16/19 17:35
Received date/time
05/21/19 10:10

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1284744	1	05/22/19 08:25	05/28/19 14:05	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1284773	1	05/23/19 15:02	05/28/19 14:05	RRE	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1284773	1	05/23/19 15:02	05/24/19 17:18	RRE	Mt. Juliet, TN

8
Al

9
Sc



All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All radiochemical sample results for solids are reported on a dry weight basis with the exception of tritium, carbon-14 and radon, unless wet weight was requested by the client. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Donna Eidson
Project Manager

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc



Collected date/time: 05/16/19 09:20

L1100949

Radiochemistry by Method 904

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-228	1.67		0.422	0.593	05/28/2019 10:55	WG1284744
(T) Barium	97.9			62.0-143	05/28/2019 10:55	WG1284744
(T) Yttrium	113			79.0-136	05/28/2019 10:55	WG1284744

1 Cp

2 Tc

3 Ss

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	3.10		0.890	0.863	05/28/2019 10:55	WG1284773

4 Cn

5 Sr

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-226	1.43		0.468	0.27	05/24/2019 17:05	WG1284773
(T) Barium-133	90.8			30.0-143	05/24/2019 17:05	WG1284773

6 Qc

7 Gl

8 Al

9 Sc

Collected date/time: 05/16/19 10:15

L1100949

Radiochemistry by Method 904

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-228	0.745		0.407	0.556	05/28/2019 10:55	WG1284744
(T) Barium	109			62.0-143	05/28/2019 10:55	WG1284744
(T) Yttrium	110			79.0-136	05/28/2019 10:55	WG1284744

1 Cp

2 Tc

3 Ss

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	1.37		0.716	0.755	05/28/2019 10:55	WG1284773

4 Cn

5 Sr

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-226	0.627		0.309	0.199	05/24/2019 17:05	WG1284773
(T) Barium-133	92.0			30.0-143	05/24/2019 17:05	WG1284773

6 Qc

7 Gl

8 Al

9 Sc

Radiochemistry by Method 904

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-228	0.403		0.412	0.638	05/28/2019 14:05	WG1284744
(T) Barium	92.8			62.0-143	05/28/2019 14:05	WG1284744
(T) Yttrium	112			79.0-136	05/28/2019 14:05	WG1284744

1 Cp

2 Tc

3 Ss

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	0.797		0.752	1.04	05/28/2019 14:05	WG1284773

4 Cn

Sr

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-226	0.394		0.340	0.403	05/24/2019 17:05	WG1284773
(T) Barium-133	59.2			30.0-143	05/24/2019 17:05	WG1284773

6 Qc

7 Gl

8 Al

9 Sc



Radiochemistry by Method 904

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	0.588		0.391	0.541	05/28/2019 14:05	WG1284744
(T) Barium	109			62.0-143	05/28/2019 14:05	WG1284744
(T) Yttrium	109			79.0-136	05/28/2019 14:05	WG1284744

1 Cp

2 Tc

3 Ss

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	1.24		0.819	0.937	05/28/2019 14:05	WG1284773

4 Cn

5 Sr

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.648		0.428	0.396	05/24/2019 17:18	WG1284773
(T) Barium-133	92.1			30.0-143	05/24/2019 17:18	WG1284773

6 Qc

7 Gl

8 Al

9 Sc

Collected date/time: 05/16/19 13:50

L1100949

Radiochemistry by Method 904

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-228	0.0624		0.333	0.506	05/28/2019 14:05	WG1284744
(T) Barium	105			62.0-143	05/28/2019 14:05	WG1284744
(T) Yttrium	108			79.0-136	05/28/2019 14:05	WG1284744

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	0.404		0.552	0.696	05/28/2019 14:05	WG1284773

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-226	0.342		0.219	0.19	05/24/2019 17:18	WG1284773
(T) Barium-133	86.7			30.0-143	05/24/2019 17:18	WG1284773

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc



Radiochemistry by Method 904

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-228	-0.0608		0.401	0.593	05/28/2019 14:05	WG1284744
(T) Barium	95.4			62.0-143	05/28/2019 14:05	WG1284744
(T) Yttrium	110			79.0-136	05/28/2019 14:05	WG1284744

1 Cp

2 Tc

3 Ss

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	0.184		0.635	0.923	05/28/2019 14:05	WG1284773

4 Cn

5 Sr

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-226	0.184		0.234	0.33	05/24/2019 17:18	WG1284773
(T) Barium-133	83.4			30.0-143	05/24/2019 17:18	WG1284773

6 Qc

7 Gl

8 Al

9 Sc



Collected date/time: 05/16/19 15:45

L1100949

Radiochemistry by Method 904

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-228	5.27		0.459	0.616	05/28/2019 14:05	WG1284744
(T) Barium	91.3			62.0-143	05/28/2019 14:05	WG1284744
(T) Yttrium	107			79.0-136	05/28/2019 14:05	WG1284744

¹ Cp

² Tc

³ Ss

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	8.40		1.14	0.795	05/28/2019 14:05	WG1284773

⁴ Cn

⁵ Sr

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-226	3.14		0.685	0.179	05/24/2019 17:18	WG1284773
(T) Barium-133	88.2			30.0-143	05/24/2019 17:18	WG1284773

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc

Radiochemistry by Method 904

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	2.75		0.444	0.645	05/28/2019 14:05	WG1284744
(T) Barium	112			62.0-143	05/28/2019 14:05	WG1284744
(T) Yttrium	108			79.0-136	05/28/2019 14:05	WG1284744

1 Cp

2 Tc

3 Ss

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	5.14		0.963	0.952	05/28/2019 14:05	WG1284773

4 Cn

5 Sr

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-226	2.39		0.519	0.307	05/24/2019 17:18	WG1284773
(T) Barium-133	97.4			30.0-143	05/24/2019 17:18	WG1284773

6 Qc

7 Gl

8 Al

9 Sc

Radiochemistry by Method 904

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-228	1.43		0.395	0.572	05/28/2019 14:05	WG1284744
(T) Barium	111			62.0-143	05/28/2019 14:05	WG1284744
(T) Yttrium	115			79.0-136	05/28/2019 14:05	WG1284744

1 Cp

2 Tc

3 Ss

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	1.81		0.642	0.813	05/28/2019 14:05	WG1284773

4 Cn

5 Sr

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-226	0.385		0.247	0.241	05/24/2019 17:18	WG1284773
(T) Barium-133	96.0			30.0-143	05/24/2019 17:18	WG1284773

6 Qc

7 Gl

8 Al

9 Sc

WG1284744

QUALITY CONTROL SUMMARY

ONE LAB. NATIONWIDE.

Radiochemistry by Method 904

L1100949-01,02,03,04,05,06,07,08,09

Method Blank (MB)

(MB) R3415641-1 05/28/19 10:55

Analyte	MB Result pCi/l	MB Qualifier	MB MDA pCi/l
Radium-228	-0.164		0.413
(T) Barium	108		
(T) Yttrium	115		

- Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gf
- 8 Al
- 9 Sc

L1100192-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1100192-01 05/28/19 10:55 • (DUP) R3415641-5 05/28/19 10:55

Analyte	Original Result pCi/l	DUP Result pCi/l	Dilution	DUP RPD %	DUP RER	DUP Qualifier	DUP RPD Limits	DUP RER Limit
Radium-228	0.157	-0.0367	1	200	0.366		20	3
(T) Barium	91.7	102						
(T) Yttrium	110	107						

Laboratory Control Sample (LCS)

(LCS) R3415641-2 05/28/19 10:55

Analyte	Spike Amount pCi/l	LCS Result pCi/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Radium-228	5.00	4.47	89.4	80.0-120	
(T) Barium			103		
(T) Yttrium			107		

L1100922-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1100922-01 05/28/19 10:55 • (MS) R3415641-3 05/28/19 10:55 • (MSD) R3415641-4 05/28/19 10:55

Analyte	Spike Amount pCi/l	Original Result pCi/l	MS Result pCi/l	MSD Result pCi/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	MS RER	RPD Limits %
Radium-228	7.14	-0.136	7.62	7.50	107	105	1	70.0-130			1.50		20
(T) Barium		111			107	110							
(T) Yttrium		114			107	110							

Method Blank (MB)

(MB) R3415635-1 05/24/19 17:04

Analyte	MB Result pCi/l	MB Qualifier	MB MDA pCi/l
Radium-226	0.459		0.209
(T) Barium-133	84.6		

L1100844-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1100844-01 05/24/19 17:04 • (DUP) R3415635-5 05/24/19 17:04

Analyte	Original Result pCi/l	DUP Result pCi/l	Dilution	DUP RPD %	DUP RER	DUP Qualifier	DUP RPD Limits	DUP RER Limit
Radium-226	0.495	0.573	1	14.6	0.182		20	3
(T) Barium-133	90.4	88.8						

Laboratory Control Sample (LCS)

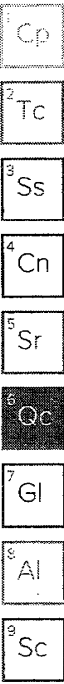
(LCS) R3415635-2 05/24/19 17:04

Analyte	Spike Amount pCi/l	LCS Result pCi/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Radium-226	20.1	19.1	95.0	80.0-120	
(T) Barium-133		79.1			

L1100433-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1100433-01 05/24/19 17:04 • (MS) R3415635-3 05/24/19 17:04 • (MSD) R3415635-4 05/24/19 17:04

Analyte	Spike Amount pCi/l	Original Result pCi/l	MS Result pCi/l	MSD Result pCi/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	MS RER	RPD Limits %
Radium-226	20.1	1.16	19.9	20.9	93.2	98.0	1	75.0-125			4.71		20
(T) Barium-133		83.2		81.1	84.7								





Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Abbreviations and Definitions

MDA	Minimum Detectable Activity.
Rec.	Recovery.
RER	Replicate Error Ratio.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(T)	Tracer - A radioisotope of known concentration added to a solution of chemically equivalent radioisotopes at a known concentration to assist in monitoring the yield of the chemical separation.
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state "ND" (Not Detected) or "BDL" (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Qualifier Description

The remainder of this page intentionally left blank, there are no qualifiers applied to this SDG.

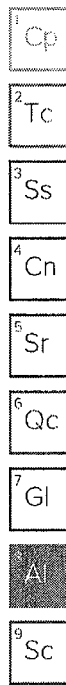


Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
 * Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

State Accreditations

Alabama	40660	Nebraska	NE-05-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey-NELAP	TN002
California	2932	New Mexico ¹	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina ¹	DW21704
Georgia	NELAP	North Carolina ³	41
Georgia ¹	923	North Dakota	R-140
Idaho	TN00003	Ohio-VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LA000356
Kentucky ^{1 6}	90010	South Carolina	84004
Kentucky ²	16	South Dakota	n/a
Louisiana	AI30792	Tennessee ^{1 4}	2006
Louisiana ¹	LA180010	Texas	T104704245-18-15
Maine	TN0002	Texas ⁵	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA



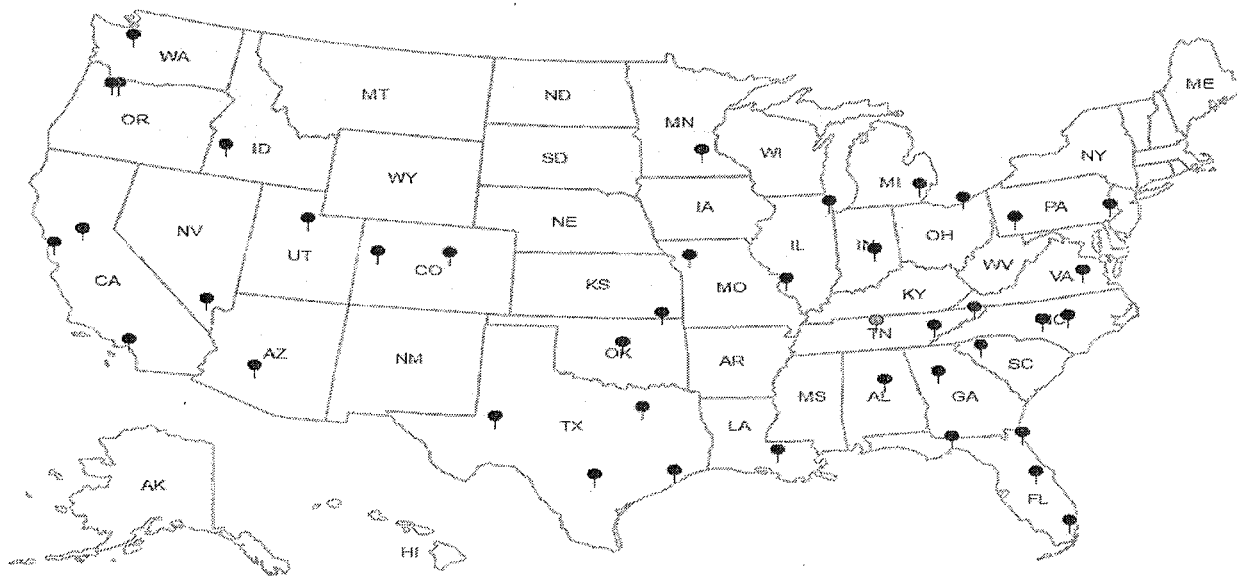
Third Party Federal Accreditations

A2LA - ISO 17025	1461.01	AIHA-LAP, LLC EMLAP	100789
A2LA - ISO 17025 ⁵	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA-Crypto	TN00003		

¹ Drinking Water ² Underground Storage Tanks ³ Aquatic Toxicity ⁴ Chemical/Microbiological ⁵ Mold ⁶ Wastewater n/a Accreditation not applicable

Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.



**Pace Analytical National Center for Testing & Innovation
Cooler Receipt Form**

Client: <i>DHLR RTX</i>	SDG#: <i>1100949</i>		
Cooler Received/Opened On: <i>5/21/19</i>	Temperature: <i>Amb</i>		
Received By: Brock Fariss			
Signature: <i>BK Fariss</i>			
Receipt Check List	NP	Yes	No
COC Seal Present / Intact?	/		
COC Signed / Accurate?		/	
Bottles arrive intact?		/	
Correct bottles used?		/	
Sufficient volume sent?		/	
If Applicable			
VOA Zero headspace?			
Preservation Correct / Checked?			/



Login #:L1100949	Client:DHLRRTX	Date:05/21	Evaluated by:Kelsey S
------------------	----------------	------------	-----------------------

Non-Conformance (check applicable items)

Sample Integrity	Chain of Custody Clarification	
Parameter(s) past holding time	Login Clarification Needed	If Broken Container:
Temperature not in range	Chain of custody is incomplete	Insufficient packing material around container
Improper container type	Please specify Metals requested.	Insufficient packing material inside cooler
x pH not in range.	Please specify TCLP requested.	Improper handling by carrier (FedEx / UPS / Courie
Insufficient sample volume.	Received additional samples not listed on coc.	Sample was frozen
Sample is biphasic.	Sample ids on containers do not match ids on coc	Container lid not intact
Vials received with headspace.	Trip Blank not received.	If no Chain of Custody:
Broken container	Client did not "X" analysis.	Received by:
Broken container:	Chain of Custody is missing	Date/Time:
Sufficient sample remains		Temp./Cont. Rec./pH:
		Carrier:
		Tracking#

Login Comments: 2 of 2 FGD-8 was received with a pH of 6. pH adj in login 1424 05/21

Client informed by:	Call	Email	Voice Mail	Date:	Time:
TSR Initials:	Client Contact:				

Login Instructions:

Noted. DE 5/24/19

DHL Analytical, Inc.
2300 Double Creek Drive
Round Rock, TX 78664

TEL: (512) 388-8222

FAX: (512) 388-8229

Work Order: 1905205

CHAIN-OF-CUSTODY RECORD

1100949

Page 1 of 1

H005

Subcontractor:

Pace Analytical
12065 Lebanon Rd
Mt. Juliet, TN 37122

TEL: (615) 773-5923
FAX:
Acct #: DHLRRTX

c2 c2



17-May-19

Sample Id	Matrix	DHL#	Date Collected	Bottle Type	Ra-228	Ra-226	Requested Tests							
					E904.0	M7500 Ra B M								
FGD-6	Aqueous	-01D	05/16/19 09:20 AM	1LHDPEHNO3		1								
FGD-6	Aqueous	-01E	05/16/19 09:20 AM	1LHDPEHNO3	1									-01
FGD-4	Aqueous	-02D	05/16/19 10:15 AM	1LHDPEHNO3		1								04
FGD-4	Aqueous	-02E	05/16/19 10:15 AM	1LHDPEHNO3	1									02
FGD-3	Aqueous	-03D	05/16/19 11:10 AM	1LHDPEHNO3		1								02
FGD-3	Aqueous	-03E	05/16/19 11:10 AM	1LHDPEHNO3	1									03
FGD-2	Aqueous	-04D	05/16/19 12:00 PM	1LHDPEHNO3		1								03
FGD-2	Aqueous	-04E	05/16/19 12:00 PM	1LHDPEHNO3	1									04
FGD-5	Aqueous	-05D	05/16/19 01:50 PM	1LHDPEHNO3		1								04
FGD-5	Aqueous	-05E	05/16/19 01:50 PM	1LHDPEHNO3	1									05
FGD-1	Aqueous	-06D	05/16/19 02:50 PM	1LHDPEHNO3		1								05
FGD-1	Aqueous	-06E	05/16/19 02:50 PM	1LHDPEHNO3	1									06
FGD-8	Aqueous	-07D	05/16/19 03:45 PM	1LHDPEHNO3		1								06
FGD-8	Aqueous	-07E	05/16/19 03:45 PM	1LHDPEHNO3	1									07
FGD-11	Aqueous	-08D	05/16/19 04:40 PM	1LHDPEHNO3		1								07
FGD-11	Aqueous	-08E	05/16/19 04:40 PM	1LHDPEHNO3	1									08
FGD-12	Aqueous	-09D	05/16/19 05:35 PM	1LHDPEHNO3		1								08
FGD-12	Aqueous	-09E	05/16/19 05:35 PM	1LHDPEHNO3	1									09

General Comments:

Please analyze these samples with Normal Turnaround Time.
Report RA-226, Ra-228 & Combined per Specs.
Quality Control Package Needed: Standard - NELAC Rad Test compliant
Email to cac@dhlanalytical.com & dupont@dhlanalytical.com

UPS
Rec-18

Relinquished by: 	Date/Time: 5/17/19 1700	Received by: 	Date/Time: 5/21/19 1010
Relinquished by:		Received by:	

PH adj @ 1424

Ambr RAD SCREEN: <0.5 mR/hr

NCL



May 29, 2019

Will Vienne
Golder
2201 Double Creek Dr #4004
Round Rock, Texas 78664
TEL: (512) 671-3434
FAX (512) 671-3446
RE: Luminant-OGSES-FGD Pond

Order No.: 1905222

Dear Will Vienne:

DHL Analytical, Inc. received 1 sample(s) on 5/18/2019 for the analyses presented in the following report.

There were no problems with the analyses and all data met requirements of NELAP except where noted in the Case Narrative. All non-NELAP methods will be identified accordingly in the case narrative and all estimated uncertainties of test results are within method or EPA specifications.

If you have any questions regarding these tests results, please feel free to call. Thank you for using DHL Analytical.

Sincerely,

A handwritten signature in red ink, appearing to read 'John DuPont'.

John DuPont
General Manager

This report was performed under the accreditation of the State of Texas Laboratory Certification Number: T104704211-19-24



Table of Contents

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AnalyticalQCSummaryReport 1905222	11



2300 Double Creek Dr. ■ Round Rock, TX 78664
 Phone (512) 388-8222 ■ FAX (512) 388-8229
 Web: www.dhlanalytical.com
 E-Mail: login@dhlanalytical.com



No 86481
 CHAIN-OF-CUSTODY

CLIENT: GOLDER
 ADDRESS: 2201 DOUBLE CREEK DR, ROUND ROCK, TX 78664
 PHONE: 512-671-3434 FAX/E-MAIL: 512-671-3446
 DATA REPORTED TO: WILL VIENNE
 ADDITIONAL REPORT COPIES TO:

DATE: 5-17-19 PAGE 1 OF 1
 PO #: _____ DHL WORK ORDER #: 1905222
 PROJECT LOCATION OR NAME: LUMINANT-OGSES-FGD POND
 CLIENT PROJECT #: 19122262-F COLLECTOR: J. BRAYTON

Field Sample I.D.	DHL Lab #	Date	Time	Matrix	Container Type	# of Containers	PRESERVATION					ANALYSES	FIELD NOTES
							HCl	HNO ₃	H ₂ SO ₄	NaOH	ICE		
<u>FGD-14</u>	<u>01</u>	<u>5-17-19</u>	<u>0750</u>	<u>W</u>	<u>P</u>	<u>2</u>							<u>XX</u>

RELINQUISHED BY: (Signature) [Signature] DATE/TIME: 5-17-19 1730 RECEIVED BY: (Signature) FEDEX
 RELINQUISHED BY: (Signature) FEDEX DATE/TIME: 5/18/19 RECEIVED BY: (Signature) [Signature]
 RELINQUISHED BY: (Signature) _____ DATE/TIME: _____ RECEIVED BY: (Signature) _____

TURN AROUND TIME
 RUSH CALL FIRST
 1 DAY CALL FIRST
 2 DAY
 NORMAL
 OTHER

LABORATORY USE ONLY:
 RECEIVING TEMP: 3.0 THERM #: 78
 CUSTODY SEALS: BROKEN INTACT NOT USED
 CARRIER: LONE STAR FEDEX UPS OTHER
 COURIER DELIVERY HAND DELIVERED
 DHL COC Rev 1 | FEB 2010

ORIGIN ID:FWHA (512) 671-3434
J. BRAYTON
GOLDER
2201 DOUBLE CREEK DR
ROUND ROCK, TX 78664
UNITED STATES US

SHIP DATE: 17MAY19
ACTWGT: 45.40 LB
CAD: 6991009/SSF02002
DIMS: 25x14x14 IN
BILL THIRD PARTY

Part # 1568
EXP 03/20

TO

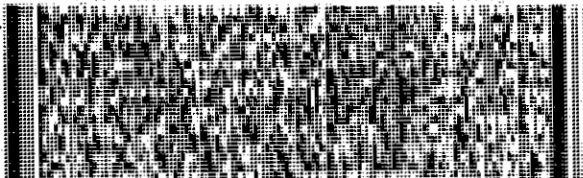
DHL
2300 DOUBLE CREEK DR

ROUND ROCK TX 78664

(512) 388-8222
INU:
PO:

REF:

DEPT:



FedEx
Express



AN102010610151F

2 of 2

MPS# 7873 2787 1824
0263

Mstr# 7873 2787 1813

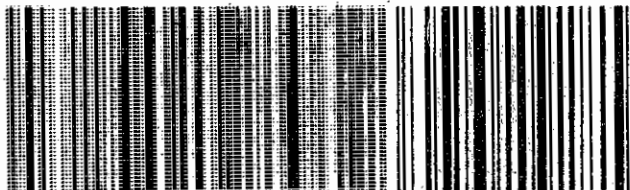
0201

XO BSMA

SATURDAY 12:00P
PRIORITY OVERNIGHT

AHS
78664

TX-US AUS



Sample Receipt Checklist

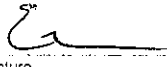
Client Name Golder

Date Received: 5/18/2019

Work Order Number 1905222

Received by AH

Checklist completed by:


Signature

5/20/2019
Date

Reviewed by


Initials

5/20/2019
Date

Carrier name FedEx 1day

- Shipping container/cooler in good condition? Yes No Not Present
- Custody seals intact on shipping container/cooler? Yes No Not Present
- Custody seals intact on sample bottles? Yes No Not Present
- Chain of custody present? Yes No
- Chain of custody signed when relinquished and received? Yes No
- Chain of custody agrees with sample labels? Yes No
- Samples in proper container/bottle? Yes No
- Sample containers intact? Yes No
- Sufficient sample volume for indicated test? Yes No
- All samples received within holding time? Yes No
- Container/Temp Blank temperature in compliance? Yes No 3.0 °C
- Water - VOA vials have zero headspace? Yes No No VOA vials submitted
- Water - pH<2 acceptable upon receipt? Yes No NA LOT # 11837
- Adjusted? no Checked by a
- Water - pH>9 (S) or pH>10 (CN) acceptable upon receipt? Yes No NA LOT #
- Adjusted? _____ Checked by _____

Any No response must be detailed in the comments section below.

Client contacted _____ Date contacted: _____ Person contacted _____

Contacted by: _____ Regarding: _____

Comments: _____

Corrective Action _____

CLIENT: Golder
Project: Luminant-OGSES-FGD Pond
Lab Order: 1905222

CASE NARRATIVE

Samples were analyzed using the methods outlined in the following references:

- Method SW6020A - Metals Analysis
- Method E300 - Anions Analysis

LOG IN

The sample was received and log-in performed on 5/18/19. A total of 1 sample was received. The sample arrived in good condition and was properly packaged. All method blanks, laboratory spikes, and/or matrix spikes met quality assurance objectives.

CLIENT: Golder
Project: Luminant-OGSES-FGD Pond
Lab Order: 1905222

Work Order Sample Summary

Lab Smp ID	Client Sample ID	Tag Number	Date Collected	Date Recved
1905222-01	FGD-14		05/17/19 07:50 AM	5/18/2019

Lab Order: 1905222
Client: Golder
Project: Luminant-OGSES-FGD Pond

PREP DATES REPORT

Sample ID	Client Sample ID	Collection Date	Matrix	Test Number	Test Name	Prep Date	Batch ID
1905222-01A	FGD-14	05/17/19 07:50 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/20/19 09:41 AM	90992
1905222-01B	FGD-14	05/17/19 07:50 AM	Aqueous	E300	Anion Preparation	05/20/19 09:15 AM	90987

Lab Order: 1905222
Client: Golder
Project: Luminant-OGSES-FGD Pond

ANALYTICAL DATES REPORT

Sample ID	Client Sample ID	Matrix	Test Number	Test Name	Batch ID	Dilution	Analysis Date	Run ID
1905222-01A	FGD-14	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	90992	1	05/21/19 01:06 PM	ICP-MS4_190521B
1905222-01B	FGD-14	Aqueous	E300	Anions by IC method - Water	90987	10	05/20/19 05:25 PM	IC2_190520A

DHL Analytical, Inc.

Date: 29-May-19

CLIENT: Golder
Project: Luminant-OGSES-FGD Pond
Project No: 19122262-F
Lab Order: 1905222

Client Sample ID: FGD-14
Lab ID: 1905222-01
Collection Date: 05/17/19 07:50 AM
Matrix: AQUEOUS

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		SW6020A					Analyst: RO
Cobalt	<0.00300	0.00300	0.00500		mg/L	1	05/21/19 01:06 PM
Lithium	0.00564	0.00500	0.0100	J	mg/L	1	05/21/19 01:06 PM
Selenium	<0.00200	0.00200	0.00500		mg/L	1	05/21/19 01:06 PM
ANIONS BY IC METHOD - WATER		E300					Analyst: JL
Sulfate	41.6	10.0	30.0		mg/L	10	05/20/19 05:25 PM

Qualifiers:

*	Value exceeds TCLP Maximum Concentration Level	C	Sample Result or QC discussed in the Case Narrative
DF	Dilution Factor	E	TPH pattern not Gas or Diesel Range Pattern
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	RL	Reporting Limit
S	Spike Recovery outside control limits	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1905222

ANALYTICAL QC SUMMARY REPORT

Project: Luminant-OGSES-FGD Pond

RunID: ICP-MS4_190521B

The QC data in batch 90992 applies to the following samples: 1905222-01A

Sample ID MB-90992	Batch ID: 90992	TestNo: SW6020A	Units: mg/L							
SampType: MBLK	Run ID: ICP-MS4_190521B	Analysis Date: 5/21/2019 12:50:00 PM	Prep Date: 5/20/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Cobalt	<0.00300	0.00500								
Lithium	<0.00500	0.0100								
Selenium	<0.00200	0.00500								

Sample ID LCS-90992	Batch ID: 90992	TestNo: SW6020A	Units: mg/L							
SampType: LCS	Run ID: ICP-MS4_190521B	Analysis Date: 5/21/2019 12:52:00 PM	Prep Date: 5/20/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Cobalt	0.205	0.00500	0.200	0	102	80	120			
Lithium	0.199	0.0100	0.200	0	99.6	80	120			
Selenium	0.202	0.00500	0.200	0	101	80	120			

Sample ID LCSD-90992	Batch ID: 90992	TestNo: SW6020A	Units: mg/L							
SampType: LCSD	Run ID: ICP-MS4_190521B	Analysis Date: 5/21/2019 12:54:00 PM	Prep Date: 5/20/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Cobalt	0.203	0.00500	0.200	0	101	80	120	1.11	15	
Lithium	0.205	0.0100	0.200	0	103	80	120	3.06	15	
Selenium	0.203	0.00500	0.200	0	102	80	120	0.424	15	

Sample ID 1905201-01A SD	Batch ID: 90992	TestNo: SW6020A	Units: mg/L							
SampType: SD	Run ID: ICP-MS4_190521B	Analysis Date: 5/21/2019 1:00:00 PM	Prep Date: 5/20/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Cobalt	<0.0150	0.0250	0	0				0	10	
Lithium	<0.0250	0.0500	0	0.0251				0	10	
Selenium	<0.0100	0.0250	0	0				0	10	

Sample ID 1905201-01A PDS	Batch ID: 90992	TestNo: SW6020A	Units: mg/L							
SampType: PDS	Run ID: ICP-MS4_190521B	Analysis Date: 5/21/2019 1:14:00 PM	Prep Date: 5/20/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Cobalt	0.197	0.00500	0.200	0	98.4	80	120			
Lithium	0.209	0.0100	0.200	0.0251	92.0	80	120			
Selenium	0.199	0.00500	0.200	0	99.7	80	120			

Qualifiers: B Analyte detected in the associated Method Blank
 J Analyte detected between MDL and RL
 ND Not Detected at the Method Detection Limit
 RL Reporting Limit
 J Analyte detected between SDL and RL
 DF Dilution Factor
 MDL Method Detection Limit
 R RPD outside accepted control limits
 S Spike Recovery outside control limits
 N Parameter not NELAP certified

CLIENT: Golder
Work Order: 1905222
Project: Luminant-OGSES-FGD Pond

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS4_190521B

Sample ID: 1905201-01A MS	Batch ID: 90992	TestNo: SW6020A	Units: mg/L							
SampType: MS	Run ID: ICP-MS4_190521B	Analysis Date: 5/21/2019 1:16:00 PM	Prep Date: 5/20/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Cobalt	0.194	0.00500	0.200	0	96.8	80	120			
Lithium	0.211	0.0100	0.200	0.0251	93.2	80	120			
Selenium	0.197	0.00500	0.200	0	98.6	80	120			

Sample ID: 1905201-01A MSD	Batch ID: 90992	TestNo: SW6020A	Units: mg/L							
SampType: MSD	Run ID: ICP-MS4_190521B	Analysis Date: 5/21/2019 1:18:00 PM	Prep Date: 5/20/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Cobalt	0.193	0.00500	0.200	0	96.5	80	120	0.256	15	
Lithium	0.216	0.0100	0.200	0.0251	95.3	80	120	2.00	15	
Selenium	0.201	0.00500	0.200	0	101	80	120	2.05	15	

<p>Qualifiers:</p> <p>B Analyte detected in the associated Method Blank</p> <p>J Analyte detected between MDL and RL</p> <p>ND Not Detected at the Method Detection Limit</p> <p>RL Reporting Limit</p> <p>J Analyte detected between SDL and RL</p>	<p>DF Dilution Factor</p> <p>MDL Method Detection Limit</p> <p>R RPD outside accepted control limits</p> <p>S Spike Recovery outside control limits</p> <p>N Parameter not NELAP certified</p>
---	--

CLIENT: Golder
Work Order: 1905222
Project: Luminant-OGSES-FGD Pond

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS4_190521B

Sample ID ICV-190521	Batch ID: R104193	TestNo: SW6020A	Units: mg/L
SampType: ICV	Run ID: ICP-MS4_190521B	Analysis Date: 5/21/2019 11:02:00 AM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Cobalt	0.104	0.00500	0.100	0	104	90	110			
Lithium	0.105	0.0100	0.100	0	105	90	110			
Selenium	0.102	0.00500	0.100	0	102	90	110			

Sample ID LCVL-190521	Batch ID: R104193	TestNo: SW6020A	Units: mg/L
SampType: LCVL	Run ID: ICP-MS4_190521B	Analysis Date: 5/21/2019 11:07:00 AM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Cobalt	0.00507	0.00500	0.00500	0	101	70	130			
Lithium	0.0101	0.0100	0.0100	0	101	70	130			
Selenium	0.00506	0.00500	0.00500	0	101	70	130			

Sample ID CCV2-190521	Batch ID: R104193	TestNo: SW6020A	Units: mg/L
SampType: CCV	Run ID: ICP-MS4_190521B	Analysis Date: 5/21/2019 12:37:00 PM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Cobalt	0.206	0.00500	0.200	0	103	90	110			
Lithium	0.196	0.0100	0.200	0	97.9	90	110			
Selenium	0.202	0.00500	0.200	0	101	90	110			

Sample ID LCVL2-190521	Batch ID: R104193	TestNo: SW6020A	Units: mg/L
SampType: LCVL	Run ID: ICP-MS4_190521B	Analysis Date: 5/21/2019 12:42:00 PM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Cobalt	0.00505	0.00500	0.00500	0	101	70	130			
Lithium	0.0106	0.0100	0.0100	0	106	70	130			
Selenium	0.00483	0.00500	0.00500	0	96.6	70	130			

Sample ID CCV3-190521	Batch ID: R104193	TestNo: SW6020A	Units: mg/L
SampType: CCV	Run ID: ICP-MS4_190521B	Analysis Date: 5/21/2019 1:20:00 PM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Cobalt	0.201	0.00500	0.200	0	100	90	110			
Lithium	0.201	0.0100	0.200	0	100	90	110			
Selenium	0.201	0.00500	0.200	0	100	90	110			

Sample ID LCVL3-190521	Batch ID: R104193	TestNo: SW6020A	Units: mg/L
SampType: LCVL	Run ID: ICP-MS4_190521B	Analysis Date: 5/21/2019 1:26:00 PM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Cobalt	0.00509	0.00500	0.00500	0	102	70	130			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1905222
Project: Luminant-OGSES-FGD Pond

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS4_190521B

Sample ID	LCVL3-190521	Batch ID:	R104193	TestNo:	SW6020A	Units:	mg/L			
SampType:	LCVL	Run ID:	ICP-MS4_190521B	Analysis Date:	5/21/2019 1:26:00 PM	Prep Date:				
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Lithium	0.0102	0.0100	0.0100	0	102	70	130			
Selenium	0.00554	0.00500	0.00500	0	111	70	130			

Qualifiers:	B Analyte detected in the associated Method Blank	DF Dilution Factor
	J Analyte detected between MDL and RL	MDL Method Detection Limit
	ND Not Detected at the Method Detection Limit	R RPD outside accepted control limits
	RL Reporting Limit	S Spike Recovery outside control limits
	J Analyte detected between SDL and RL	N Parameter not NELAP certified

CLIENT: Golder
Work Order: 1905222
Project: Luminant-OGSES-FGD Pond

ANALYTICAL QC SUMMARY REPORT

RunID: IC2_190520A

The QC data in batch 90987 applies to the following samples: 1905222-01B

Sample ID MB-90987	Batch ID: 90987	TestNo: E300	Units: mg/L							
SampType: MBLK	Run ID: IC2_190520A	Analysis Date: 5/20/2019 10:20:40 AM	Prep Date: 5/20/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Sulfate	<1.00	3.00								
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Sample ID LCS-90987	Batch ID: 90987	TestNo: E300	Units: mg/L							
SampType: LCS	Run ID: IC2_190520A	Analysis Date: 5/20/2019 10:36:40 AM	Prep Date: 5/20/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Sulfate	30.7	3.00	30.00	0	102	90	110			
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Sample ID LCSD-90987	Batch ID: 90987	TestNo: E300	Units: mg/L							
SampType: LCSD	Run ID: IC2_190520A	Analysis Date: 5/20/2019 10:52:40 AM	Prep Date: 5/20/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Sulfate	30.7	3.00	30.00	0	102	90	110	0.038	20	
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Sample ID 1905221-01BMS	Batch ID: 90987	TestNo: E300	Units: mg/L							
SampType: MS	Run ID: IC2_190520A	Analysis Date: 5/20/2019 3:01:53 PM	Prep Date: 5/20/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Sulfate	238	30.0	200.0	29.76	104	90	110			
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Sample ID 1905221-01BMSD	Batch ID: 90987	TestNo: E300	Units: mg/L							
SampType: MSD	Run ID: IC2_190520A	Analysis Date: 5/20/2019 3:17:53 PM	Prep Date: 5/20/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Sulfate	236	30.0	200.0	29.76	103	90	110	0.887	20	
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Sample ID 1905221-02BMS	Batch ID: 90987	TestNo: E300	Units: mg/L							
SampType: MS	Run ID: IC2_190520A	Analysis Date: 5/20/2019 3:49:53 PM	Prep Date: 5/20/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Sulfate	218	30.0	200.0	12.12	103	90	110			
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Sample ID 1905221-02BMSD	Batch ID: 90987	TestNo: E300	Units: mg/L							
SampType: MSD	Run ID: IC2_190520A	Analysis Date: 5/20/2019 4:05:53 PM	Prep Date: 5/20/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Sulfate	221	30.0	200.0	12.12	104	90	110	1.08	20	
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- Qualifiers:**
- B Analyte detected in the associated Method Blank
 - J Analyte detected between MDL and RL
 - ND Not Detected at the Method Detection Limit
 - RL Reporting Limit
 - J Analyte detected between SDL and RL
 - DF Dilution Factor
 - MDL Method Detection Limit
 - R RPD outside accepted control limits
 - S Spike Recovery outside control limits
 - N Parameter not NELAP certified

CLIENT: Golder
Work Order: 1905222
Project: Luminant-OGSES-FGD Pond

ANALYTICAL QC SUMMARY REPORT

RunID: IC2_190520A

Sample ID ICV-190520	Batch ID: R104174	TestNo: E300	Units: mg/L							
SampType: ICV	Run ID: IC2_190520A	Analysis Date: 5/20/2019 9:48:40 AM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Sulfate	78.2	3.00	75.00	0	104	90	110			

Sample ID CCV1-190520	Batch ID: R104174	TestNo: E300	Units: mg/L							
SampType: CCV	Run ID: IC2_190520A	Analysis Date: 5/20/2019 6:29:53 PM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Sulfate	31.3	3.00	30.00	0	104	90	110			

Qualifiers:	<p>B Analyte detected in the associated Method Blank</p> <p>J Analyte detected between MDL and RL</p> <p>ND Not Detected at the Method Detection Limit</p> <p>RL Reporting Limit</p> <p>J Analyte detected between SDL and RL</p>	<p>DF Dilution Factor</p> <p>MDL Method Detection Limit</p> <p>R RPD outside accepted control limits</p> <p>S Spike Recovery outside control limits</p> <p>N Parameter not NELAP certified</p>
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June 18, 2019

Will Vienne
Golder
2201 Double Creek Dr #4004
Round Rock, Texas 78664
TEL: (512) 671-3434
FAX (512) 671-3446
RE: LUMINANT-OGSES-FGD

Order No.: 1906072

Dear Will Vienne:

DHL Analytical, Inc. received 2 sample(s) on 6/7/2019 for the analyses presented in the following report.

There were no problems with the analyses and all data met requirements of NELAP except where noted in the Case Narrative. All non-NELAP methods will be identified accordingly in the case narrative and all estimated uncertainties of test results are within method or EPA specifications.

If you have any questions regarding these tests results, please feel free to call. Thank you for using DHL Analytical.

Sincerely,

A handwritten signature in red ink, appearing to read 'John DuPont', written in a cursive style.

John DuPont
General Manager

This report was performed under the accreditation of the State of Texas Laboratory Certification Number: T104704211-19-24



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AnalyticalQCSummaryReport 1906072	13



2300 Double Creek Dr. ■ Round Rock, TX 78664
 Phone (512) 388-8222 ■ FAX (512) 388-8229
 Web: www.dhlanalytical.com
 E-Mail: login@dhlanalytical.com



№ 83076
CHAIN-OF-CUSTODY

CLIENT: GOLDER
 ADDRESS: 2201 DOUBLECREEK DR ROUND ROCK, TX 78664
 PHONE: 512-671-3434 FAX/E-MAIL: 512-671-3446
 DATA REPORTED TO: WILL VIENNE
 ADDITIONAL REPORT COPIES TO: _____

DATE: 6-6-19 PAGE 1 OF 1
 PO #: 19122262-F DHL WORK ORDER #: 1906072
 PROJECT LOCATION OR NAME: LUMINANT- OGSES- FGD
 CLIENT PROJECT #: 19122262-F COLLECTOR: J. BRAYTON

Authorize 5% surcharge for TRRP Report? <input type="checkbox"/> Yes <input type="checkbox"/> No		S=SOIL W=WATER P=PAINT A=AIR SL=SLUDGE O=OTHER L=LIQUID SE=SEDIMENT SO=SOLID			Container Type	# of Containers	PRESERVATION					ANALYSES	FIELD NOTES
		DHL Lab #	Date	Time			Matrix	HCl	HNO ₃	H ₂ SO ₄ □ NaOH □	ICE		
<u>FGD-16</u>	<u>01</u>	<u>6-6-19</u>	<u>1300</u>	<u>W</u>		<u>7</u>	<u>X</u>	<u>X</u>				<u>JK</u>	<u>XXX</u>
<u>FGD-15</u>	<u>02</u>	<u>6-6-19</u>	<u>1445</u>	<u>W</u>		<u>7</u>	<u>X</u>	<u>X</u>					<u>XXX</u>

RELINQUISHED BY: (Signature) John D... DATE/TIME 6-6-19 1830 RECEIVED BY: (Signature) Fel EX
 RELINQUISHED BY: (Signature) Fel EX DATE/TIME 6-7-19 1029 RECEIVED BY: (Signature) G...
 RELINQUISHED BY: (Signature) _____ DATE/TIME _____ RECEIVED BY: (Signature) _____

DHL DISPOSAL @ \$5.00 each Return 3

TURN AROUND TIME
 RUSH CALL FIRST
 1 DAY CALL FIRST
 2 DAY
 NORMAL
 OTHER

LABORATORY USE ONLY:
 RECEIVING TEMP: 5.50C THERM #: 78
 CUSTODY SEALS: BROKEN INTACT NOT USED
 CARRIER: LONE STAR FEDEX UPS OTHER
 COURIER DELIVERY HAND DELIVERED

DHL COC Rev 1 | FEB 2010

Eric Lau

From: John DuPont
Sent: Tuesday, May 28, 2019 11:35 AM
To: Eric Lau
Subject: FW: CCR Analysis

Appendix III Parameters:

Metals (Ca and B)
Anions (Cl, F, and SO4)
TDS

Appendix IV Parameters:

Metals (As, Ba, Be, Cd, Co, Cr, Hg, Li, Mo, Pb, Sb, Se, and Tl)
Ra-226
Ra-228

From: Vienne, Will [mailto:William_Vienne@golder.com]
Sent: Tuesday, April 09, 2019 12:48 PM
To: John DuPont <dupont@dhlanalytical.com>
Subject: CCR Analysis

FACTA (512) 671-3434
YTON
ORIGIN
J. BRAY DOUBLE CREEK DR STE 40D4
GOLDER ROCK, TX 78664
2201 D STATES US

06JUN19
0 LB
8/55FE2002
3 IN

Part # 156297-488Z ANELETENP 02/20

RT 512

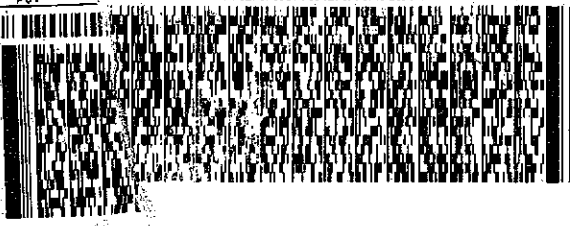
10:30
16:01
D

ROUND
UNITED

TO DHL
DH00 DOUBLE CREEK DR.
230
UND ROCK TX 78664

RO - B222 REF: DEPT:

(512) 88L
DU:
PO:



FedEx
Express



1M1070106101610

FRI - 07 JUN 10:30A
PRIORITY OVERNIGHT

7877 3109 7995

44 BOMA

78664
TX-US AUS



50
73

7877
44

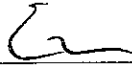
Sample Receipt Checklist

Client Name **Golder**

Date Received: **6/7/2019**

Work Order Number **1906072**

Received by **EL**

Checklist completed by:  6/17/2019
Signature Date

Reviewed by:  6/17/2019
Initials Date

Carrier name **FedEx 1day**

- Shipping container/cooler in good condition? Yes No Not Present
- Custody seals intact on shipping container/cooler? Yes No Not Present
- Custody seals intact on sample bottles? Yes No Not Present
- Chain of custody present? Yes No
- Chain of custody signed when relinquished and received? Yes No
- Chain of custody agrees with sample labels? Yes No
- Samples in proper container/bottle? Yes No
- Sample containers intact? Yes No
- Sufficient sample volume for indicated test? Yes No
- All samples received within holding time? Yes No
- Container/Temp Blank temperature in compliance? Yes No **5.5 °C**
- Water - VOA vials have zero headspace? Yes No No VOA vials submitted
- Water - pH<2 acceptable upon receipt? Yes No NA LOT # **11837**
Adjusted? no Checked by EL
- Water - pH>9 (S) or pH>10 (CN) acceptable upon receipt? Yes No NA LOT #
Adjusted? _____ Checked by _____

Any No response must be detailed in the comments section below.

Client contacted _____ Date contacted: _____ Person contacted _____

Contacted by: _____ Regarding: _____

Comments: _____

Corrective Action _____

CLIENT: Golder
Project: LUMINANT-OGSES-FGD
Lab Order: 1906072

CASE NARRATIVE

Samples were analyzed using the methods outlined in the following references:

- Method SW6020A - Metals Analysis
- Method E300 - Anions Analysis
- Method M2320 B - Alkalinity Analysis
- Method M3500-Fe D - Ferrous Iron Analysis (this parameter is not NELAP certified)
- Method M3500-Fe D - Ferric Iron (calculation) (this calculation is not NELAP certified).
- Method M4500-P E - Orthophosphate Analysis
- Method M2540C - TDS Analysis

LOG IN

The samples were received and log-in performed on 6/7/19. A total of 2 samples were received. The samples arrived in good condition and were properly packaged.

METALS ANALYSIS

For Metals analysis performed on 6/12/19 the matrix spike and matrix spike duplicate recoveries were below control limits for Sodium. These are flagged accordingly in the QC summary report. The sample selected for the matrix spike and matrix spike duplicate was not from this work order. The LCS was within control limits for this analyte. No further corrective actions were taken.

FERRIC IRON CALCULATION

The Ferric Iron is calculated as the Total Iron minus the Ferrous Iron.

CLIENT: Golder
Project: LUMINANT-OGSES-FGD
Lab Order: 1906072

Work Order Sample Summary

Lab Smp ID	Client Sample ID	Tag Number	Date Collected	Date Recved
1906072-01	FGD-16		06/06/19 01:00 PM	6/7/2019
1906072-02	FGD-15		06/06/19 02:45 PM	6/7/2019

Lab Order: 1906072
 Client: Golder
 Project: LUMINANT-OGSES-FGD

PREP DATES REPORT

Sample ID	Client Sample ID	Collection Date	Matrix	Test Number	Test Name	Prep Date	Batch ID
1906072-01A	FGD-16	06/06/19 01:00 PM	Aqueous	M3500-Fe	Ferrous Iron Prep Water	06/10/19 09:28 AM	91267
1906072-01B	FGD-16	06/06/19 01:00 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	06/10/19 08:17 AM	91261
	FGD-16	06/06/19 01:00 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	06/10/19 08:17 AM	91261
	FGD-16	06/06/19 01:00 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	06/10/19 08:17 AM	91261
1906072-01C	FGD-16	06/06/19 01:00 PM	Aqueous	M2320 B	Alkalinity Preparation	06/10/19 09:34 AM	91271
	FGD-16	06/06/19 01:00 PM	Aqueous	E300	Anion Preparation	06/07/19 12:27 PM	91226
	FGD-16	06/06/19 01:00 PM	Aqueous	E300	Anion Preparation	06/17/19 08:40 AM	91349
	FGD-16	06/06/19 01:00 PM	Aqueous	E300	Anion Preparation	06/17/19 08:40 AM	91349
	FGD-16	06/06/19 01:00 PM	Aqueous	M4500-P E	Orthophosphate Prep	06/07/19 01:20 PM	91254
	FGD-16	06/06/19 01:00 PM	Aqueous	M2540C	TDS Preparation	06/13/19 04:04 PM	91332
1906072-02A	FGD-15	06/06/19 02:45 PM	Aqueous	M3500-Fe	Ferrous Iron Prep Water	06/10/19 09:28 AM	91267
1906072-02B	FGD-15	06/06/19 02:45 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	06/10/19 08:17 AM	91261
	FGD-15	06/06/19 02:45 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	06/10/19 08:17 AM	91261
	FGD-15	06/06/19 02:45 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	06/10/19 08:17 AM	91261
1906072-02C	FGD-15	06/06/19 02:45 PM	Aqueous	M2320 B	Alkalinity Preparation	06/10/19 09:34 AM	91271
	FGD-15	06/06/19 02:45 PM	Aqueous	E300	Anion Preparation	06/07/19 12:27 PM	91226
	FGD-15	06/06/19 02:45 PM	Aqueous	E300	Anion Preparation	06/17/19 08:40 AM	91349
	FGD-15	06/06/19 02:45 PM	Aqueous	M4500-P E	Orthophosphate Prep	06/07/19 01:20 PM	91254
	FGD-15	06/06/19 02:45 PM	Aqueous	M2540C	TDS Preparation	06/13/19 04:04 PM	91332

Lab Order: 1906072
 Client: Golder
 Project: LUMINANT-OGSES-FGD

ANALYTICAL DATES REPORT

Sample ID	Client Sample ID	Matrix	Test Number	Test Name	Batch ID	Dilution	Analysis Date	Run ID
1906072-01A	FGD-16	Aqueous	M3500-Fe D	Ferric Iron (Calculated)	R104593	1	06/14/19	UV/VIS_2_190614A
	FGD-16	Aqueous	M3500-Fe D	Ferrous Iron	91267	1	06/10/19 11:01 AM	UV/VIS_2_190610A
1906072-01B	FGD-16	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	91261	10	06/12/19 11:53 AM	ICP-MS4_190612A
	FGD-16	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	91261	1	06/12/19 01:41 PM	ICP-MS4_190612A
	FGD-16	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	91261	1	06/11/19 04:05 PM	ICP-MS5_190611D
1906072-01C	FGD-16	Aqueous	M2320 B	Alkalinity	91271	1	06/10/19 12:47 PM	TITRATOR_190610A
	FGD-16	Aqueous	E300	Anions by IC method - Water	91226	1	06/07/19 04:58 PM	IC2_190607A
	FGD-16	Aqueous	E300	Anions by IC method - Water	91349	10	06/17/19 10:56 AM	IC2_190617A
	FGD-16	Aqueous	E300	Anions by IC method - Water	91349	1	06/17/19 12:16 PM	IC2_190617A
	FGD-16	Aqueous	M4500-P E	Orthophosphate	91254	1	06/07/19 01:51 PM	UV/VIS_2_190607B
	FGD-16	Aqueous	M2540C	Total Dissolved Solids	91332	1	06/14/19 12:00 PM	WC_190614B
1906072-02A	FGD-15	Aqueous	M3500-Fe D	Ferric Iron (Calculated)	R104593	1	06/14/19	UV/VIS_2_190614A
	FGD-15	Aqueous	M3500-Fe D	Ferrous Iron	91267	1	06/10/19 11:03 AM	UV/VIS_2_190610A
1906072-02B	FGD-15	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	91261	50	06/12/19 11:55 AM	ICP-MS4_190612A
	FGD-15	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	91261	1	06/12/19 01:43 PM	ICP-MS4_190612A
	FGD-15	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	91261	1	06/11/19 04:08 PM	ICP-MS5_190611D
1906072-02C	FGD-15	Aqueous	M2320 B	Alkalinity	91271	1	06/10/19 12:56 PM	TITRATOR_190610A
	FGD-15	Aqueous	E300	Anions by IC method - Water	91226	1	06/07/19 05:14 PM	IC2_190607A
	FGD-15	Aqueous	E300	Anions by IC method - Water	91349	100	06/17/19 11:44 AM	IC2_190617A
	FGD-15	Aqueous	M4500-P E	Orthophosphate	91254	1	06/07/19 01:52 PM	UV/VIS_2_190607B
	FGD-15	Aqueous	M2540C	Total Dissolved Solids	91332	1	06/14/19 12:00 PM	WC_190614B

DHL Analytical, Inc.

Date: 18-Jun-19

CLIENT: Golder
Project: LUMINANT-OGSES-FGD
Project No: 19122262-F
Lab Order: 1906072

Client Sample ID: FGD-16
Lab ID: 1906072-01
Collection Date: 06/06/19 01:00 PM
Matrix: AQUEOUS

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		SW6020A		Analyst: SP			
Calcium	16.5	1.00	3.00		mg/L	10	06/12/19 11:53 AM
Iron	<0.0300	0.0300	0.100		mg/L	1	06/11/19 04:05 PM
Magnesium	3.33	0.100	0.300		mg/L	1	06/11/19 04:05 PM
Potassium	3.06	0.100	0.300		mg/L	1	06/12/19 01:41 PM
Sodium	82.1	1.00	3.00		mg/L	10	06/12/19 11:53 AM
ANIONS BY IC METHOD - WATER		E300		Analyst: JL			
Chloride	74.8	3.00	10.0		mg/L	10	06/17/19 10:56 AM
Fluoride	0.164	0.100	0.400	J	mg/L	1	06/07/19 04:58 PM
Nitrate-N	0.361	0.100	0.500	J	mg/L	1	06/07/19 04:58 PM
Sulfate	13.9	1.00	3.00		mg/L	1	06/17/19 12:16 PM
ALKALINITY		M2320 B		Analyst: CC			
Alkalinity, Bicarbonate (As CaCO3)	159	10.0	20.0		mg/L @ pH 4.55	1	06/10/19 12:47 PM
Alkalinity, Carbonate (As CaCO3)	<10.0	10.0	20.0		mg/L @ pH 4.55	1	06/10/19 12:47 PM
Alkalinity, Hydroxide (As CaCO3)	<10.0	10.0	20.0		mg/L @ pH 4.55	1	06/10/19 12:47 PM
Alkalinity, Total (As CaCO3)	159	20.0	20.0		mg/L @ pH 4.55	1	06/10/19 12:47 PM
FERRIC IRON (CALCULATED)		M3500-FE D		Analyst: CAC			
Iron, Ferric	<0.0500	0.0500	0.100	N	mg/L	1	06/14/19
FERROUS IRON		M3500-FE D		Analyst: BTJ			
Iron, Ferrous	<0.0500	0.0500	0.100	N	mg/L	1	06/10/19 11:01 AM
ORTHOPHOSPHATE		M4500-P E		Analyst: BTJ			
Phosphorus, Total Orthophosphate (As P)	0.0490	0.0300	0.100	J	mg/L	1	06/07/19 01:51 PM
TOTAL DISSOLVED SOLIDS		M2540C		Analyst: JS			
Total Dissolved Solids (Residue, Filterable)	325	10.0	10.0		mg/L	1	06/14/19 12:00 PM

Qualifiers:

*	Value exceeds TCLP Maximum Concentration Level	C	Sample Result or QC discussed in the Case Narrative
DF	Dilution Factor	E	TPH pattern not Gas or Diesel Range Pattern
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	RL	Reporting Limit
S	Spike Recovery outside control limits	N	Parameter not NELAP certified

DHL Analytical, Inc.

Date: 18-Jun-19

CLIENT: Golder
Project: LUMINANT-OGSES-FGD
Project No: 19122262-F
Lab Order: 1906072

Client Sample ID: FGD-15
Lab ID: 1906072-02
Collection Date: 06/06/19 02:45 PM
Matrix: AQUEOUS

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		SW6020A		Analyst: SP			
Calcium	252	5.00	15.0		mg/L	50	06/12/19 11:55 AM
Iron	<0.0300	0.0300	0.100		mg/L	1	06/11/19 04:08 PM
Lithium	0.0768	0.00500	0.0100		mg/L	1	06/11/19 04:08 PM
Magnesium	97.2	5.00	15.0		mg/L	50	06/12/19 11:55 AM
Potassium	5.06	0.100	0.300		mg/L	1	06/12/19 01:43 PM
Sodium	457	5.00	15.0		mg/L	50	06/12/19 11:55 AM
ANIONS BY IC METHOD - WATER		E300		Analyst: JL			
Chloride	634	30.0	100		mg/L	100	06/17/19 11:44 AM
Fluoride	0.622	0.100	0.400		mg/L	1	06/07/19 05:14 PM
Nitrate-N	<0.100	0.100	0.500		mg/L	1	06/07/19 05:14 PM
Sulfate	926	100	300		mg/L	100	06/17/19 11:44 AM
ALKALINITY		M2320 B		Analyst: CC			
Alkalinity, Bicarbonate (As CaCO3)	178	10.0	20.0		mg/L @ pH 4.54	1	06/10/19 12:56 PM
Alkalinity, Carbonate (As CaCO3)	<10.0	10.0	20.0		mg/L @ pH 4.54	1	06/10/19 12:56 PM
Alkalinity, Hydroxide (As CaCO3)	<10.0	10.0	20.0		mg/L @ pH 4.54	1	06/10/19 12:56 PM
Alkalinity, Total (As CaCO3)	178	20.0	20.0		mg/L @ pH 4.54	1	06/10/19 12:56 PM
FERRIC IRON (CALCULATED)		M3500-FE D		Analyst: CAC			
Iron, Ferric	<0.0500	0.0500	0.100	N	mg/L	1	06/14/19
FERROUS IRON		M3500-FE D		Analyst: BTJ			
Iron, Ferrous	<0.0500	0.0500	0.100	N	mg/L	1	06/10/19 11:03 AM
ORTHOPHOSPHATE		M4500-P E		Analyst: BTJ			
Phosphorus, Total Orthophosphate (As P)	0.0840	0.0300	0.100	J	mg/L	1	06/07/19 01:52 PM
TOTAL DISSOLVED SOLIDS		M2540C		Analyst: JS			
Total Dissolved Solids (Residue, Filterable)	2880	50.0	50.0		mg/L	1	06/14/19 12:00 PM

Qualifiers:

*	Value exceeds TCLP Maximum Concentration Level	C	Sample Result or QC discussed in the Case Narrative
DF	Dilution Factor	E	TPH pattern not Gas or Diesel Range Pattern
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	RL	Reporting Limit
S	Spike Recovery outside control limits	N	Parameter not NELAP certified

CLIENT: Golder
 Work Order: 1906072

ANALYTICAL QC SUMMARY REPORT

Project: LUMINANT-OGSES-FGD

RunID: ICP-MS4_190612A

The QC data in batch 91261 applies to the following samples: 1906072-01B, 1906072-02B

Sample ID	MB-91261	Batch ID:	91261	TestNo:	SW6020A	Units:	mg/L			
SampType:	MBLK	Run ID:	ICP-MS4_190612A	Analysis Date:	6/12/2019 10:50:00 AM	Prep Date:	6/10/2019			
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Calcium	<0.100	0.300								
Potassium	<0.100	0.300								
Sodium	<0.100	0.300								

Sample ID	LCS-91261	Batch ID:	91261	TestNo:	SW6020A	Units:	mg/L			
SampType:	LCS	Run ID:	ICP-MS4_190612A	Analysis Date:	6/12/2019 10:52:00 AM	Prep Date:	6/10/2019			
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Calcium	4.66	0.300	5.00	0	93.2	80	120			
Potassium	4.97	0.300	5.00	0	99.4	80	120			
Sodium	5.11	0.300	5.00	0	102	80	120			

Sample ID	LCSD-91261	Batch ID:	91261	TestNo:	SW6020A	Units:	mg/L			
SampType:	LCSD	Run ID:	ICP-MS4_190612A	Analysis Date:	6/12/2019 10:54:00 AM	Prep Date:	6/10/2019			
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Calcium	4.67	0.300	5.00	0	93.4	80	120	0.234	15
Potassium	4.93	0.300	5.00	0	98.5	80	120	0.913	15
Sodium	5.15	0.300	5.00	0	103	80	120	0.824	15

Sample ID	1906056-01A SD	Batch ID:	91261	TestNo:	SW6020A	Units:	mg/L			
SampType:	SD	Run ID:	ICP-MS4_190612A	Analysis Date:	6/12/2019 11:00:00 AM	Prep Date:	6/10/2019			
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Calcium	39.0	75.0	0	38.0				2.46	10
Potassium	<25.0	75.0	0	0				0	10
Sodium	116	75.0	0	115				0.316	10

Sample ID	1906056-01A PDS	Batch ID:	91261	TestNo:	SW6020A	Units:	mg/L			
SampType:	PDS	Run ID:	ICP-MS4_190612A	Analysis Date:	6/12/2019 11:20:00 AM	Prep Date:	6/10/2019			
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Calcium	276	15.0	250	38.0	95.0	80	120			
Potassium	247	15.0	250	0	98.7	80	120			
Sodium	379	15.0	250	115	105	80	120			

- Qualifiers:**
- B Analyte detected in the associated Method Blank
 - J Analyte detected between MDL and RL
 - ND Not Detected at the Method Detection Limit
 - RL Reporting Limit
 - J Analyte detected between SDL and RL
 - DF Dilution Factor
 - MDL Method Detection Limit
 - R RPD outside accepted control limits
 - S Spike Recovery outside control limits
 - N Parameter not NELAP certified

CLIENT: Golder
Work Order: 1906072
Project: LUMINANT-OGSES-FGD

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS4_190612A

Sample ID: 1906056-01A MS	Batch ID: 91261	TestNo: SW6020A	Units: mg/L
SampType: MS	Run ID: ICP-MS4_190612A	Analysis Date: 6/12/2019 11:22:00 AM	Prep Date: 6/10/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	42.9	15.0	5.00	38.0	98.3	80	120			
Potassium	5.61	15.0	5.00	0	112	80	120			
Sodium	118	15.0	5.00	115	44.1	80	120			S

Sample ID: 1906056-01A MSD	Batch ID: 91261	TestNo: SW6020A	Units: mg/L
SampType: MSD	Run ID: ICP-MS4_190612A	Analysis Date: 6/12/2019 11:24:00 AM	Prep Date: 6/10/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	42.4	15.0	5.00	38.0	87.2	80	120	1.30	15	
Potassium	5.65	15.0	5.00	0	113	80	120	0.726	15	
Sodium	116	15.0	5.00	115	20.3	80	120	1.02	15	S

Qualifiers: B Analyte detected in the associated Method Blank DF Dilution Factor
 J Analyte detected between MDL and RL MDL Method Detection Limit
 ND Not Detected at the Method Detection Limit R RPD outside accepted control limits
 RL Reporting Limit S Spike Recovery outside control limits
 J Analyte detected between SDL and RL N Parameter not NELAP certified

CLIENT: Golder
Work Order: 1906072
Project: LUMINANT-OGSES-FGD

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS4_190612A

Sample ID ICV-190612	Batch ID: R104563	TestNo: SW6020A	Units: mg/L							
SampType: ICV	Run ID: ICP-MS4_190612A	Analysis Date: 6/12/2019 10:34:00 AM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	2.45	0.300	2.50	0	98.1	90	110			
Magnesium	2.44	0.300	2.50	0	97.4	90	110			
Potassium	2.48	0.300	2.50	0	99.1	90	110			
Sodium	2.55	0.300	2.50	0	102	90	110			

Sample ID LCVL-190612	Batch ID: R104563	TestNo: SW6020A	Units: mg/L							
SampType: LCVL	Run ID: ICP-MS4_190612A	Analysis Date: 6/12/2019 10:44:00 AM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	0.0989	0.300	0.100	0	98.9	70	130			
Magnesium	0.0972	0.300	0.100	0	97.2	70	130			
Potassium	0.101	0.300	0.100	0	101	70	130			
Sodium	0.103	0.300	0.100	0	103	70	130			

Sample ID CCV1-190612	Batch ID: R104563	TestNo: SW6020A	Units: mg/L							
SampType: CCV	Run ID: ICP-MS4_190612A	Analysis Date: 6/12/2019 11:26:00 AM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	4.71	0.300	5.00	0	94.3	90	110			
Magnesium	4.96	0.300	5.00	0	99.1	90	110			
Potassium	5.03	0.300	5.00	0	101	90	110			
Sodium	4.99	0.300	5.00	0	99.8	90	110			

Sample ID LCVL1-190612	Batch ID: R104563	TestNo: SW6020A	Units: mg/L							
SampType: LCVL	Run ID: ICP-MS4_190612A	Analysis Date: 6/12/2019 11:42:00 AM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	0.102	0.300	0.100	0	102	70	130			
Magnesium	0.0966	0.300	0.100	0	96.6	70	130			
Potassium	0.0990	0.300	0.100	0	99.0	70	130			
Sodium	0.103	0.300	0.100	0	103	70	130			

Sample ID CCV2-190612	Batch ID: R104563	TestNo: SW6020A	Units: mg/L							
SampType: CCV	Run ID: ICP-MS4_190612A	Analysis Date: 6/12/2019 12:01:00 PM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	4.65	0.300	5.00	0	93.1	90	110			
Magnesium	5.02	0.300	5.00	0	100	90	110			
Sodium	5.11	0.300	5.00	0	102	90	110			

Qualifiers:

B Analyte detected in the associated Method Blank	DF Dilution Factor
J Analyte detected between MDL and RL	MDL Method Detection Limit
ND Not Detected at the Method Detection Limit	R RPD outside accepted control limits
RL Reporting Limit	S Spike Recovery outside control limits
J Analyte detected between SDL and RL	N Parameter not NELAP certified

CLIENT: Golder
Work Order: 1906072
Project: LUMINANT-OGSES-FGD

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS4_190612A

Sample ID: LCVL2-190612	Batch ID: R104563	TestNo: SW6020A	Units: mg/L
SampType: LCVL	Run ID: ICP-MS4_190612A	Analysis Date: 6/12/2019 12:08:00 PM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	0.0958	0.300	0.100	0	95.8	70	130			
Magnesium	0.0967	0.300	0.100	0	96.7	70	130			
Sodium	0.103	0.300	0.100	0	103	70	130			

Sample ID: CCV4-190612	Batch ID: R104563	TestNo: SW6020A	Units: mg/L
SampType: CCV	Run ID: ICP-MS4_190612A	Analysis Date: 6/12/2019 1:23:00 PM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Potassium	5.05	0.300	5.00	0	101	90	110			

Sample ID: LCVL4-190612	Batch ID: R104563	TestNo: SW6020A	Units: mg/L
SampType: LCVL	Run ID: ICP-MS4_190612A	Analysis Date: 6/12/2019 1:27:00 PM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Potassium	0.0950	0.300	0.100	0	95.0	70	130			

Sample ID: CCV5-190612	Batch ID: R104563	TestNo: SW6020A	Units: mg/L
SampType: CCV	Run ID: ICP-MS4_190612A	Analysis Date: 6/12/2019 1:45:00 PM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Potassium	5.00	0.300	5.00	0	100	90	110			

Sample ID: LCVL5-190612	Batch ID: R104563	TestNo: SW6020A	Units: mg/L
SampType: LCVL	Run ID: ICP-MS4_190612A	Analysis Date: 6/12/2019 1:50:00 PM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Potassium	0.0947	0.300	0.100	0	94.7	70	130			

Qualifiers: B Analyte detected in the associated Method Blank DF Dilution Factor
 J Analyte detected between MDL and RL MDL Method Detection Limit
 ND Not Detected at the Method Detection Limit R RPD outside accepted control limits
 RL Reporting Limit S Spike Recovery outside control limits
 J Analyte detected between SDL and RL N Parameter not NELAP certified

CLIENT: Golder
Work Order: 1906072
Project: LUMINANT-OGSES-FGD

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS5_190611D

The QC data in batch 91261 applies to the following samples: 1906072-01B, 1906072-02B

Sample ID MB-91261	Batch ID: 91261	TestNo: SW6020A	Units: mg/L							
SampType: MBLK	Run ID: ICP-MS5_190611D	Analysis Date: 6/11/2019 3:05:00 PM	Prep Date: 6/10/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron	<0.0300	0.100								
Lithium	<0.00500	0.0100								
Magnesium	<0.100	0.300								

Sample ID LCS-91261	Batch ID: 91261	TestNo: SW6020A	Units: mg/L							
SampType: LCS	Run ID: ICP-MS5_190611D	Analysis Date: 6/11/2019 3:07:00 PM	Prep Date: 6/10/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron	5.05	0.100	5.00	0	101	80	120			
Lithium	0.208	0.0100	0.200	0	104	80	120			
Magnesium	5.05	0.300	5.00	0	101	80	120			

Sample ID LCSD-91261	Batch ID: 91261	TestNo: SW6020A	Units: mg/L							
SampType: LCSD	Run ID: ICP-MS5_190611D	Analysis Date: 6/11/2019 3:10:00 PM	Prep Date: 6/10/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron	5.01	0.100	5.00	0	100	80	120	0.604	15	
Lithium	0.206	0.0100	0.200	0	103	80	120	0.952	15	
Magnesium	5.04	0.300	5.00	0	101	80	120	0.085	15	

Sample ID 1906056-01A SD	Batch ID: 91261	TestNo: SW6020A	Units: mg/L							
SampType: SD	Run ID: ICP-MS5_190611D	Analysis Date: 6/11/2019 3:16:00 PM	Prep Date: 6/10/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron	0.190	0.500	0	0.0550				110	10	
Lithium	<0.0250	0.0500	0	0.00980				0	10	
Magnesium	8.05	1.50	0	7.98				0.840	10	

Sample ID 1906056-01A PDS	Batch ID: 91261	TestNo: SW6020A	Units: mg/L							
SampType: PDS	Run ID: ICP-MS5_190611D	Analysis Date: 6/11/2019 3:39:00 PM	Prep Date: 6/10/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron	4.99	0.100	5.00	0.0550	98.7	80	120			
Lithium	0.215	0.0100	0.200	0.00980	103	80	120			
Magnesium	12.3	0.300	5.00	7.98	87.2	80	120			

Sample ID 1906056-01A MS	Batch ID: 91261	TestNo: SW6020A	Units: mg/L							
SampType: MS	Run ID: ICP-MS5_190611D	Analysis Date: 6/11/2019 3:41:00 PM	Prep Date: 6/10/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Qualifiers:

B Analyte detected in the associated Method Blank	DF Dilution Factor
J Analyte detected between MDL and RL	MDL Method Detection Limit
ND Not Detected at the Method Detection Limit	R RPD outside accepted control limits
RL Reporting Limit	S Spike Recovery outside control limits
J Analyte detected between SDL and RL	N Parameter not NELAP certified

CLIENT: Golder
Work Order: 1906072
Project: LUMINANT-OGSES-FGD

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS5_190611D

Sample ID: 1906056-01A MS	Batch ID: 91261	TestNo: SW6020A	Units: mg/L							
SampType: MS	Run ID: ICP-MS5_190611D	Analysis Date: 6/11/2019 3:41:00 PM	Prep Date: 6/10/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron	5.06	0.100	5.00	0.0550	100	80	120			
Lithium	0.210	0.0100	0.200	0.00980	100	80	120			
Magnesium	12.9	0.300	5.00	7.98	97.7	80	120			

Sample ID: 1906056-01A MSD	Batch ID: 91261	TestNo: SW6020A	Units: mg/L							
SampType: MSD	Run ID: ICP-MS5_190611D	Analysis Date: 6/11/2019 3:43:00 PM	Prep Date: 6/10/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron	5.08	0.100	5.00	0.0550	101	80	120	0.370	15	
Lithium	0.209	0.0100	0.200	0.00980	99.7	80	120	0.400	15	
Magnesium	13.0	0.300	5.00	7.98	99.4	80	120	0.654	15	

Qualifiers:	<p>B Analyte detected in the associated Method Blank</p> <p>J Analyte detected between MDL and RL</p> <p>ND Not Detected at the Method Detection Limit</p> <p>RL Reporting Limit</p> <p>J Analyte detected between SDL and RL</p>	<p>DF Dilution Factor</p> <p>MDL Method Detection Limit</p> <p>R RPD outside accepted control limits</p> <p>S Spike Recovery outside control limits</p> <p>N Parameter not NELAP certified</p>
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CLIENT: Golder
Work Order: 1906072
Project: LUMINANT-OGSES-FGD

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS5_190611D

Sample ID: ICV-190611	Batch ID: R104548	TestNo: SW6020A	Units: mg/L
SampType: ICV	Run ID: ICP-MS5_190611D	Analysis Date: 6/11/2019 10:46:00 AM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron	2.45	0.100	2.50	0	98.2	90	110			
Lithium	0.102	0.0100	0.100	0	102	90	110			
Magnesium	2.39	0.300	2.50	0	95.6	90	110			

Sample ID: LCVL-190611	Batch ID: R104548	TestNo: SW6020A	Units: mg/L
SampType: LCVL	Run ID: ICP-MS5_190611D	Analysis Date: 6/11/2019 10:52:00 AM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron	0.0944	0.100	0.100	0	94.4	70	130			
Lithium	0.0101	0.0100	0.0100	0	101	70	130			
Magnesium	0.0959	0.300	0.100	0	95.9	70	130			

Sample ID: CCV3-190611	Batch ID: R104548	TestNo: SW6020A	Units: mg/L
SampType: CCV	Run ID: ICP-MS5_190611D	Analysis Date: 6/11/2019 2:53:00 PM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron	4.97	0.100	5.00	0	99.4	90	110			
Lithium	0.204	0.0100	0.200	0	102	90	110			
Magnesium	4.96	0.300	5.00	0	99.2	90	110			

Sample ID: LCVL3-190611	Batch ID: R104548	TestNo: SW6020A	Units: mg/L
SampType: LCVL	Run ID: ICP-MS5_190611D	Analysis Date: 6/11/2019 2:57:00 PM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron	0.0963	0.100	0.100	0	96.3	70	130			
Lithium	0.0104	0.0100	0.0100	0	104	70	130			
Magnesium	0.0942	0.300	0.100	0	94.2	70	130			

Sample ID: CCV4-190611	Batch ID: R104548	TestNo: SW6020A	Units: mg/L
SampType: CCV	Run ID: ICP-MS5_190611D	Analysis Date: 6/11/2019 3:48:00 PM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron	4.93	0.100	5.00	0	98.6	90	110			
Lithium	0.202	0.0100	0.200	0	101	90	110			
Magnesium	4.99	0.300	5.00	0	99.7	90	110			

Sample ID: LCVL4-190611	Batch ID: R104548	TestNo: SW6020A	Units: mg/L
SampType: LCVL	Run ID: ICP-MS5_190611D	Analysis Date: 6/11/2019 3:59:00 PM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron	0.0969	0.100	0.100	0	96.9	70	130			

Qualifiers:

B Analyte detected in the associated Method Blank	DF Dilution Factor
J Analyte detected between MDL and RL	MDL Method Detection Limit
ND Not Detected at the Method Detection Limit	R RPD outside accepted control limits
RL Reporting Limit	S Spike Recovery outside control limits
J Analyte detected between SDL and RL	N Parameter not NELAP certified

CLIENT: Golder
Work Order: 1906072
Project: LUMINANT-OGSES-FGD

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS5_190611D

Sample ID: LCVL4-190611	Batch ID: R104548	TestNo: SW6020A	Units: mg/L							
SampType: LCVL	Run ID: ICP-MS5_190611D	Analysis Date: 6/11/2019 3:59:00 PM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Lithium	0.0106	0.0100	0.0100	0	106	70	130			
Magnesium	0.100	0.300	0.100	0	100	70	130			

Sample ID: CCV5-190611	Batch ID: R104548	TestNo: SW6020A	Units: mg/L							
SampType: CCV	Run ID: ICP-MS5_190611D	Analysis Date: 6/11/2019 4:21:00 PM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron	4.87	0.100	5.00	0	97.5	90	110			
Lithium	0.204	0.0100	0.200	0	102	90	110			
Magnesium	5.01	0.300	5.00	0	100	90	110			

Sample ID: LCVL5-190611	Batch ID: R104548	TestNo: SW6020A	Units: mg/L							
SampType: LCVL	Run ID: ICP-MS5_190611D	Analysis Date: 6/11/2019 4:26:00 PM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron	0.0924	0.100	0.100	0	92.4	70	130			
Lithium	0.0101	0.0100	0.0100	0	101	70	130			
Magnesium	0.100	0.300	0.100	0	100	70	130			

<p>Qualifiers:</p> <p>B Analyte detected in the associated Method Blank</p> <p>J Analyte detected between MDL and RL</p> <p>ND Not Detected at the Method Detection Limit</p> <p>RL Reporting Limit</p> <p>J Analyte detected between SDL and RL</p>	<p>DF Dilution Factor</p> <p>MDL Method Detection Limit</p> <p>R RPD outside accepted control limits</p> <p>S Spike Recovery outside control limits</p> <p>N Parameter not NELAP certified</p>
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CLIENT: Golder
Work Order: 1906072
Project: LUMINANT-OGSES-FGD

ANALYTICAL QC SUMMARY REPORT

RunID: IC2_190607A

The QC data in batch 91226 applies to the following samples: 1906072-01C, 1906072-02C

Sample ID MB-91226	Batch ID: 91226	TestNo: E300	Units: mg/L							
SampType: MBLK	Run ID: IC2_190607A	Analysis Date: 6/7/2019 10:25:46 AM	Prep Date: 6/7/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	<0.100	0.400								
Nitrate-N	<0.100	0.500								

Sample ID LCS-91226	Batch ID: 91226	TestNo: E300	Units: mg/L							
SampType: LCS	Run ID: IC2_190607A	Analysis Date: 6/7/2019 10:41:46 AM	Prep Date: 6/7/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	4.06	0.400	4.000	0	101	90	110			
Nitrate-N	5.17	0.500	5.000	0	103	90	110			

Sample ID LCSD-91226	Batch ID: 91226	TestNo: E300	Units: mg/L							
SampType: LCSD	Run ID: IC2_190607A	Analysis Date: 6/7/2019 10:57:46 AM	Prep Date: 6/7/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	4.07	0.400	4.000	0	102	90	110	0.405	20	
Nitrate-N	5.11	0.500	5.000	0	102	90	110	1.10	20	

Sample ID 1906064-01EMS	Batch ID: 91226	TestNo: E300	Units: mg/L							
SampType: MS	Run ID: IC2_190607A	Analysis Date: 6/7/2019 12:01:26 PM	Prep Date: 6/7/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	21.2	0.400	20.00	0.1842	105	90	110			
Nitrate-N	4.75	0.500	4.516	0.1911	101	90	110			

Sample ID 1906064-01EMSD	Batch ID: 91226	TestNo: E300	Units: mg/L							
SampType: MSD	Run ID: IC2_190607A	Analysis Date: 6/7/2019 12:17:26 PM	Prep Date: 6/7/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	21.2	0.400	20.00	0.1842	105	90	110	0.188	20	
Nitrate-N	4.75	0.500	4.516	0.1911	101	90	110	0.115	20	

Sample ID 1906066-01DMS	Batch ID: 91226	TestNo: E300	Units: mg/L							
SampType: MS	Run ID: IC2_190607A	Analysis Date: 6/7/2019 1:46:15 PM	Prep Date: 6/7/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	2110	40.0	2000	0	106	90	110			
Nitrate-N	456	50.0	451.6	0	101	90	110			

Qualifiers: B Analyte detected in the associated Method Blank DF Dilution Factor
J Analyte detected between MDL and RL MDL Method Detection Limit
ND Not Detected at the Method Detection Limit R RPD outside accepted control limits
RL Reporting Limit S Spike Recovery outside control limits
J Analyte detected between SDL and RL N Parameter not NELAP certified

CLIENT: Golder
Work Order: 1906072
Project: LUMINANT-OGSES-FGD

ANALYTICAL QC SUMMARY REPORT

RunID: IC2_190607A

Sample ID	1906066-01DMSD	Batch ID:	91226	TestNo:	E300	Units:	mg/L			
SampType:	MSD	Run ID:	IC2_190607A	Analysis Date:	6/7/2019 2:02:15 PM	Prep Date:	6/7/2019			
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	2110	40.0	2000	0	105	90	110	0.071	20	
Nitrate-N	455	50.0	451.6	0	101	90	110	0.150	20	

Qualifiers: B Analyte detected in the associated Method Blank DF Dilution Factor
 J Analyte detected between MDL and RL MDL Method Detection Limit
 ND Not Detected at the Method Detection Limit R RPD outside accepted control limits
 RL Reporting Limit S Spike Recovery outside control limits
 J Analyte detected between SDL and RL N Parameter not NELAP certified

CLIENT: Golder
Work Order: 1906072
Project: LUMINANT-OGSES-FGD

ANALYTICAL QC SUMMARY REPORT

RunID: IC2_190607A

Sample ID ICV-190607	Batch ID: R104496	TestNo: E300	Units: mg/L							
SampType: ICV	Run ID: IC2_190607A	Analysis Date: 6/7/2019 9:53:47 AM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	10.4	0.400	10.00	0	104	90	110			
Nitrate-N	13.2	0.500	12.50	0	106	90	110			

Sample ID CCV1-190607	Batch ID: R104496	TestNo: E300	Units: mg/L							
SampType: CCV	Run ID: IC2_190607A	Analysis Date: 6/7/2019 3:38:14 PM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	4.14	0.400	4.000	0	104	90	110			
Nitrate-N	5.23	0.500	5.000	0	105	90	110			

Sample ID CCV2-190607	Batch ID: R104496	TestNo: E300	Units: mg/L							
SampType: CCV	Run ID: IC2_190607A	Analysis Date: 6/7/2019 6:18:14 PM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	4.16	0.400	4.000	0	104	90	110			
Nitrate-N	5.17	0.500	5.000	0	103	90	110			

<p>Qualifiers:</p> <p>B Analyte detected in the associated Method Blank</p> <p>J Analyte detected between MDL and RL</p> <p>ND Not Detected at the Method Detection Limit</p> <p>RL Reporting Limit</p> <p>J Analyte detected between SDL and RL</p>	<p>DF Dilution Factor</p> <p>MDL Method Detection Limit</p> <p>R RPD outside accepted control limits</p> <p>S Spike Recovery outside control limits</p> <p>N Parameter not NELAP certified</p>
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CLIENT: Golder
Work Order: 1906072
Project: LUMINANT-OGSES-FGD

ANALYTICAL QC SUMMARY REPORT

RunID: IC2_190617A

The QC data in batch 91349 applies to the following samples: 1906072-01C, 1906072-02C

Sample ID MB-91349	Batch ID: 91349	TestNo: E300	Units: mg/L							
SampType: MBLK	Run ID: IC2_190617A	Analysis Date: 6/17/2019 9:53:33 AM	Prep Date: 6/17/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	<0.300	1.00								
Sulfate	<1.00	3.00								

Sample ID LCS-91349	Batch ID: 91349	TestNo: E300	Units: mg/L							
SampType: LCS	Run ID: IC2_190617A	Analysis Date: 6/17/2019 10:09:33 AM	Prep Date: 6/17/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	10.0	1.00	10.00	0	100	90	110			
Sulfate	30.4	3.00	30.00	0	101	90	110			

Sample ID LCSD-91349	Batch ID: 91349	TestNo: E300	Units: mg/L							
SampType: LCSD	Run ID: IC2_190617A	Analysis Date: 6/17/2019 10:25:33 AM	Prep Date: 6/17/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	10.2	1.00	10.00	0	102	90	110	1.27	20	
Sulfate	30.8	3.00	30.00	0	103	90	110	1.19	20	

Sample ID 1906072-01CMS	Batch ID: 91349	TestNo: E300	Units: mg/L							
SampType: MS	Run ID: IC2_190617A	Analysis Date: 6/17/2019 11:12:11 AM	Prep Date: 6/17/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	284	10.0	200.0	74.78	105	90	110			
Sulfate	219	30.0	200.0	15.57	102	90	110			

Sample ID 1906072-01CMSD	Batch ID: 91349	TestNo: E300	Units: mg/L							
SampType: MSD	Run ID: IC2_190617A	Analysis Date: 6/17/2019 11:28:11 AM	Prep Date: 6/17/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	287	10.0	200.0	74.78	106	90	110	0.914	20	
Sulfate	222	30.0	200.0	15.57	103	90	110	1.08	20	

Qualifiers: B Analyte detected in the associated Method Blank J Analyte detected between MDL and RL ND Not Detected at the Method Detection Limit RL Reporting Limit J Analyte detected between SDL and RL	DF Dilution Factor MDL Method Detection Limit R RPD outside accepted control limits S Spike Recovery outside control limits N Parameter not NELAP certified
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CLIENT: Golder
Work Order: 1906072
Project: LUMINANT-OGSES-FGD

ANALYTICAL QC SUMMARY REPORT

RunID: IC2_190617A

Sample ID ICV-190615	Batch ID: R104618	TestNo: E300	Units: mg/L							
SampType: ICV	Run ID: IC2_190617A	Analysis Date: 6/17/2019 9:21:33 AM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	25.5	1.00	25.00	0	102	90	110			
Sulfate	77.0	3.00	75.00	0	103	90	110			

Sample ID CCV1-190617	Batch ID: R104618	TestNo: E300	Units: mg/L							
SampType: CCV	Run ID: IC2_190617A	Analysis Date: 6/17/2019 1:20:11 PM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	10.2	1.00	10.00	0	102	90	110			
Sulfate	30.8	3.00	30.00	0	103	90	110			

Qualifiers: B Analyte detected in the associated Method Blank J Analyte detected between MDL and RL ND Not Detected at the Method Detection Limit RL Reporting Limit J Analyte detected between SDL and RL	DF Dilution Factor MDL Method Detection Limit R RPD outside accepted control limits S Spike Recovery outside control limits N Parameter not NELAP certified
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CLIENT: Golder
Work Order: 1906072
Project: LUMINANT-OGSES-FGD

ANALYTICAL QC SUMMARY REPORT

RunID: TITRATOR_190610A

The QC data in batch 91271 applies to the following samples: 1906072-01C, 1906072-02C

Sample ID MB-91271	Batch ID: 91271	TestNo: M2320 B	Units: mg/L @ pH 4.27
SampType: MBLK	Run ID: TITRATOR_190610A	Analysis Date: 6/10/2019 10:17:00 AM	Prep Date: 6/10/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Alkalinity, Bicarbonate (As CaCO3)	<10.0	20.0								
Alkalinity, Carbonate (As CaCO3)	<10.0	20.0								
Alkalinity, Hydroxide (As CaCO3)	<10.0	20.0								
Alkalinity, Total (As CaCO3)	<20.0	20.0								

Sample ID LCS-91271	Batch ID: 91271	TestNo: M2320 B	Units: mg/L @ pH 4.39
SampType: LCS	Run ID: TITRATOR_190610A	Analysis Date: 6/10/2019 10:22:00 AM	Prep Date: 6/10/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	49.8	20.0	50.00	0	99.5	74	129			

Sample ID 1906073-02C DUP	Batch ID: 91271	TestNo: M2320 B	Units: mg/L @ pH 4.54
SampType: DUP	Run ID: TITRATOR_190610A	Analysis Date: 6/10/2019 1:11:00 PM	Prep Date: 6/10/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Alkalinity, Bicarbonate (As CaCO3)	66.8	20.0	0	68.00				1.78	20	
Alkalinity, Carbonate (As CaCO3)	<10.0	20.0	0	0				0	20	
Alkalinity, Hydroxide (As CaCO3)	<10.0	20.0	0	0				0	20	
Alkalinity, Total (As CaCO3)	66.8	20.0	0	68.00				1.78	20	

<p>Qualifiers:</p> <p>B Analyte detected in the associated Method Blank</p> <p>J Analyte detected between MDL and RL</p> <p>ND Not Detected at the Method Detection Limit</p> <p>RL Reporting Limit</p> <p>J Analyte detected between SDL and RL</p>	<p>DF Dilution Factor</p> <p>MDL Method Detection Limit</p> <p>R RPD outside accepted control limits</p> <p>S Spike Recovery outside control limits</p> <p>N Parameter not NELAP certified</p>
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CLIENT: Golder
Work Order: 1906072
Project: LUMINANT-OGSES-FGD

ANALYTICAL QC SUMMARY REPORT

RunID: TITRATOR_190610A

Sample ID ICV-190610	Batch ID: R104513	TestNo: M2320 B	Units: mg/L @ pH 4.29
SampType: ICV	Run ID: TITRATOR_190610A	Analysis Date: 6/10/2019 10:15:00 AM	Prep Date: 6/10/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Alkalinity, Bicarbonate (As CaCO3)	4.00	20.0	0							
Alkalinity, Carbonate (As CaCO3)	96.2	20.0	0							
Alkalinity, Hydroxide (As CaCO3)	<10.0	20.0	0							
Alkalinity, Total (As CaCO3)	100	20.0	100.0	0	100	98	102			

Sample ID CCV1-190610	Batch ID: R104513	TestNo: M2320 B	Units: mg/L @ pH 4.22
SampType: CCV	Run ID: TITRATOR_190610A	Analysis Date: 6/10/2019 1:08:00 PM	Prep Date: 6/10/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Alkalinity, Bicarbonate (As CaCO3)	27.7	20.0	0							
Alkalinity, Carbonate (As CaCO3)	74.1	20.0	0							
Alkalinity, Hydroxide (As CaCO3)	<10.0	20.0	0							
Alkalinity, Total (As CaCO3)	102	20.0	100.0	0	102	90	110			

Sample ID CCV2-190610	Batch ID: R104513	TestNo: M2320 B	Units: mg/L @ pH 4.21
SampType: CCV	Run ID: TITRATOR_190610A	Analysis Date: 6/10/2019 1:16:00 PM	Prep Date: 6/10/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Alkalinity, Bicarbonate (As CaCO3)	26.1	20.0	0							
Alkalinity, Carbonate (As CaCO3)	73.8	20.0	0							
Alkalinity, Hydroxide (As CaCO3)	<10.0	20.0	0							
Alkalinity, Total (As CaCO3)	99.8	20.0	100.0	0	99.8	90	110			

Qualifiers: B Analyte detected in the associated Method Blank DF Dilution Factor
 J Analyte detected between MDL and RL MDL Method Detection Limit
 ND Not Detected at the Method Detection Limit R RPD outside accepted control limits
 RL Reporting Limit S Spike Recovery outside control limits
 J Analyte detected between SDL and RL N Parameter not NELAP certified

CLIENT: Golder
Work Order: 1906072
Project: LUMINANT-OGSES-FGD

ANALYTICAL QC SUMMARY REPORT

RunID: UV/VIS_2_190607B

The QC data in batch 91254 applies to the following samples: 1906072-01C, 1906072-02C

Sample ID MB-91254	Batch ID: 91254	TestNo: M4500-P E	Units: mg/L							
SampType: MBLK	Run ID: UV/VIS_2_190607B	Analysis Date: 6/7/2019 1:50:00 PM	Prep Date: 6/7/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Phosphorus, Total Orthophosphate (As <0.0300 0.100

Sample ID LCS-91254	Batch ID: 91254	TestNo: M4500-P E	Units: mg/L							
SampType: LCS	Run ID: UV/VIS_2_190607B	Analysis Date: 6/7/2019 1:50:00 PM	Prep Date: 6/7/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Phosphorus, Total Orthophosphate (As 0.509 0.100 0.5000 0 102 80 120

Sample ID LCSD-91254	Batch ID: 91254	TestNo: M4500-P E	Units: mg/L							
SampType: LCSD	Run ID: UV/VIS_2_190607B	Analysis Date: 6/7/2019 1:50:00 PM	Prep Date: 6/7/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Phosphorus, Total Orthophosphate (As 0.507 0.100 0.5000 0 101 80 120 0.394 15

Sample ID 1906073-02CMS	Batch ID: 91254	TestNo: M4500-P E	Units: mg/L							
SampType: MS	Run ID: UV/VIS_2_190607B	Analysis Date: 6/7/2019 1:53:00 PM	Prep Date: 6/7/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Phosphorus, Total Orthophosphate (As 0.517 0.100 0.5000 0 103 80 120

Sample ID 1906073-02CMSD	Batch ID: 91254	TestNo: M4500-P E	Units: mg/L							
SampType: MSD	Run ID: UV/VIS_2_190607B	Analysis Date: 6/7/2019 1:53:00 PM	Prep Date: 6/7/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Phosphorus, Total Orthophosphate (As 0.518 0.100 0.5000 0 104 80 120 0.193 15

Qualifiers: B Analyte detected in the associated Method Blank
J Analyte detected between MDL and RL
ND Not Detected at the Method Detection Limit
RL Reporting Limit
J Analyte detected between SDL and RL
DF Dilution Factor
MDL Method Detection Limit
R RPD outside accepted control limits
S Spike Recovery outside control limits
N Parameter not NELAP certified

CLIENT: Golder
Work Order: 1906072
Project: LUMINANT-OGSES-FGD

ANALYTICAL QC SUMMARY REPORT

RunID: UV/VIS_2_190607B

Sample ID ICV-190607	Batch ID: R104504	TestNo: M4500-P E	Units: mg/L							
SampType: ICV	Run ID: UV/VIS_2_190607B	Analysis Date: 6/7/2019 1:49:00 PM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Phosphorus, Total Orthophosphate (As	0.203	0.100	0.2000	0	102	85	115			

Sample ID CCV1-190607	Batch ID: R104504	TestNo: M4500-P E	Units: mg/L							
SampType: CCV	Run ID: UV/VIS_2_190607B	Analysis Date: 6/7/2019 1:53:00 PM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Phosphorus, Total Orthophosphate (As	0.566	0.100	0.5000	0	113	85	115			

Qualifiers:

- B Analyte detected in the associated Method Blank
- J Analyte detected between MDL and RL
- ND Not Detected at the Method Detection Limit
- RL Reporting Limit
- J Analyte detected between SDL and RL

- DF Dilution Factor
- MDL Method Detection Limit
- R RPD outside accepted control limits
- S Spike Recovery outside control limits
- N Parameter not NELAP certified

CLIENT: Golder
 Work Order: 1906072
 Project: LUMINANT-OGSES-FGD

ANALYTICAL QC SUMMARY REPORT

RunID: UV/VIS_2_190610A

The QC data in batch 91267 applies to the following samples: 1906072-01A, 1906072-02A

Sample ID MB-91267	Batch ID: 91267	TestNo: M3500-Fe D	Units: mg/L							
SampType: MBLK	Run ID: UV/VIS_2_190610A	Analysis Date: 6/10/2019 10:55:00 AM	Prep Date: 6/10/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron, Ferrous	<0.0500	0.100								N

Sample ID LCS-91267	Batch ID: 91267	TestNo: M3500-Fe D	Units: mg/L							
SampType: LCS	Run ID: UV/VIS_2_190610A	Analysis Date: 6/10/2019 10:57:00 AM	Prep Date: 6/10/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron, Ferrous	0.110	0.100	0.1000	0	110	85	115			N

Sample ID LCSD-91267	Batch ID: 91267	TestNo: M3500-Fe D	Units: mg/L							
SampType: LCSD	Run ID: UV/VIS_2_190610A	Analysis Date: 6/10/2019 10:57:00 AM	Prep Date: 6/10/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron, Ferrous	0.110	0.100	0.1000	0	110	85	115	0.609	15	N

Sample ID 1906073-02AMS	Batch ID: 91267	TestNo: M3500-Fe D	Units: mg/L							
SampType: MS	Run ID: UV/VIS_2_190610A	Analysis Date: 6/10/2019 11:05:00 AM	Prep Date: 6/10/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron, Ferrous	0.107	0.100	0.1000	0	107	85	115			N

Sample ID 1906073-02AMSD	Batch ID: 91267	TestNo: M3500-Fe D	Units: mg/L							
SampType: MSD	Run ID: UV/VIS_2_190610A	Analysis Date: 6/10/2019 11:05:00 AM	Prep Date: 6/10/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron, Ferrous	0.102	0.100	0.1000	0	102	85	115	4.86	15	N

Qualifiers: B Analyte detected in the associated Method Blank J Analyte detected between MDL and RL ND Not Detected at the Method Detection Limit RL Reporting Limit J Analyte detected between SDL and RL	DF Dilution Factor MDL Method Detection Limit R RPD outside accepted control limits S Spike Recovery outside control limits N Parameter not NELAP certified
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CLIENT: Golder
Work Order: 1906072
Project: LUMINANT-OGSES-FGD

ANALYTICAL QC SUMMARY REPORT

RunID: UV/VIS_2_190610A

Sample ID ICV-190610	Batch ID: R104507	TestNo: M3500-Fe D	Units: mg/L							
SampType: ICV	Run ID: UV/VIS_2_190610A	Analysis Date: 6/10/2019 10:51:00 AM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron, Ferrous	0.0908	0.100	0.1000	0	90.8	85	115			N

Sample ID CCV1-190610	Batch ID: R104507	TestNo: M3500-Fe D	Units: mg/L							
SampType: CCV	Run ID: UV/VIS_2_190610A	Analysis Date: 6/10/2019 11:01:00 AM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron, Ferrous	0.223	0.100	0.2000	0	112	85	115			N

Sample ID CCV2-190610	Batch ID: R104507	TestNo: M3500-Fe D	Units: mg/L							
SampType: CCV	Run ID: UV/VIS_2_190610A	Analysis Date: 6/10/2019 11:06:00 AM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron, Ferrous	0.204	0.100	0.2000	0	102	85	115			N

Qualifiers:	B Analyte detected in the associated Method Blank J Analyte detected between MDL and RL ND Not Detected at the Method Detection Limit RL Reporting Limit J Analyte detected between SDL and RL	DF Dilution Factor MDL Method Detection Limit R RPD outside accepted control limits S Spike Recovery outside control limits N Parameter not NELAP certified
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CLIENT: Golder
Work Order: 1906072
Project: LUMINANT-OGSES-FGD

ANALYTICAL QC SUMMARY REPORT

RunID: WC_190614B

The QC data in batch 91332 applies to the following samples: 1906072-01C, 1906072-02C

Sample ID MB-91332	Batch ID: 91332	TestNo: M2540C	Units: mg/L							
SampType: MBLK	Run ID: WC_190614B	Analysis Date: 6/14/2019 12:00:00 PM	Prep Date: 6/13/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Total Dissolved Solids (Residue, Filtera	<10.0	10.0
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Sample ID LCS-91332	Batch ID: 91332	TestNo: M2540C	Units: mg/L							
SampType: LCS	Run ID: WC_190614B	Analysis Date: 6/14/2019 12:00:00 PM	Prep Date: 6/13/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Total Dissolved Solids (Residue, Filtera	762	10.0	745.6	0	102	90	113
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Sample ID 1906109-02B-DUP	Batch ID: 91332	TestNo: M2540C	Units: mg/L							
SampType: DUP	Run ID: WC_190614B	Analysis Date: 6/14/2019 12:00:00 PM	Prep Date: 6/13/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Total Dissolved Solids (Residue, Filtera	1800	50.0	0	1825	1.38	5
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Qualifiers:	B Analyte detected in the associated Method Blank	DF Dilution Factor
	J Analyte detected between MDL and RL	MDL Method Detection Limit
	ND Not Detected at the Method Detection Limit	R RPD outside accepted control limits
	RL Reporting Limit	S Spike Recovery outside control limits
	J Analyte detected between SDL and RL	N Parameter not NELAP certified



Quantitative X-Ray Diffraction by Rietveld Refinement

Report Prepared for: Golder Associates

Project Number/ LIMS No. 17431-01 / MI7024-MAY19

Batch: Oak Grove FDG Ponds

Sample Receipt: May 30, 2019

Sample Analysis: June 12, 2019

Reporting Date: June 14, 2019

Instrument: Panalytical X'pert Pro Diffractometer

Test Conditions: Co radiation, 40 kV, 45 mA
Regular Scanning: Step: 0.033°, Step time:0.15s, 2θ range: 6-70°

Interpretations: HighScore Plus software using Crystallography Open Database (COD) and Joint Committee on Powder Diffraction Standards -International Center for Diffraction Data (JCPDS-ICDD).

Detection Limit: 0.5-2%. Strongly dependent on crystallinity.

Contents:

- 1) Method Summary
- 2) Summary of Mineral Assemblages
- 3) Quantitative XRD Results
- 4) XRD Pattern(s)

Lain Glossop H.B.Sc / Ben Eaton
Senior Mineralogist / Junior Mineralogist

Sarah Prout, Ph.D.,
Manager: Metallurgy



Method Summary

Mineral Identification and Interpretation:

Mineral identification and interpretation involve matching the diffraction pattern of a test sample material to patterns of single-phase reference materials. The reference patterns from the Crystallography Open Database (COD) and the Joint Committee on Powder Diffraction Standards - International Center for Diffraction Data (JCPDS-ICDD).

Interpretations do not reflect the presence of non-crystalline and/or amorphous compounds, except when internal standards have been added by request. Mineral proportions may be strongly influenced by crystallinity, crystal structure and preferred orientations. Mineral or compound identification and quantitative analysis results should be accompanied by supporting chemical assay data or other additional tests.

Quantitative Rietveld Analysis:

Panalytical Highscore Plus software was used to perform the quantitative Rietveld Analysis. This software uses a graphics based profile analysis program built around a non-linear least squares fitting system, to quantitatively determine the amount of different phases present in a multicomponent sample. Whole pattern analyses are predicated by the fact that the X-ray diffraction pattern is a total sum of both instrumental and specimen factors. Unlike other peak intensity-based methods, the Rietveld method uses a least squares approach to refine a theoretical line profile (shown as a blue pattern in the analyses plots) until it matches the obtained experimental patterns (shown as the coloured pattern in the analyses plots).

Rietveld refinement is completed with a set of minerals specifically identified for the sample. Zero values indicate that the mineral was included in the refinement calculations, but the calculated concentration was less than 0.5 wt%. Minerals not identified by the analyst are not included in refinement calculations for specific samples and are indicated with a dash.

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WARNING: The sample(s) to which the findings recorded herein (the "Findings") relate was(were) drawn and / or provided by the Client or by a third party acting at the Client's direction. The Findings constitute no warranty of the sample's representativeness of any goods and strictly relate to the sample(s). The Company accepts no liability with regard to the origin or source from which the sample(s) is/are said to be extracted.

Summary of Rietveld Quantitative Analysis X-ray Diffraction Results

Quantitative X-ray Diffraction Results

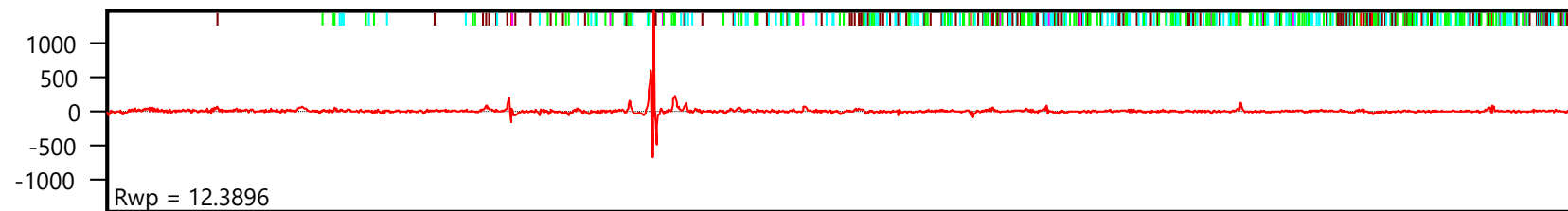
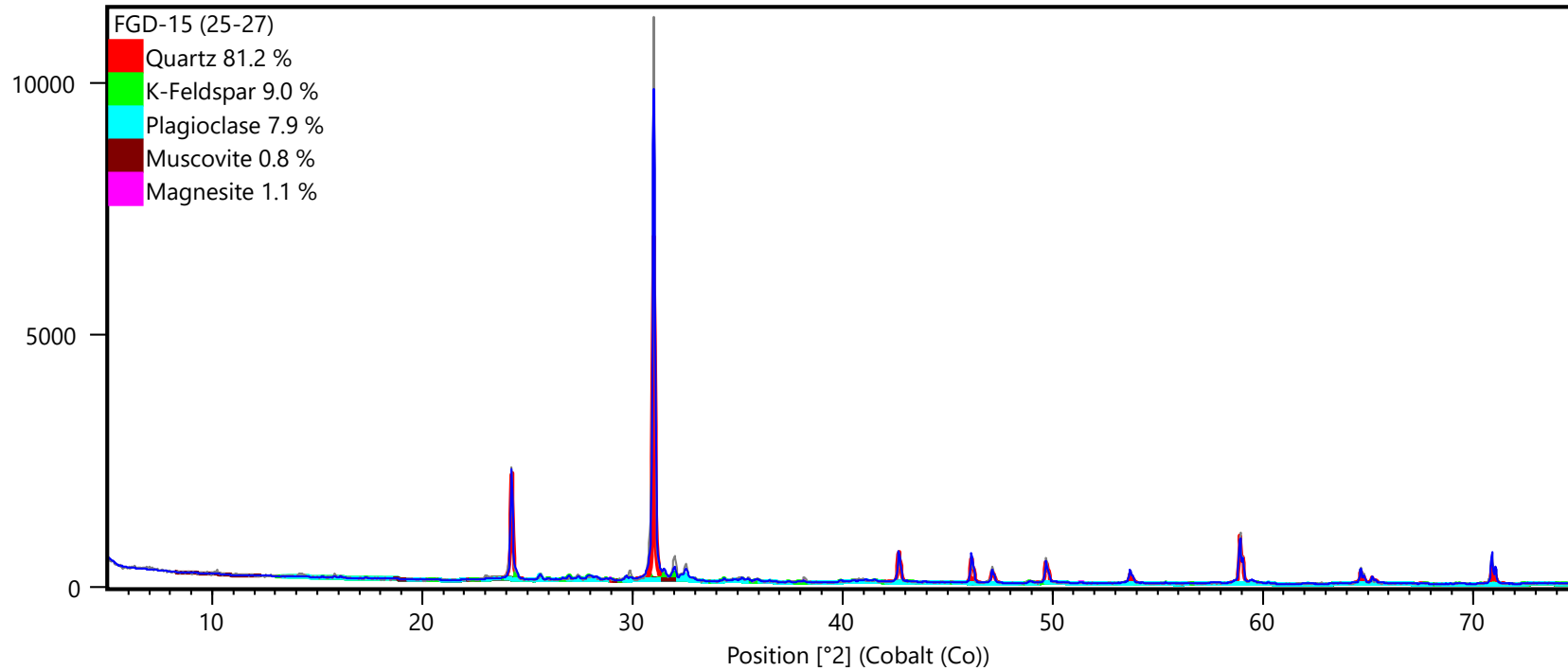
Mineral/Compound	1	2	3
	FGD-15 (25-27)	FGD-16 (30-32)	FGD-2019-1 (23-25)
	(wt %)	(wt %)	(wt %)
Quartz	81.2	80.5	84.9
K-feldspar	9.0	10.4	6.8
Plagioclase	7.9	9.0	7.3
Muscovite	0.8	0.1	1.0
Magnesite	1.1	--	--
TOTAL	100	100	100

Zero values indicate that the mineral was included in the refinement, but the calculated concentration is below a measurable value.

Dashes indicate that the mineral was not identified by the analyst and not included in the refinement calculation for the sample.

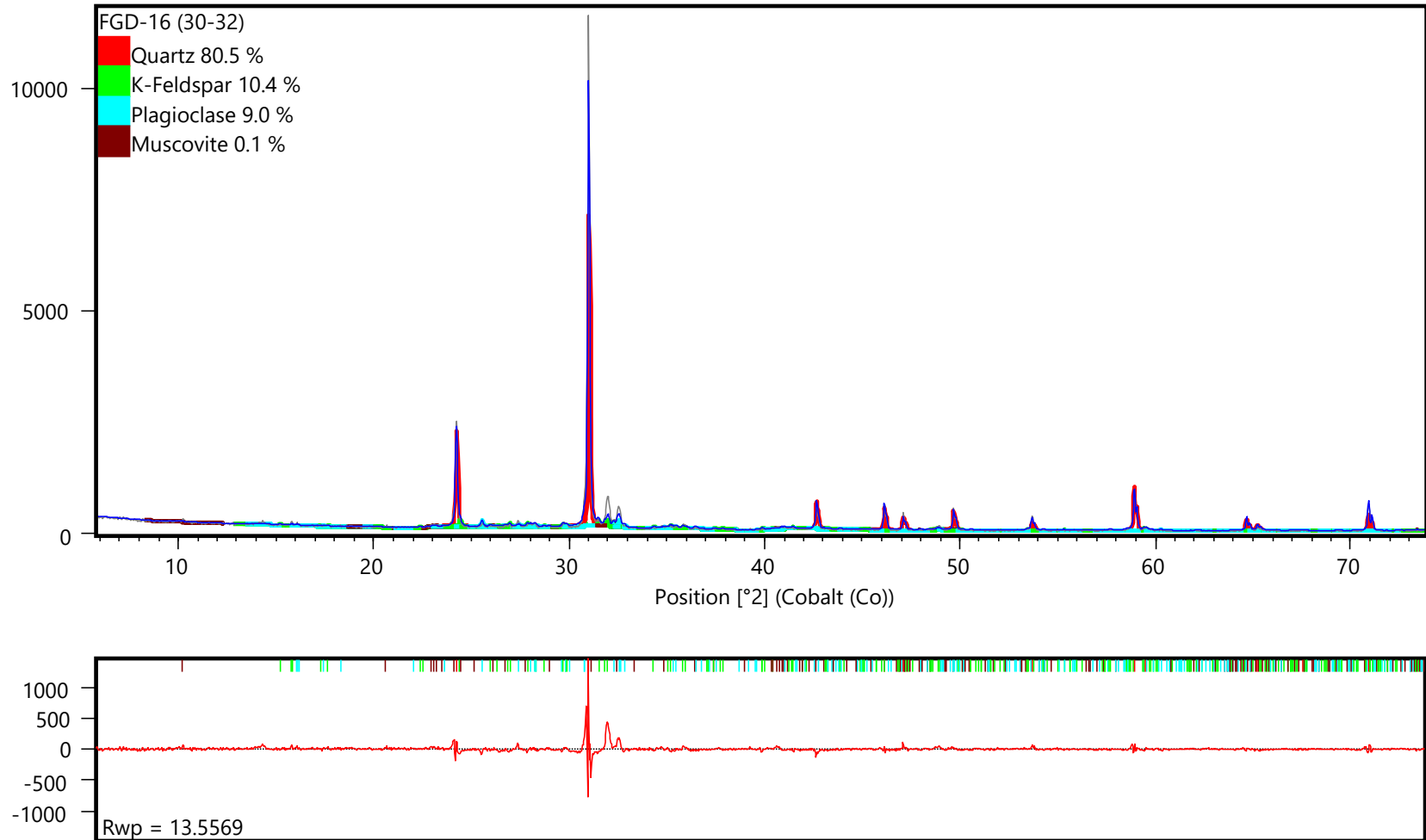
Mineral/Compound	Formula
Quartz	SiO ₂
K-feldspar	KAlSi ₃ O ₈
Plagioclase	(Na,Ca)[Al(Si,Al)Si ₂ O ₈]
Muscovite	KAl ₂ (AlSi ₃ O ₁₀)(OH) ₂
Magnesite	MgCO ₃

Counts



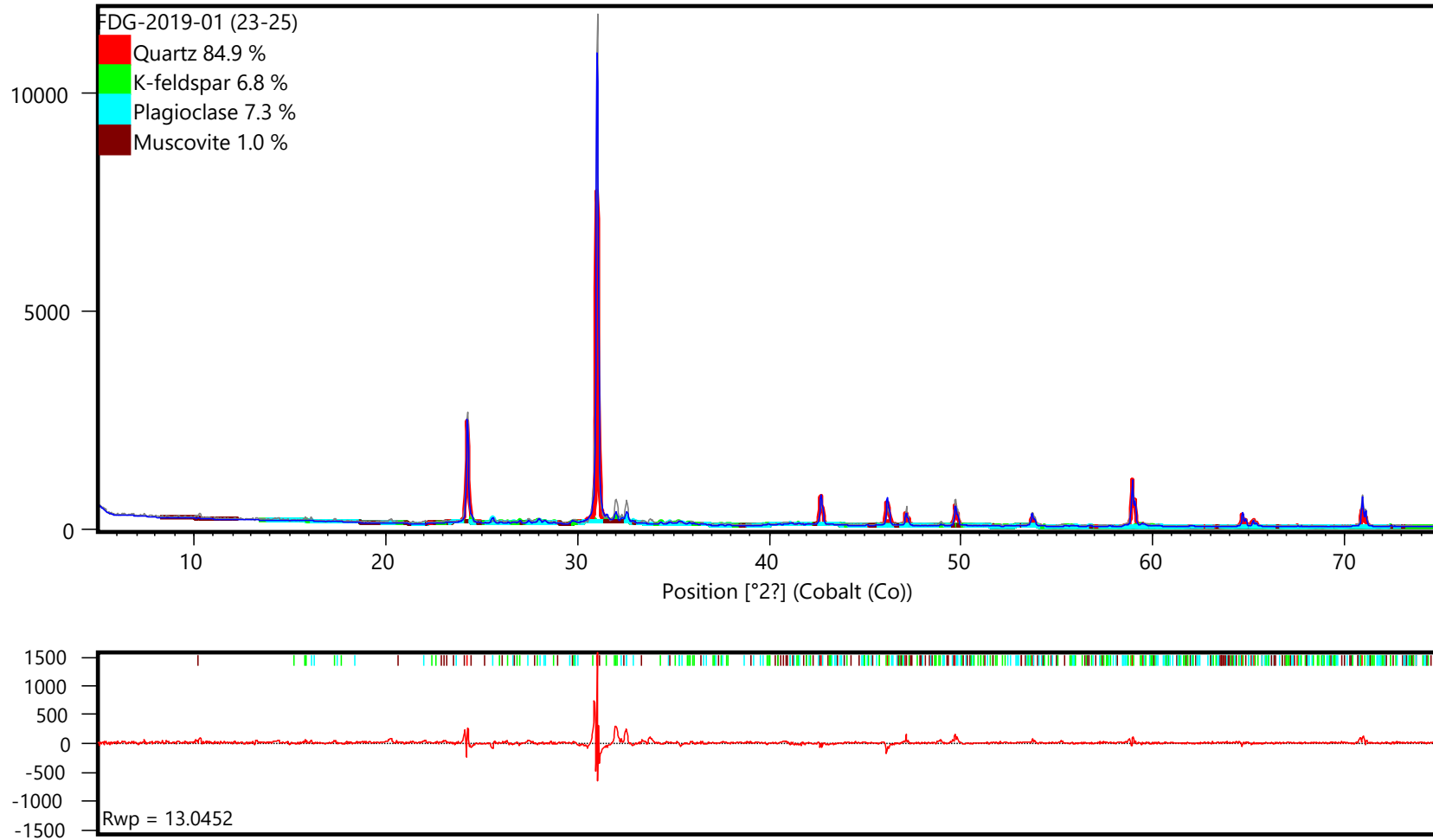
X-ray diffractogram. The upper pattern is the measured diffractogram, the blue curve is the calculated pattern from the Rietveld Refinement and the lower red curve is the difference plot.

Counts



X-ray diffractogram. The upper pattern is the measured diffractogram, the blue curve is the calculated pattern from the Rietveld Refinement and the lower red curve is the difference plot.

Counts



X-ray diffractogram. The upper pattern is the measured diffractogram, the blue curve is the calculated pattern from the Rietveld Refinement and the lower red curve is the difference plot.



July 12, 2019

Will Vienne
Golder
2201 Double Creek Dr #4004
Round Rock, Texas 78664
TEL: (512) 671-3434
FAX (512) 671-3446
RE: LUMINANT-OGSES-PONDS

Order No.: 1906073

Dear Will Vienne:

DHL Analytical, Inc. received 2 sample(s) on 6/7/2019 for the analyses presented in the following report.

There were no problems with the analyses and all data met requirements of NELAP except where noted in the Case Narrative. All non-NELAP methods will be identified accordingly in the case narrative and all estimated uncertainties of test results are within method or EPA specifications.

If you have any questions regarding these tests results, please feel free to call. Thank you for using DHL Analytical.

Sincerely,


John DuPont
General Manager

This report was performed under the accreditation of the State of Texas Laboratory Certification Number: T104704211-19-24



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2300 Double Creek Dr. ■ Round Rock, TX 78664
 Phone (512) 388-8222 ■ FAX (512) 388-8229
 Web: www.dhlanalytical.com
 E-Mail: login@dhlanalytical.com



No 83077
CHAIN-OF-CUSTODY

CLIENT: GOLDER
 ADDRESS: 2201 DOUBLE CREEK DR ROUND ROCK, TX 78664
 PHONE: 512-671-3434 FAX/E-MAIL: 512-671-3446
 DATA REPORTED TO: WILL VIENNE
 ADDITIONAL REPORT COPIES TO: _____

DATE: 6-6-19 PAGE 1 OF 1
 PO #: 19122262-F DHL WORK ORDER #: 1906073
 PROJECT LOCATION OR NAME: LUMINANT-06SES -POADS
 CLIENT PROJECT #: 19122262-F COLLECTOR: J. BRAUNTON

Authorize 5% surcharge for TRRP Report? <input type="checkbox"/> Yes <input type="checkbox"/> No	S=SOIL W=WATER A=AIR L=LIQUID SE=SEDIMENT	P=PAINT SL=SLUDGE O=OTHER SO=SOLID		PRESERVATION		# of Containers HCl HNO ₃ H ₂ SO ₄ NaOH ICE UNPRESERVED	ANALYSES BTEX <input type="checkbox"/> MTBE <input type="checkbox"/> (METHOD 8021) TPH 1005 <input type="checkbox"/> TPH 1006 <input type="checkbox"/> HOLD 1006 <input type="checkbox"/> GRO (METHOD 8015) <input type="checkbox"/> DRO (METHOD 8109) <input type="checkbox"/> VOC 8260 <input type="checkbox"/> VOC 624 <input type="checkbox"/> VOC 8260/5935 <input type="checkbox"/> SVOC 8270 <input type="checkbox"/> PAH 8270 <input type="checkbox"/> HOLD PH <input type="checkbox"/> SVOC 6230 <input type="checkbox"/> 8270 PEST <input type="checkbox"/> 625 PEST/PCB <input type="checkbox"/> 608 PCB <input type="checkbox"/> 8321 HERB <input type="checkbox"/> 8082 PCB <input type="checkbox"/> 8270 PCB <input type="checkbox"/> METALS 6020 <input type="checkbox"/> METALS-2008 <input type="checkbox"/> AMMONIA <input type="checkbox"/> PH <input type="checkbox"/> TX11 <input type="checkbox"/> CHLORIDE <input type="checkbox"/> ALKALINITY <input type="checkbox"/> METALS <input type="checkbox"/> TCLP-SVOC <input type="checkbox"/> VOCC <input type="checkbox"/> ANIONS <input type="checkbox"/> RG <input type="checkbox"/> METALS <input type="checkbox"/> RCRA 80 <input type="checkbox"/> PEST <input type="checkbox"/> HERB <input type="checkbox"/> TDS <input type="checkbox"/> TS <input type="checkbox"/> FLASHPOINT <input type="checkbox"/> TX-11 <input type="checkbox"/> P/B <input type="checkbox"/> % MOISTURE <input type="checkbox"/> DGAS <input type="checkbox"/> APP 3 AND 4 CRUDS - ANIONS FERRYS - FERRIC - RDD CYANIDE <input type="checkbox"/>	FIELD NOTES
				Field Sample I.D.	DHL Lab #			

Field Sample I.D.	DHL Lab #	Date	Time	Matrix	Container Type	# of Containers	HCl	HNO ₃	H ₂ SO ₄ NaOH	ICE	UNPRESERVED	ANALYSES												FIELD NOTES							
FGD-A-2019-1	01	6-6-19	1325	W		7	X		X																		X	X	X		
FGD-B-2019-1	02	6-6-19	1345	W		7	X		X																		X	X	X		

RELINQUISHED BY: (Signature) <i>[Signature]</i>	DATE/TIME <u>6-6-19 1830</u>	RECEIVED BY: (Signature) <i>[Signature]</i>	TURN AROUND TIME	LABORATORY USE ONLY:
RELINQUISHED BY: (Signature) <i>[Signature]</i>	DATE/TIME <u>6-7-19 1029</u>	RECEIVED BY: (Signature) <i>[Signature]</i>	RUSH <input type="checkbox"/> CALL FIRST	RECEIVING TEMP: <u>5.5°C</u> THERM #: <u>78</u>
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	1 DAY <input type="checkbox"/> CALL FIRST	CUSTODY SEALS: <input type="checkbox"/> BROKEN <input type="checkbox"/> INTACT <input checked="" type="checkbox"/> NOT USED
			2 DAY <input type="checkbox"/>	CARRIER: <input type="checkbox"/> LONE STAR <input checked="" type="checkbox"/> FEDEX <input type="checkbox"/> UPS <input type="checkbox"/> OTHER
			NORMAL <input checked="" type="checkbox"/>	<input type="checkbox"/> COURIER DELIVERY
			OTHER <input type="checkbox"/> _____	<input type="checkbox"/> HAND DELIVERED
<input type="checkbox"/> DHL DISPOSAL @ \$.50 each <input type="checkbox"/> Return			3	DHL COC Rev 1 FEB 2010

Eric Lau

From: John DuPont
Sent: Tuesday, May 28, 2019 11:35 AM
To: Eric Lau
Subject: FW: CCR Analysis

Appendix III Parameters:

Metals (Ca and B)
Anions (Cl, F, and SO4)
TDS

Appendix IV Parameters:

Metals (As, Ba, Be, Cd, Co, Cr, Hg, Li, Mo, Pb, Sb, Se, and Tl)
Ra-226
Ra-228

From: Vienne, Will [mailto:William_Vienne@golder.com]
Sent: Tuesday, April 09, 2019 12:48 PM
To: John DuPont <dupont@dhlanalytical.com>
Subject: CCR Analysis

FACTA (512) 671-3434
YTON
ORIGIN J. BRAD
GOLDER DOUBLE CREEK DR STE 4004
2201 D ROCK, TX 78664
STATES US

06 JUN 1985
10 LB
18/SSFE2002
3 IN

Part # 150297-4862415521598 02/20

RT 512
FZ

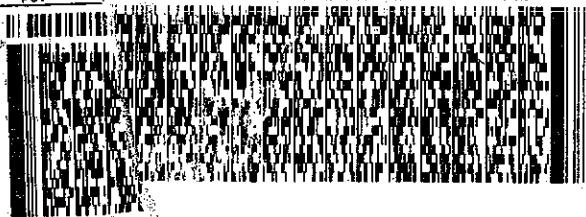
10:30
D
10:30
10:30

ROUND UNITED L

TO DHL
DH00 DOUBLE CREEK DR.
230
UND ROCK TX 78664

RO -8222 REF: DEPT:

(512) 381
INV:
PO:

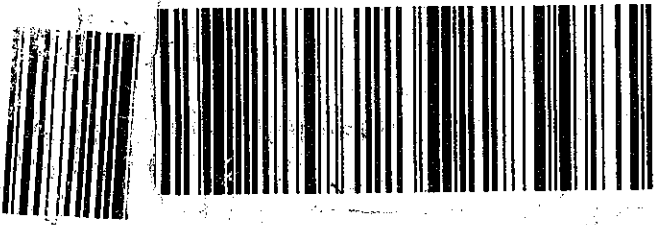


FRI - 07 JUN 10:30A
PRIORITY OVERNIGHT

7877 31 09 7995

44 B MA

78664
TX-US AUS



50
73

7877
44

Sample Receipt Checklist

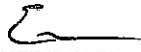
Client Name Golder

Date Received: 6/7/2019

Work Order Number 1906073

Received by EL

Checklist completed by:


Signature

6/7/2019
Date

Reviewed by


Initials

6/7/2019
Date

Carrier name FedEx 1day

- Shipping container/cooler in good condition? Yes No Not Present
- Custody seals intact on shipping container/cooler? Yes No Not Present
- Custody seals intact on sample bottles? Yes No Not Present
- Chain of custody present? Yes No
- Chain of custody signed when relinquished and received? Yes No
- Chain of custody agrees with sample labels? Yes No
- Samples in proper container/bottle? Yes No
- Sample containers intact? Yes No
- Sufficient sample volume for indicated test? Yes No
- All samples received within holding time? Yes No
- Container/Temp Blank temperature in compliance? Yes No 5.5 °C
- Water - VOA vials have zero headspace? Yes No No VOA vials submitted
- Water - pH<2 acceptable upon receipt? Yes No NA LOT # 11837
- Adjusted? No Checked by EL
- Water - pH>9 (S) or pH>10 (CN) acceptable upon receipt? Yes No NA LOT #
- Adjusted? Checked by

Any No response must be detailed in the comments section below.

Client contacted _____ Date contacted: _____ Person contacted _____

Contacted by: _____ Regarding: _____

Comments: _____

Corrective Action _____

CLIENT: Golder
Project: LUMINANT-OGSES-PONDS
Lab Order: 1906073

CASE NARRATIVE

Samples were analyzed using the methods outlined in the following references:

- Method SW6020A - Metals Analysis
 - Method SW7470A - Mercury Analysis
 - Method E300 - Anions Analysis
 - Method M2320 B - Alkalinity Analysis
 - Method M3500-Fe D - Ferrous Iron Analysis (this parameter is not NELAP certified)
 - Method M3500-Fe D - Ferric Iron (calculation) (this parameter is not NELAP certified)
 - Method M4500-P E - Orthophosphate Analysis
 - Method M2540C - TDS Analysis
 - Sub-contract - Radium-228 and Radium-226 analyses by methods E904 and SM 7500 Ra B M.
- Analyzed at Pace Analytical.

LOG IN

The samples were received and log-in performed on 6/7/19. A total of 2 samples were received. The samples arrived in good condition and were properly packaged.

METALS ANALYSIS

For Metals analysis performed on 6/12/19 the matrix spike and matrix spike duplicate recoveries were out of control limits for Boron and Sodium. These are flagged accordingly in the QC summary report. The sample selected for the matrix spike and matrix spike duplicate was not from this work order. The LCS was within control limits for these analytes. No further corrective actions were taken.

CLIENT: Golder
Project: LUMINANT-OGSES-PONDS
Lab Order: 1906073

Work Order Sample Summary

Lab Smp ID	Client Sample ID	Tag Number	Date Collected	Date Recved
1906073-01	FGD-A-2019-1		06/06/19 01:25 PM	6/7/2019
1906073-02	FGD-B-2019-1		06/06/19 01:45 PM	6/7/2019

Lab Order: 1906073
 Client: Golder
 Project: LUMINANT-OGSES-PONDS

PREP DATES REPORT

Sample ID	Client Sample ID	Collection Date	Matrix	Test Number	Test Name	Prep Date	Batch ID
1906073-01A	FGD-A-2019-1	06/06/19 01:25 PM	Aqueous	M3500-Fe	Ferrous Iron Prep Water	06/10/19 09:28 AM	91267
1906073-01B	FGD-A-2019-1	06/06/19 01:25 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	06/10/19 08:17 AM	91261
	FGD-A-2019-1	06/06/19 01:25 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	06/10/19 08:17 AM	91261
	FGD-A-2019-1	06/06/19 01:25 PM	Aqueous	SW7470A	Mercury Aq Prep	06/13/19 09:34 AM	91319
1906073-01C	FGD-A-2019-1	06/06/19 01:25 PM	Aqueous	M2320 B	Alkalinity Preparation	06/10/19 09:34 AM	91271
	FGD-A-2019-1	06/06/19 01:25 PM	Aqueous	E300	Anion Preparation	06/07/19 12:27 PM	91226
	FGD-A-2019-1	06/06/19 01:25 PM	Aqueous	E300	Anion Preparation	06/07/19 12:27 PM	91226
	FGD-A-2019-1	06/06/19 01:25 PM	Aqueous	E300	Anion Preparation	06/10/19 09:06 AM	91262
	FGD-A-2019-1	06/06/19 01:25 PM	Aqueous	M4500-P E	Orthophosphate Prep	06/07/19 01:20 PM	91254
FGD-A-2019-1	06/06/19 01:25 PM	Aqueous	M2540C	TDS Preparation	06/07/19 01:39 PM	91255	
1906073-02A	FGD-B-2019-1	06/06/19 01:45 PM	Aqueous	M3500-Fe	Ferrous Iron Prep Water	06/10/19 09:28 AM	91267
1906073-02B	FGD-B-2019-1	06/06/19 01:45 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	06/10/19 08:17 AM	91261
	FGD-B-2019-1	06/06/19 01:45 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	06/10/19 08:17 AM	91261
	FGD-B-2019-1	06/06/19 01:45 PM	Aqueous	SW7470A	Mercury Aq Prep	06/13/19 09:34 AM	91319
1906073-02C	FGD-B-2019-1	06/06/19 01:45 PM	Aqueous	M2320 B	Alkalinity Preparation	06/10/19 09:34 AM	91271
	FGD-B-2019-1	06/06/19 01:45 PM	Aqueous	E300	Anion Preparation	06/07/19 12:27 PM	91226
	FGD-B-2019-1	06/06/19 01:45 PM	Aqueous	E300	Anion Preparation	06/07/19 12:27 PM	91226
	FGD-B-2019-1	06/06/19 01:45 PM	Aqueous	E300	Anion Preparation	06/10/19 09:06 AM	91262
	FGD-B-2019-1	06/06/19 01:45 PM	Aqueous	M4500-P E	Orthophosphate Prep	06/07/19 01:20 PM	91254
	FGD-B-2019-1	06/06/19 01:45 PM	Aqueous	M2540C	TDS Preparation	06/07/19 01:39 PM	91255

Lab Order: 1906073
 Client: Golder
 Project: LUMINANT-OGSES-PONDS

ANALYTICAL DATES REPORT

Sample ID	Client Sample ID	Matrix	Test Number	Test Name	Batch ID	Dilution	Analysis Date	Run ID
1906073-01A	FGD-A-2019-1	Aqueous	M3500-Fe D	Ferric Iron (Calculated)	91267	1	06/18/19	UV/VIS_2_190618B
	FGD-A-2019-1	Aqueous	M3500-Fe D	Ferrous Iron	91267	1	06/10/19 11:04 AM	UV/VIS_2_190610A
1906073-01B	FGD-A-2019-1	Aqueous	SW7470A	Mercury Total: Aqueous	91319	1	06/14/19 01:11 PM	CETAC2_HG_190614 C
	FGD-A-2019-1	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	91261	250	06/12/19 11:02 AM	ICP-MS4_190612A
	FGD-A-2019-1	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	91261	1	06/11/19 04:10 PM	ICP-MS5_190611D
1906073-01C	FGD-A-2019-1	Aqueous	M2320 B	Alkalinity	91271	1	06/10/19 12:59 PM	TITRATOR_190610A
	FGD-A-2019-1	Aqueous	E300	Anions by IC method - Water	91226	10	06/07/19 02:18 PM	IC2_190607A
	FGD-A-2019-1	Aqueous	E300	Anions by IC method - Water	91226	1	06/07/19 04:26 PM	IC2_190607A
	FGD-A-2019-1	Aqueous	E300	Anions by IC method - Water	91262	100	06/10/19 11:08 AM	IC2_190610A
	FGD-A-2019-1	Aqueous	M4500-P E	Orthophosphate	91254	1	06/07/19 01:52 PM	UV/VIS_2_190607B
	FGD-A-2019-1	Aqueous	M2540C	Total Dissolved Solids	91255	1	06/07/19 04:00 PM	WC_190607A
1906073-02A	FGD-B-2019-1	Aqueous	M3500-Fe D	Ferric Iron (Calculated)	91267	1	06/18/19	UV/VIS_2_190618B
	FGD-B-2019-1	Aqueous	M3500-Fe D	Ferrous Iron	91267	1	06/10/19 11:05 AM	UV/VIS_2_190610A
1906073-02B	FGD-B-2019-1	Aqueous	SW7470A	Mercury Total: Aqueous	91319	1	06/14/19 01:13 PM	CETAC2_HG_190614 C
	FGD-B-2019-1	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	91261	250	06/12/19 11:04 AM	ICP-MS4_190612A
	FGD-B-2019-1	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	91261	1	06/11/19 04:12 PM	ICP-MS5_190611D
1906073-02C	FGD-B-2019-1	Aqueous	M2320 B	Alkalinity	91271	1	06/10/19 01:03 PM	TITRATOR_190610A
	FGD-B-2019-1	Aqueous	E300	Anions by IC method - Water	91226	10	06/07/19 02:34 PM	IC2_190607A
	FGD-B-2019-1	Aqueous	E300	Anions by IC method - Water	91226	1	06/07/19 04:42 PM	IC2_190607A
	FGD-B-2019-1	Aqueous	E300	Anions by IC method - Water	91262	100	06/10/19 11:56 AM	IC2_190610A
	FGD-B-2019-1	Aqueous	M4500-P E	Orthophosphate	91254	1	06/07/19 01:53 PM	UV/VIS_2_190607B
	FGD-B-2019-1	Aqueous	M2540C	Total Dissolved Solids	91255	1	06/07/19 04:00 PM	WC_190607A

DHL Analytical, Inc.

Date: 12-Jul-19

CLIENT: Golder
Project: LUMINANT-OGSES-PONDS
Project No: 19122262-F
Lab Order: 1906073

Client Sample ID: FGD-A-2019-1
Lab ID: 1906073-01
Collection Date: 06/06/19 01:25 PM
Matrix: AQUEOUS

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		SW6020A			Analyst: SP		
Antimony	0.00155	0.000800	0.00250	J	mg/L	1	06/11/19 04:10 PM
Arsenic	<0.00200	0.00200	0.00500		mg/L	1	06/11/19 04:10 PM
Barium	0.0781	0.00300	0.0100		mg/L	1	06/11/19 04:10 PM
Beryllium	<0.000300	0.000300	0.00100		mg/L	1	06/11/19 04:10 PM
Boron	72.1	2.50	7.50		mg/L	250	06/12/19 11:02 AM
Cadmium	0.000348	0.000300	0.00100	J	mg/L	1	06/11/19 04:10 PM
Calcium	487	25.0	75.0		mg/L	250	06/12/19 11:02 AM
Chromium	<0.00200	0.00200	0.00500		mg/L	1	06/11/19 04:10 PM
Cobalt	<0.00300	0.00300	0.00500		mg/L	1	06/11/19 04:10 PM
Iron	<0.0300	0.0300	0.100		mg/L	1	06/11/19 04:10 PM
Lead	<0.000300	0.000300	0.00100		mg/L	1	06/11/19 04:10 PM
Lithium	0.167	0.00500	0.0100		mg/L	1	06/11/19 04:10 PM
Magnesium	809	25.0	75.0		mg/L	250	06/12/19 11:02 AM
Molybdenum	0.152	0.00200	0.00500		mg/L	1	06/11/19 04:10 PM
Potassium	82.1	25.0	75.0		mg/L	250	06/12/19 11:02 AM
Selenium	1.30	0.00200	0.00500		mg/L	1	06/11/19 04:10 PM
Sodium	270	25.0	75.0		mg/L	250	06/12/19 11:02 AM
Thallium	0.00144	0.000500	0.00150	J	mg/L	1	06/11/19 04:10 PM
MERCURY TOTAL: AQUEOUS		SW7470A			Analyst: BM		
Mercury	0.000615	0.0000800	0.000200		mg/L	1	06/14/19 01:11 PM
ANIONS BY IC METHOD - WATER		E300			Analyst: JL		
Chloride	1510	30.0	100		mg/L	100	06/10/19 11:08 AM
Fluoride	17.2	0.100	0.400		mg/L	1	06/07/19 04:26 PM
Nitrate-N	1.87	0.100	0.500		mg/L	1	06/07/19 04:26 PM
Sulfate	3260	100	300		mg/L	100	06/10/19 11:08 AM
ALKALINITY		M2320 B			Analyst: CC		
Alkalinity, Bicarbonate (As CaCO3)	58.6	10.0	20.0		mg/L @ pH 4.54	1	06/10/19 12:59 PM
Alkalinity, Carbonate (As CaCO3)	<10.0	10.0	20.0		mg/L @ pH 4.54	1	06/10/19 12:59 PM
Alkalinity, Hydroxide (As CaCO3)	<10.0	10.0	20.0		mg/L @ pH 4.54	1	06/10/19 12:59 PM
Alkalinity, Total (As CaCO3)	58.6	20.0	20.0		mg/L @ pH 4.54	1	06/10/19 12:59 PM
FERRIC IRON (CALCULATED)		M3500-FE D			Analyst: CAC		
Iron, Ferric	<0.0500	0.0500	0.100	N	mg/L	1	06/18/19
FERROUS IRON		M3500-FE D			Analyst: BTJ		
Iron, Ferrous	<0.0500	0.0500	0.100	N	mg/L	1	06/10/19 11:04 AM

Qualifiers: * Value exceeds TCLP Maximum Concentration Level C Sample Result or QC discussed in the Case Narrative
 DF Dilution Factor E TPH pattern not Gas or Diesel Range Pattern
 J Analyte detected between MDL and RL MDL Method Detection Limit
 ND Not Detected at the Method Detection Limit RL Reporting Limit
 S Spike Recovery outside control limits N Parameter not NELAP certified

DHL Analytical, Inc.

Date: 12-Jul-19

CLIENT: Golder
Project: LUMINANT-OGSES-PONDS
Project No: 19122262-F
Lab Order: 1906073

Client Sample ID: FGD-A-2019-1
Lab ID: 1906073-01
Collection Date: 06/06/19 01:25 PM
Matrix: AQUEOUS

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed
ORTHOPHOSPHATE		M4500-P E					Analyst: BTJ
Phosphorus, Total Orthophosphate (As P)	<0.0300	0.0300	0.100		mg/L	1	06/07/19 01:52 PM
TOTAL DISSOLVED SOLIDS		M2540C					Analyst: JS
Total Dissolved Solids (Residue, Filterable)	7410	50.0	50.0		mg/L	1	06/07/19 04:00 PM

Qualifiers:	*	Value exceeds TCLP Maximum Concentration Level	C	Sample Result or QC discussed in the Case Narrative
	DF	Dilution Factor	E	TPH pattern not Gas or Diesel Range Pattern
	J	Analyte detected between MDL and RL	MDL	Method Detection Limit
	ND	Not Detected at the Method Detection Limit	RL	Reporting Limit
	S	Spike Recovery outside control limits	N	Parameter not NELAP certified

DHL Analytical, Inc.

Date: 12-Jul-19

CLIENT: Golder
Project: LUMINANT-OGSES-PONDS
Project No: 19122262-F
Lab Order: 1906073

Client Sample ID: FGD-B-2019-1
Lab ID: 1906073-02
Collection Date: 06/06/19 01:45 PM
Matrix: AQUEOUS

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		SW6020A			Analyst: SP		
Antimony	0.00146	0.000800	0.00250	J	mg/L	1	06/11/19 04:12 PM
Arsenic	<0.00200	0.00200	0.00500		mg/L	1	06/11/19 04:12 PM
Barium	0.0835	0.00300	0.0100		mg/L	1	06/11/19 04:12 PM
Beryllium	<0.000300	0.000300	0.00100		mg/L	1	06/11/19 04:12 PM
Boron	73.3	2.50	7.50		mg/L	250	06/12/19 11:04 AM
Cadmium	<0.000300	0.000300	0.00100		mg/L	1	06/11/19 04:12 PM
Calcium	458	25.0	75.0		mg/L	250	06/12/19 11:04 AM
Chromium	0.00427	0.00200	0.00500	J	mg/L	1	06/11/19 04:12 PM
Cobalt	<0.00300	0.00300	0.00500		mg/L	1	06/11/19 04:12 PM
Iron	<0.0300	0.0300	0.100		mg/L	1	06/11/19 04:12 PM
Lead	<0.000300	0.000300	0.00100		mg/L	1	06/11/19 04:12 PM
Lithium	0.172	0.00500	0.0100		mg/L	1	06/11/19 04:12 PM
Magnesium	796	25.0	75.0		mg/L	250	06/12/19 11:04 AM
Molybdenum	0.241	0.00200	0.00500		mg/L	1	06/11/19 04:12 PM
Potassium	86.9	25.0	75.0		mg/L	250	06/12/19 11:04 AM
Selenium	1.20	0.00200	0.00500		mg/L	1	06/11/19 04:12 PM
Sodium	287	25.0	75.0		mg/L	250	06/12/19 11:04 AM
Thallium	0.000788	0.000500	0.00150	J	mg/L	1	06/11/19 04:12 PM
MERCURY TOTAL: AQUEOUS		SW7470A			Analyst: BM		
Mercury	0.00134	0.0000800	0.000200		mg/L	1	06/14/19 01:13 PM
ANIONS BY IC METHOD - WATER		E300			Analyst: JL		
Chloride	1470	30.0	100		mg/L	100	06/10/19 11:56 AM
Fluoride	17.5	0.100	0.400		mg/L	1	06/07/19 04:42 PM
Nitrate-N	3.24	0.100	0.500		mg/L	1	06/07/19 04:42 PM
Sulfate	3040	100	300		mg/L	100	06/10/19 11:56 AM
ALKALINITY		M2320 B			Analyst: CC		
Alkalinity, Bicarbonate (As CaCO3)	68.0	10.0	20.0		mg/L @ pH 4.55	1	06/10/19 01:03 PM
Alkalinity, Carbonate (As CaCO3)	<10.0	10.0	20.0		mg/L @ pH 4.55	1	06/10/19 01:03 PM
Alkalinity, Hydroxide (As CaCO3)	<10.0	10.0	20.0		mg/L @ pH 4.55	1	06/10/19 01:03 PM
Alkalinity, Total (As CaCO3)	68.0	20.0	20.0		mg/L @ pH 4.55	1	06/10/19 01:03 PM
FERRIC IRON (CALCULATED)		M3500-FE D			Analyst: CAC		
Iron, Ferric	0.00427	0.00200	0.00500	JN	mg/L	1	06/18/19
FERROUS IRON		M3500-FE D			Analyst: BTJ		
Iron, Ferrous	<0.0500	0.0500	0.100	N	mg/L	1	06/10/19 11:05 AM

Qualifiers: * Value exceeds TCLP Maximum Concentration Level C Sample Result or QC discussed in the Case Narrative
 DF Dilution Factor E TPH pattern not Gas or Diesel Range Pattern
 J Analyte detected between MDL and RL MDL Method Detection Limit
 ND Not Detected at the Method Detection Limit RL Reporting Limit
 S Spike Recovery outside control limits N Parameter not NELAP certified

DHL Analytical, Inc.

Date: 12-Jul-19

CLIENT: Golder
Project: LUMINANT-OGSES-PONDS
Project No: 19122262-F
Lab Order: 1906073

Client Sample ID: FGD-B-2019-1
Lab ID: 1906073-02
Collection Date: 06/06/19 01:45 PM
Matrix: AQUEOUS

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed
ORTHOPHOSPHATE		M4500-P E					Analyst: BTJ
Phosphorus, Total Orthophosphate (As P)	<0.0300	0.0300	0.100		mg/L	1	06/07/19 01:53 PM
TOTAL DISSOLVED SOLIDS		M2540C					Analyst: JS
Total Dissolved Solids (Residue, Filterable)	7240	50.0	50.0		mg/L	1	06/07/19 04:00 PM

Qualifiers:	*	Value exceeds TCLP Maximum Concentration Level	C	Sample Result or QC discussed in the Case Narrative
	DF	Dilution Factor	E	TPH pattern not Gas or Diesel Range Pattern
	J	Analyte detected between MDL and RL	MDL	Method Detection Limit
	ND	Not Detected at the Method Detection Limit	RL	Reporting Limit
	S	Spike Recovery outside control limits	N	Parameter not NELAP certified

CLIENT: Golder
 Work Order: 1906073

ANALYTICAL QC SUMMARY REPORT

Project: LUMINANT-OGSES-PONDS

RunID: CETAC2_HG_190614C

The QC data in batch 91319 applies to the following samples: 1906073-01B, 1906073-02B

Sample ID MB-91319	Batch ID: 91319	TestNo: SW7470A	Units: mg/L							
SampType: MBLK	Run ID: CETAC2_HG_190614	Analysis Date: 6/14/2019 12:48:31 PM	Prep Date: 6/13/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Mercury <0.0000800 0.000200

Sample ID LCS-91319	Batch ID: 91319	TestNo: SW7470A	Units: mg/L							
SampType: LCS	Run ID: CETAC2_HG_190614	Analysis Date: 6/14/2019 12:53:03 PM	Prep Date: 6/13/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Mercury 0.00201 0.000200 0.00200 0 101 85 115

Sample ID LCS-91319	Batch ID: 91319	TestNo: SW7470A	Units: mg/L							
SampType: LCS	Run ID: CETAC2_HG_190614	Analysis Date: 6/14/2019 12:55:19 PM	Prep Date: 6/13/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Mercury 0.00196 0.000200 0.00200 0 98.0 85 115 2.52 15

Sample ID 1906077-01A MS	Batch ID: 91319	TestNo: SW7470A	Units: mg/L							
SampType: MS	Run ID: CETAC2_HG_190614	Analysis Date: 6/14/2019 1:17:57 PM	Prep Date: 6/13/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Mercury 0.0105 0.00100 0.0100 0 105 80 120

Sample ID 1906077-01A MSD	Batch ID: 91319	TestNo: SW7470A	Units: mg/L							
SampType: MSD	Run ID: CETAC2_HG_190614	Analysis Date: 6/14/2019 1:20:13 PM	Prep Date: 6/13/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Mercury 0.0104 0.00100 0.0100 0 104 80 120 1.44 15

Sample ID 1906077-01A SD	Batch ID: 91319	TestNo: SW7470A	Units: mg/L							
SampType: SD	Run ID: CETAC2_HG_190614	Analysis Date: 6/14/2019 1:22:29 PM	Prep Date: 6/13/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Mercury <0.00200 0.00500 0 0 0 0 10

Sample ID 1906077-01A PDS	Batch ID: 91319	TestNo: SW7470A	Units: mg/L							
SampType: PDS	Run ID: CETAC2_HG_190614	Analysis Date: 6/14/2019 1:24:45 PM	Prep Date: 6/13/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Mercury 0.0125 0.00100 0.0125 0 99.6 85 115

- Qualifiers:**
- B Analyte detected in the associated Method Blank
 - J Analyte detected between MDL and RL
 - ND Not Detected at the Method Detection Limit
 - RL Reporting Limit
 - J Analyte detected between SDL and RL
 - DF Dilution Factor
 - MDL Method Detection Limit
 - R RPD outside accepted control limits
 - S Spike Recovery outside control limits
 - N Parameter not NELAP certified

CLIENT: Golder
Work Order: 1906073
Project: LUMINANT-OGSES-PONDS

ANALYTICAL QC SUMMARY REPORT

RunID: CETAC2_HG_190614C

Sample ID ICV-190614	Batch ID: R104600	TestNo: SW7470A	Units: mg/L							
SampType: ICV	Run ID: CETAC2_HG_190614	Analysis Date: 6/14/2019 12:43:57 PM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.00425	0.000200	0.00400	0	106	90	110			

Sample ID CCV1-190613	Batch ID: R104600	TestNo: SW7470A	Units: mg/L							
SampType: CCV	Run ID: CETAC2_HG_190614	Analysis Date: 6/14/2019 1:29:19 PM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.00206	0.000200	0.00200	0	103	90	110			

Qualifiers: B Analyte detected in the associated Method Blank J Analyte detected between MDL and RL ND Not Detected at the Method Detection Limit RL Reporting Limit J Analyte detected between SDL and RL	DF Dilution Factor MDL Method Detection Limit R RPD outside accepted control limits S Spike Recovery outside control limits N Parameter not NELAP certified
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CLIENT: Golder
Work Order: 1906073
Project: LUMINANT-OGSES-PONDS

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS4_190612A

The QC data in batch 91261 applies to the following samples: 1906073-01B, 1906073-02B

Sample ID: MB-91261	Batch ID: 91261	TestNo: SW6020A	Units: mg/L
SampType: MBLK	Run ID: ICP-MS4_190612A	Analysis Date: 6/12/2019 10:50:00 AM	Prep Date: 6/10/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Boron	<0.0100	0.0300								
Calcium	<0.100	0.300								
Potassium	<0.100	0.300								
Sodium	<0.100	0.300								

Sample ID: LCS-91261	Batch ID: 91261	TestNo: SW6020A	Units: mg/L
SampType: LCS	Run ID: ICP-MS4_190612A	Analysis Date: 6/12/2019 10:52:00 AM	Prep Date: 6/10/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Boron	0.204	0.0300	0.200	0	102	80	120			
Calcium	4.66	0.300	5.00	0	93.2	80	120			
Potassium	4.97	0.300	5.00	0	99.4	80	120			
Sodium	5.11	0.300	5.00	0	102	80	120			

Sample ID: LCSD-91261	Batch ID: 91261	TestNo: SW6020A	Units: mg/L
SampType: LCSD	Run ID: ICP-MS4_190612A	Analysis Date: 6/12/2019 10:54:00 AM	Prep Date: 6/10/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Boron	0.211	0.0300	0.200	0	106	80	120	3.53	15	
Calcium	4.67	0.300	5.00	0	93.4	80	120	0.234	15	
Potassium	4.93	0.300	5.00	0	98.5	80	120	0.913	15	
Sodium	5.15	0.300	5.00	0	103	80	120	0.824	15	

Sample ID: 1906056-01A SD	Batch ID: 91261	TestNo: SW6020A	Units: mg/L
SampType: SD	Run ID: ICP-MS4_190612A	Analysis Date: 6/12/2019 11:00:00 AM	Prep Date: 6/10/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Boron	10.3	7.50	0	10.0				2.62	10	
Calcium	39.0	75.0	0	38.0				2.46	10	
Potassium	<25.0	75.0	0	0				0	10	
Sodium	116	75.0	0	115				0.316	10	

Sample ID: 1906056-01A PDS	Batch ID: 91261	TestNo: SW6020A	Units: mg/L
SampType: PDS	Run ID: ICP-MS4_190612A	Analysis Date: 6/12/2019 11:20:00 AM	Prep Date: 6/10/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Boron	20.3	1.50	10.0	10.0	103	80	120			
Calcium	276	15.0	250	38.0	95.0	80	120			
Potassium	247	15.0	250	0	98.7	80	120			
Sodium	379	15.0	250	115	105	80	120			

Qualifiers:

B Analyte detected in the associated Method Blank	DF Dilution Factor
J Analyte detected between MDL and RL	MDL Method Detection Limit
ND Not Detected at the Method Detection Limit	R RPD outside accepted control limits
RL Reporting Limit	S Spike Recovery outside control limits
J Analyte detected between SDL and RL	N Parameter not NELAP certified

CLIENT: Golder
Work Order: 1906073
Project: LUMINANT-OGSES-PONDS

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS4_190612A

Sample ID 1906056-01A MS	Batch ID: 91261	TestNo: SW6020A	Units: mg/L							
SampType: MS	Run ID: ICP-MS4_190612A	Analysis Date: 6/12/2019 11:22:00 AM	Prep Date: 6/10/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Boron	10.6	1.50	0.200	10.0	294	80	120			S
Calcium	42.9	15.0	5.00	38.0	98.3	80	120			
Potassium	5.61	15.0	5.00	0	112	80	120			
Sodium	118	15.0	5.00	115	44.1	80	120			S

Sample ID 1906056-01A MSD	Batch ID: 91261	TestNo: SW6020A	Units: mg/L							
SampType: MSD	Run ID: ICP-MS4_190612A	Analysis Date: 6/12/2019 11:24:00 AM	Prep Date: 6/10/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Boron	9.81	1.50	0.200	10.0	-111	80	120	7.95	15	S
Calcium	42.4	15.0	5.00	38.0	87.2	80	120	1.30	15	
Potassium	5.65	15.0	5.00	0	113	80	120	0.726	15	
Sodium	116	15.0	5.00	115	20.3	80	120	1.02	15	S

Qualifiers: B Analyte detected in the associated Method Blank
 J Analyte detected between MDL and RL
 ND Not Detected at the Method Detection Limit
 RL Reporting Limit
 J Analyte detected between SDL and RL
 DF Dilution Factor
 MDL Method Detection Limit
 R RPD outside accepted control limits
 S Spike Recovery outside control limits
 N Parameter not NELAP certified

CLIENT: Golder
Work Order: 1906073
Project: LUMINANT-OGSES-PONDS

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS4_190612A

Sample ID ICV-190612	Batch ID: R104563	TestNo: SW6020A	Units: mg/L
SampType: ICV	Run ID: ICP-MS4_190612A	Analysis Date: 6/12/2019 10:34:00 AM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Boron	0.0999	0.0300	0.100	0	99.9	90	110			
Calcium	2.45	0.300	2.50	0	98.1	90	110			
Magnesium	2.44	0.300	2.50	0	97.4	90	110			
Potassium	2.48	0.300	2.50	0	99.1	90	110			
Sodium	2.55	0.300	2.50	0	102	90	110			

Sample ID LCVL-190612	Batch ID: R104563	TestNo: SW6020A	Units: mg/L
SampType: LCVL	Run ID: ICP-MS4_190612A	Analysis Date: 6/12/2019 10:44:00 AM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Boron	0.0212	0.0300	0.0200	0	106	70	130			
Calcium	0.0989	0.300	0.100	0	98.9	70	130			
Magnesium	0.0972	0.300	0.100	0	97.2	70	130			
Potassium	0.101	0.300	0.100	0	101	70	130			
Sodium	0.103	0.300	0.100	0	103	70	130			

Sample ID CCV1-190612	Batch ID: R104563	TestNo: SW6020A	Units: mg/L
SampType: CCV	Run ID: ICP-MS4_190612A	Analysis Date: 6/12/2019 11:26:00 AM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Boron	0.215	0.0300	0.200	0	107	90	110			
Calcium	4.71	0.300	5.00	0	94.3	90	110			
Magnesium	4.96	0.300	5.00	0	99.1	90	110			
Potassium	5.03	0.300	5.00	0	101	90	110			
Sodium	4.99	0.300	5.00	0	99.8	90	110			

Sample ID LCVL1-190612	Batch ID: R104563	TestNo: SW6020A	Units: mg/L
SampType: LCVL	Run ID: ICP-MS4_190612A	Analysis Date: 6/12/2019 11:42:00 AM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Boron	0.0230	0.0300	0.0200	0	115	70	130			
Calcium	0.102	0.300	0.100	0	102	70	130			
Magnesium	0.0966	0.300	0.100	0	96.6	70	130			
Potassium	0.0990	0.300	0.100	0	99.0	70	130			
Sodium	0.103	0.300	0.100	0	103	70	130			

Qualifiers: B Analyte detected in the associated Method Blank DF Dilution Factor
J Analyte detected between MDL and RL MDL Method Detection Limit
ND Not Detected at the Method Detection Limit R RPD outside accepted control limits
RL Reporting Limit S Spike Recovery outside control limits
J Analyte detected between SDL and RL N Parameter not NELAP certified

CLIENT: Golder
Work Order: 1906073
Project: LUMINANT-OGSES-PONDS

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS5_190611D

The QC data in batch 91261 applies to the following samples: 1906073-01B, 1906073-02B

Sample ID MB-91261	Batch ID: 91261	TestNo: SW6020A	Units: mg/L
SampType: MBLK	Run ID: ICP-MS5_190611D	Analysis Date: 6/11/2019 3:05:00 PM	Prep Date: 6/10/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	<0.000800	0.00250								
Arsenic	<0.00200	0.00500								
Barium	<0.00300	0.0100								
Beryllium	<0.000300	0.00100								
Cadmium	<0.000300	0.00100								
Chromium	<0.00200	0.00500								
Cobalt	<0.00300	0.00500								
Iron	<0.0300	0.100								
Lead	<0.000300	0.00100								
Lithium	<0.00500	0.0100								
Magnesium	<0.100	0.300								
Molybdenum	<0.00200	0.00500								
Selenium	<0.00200	0.00500								
Thallium	<0.000500	0.00150								

Sample ID LCS-91261	Batch ID: 91261	TestNo: SW6020A	Units: mg/L
SampType: LCS	Run ID: ICP-MS5_190611D	Analysis Date: 6/11/2019 3:07:00 PM	Prep Date: 6/10/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.199	0.00250	0.200	0	99.6	80	120			
Arsenic	0.211	0.00500	0.200	0	105	80	120			
Barium	0.201	0.0100	0.200	0	101	80	120			
Beryllium	0.195	0.00100	0.200	0	97.6	80	120			
Cadmium	0.201	0.00100	0.200	0	101	80	120			
Chromium	0.203	0.00500	0.200	0	101	80	120			
Cobalt	0.208	0.00500	0.200	0	104	80	120			
Iron	5.05	0.100	5.00	0	101	80	120			
Lead	0.196	0.00100	0.200	0	97.9	80	120			
Lithium	0.208	0.0100	0.200	0	104	80	120			
Magnesium	5.05	0.300	5.00	0	101	80	120			
Molybdenum	0.206	0.00500	0.200	0	103	80	120			
Selenium	0.215	0.00500	0.200	0	107	80	120			
Thallium	0.196	0.00150	0.200	0	97.9	80	120			

Sample ID LCSD-91261	Batch ID: 91261	TestNo: SW6020A	Units: mg/L
SampType: LCSD	Run ID: ICP-MS5_190611D	Analysis Date: 6/11/2019 3:10:00 PM	Prep Date: 6/10/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.199	0.00250	0.200	0	99.7	80	120	0.129	15	
Arsenic	0.211	0.00500	0.200	0	105	80	120	0.014	15	

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
 Work Order: 1906073
 Project: LUMINANT-OGSES-PONDS

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS5_190611D

Sample ID: LCSD-91261	Batch ID: 91261	TestNo: SW6020A	Units: mg/L
SampType: LCSD	Run ID: ICP-MS5_190611D	Analysis Date: 6/11/2019 3:10:00 PM	Prep Date: 6/10/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	0.204	0.0100	0.200	0	102	80	120	1.13	15	
Beryllium	0.194	0.00100	0.200	0	96.9	80	120	0.710	15	
Cadmium	0.203	0.00100	0.200	0	101	80	120	0.819	15	
Chromium	0.202	0.00500	0.200	0	101	80	120	0.363	15	
Cobalt	0.207	0.00500	0.200	0	104	80	120	0.342	15	
Iron	5.01	0.100	5.00	0	100	80	120	0.604	15	
Lead	0.195	0.00100	0.200	0	97.5	80	120	0.470	15	
Lithium	0.206	0.0100	0.200	0	103	80	120	0.952	15	
Magnesium	5.04	0.300	5.00	0	101	80	120	0.085	15	
Molybdenum	0.205	0.00500	0.200	0	102	80	120	0.473	15	
Selenium	0.219	0.00500	0.200	0	110	80	120	2.02	15	
Thallium	0.195	0.00150	0.200	0	97.4	80	120	0.582	15	

Sample ID: 1906056-01A SD	Batch ID: 91261	TestNo: SW6020A	Units: mg/L
SampType: SD	Run ID: ICP-MS5_190611D	Analysis Date: 6/11/2019 3:16:00 PM	Prep Date: 6/10/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	<0.00400	0.0125	0	0				0	10	
Arsenic	0.0137	0.0250	0	0.0135				0.978	10	
Barium	0.0549	0.0500	0	0.0554				0.861	10	
Beryllium	<0.00150	0.00500	0	0				0	10	
Cadmium	<0.00150	0.00500	0	0				0	10	
Chromium	<0.0100	0.0250	0	0				0	10	
Cobalt	<0.0150	0.0250	0	0				0	10	
Iron	0.190	0.500	0	0.0550				110	10	
Lead	<0.00150	0.00500	0	0				0	10	
Lithium	<0.0250	0.0500	0	0.00980				0	10	
Magnesium	8.05	1.50	0	7.98				0.840	10	
Molybdenum	0.146	0.0250	0	0.148				0.851	10	
Selenium	<0.0100	0.0250	0	0				0	10	
Thallium	<0.00250	0.00750	0	0				0	10	

Sample ID: 1906056-01A PDS	Batch ID: 91261	TestNo: SW6020A	Units: mg/L
SampType: PDS	Run ID: ICP-MS5_190611D	Analysis Date: 6/11/2019 3:39:00 PM	Prep Date: 6/10/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.198	0.00250	0.200	0	99.1	80	120			
Arsenic	0.208	0.00500	0.200	0.0135	97.3	80	120			
Barium	0.249	0.0100	0.200	0.0554	96.7	80	120			
Beryllium	0.187	0.00100	0.200	0	93.4	80	120			
Cadmium	0.199	0.00100	0.200	0	99.7	80	120			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1906073
Project: LUMINANT-OGSES-PONDS

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS5_190611D

Sample ID: 1906056-01A PDS	Batch ID: 91261	TestNo: SW6020A	Units: mg/L
SampType: PDS	Run ID: ICP-MS5_190611D	Analysis Date: 6/11/2019 3:39:00 PM	Prep Date: 6/10/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chromium	0.206	0.00500	0.200	0	103	80	120			
Cobalt	0.198	0.00500	0.200	0	98.9	80	120			
Iron	4.99	0.100	5.00	0.0550	98.7	80	120			
Lead	0.194	0.00100	0.200	0	96.9	80	120			
Lithium	0.215	0.0100	0.200	0.00980	103	80	120			
Magnesium	12.3	0.300	5.00	7.98	87.2	80	120			
Molybdenum	0.337	0.00500	0.200	0.148	94.9	80	120			
Selenium	0.196	0.00500	0.200	0	98.2	80	120			
Thallium	0.194	0.00150	0.200	0	97.0	80	120			

Sample ID: 1906056-01A MS	Batch ID: 91261	TestNo: SW6020A	Units: mg/L
SampType: MS	Run ID: ICP-MS5_190611D	Analysis Date: 6/11/2019 3:41:00 PM	Prep Date: 6/10/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.201	0.00250	0.200	0	100	80	120			
Arsenic	0.213	0.00500	0.200	0.0135	99.9	80	120			
Barium	0.256	0.0100	0.200	0.0554	100	80	120			
Beryllium	0.186	0.00100	0.200	0	93.1	80	120			
Cadmium	0.202	0.00100	0.200	0	101	80	120			
Chromium	0.202	0.00500	0.200	0	101	80	120			
Cobalt	0.199	0.00500	0.200	0	99.7	80	120			
Iron	5.06	0.100	5.00	0.0550	100	80	120			
Lead	0.194	0.00100	0.200	0	97.1	80	120			
Lithium	0.210	0.0100	0.200	0.00980	100	80	120			
Magnesium	12.9	0.300	5.00	7.98	97.7	80	120			
Molybdenum	0.355	0.00500	0.200	0.148	104	80	120			
Selenium	0.196	0.00500	0.200	0	98.0	80	120			
Thallium	0.195	0.00150	0.200	0	97.3	80	120			

Sample ID: 1906056-01A MSD	Batch ID: 91261	TestNo: SW6020A	Units: mg/L
SampType: MSD	Run ID: ICP-MS5_190611D	Analysis Date: 6/11/2019 3:43:00 PM	Prep Date: 6/10/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.199	0.00250	0.200	0	99.3	80	120	0.921	15	
Arsenic	0.214	0.00500	0.200	0.0135	100	80	120	0.278	15	
Barium	0.257	0.0100	0.200	0.0554	101	80	120	0.287	15	
Beryllium	0.187	0.00100	0.200	0	93.5	80	120	0.464	15	
Cadmium	0.203	0.00100	0.200	0	102	80	120	0.488	15	
Chromium	0.202	0.00500	0.200	0	101	80	120	0.016	15	
Cobalt	0.199	0.00500	0.200	0	99.6	80	120	0.064	15	
Iron	5.08	0.100	5.00	0.0550	101	80	120	0.370	15	

Qualifiers:

B Analyte detected in the associated Method Blank	DF Dilution Factor
J Analyte detected between MDL and RL	MDL Method Detection Limit
ND Not Detected at the Method Detection Limit	R RPD outside accepted control limits
RL Reporting Limit	S Spike Recovery outside control limits
J Analyte detected between SDL and RL	N Parameter not NELAP certified

CLIENT: Golder
Work Order: 1906073
Project: LUMINANT-OGSES-PONDS

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS5_190611D

Sample ID: 1906056-01A MSD	Batch ID: 91261	TestNo: SW6020A	Units: mg/L
SampType: MSD	Run ID: ICP-MS5_190611D	Analysis Date: 6/11/2019 3:43:00 PM	Prep Date: 6/10/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Lead	0.193	0.00100	0.200	0	96.5	80	120	0.562	15	
Lithium	0.209	0.0100	0.200	0.00980	99.7	80	120	0.400	15	
Magnesium	13.0	0.300	5.00	7.98	99.4	80	120	0.654	15	
Molybdenum	0.358	0.00500	0.200	0.148	105	80	120	0.791	15	
Selenium	0.197	0.00500	0.200	0	98.6	80	120	0.595	15	
Thallium	0.194	0.00150	0.200	0	97.0	80	120	0.390	15	

Qualifiers: B Analyte detected in the associated Method Blank J Analyte detected between MDL and RL ND Not Detected at the Method Detection Limit RL Reporting Limit J Analyte detected between SDL and RL	DF Dilution Factor MDL Method Detection Limit R RPD outside accepted control limits S Spike Recovery outside control limits N Parameter not NELAP certified
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CLIENT: Golder
 Work Order: 1906073
 Project: LUMINANT-OGSES-PONDS

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS5_190611D

Sample ID ICV-190611	Batch ID: R104548	TestNo: SW6020A	Units: mg/L
SampType: ICV	Run ID: ICP-MS5_190611D	Analysis Date: 6/11/2019 10:46:00 AM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.0982	0.00250	0.100	0	98.2	90	110			
Arsenic	0.103	0.00500	0.100	0	103	90	110			
Barium	0.0976	0.0100	0.100	0	97.6	90	110			
Beryllium	0.0929	0.00100	0.100	0	92.9	90	110			
Cadmium	0.0986	0.00100	0.100	0	98.6	90	110			
Chromium	0.101	0.00500	0.100	0	101	90	110			
Cobalt	0.102	0.00500	0.100	0	102	90	110			
Iron	2.45	0.100	2.50	0	98.2	90	110			
Lead	0.0957	0.00100	0.100	0	95.7	90	110			
Lithium	0.102	0.0100	0.100	0	102	90	110			
Magnesium	2.39	0.300	2.50	0	95.6	90	110			
Molybdenum	0.0956	0.00500	0.100	0	95.6	90	110			
Selenium	0.103	0.00500	0.100	0	103	90	110			
Thallium	0.0957	0.00150	0.100	0	95.7	90	110			

Sample ID LCVL-190611	Batch ID: R104548	TestNo: SW6020A	Units: mg/L
SampType: LCVL	Run ID: ICP-MS5_190611D	Analysis Date: 6/11/2019 10:52:00 AM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.00196	0.00250	0.00200	0	97.8	70	130			
Arsenic	0.00500	0.00500	0.00500	0	100	70	130			
Barium	0.00471	0.0100	0.00500	0	94.2	70	130			
Beryllium	0.000890	0.00100	0.00100	0	89.0	70	130			
Cadmium	0.000934	0.00100	0.00100	0	93.4	70	130			
Chromium	0.00465	0.00500	0.00500	0	93.0	70	130			
Cobalt	0.00487	0.00500	0.00500	0	97.5	70	130			
Iron	0.0944	0.100	0.100	0	94.4	70	130			
Lead	0.000939	0.00100	0.00100	0	93.9	70	130			
Lithium	0.0101	0.0100	0.0100	0	101	70	130			
Magnesium	0.0959	0.300	0.100	0	95.9	70	130			
Molybdenum	0.00524	0.00500	0.00500	0	105	70	130			
Selenium	0.00564	0.00500	0.00500	0	113	70	130			
Thallium	0.000930	0.00150	0.00100	0	93.0	70	130			

Sample ID CCV3-190611	Batch ID: R104548	TestNo: SW6020A	Units: mg/L
SampType: CCV	Run ID: ICP-MS5_190611D	Analysis Date: 6/11/2019 2:53:00 PM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.203	0.00250	0.200	0	101	90	110			
Arsenic	0.205	0.00500	0.200	0	102	90	110			
Barium	0.201	0.0100	0.200	0	100	90	110			

- Qualifiers:**
- B Analyte detected in the associated Method Blank
 - J Analyte detected between MDL and RL
 - ND Not Detected at the Method Detection Limit
 - RL Reporting Limit
 - J Analyte detected between SDL and RL
 - DF Dilution Factor
 - MDL Method Detection Limit
 - R RPD outside accepted control limits
 - S Spike Recovery outside control limits
 - N Parameter not NELAP certified

CLIENT: Golder
Work Order: 1906073
Project: LUMINANT-OGSES-PONDS

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS5_190611D

Sample ID CCV3-190611	Batch ID: R104548	TestNo: SW6020A	Units: mg/L
SampType: CCV	Run ID: ICP-MS5_190611D	Analysis Date: 6/11/2019 2:53:00 PM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Beryllium	0.193	0.00100	0.200	0	96.4	90	110			
Cadmium	0.203	0.00100	0.200	0	101	90	110			
Chromium	0.203	0.00500	0.200	0	101	90	110			
Cobalt	0.204	0.00500	0.200	0	102	90	110			
Iron	4.97	0.100	5.00	0	99.4	90	110			
Lead	0.193	0.00100	0.200	0	96.7	90	110			
Lithium	0.204	0.0100	0.200	0	102	90	110			
Magnesium	4.96	0.300	5.00	0	99.2	90	110			
Molybdenum	0.205	0.00500	0.200	0	102	90	110			
Selenium	0.207	0.00500	0.200	0	104	90	110			
Thallium	0.193	0.00150	0.200	0	96.4	90	110			

Sample ID LCVL3-190611	Batch ID: R104548	TestNo: SW6020A	Units: mg/L
SampType: LCVL	Run ID: ICP-MS5_190611D	Analysis Date: 6/11/2019 2:57:00 PM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.00207	0.00250	0.00200	0	104	70	130			
Arsenic	0.00490	0.00500	0.00500	0	98.1	70	130			
Barium	0.00516	0.0100	0.00500	0	103	70	130			
Beryllium	0.000878	0.00100	0.00100	0	87.8	70	130			
Cadmium	0.00113	0.00100	0.00100	0	113	70	130			
Chromium	0.00488	0.00500	0.00500	0	97.6	70	130			
Cobalt	0.00515	0.00500	0.00500	0	103	70	130			
Iron	0.0963	0.100	0.100	0	96.3	70	130			
Lead	0.000922	0.00100	0.00100	0	92.2	70	130			
Lithium	0.0104	0.0100	0.0100	0	104	70	130			
Magnesium	0.0942	0.300	0.100	0	94.2	70	130			
Molybdenum	0.00507	0.00500	0.00500	0	101	70	130			
Selenium	0.00495	0.00500	0.00500	0	99.0	70	130			
Thallium	0.000988	0.00150	0.00100	0	98.8	70	130			

Sample ID CCV4-190611	Batch ID: R104548	TestNo: SW6020A	Units: mg/L
SampType: CCV	Run ID: ICP-MS5_190611D	Analysis Date: 6/11/2019 3:48:00 PM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.202	0.00250	0.200	0	101	90	110			
Arsenic	0.205	0.00500	0.200	0	103	90	110			
Barium	0.201	0.0100	0.200	0	100	90	110			
Beryllium	0.187	0.00100	0.200	0	93.7	90	110			
Cadmium	0.204	0.00100	0.200	0	102	90	110			
Chromium	0.202	0.00500	0.200	0	101	90	110			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
 Work Order: 1906073
 Project: LUMINANT-OGSES-PONDS

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS5_190611D

Sample ID: CCV4-190611	Batch ID: R104548	TestNo: SW6020A	Units: mg/L
SampType: CCV	Run ID: ICP-MS5_190611D	Analysis Date: 6/11/2019 3:48:00 PM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Cobalt	0.205	0.00500	0.200	0	102	90	110			
Iron	4.93	0.100	5.00	0	98.6	90	110			
Lead	0.193	0.00100	0.200	0	96.7	90	110			
Lithium	0.202	0.0100	0.200	0	101	90	110			
Magnesium	4.99	0.300	5.00	0	99.7	90	110			
Molybdenum	0.207	0.00500	0.200	0	103	90	110			
Selenium	0.200	0.00500	0.200	0	100	90	110			
Thallium	0.193	0.00150	0.200	0	96.5	90	110			

Sample ID: LCVL4-190611	Batch ID: R104548	TestNo: SW6020A	Units: mg/L
SampType: LCVL	Run ID: ICP-MS5_190611D	Analysis Date: 6/11/2019 3:59:00 PM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.00205	0.00250	0.00200	0	103	70	130			
Arsenic	0.00491	0.00500	0.00500	0	98.2	70	130			
Barium	0.00520	0.0100	0.00500	0	104	70	130			
Beryllium	0.000861	0.00100	0.00100	0	86.1	70	130			
Cadmium	0.000971	0.00100	0.00100	0	97.1	70	130			
Chromium	0.00490	0.00500	0.00500	0	98.0	70	130			
Cobalt	0.00517	0.00500	0.00500	0	103	70	130			
Iron	0.0969	0.100	0.100	0	96.9	70	130			
Lead	0.000944	0.00100	0.00100	0	94.4	70	130			
Lithium	0.0106	0.0100	0.0100	0	106	70	130			
Magnesium	0.100	0.300	0.100	0	100	70	130			
Molybdenum	0.00510	0.00500	0.00500	0	102	70	130			
Selenium	0.00552	0.00500	0.00500	0	110	70	130			
Thallium	0.00101	0.00150	0.00100	0	101	70	130			

Sample ID: CCV5-190611	Batch ID: R104548	TestNo: SW6020A	Units: mg/L
SampType: CCV	Run ID: ICP-MS5_190611D	Analysis Date: 6/11/2019 4:21:00 PM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.202	0.00250	0.200	0	101	90	110			
Arsenic	0.203	0.00500	0.200	0	102	90	110			
Barium	0.200	0.0100	0.200	0	100	90	110			
Beryllium	0.191	0.00100	0.200	0	95.3	90	110			
Cadmium	0.199	0.00100	0.200	0	99.5	90	110			
Chromium	0.199	0.00500	0.200	0	99.4	90	110			
Cobalt	0.201	0.00500	0.200	0	101	90	110			
Iron	4.87	0.100	5.00	0	97.5	90	110			
Lead	0.194	0.00100	0.200	0	97.1	90	110			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1906073
Project: LUMINANT-OGSES-PONDS

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS5_190611D

Sample ID: CCV5-190611	Batch ID: R104548	TestNo: SW6020A	Units: mg/L
SampType: CCV	Run ID: ICP-MS5_190611D	Analysis Date: 6/11/2019 4:21:00 PM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Lithium	0.204	0.0100	0.200	0	102	90	110			
Magnesium	5.01	0.300	5.00	0	100	90	110			
Molybdenum	0.204	0.00500	0.200	0	102	90	110			
Selenium	0.216	0.00500	0.200	0	108	90	110			
Thallium	0.194	0.00150	0.200	0	97.1	90	110			

Sample ID: LCVL5-190611	Batch ID: R104548	TestNo: SW6020A	Units: mg/L
SampType: LCVL	Run ID: ICP-MS5_190611D	Analysis Date: 6/11/2019 4:26:00 PM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.00190	0.00250	0.00200	0	94.8	70	130			
Arsenic	0.00482	0.00500	0.00500	0	96.5	70	130			
Barium	0.00464	0.0100	0.00500	0	92.9	70	130			
Beryllium	0.000880	0.00100	0.00100	0	88.0	70	130			
Cadmium	0.000935	0.00100	0.00100	0	93.5	70	130			
Chromium	0.00464	0.00500	0.00500	0	92.8	70	130			
Cobalt	0.00480	0.00500	0.00500	0	96.0	70	130			
Iron	0.0924	0.100	0.100	0	92.4	70	130			
Lead	0.000913	0.00100	0.00100	0	91.3	70	130			
Lithium	0.0101	0.0100	0.0100	0	101	70	130			
Magnesium	0.100	0.300	0.100	0	100	70	130			
Molybdenum	0.00498	0.00500	0.00500	0	99.6	70	130			
Selenium	0.00652	0.00500	0.00500	0	130	70	130			
Thallium	0.000948	0.00150	0.00100	0	94.8	70	130			

Qualifiers: B Analyte detected in the associated Method Blank DF Dilution Factor
 J Analyte detected between MDL and RL MDL Method Detection Limit
 ND Not Detected at the Method Detection Limit R RPD outside accepted control limits
 RL Reporting Limit S Spike Recovery outside control limits
 J Analyte detected between SDL and RL N Parameter not NELAP certified

CLIENT: Golder
Work Order: 1906073
Project: LUMINANT-OGSES-PONDS

ANALYTICAL QC SUMMARY REPORT

RunID: IC2_190607A

The QC data in batch 91226 applies to the following samples: 1906073-01C, 1906073-02C

Sample ID: MB-91226	Batch ID: 91226	TestNo: E300	Units: mg/L							
SampType: MBLK	Run ID: IC2_190607A	Analysis Date: 6/7/2019 10:25:46 AM	Prep Date: 6/7/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	<0.300	1.00								
Fluoride	<0.100	0.400								
Nitrate-N	<0.100	0.500								
Sulfate	<1.00	3.00								

Sample ID: LCS-91226	Batch ID: 91226	TestNo: E300	Units: mg/L							
SampType: LCS	Run ID: IC2_190607A	Analysis Date: 6/7/2019 10:41:46 AM	Prep Date: 6/7/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	10.2	1.00	10.00	0	102	90	110			
Fluoride	4.06	0.400	4.000	0	101	90	110			
Nitrate-N	5.17	0.500	5.000	0	103	90	110			
Sulfate	30.9	3.00	30.00	0	103	90	110			

Sample ID: LCSD-91226	Batch ID: 91226	TestNo: E300	Units: mg/L							
SampType: LCSD	Run ID: IC2_190607A	Analysis Date: 6/7/2019 10:57:46 AM	Prep Date: 6/7/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	10.3	1.00	10.00	0	103	90	110	0.438	20	
Fluoride	4.07	0.400	4.000	0	102	90	110	0.405	20	
Nitrate-N	5.11	0.500	5.000	0	102	90	110	1.10	20	
Sulfate	31.1	3.00	30.00	0	104	90	110	0.707	20	

Sample ID: 1906064-01EMS	Batch ID: 91226	TestNo: E300	Units: mg/L							
SampType: MS	Run ID: IC2_190607A	Analysis Date: 6/7/2019 12:01:26 PM	Prep Date: 6/7/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	34.9	1.00	20.00	14.68	101	90	110			
Fluoride	21.2	0.400	20.00	0.1842	105	90	110			
Nitrate-N	4.75	0.500	4.516	0.1911	101	90	110			
Sulfate	24.4	3.00	20.00	4.032	102	90	110			

Sample ID: 1906064-01EMSD	Batch ID: 91226	TestNo: E300	Units: mg/L							
SampType: MSD	Run ID: IC2_190607A	Analysis Date: 6/7/2019 12:17:26 PM	Prep Date: 6/7/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	35.0	1.00	20.00	14.68	101	90	110	0.143	20	
Fluoride	21.2	0.400	20.00	0.1842	105	90	110	0.188	20	
Nitrate-N	4.75	0.500	4.516	0.1911	101	90	110	0.115	20	
Sulfate	24.5	3.00	20.00	4.032	102	90	110	0.366	20	

Qualifiers:

B Analyte detected in the associated Method Blank	DF Dilution Factor
J Analyte detected between MDL and RL	MDL Method Detection Limit
ND Not Detected at the Method Detection Limit	R RPD outside accepted control limits
RL Reporting Limit	S Spike Recovery outside control limits
J Analyte detected between SDL and RL	N Parameter not NELAP certified

CLIENT: Golder
Work Order: 1906073
Project: LUMINANT-OGSES-PONDS

ANALYTICAL QC SUMMARY REPORT

RunID: IC2_190607A

Sample ID: 1906066-01DMS	Batch ID: 91226	TestNo: E300	Units: mg/L							
SampType: MS	Run ID: IC2_190607A	Analysis Date: 6/7/2019 1:46:15 PM	Prep Date: 6/7/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	2150	100	2000	65.56	104	90	110			
Fluoride	2110	40.0	2000	0	106	90	110			
Nitrate-N	456	50.0	451.6	0	101	90	110			
Sulfate	2060	300	2000	0	103	90	110			

Sample ID: 1906066-01DMSD	Batch ID: 91226	TestNo: E300	Units: mg/L							
SampType: MSD	Run ID: IC2_190607A	Analysis Date: 6/7/2019 2:02:15 PM	Prep Date: 6/7/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	2150	100	2000	65.56	104	90	110	0.028	20	
Fluoride	2110	40.0	2000	0	105	90	110	0.071	20	
Nitrate-N	455	50.0	451.6	0	101	90	110	0.150	20	
Sulfate	2060	300	2000	0	103	90	110	0.420	20	

Qualifiers: B Analyte detected in the associated Method Blank DF Dilution Factor
 J Analyte detected between MDL and RL MDL Method Detection Limit
 ND Not Detected at the Method Detection Limit R RPD outside accepted control limits
 RL Reporting Limit S Spike Recovery outside control limits
 J Analyte detected between SDL and RL N Parameter not NELAP certified

CLIENT: Golder
Work Order: 1906073
Project: LUMINANT-OGSES-PONDS

ANALYTICAL QC SUMMARY REPORT

RunID: IC2_190607A

Sample ID ICV-190607	Batch ID: R104496	TestNo: E300	Units: mg/L							
SampType: ICV	Run ID: IC2_190607A	Analysis Date: 6/7/2019 9:53:47 AM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	26.1	1.00	25.00	0	104	90	110			
Fluoride	10.4	0.400	10.00	0	104	90	110			
Nitrate-N	13.2	0.500	12.50	0	106	90	110			
Sulfate	78.5	3.00	75.00	0	105	90	110			

Sample ID CCV1-190607	Batch ID: R104496	TestNo: E300	Units: mg/L							
SampType: CCV	Run ID: IC2_190607A	Analysis Date: 6/7/2019 3:38:14 PM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	10.4	1.00	10.00	0	104	90	110			
Fluoride	4.14	0.400	4.000	0	104	90	110			
Nitrate-N	5.23	0.500	5.000	0	105	90	110			
Sulfate	31.7	3.00	30.00	0	106	90	110			

Sample ID CCV2-190607	Batch ID: R104496	TestNo: E300	Units: mg/L							
SampType: CCV	Run ID: IC2_190607A	Analysis Date: 6/7/2019 6:18:14 PM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	10.6	1.00	10.00	0	106	90	110			
Fluoride	4.16	0.400	4.000	0	104	90	110			
Nitrate-N	5.17	0.500	5.000	0	103	90	110			
Sulfate	32.2	3.00	30.00	0	107	90	110			

Qualifiers: B Analyte detected in the associated Method Blank DF Dilution Factor
 J Analyte detected between MDL and RL MDL Method Detection Limit
 ND Not Detected at the Method Detection Limit R RPD outside accepted control limits
 RL Reporting Limit S Spike Recovery outside control limits
 J Analyte detected between SDL and RL N Parameter not NELAP certified

CLIENT: Golder
 Work Order: 1906073
 Project: LUMINANT-OGSES-PONDS

ANALYTICAL QC SUMMARY REPORT

RunID: IC2_190610A

The QC data in batch 91262 applies to the following samples: 1906073-01C, 1906073-02C

Sample ID	MB-91262	Batch ID:	91262	TestNo:	E300	Units:	mg/L			
SampType:	MBLK	Run ID:	IC2_190610A	Analysis Date:	6/10/2019 10:16:07 AM	Prep Date:	6/10/2019			
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	<0.300	1.00								
Sulfate	<1.00	3.00								

Sample ID	LCS-91262	Batch ID:	91262	TestNo:	E300	Units:	mg/L			
SampType:	LCS	Run ID:	IC2_190610A	Analysis Date:	6/10/2019 10:32:07 AM	Prep Date:	6/10/2019			
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	10.1	1.00	10.00	0	101	90	110			
Sulfate	30.4	3.00	30.00	0	101	90	110			

Sample ID	LCSD-91262	Batch ID:	91262	TestNo:	E300	Units:	mg/L			
SampType:	LCSD	Run ID:	IC2_190610A	Analysis Date:	6/10/2019 10:48:07 AM	Prep Date:	6/10/2019			
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	10.1	1.00	10.00	0	101	90	110	0.568	20	
Sulfate	30.7	3.00	30.00	0	102	90	110	0.872	20	

Sample ID	1906073-01CMS	Batch ID:	91262	TestNo:	E300	Units:	mg/L			
SampType:	MS	Run ID:	IC2_190610A	Analysis Date:	6/10/2019 11:24:48 AM	Prep Date:	6/10/2019			
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	3510	100	2000	1510	100	90	110			
Sulfate	5260	300	2000	3263	99.9	90	110			

Sample ID	1906073-01CMSD	Batch ID:	91262	TestNo:	E300	Units:	mg/L			
SampType:	MSD	Run ID:	IC2_190610A	Analysis Date:	6/10/2019 11:40:48 AM	Prep Date:	6/10/2019			
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	3490	100	2000	1510	98.9	90	110	0.754	20	
Sulfate	5250	300	2000	3263	99.3	90	110	0.226	20	

Qualifiers: B Analyte detected in the associated Method Blank J Analyte detected between MDL and RL ND Not Detected at the Method Detection Limit RL Reporting Limit J Analyte detected between SDL and RL	DF Dilution Factor MDL Method Detection Limit R RPD outside accepted control limits S Spike Recovery outside control limits N Parameter not NELAP certified
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CLIENT: Golder
Work Order: 1906073
Project: LUMINANT-OGSES-PONDS

ANALYTICAL QC SUMMARY REPORT

RunID: IC2_190610A

Sample ID ICV-190610	Batch ID: R104514	TestNo: E300	Units: mg/L							
SampType: ICV	Run ID: IC2_190610A	Analysis Date: 6/10/2019 9:44:07 AM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	25.5	1.00	25.00	0	102	90	110			
Sulfate	77.4	3.00	75.00	0	103	90	110			

Sample ID CCV1-190610	Batch ID: R104514	TestNo: E300	Units: mg/L							
SampType: CCV	Run ID: IC2_190610A	Analysis Date: 6/10/2019 1:32:48 PM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	10.2	1.00	10.00	0	102	90	110			
Sulfate	31.0	3.00	30.00	0	103	90	110			

<p>Qualifiers:</p> <p>B Analyte detected in the associated Method Blank</p> <p>J Analyte detected between MDL and RL</p> <p>ND Not Detected at the Method Detection Limit</p> <p>RL Reporting Limit</p> <p>J Analyte detected between SDL and RL</p>	<p>DF Dilution Factor</p> <p>MDL Method Detection Limit</p> <p>R RPD outside accepted control limits</p> <p>S Spike Recovery outside control limits</p> <p>N Parameter not NELAP certified</p>
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CLIENT: Golder
Work Order: 1906073
Project: LUMINANT-OGSES-PONDS

ANALYTICAL QC SUMMARY REPORT

RunID: TITRATOR_190610A

The QC data in batch 91271 applies to the following samples: 1906073-01C, 1906073-02C

Sample ID MB-91271	Batch ID: 91271	TestNo: M2320 B	Units: mg/L @ pH 4.27
SampType: MBLK	Run ID: TITRATOR_190610A	Analysis Date: 6/10/2019 10:17:00 AM	Prep Date: 6/10/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Alkalinity, Bicarbonate (As CaCO3)	<10.0	20.0								
Alkalinity, Carbonate (As CaCO3)	<10.0	20.0								
Alkalinity, Hydroxide (As CaCO3)	<10.0	20.0								
Alkalinity, Total (As CaCO3)	<20.0	20.0								

Sample ID LCS-91271	Batch ID: 91271	TestNo: M2320 B	Units: mg/L @ pH 4.39
SampType: LCS	Run ID: TITRATOR_190610A	Analysis Date: 6/10/2019 10:22:00 AM	Prep Date: 6/10/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	49.8	20.0	50.00	0	99.5	74	129			

Sample ID 1906073-02C DUP	Batch ID: 91271	TestNo: M2320 B	Units: mg/L @ pH 4.54
SampType: DUP	Run ID: TITRATOR_190610A	Analysis Date: 6/10/2019 1:11:00 PM	Prep Date: 6/10/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Alkalinity, Bicarbonate (As CaCO3)	66.8	20.0	0	68.00				1.78	20	
Alkalinity, Carbonate (As CaCO3)	<10.0	20.0	0	0				0	20	
Alkalinity, Hydroxide (As CaCO3)	<10.0	20.0	0	0				0	20	
Alkalinity, Total (As CaCO3)	66.8	20.0	0	68.00				1.78	20	

Qualifiers:	B Analyte detected in the associated Method Blank	DF Dilution Factor	
	J Analyte detected between MDL and RL	MDL Method Detection Limit	
	ND Not Detected at the Method Detection Limit	R RPD outside accepted control limits	
	RL Reporting Limit	S Spike Recovery outside control limits	
	J Analyte detected between SDL and RL	N Parameter not NELAP certified	

CLIENT: Golder
Work Order: 1906073
Project: LUMINANT-OGSES-PONDS

ANALYTICAL QC SUMMARY REPORT

RunID: TITRATOR_190610A

Sample ID ICV-190610	Batch ID: R104513	TestNo: M2320 B	Units: mg/L @ pH 4.29
SampType: ICV	Run ID: TITRATOR_190610A	Analysis Date: 6/10/2019 10:15:00 AM	Prep Date: 6/10/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Alkalinity, Bicarbonate (As CaCO3)	4.00	20.0	0							
Alkalinity, Carbonate (As CaCO3)	96.2	20.0	0							
Alkalinity, Hydroxide (As CaCO3)	<10.0	20.0	0							
Alkalinity, Total (As CaCO3)	100	20.0	100.0	0	100	98	102			

Sample ID CCV1-190610	Batch ID: R104513	TestNo: M2320 B	Units: mg/L @ pH 4.22
SampType: CCV	Run ID: TITRATOR_190610A	Analysis Date: 6/10/2019 1:08:00 PM	Prep Date: 6/10/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Alkalinity, Bicarbonate (As CaCO3)	27.7	20.0	0							
Alkalinity, Carbonate (As CaCO3)	74.1	20.0	0							
Alkalinity, Hydroxide (As CaCO3)	<10.0	20.0	0							
Alkalinity, Total (As CaCO3)	102	20.0	100.0	0	102	90	110			

Sample ID CCV2-190610	Batch ID: R104513	TestNo: M2320 B	Units: mg/L @ pH 4.21
SampType: CCV	Run ID: TITRATOR_190610A	Analysis Date: 6/10/2019 1:16:00 PM	Prep Date: 6/10/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Alkalinity, Bicarbonate (As CaCO3)	26.1	20.0	0							
Alkalinity, Carbonate (As CaCO3)	73.8	20.0	0							
Alkalinity, Hydroxide (As CaCO3)	<10.0	20.0	0							
Alkalinity, Total (As CaCO3)	99.8	20.0	100.0	0	99.8	90	110			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1906073
Project: LUMINANT-OGSES-PONDS

ANALYTICAL QC SUMMARY REPORT

RunID: UV/VIS_2_190607B

The QC data in batch 91254 applies to the following samples: 1906073-01C, 1906073-02C

Sample ID MB-91254	Batch ID: 91254	TestNo: M4500-P E	Units: mg/L							
SampType: MBLK	Run ID: UV/VIS_2_190607B	Analysis Date: 6/7/2019 1:50:00 PM	Prep Date: 6/7/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Phosphorus, Total Orthophosphate (As <0.0300 0.100

Sample ID LCS-91254	Batch ID: 91254	TestNo: M4500-P E	Units: mg/L							
SampType: LCS	Run ID: UV/VIS_2_190607B	Analysis Date: 6/7/2019 1:50:00 PM	Prep Date: 6/7/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Phosphorus, Total Orthophosphate (As 0.509 0.100 0.5000 0 102 80 120

Sample ID LCSD-91254	Batch ID: 91254	TestNo: M4500-P E	Units: mg/L							
SampType: LCSD	Run ID: UV/VIS_2_190607B	Analysis Date: 6/7/2019 1:50:00 PM	Prep Date: 6/7/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Phosphorus, Total Orthophosphate (As 0.507 0.100 0.5000 0 101 80 120 0.394 15

Sample ID 1906073-02CMS	Batch ID: 91254	TestNo: M4500-P E	Units: mg/L							
SampType: MS	Run ID: UV/VIS_2_190607B	Analysis Date: 6/7/2019 1:53:00 PM	Prep Date: 6/7/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Phosphorus, Total Orthophosphate (As 0.517 0.100 0.5000 0 103 80 120

Sample ID 1906073-02CMSD	Batch ID: 91254	TestNo: M4500-P E	Units: mg/L							
SampType: MSD	Run ID: UV/VIS_2_190607B	Analysis Date: 6/7/2019 1:53:00 PM	Prep Date: 6/7/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Phosphorus, Total Orthophosphate (As 0.518 0.100 0.5000 0 104 80 120 0.193 15

Qualifiers: B Analyte detected in the associated Method Blank
J Analyte detected between MDL and RL
ND Not Detected at the Method Detection Limit
RL Reporting Limit
J Analyte detected between SDL and RL
DF Dilution Factor
MDL Method Detection Limit
R RPD outside accepted control limits
S Spike Recovery outside control limits
N Parameter not NELAP certified

CLIENT: Golder
Work Order: 1906073
Project: LUMINANT-OGSES-PONDS

ANALYTICAL QC SUMMARY REPORT

RunID: UV/VIS_2_190607B

Sample ID ICV-190607	Batch ID: R104504	TestNo: M4500-P E	Units: mg/L							
SampType: ICV	Run ID: UV/VIS_2_190607B	Analysis Date: 6/7/2019 1:49:00 PM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Phosphorus, Total Orthophosphate (As	0.203	0.100	0.2000	0	102	85	115			

Sample ID CCV1-190607	Batch ID: R104504	TestNo: M4500-P E	Units: mg/L							
SampType: CCV	Run ID: UV/VIS_2_190607B	Analysis Date: 6/7/2019 1:53:00 PM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Phosphorus, Total Orthophosphate (As	0.566	0.100	0.5000	0	113	85	115			

<p>Qualifiers:</p> <p>B Analyte detected in the associated Method Blank</p> <p>J Analyte detected between MDL and RL</p> <p>ND Not Detected at the Method Detection Limit</p> <p>RL Reporting Limit</p> <p>J Analyte detected between SDL and RL</p>	<p>DF Dilution Factor</p> <p>MDL Method Detection Limit</p> <p>R RPD outside accepted control limits</p> <p>S Spike Recovery outside control limits</p> <p>N Parameter not NELAP certified</p>
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CLIENT: Golder
Work Order: 1906073
Project: LUMINANT-OGSES-PONDS

ANALYTICAL QC SUMMARY REPORT

RunID: UV/VIS_2_190610A

The QC data in batch 91267 applies to the following samples: 1906073-01A, 1906073-02A

Sample ID MB-91267	Batch ID: 91267	TestNo: M3500-Fe D	Units: mg/L							
SampType: MBLK	Run ID: UV/VIS_2_190610A	Analysis Date: 6/10/2019 10:55:00 AM	Prep Date: 6/10/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron, Ferrous	<0.0500	0.100								N

Sample ID LCS-91267	Batch ID: 91267	TestNo: M3500-Fe D	Units: mg/L							
SampType: LCS	Run ID: UV/VIS_2_190610A	Analysis Date: 6/10/2019 10:57:00 AM	Prep Date: 6/10/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron, Ferrous	0.110	0.100	0.1000	0	110	85	115			N

Sample ID LCSD-91267	Batch ID: 91267	TestNo: M3500-Fe D	Units: mg/L							
SampType: LCSD	Run ID: UV/VIS_2_190610A	Analysis Date: 6/10/2019 10:57:00 AM	Prep Date: 6/10/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron, Ferrous	0.110	0.100	0.1000	0	110	85	115	0.609	15	N

Sample ID 1906073-02AMS	Batch ID: 91267	TestNo: M3500-Fe D	Units: mg/L							
SampType: MS	Run ID: UV/VIS_2_190610A	Analysis Date: 6/10/2019 11:05:00 AM	Prep Date: 6/10/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron, Ferrous	0.107	0.100	0.1000	0	107	85	115			N

Sample ID 1906073-02AMSD	Batch ID: 91267	TestNo: M3500-Fe D	Units: mg/L							
SampType: MSD	Run ID: UV/VIS_2_190610A	Analysis Date: 6/10/2019 11:05:00 AM	Prep Date: 6/10/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron, Ferrous	0.102	0.100	0.1000	0	102	85	115	4.86	15	N

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1906073
Project: LUMINANT-OGSES-PONDS

ANALYTICAL QC SUMMARY REPORT

RunID: UV/VIS_2_190610A

Sample ID ICV-190610	Batch ID: R104507	TestNo: M3500-Fe D	Units: mg/L							
SampType: ICV	Run ID: UV/VIS_2_190610A	Analysis Date: 6/10/2019 10:51:00 AM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron, Ferrous	0.0908	0.100	0.1000	0	90.8	85	115			N

Sample ID CCV1-190610	Batch ID: R104507	TestNo: M3500-Fe D	Units: mg/L							
SampType: CCV	Run ID: UV/VIS_2_190610A	Analysis Date: 6/10/2019 11:01:00 AM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron, Ferrous	0.223	0.100	0.2000	0	112	85	115			N

Sample ID CCV2-190610	Batch ID: R104507	TestNo: M3500-Fe D	Units: mg/L							
SampType: CCV	Run ID: UV/VIS_2_190610A	Analysis Date: 6/10/2019 11:06:00 AM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron, Ferrous	0.204	0.100	0.2000	0	102	85	115			N

Qualifiers: B Analyte detected in the associated Method Blank
 J Analyte detected between MDL and RL
 ND Not Detected at the Method Detection Limit
 RL Reporting Limit
 J Analyte detected between SDL and RL

DF Dilution Factor
 MDL Method Detection Limit
 R RPD outside accepted control limits
 S Spike Recovery outside control limits
 N Parameter not NELAP certified

CLIENT: Golder
Work Order: 1906073
Project: LUMINANT-OGSES-PONDS

ANALYTICAL QC SUMMARY REPORT

RunID: WC_190607A

The QC data in batch 91255 applies to the following samples: 1906073-01C, 1906073-02C

Sample ID MB-91255	Batch ID: 91255	TestNo: M2540C	Units: mg/L							
SampType: MBLK	Run ID: WC_190607A	Analysis Date: 6/7/2019 4:00:00 PM	Prep Date: 6/7/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera										
	<10.0	10.0								

Sample ID LCS-91255	Batch ID: 91255	TestNo: M2540C	Units: mg/L							
SampType: LCS	Run ID: WC_190607A	Analysis Date: 6/7/2019 4:00:00 PM	Prep Date: 6/7/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera										
	752	10.0	745.6	0	101	90	113			

Sample ID 1906040-01A-DUP	Batch ID: 91255	TestNo: M2540C	Units: mg/L							
SampType: DUP	Run ID: WC_190607A	Analysis Date: 6/7/2019 4:00:00 PM	Prep Date: 6/7/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera										
	1240	50.0	0	1235				0.404	5	

Sample ID 1906073-01C-DUP	Batch ID: 91255	TestNo: M2540C	Units: mg/L							
SampType: DUP	Run ID: WC_190607A	Analysis Date: 6/7/2019 4:00:00 PM	Prep Date: 6/7/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera										
	7310	50.0	0	7405				1.36	5	

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

ANALYTICAL REPORT

July 11, 2019



²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

DHL Analytical, Inc.

Sample Delivery Group: L1108602
Samples Received: 06/13/2019
Project Number: 1906073
Description:

Report To: John DuPont
2300 Double Creek Drive
Round Rock, TX 78664

Entire Report Reviewed By:

Donna Eidson
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace National is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.

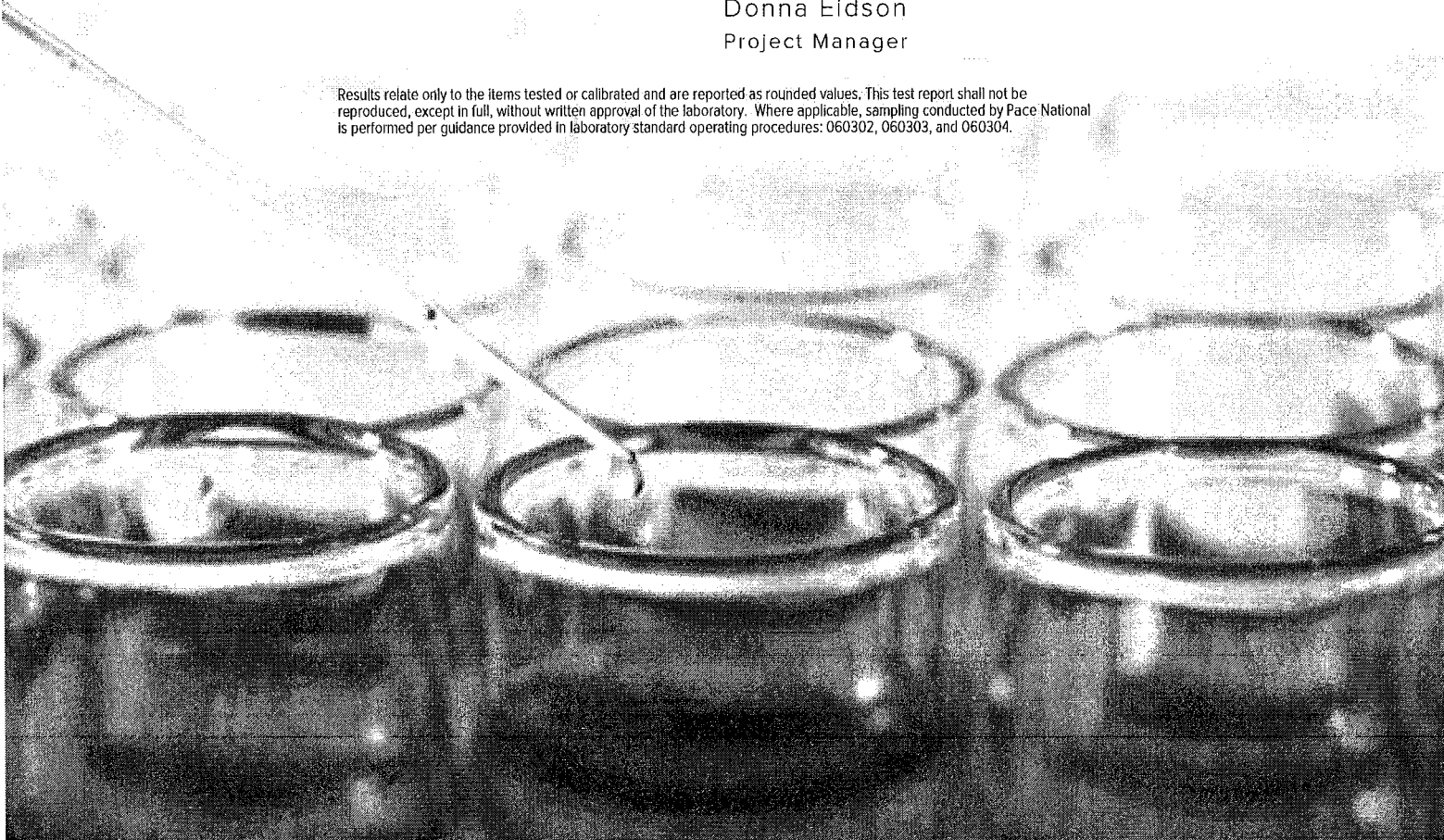


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ONE LAB. NATIONWIDE.



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SAMPLE SUMMARY

ONE LAB. NATIONWIDE.

Collected by _____ Collected date/time 06/06/19 13:25 Received date/time 06/13/19 09:30

FGD-A-2019-1 L1108602-01 Non-Potable Water

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1302066	1	06/26/19 13:32	07/10/19 11:05	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1300120	1	06/25/19 09:40	07/10/19 11:05	JMR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1300120	1	06/25/19 09:40	06/26/19 17:14	RGT	Mt. Juliet, TN

1
Cp

2
Tc

3
Ss

4
Cn

5
Sr

6
Qc

7
Gl

8
Al

9
Sc

Collected by _____ Collected date/time 06/06/19 13:45 Received date/time 06/13/19 09:30

FGD-B-2019-1 L1108602-02 Non-Potable Water

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1302066	1	06/26/19 13:32	07/10/19 11:05	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1300120	1	06/25/19 09:40	07/10/19 11:05	JMR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1300120	1	06/25/19 09:40	06/26/19 17:14	RGT	Mt. Juliet, TN



All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All radiochemical sample results for solids are reported on a dry weight basis with the exception of tritium, carbon-14 and radon, unless wet weight was requested by the client. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Donna Eidson
Project Manager

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc

Radiochemistry by Method 904

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-228	0.391		0.393	0.691	07/10/2019 11:05	WG1302066
(T) Barium	97.9			62.0-143	07/10/2019 11:05	WG1302066
(T) Yttrium	99.7			79.0-136	07/10/2019 11:05	WG1302066

1 Cp

2 Tc

3 Ss

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	0.406		0.604	1.07	07/10/2019 11:05	WG1300120

4 Cn

5 Sr

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-226	0.0156		0.211	0.383	06/26/2019 17:14	WG1300120
(T) Barium-133	86.1			30.0-143	06/26/2019 17:14	WG1300120

6 Qc

7 Gl

8 Al

9 Sc



Collected date/time: 06/06/19 13:45

L1108602

Radiochemistry by Method 904

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	0.411		0.488	0.82	07/10/2019 11:05	WG1302066
(T) Barium	95.4			62.0-143	07/10/2019 11:05	WG1302066
(T) Yttrium	90.6			79.0-136	07/10/2019 11:05	WG1302066

¹ Cp

² Tc

³ Ss

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	0.709		0.796	1.22	07/10/2019 11:05	WG1300120

⁴ Cn

⁵ Sr

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.298		0.308	0.402	06/26/2019 17:14	WG1300120
(T) Barium-133	75.7			30.0-143	06/26/2019 17:14	WG1300120

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc



Radiochemistry by Method 904

L1108602-01,02

Method Blank (MB)

(MB) R3429617-1 07/10/19 11:05

Analyte	MB Result pCi/l	MB Qualifier	MB MDA pCi/l
Radium-228	0.284		0.447
(T) Barium	111		
(T) Yttrium	92.7		

¹Cp

²Tc

³Ss

⁴Cn

L1107592-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1107592-01 07/10/19 11:05 • (DUP) R3429617-5 07/10/19 11:05

Analyte	Original Result pCi/l	DUP Result pCi/l	Dilution	DUP RPD %	DUP RER	DUP Qualifier	DUP RPD Limits %	DUP RER Limit
Radium-228	0.627	0.940	1	39.9	0.487		20	3
(T) Barium	108	111						
(T) Yttrium	86.9	94.5						

⁵Sr

⁶Qc

⁷GI

⁸AI

Laboratory Control Sample (LCS)

(LCS) R3429617-2 07/10/19 11:05

Analyte	Spike Amount pCi/l	LCS Result pCi/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Radium-228	5.00	5.80	116	80.0-120	
(T) Barium			110		
(T) Yttrium			87.7		

⁹Sc

L1108597-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1108597-01 07/10/19 11:05 • (MS) R3429617-3 07/10/19 11:05 • (MSD) R3429617-4 07/10/19 11:05

Analyte	Spike Amount pCi/l	Original Result pCi/l	MS Result pCi/l	MSD Result pCi/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	MS RER	RPD Limits %
Radium-228	7.14	0.711	7.45	7.59	94.4	96.3	1	70.0-130			1.78		20
(T) Barium		112			115	109							
(T) Yttrium		94.4			97.9	99.3							

Method Blank (MB)

(MB) R3425425-1 06/26/19 12:51

Analyte	MB Result pCi/l	MB Qualifier	MB MDA pCi/l
Radium-226	0.481	<u>B</u>	0.0511
(T) Barium-133	82.2		

L1111912-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1111912-03 06/26/19 17:14 • (DUP) R3425425-5 06/26/19 12:51

Analyte	Original Result pCi/l	DUP Result pCi/l	Dilution	DUP RPD %	DUP RER	DUP Qualifier	DUP RPD Limits %	DUP RER Limit
Radium-226	0.637	0.531	1	18.1	0.207		20	3
(T) Barium-133	77.5	71.9						

Laboratory Control Sample (LCS)

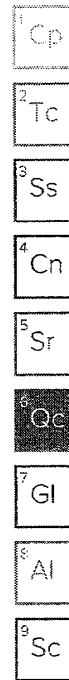
(LCS) R3425425-2 06/26/19 12:51

Analyte	Spike Amount pCi/l	LCS Result pCi/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Radium-226	5.02	4.73	94.2	80.0-120	
(T) Barium-133			80.0		

L1111912-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1111912-01 06/26/19 17:14 • (MS) R3425425-3 06/26/19 12:51 • (MSD) R3425425-4 06/26/19 12:51

Analyte	Spike Amount pCi/l	Original Result pCi/l	MS Result pCi/l	MSD Result pCi/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	MS RER	RPD Limits %
Radium-226	20.1	0.471	20.4	20.3	99.0	98.4	1	75.0-125			0.591		20
(T) Barium-133		63.5			87.6	79.5							





Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Abbreviations and Definitions

MDA	Minimum Detectable Activity.
Rec.	Recovery.
RER	Replicate Error Ratio.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(T)	Tracer - A radioisotope of known concentration added to a solution of chemically equivalent radioisotopes at a known concentration to assist in monitoring the yield of the chemical separation.
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state "ND" (Not Detected) or "BDL" (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ G

⁸ Ai

⁹ Sc

Qualifier Description

B The same analyte is found in the associated blank.

ACCREDITATIONS & LOCATIONS

ONE LAB. NATIONWIDE.



Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
 * Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey-NELAP	TN002
California	2932	New Mexico ¹	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina ¹	DW21704
Georgia	NELAP	North Carolina ³	41
Georgia ¹	923	North Dakota	R-140
Idaho	TN00003	Ohio-VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky ^{1,6}	90010	South Carolina	84004
Kentucky ²	16	South Dakota	n/a
Louisiana	AI30792	Tennessee ^{1,4}	2006
Louisiana ¹	LA180010	Texas	T104704245-18-15
Maine	TN0002	Texas ⁵	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA



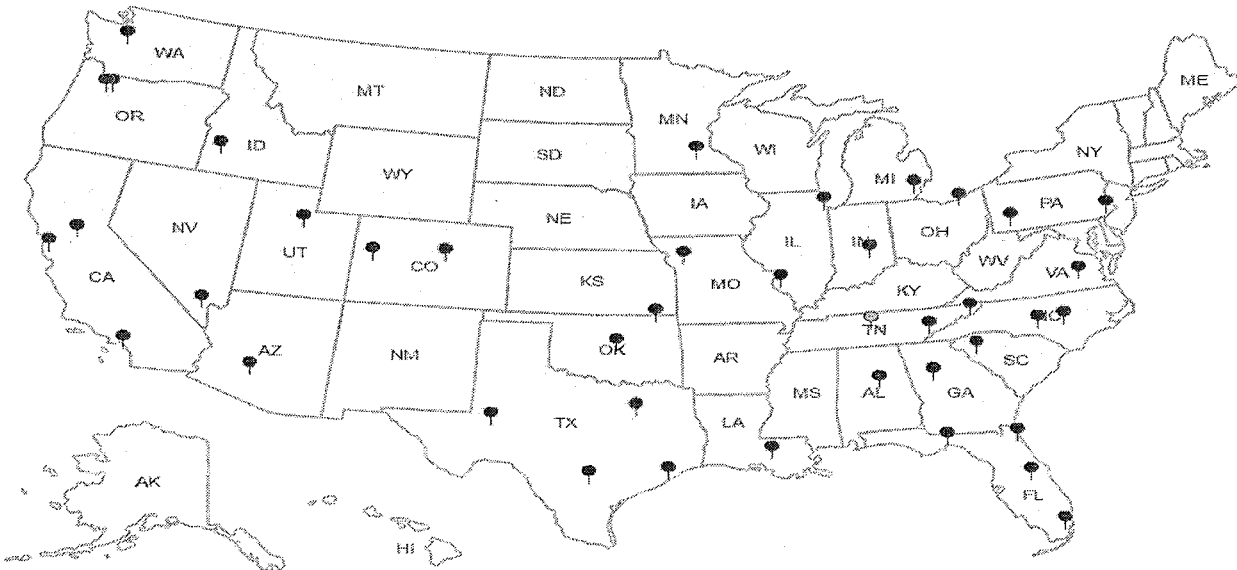
Third Party Federal Accreditations

A2LA - ISO 17025	1461.01	AIHA-LAP, LLC EMLAP	100789
A2LA - ISO 17025 ⁹	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA-Crypto	TN00003		

¹ Drinking Water ² Underground Storage Tanks ³ Aquatic Toxicity ⁴ Chemical/Microbiological ⁵ Mold ⁶ Wastewater n/a Accreditation not applicable

Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.



ACCOUNT:
DHL Analytical, Inc.

PROJECT:
1906073 **49**

SDG:
L1108602

DATE/TIME:
07/11/19 22:27

PAGE:
10 of 12

Pace Analytical National Center for Testing & Innovation Cooler Receipt Form

Client: <i>DURETA</i>	SDG#:	<i>1108602</i>	
Cooler Received/Opened On: <i>6/13/19</i>	Temperature:	<i>Amb</i>	
Received By: Brock Fariss			
Signature: <i>[Signature]</i>			
Receipt Check List	NP	Yes	No
COC Seal Present / Intact?	<i>/</i>		
COC Signed / Accurate?		<i>/</i>	
Bottles arrive intact?		<i>/</i>	
Correct bottles used?		<i>/</i>	
Sufficient volume sent?		<i>/</i>	
If Applicable			
VOA Zero headspace?			
Preservation Correct / Checked?		<i>/</i>	

1108602

DHL Analytical, Inc.

2300 Double Creek Drive
Round Rock, TX 78664

TEL: (512) 388-8222

FAX: (512) 388-8229

Work Order: 1906073

CHAIN-OF-CUSTODY RECORD

H117

Subcontractor:

Pace Analytical
12065 Lebanon Rd
Mt. Juliet, TN 37122

TEL: (615) 773-5923

FAX:

Acct #: DHLRRTX

22 22

11-Jun-19

Sample Id	Matrix	DHL#	Date Collected	Bottle Type	RA-228	RA-226	Requested Tests			
					E904.0	M7500 Ra B M				
FGD-A-2019-1	Aqueous	-01D	06/06/19 01:25 PM	1LHDPEHNO3		1				-01
FGD-A-2019-1	Aqueous	-01E	06/06/19 01:25 PM	1LHDPEHNO3	1					02
FGD-B-2019-1	Aqueous	-02D	06/06/19 01:45 PM	1LHDPEHNO3		1				
FGD-B-2019-1	Aqueous	-02E	06/06/19 01:45 PM	1LHDPEHNO3	1					

RAD SCREEN: <0.5 mR/hr

Amb

General Comments:

Please analyze these samples with Normal Turnaround Time.
Report RA-226, RA-228 & Combined per Specs.
Quality Control Package Needed: Standard - NELAC Rad Test compliant
Email to cac@dhlanalytical.com & dupont@dhlanalytical.com

Relinquished by:

Date/Time

6/11/19 1700

Received by:

Date/Time

6/13/19 0845 BF 0930

Relinquished by:

HPS Rec: 4

ANALYTICAL REPORT

Eurofins TestAmerica, Knoxville
5815 Middlebrook Pike
Knoxville, TN 37921
Tel: (865)291-3000

Laboratory Job ID: 140-15376-1

Client Project/Site: Oak Grove FGD Ponds - 7-Step SEP Metals
Revision: 1

For:

Golder Associates Inc.
2201 Double Creek Dr
Suite 4004
Round Rock, Texas 78664

Attn: Will Vienne



Authorized for release by:
12/11/2019 2:05:31 PM

Ryan Henry, Project Manager I
(865)291-3000

william.henry@testamericainc.com

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For questions please contact the Project Manager at the e-mail address or telephone number
listed on this page.*



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Definitions/Glossary

Client: Golder Associates Inc.
Project/Site: Oak Grove FGD Ponds - 7-Step SEP Metals

Job ID: 140-15376-1

Qualifiers

Metals

Qualifier	Qualifier Description
*	LCS or LCSD is outside acceptance limits.
*	RPD of the LCS and LCSD exceeds the control limits
B	Compound was found in the blank and sample.
F3	Duplicate RPD exceeds the control limit
F5	Duplicate RPD exceeds limit, and one or both sample results are less than 5 times RL. The data are considered valid because the absolute difference is less than the RL.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Case Narrative

Client: Golder Associates Inc.
Project/Site: Oak Grove FGD Ponds - 7-Step SEP Metals

Job ID: 140-15376-1

Job ID: 140-15376-1

Laboratory: Eurofins TestAmerica, Knoxville

Narrative

Job Narrative 140-15376-1 Revised

This report has been revised to change the sample IDs as requested by the client.

Receipt

The samples were received on 5/24/2019 at 9:40 AM. The samples arrived in good condition, properly preserved, and on ice. The temperature of the cooler at receipt was 0.8° C.

Metals - 7 Step Sequential Extraction Procedure

These soil samples were prepared and analyzed using Eurofins TestAmerica Knoxville standard operating procedure KNOX-MT-0008, "7 Step Sequential Extraction Procedure". SW-846 Method 6010B as incorporated in Eurofins TestAmerica Knoxville standard operating procedure KNOX-MT-0007 was used to perform the final instrument analyses.

An aliquot of each sample was sequentially extracted using the steps listed below:

- **Step 1 - Exchangeable Fraction:** A 5 gram aliquot of sample was extracted with 25 mL of 1M magnesium sulfate (MgSO₄), centrifuged and filtered. 5 mL of the resulting leachate was digested using method 3010A and analyzed by method 6010B. Results are reported in mg/kg on a dry weight basis.
- **Step 2 - Carbonate Fraction:** The sample residue from step 1 was extracted with 25 mL of 1M sodium acetate/acetic acid (NaOAc/HOAc) at pH 5, centrifuged and filtered. 5 mL of the resulting leachate was digested using method 3010A and analyzed by method 6010B. Results are reported in mg/kg on a dry weight basis.
- **Step 3 - Non-crystalline Materials Fraction:** The sample residue from step 2 was extracted with 25 mL of 0.2M ammonium oxalate (pH 3), centrifuged and filtered. 5 mL of the resulting leachate was digested using method 3010A and analyzed by method 6010B. Results are reported in mg/kg on a dry weight basis.
- **Step 4 - Metal Hydroxide Fraction:** The sample residue from step 3 was extracted with 25 mL of 1M hydroxylamine hydrochloride solution in 25% v/v acetic acid, centrifuged and filtered. 5 mL of the resulting leachate was digested using method 3010A and analyzed by method 6010B. Results are reported in mg/kg on a dry weight basis.
- **Step 5 - Organic-bound Fraction:** The sample residue from step 4 was extracted three times with 25 mL of 5% sodium hypochlorite (NaClO) at pH 9.5, centrifuged and filtered. The resulting leachates were combined and 5 mL were digested using method 3010A and analyzed by method 6010B. Results are reported in mg/kg on a dry weight basis.
- **Step 6 - Acid/Sulfide Fraction:** The sample residue from step 5 was extracted with 25 mL of a 3:1:2 v/v solution of HCl-HNO₃-H₂O, centrifuged and filtered. 5 mL of the resulting leachate was diluted to 50 mL with reagent water and analyzed by method 6010B. Results are reported in mg/kg on a dry weight basis.
- **Step 7 - Residual Fraction:** A 1.0 g aliquot of the sample residue from step 6 was digested using HF, HNO₃, HCl and H₃BO₃. The digestate was analyzed by ICP using method 6010B. Results are reported in mg/kg on a dry weight basis.

In addition, a 1.0 g aliquot of the original sample was digested using HF, HNO₃, HCl and H₃BO₃. The digestate was analyzed by ICP using method 6010B. Total metal results are reported in mg/kg on a dry weight basis.

Results were calculated using the following equation:

$$\text{Result, } \mu\text{g/g or mg/Kg, dry weight} = (C \times V \times V1 \times D) / (W \times S \times V2)$$

Where:

- C = Concentration from instrument readout, $\mu\text{g/mL}$
- V = Final volume of digestate, mL
- D = Instrument dilution factor
- V1 = Total volume of leachate, mL
- V2 = Volume of leachate digested, mL
- W = Wet weight of sample, g
- S = Percent solids/100

A method blank, laboratory control sample and laboratory control sample duplicate were prepared and analyzed with each SEP step in

Case Narrative

Client: Golder Associates Inc.
Project/Site: Oak Grove FGD Ponds - 7-Step SEP Metals

Job ID: 140-15376-1

Job ID: 140-15376-1 (Continued)

Laboratory: Eurofins TestAmerica, Knoxville (Continued)

order to provide information about both the presence of elements of interest in the extraction solutions, and the recovery of elements of interest from the extraction solutions. Results outside of laboratory QC limits do not reflect out of control performance, but rather the effect of the extraction solution upon the analyte.

A laboratory sample duplicate was prepared and analyzed with each batch of samples in order to provide information regarding the reproducibility of the procedure.

SEP Report Notes:

The final report lists the results for each step, the result for the total digestion of the sample, and a sum of the results of steps 1 through 7 by element.

Magnesium was not reported for step 1 because the extraction solution for this step (magnesium sulfate) contains high levels of magnesium. Sodium was not reported for steps 2 and 5 since the extraction solutions for these steps contain high levels of sodium. The sum of steps 1 through 7 is much higher than the total result for sodium and magnesium due to the magnesium and sodium introduced by the extraction solutions.

The step 1 digestates were reanalyzed for vanadium at a 1/10 dilution due to positive interelement interferences resulting from the high magnesium results. The reporting limits were adjusted accordingly.

The digestates for steps 1, 2 and 5 were analyzed at a dilution due to instrument problems caused by the high solids content of the digestates. The reporting limits were adjusted accordingly.

The serial dilution performed for the following samples associated with batch 140-31255 was outside control limits: (140-15376-A-1-A SD ^5), (140-15376-A-1-A SD ^50) and (140-15376-A-1-AA SD ^50)

Samples FGD-15 (25-27) (140-15376-1), FGD-16 (30-32) (140-15376-2), FGD-2019-1 (23-25) (140-15376-3), (140-15376-A-1-AB DU) and (140-15376-A-1-B DU) were diluted due to the presence of silicon or titanium which interferes with Arsenic, Cobalt, Selenium and Thallium. Elevated reporting limits (RLs) are provided.

Sample FGD-2019-1 (23-25) (140-15376-3) was diluted due to the presence of titanium which interferes with Cobalt. Elevated reporting limits (RLs) are provided.

There was a difference between the Total Metals results for cobalt and the Total SEP result for cobalt. At the client's request, the cobalt results for SEP 3 and SEP 4 were confirmed by reanalysis, and the total analysis for metals was reanalyzed with a separate aliquot. The original results for SEP 3 and SEP 4 were confirmed, but the reanalysis of the totals was much higher than the original test result. This suggests that the sample is heterogeneous, as different total cobalt results are obtained by the three tests. The affected sample is FGD-2019-1 (23-25) (140-15376-3).

The sample duplicate (DUP) precision for preparation batch 140-30453, 140-30480, 140-30481, 140-31696 and 140-31697 and analytical batch 140-31197 was outside control limits. Sample non-homogeneity is suspected.

The sample duplicate (DUP) precision for preparation batch 140-30852 and analytical batch 140-31255 was outside control limits. Sample non-homogeneity is suspected.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

General Chemistry - % Moisture

The samples were analyzed for percent moisture using SOP number KNOX-WC-0012 (based on Modified MCAWW 160.3 and SM2540B and on the percent moisture determinations described in methods 3540C and 3550B).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Comments

No additional comments.

Sample Summary

Client: Golder Associates Inc.
Project/Site: Oak Grove FGD Ponds - 7-Step SEP Metals

Job ID: 140-15376-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
140-15376-1	FGD-15 (25-27)	Solid	05/22/19 19:15	05/24/19 09:40	
140-15376-2	FGD-16 (30-32)	Solid	05/23/19 10:40	05/24/19 09:40	
140-15376-3	FGD-2019-1 (23-25)	Solid	05/23/19 15:20	05/24/19 09:40	

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Client Sample Results

Client: Golder Associates Inc.
Project/Site: Oak Grove FGD Ponds - 7-Step SEP Metals

Job ID: 140-15376-1

Client Sample ID: FGD-15 (25-27)

Lab Sample ID: 140-15376-1

Date Collected: 05/22/19 19:15

Matrix: Solid

Date Received: 05/24/19 09:40

Percent Solids: 76.6

Method: 6010B SEP - SEP Metals (ICP) - Step 1

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		52	8.4	mg/Kg	☼	05/31/19 08:00	06/17/19 14:14	4
Antimony	ND		16	1.5	mg/Kg	☼	05/31/19 08:00	06/17/19 14:14	4
Arsenic	ND		2.6	0.68	mg/Kg	☼	05/31/19 08:00	06/17/19 14:14	4
Barium	ND		13	0.63	mg/Kg	☼	05/31/19 08:00	06/17/19 14:14	4
Beryllium	ND		1.3	0.40	mg/Kg	☼	05/31/19 08:00	06/17/19 14:14	4
Cobalt	ND		13	0.24	mg/Kg	☼	05/31/19 08:00	06/17/19 14:14	4
Iron	ND		26	15	mg/Kg	☼	05/31/19 08:00	06/17/19 14:14	4
Li	ND		13	0.78	mg/Kg	☼	05/31/19 08:00	06/17/19 14:14	4
Manganese	0.47	J	3.9	0.16	mg/Kg	☼	05/31/19 08:00	06/17/19 14:14	4
Mo	ND		10	0.43	mg/Kg	☼	05/31/19 08:00	06/17/19 14:14	4
Selenium	ND		2.6	0.89	mg/Kg	☼	05/31/19 08:00	06/17/19 14:14	4
Thallium	ND		9.1	1.1	mg/Kg	☼	05/31/19 08:00	06/17/19 14:14	4

Method: 6010B SEP - SEP Metals (ICP) - Step 2

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND	*	39	6.3	mg/Kg	☼	06/03/19 08:00	06/17/19 15:37	3
Antimony	ND		12	1.1	mg/Kg	☼	06/03/19 08:00	06/17/19 15:37	3
Arsenic	ND		2.0	0.51	mg/Kg	☼	06/03/19 08:00	06/17/19 15:37	3
Barium	ND	*	9.8	0.47	mg/Kg	☼	06/03/19 08:00	06/17/19 15:37	3
Beryllium	ND	*	0.98	0.063	mg/Kg	☼	06/03/19 08:00	06/17/19 15:37	3
Cobalt	ND		9.8	0.25	mg/Kg	☼	06/03/19 08:00	06/17/19 15:37	3
Iron	ND	*	20	11	mg/Kg	☼	06/03/19 08:00	06/17/19 15:37	3
Li	ND		9.8	0.59	mg/Kg	☼	06/03/19 08:00	06/17/19 15:37	3
Manganese	1.4	J	2.9	1.1	mg/Kg	☼	06/03/19 08:00	06/17/19 15:37	3
Mo	ND		7.8	0.32	mg/Kg	☼	06/03/19 08:00	06/17/19 15:37	3
Selenium	ND		2.0	0.67	mg/Kg	☼	06/03/19 08:00	06/17/19 15:37	3
Thallium	ND		6.9	0.82	mg/Kg	☼	06/03/19 08:00	06/17/19 15:37	3

Method: 6010B SEP - SEP Metals (ICP) - Step 3

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	23		13	2.7	mg/Kg	☼	06/04/19 08:00	06/26/19 17:30	1
Antimony	ND		3.9	0.37	mg/Kg	☼	06/04/19 08:00	06/26/19 17:30	1
Arsenic	ND		0.65	0.17	mg/Kg	☼	06/04/19 08:00	06/26/19 17:30	1
Barium	1.4	J B	3.3	0.16	mg/Kg	☼	06/04/19 08:00	06/26/19 17:30	1
Beryllium	0.020	J	0.33	0.020	mg/Kg	☼	06/04/19 08:00	06/26/19 17:30	1
Cobalt	0.63	J	3.3	0.059	mg/Kg	☼	06/04/19 08:00	06/26/19 17:30	1
Iron	58		6.5	3.8	mg/Kg	☼	06/04/19 08:00	06/26/19 17:30	1
Li	ND		3.3	0.20	mg/Kg	☼	06/04/19 08:00	06/26/19 17:30	1
Manganese	14	B	0.98	0.035	mg/Kg	☼	06/04/19 08:00	06/26/19 17:30	1
Mo	ND		2.6	0.11	mg/Kg	☼	06/04/19 08:00	06/26/19 17:30	1
Selenium	ND		0.65	0.22	mg/Kg	☼	06/04/19 08:00	06/26/19 17:30	1
Thallium	ND		2.3	0.27	mg/Kg	☼	06/04/19 08:00	06/26/19 17:30	1

Method: 6010B SEP - SEP Metals (ICP) - Step 4

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	600		13	2.1	mg/Kg	☼	06/10/19 08:00	06/26/19 18:52	1
Antimony	ND		3.9	0.59	mg/Kg	☼	06/10/19 08:00	06/26/19 18:52	1
Arsenic	0.64	J B	0.65	0.29	mg/Kg	☼	06/10/19 08:00	06/26/19 18:52	1
Barium	9.6		3.3	0.16	mg/Kg	☼	06/10/19 08:00	06/26/19 18:52	1
Beryllium	0.12	J	0.33	0.021	mg/Kg	☼	06/10/19 08:00	06/26/19 18:52	1

Eurofins TestAmerica, Knoxville

Client Sample Results

Client: Golder Associates Inc.
Project/Site: Oak Grove FGD Ponds - 7-Step SEP Metals

Job ID: 140-15376-1

Client Sample ID: FGD-15 (25-27)

Lab Sample ID: 140-15376-1

Date Collected: 05/22/19 19:15

Matrix: Solid

Date Received: 05/24/19 09:40

Percent Solids: 76.6

Method: 6010B SEP - SEP Metals (ICP) - Step 4 (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	0.41	J	3.3	0.069	mg/Kg	☼	06/10/19 08:00	06/26/19 18:52	1
Iron	1400		6.5	3.8	mg/Kg	☼	06/10/19 08:00	06/26/19 18:52	1
Li	0.93	J	3.3	0.20	mg/Kg	☼	06/10/19 08:00	06/26/19 18:52	1
Manganese	6.9		0.98	0.17	mg/Kg	☼	06/10/19 08:00	06/26/19 18:52	1
Mo	ND		2.6	0.11	mg/Kg	☼	06/10/19 08:00	06/26/19 18:52	1
Selenium	0.65	* B	0.65	0.61	mg/Kg	☼	06/10/19 08:00	06/26/19 18:52	1
Thallium	ND		2.3	0.38	mg/Kg	☼	06/10/19 08:00	06/26/19 18:52	1

Method: 6010B SEP - SEP Metals (ICP) - Step 5

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	67	J*	200	31	mg/Kg	☼	06/12/19 08:00	06/26/19 20:25	5
Antimony	ND		59	5.5	mg/Kg	☼	06/12/19 08:00	06/26/19 20:25	5
Arsenic	ND		9.8	2.5	mg/Kg	☼	06/12/19 08:00	06/26/19 20:25	5
Barium	ND	*	49	2.4	mg/Kg	☼	06/12/19 08:00	06/26/19 20:25	5
Beryllium	ND	*	4.9	0.41	mg/Kg	☼	06/12/19 08:00	06/26/19 20:25	5
Cobalt	ND	*	49	0.78	mg/Kg	☼	06/12/19 08:00	06/26/19 20:25	5
Iron	ND	*	98	57	mg/Kg	☼	06/12/19 08:00	06/26/19 20:25	5
Li	ND		49	2.9	mg/Kg	☼	06/12/19 08:00	06/26/19 20:25	5
Manganese	ND	*	15	2.4	mg/Kg	☼	06/12/19 08:00	06/26/19 20:25	5
Mo	ND		39	1.6	mg/Kg	☼	06/12/19 08:00	06/26/19 20:25	5
Selenium	ND		9.8	3.4	mg/Kg	☼	06/12/19 08:00	06/26/19 20:25	5
Thallium	ND	*	34	4.6	mg/Kg	☼	06/12/19 08:00	06/26/19 20:25	5

Method: 6010B SEP - SEP Metals (ICP) - Step 6

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	1200		13	2.1	mg/Kg	☼	06/15/19 08:00	06/26/19 21:48	1
Antimony	ND		3.9	0.37	mg/Kg	☼	06/15/19 08:00	06/26/19 21:48	1
Arsenic	0.62	J	0.65	0.20	mg/Kg	☼	06/15/19 08:00	06/26/19 21:48	1
Barium	6.0		3.3	0.16	mg/Kg	☼	06/15/19 08:00	06/26/19 21:48	1
Beryllium	0.053	J	0.33	0.016	mg/Kg	☼	06/15/19 08:00	06/26/19 21:48	1
Cobalt	0.27	J	3.3	0.060	mg/Kg	☼	06/15/19 08:00	06/26/19 21:48	1
Iron	1100		6.5	3.8	mg/Kg	☼	06/15/19 08:00	06/26/19 21:48	1
Li	0.93	J	3.3	0.20	mg/Kg	☼	06/15/19 08:00	06/26/19 21:48	1
Manganese	10		0.98	0.33	mg/Kg	☼	06/15/19 08:00	06/26/19 21:48	1
Mo	ND		2.6	0.13	mg/Kg	☼	06/15/19 08:00	06/26/19 21:48	1
Selenium	ND		0.65	0.22	mg/Kg	☼	06/15/19 08:00	06/26/19 21:48	1
Thallium	ND		2.3	0.27	mg/Kg	☼	06/15/19 08:00	06/26/19 21:48	1

Method: 6010B SEP - SEP Metals (ICP) - Step 7

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	28000		130	21	mg/Kg	☼	06/16/19 08:00	06/28/19 14:17	10
Antimony	ND		3.9	0.18	mg/Kg	☼	06/16/19 08:00	06/28/19 12:53	1
Arsenic	0.90	J	1.3	0.34	mg/Kg	☼	06/16/19 08:00	06/28/19 17:43	2
Barium	510		33	1.6	mg/Kg	☼	06/16/19 08:00	06/28/19 14:17	10
Beryllium	0.48		0.33	0.0098	mg/Kg	☼	06/16/19 08:00	06/28/19 12:53	1
Cobalt	0.48	J	6.5	0.39	mg/Kg	☼	06/16/19 08:00	06/28/19 17:43	2
Iron	2900		6.5	5.4	mg/Kg	☼	06/16/19 08:00	06/28/19 12:53	1
Li	7.0		3.3	0.20	mg/Kg	☼	06/16/19 08:00	06/28/19 12:53	1
Manganese	54	B	0.98	0.068	mg/Kg	☼	06/16/19 08:00	06/28/19 12:53	1
Mo	0.11	J	2.6	0.11	mg/Kg	☼	06/16/19 08:00	06/28/19 12:53	1

Eurofins TestAmerica, Knoxville

Client Sample Results

Client: Golder Associates Inc.
 Project/Site: Oak Grove FGD Ponds - 7-Step SEP Metals

Job ID: 140-15376-1

Client Sample ID: FGD-15 (25-27)

Lab Sample ID: 140-15376-1

Date Collected: 05/22/19 19:15

Matrix: Solid

Date Received: 05/24/19 09:40

Percent Solids: 76.6

Method: 6010B SEP - SEP Metals (ICP) - Step 7 (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Selenium	ND		1.3	0.44	mg/Kg	☼	06/16/19 08:00	06/28/19 17:43	2
Thallium	0.59	J	4.6	0.47	mg/Kg	☼	06/16/19 08:00	06/28/19 17:43	2

Method: 6010B SEP - SEP Metals (ICP) - Sum of Steps 1-7

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	30000		10	1.6	mg/Kg			07/11/19 10:59	1
Antimony	ND		3.0	0.14	mg/Kg			07/11/19 10:59	1
Arsenic	2.2		0.50	0.13	mg/Kg			07/11/19 10:59	1
Barium	530		2.5	0.12	mg/Kg			07/11/19 10:59	1
Beryllium	0.67		0.25	0.0075	mg/Kg			07/11/19 10:59	1
Cobalt	1.8	J	2.5	0.023	mg/Kg			07/11/19 10:59	1
Iron	5400		5.0	4.1	mg/Kg			07/11/19 10:59	1
Li	8.9		2.5	0.15	mg/Kg			07/11/19 10:59	1
Manganese	88		0.75	0.052	mg/Kg			07/11/19 10:59	1
Mo	0.11	J	2.0	0.082	mg/Kg			07/11/19 10:59	1
Selenium	0.65		0.50	0.17	mg/Kg			07/11/19 10:59	1
Thallium	0.59	J	1.8	0.18	mg/Kg			07/11/19 10:59	1

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		24	12	mg/Kg	☼	06/16/19 08:00	06/17/19 11:27	1
Chromium	4.2		1.8	0.27	mg/Kg	☼	06/16/19 08:00	06/17/19 11:27	1
Lead	3.2		1.8	0.34	mg/Kg	☼	06/16/19 08:00	06/17/19 11:27	1
Phosphorus	69		36	2.9	mg/Kg	☼	06/16/19 08:00	06/17/19 11:27	1

Method: 6010B - SEP Metals (ICP) - Total

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	46000		130	21	mg/Kg	☼	05/30/19 08:00	06/28/19 16:37	10
Antimony	ND		3.9	0.18	mg/Kg	☼	05/30/19 08:00	06/28/19 15:23	1
Arsenic	1.6		0.65	0.17	mg/Kg	☼	05/30/19 08:00	06/28/19 15:23	1
Barium	670		33	1.6	mg/Kg	☼	05/30/19 08:00	06/28/19 16:37	10
Beryllium	0.71		0.33	0.0098	mg/Kg	☼	05/30/19 08:00	06/28/19 15:23	1
Cobalt	1.8	J	6.5	0.39	mg/Kg	☼	05/30/19 08:00	06/28/19 18:40	2
Iron	5700		6.5	5.4	mg/Kg	☼	05/30/19 08:00	06/28/19 15:23	1
Lithium	10		3.3	0.20	mg/Kg	☼	05/30/19 08:00	06/28/19 15:23	1
Manganese	93		0.98	0.068	mg/Kg	☼	05/30/19 08:00	06/28/19 15:23	1
Molybdenum	0.21	J	2.6	0.11	mg/Kg	☼	05/30/19 08:00	06/28/19 15:23	1
Selenium	ND		0.65	0.22	mg/Kg	☼	05/30/19 08:00	06/28/19 15:23	1
Thallium	ND		4.6	0.47	mg/Kg	☼	05/30/19 08:00	06/28/19 18:40	2

Client Sample Results

Client: Golder Associates Inc.
Project/Site: Oak Grove FGD Ponds - 7-Step SEP Metals

Job ID: 140-15376-1

Client Sample ID: FGD-16 (30-32)

Lab Sample ID: 140-15376-2

Date Collected: 05/23/19 10:40

Matrix: Solid

Date Received: 05/24/19 09:40

Percent Solids: 79.2

Method: 6010B SEP - SEP Metals (ICP) - Step 1

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		51	8.1	mg/Kg	☼	05/31/19 08:00	06/17/19 14:24	4
Antimony	ND		15	1.4	mg/Kg	☼	05/31/19 08:00	06/17/19 14:24	4
Arsenic	ND		2.5	0.66	mg/Kg	☼	05/31/19 08:00	06/17/19 14:24	4
Barium	0.67	J	13	0.61	mg/Kg	☼	05/31/19 08:00	06/17/19 14:24	4
Beryllium	ND		1.3	0.39	mg/Kg	☼	05/31/19 08:00	06/17/19 14:24	4
Cobalt	ND		13	0.23	mg/Kg	☼	05/31/19 08:00	06/17/19 14:24	4
Iron	ND		25	15	mg/Kg	☼	05/31/19 08:00	06/17/19 14:24	4
Li	ND		13	0.76	mg/Kg	☼	05/31/19 08:00	06/17/19 14:24	4
Manganese	0.20	J	3.8	0.16	mg/Kg	☼	05/31/19 08:00	06/17/19 14:24	4
Mo	ND		10	0.41	mg/Kg	☼	05/31/19 08:00	06/17/19 14:24	4
Selenium	ND		2.5	0.86	mg/Kg	☼	05/31/19 08:00	06/17/19 14:24	4
Thallium	ND		8.8	1.1	mg/Kg	☼	05/31/19 08:00	06/17/19 14:24	4

Method: 6010B SEP - SEP Metals (ICP) - Step 2

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND	*	38	6.1	mg/Kg	☼	06/03/19 08:00	06/17/19 15:58	3
Antimony	ND		11	1.1	mg/Kg	☼	06/03/19 08:00	06/17/19 15:58	3
Arsenic	ND		1.9	0.49	mg/Kg	☼	06/03/19 08:00	06/17/19 15:58	3
Barium	0.55	J *	9.5	0.45	mg/Kg	☼	06/03/19 08:00	06/17/19 15:58	3
Beryllium	ND	*	0.95	0.061	mg/Kg	☼	06/03/19 08:00	06/17/19 15:58	3
Cobalt	ND		9.5	0.24	mg/Kg	☼	06/03/19 08:00	06/17/19 15:58	3
Iron	ND	*	19	11	mg/Kg	☼	06/03/19 08:00	06/17/19 15:58	3
Li	ND		9.5	0.57	mg/Kg	☼	06/03/19 08:00	06/17/19 15:58	3
Manganese	ND		2.8	1.1	mg/Kg	☼	06/03/19 08:00	06/17/19 15:58	3
Mo	ND		7.6	0.31	mg/Kg	☼	06/03/19 08:00	06/17/19 15:58	3
Selenium	ND		1.9	0.64	mg/Kg	☼	06/03/19 08:00	06/17/19 15:58	3
Thallium	ND		6.6	0.80	mg/Kg	☼	06/03/19 08:00	06/17/19 15:58	3

Method: 6010B SEP - SEP Metals (ICP) - Step 3

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	40		13	2.7	mg/Kg	☼	06/04/19 08:00	06/26/19 17:40	1
Antimony	ND		3.8	0.35	mg/Kg	☼	06/04/19 08:00	06/26/19 17:40	1
Arsenic	0.28	J	0.63	0.16	mg/Kg	☼	06/04/19 08:00	06/26/19 17:40	1
Barium	6.4	B	3.2	0.15	mg/Kg	☼	06/04/19 08:00	06/26/19 17:40	1
Beryllium	0.036	J	0.32	0.019	mg/Kg	☼	06/04/19 08:00	06/26/19 17:40	1
Cobalt	0.63	J	3.2	0.057	mg/Kg	☼	06/04/19 08:00	06/26/19 17:40	1
Iron	31		6.3	3.7	mg/Kg	☼	06/04/19 08:00	06/26/19 17:40	1
Li	ND		3.2	0.19	mg/Kg	☼	06/04/19 08:00	06/26/19 17:40	1
Manganese	4.4	B	0.95	0.034	mg/Kg	☼	06/04/19 08:00	06/26/19 17:40	1
Mo	ND		2.5	0.10	mg/Kg	☼	06/04/19 08:00	06/26/19 17:40	1
Selenium	ND		0.63	0.21	mg/Kg	☼	06/04/19 08:00	06/26/19 17:40	1
Thallium	ND		2.2	0.27	mg/Kg	☼	06/04/19 08:00	06/26/19 17:40	1

Method: 6010B SEP - SEP Metals (ICP) - Step 4

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	990		13	2.0	mg/Kg	☼	06/10/19 08:00	06/26/19 19:13	1
Antimony	ND		3.8	0.57	mg/Kg	☼	06/10/19 08:00	06/26/19 19:13	1
Arsenic	1.1	B	0.63	0.28	mg/Kg	☼	06/10/19 08:00	06/26/19 19:13	1
Barium	12		3.2	0.15	mg/Kg	☼	06/10/19 08:00	06/26/19 19:13	1
Beryllium	0.18	J	0.32	0.020	mg/Kg	☼	06/10/19 08:00	06/26/19 19:13	1

Eurofins TestAmerica, Knoxville

Client Sample Results

Client: Golder Associates Inc.
Project/Site: Oak Grove FGD Ponds - 7-Step SEP Metals

Job ID: 140-15376-1

Client Sample ID: FGD-16 (30-32)

Lab Sample ID: 140-15376-2

Date Collected: 05/23/19 10:40

Matrix: Solid

Date Received: 05/24/19 09:40

Percent Solids: 79.2

Method: 6010B SEP - SEP Metals (ICP) - Step 4 (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	0.63	J	3.2	0.067	mg/Kg	☼	06/10/19 08:00	06/26/19 19:13	1
Iron	2100		6.3	3.7	mg/Kg	☼	06/10/19 08:00	06/26/19 19:13	1
Li	0.27	J	3.2	0.19	mg/Kg	☼	06/10/19 08:00	06/26/19 19:13	1
Manganese	4.8		0.95	0.16	mg/Kg	☼	06/10/19 08:00	06/26/19 19:13	1
Mo	ND		2.5	0.10	mg/Kg	☼	06/10/19 08:00	06/26/19 19:13	1
Selenium	ND	*	0.63	0.59	mg/Kg	☼	06/10/19 08:00	06/26/19 19:13	1
Thallium	ND		2.2	0.37	mg/Kg	☼	06/10/19 08:00	06/26/19 19:13	1

Method: 6010B SEP - SEP Metals (ICP) - Step 5

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	90	J*	190	30	mg/Kg	☼	06/12/19 08:00	06/26/19 20:35	5
Antimony	ND		57	5.3	mg/Kg	☼	06/12/19 08:00	06/26/19 20:35	5
Arsenic	ND		9.5	2.4	mg/Kg	☼	06/12/19 08:00	06/26/19 20:35	5
Barium	ND	*	47	2.3	mg/Kg	☼	06/12/19 08:00	06/26/19 20:35	5
Beryllium	ND	*	4.7	0.40	mg/Kg	☼	06/12/19 08:00	06/26/19 20:35	5
Cobalt	ND	*	47	0.76	mg/Kg	☼	06/12/19 08:00	06/26/19 20:35	5
Iron	ND	*	95	56	mg/Kg	☼	06/12/19 08:00	06/26/19 20:35	5
Li	ND		47	2.8	mg/Kg	☼	06/12/19 08:00	06/26/19 20:35	5
Manganese	ND	*	14	2.3	mg/Kg	☼	06/12/19 08:00	06/26/19 20:35	5
Mo	ND		38	1.6	mg/Kg	☼	06/12/19 08:00	06/26/19 20:35	5
Selenium	ND		9.5	3.3	mg/Kg	☼	06/12/19 08:00	06/26/19 20:35	5
Thallium	ND	*	33	4.4	mg/Kg	☼	06/12/19 08:00	06/26/19 20:35	5

Method: 6010B SEP - SEP Metals (ICP) - Step 6

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	1600		13	2.0	mg/Kg	☼	06/15/19 08:00	06/26/19 22:14	1
Antimony	ND		3.8	0.35	mg/Kg	☼	06/15/19 08:00	06/26/19 22:14	1
Arsenic	0.69		0.63	0.19	mg/Kg	☼	06/15/19 08:00	06/26/19 22:14	1
Barium	4.2		3.2	0.15	mg/Kg	☼	06/15/19 08:00	06/26/19 22:14	1
Beryllium	0.056	J	0.32	0.015	mg/Kg	☼	06/15/19 08:00	06/26/19 22:14	1
Cobalt	0.32	J	3.2	0.058	mg/Kg	☼	06/15/19 08:00	06/26/19 22:14	1
Iron	1300		6.3	3.7	mg/Kg	☼	06/15/19 08:00	06/26/19 22:14	1
Li	0.57	J	3.2	0.19	mg/Kg	☼	06/15/19 08:00	06/26/19 22:14	1
Manganese	6.4		0.95	0.32	mg/Kg	☼	06/15/19 08:00	06/26/19 22:14	1
Mo	ND		2.5	0.13	mg/Kg	☼	06/15/19 08:00	06/26/19 22:14	1
Selenium	ND		0.63	0.21	mg/Kg	☼	06/15/19 08:00	06/26/19 22:14	1
Thallium	ND		2.2	0.27	mg/Kg	☼	06/15/19 08:00	06/26/19 22:14	1

Method: 6010B SEP - SEP Metals (ICP) - Step 7

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	39000		130	20	mg/Kg	☼	06/16/19 08:00	06/28/19 14:27	10
Antimony	ND		3.8	0.18	mg/Kg	☼	06/16/19 08:00	06/28/19 13:19	1
Arsenic	0.47	J	1.3	0.33	mg/Kg	☼	06/16/19 08:00	06/28/19 17:53	2
Barium	520		32	1.5	mg/Kg	☼	06/16/19 08:00	06/28/19 14:27	10
Beryllium	0.59		0.32	0.0095	mg/Kg	☼	06/16/19 08:00	06/28/19 13:19	1
Cobalt	0.62	J	6.3	0.38	mg/Kg	☼	06/16/19 08:00	06/28/19 17:53	2
Iron	3100		6.3	5.2	mg/Kg	☼	06/16/19 08:00	06/28/19 13:19	1
Li	7.9		3.2	0.19	mg/Kg	☼	06/16/19 08:00	06/28/19 13:19	1
Manganese	18	B	0.95	0.066	mg/Kg	☼	06/16/19 08:00	06/28/19 13:19	1
Mo	ND		2.5	0.10	mg/Kg	☼	06/16/19 08:00	06/28/19 13:19	1

Eurofins TestAmerica, Knoxville

Client Sample Results

Client: Golder Associates Inc.
Project/Site: Oak Grove FGD Ponds - 7-Step SEP Metals

Job ID: 140-15376-1

Client Sample ID: FGD-16 (30-32)

Lab Sample ID: 140-15376-2

Date Collected: 05/23/19 10:40

Matrix: Solid

Date Received: 05/24/19 09:40

Percent Solids: 79.2

Method: 6010B SEP - SEP Metals (ICP) - Step 7 (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Selenium	ND		1.3	0.43	mg/Kg	☼	06/16/19 08:00	06/28/19 17:53	2
Thallium	0.95	J	4.4	0.45	mg/Kg	☼	06/16/19 08:00	06/28/19 17:53	2

Method: 6010B SEP - SEP Metals (ICP) - Sum of Steps 1-7

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	42000		10	1.6	mg/Kg			07/11/19 10:59	1
Antimony	ND		3.0	0.14	mg/Kg			07/11/19 10:59	1
Arsenic	2.5		0.50	0.13	mg/Kg			07/11/19 10:59	1
Barium	540		2.5	0.12	mg/Kg			07/11/19 10:59	1
Beryllium	0.86		0.25	0.0075	mg/Kg			07/11/19 10:59	1
Cobalt	2.2	J	2.5	0.023	mg/Kg			07/11/19 10:59	1
Iron	6600		5.0	4.1	mg/Kg			07/11/19 10:59	1
Li	8.7		2.5	0.15	mg/Kg			07/11/19 10:59	1
Manganese	34		0.75	0.052	mg/Kg			07/11/19 10:59	1
Mo	ND		2.0	0.082	mg/Kg			07/11/19 10:59	1
Selenium	ND		0.50	0.17	mg/Kg			07/11/19 10:59	1
Thallium	0.95	J	1.8	0.18	mg/Kg			07/11/19 10:59	1

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		24	12	mg/Kg	☼	06/16/19 08:00	06/17/19 11:41	1
Chromium	3.3		1.8	0.26	mg/Kg	☼	06/16/19 08:00	06/17/19 11:41	1
Lead	3.4		1.8	0.33	mg/Kg	☼	06/16/19 08:00	06/17/19 11:41	1
Phosphorus	43		35	2.8	mg/Kg	☼	06/16/19 08:00	06/17/19 11:41	1

Method: 6010B - SEP Metals (ICP) - Total

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	44000		130	20	mg/Kg	☼	05/30/19 08:00	06/28/19 16:47	10
Antimony	ND		3.8	0.18	mg/Kg	☼	05/30/19 08:00	06/28/19 15:34	1
Arsenic	2.5		1.3	0.33	mg/Kg	☼	05/30/19 08:00	06/28/19 18:50	2
Barium	760		32	1.5	mg/Kg	☼	05/30/19 08:00	06/28/19 16:47	10
Beryllium	0.85		0.32	0.0095	mg/Kg	☼	05/30/19 08:00	06/28/19 15:34	1
Cobalt	1.7	J	6.3	0.38	mg/Kg	☼	05/30/19 08:00	06/28/19 18:50	2
Iron	5900		6.3	5.2	mg/Kg	☼	05/30/19 08:00	06/28/19 15:34	1
Lithium	7.6		3.2	0.19	mg/Kg	☼	05/30/19 08:00	06/28/19 15:34	1
Manganese	34		0.95	0.066	mg/Kg	☼	05/30/19 08:00	06/28/19 15:34	1
Molybdenum	0.16	J	2.5	0.10	mg/Kg	☼	05/30/19 08:00	06/28/19 15:34	1
Selenium	ND		1.3	0.43	mg/Kg	☼	05/30/19 08:00	06/28/19 18:50	2
Thallium	0.68	J	4.4	0.45	mg/Kg	☼	05/30/19 08:00	06/28/19 18:50	2

Method: 7470A - SEP Mercury (CVAA) - Total

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		0.13	0.051	mg/Kg	☼	05/30/19 08:00	06/03/19 14:52	1

Client Sample Results

Client: Golder Associates Inc.
Project/Site: Oak Grove FGD Ponds - 7-Step SEP Metals

Job ID: 140-15376-1

Client Sample ID: FGD-2019-1 (23-25)

Lab Sample ID: 140-15376-3

Date Collected: 05/23/19 15:20

Matrix: Solid

Date Received: 05/24/19 09:40

Percent Solids: 77.2

Method: 6010B SEP - SEP Metals (ICP) - Step 1

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		52	8.3	mg/Kg	☼	05/31/19 08:00	06/17/19 14:29	4
Antimony	ND		16	1.5	mg/Kg	☼	05/31/19 08:00	06/17/19 14:29	4
Arsenic	ND		2.6	0.67	mg/Kg	☼	05/31/19 08:00	06/17/19 14:29	4
Barium	0.86	J	13	0.62	mg/Kg	☼	05/31/19 08:00	06/17/19 14:29	4
Beryllium	ND		1.3	0.40	mg/Kg	☼	05/31/19 08:00	06/17/19 14:29	4
Cobalt	ND		13	0.23	mg/Kg	☼	05/31/19 08:00	06/17/19 14:29	4
Iron	ND		26	15	mg/Kg	☼	05/31/19 08:00	06/17/19 14:29	4
Li	ND		13	0.78	mg/Kg	☼	05/31/19 08:00	06/17/19 14:29	4
Manganese	0.99	J	3.9	0.16	mg/Kg	☼	05/31/19 08:00	06/17/19 14:29	4
Mo	ND		10	0.43	mg/Kg	☼	05/31/19 08:00	06/17/19 14:29	4
Selenium	ND		2.6	0.88	mg/Kg	☼	05/31/19 08:00	06/17/19 14:29	4
Thallium	ND		9.1	1.1	mg/Kg	☼	05/31/19 08:00	06/17/19 14:29	4

Method: 6010B SEP - SEP Metals (ICP) - Step 2

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND	*	39	6.2	mg/Kg	☼	06/03/19 08:00	06/17/19 16:03	3
Antimony	ND		12	1.1	mg/Kg	☼	06/03/19 08:00	06/17/19 16:03	3
Arsenic	ND		1.9	0.51	mg/Kg	☼	06/03/19 08:00	06/17/19 16:03	3
Barium	1.9	J *	9.7	0.47	mg/Kg	☼	06/03/19 08:00	06/17/19 16:03	3
Beryllium	ND	*	0.97	0.062	mg/Kg	☼	06/03/19 08:00	06/17/19 16:03	3
Cobalt	ND		9.7	0.24	mg/Kg	☼	06/03/19 08:00	06/17/19 16:03	3
Iron	ND	*	19	11	mg/Kg	☼	06/03/19 08:00	06/17/19 16:03	3
Li	ND		9.7	0.58	mg/Kg	☼	06/03/19 08:00	06/17/19 16:03	3
Manganese	ND		2.9	1.1	mg/Kg	☼	06/03/19 08:00	06/17/19 16:03	3
Mo	ND		7.8	0.32	mg/Kg	☼	06/03/19 08:00	06/17/19 16:03	3
Selenium	0.88	J B	1.9	0.66	mg/Kg	☼	06/03/19 08:00	06/17/19 16:03	3
Thallium	ND		6.8	0.82	mg/Kg	☼	06/03/19 08:00	06/17/19 16:03	3

Method: 6010B SEP - SEP Metals (ICP) - Step 3

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	62		13	2.7	mg/Kg	☼	06/04/19 08:00	06/26/19 17:45	1
Antimony	ND		3.9	0.36	mg/Kg	☼	06/04/19 08:00	06/26/19 17:45	1
Arsenic	0.30	J	0.65	0.17	mg/Kg	☼	06/04/19 08:00	06/26/19 17:45	1
Barium	4.0	B	3.2	0.16	mg/Kg	☼	06/04/19 08:00	06/26/19 17:45	1
Beryllium	0.10	J	0.32	0.019	mg/Kg	☼	06/04/19 08:00	06/26/19 17:45	1
Cobalt	29		3.2	0.058	mg/Kg	☼	06/04/19 08:00	06/26/19 17:45	1
Cobalt	29		3.2	0.058	mg/Kg	☼	07/16/19 08:00	07/17/19 11:32	1
Iron	61		6.5	3.8	mg/Kg	☼	06/04/19 08:00	06/26/19 17:45	1
Li	0.80	J	3.2	0.19	mg/Kg	☼	06/04/19 08:00	06/26/19 17:45	1
Manganese	110	B	0.97	0.035	mg/Kg	☼	06/04/19 08:00	06/26/19 17:45	1
Mo	ND		2.6	0.11	mg/Kg	☼	06/04/19 08:00	06/26/19 17:45	1
Selenium	ND		0.65	0.22	mg/Kg	☼	06/04/19 08:00	06/26/19 17:45	1
Thallium	ND		2.3	0.27	mg/Kg	☼	06/04/19 08:00	06/26/19 17:45	1

Method: 6010B SEP - SEP Metals (ICP) - Step 4

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	1800		13	2.1	mg/Kg	☼	06/10/19 08:00	06/26/19 19:18	1
Antimony	ND		3.9	0.58	mg/Kg	☼	06/10/19 08:00	06/26/19 19:18	1
Arsenic	1.9	B	0.65	0.29	mg/Kg	☼	06/10/19 08:00	06/26/19 19:18	1
Barium	14		3.2	0.16	mg/Kg	☼	06/10/19 08:00	06/26/19 19:18	1

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Client Sample Results

Client: Golder Associates Inc.
Project/Site: Oak Grove FGD Ponds - 7-Step SEP Metals

Job ID: 140-15376-1

Client Sample ID: FGD-2019-1 (23-25)

Lab Sample ID: 140-15376-3

Date Collected: 05/23/19 15:20

Matrix: Solid

Date Received: 05/24/19 09:40

Percent Solids: 77.2

Method: 6010B SEP - SEP Metals (ICP) - Step 4 (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	0.25	J	0.32	0.021	mg/Kg	☼	06/10/19 08:00	06/26/19 19:18	1
Cobalt	36		3.2	0.069	mg/Kg	☼	06/10/19 08:00	06/26/19 19:18	1
Cobalt	35		3.2	0.069	mg/Kg	☼	07/16/19 08:00	07/17/19 11:53	1
Iron	3400		6.5	3.8	mg/Kg	☼	06/10/19 08:00	06/26/19 19:18	1
Li	3.9		3.2	0.19	mg/Kg	☼	06/10/19 08:00	06/26/19 19:18	1
Manganese	98		0.97	0.17	mg/Kg	☼	06/10/19 08:00	06/26/19 19:18	1
Mo	0.18	J	2.6	0.11	mg/Kg	☼	06/10/19 08:00	06/26/19 19:18	1
Selenium	ND	*	0.65	0.61	mg/Kg	☼	06/10/19 08:00	06/26/19 19:18	1
Thallium	ND		2.3	0.38	mg/Kg	☼	06/10/19 08:00	06/26/19 19:18	1

Method: 6010B SEP - SEP Metals (ICP) - Step 5

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	65	J *	190	30	mg/Kg	☼	06/12/19 08:00	06/26/19 20:41	5
Antimony	ND		58	5.4	mg/Kg	☼	06/12/19 08:00	06/26/19 20:41	5
Arsenic	ND		9.7	2.5	mg/Kg	☼	06/12/19 08:00	06/26/19 20:41	5
Barium	27	J *	49	2.3	mg/Kg	☼	06/12/19 08:00	06/26/19 20:41	5
Beryllium	ND	*	4.9	0.41	mg/Kg	☼	06/12/19 08:00	06/26/19 20:41	5
Cobalt	2.6	J *	49	0.78	mg/Kg	☼	06/12/19 08:00	06/26/19 20:41	5
Iron	ND	*	97	57	mg/Kg	☼	06/12/19 08:00	06/26/19 20:41	5
Li	ND		49	2.9	mg/Kg	☼	06/12/19 08:00	06/26/19 20:41	5
Manganese	ND	*	15	2.4	mg/Kg	☼	06/12/19 08:00	06/26/19 20:41	5
Mo	ND		39	1.6	mg/Kg	☼	06/12/19 08:00	06/26/19 20:41	5
Selenium	ND		9.7	3.4	mg/Kg	☼	06/12/19 08:00	06/26/19 20:41	5
Thallium	ND	*	34	4.5	mg/Kg	☼	06/12/19 08:00	06/26/19 20:41	5

Method: 6010B SEP - SEP Metals (ICP) - Step 6

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	2600		13	2.1	mg/Kg	☼	06/15/19 08:00	06/26/19 22:20	1
Antimony	ND		3.9	0.36	mg/Kg	☼	06/15/19 08:00	06/26/19 22:20	1
Arsenic	1.6		0.65	0.19	mg/Kg	☼	06/15/19 08:00	06/26/19 22:20	1
Barium	35		3.2	0.16	mg/Kg	☼	06/15/19 08:00	06/26/19 22:20	1
Beryllium	0.074	J	0.32	0.016	mg/Kg	☼	06/15/19 08:00	06/26/19 22:20	1
Cobalt	1.6	J	3.2	0.060	mg/Kg	☼	06/15/19 08:00	06/26/19 22:20	1
Iron	1100		6.5	3.8	mg/Kg	☼	06/15/19 08:00	06/26/19 22:20	1
Li	1.2	J	3.2	0.19	mg/Kg	☼	06/15/19 08:00	06/26/19 22:20	1
Manganese	10		0.97	0.32	mg/Kg	☼	06/15/19 08:00	06/26/19 22:20	1
Mo	0.21	J	2.6	0.13	mg/Kg	☼	06/15/19 08:00	06/26/19 22:20	1
Selenium	ND		0.65	0.22	mg/Kg	☼	06/15/19 08:00	06/26/19 22:20	1
Thallium	ND		2.3	0.27	mg/Kg	☼	06/15/19 08:00	06/26/19 22:20	1

Method: 6010B SEP - SEP Metals (ICP) - Step 7

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	33000		130	21	mg/Kg	☼	06/16/19 08:00	06/28/19 14:32	10
Antimony	ND		3.9	0.18	mg/Kg	☼	06/16/19 08:00	06/28/19 13:24	1
Arsenic	1.2		0.65	0.17	mg/Kg	☼	06/16/19 08:00	06/28/19 13:24	1
Barium	410		32	1.6	mg/Kg	☼	06/16/19 08:00	06/28/19 14:32	10
Beryllium	0.39		0.32	0.0097	mg/Kg	☼	06/16/19 08:00	06/28/19 13:24	1
Cobalt	0.70	J	6.5	0.39	mg/Kg	☼	06/16/19 08:00	06/28/19 17:58	2
Iron	4400		6.5	5.3	mg/Kg	☼	06/16/19 08:00	06/28/19 13:24	1
Li	14		3.2	0.19	mg/Kg	☼	06/16/19 08:00	06/28/19 13:24	1

Eurofins TestAmerica, Knoxville

Client Sample Results

Client: Golder Associates Inc.
Project/Site: Oak Grove FGD Ponds - 7-Step SEP Metals

Job ID: 140-15376-1

Client Sample ID: FGD-2019-1 (23-25)

Lab Sample ID: 140-15376-3

Date Collected: 05/23/19 15:20

Matrix: Solid

Date Received: 05/24/19 09:40

Percent Solids: 77.2

Method: 6010B SEP - SEP Metals (ICP) - Step 7 (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Manganese	19	B	0.97	0.067	mg/Kg	☼	06/16/19 08:00	06/28/19 13:24	1
Mo	0.80	J	2.6	0.11	mg/Kg	☼	06/16/19 08:00	06/28/19 13:24	1
Selenium	ND		0.65	0.22	mg/Kg	☼	06/16/19 08:00	06/28/19 13:24	1
Thallium	ND		4.5	0.47	mg/Kg	☼	06/16/19 08:00	06/28/19 17:58	2

Method: 6010B SEP - SEP Metals (ICP) - Sum of Steps 1-7

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	38000		10	1.6	mg/Kg			07/11/19 10:59	1
Antimony	ND		3.0	0.14	mg/Kg			07/11/19 10:59	1
Arsenic	5.0		0.50	0.13	mg/Kg			07/11/19 10:59	1
Barium	490		2.5	0.12	mg/Kg			07/11/19 10:59	1
Beryllium	0.81		0.25	0.0075	mg/Kg			07/11/19 10:59	1
Cobalt	69		2.5	0.023	mg/Kg			07/11/19 10:59	1
Iron	9100		5.0	4.1	mg/Kg			07/11/19 10:59	1
Li	20		2.5	0.15	mg/Kg			07/11/19 10:59	1
Manganese	230		0.75	0.052	mg/Kg			07/11/19 10:59	1
Mo	1.2	J	2.0	0.082	mg/Kg			07/11/19 10:59	1
Selenium	0.88		0.50	0.17	mg/Kg			07/11/19 10:59	1
Thallium	ND		1.8	0.18	mg/Kg			07/11/19 10:59	1

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		24	12	mg/Kg	☼	06/16/19 08:00	06/17/19 11:47	1
Chromium	4.8		1.8	0.27	mg/Kg	☼	06/16/19 08:00	06/17/19 11:47	1
Lead	6.0		1.8	0.34	mg/Kg	☼	06/16/19 08:00	06/17/19 11:47	1
Phosphorus	65		36	2.9	mg/Kg	☼	06/16/19 08:00	06/17/19 11:47	1

Method: 6010B - SEP Metals (ICP) - Total

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	43000		130	21	mg/Kg	☼	05/30/19 08:00	06/28/19 16:52	10
Antimony	ND		3.9	0.18	mg/Kg	☼	05/30/19 08:00	06/28/19 15:40	1
Arsenic	7.6		0.65	0.17	mg/Kg	☼	05/30/19 08:00	06/28/19 15:40	1
Barium	730		32	1.6	mg/Kg	☼	05/30/19 08:00	06/28/19 16:52	10
Beryllium	0.76		0.32	0.0097	mg/Kg	☼	05/30/19 08:00	06/28/19 15:40	1
Cobalt	6.9		3.2	0.19	mg/Kg	☼	05/30/19 08:00	06/28/19 15:40	1
Cobalt	17		6.5	0.39	mg/Kg	☼	07/16/19 08:00	07/17/19 12:03	2
Iron	8400		6.5	5.3	mg/Kg	☼	05/30/19 08:00	06/28/19 15:40	1
Lithium	14		3.2	0.19	mg/Kg	☼	05/30/19 08:00	06/28/19 15:40	1
Manganese	61		0.97	0.067	mg/Kg	☼	05/30/19 08:00	06/28/19 15:40	1
Molybdenum	1.1	J	2.6	0.11	mg/Kg	☼	05/30/19 08:00	06/28/19 15:40	1
Selenium	ND		0.65	0.22	mg/Kg	☼	05/30/19 08:00	06/28/19 15:40	1
Thallium	0.85	J	2.3	0.23	mg/Kg	☼	05/30/19 08:00	06/28/19 15:40	1

Method: 7470A - SEP Mercury (CVAA) - Total

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	0.15		0.13	0.052	mg/Kg	☼	05/30/19 08:00	06/03/19 14:54	1

Default Detection Limits

Client: Golder Associates Inc.
Project/Site: Oak Grove FGD Ponds - 7-Step SEP Metals

Job ID: 140-15376-1

Method: 6010B SEP - SEP Metals (ICP) - Step 1

Prep: 3010A

SEP: Exchangeable

Analyte	RL	MDL	Units
Aluminum	10	1.6	mg/Kg
Antimony	3.0	0.28	mg/Kg
Arsenic	0.50	0.13	mg/Kg
Barium	2.5	0.12	mg/Kg
Beryllium	0.25	0.077	mg/Kg
Cobalt	2.5	0.045	mg/Kg
Iron	5.0	2.9	mg/Kg
Li	2.5	0.15	mg/Kg
Manganese	0.75	0.031	mg/Kg
Mo	2.0	0.082	mg/Kg
Selenium	0.50	0.17	mg/Kg
Thallium	1.8	0.21	mg/Kg

Method: 6010B SEP - SEP Metals (ICP) - Step 2

Prep: 3010A

SEP: Carbonate

Analyte	RL	MDL	Units
Aluminum	10	1.6	mg/Kg
Antimony	3.0	0.28	mg/Kg
Arsenic	0.50	0.13	mg/Kg
Barium	2.5	0.12	mg/Kg
Beryllium	0.25	0.016	mg/Kg
Cobalt	2.5	0.063	mg/Kg
Iron	5.0	2.9	mg/Kg
Li	2.5	0.15	mg/Kg
Manganese	0.75	0.28	mg/Kg
Mo	2.0	0.082	mg/Kg
Selenium	0.50	0.17	mg/Kg
Thallium	1.8	0.21	mg/Kg

Method: 6010B SEP - SEP Metals (ICP) - Step 3

Prep: 3010A

SEP: Non-Crystalline

Analyte	RL	MDL	Units
Aluminum	10	2.1	mg/Kg
Antimony	3.0	0.28	mg/Kg
Arsenic	0.50	0.13	mg/Kg
Barium	2.5	0.12	mg/Kg
Beryllium	0.25	0.015	mg/Kg
Cobalt	2.5	0.045	mg/Kg
Iron	5.0	2.9	mg/Kg
Li	2.5	0.15	mg/Kg
Manganese	0.75	0.027	mg/Kg
Mo	2.0	0.082	mg/Kg
Selenium	0.50	0.17	mg/Kg
Thallium	1.8	0.21	mg/Kg

Method: 6010B SEP - SEP Metals (ICP) - Step 4

Prep: 3010A

SEP: Metal Hydroxide

Eurofins TestAmerica, Knoxville

Default Detection Limits

Client: Golder Associates Inc.
 Project/Site: Oak Grove FGD Ponds - 7-Step SEP Metals

Job ID: 140-15376-1

Method: 6010B SEP - SEP Metals (ICP) - Step 4

Prep: 3010A

SEP: Metal Hydroxide

Analyte	RL	MDL	Units
Aluminum	10	1.6	mg/Kg
Antimony	3.0	0.45	mg/Kg
Arsenic	0.50	0.22	mg/Kg
Barium	2.5	0.12	mg/Kg
Beryllium	0.25	0.016	mg/Kg
Cobalt	2.5	0.053	mg/Kg
Iron	5.0	2.9	mg/Kg
Li	2.5	0.15	mg/Kg
Manganese	0.75	0.13	mg/Kg
Mo	2.0	0.082	mg/Kg
Selenium	0.50	0.47	mg/Kg
Thallium	1.8	0.29	mg/Kg

Method: 6010B SEP - SEP Metals (ICP) - Step 5

Prep: 3010A

SEP: Organic-Bound

Analyte	RL	MDL	Units
Aluminum	30	4.7	mg/Kg
Antimony	9.0	0.84	mg/Kg
Arsenic	1.5	0.38	mg/Kg
Barium	7.5	0.36	mg/Kg
Beryllium	0.75	0.063	mg/Kg
Cobalt	7.5	0.12	mg/Kg
Iron	15	8.8	mg/Kg
Li	7.5	0.44	mg/Kg
Manganese	2.3	0.37	mg/Kg
Mo	6.0	0.25	mg/Kg
Selenium	1.5	0.52	mg/Kg
Thallium	5.3	0.70	mg/Kg

Method: 6010B SEP - SEP Metals (ICP) - Step 6

SEP: Acid/Sulfide

Analyte	RL	MDL	Units
Aluminum	10	1.6	mg/Kg
Antimony	3.0	0.28	mg/Kg
Arsenic	0.50	0.15	mg/Kg
Barium	2.5	0.12	mg/Kg
Beryllium	0.25	0.012	mg/Kg
Cobalt	2.5	0.046	mg/Kg
Iron	5.0	2.9	mg/Kg
Li	2.5	0.15	mg/Kg
Manganese	0.75	0.25	mg/Kg
Mo	2.0	0.099	mg/Kg
Selenium	0.50	0.17	mg/Kg
Thallium	1.8	0.21	mg/Kg

Method: 6010B SEP - SEP Metals (ICP) - Step 7

Prep: Residual

Analyte	RL	MDL	Units
Aluminum	10	1.6	mg/Kg

Eurofins TestAmerica, Knoxville

Default Detection Limits

Client: Golder Associates Inc.
 Project/Site: Oak Grove FGD Ponds - 7-Step SEP Metals

Job ID: 140-15376-1

Method: 6010B SEP - SEP Metals (ICP) - Step 7 (Continued)

Prep: Residual

Analyte	RL	MDL	Units
Antimony	3.0	0.14	mg/Kg
Arsenic	0.50	0.13	mg/Kg
Barium	2.5	0.12	mg/Kg
Beryllium	0.25	0.0075	mg/Kg
Cobalt	2.5	0.15	mg/Kg
Iron	5.0	4.1	mg/Kg
Li	2.5	0.15	mg/Kg
Manganese	0.75	0.052	mg/Kg
Mo	2.0	0.082	mg/Kg
Selenium	0.50	0.17	mg/Kg
Thallium	1.8	0.18	mg/Kg

Method: 6010B SEP - SEP Metals (ICP) - Sum of Steps 1-7

Analyte	RL	MDL	Units
Aluminum	10	1.6	mg/Kg
Antimony	3.0	0.14	mg/Kg
Arsenic	0.50	0.13	mg/Kg
Barium	2.5	0.12	mg/Kg
Beryllium	0.25	0.0075	mg/Kg
Cobalt	2.5	0.023	mg/Kg
Iron	5.0	4.1	mg/Kg
Li	2.5	0.15	mg/Kg
Manganese	0.75	0.052	mg/Kg
Mo	2.0	0.082	mg/Kg
Selenium	0.50	0.17	mg/Kg
Thallium	1.8	0.18	mg/Kg

Method: 6010B - Metals (ICP)

Prep: 3050B

Analyte	RL	MDL	Units
Boron	20	10	mg/Kg
Chromium	1.5	0.22	mg/Kg
Lead	1.5	0.28	mg/Kg
Phosphorus	30	2.4	mg/Kg

Method: 6010B - SEP Metals (ICP) - Total

Prep: Total

Analyte	RL	MDL	Units
Aluminum	10	1.6	mg/Kg
Antimony	3.0	0.14	mg/Kg
Arsenic	0.50	0.13	mg/Kg
Barium	2.5	0.12	mg/Kg
Beryllium	0.25	0.0075	mg/Kg
Cobalt	2.5	0.15	mg/Kg
Iron	5.0	4.1	mg/Kg
Lithium	2.5	0.15	mg/Kg
Manganese	0.75	0.052	mg/Kg
Molybdenum	2.0	0.082	mg/Kg
Selenium	0.50	0.17	mg/Kg
Thallium	1.8	0.18	mg/Kg

Default Detection Limits

Client: Golder Associates Inc.
Project/Site: Oak Grove FGD Ponds - 7-Step SEP Metals

Job ID: 140-15376-1

Method: 7470A - SEP Mercury (CVAA) - Total
Prep: Total

Analyte	RL	MDL	Units
Hg	0.10	0.040	mg/Kg

1

2

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QC Sample Results

Client: Golder Associates Inc.
Project/Site: Oak Grove FGD Ponds - 7-Step SEP Metals

Job ID: 140-15376-1

Method: 6010B - Metals (ICP)

Lab Sample ID: MB 140-30853/8-A
Matrix: Solid
Analysis Batch: 30900

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 30853

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		20	10	mg/Kg		06/16/19 08:00	06/17/19 11:06	1
Chromium	ND		1.5	0.22	mg/Kg		06/16/19 08:00	06/17/19 11:06	1
Lead	ND		1.5	0.28	mg/Kg		06/16/19 08:00	06/17/19 11:06	1
Phosphorus	ND		30	2.4	mg/Kg		06/16/19 08:00	06/17/19 11:06	1

Lab Sample ID: LCS 140-30853/9-A
Matrix: Solid
Analysis Batch: 30900

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 30853

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Boron	100	99.1		mg/Kg		99	80 - 120
Chromium	20.0	20.5		mg/Kg		102	90 - 110
Lead	10.0	10.2		mg/Kg		102	90 - 110
Phosphorus	500	507		mg/Kg		101	80 - 120

Lab Sample ID: 140-15376-1 MS
Matrix: Solid
Analysis Batch: 30900

Client Sample ID: FGD-15 (25-27)
Prep Type: Total/NA
Prep Batch: 30853

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Boron	ND		128	121		mg/Kg	☼	95	75 - 125
Chromium	4.2		25.5	33.9		mg/Kg	☼	117	75 - 125
Lead	3.2		12.8	15.4		mg/Kg	☼	96	75 - 125
Phosphorus	69		638	680		mg/Kg	☼	96	75 - 125

Lab Sample ID: 140-15376-1 MSD
Matrix: Solid
Analysis Batch: 30900

Client Sample ID: FGD-15 (25-27)
Prep Type: Total/NA
Prep Batch: 30853

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Boron	ND		127	122		mg/Kg	☼	96	75 - 125	1	20
Chromium	4.2		25.4	33.5		mg/Kg	☼	116	75 - 125	1	20
Lead	3.2		12.7	15.4		mg/Kg	☼	96	75 - 125	1	20
Phosphorus	69		635	672		mg/Kg	☼	95	75 - 125	1	20

Method: 6010B - SEP Metals (ICP) - Total

Lab Sample ID: MB 140-30373/11-A
Matrix: Solid
Analysis Batch: 31255

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 30373

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		10	1.6	mg/Kg		05/30/19 08:00	06/28/19 12:27	1
Antimony	ND		3.0	0.14	mg/Kg		05/30/19 08:00	06/28/19 12:27	1
Arsenic	ND		0.50	0.13	mg/Kg		05/30/19 08:00	06/28/19 12:27	1
Barium	ND		2.5	0.12	mg/Kg		05/30/19 08:00	06/28/19 12:27	1
Beryllium	ND		0.25	0.0075	mg/Kg		05/30/19 08:00	06/28/19 12:27	1
Cobalt	ND		2.5	0.15	mg/Kg		05/30/19 08:00	06/28/19 12:27	1
Iron	ND		5.0	4.1	mg/Kg		05/30/19 08:00	06/28/19 12:27	1
Lithium	ND		2.5	0.15	mg/Kg		05/30/19 08:00	06/28/19 12:27	1

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QC Sample Results

Client: Golder Associates Inc.
 Project/Site: Oak Grove FGD Ponds - 7-Step SEP Metals

Job ID: 140-15376-1

Method: 6010B - SEP Metals (ICP) - Total (Continued)

Lab Sample ID: MB 140-30373/11-A
Matrix: Solid
Analysis Batch: 31255

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 30373

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Manganese	ND		0.75	0.052	mg/Kg		05/30/19 08:00	06/28/19 12:27	1
Molybdenum	ND		2.0	0.082	mg/Kg		05/30/19 08:00	06/28/19 12:27	1
Selenium	ND		0.50	0.17	mg/Kg		05/30/19 08:00	06/28/19 12:27	1
Thallium	ND		1.8	0.18	mg/Kg		05/30/19 08:00	06/28/19 12:27	1

Lab Sample ID: LCS 140-30373/12-A
Matrix: Solid
Analysis Batch: 31255

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 30373

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Aluminum	100	96.4		mg/Kg		96	75 - 125
Antimony	25.0	25.3		mg/Kg		101	75 - 125
Arsenic	5.00	5.23		mg/Kg		105	75 - 125
Barium	5.00	5.07		mg/Kg		101	75 - 125
Beryllium	2.50	2.47		mg/Kg		99	75 - 125
Cobalt	5.00	5.25		mg/Kg		105	75 - 125
Iron	50.0	50.6		mg/Kg		101	75 - 125
Lithium	5.00	5.37		mg/Kg		107	75 - 125
Manganese	5.00	5.27		mg/Kg		105	75 - 125
Molybdenum	25.0	26.5		mg/Kg		106	75 - 125
Selenium	7.50	7.36		mg/Kg		98	75 - 125
Thallium	20.0	21.6		mg/Kg		108	75 - 125

Lab Sample ID: LCSD 140-30373/13-A
Matrix: Solid
Analysis Batch: 31255

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 30373

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	Limit
Aluminum	100	95.8		mg/Kg		96	75 - 125	1	30
Antimony	25.0	25.3		mg/Kg		101	75 - 125	0	30
Arsenic	5.00	5.23		mg/Kg		105	75 - 125	0	30
Barium	5.00	5.06		mg/Kg		101	75 - 125	0	30
Beryllium	2.50	2.47		mg/Kg		99	75 - 125	0	30
Cobalt	5.00	5.22		mg/Kg		104	75 - 125	0	30
Iron	50.0	50.6		mg/Kg		101	75 - 125	0	30
Lithium	5.00	5.35		mg/Kg		107	75 - 125	0	30
Manganese	5.00	5.25		mg/Kg		105	75 - 125	0	30
Molybdenum	25.0	26.4		mg/Kg		106	75 - 125	0	30
Selenium	7.50	7.37		mg/Kg		98	75 - 125	0	30
Thallium	20.0	21.4		mg/Kg		107	75 - 125	1	30

Lab Sample ID: 140-15376-1 DU
Matrix: Solid
Analysis Batch: 31255

Client Sample ID: FGD-15 (25-27)
Prep Type: Total/NA
Prep Batch: 30373

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	Limit
Antimony	ND		ND		mg/Kg	☼	NC	30
Arsenic	1.6		1.73		mg/Kg	☼	10	30
Beryllium	0.71		0.709		mg/Kg	☼	0.6	30

Eurofins TestAmerica, Knoxville

QC Sample Results

Client: Golder Associates Inc.
 Project/Site: Oak Grove FGD Ponds - 7-Step SEP Metals

Job ID: 140-15376-1

Method: 6010B - SEP Metals (ICP) - Total (Continued)

Lab Sample ID: 140-15376-1 DU
Matrix: Solid
Analysis Batch: 31255

Client Sample ID: FGD-15 (25-27)
Prep Type: Total/NA
Prep Batch: 30373

Analyte	Sample	Sample	DU	DU	Unit	D	RPD	Limit
	Result	Qualifier	Result	Qualifier				
Iron	5700		5780		mg/Kg	☼	2	30
Lithium	10		10.4		mg/Kg	☼	0.9	30
Manganese	93		86.6		mg/Kg	☼	7	30
Molybdenum	0.21	J	0.176	J	mg/Kg	☼	17	30
Selenium	ND		ND		mg/Kg	☼	NC	30

Lab Sample ID: 140-15376-1 DU
Matrix: Solid
Analysis Batch: 31255

Client Sample ID: FGD-15 (25-27)
Prep Type: Total/NA
Prep Batch: 30373

Analyte	Sample	Sample	DU	DU	Unit	D	RPD	Limit
	Result	Qualifier	Result	Qualifier				
Aluminum	46000		46400		mg/Kg	☼	1	30
Barium	670		697		mg/Kg	☼	3	30

Lab Sample ID: 140-15376-1 DU
Matrix: Solid
Analysis Batch: 31255

Client Sample ID: FGD-15 (25-27)
Prep Type: Total/NA
Prep Batch: 30373

Analyte	Sample	Sample	DU	DU	Unit	D	RPD	Limit
	Result	Qualifier	Result	Qualifier				
Cobalt	1.8	J	1.74	J	mg/Kg	☼	5	30
Thallium	ND		ND		mg/Kg	☼	NC	30

Lab Sample ID: MB 140-31695/2-A
Matrix: Solid
Analysis Batch: 31812

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 31695

Analyte	MB	MB	RL	MDL	Unit	D	Prepared	Analyzed	Dil	Fac
	Result	Qualifier								
Cobalt	ND		2.5	0.15	mg/Kg		07/16/19 08:00	07/17/19 11:17		1

Lab Sample ID: LCS 140-31695/3-A
Matrix: Solid
Analysis Batch: 31812

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 31695

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits

Lab Sample ID: LCSD 140-31695/4-A
Matrix: Solid
Analysis Batch: 31812

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 31695

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	Limit

QC Sample Results

Client: Golder Associates Inc.
 Project/Site: Oak Grove FGD Ponds - 7-Step SEP Metals

Job ID: 140-15376-1

Method: 6010B SEP - SEP Metals (ICP)

Lab Sample ID: MB 140-30374/11-B ^4
Matrix: Solid
Analysis Batch: 30900

Client Sample ID: Method Blank
Prep Type: Step 1
Prep Batch: 30422

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		40	6.4	mg/Kg		05/31/19 08:00	06/17/19 13:48	4
Antimony	ND		12	1.1	mg/Kg		05/31/19 08:00	06/17/19 13:48	4
Arsenic	ND		2.0	0.52	mg/Kg		05/31/19 08:00	06/17/19 13:48	4
Barium	ND		10	0.48	mg/Kg		05/31/19 08:00	06/17/19 13:48	4
Beryllium	ND		1.0	0.31	mg/Kg		05/31/19 08:00	06/17/19 13:48	4
Cobalt	ND		10	0.18	mg/Kg		05/31/19 08:00	06/17/19 13:48	4
Iron	ND		20	12	mg/Kg		05/31/19 08:00	06/17/19 13:48	4
Li	ND		10	0.60	mg/Kg		05/31/19 08:00	06/17/19 13:48	4
Manganese	ND		3.0	0.12	mg/Kg		05/31/19 08:00	06/17/19 13:48	4
Mo	ND		8.0	0.33	mg/Kg		05/31/19 08:00	06/17/19 13:48	4
Selenium	ND		2.0	0.68	mg/Kg		05/31/19 08:00	06/17/19 13:48	4
Thallium	ND		7.0	0.84	mg/Kg		05/31/19 08:00	06/17/19 13:48	4

Lab Sample ID: LCS 140-30374/12-B ^5
Matrix: Solid
Analysis Batch: 30900

Client Sample ID: Lab Control Sample
Prep Type: Step 1
Prep Batch: 30422

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Aluminum	100	94.0		mg/Kg		94	75 - 125
Antimony	25.0	24.7		mg/Kg		99	75 - 125
Arsenic	5.00	4.79		mg/Kg		96	75 - 125
Barium	5.00	5.16	J	mg/Kg		103	75 - 125
Beryllium	2.50	2.57		mg/Kg		103	75 - 125
Cobalt	5.00	5.06	J	mg/Kg		101	75 - 125
Iron	50.0	51.3		mg/Kg		103	75 - 125
Li	5.00	5.37	J	mg/Kg		107	75 - 125
Manganese	5.00	4.96		mg/Kg		99	75 - 125
Mo	25.0	25.8		mg/Kg		103	75 - 125
Selenium	7.50	7.86		mg/Kg		105	75 - 125
Thallium	20.0	19.6		mg/Kg		98	75 - 125

Lab Sample ID: LCSD 140-30374/13-B ^5
Matrix: Solid
Analysis Batch: 30900

Client Sample ID: Lab Control Sample Dup
Prep Type: Step 1
Prep Batch: 30422

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	Limit
Aluminum	100	96.4		mg/Kg		96	75 - 125	3	30
Antimony	25.0	23.9		mg/Kg		95	75 - 125	4	30
Arsenic	5.00	4.66		mg/Kg		93	75 - 125	3	30
Barium	5.00	5.00	J	mg/Kg		100	75 - 125	3	30
Beryllium	2.50	2.55		mg/Kg		102	75 - 125	1	30
Cobalt	5.00	4.97	J	mg/Kg		99	75 - 125	2	30
Iron	50.0	50.4		mg/Kg		101	75 - 125	2	30
Li	5.00	5.04	J	mg/Kg		101	75 - 125	6	30
Manganese	5.00	4.92		mg/Kg		98	75 - 125	1	30
Mo	25.0	25.3		mg/Kg		101	75 - 125	2	30
Selenium	7.50	7.98		mg/Kg		106	75 - 125	2	30
Thallium	20.0	19.4		mg/Kg		97	75 - 125	1	30

Eurofins TestAmerica, Knoxville

QC Sample Results

Client: Golder Associates Inc.
Project/Site: Oak Grove FGD Ponds - 7-Step SEP Metals

Job ID: 140-15376-1

Method: 6010B SEP - SEP Metals (ICP) (Continued)

Lab Sample ID: 140-15376-1 DU
Matrix: Solid
Analysis Batch: 30900

Client Sample ID: FGD-15 (25-27)
Prep Type: Step 1
Prep Batch: 30422

Analyte	Sample	Sample	DU	DU	Unit	D	RPD	Limit
	Result	Qualifier	Result	Qualifier				
Aluminum	ND		ND		mg/Kg	☼	NC	30
Antimony	ND		ND		mg/Kg	☼	NC	30
Arsenic	ND		ND		mg/Kg	☼	NC	30
Barium	ND		ND		mg/Kg	☼	NC	30
Beryllium	ND		ND		mg/Kg	☼	NC	30
Cobalt	ND		ND		mg/Kg	☼	NC	30
Iron	ND		ND		mg/Kg	☼	NC	30
Li	ND		ND		mg/Kg	☼	NC	30
Manganese	0.47	J	1.04	J F5	mg/Kg	☼	76	30
Mo	ND		ND		mg/Kg	☼	NC	30
Selenium	ND		ND		mg/Kg	☼	NC	30
Thallium	ND		ND		mg/Kg	☼	NC	30

Lab Sample ID: MB 140-30423/11-B ^3
Matrix: Solid
Analysis Batch: 30900

Client Sample ID: Method Blank
Prep Type: Step 2
Prep Batch: 30452

Analyte	MB	MB	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Aluminum	ND		30	4.8	mg/Kg		06/03/19 08:00	06/17/19 15:11	3
Antimony	ND		9.0	0.84	mg/Kg		06/03/19 08:00	06/17/19 15:11	3
Arsenic	ND		1.5	0.39	mg/Kg		06/03/19 08:00	06/17/19 15:11	3
Barium	ND		7.5	0.36	mg/Kg		06/03/19 08:00	06/17/19 15:11	3
Beryllium	ND		0.75	0.048	mg/Kg		06/03/19 08:00	06/17/19 15:11	3
Cobalt	ND		7.5	0.19	mg/Kg		06/03/19 08:00	06/17/19 15:11	3
Iron	ND		15	8.7	mg/Kg		06/03/19 08:00	06/17/19 15:11	3
Li	ND		7.5	0.45	mg/Kg		06/03/19 08:00	06/17/19 15:11	3
Manganese	ND		2.3	0.84	mg/Kg		06/03/19 08:00	06/17/19 15:11	3
Mo	ND		6.0	0.25	mg/Kg		06/03/19 08:00	06/17/19 15:11	3
Selenium	0.644	J	1.5	0.51	mg/Kg		06/03/19 08:00	06/17/19 15:11	3
Thallium	ND		5.3	0.63	mg/Kg		06/03/19 08:00	06/17/19 15:11	3

Lab Sample ID: LCS 140-30423/12-B ^5
Matrix: Solid
Analysis Batch: 30900

Client Sample ID: Lab Control Sample
Prep Type: Step 2
Prep Batch: 30452

Analyte	Spike Added	LCS	LCS	Unit	D	%Rec	%Rec. Limits
		Result	Qualifier				
Aluminum	100	ND	*	mg/Kg		-4	75 - 125
Antimony	25.0	21.2		mg/Kg		85	75 - 125
Arsenic	5.00	3.93		mg/Kg		79	75 - 125
Barium	5.00	2.38	J *	mg/Kg		48	75 - 125
Beryllium	2.50	1.28	J *	mg/Kg		51	75 - 125
Cobalt	5.00	4.75	J	mg/Kg		95	75 - 125
Iron	50.0	ND	*	mg/Kg		2	75 - 125
Li	5.00	4.71	J	mg/Kg		94	75 - 125
Manganese	5.00	4.63		mg/Kg		93	75 - 125
Mo	25.0	21.1		mg/Kg		84	75 - 125
Selenium	7.50	6.91		mg/Kg		92	75 - 125
Thallium	20.0	18.1		mg/Kg		90	75 - 125

Eurofins TestAmerica, Knoxville

QC Sample Results

Client: Golder Associates Inc.
 Project/Site: Oak Grove FGD Ponds - 7-Step SEP Metals

Job ID: 140-15376-1

Method: 6010B SEP - SEP Metals (ICP) (Continued)

Lab Sample ID: LCSD 140-30423/13-B ^5
Matrix: Solid
Analysis Batch: 30900

Client Sample ID: Lab Control Sample Dup
Prep Type: Step 2
Prep Batch: 30452

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec.		RPD	Limit
							Limits	RPD		
Aluminum	100	ND	*	mg/Kg		-0.3	75 - 125	167	30	
Antimony	25.0	21.3		mg/Kg		85	75 - 125	0	30	
Arsenic	5.00	4.07		mg/Kg		81	75 - 125	4	30	
Barium	5.00	2.40	J *	mg/Kg		48	75 - 125	1	30	
Beryllium	2.50	1.27	J *	mg/Kg		51	75 - 125	0	30	
Cobalt	5.00	4.76	J	mg/Kg		95	75 - 125	0	30	
Iron	50.0	ND	*	mg/Kg		4	75 - 125	57	30	
Li	5.00	5.06	J	mg/Kg		101	75 - 125	7	30	
Manganese	5.00	4.64		mg/Kg		93	75 - 125	0	30	
Mo	25.0	21.2		mg/Kg		85	75 - 125	0	30	
Selenium	7.50	6.76		mg/Kg		90	75 - 125	2	30	
Thallium	20.0	18.8		mg/Kg		94	75 - 125	4	30	

Lab Sample ID: 140-15376-1 DU
Matrix: Solid
Analysis Batch: 30900

Client Sample ID: FGD-15 (25-27)
Prep Type: Step 2
Prep Batch: 30452

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	Limit
Antimony	ND		ND		mg/Kg	☼	NC	30
Arsenic	ND		ND		mg/Kg	☼	NC	30
Barium	ND	*	ND	*	mg/Kg	☼	NC	30
Beryllium	ND	*	ND	*	mg/Kg	☼	NC	30
Cobalt	ND		ND		mg/Kg	☼	NC	30
Iron	ND	*	ND	*	mg/Kg	☼	NC	30
Li	ND		ND		mg/Kg	☼	NC	30
Manganese	1.4	J	1.49	J	mg/Kg	☼	8	30
Mo	ND		ND		mg/Kg	☼	NC	30
Selenium	ND		ND		mg/Kg	☼	NC	30
Thallium	ND		ND		mg/Kg	☼	NC	30

Lab Sample ID: MB 140-30453/11-B
Matrix: Solid
Analysis Batch: 31197

Client Sample ID: Method Blank
Prep Type: Step 3
Prep Batch: 30480

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		3.0	0.28	mg/Kg		06/04/19 08:00	06/26/19 17:04	1
Arsenic	ND		0.50	0.13	mg/Kg		06/04/19 08:00	06/26/19 17:04	1
Barium	0.487	J	2.5	0.12	mg/Kg		06/04/19 08:00	06/26/19 17:04	1
Beryllium	ND		0.25	0.015	mg/Kg		06/04/19 08:00	06/26/19 17:04	1
Cobalt	ND		2.5	0.045	mg/Kg		06/04/19 08:00	06/26/19 17:04	1
Iron	ND		5.0	2.9	mg/Kg		06/04/19 08:00	06/26/19 17:04	1
Li	ND		2.5	0.15	mg/Kg		06/04/19 08:00	06/26/19 17:04	1
Manganese	0.0625	J	0.75	0.027	mg/Kg		06/04/19 08:00	06/26/19 17:04	1
Mo	ND		2.0	0.082	mg/Kg		06/04/19 08:00	06/26/19 17:04	1
Selenium	ND		0.50	0.17	mg/Kg		06/04/19 08:00	06/26/19 17:04	1
Thallium	ND		1.8	0.21	mg/Kg		06/04/19 08:00	06/26/19 17:04	1

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QC Sample Results

Client: Golder Associates Inc.
 Project/Site: Oak Grove FGD Ponds - 7-Step SEP Metals

Job ID: 140-15376-1

Method: 6010B SEP - SEP Metals (ICP) (Continued)

Lab Sample ID: LCS 140-30453/12-B
Matrix: Solid
Analysis Batch: 31197

Client Sample ID: Lab Control Sample
Prep Type: Step 3
Prep Batch: 30480

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Aluminum	100	95.1		mg/Kg		95	75 - 125
Antimony	25.0	24.2		mg/Kg		97	75 - 125
Arsenic	5.00	5.01		mg/Kg		100	75 - 125
Barium	5.00	4.36		mg/Kg		87	75 - 125
Beryllium	2.50	2.53		mg/Kg		101	75 - 125
Cobalt	5.00	4.87		mg/Kg		97	75 - 125
Iron	50.0	49.3		mg/Kg		99	75 - 125
Li	5.00	4.84		mg/Kg		97	75 - 125
Manganese	5.00	4.86		mg/Kg		97	75 - 125
Mo	25.0	24.5		mg/Kg		98	75 - 125
Selenium	7.50	7.45		mg/Kg		99	75 - 125
Thallium	20.0	20.0		mg/Kg		100	75 - 125

Lab Sample ID: LCSD 140-30453/13-B
Matrix: Solid
Analysis Batch: 31197

Client Sample ID: Lab Control Sample Dup
Prep Type: Step 3
Prep Batch: 30480

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Aluminum	100	98.4		mg/Kg		98	75 - 125	3	30
Antimony	25.0	25.0		mg/Kg		100	75 - 125	3	30
Arsenic	5.00	5.11		mg/Kg		102	75 - 125	2	30
Barium	5.00	4.42		mg/Kg		88	75 - 125	2	30
Beryllium	2.50	2.64		mg/Kg		106	75 - 125	4	30
Cobalt	5.00	4.99		mg/Kg		100	75 - 125	2	30
Iron	50.0	50.9		mg/Kg		102	75 - 125	3	30
Li	5.00	4.97		mg/Kg		99	75 - 125	3	30
Manganese	5.00	5.00		mg/Kg		100	75 - 125	3	30
Mo	25.0	25.2		mg/Kg		101	75 - 125	3	30
Selenium	7.50	7.80		mg/Kg		104	75 - 125	5	30
Thallium	20.0	20.7		mg/Kg		104	75 - 125	3	30

Lab Sample ID: 140-15376-1 DU
Matrix: Solid
Analysis Batch: 31197

Client Sample ID: FGD-15 (25-27)
Prep Type: Step 3
Prep Batch: 30480

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Aluminum	23		21.4		mg/Kg	☼	7	30
Antimony	ND		ND		mg/Kg	☼	NC	30
Arsenic	ND		ND		mg/Kg	☼	NC	30
Barium	1.4	J B	1.37	J	mg/Kg	☼	5	30
Beryllium	0.020	J	0.0202	J	mg/Kg	☼	3	30
Cobalt	0.63	J	0.599	J	mg/Kg	☼	4	30
Iron	58		54.6		mg/Kg	☼	6	30
Li	ND		ND		mg/Kg	☼	NC	30
Manganese	14	B	7.32	F3	mg/Kg	☼	63	30
Mo	ND		ND		mg/Kg	☼	NC	30
Selenium	ND		ND		mg/Kg	☼	NC	30
Thallium	ND		ND		mg/Kg	☼	NC	30

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QC Sample Results

Client: Golder Associates Inc.
 Project/Site: Oak Grove FGD Ponds - 7-Step SEP Metals

Job ID: 140-15376-1

Method: 6010B SEP - SEP Metals (ICP) (Continued)

Lab Sample ID: MB 140-30453/11-C
Matrix: Solid
Analysis Batch: 31812

Client Sample ID: Method Blank
Prep Type: Step 3
Prep Batch: 31696

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	ND		2.5	0.045	mg/Kg		07/16/19 08:00	07/17/19 10:47	1

Lab Sample ID: LCS 140-30453/12-C
Matrix: Solid
Analysis Batch: 31812

Client Sample ID: Lab Control Sample
Prep Type: Step 3
Prep Batch: 31696

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Cobalt	5.00	4.88		mg/Kg		98	75 - 125

Lab Sample ID: LCSD 140-30453/13-C
Matrix: Solid
Analysis Batch: 31812

Client Sample ID: Lab Control Sample Dup
Prep Type: Step 3
Prep Batch: 31696

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Cobalt	5.00	5.04		mg/Kg		101	75 - 125	3	30

Lab Sample ID: MB 140-30481/11-B
Matrix: Solid
Analysis Batch: 31197

Client Sample ID: Method Blank
Prep Type: Step 4
Prep Batch: 30528

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		10	1.6	mg/Kg		06/10/19 08:00	06/26/19 18:27	1
Antimony	ND		3.0	0.45	mg/Kg		06/10/19 08:00	06/26/19 18:27	1
Arsenic	0.220	J	0.50	0.22	mg/Kg		06/10/19 08:00	06/26/19 18:27	1
Barium	ND		2.5	0.12	mg/Kg		06/10/19 08:00	06/26/19 18:27	1
Beryllium	ND		0.25	0.016	mg/Kg		06/10/19 08:00	06/26/19 18:27	1
Cobalt	ND		2.5	0.053	mg/Kg		06/10/19 08:00	06/26/19 18:27	1
Iron	ND		5.0	2.9	mg/Kg		06/10/19 08:00	06/26/19 18:27	1
Li	ND		2.5	0.15	mg/Kg		06/10/19 08:00	06/26/19 18:27	1
Manganese	ND		0.75	0.13	mg/Kg		06/10/19 08:00	06/26/19 18:27	1
Mo	ND		2.0	0.082	mg/Kg		06/10/19 08:00	06/26/19 18:27	1
Selenium	0.473	J	0.50	0.47	mg/Kg		06/10/19 08:00	06/26/19 18:27	1
Thallium	ND		1.8	0.29	mg/Kg		06/10/19 08:00	06/26/19 18:27	1

Lab Sample ID: LCS 140-30481/12-B
Matrix: Solid
Analysis Batch: 31197

Client Sample ID: Lab Control Sample
Prep Type: Step 4
Prep Batch: 30528

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Aluminum	100	96.7		mg/Kg		97	75 - 125
Antimony	25.0	24.7		mg/Kg		99	75 - 125
Arsenic	5.00	5.37		mg/Kg		107	75 - 125
Barium	5.00	4.86		mg/Kg		97	75 - 125
Beryllium	2.50	2.61		mg/Kg		104	75 - 125
Cobalt	5.00	4.98		mg/Kg		100	75 - 125
Iron	50.0	50.1		mg/Kg		100	75 - 125
Li	5.00	5.01		mg/Kg		100	75 - 125
Manganese	5.00	4.99		mg/Kg		100	75 - 125
Mo	25.0	25.1		mg/Kg		100	75 - 125

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QC Sample Results

Client: Golder Associates Inc.
Project/Site: Oak Grove FGD Ponds - 7-Step SEP Metals

Job ID: 140-15376-1

Method: 6010B SEP - SEP Metals (ICP) (Continued)

Lab Sample ID: LCS 140-30481/12-B
Matrix: Solid
Analysis Batch: 31197

Client Sample ID: Lab Control Sample
Prep Type: Step 4
Prep Batch: 30528

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Selenium	7.50	0.489	J *	mg/Kg		7	75 - 125
Thallium	20.0	18.2		mg/Kg		91	75 - 125

Lab Sample ID: LCSD 140-30481/13-B
Matrix: Solid
Analysis Batch: 31197

Client Sample ID: Lab Control Sample Dup
Prep Type: Step 4
Prep Batch: 30528

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Aluminum	100	100		mg/Kg		100	75 - 125	4	30
Antimony	25.0	26.1		mg/Kg		104	75 - 125	5	30
Arsenic	5.00	5.60		mg/Kg		112	75 - 125	4	30
Barium	5.00	5.02		mg/Kg		100	75 - 125	3	30
Beryllium	2.50	2.71		mg/Kg		108	75 - 125	4	30
Cobalt	5.00	5.15		mg/Kg		103	75 - 125	3	30
Iron	50.0	51.4		mg/Kg		103	75 - 125	3	30
Li	5.00	5.15		mg/Kg		103	75 - 125	3	30
Manganese	5.00	5.14		mg/Kg		103	75 - 125	3	30
Mo	25.0	26.7		mg/Kg		107	75 - 125	6	30
Selenium	7.50	0.529	*	mg/Kg		7	75 - 125	8	30
Thallium	20.0	18.7		mg/Kg		94	75 - 125	3	30

Lab Sample ID: 140-15376-1 DU
Matrix: Solid
Analysis Batch: 31197

Client Sample ID: FGD-15 (25-27)
Prep Type: Step 4
Prep Batch: 30528

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Aluminum	600		659		mg/Kg	☼	9	30
Antimony	ND		ND		mg/Kg	☼	NC	30
Arsenic	0.64	J B	0.637	J	mg/Kg	☼	0.5	30
Barium	9.6		10.1		mg/Kg	☼	5	30
Beryllium	0.12	J	0.120	J	mg/Kg	☼	4	30
Cobalt	0.41	J	0.445	J	mg/Kg	☼	8	30
Iron	1400		1370		mg/Kg	☼	2	30
Li	0.93	J	1.11	J	mg/Kg	☼	18	30
Manganese	6.9		5.98		mg/Kg	☼	14	30
Mo	ND		ND		mg/Kg	☼	NC	30
Selenium	0.65	* B	0.697	*	mg/Kg	☼	8	30
Thallium	ND		ND		mg/Kg	☼	NC	30

Lab Sample ID: MB 140-30481/11-C
Matrix: Solid
Analysis Batch: 31812

Client Sample ID: Method Blank
Prep Type: Step 4
Prep Batch: 31697

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	ND		2.5	0.053	mg/Kg		07/16/19 08:00	07/17/19 11:02	1

QC Sample Results

Client: Golder Associates Inc.
 Project/Site: Oak Grove FGD Ponds - 7-Step SEP Metals

Job ID: 140-15376-1

Method: 6010B SEP - SEP Metals (ICP) (Continued)

Lab Sample ID: LCS 140-30481/12-C
Matrix: Solid
Analysis Batch: 31812

Client Sample ID: Lab Control Sample
Prep Type: Step 4
Prep Batch: 31697

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Cobalt	5.00	5.05		mg/Kg		101	75 - 125

Lab Sample ID: LCSD 140-30481/13-C
Matrix: Solid
Analysis Batch: 31812

Client Sample ID: Lab Control Sample Dup
Prep Type: Step 4
Prep Batch: 31697

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	Limit
Cobalt	5.00	5.21		mg/Kg		104	75 - 125	3	30

Lab Sample ID: MB 140-30529/11-B ^5
Matrix: Solid
Analysis Batch: 31197

Client Sample ID: Method Blank
Prep Type: Step 5
Prep Batch: 30726

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		150	24	mg/Kg		06/12/19 08:00	06/26/19 19:48	5
Antimony	ND		45	4.2	mg/Kg		06/12/19 08:00	06/26/19 19:48	5
Arsenic	ND		7.5	1.9	mg/Kg		06/12/19 08:00	06/26/19 19:48	5
Barium	ND		38	1.8	mg/Kg		06/12/19 08:00	06/26/19 19:48	5
Beryllium	ND		3.8	0.32	mg/Kg		06/12/19 08:00	06/26/19 19:48	5
Cobalt	ND		38	0.60	mg/Kg		06/12/19 08:00	06/26/19 19:48	5
Iron	ND		75	44	mg/Kg		06/12/19 08:00	06/26/19 19:48	5
Li	ND		38	2.2	mg/Kg		06/12/19 08:00	06/26/19 19:48	5
Manganese	ND		11	1.9	mg/Kg		06/12/19 08:00	06/26/19 19:48	5
Mo	ND		30	1.3	mg/Kg		06/12/19 08:00	06/26/19 19:48	5
Selenium	ND		7.5	2.6	mg/Kg		06/12/19 08:00	06/26/19 19:48	5
Thallium	ND		26	3.5	mg/Kg		06/12/19 08:00	06/26/19 19:48	5

Lab Sample ID: LCS 140-30529/12-B ^5
Matrix: Solid
Analysis Batch: 31197

Client Sample ID: Lab Control Sample
Prep Type: Step 5
Prep Batch: 30726

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Aluminum	300	30.0	J *	mg/Kg		10	75 - 125
Antimony	75.0	85.8		mg/Kg		114	75 - 125
Arsenic	15.0	12.7		mg/Kg		85	75 - 125
Barium	15.0	8.33	J *	mg/Kg		56	75 - 125
Beryllium	7.50	4.27	*	mg/Kg		57	75 - 125
Cobalt	15.0	5.06	J *	mg/Kg		34	75 - 125
Iron	150	ND	*	mg/Kg		0.4	75 - 125
Li	15.0	16.5	J	mg/Kg		110	75 - 125
Manganese	15.0	3.17	J *	mg/Kg		21	75 - 125
Mo	75.0	63.7		mg/Kg		85	75 - 125
Selenium	22.5	26.1		mg/Kg		116	75 - 125
Thallium	60.0	25.2	J *	mg/Kg		42	75 - 125

QC Sample Results

Client: Golder Associates Inc.
Project/Site: Oak Grove FGD Ponds - 7-Step SEP Metals

Job ID: 140-15376-1

Method: 6010B SEP - SEP Metals (ICP) (Continued)

Lab Sample ID: LCSD 140-30529/13-B ^5
Matrix: Solid
Analysis Batch: 31197

Client Sample ID: Lab Control Sample Dup
Prep Type: Step 5
Prep Batch: 30726

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	
								RPD	Limit
Aluminum	300	ND	*	mg/Kg		6	75 - 125	43	30
Antimony	75.0	85.4		mg/Kg		114	75 - 125	0	30
Arsenic	15.0	12.5		mg/Kg		84	75 - 125	2	30
Barium	15.0	8.04	J *	mg/Kg		54	75 - 125	3	30
Beryllium	7.50	4.25	*	mg/Kg		57	75 - 125	0	30
Cobalt	15.0	4.94	J *	mg/Kg		33	75 - 125	2	30
Iron	150	ND	*	mg/Kg		1	75 - 125	103	30
Li	15.0	17.4	J	mg/Kg		116	75 - 125	5	30
Manganese	15.0	4.43	J *	mg/Kg		30	75 - 125	33	30
Mo	75.0	64.0		mg/Kg		85	75 - 125	0	30
Selenium	22.5	27.5		mg/Kg		122	75 - 125	5	30
Thallium	60.0	26.1	*	mg/Kg		44	75 - 125	3	30

Lab Sample ID: 140-15376-1 DU
Matrix: Solid
Analysis Batch: 31197

Client Sample ID: FGD-15 (25-27)
Prep Type: Step 5
Prep Batch: 30726

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD	
								RPD	Limit
Aluminum	67	J *	61.2	J *	mg/Kg	☼	10		30
Antimony	ND		ND		mg/Kg	☼	NC		30
Arsenic	ND		ND		mg/Kg	☼	NC		30
Barium	ND	*	ND	*	mg/Kg	☼	NC		30
Beryllium	ND	*	ND	*	mg/Kg	☼	NC		30
Cobalt	ND	*	ND	*	mg/Kg	☼	NC		30
Iron	ND	*	ND	*	mg/Kg	☼	NC		30
Li	ND		ND		mg/Kg	☼	NC		30
Manganese	ND	*	ND	*	mg/Kg	☼	NC		30
Mo	ND		ND		mg/Kg	☼	NC		30
Selenium	ND		ND		mg/Kg	☼	NC		30
Thallium	ND	*	ND	*	mg/Kg	☼	NC		30

Lab Sample ID: MB 140-30781/11-A
Matrix: Solid
Analysis Batch: 31197

Client Sample ID: Method Blank
Prep Type: Step 6
Prep Batch: 30781

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		3.0	0.28	mg/Kg		06/15/19 08:00	06/26/19 21:23	1
Arsenic	ND		0.50	0.15	mg/Kg		06/15/19 08:00	06/26/19 21:23	1
Barium	ND		2.5	0.12	mg/Kg		06/15/19 08:00	06/26/19 21:23	1
Beryllium	ND		0.25	0.012	mg/Kg		06/15/19 08:00	06/26/19 21:23	1
Cobalt	ND		2.5	0.046	mg/Kg		06/15/19 08:00	06/26/19 21:23	1
Iron	ND		5.0	2.9	mg/Kg		06/15/19 08:00	06/26/19 21:23	1
Li	ND		2.5	0.15	mg/Kg		06/15/19 08:00	06/26/19 21:23	1
Manganese	ND		0.75	0.25	mg/Kg		06/15/19 08:00	06/26/19 21:23	1
Mo	ND		2.0	0.099	mg/Kg		06/15/19 08:00	06/26/19 21:23	1
Selenium	ND		0.50	0.17	mg/Kg		06/15/19 08:00	06/26/19 21:23	1
Thallium	ND		1.8	0.21	mg/Kg		06/15/19 08:00	06/26/19 21:23	1

Eurofins TestAmerica, Knoxville

QC Sample Results

Client: Golder Associates Inc.
Project/Site: Oak Grove FGD Ponds - 7-Step SEP Metals

Job ID: 140-15376-1

Method: 6010B SEP - SEP Metals (ICP) (Continued)

Lab Sample ID: LCS 140-30781/12-A
Matrix: Solid
Analysis Batch: 31197

Client Sample ID: Lab Control Sample
Prep Type: Step 6
Prep Batch: 30781

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Aluminum	100	97.3		mg/Kg		97	75 - 125
Antimony	25.0	25.0		mg/Kg		100	75 - 125
Arsenic	5.00	5.14		mg/Kg		103	75 - 125
Barium	5.00	4.63		mg/Kg		93	75 - 125
Beryllium	2.50	2.59		mg/Kg		104	75 - 125
Cobalt	5.00	4.78		mg/Kg		96	75 - 125
Iron	50.0	49.6		mg/Kg		99	75 - 125
Li	5.00	4.67		mg/Kg		93	75 - 125
Manganese	5.00	4.87		mg/Kg		97	75 - 125
Mo	25.0	24.3		mg/Kg		97	75 - 125
Selenium	7.50	7.24		mg/Kg		97	75 - 125
Thallium	20.0	19.7		mg/Kg		99	75 - 125

Lab Sample ID: LCSD 140-30781/13-A
Matrix: Solid
Analysis Batch: 31197

Client Sample ID: Lab Control Sample Dup
Prep Type: Step 6
Prep Batch: 30781

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Aluminum	100	103		mg/Kg		103	75 - 125	5	30
Antimony	25.0	26.5		mg/Kg		106	75 - 125	6	30
Arsenic	5.00	5.49		mg/Kg		110	75 - 125	7	30
Barium	5.00	4.90		mg/Kg		98	75 - 125	6	30
Beryllium	2.50	2.76		mg/Kg		110	75 - 125	6	30
Cobalt	5.00	5.04		mg/Kg		101	75 - 125	5	30
Iron	50.0	52.4		mg/Kg		105	75 - 125	5	30
Li	5.00	4.93		mg/Kg		99	75 - 125	5	30
Manganese	5.00	5.14		mg/Kg		103	75 - 125	5	30
Mo	25.0	25.7		mg/Kg		103	75 - 125	6	30
Selenium	7.50	7.77		mg/Kg		104	75 - 125	7	30
Thallium	20.0	20.7		mg/Kg		104	75 - 125	5	30

Lab Sample ID: 140-15376-1 DU
Matrix: Solid
Analysis Batch: 31197

Client Sample ID: FGD-15 (25-27)
Prep Type: Step 6
Prep Batch: 30781

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Aluminum	1200		1360		mg/Kg	☼	9	30
Antimony	ND		ND		mg/Kg	☼	NC	30
Arsenic	0.62	J	0.568	J	mg/Kg	☼	9	30
Barium	6.0		6.53		mg/Kg	☼	8	30
Beryllium	0.053	J	0.0522	J	mg/Kg	☼	1	30
Cobalt	0.27	J	0.286	J	mg/Kg	☼	8	30
Iron	1100		1090		mg/Kg	☼	2	30
Li	0.93	J	0.902	J	mg/Kg	☼	3	30
Manganese	10		10.8		mg/Kg	☼	5	30
Mo	ND		ND		mg/Kg	☼	NC	30
Selenium	ND		ND		mg/Kg	☼	NC	30
Thallium	ND		ND		mg/Kg	☼	NC	30

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QC Sample Results

Client: Golder Associates Inc.
Project/Site: Oak Grove FGD Ponds - 7-Step SEP Metals

Job ID: 140-15376-1

Method: 6010B SEP - SEP Metals (ICP) (Continued)

Lab Sample ID: MB 140-30852/11-A
Matrix: Solid
Analysis Batch: 31255

Client Sample ID: Method Blank
Prep Type: Step 7
Prep Batch: 30852

Analyte	MB	MB	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Aluminum	ND		10	1.6	mg/Kg		06/16/19 08:00	06/28/19 12:11	1
Antimony	ND		3.0	0.14	mg/Kg		06/16/19 08:00	06/28/19 12:11	1
Arsenic	ND		0.50	0.13	mg/Kg		06/16/19 08:00	06/28/19 12:11	1
Barium	ND		2.5	0.12	mg/Kg		06/16/19 08:00	06/28/19 12:11	1
Beryllium	ND		0.25	0.0075	mg/Kg		06/16/19 08:00	06/28/19 12:11	1
Cobalt	ND		2.5	0.15	mg/Kg		06/16/19 08:00	06/28/19 12:11	1
Iron	ND		5.0	4.1	mg/Kg		06/16/19 08:00	06/28/19 12:11	1
Li	ND		2.5	0.15	mg/Kg		06/16/19 08:00	06/28/19 12:11	1
Manganese	0.0585	J	0.75	0.052	mg/Kg		06/16/19 08:00	06/28/19 12:11	1
Mo	ND		2.0	0.082	mg/Kg		06/16/19 08:00	06/28/19 12:11	1
Selenium	ND		0.50	0.17	mg/Kg		06/16/19 08:00	06/28/19 12:11	1
Thallium	ND		1.8	0.18	mg/Kg		06/16/19 08:00	06/28/19 12:11	1

Lab Sample ID: LCS 140-30852/12-A
Matrix: Solid
Analysis Batch: 31255

Client Sample ID: Lab Control Sample
Prep Type: Step 7
Prep Batch: 30852

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec.	
							Limits	
Aluminum	100	96.0		mg/Kg		96	75 - 125	
Antimony	25.0	25.5		mg/Kg		102	75 - 125	
Arsenic	5.00	5.23		mg/Kg		105	75 - 125	
Barium	5.00	5.07		mg/Kg		101	75 - 125	
Beryllium	2.50	2.50		mg/Kg		100	75 - 125	
Cobalt	5.00	5.26		mg/Kg		105	75 - 125	
Iron	50.0	51.1		mg/Kg		102	75 - 125	
Li	5.00	5.34		mg/Kg		107	75 - 125	
Manganese	5.00	5.28		mg/Kg		106	75 - 125	
Mo	25.0	26.6		mg/Kg		106	75 - 125	
Selenium	7.50	7.39		mg/Kg		98	75 - 125	
Thallium	20.0	21.5		mg/Kg		108	75 - 125	

Lab Sample ID: LCSD 140-30852/13-A
Matrix: Solid
Analysis Batch: 31255

Client Sample ID: Lab Control Sample Dup
Prep Type: Step 7
Prep Batch: 30852

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec.		RPD	
							Limits		RPD	Limit
Aluminum	100	95.8		mg/Kg		96	75 - 125	0	30	
Antimony	25.0	25.6		mg/Kg		102	75 - 125	0	30	
Arsenic	5.00	5.24		mg/Kg		105	75 - 125	0	30	
Barium	5.00	5.13		mg/Kg		103	75 - 125	1	30	
Beryllium	2.50	2.51		mg/Kg		100	75 - 125	0	30	
Cobalt	5.00	5.29		mg/Kg		106	75 - 125	1	30	
Iron	50.0	51.1		mg/Kg		102	75 - 125	0	30	
Li	5.00	5.47		mg/Kg		109	75 - 125	2	30	
Manganese	5.00	5.42		mg/Kg		108	75 - 125	3	30	
Mo	25.0	26.8		mg/Kg		107	75 - 125	1	30	
Selenium	7.50	7.49		mg/Kg		100	75 - 125	1	30	
Thallium	20.0	21.6		mg/Kg		108	75 - 125	0	30	

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QC Sample Results

Client: Golder Associates Inc.
 Project/Site: Oak Grove FGD Ponds - 7-Step SEP Metals

Job ID: 140-15376-1

Method: 6010B SEP - SEP Metals (ICP) (Continued)

Lab Sample ID: 140-15376-1 DU
Matrix: Solid
Analysis Batch: 31255

Client Sample ID: FGD-15 (25-27)
Prep Type: Step 7
Prep Batch: 30852

Analyte	Sample	Sample	DU	DU	Unit	D	RPD	RPD	Limit
	Result	Qualifier	Result	Qualifier					
Antimony	ND		ND		mg/Kg	☼		NC	30
Beryllium	0.48		0.502		mg/Kg	☼		5	30
Iron	2900		3090		mg/Kg	☼		5	30
Li	7.0		8.01		mg/Kg	☼		13	30
Manganese	54	B	51.4		mg/Kg	☼		6	30
Mo	0.11	J	ND		mg/Kg	☼		NC	30

Lab Sample ID: 140-15376-1 DU
Matrix: Solid
Analysis Batch: 31255

Client Sample ID: FGD-15 (25-27)
Prep Type: Step 7
Prep Batch: 30852

Analyte	Sample	Sample	DU	DU	Unit	D	RPD	RPD	Limit
	Result	Qualifier	Result	Qualifier					
Aluminum	28000		35200		mg/Kg	☼		23	30
Barium	510		545		mg/Kg	☼		6	30

Lab Sample ID: 140-15376-1 DU
Matrix: Solid
Analysis Batch: 31255

Client Sample ID: FGD-15 (25-27)
Prep Type: Step 7
Prep Batch: 30852

Analyte	Sample	Sample	DU	DU	Unit	D	RPD	RPD	Limit
	Result	Qualifier	Result	Qualifier					
Arsenic	0.90	J	0.478	J F5	mg/Kg	☼		61	30
Cobalt	0.48	J	0.509	J	mg/Kg	☼		7	30
Selenium	ND		ND		mg/Kg	☼		NC	30
Thallium	0.59	J	0.828	J F5	mg/Kg	☼		34	30

Method: 7470A - SEP Mercury (CVAA) - Total

Lab Sample ID: MB 140-30373/11-B
Matrix: Solid
Analysis Batch: 30491

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 30373

Analyte	MB	MB	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Hg	ND		0.10	0.040	mg/Kg		05/30/19 08:00	06/03/19 14:34	1

Lab Sample ID: LCS 140-30373/12-B
Matrix: Solid
Analysis Batch: 30491

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 30373

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits

Lab Sample ID: LCSD 140-30373/13-B
Matrix: Solid
Analysis Batch: 30491

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 30373

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	Limit

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QC Sample Results

Client: Golder Associates Inc.
 Project/Site: Oak Grove FGD Ponds - 7-Step SEP Metals

Job ID: 140-15376-1

Method: 7470A - SEP Mercury (CVAA) - Total (Continued)

Lab Sample ID: 140-15376-A-1-J DU
Matrix: Solid
Analysis Batch: 30491

Client Sample ID: 140-15376-A-1-J DU
Prep Type: Total/NA
Prep Batch: 30373

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Hg	ND		ND		mg/Kg	✪	NC	30

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12

QC Association Summary

Client: Golder Associates Inc.
 Project/Site: Oak Grove FGD Ponds - 7-Step SEP Metals

Job ID: 140-15376-1

Metals

Prep Batch: 30373

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-15376-1	FGD-15 (25-27)	Total/NA	Solid	Total	
140-15376-2	FGD-16 (30-32)	Total/NA	Solid	Total	
140-15376-3	FGD-2019-1 (23-25)	Total/NA	Solid	Total	
MB 140-30373/11-A	Method Blank	Total/NA	Solid	Total	
MB 140-30373/11-B	Method Blank	Total/NA	Solid	Total	
LCS 140-30373/12-A	Lab Control Sample	Total/NA	Solid	Total	
LCS 140-30373/12-B	Lab Control Sample	Total/NA	Solid	Total	
LCSD 140-30373/13-A	Lab Control Sample Dup	Total/NA	Solid	Total	
LCSD 140-30373/13-B	Lab Control Sample Dup	Total/NA	Solid	Total	
140-15376-1 DU	FGD-15 (25-27)	Total/NA	Solid	Total	
140-15376-A-1-J DU	140-15376-A-1-J DU	Total/NA	Solid	Total	

SEP Batch: 30374

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-15376-1	FGD-15 (25-27)	Step 1	Solid	Exchangeable	
140-15376-2	FGD-16 (30-32)	Step 1	Solid	Exchangeable	
140-15376-3	FGD-2019-1 (23-25)	Step 1	Solid	Exchangeable	
MB 140-30374/11-B ^4	Method Blank	Step 1	Solid	Exchangeable	
LCS 140-30374/12-B ^5	Lab Control Sample	Step 1	Solid	Exchangeable	
LCSD 140-30374/13-B ^5	Lab Control Sample Dup	Step 1	Solid	Exchangeable	
140-15376-1 DU	FGD-15 (25-27)	Step 1	Solid	Exchangeable	

Prep Batch: 30422

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-15376-1	FGD-15 (25-27)	Step 1	Solid	3010A	30374
140-15376-2	FGD-16 (30-32)	Step 1	Solid	3010A	30374
140-15376-3	FGD-2019-1 (23-25)	Step 1	Solid	3010A	30374
MB 140-30374/11-B ^4	Method Blank	Step 1	Solid	3010A	30374
LCS 140-30374/12-B ^5	Lab Control Sample	Step 1	Solid	3010A	30374
LCSD 140-30374/13-B ^5	Lab Control Sample Dup	Step 1	Solid	3010A	30374
140-15376-1 DU	FGD-15 (25-27)	Step 1	Solid	3010A	30374

SEP Batch: 30423

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-15376-1	FGD-15 (25-27)	Step 2	Solid	Carbonate	
140-15376-2	FGD-16 (30-32)	Step 2	Solid	Carbonate	
140-15376-3	FGD-2019-1 (23-25)	Step 2	Solid	Carbonate	
MB 140-30423/11-B ^3	Method Blank	Step 2	Solid	Carbonate	
LCS 140-30423/12-B ^5	Lab Control Sample	Step 2	Solid	Carbonate	
LCSD 140-30423/13-B ^5	Lab Control Sample Dup	Step 2	Solid	Carbonate	
140-15376-1 DU	FGD-15 (25-27)	Step 2	Solid	Carbonate	

Prep Batch: 30447

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-15376-2	FGD-16 (30-32)	Total/NA	Solid	7470A	30373
140-15376-3	FGD-2019-1 (23-25)	Total/NA	Solid	7470A	30373
MB 140-30373/11-B	Method Blank	Total/NA	Solid	7470A	30373
LCS 140-30373/12-B	Lab Control Sample	Total/NA	Solid	7470A	30373
LCSD 140-30373/13-B	Lab Control Sample Dup	Total/NA	Solid	7470A	30373
140-15376-A-1-J DU	140-15376-A-1-J DU	Total/NA	Solid	7470A	30373

QC Association Summary

Client: Golder Associates Inc.
 Project/Site: Oak Grove FGD Ponds - 7-Step SEP Metals

Job ID: 140-15376-1

Metals

Prep Batch: 30452

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-15376-1	FGD-15 (25-27)	Step 2	Solid	3010A	30423
140-15376-2	FGD-16 (30-32)	Step 2	Solid	3010A	30423
140-15376-3	FGD-2019-1 (23-25)	Step 2	Solid	3010A	30423
MB 140-30423/11-B ^3	Method Blank	Step 2	Solid	3010A	30423
LCS 140-30423/12-B ^5	Lab Control Sample	Step 2	Solid	3010A	30423
LCSD 140-30423/13-B ^5	Lab Control Sample Dup	Step 2	Solid	3010A	30423
140-15376-1 DU	FGD-15 (25-27)	Step 2	Solid	3010A	30423

SEP Batch: 30453

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-15376-1	FGD-15 (25-27)	Step 3	Solid	Non-Crystalline	
140-15376-2	FGD-16 (30-32)	Step 3	Solid	Non-Crystalline	
140-15376-3	FGD-2019-1 (23-25)	Step 3	Solid	Non-Crystalline	
MB 140-30453/11-B	Method Blank	Step 3	Solid	Non-Crystalline	
MB 140-30453/11-C	Method Blank	Step 3	Solid	Non-Crystalline	
LCS 140-30453/12-B	Lab Control Sample	Step 3	Solid	Non-Crystalline	
LCS 140-30453/12-C	Lab Control Sample	Step 3	Solid	Non-Crystalline	
LCSD 140-30453/13-B	Lab Control Sample Dup	Step 3	Solid	Non-Crystalline	
LCSD 140-30453/13-C	Lab Control Sample Dup	Step 3	Solid	Non-Crystalline	
140-15376-1 DU	FGD-15 (25-27)	Step 3	Solid	Non-Crystalline	

Prep Batch: 30480

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-15376-1	FGD-15 (25-27)	Step 3	Solid	3010A	30453
140-15376-2	FGD-16 (30-32)	Step 3	Solid	3010A	30453
140-15376-3	FGD-2019-1 (23-25)	Step 3	Solid	3010A	30453
MB 140-30453/11-B	Method Blank	Step 3	Solid	3010A	30453
LCS 140-30453/12-B	Lab Control Sample	Step 3	Solid	3010A	30453
LCSD 140-30453/13-B	Lab Control Sample Dup	Step 3	Solid	3010A	30453
140-15376-1 DU	FGD-15 (25-27)	Step 3	Solid	3010A	30453

SEP Batch: 30481

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-15376-1	FGD-15 (25-27)	Step 4	Solid	Metal Hydroxide	
140-15376-2	FGD-16 (30-32)	Step 4	Solid	Metal Hydroxide	
140-15376-3	FGD-2019-1 (23-25)	Step 4	Solid	Metal Hydroxide	
MB 140-30481/11-B	Method Blank	Step 4	Solid	Metal Hydroxide	
MB 140-30481/11-C	Method Blank	Step 4	Solid	Metal Hydroxide	
LCS 140-30481/12-B	Lab Control Sample	Step 4	Solid	Metal Hydroxide	
LCS 140-30481/12-C	Lab Control Sample	Step 4	Solid	Metal Hydroxide	
LCSD 140-30481/13-B	Lab Control Sample Dup	Step 4	Solid	Metal Hydroxide	
LCSD 140-30481/13-C	Lab Control Sample Dup	Step 4	Solid	Metal Hydroxide	
140-15376-1 DU	FGD-15 (25-27)	Step 4	Solid	Metal Hydroxide	

Analysis Batch: 30491

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-15376-2	FGD-16 (30-32)	Total/NA	Solid	7470A	30447
140-15376-3	FGD-2019-1 (23-25)	Total/NA	Solid	7470A	30447
MB 140-30373/11-B	Method Blank	Total/NA	Solid	7470A	30447
LCS 140-30373/12-B	Lab Control Sample	Total/NA	Solid	7470A	30447
LCSD 140-30373/13-B	Lab Control Sample Dup	Total/NA	Solid	7470A	30447

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QC Association Summary

Client: Golder Associates Inc.
Project/Site: Oak Grove FGD Ponds - 7-Step SEP Metals

Job ID: 140-15376-1

Metals (Continued)

Analysis Batch: 30491 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-15376-A-1-J DU	140-15376-A-1-J DU	Total/NA	Solid	7470A	30447

Prep Batch: 30528

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-15376-1	FGD-15 (25-27)	Step 4	Solid	3010A	30481
140-15376-2	FGD-16 (30-32)	Step 4	Solid	3010A	30481
140-15376-3	FGD-2019-1 (23-25)	Step 4	Solid	3010A	30481
MB 140-30481/11-B	Method Blank	Step 4	Solid	3010A	30481
LCS 140-30481/12-B	Lab Control Sample	Step 4	Solid	3010A	30481
LCSD 140-30481/13-B	Lab Control Sample Dup	Step 4	Solid	3010A	30481
140-15376-1 DU	FGD-15 (25-27)	Step 4	Solid	3010A	30481

SEP Batch: 30529

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-15376-1	FGD-15 (25-27)	Step 5	Solid	Organic-Bound	
140-15376-2	FGD-16 (30-32)	Step 5	Solid	Organic-Bound	
140-15376-3	FGD-2019-1 (23-25)	Step 5	Solid	Organic-Bound	
MB 140-30529/11-B ^5	Method Blank	Step 5	Solid	Organic-Bound	
LCS 140-30529/12-B ^5	Lab Control Sample	Step 5	Solid	Organic-Bound	
LCSD 140-30529/13-B ^5	Lab Control Sample Dup	Step 5	Solid	Organic-Bound	
140-15376-1 DU	FGD-15 (25-27)	Step 5	Solid	Organic-Bound	

Prep Batch: 30726

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-15376-1	FGD-15 (25-27)	Step 5	Solid	3010A	30529
140-15376-2	FGD-16 (30-32)	Step 5	Solid	3010A	30529
140-15376-3	FGD-2019-1 (23-25)	Step 5	Solid	3010A	30529
MB 140-30529/11-B ^5	Method Blank	Step 5	Solid	3010A	30529
LCS 140-30529/12-B ^5	Lab Control Sample	Step 5	Solid	3010A	30529
LCSD 140-30529/13-B ^5	Lab Control Sample Dup	Step 5	Solid	3010A	30529
140-15376-1 DU	FGD-15 (25-27)	Step 5	Solid	3010A	30529

SEP Batch: 30781

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-15376-1	FGD-15 (25-27)	Step 6	Solid	Acid/Sulfide	
140-15376-2	FGD-16 (30-32)	Step 6	Solid	Acid/Sulfide	
140-15376-3	FGD-2019-1 (23-25)	Step 6	Solid	Acid/Sulfide	
MB 140-30781/11-A	Method Blank	Step 6	Solid	Acid/Sulfide	
LCS 140-30781/12-A	Lab Control Sample	Step 6	Solid	Acid/Sulfide	
LCSD 140-30781/13-A	Lab Control Sample Dup	Step 6	Solid	Acid/Sulfide	
140-15376-1 DU	FGD-15 (25-27)	Step 6	Solid	Acid/Sulfide	

Prep Batch: 30852

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-15376-1	FGD-15 (25-27)	Step 7	Solid	Residual	
140-15376-2	FGD-16 (30-32)	Step 7	Solid	Residual	
140-15376-3	FGD-2019-1 (23-25)	Step 7	Solid	Residual	
MB 140-30852/11-A	Method Blank	Step 7	Solid	Residual	
LCS 140-30852/12-A	Lab Control Sample	Step 7	Solid	Residual	
LCSD 140-30852/13-A	Lab Control Sample Dup	Step 7	Solid	Residual	
140-15376-1 DU	FGD-15 (25-27)	Step 7	Solid	Residual	

Eurofins TestAmerica, Knoxville

QC Association Summary

Client: Golder Associates Inc.
 Project/Site: Oak Grove FGD Ponds - 7-Step SEP Metals

Job ID: 140-15376-1

Metals

Prep Batch: 30853

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-15376-1	FGD-15 (25-27)	Total/NA	Solid	3050B	
140-15376-2	FGD-16 (30-32)	Total/NA	Solid	3050B	
140-15376-3	FGD-2019-1 (23-25)	Total/NA	Solid	3050B	
MB 140-30853/8-A	Method Blank	Total/NA	Solid	3050B	
LCS 140-30853/9-A	Lab Control Sample	Total/NA	Solid	3050B	
140-15376-1 MS	FGD-15 (25-27)	Total/NA	Solid	3050B	
140-15376-1 MSD	FGD-15 (25-27)	Total/NA	Solid	3050B	

Analysis Batch: 30900

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-15376-1	FGD-15 (25-27)	Step 1	Solid	6010B SEP	30422
140-15376-1	FGD-15 (25-27)	Step 2	Solid	6010B SEP	30452
140-15376-1	FGD-15 (25-27)	Total/NA	Solid	6010B	30853
140-15376-2	FGD-16 (30-32)	Step 1	Solid	6010B SEP	30422
140-15376-2	FGD-16 (30-32)	Step 2	Solid	6010B SEP	30452
140-15376-2	FGD-16 (30-32)	Total/NA	Solid	6010B	30853
140-15376-3	FGD-2019-1 (23-25)	Step 1	Solid	6010B SEP	30422
140-15376-3	FGD-2019-1 (23-25)	Step 2	Solid	6010B SEP	30452
140-15376-3	FGD-2019-1 (23-25)	Total/NA	Solid	6010B	30853
MB 140-30374/11-B ^4	Method Blank	Step 1	Solid	6010B SEP	30422
MB 140-30423/11-B ^3	Method Blank	Step 2	Solid	6010B SEP	30452
MB 140-30853/8-A	Method Blank	Total/NA	Solid	6010B	30853
LCS 140-30374/12-B ^5	Lab Control Sample	Step 1	Solid	6010B SEP	30422
LCS 140-30423/12-B ^5	Lab Control Sample	Step 2	Solid	6010B SEP	30452
LCS 140-30853/9-A	Lab Control Sample	Total/NA	Solid	6010B	30853
LCSD 140-30374/13-B ^5	Lab Control Sample Dup	Step 1	Solid	6010B SEP	30422
LCSD 140-30423/13-B ^5	Lab Control Sample Dup	Step 2	Solid	6010B SEP	30452
140-15376-1 MS	FGD-15 (25-27)	Total/NA	Solid	6010B	30853
140-15376-1 MSD	FGD-15 (25-27)	Total/NA	Solid	6010B	30853
140-15376-1 DU	FGD-15 (25-27)	Step 1	Solid	6010B SEP	30422
140-15376-1 DU	FGD-15 (25-27)	Step 2	Solid	6010B SEP	30452

Analysis Batch: 31197

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-15376-1	FGD-15 (25-27)	Step 3	Solid	6010B SEP	30480
140-15376-1	FGD-15 (25-27)	Step 4	Solid	6010B SEP	30528
140-15376-1	FGD-15 (25-27)	Step 5	Solid	6010B SEP	30726
140-15376-1	FGD-15 (25-27)	Step 6	Solid	6010B SEP	30781
140-15376-2	FGD-16 (30-32)	Step 3	Solid	6010B SEP	30480
140-15376-2	FGD-16 (30-32)	Step 4	Solid	6010B SEP	30528
140-15376-2	FGD-16 (30-32)	Step 5	Solid	6010B SEP	30726
140-15376-2	FGD-16 (30-32)	Step 6	Solid	6010B SEP	30781
140-15376-3	FGD-2019-1 (23-25)	Step 3	Solid	6010B SEP	30480
140-15376-3	FGD-2019-1 (23-25)	Step 4	Solid	6010B SEP	30528
140-15376-3	FGD-2019-1 (23-25)	Step 5	Solid	6010B SEP	30726
140-15376-3	FGD-2019-1 (23-25)	Step 6	Solid	6010B SEP	30781
MB 140-30453/11-B	Method Blank	Step 3	Solid	6010B SEP	30480
MB 140-30481/11-B	Method Blank	Step 4	Solid	6010B SEP	30528
MB 140-30529/11-B ^5	Method Blank	Step 5	Solid	6010B SEP	30726
MB 140-30781/11-A	Method Blank	Step 6	Solid	6010B SEP	30781
LCS 140-30453/12-B	Lab Control Sample	Step 3	Solid	6010B SEP	30480

Eurofins TestAmerica, Knoxville

QC Association Summary

Client: Golder Associates Inc.
Project/Site: Oak Grove FGD Ponds - 7-Step SEP Metals

Job ID: 140-15376-1

Metals (Continued)

Analysis Batch: 31197 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 140-30481/12-B	Lab Control Sample	Step 4	Solid	6010B SEP	30528
LCS 140-30529/12-B ^5	Lab Control Sample	Step 5	Solid	6010B SEP	30726
LCS 140-30781/12-A	Lab Control Sample	Step 6	Solid	6010B SEP	30781
LCSD 140-30453/13-B	Lab Control Sample Dup	Step 3	Solid	6010B SEP	30480
LCSD 140-30481/13-B	Lab Control Sample Dup	Step 4	Solid	6010B SEP	30528
LCSD 140-30529/13-B ^5	Lab Control Sample Dup	Step 5	Solid	6010B SEP	30726
LCSD 140-30781/13-A	Lab Control Sample Dup	Step 6	Solid	6010B SEP	30781
140-15376-1 DU	FGD-15 (25-27)	Step 3	Solid	6010B SEP	30480
140-15376-1 DU	FGD-15 (25-27)	Step 4	Solid	6010B SEP	30528
140-15376-1 DU	FGD-15 (25-27)	Step 5	Solid	6010B SEP	30726
140-15376-1 DU	FGD-15 (25-27)	Step 6	Solid	6010B SEP	30781

Analysis Batch: 31255

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-15376-1	FGD-15 (25-27)	Step 7	Solid	6010B SEP	30852
140-15376-1	FGD-15 (25-27)	Step 7	Solid	6010B SEP	30852
140-15376-1	FGD-15 (25-27)	Step 7	Solid	6010B SEP	30852
140-15376-1	FGD-15 (25-27)	Total/NA	Solid	6010B	30373
140-15376-1	FGD-15 (25-27)	Total/NA	Solid	6010B	30373
140-15376-1	FGD-15 (25-27)	Total/NA	Solid	6010B	30373
140-15376-2	FGD-16 (30-32)	Step 7	Solid	6010B SEP	30852
140-15376-2	FGD-16 (30-32)	Step 7	Solid	6010B SEP	30852
140-15376-2	FGD-16 (30-32)	Step 7	Solid	6010B SEP	30852
140-15376-2	FGD-16 (30-32)	Total/NA	Solid	6010B	30373
140-15376-2	FGD-16 (30-32)	Total/NA	Solid	6010B	30373
140-15376-2	FGD-16 (30-32)	Total/NA	Solid	6010B	30373
140-15376-3	FGD-2019-1 (23-25)	Step 7	Solid	6010B SEP	30852
140-15376-3	FGD-2019-1 (23-25)	Step 7	Solid	6010B SEP	30852
140-15376-3	FGD-2019-1 (23-25)	Step 7	Solid	6010B SEP	30852
140-15376-3	FGD-2019-1 (23-25)	Total/NA	Solid	6010B	30373
140-15376-3	FGD-2019-1 (23-25)	Total/NA	Solid	6010B	30373
140-15376-3	FGD-2019-1 (23-25)	Total/NA	Solid	6010B	30373
MB 140-30373/11-A	Method Blank	Total/NA	Solid	6010B	30373
MB 140-30852/11-A	Method Blank	Step 7	Solid	6010B SEP	30852
LCS 140-30373/12-A	Lab Control Sample	Total/NA	Solid	6010B	30373
LCS 140-30852/12-A	Lab Control Sample	Step 7	Solid	6010B SEP	30852
LCSD 140-30373/13-A	Lab Control Sample Dup	Total/NA	Solid	6010B	30373
LCSD 140-30852/13-A	Lab Control Sample Dup	Step 7	Solid	6010B SEP	30852
140-15376-1 DU	FGD-15 (25-27)	Step 7	Solid	6010B SEP	30852
140-15376-1 DU	FGD-15 (25-27)	Step 7	Solid	6010B SEP	30852
140-15376-1 DU	FGD-15 (25-27)	Step 7	Solid	6010B SEP	30852
140-15376-1 DU	FGD-15 (25-27)	Total/NA	Solid	6010B	30373
140-15376-1 DU	FGD-15 (25-27)	Total/NA	Solid	6010B	30373
140-15376-1 DU	FGD-15 (25-27)	Total/NA	Solid	6010B	30373

Analysis Batch: 31570

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-15376-1	FGD-15 (25-27)	Sum of Steps 1-7	Solid	6010B SEP	
140-15376-2	FGD-16 (30-32)	Sum of Steps 1-7	Solid	6010B SEP	
140-15376-3	FGD-2019-1 (23-25)	Sum of Steps 1-7	Solid	6010B SEP	

QC Association Summary

Client: Golder Associates Inc.
Project/Site: Oak Grove FGD Ponds - 7-Step SEP Metals

Job ID: 140-15376-1

Metals

Prep Batch: 31695

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-15376-3	FGD-2019-1 (23-25)	Total/NA	Solid	Total	
MB 140-31695/2-A	Method Blank	Total/NA	Solid	Total	
LCS 140-31695/3-A	Lab Control Sample	Total/NA	Solid	Total	
LCSD 140-31695/4-A	Lab Control Sample Dup	Total/NA	Solid	Total	

Prep Batch: 31696

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-15376-3	FGD-2019-1 (23-25)	Step 3	Solid	3010A	30453
MB 140-30453/11-C	Method Blank	Step 3	Solid	3010A	30453
LCS 140-30453/12-C	Lab Control Sample	Step 3	Solid	3010A	30453
LCSD 140-30453/13-C	Lab Control Sample Dup	Step 3	Solid	3010A	30453

Prep Batch: 31697

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-15376-3	FGD-2019-1 (23-25)	Step 4	Solid	3010A	30481
MB 140-30481/11-C	Method Blank	Step 4	Solid	3010A	30481
LCS 140-30481/12-C	Lab Control Sample	Step 4	Solid	3010A	30481
LCSD 140-30481/13-C	Lab Control Sample Dup	Step 4	Solid	3010A	30481

Analysis Batch: 31812

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-15376-3	FGD-2019-1 (23-25)	Step 3	Solid	6010B SEP	31696
140-15376-3	FGD-2019-1 (23-25)	Step 4	Solid	6010B SEP	31697
140-15376-3	FGD-2019-1 (23-25)	Total/NA	Solid	6010B	31695
MB 140-30453/11-C	Method Blank	Step 3	Solid	6010B SEP	31696
MB 140-30481/11-C	Method Blank	Step 4	Solid	6010B SEP	31697
MB 140-31695/2-A	Method Blank	Total/NA	Solid	6010B	31695
LCS 140-30453/12-C	Lab Control Sample	Step 3	Solid	6010B SEP	31696
LCS 140-30481/12-C	Lab Control Sample	Step 4	Solid	6010B SEP	31697
LCS 140-31695/3-A	Lab Control Sample	Total/NA	Solid	6010B	31695
LCSD 140-30453/13-C	Lab Control Sample Dup	Step 3	Solid	6010B SEP	31696
LCSD 140-30481/13-C	Lab Control Sample Dup	Step 4	Solid	6010B SEP	31697
LCSD 140-31695/4-A	Lab Control Sample Dup	Total/NA	Solid	6010B	31695

General Chemistry

Analysis Batch: 30352

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-15376-1	FGD-15 (25-27)	Total/NA	Solid	Moisture	
140-15376-2	FGD-16 (30-32)	Total/NA	Solid	Moisture	
140-15376-3	FGD-2019-1 (23-25)	Total/NA	Solid	Moisture	
140-15376-1 DU	FGD-15 (25-27)	Total/NA	Solid	Moisture	

Lab Chronicle

Client: Golder Associates Inc.
 Project/Site: Oak Grove FGD Ponds - 7-Step SEP Metals

Job ID: 140-15376-1

Client Sample ID: FGD-15 (25-27)

Lab Sample ID: 140-15376-1

Date Collected: 05/22/19 19:15

Matrix: Solid

Date Received: 05/24/19 09:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Sum of Steps 1-7	Analysis	6010B SEP		1			31570	07/11/19 10:59	CLJ	TAL KNX
		Instrument ID: NOEQUIP								
Total/NA	Analysis	Moisture		1			30352	05/28/19 16:16	BKD	TAL KNX
		Instrument ID: W3								

Client Sample ID: FGD-15 (25-27)

Lab Sample ID: 140-15376-1

Date Collected: 05/22/19 19:15

Matrix: Solid

Date Received: 05/24/19 09:40

Percent Solids: 76.6

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			0.542 g	50 mL	30853	06/16/19 08:00	KNC	TAL KNX
Total/NA	Analysis	6010B		1			30900	06/17/19 11:27	KNC	TAL KNX
		Instrument ID: DUO								
Total/NA	Prep	Total			1.000 g	50 mL	30373	05/30/19 08:00	KNC	TAL KNX
Total/NA	Analysis	6010B		1			31255	06/28/19 15:23	KNC	TAL KNX
		Instrument ID: DUO								
Total/NA	Prep	Total			1.000 g	50 mL	30373	05/30/19 08:00	KNC	TAL KNX
Total/NA	Analysis	6010B		10			31255	06/28/19 16:37	KNC	TAL KNX
		Instrument ID: DUO								
Total/NA	Prep	Total			1.000 g	50 mL	30373	05/30/19 08:00	KNC	TAL KNX
Total/NA	Analysis	6010B		2			31255	06/28/19 18:40	KNC	TAL KNX
		Instrument ID: DUO								
Step 1	SEP	Exchangeable			5.000 g	25 mL	30374	05/30/19 08:00	KNC	TAL KNX
Step 1	Prep	3010A			5 mL	50 mL	30422	05/31/19 08:00	KNC	TAL KNX
Step 1	Analysis	6010B SEP		4			30900	06/17/19 14:14	KNC	TAL KNX
		Instrument ID: DUO								
Step 2	SEP	Carbonate			5.000 g	25 mL	30423	05/31/19 08:00	KNC	TAL KNX
Step 2	Prep	3010A			5 mL	50 mL	30452	06/03/19 08:00	KNC	TAL KNX
Step 2	Analysis	6010B SEP		3			30900	06/17/19 15:37	KNC	TAL KNX
		Instrument ID: DUO								
Step 3	SEP	Non-Crystalline			5.000 g	25 mL	30453	06/03/19 08:00	KNC	TAL KNX
Step 3	Prep	3010A			5 mL	50 mL	30480	06/04/19 08:00	KNC	TAL KNX
Step 3	Analysis	6010B SEP		1			31197	06/26/19 17:30	KNC	TAL KNX
		Instrument ID: DUO								
Step 4	SEP	Metal Hydroxide			5.000 g	25 mL	30481	06/04/19 08:00	KNC	TAL KNX
Step 4	Prep	3010A			5 mL	50 mL	30528	06/10/19 08:00	KNC	TAL KNX
Step 4	Analysis	6010B SEP		1			31197	06/26/19 18:52	KNC	TAL KNX
		Instrument ID: DUO								
Step 5	SEP	Organic-Bound			5.000 g	75 mL	30529	06/10/19 08:00	KNC	TAL KNX
Step 5	Prep	3010A			5 mL	50 mL	30726	06/12/19 08:00	KNC	TAL KNX
Step 5	Analysis	6010B SEP		5			31197	06/26/19 20:25	KNC	TAL KNX
		Instrument ID: DUO								
Step 6	SEP	Acid/Sulfide			5.000 g	250 mL	30781	06/15/19 08:00	KNC	TAL KNX
Step 6	Analysis	6010B SEP		1			31197	06/26/19 21:48	KNC	TAL KNX
		Instrument ID: DUO								

Eurofins TestAmerica, Knoxville

Lab Chronicle

Client: Golder Associates Inc.
Project/Site: Oak Grove FGD Ponds - 7-Step SEP Metals

Job ID: 140-15376-1

Client Sample ID: FGD-15 (25-27)

Date Collected: 05/22/19 19:15

Date Received: 05/24/19 09:40

Lab Sample ID: 140-15376-1

Matrix: Solid

Percent Solids: 76.6

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 7	Prep	Residual			1.000 g	50 mL	30852	06/16/19 08:00	KNC	TAL KNX
Step 7	Analysis	6010B SEP		1			31255	06/28/19 12:53	KNC	TAL KNX
Instrument ID: DUO										
Step 7	Prep	Residual			1.000 g	50 mL	30852	06/16/19 08:00	KNC	TAL KNX
Step 7	Analysis	6010B SEP		10			31255	06/28/19 14:17	KNC	TAL KNX
Instrument ID: DUO										
Step 7	Prep	Residual			1.000 g	50 mL	30852	06/16/19 08:00	KNC	TAL KNX
Step 7	Analysis	6010B SEP		2			31255	06/28/19 17:43	KNC	TAL KNX
Instrument ID: DUO										

Client Sample ID: FGD-16 (30-32)

Date Collected: 05/23/19 10:40

Date Received: 05/24/19 09:40

Lab Sample ID: 140-15376-2

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Sum of Steps 1-7	Analysis	6010B SEP		1			31570	07/11/19 10:59	CLJ	TAL KNX
Instrument ID: NOEQUIP										
Total/NA	Analysis	Moisture		1			30352	05/28/19 16:16	BKD	TAL KNX
Instrument ID: W3										

Client Sample ID: FGD-16 (30-32)

Date Collected: 05/23/19 10:40

Date Received: 05/24/19 09:40

Lab Sample ID: 140-15376-2

Matrix: Solid

Percent Solids: 79.2

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			0.535 g	50 mL	30853	06/16/19 08:00	KNC	TAL KNX
Total/NA	Analysis	6010B		1			30900	06/17/19 11:41	KNC	TAL KNX
Instrument ID: DUO										
Total/NA	Prep	Total			1.000 g	50 mL	30373	05/30/19 08:00	KNC	TAL KNX
Total/NA	Analysis	6010B		1			31255	06/28/19 15:34	KNC	TAL KNX
Instrument ID: DUO										
Total/NA	Prep	Total			1.000 g	50 mL	30373	05/30/19 08:00	KNC	TAL KNX
Total/NA	Analysis	6010B		10			31255	06/28/19 16:47	KNC	TAL KNX
Instrument ID: DUO										
Total/NA	Prep	Total			1.000 g	50 mL	30373	05/30/19 08:00	KNC	TAL KNX
Total/NA	Analysis	6010B		2			31255	06/28/19 18:50	KNC	TAL KNX
Instrument ID: DUO										
Step 1	SEP	Exchangeable			5.000 g	25 mL	30374	05/30/19 08:00	KNC	TAL KNX
Step 1	Prep	3010A			5 mL	50 mL	30422	05/31/19 08:00	KNC	TAL KNX
Step 1	Analysis	6010B SEP		4			30900	06/17/19 14:24	KNC	TAL KNX
Instrument ID: DUO										
Step 2	SEP	Carbonate			5.000 g	25 mL	30423	05/31/19 08:00	KNC	TAL KNX
Step 2	Prep	3010A			5 mL	50 mL	30452	06/03/19 08:00	KNC	TAL KNX
Step 2	Analysis	6010B SEP		3			30900	06/17/19 15:58	KNC	TAL KNX
Instrument ID: DUO										

Eurofins TestAmerica, Knoxville

Lab Chronicle

Client: Golder Associates Inc.
 Project/Site: Oak Grove FGD Ponds - 7-Step SEP Metals

Job ID: 140-15376-1

Client Sample ID: FGD-16 (30-32)

Lab Sample ID: 140-15376-2

Date Collected: 05/23/19 10:40

Matrix: Solid

Date Received: 05/24/19 09:40

Percent Solids: 79.2

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 3	SEP	Non-Crystalline			5.000 g	25 mL	30453	06/03/19 08:00	KNC	TAL KNX
Step 3	Prep	3010A			5 mL	50 mL	30480	06/04/19 08:00	KNC	TAL KNX
Step 3	Analysis	6010B SEP		1			31197	06/26/19 17:40	KNC	TAL KNX
Instrument ID: DUO										
Step 4	SEP	Metal Hydroxide			5.000 g	25 mL	30481	06/04/19 08:00	KNC	TAL KNX
Step 4	Prep	3010A			5 mL	50 mL	30528	06/10/19 08:00	KNC	TAL KNX
Step 4	Analysis	6010B SEP		1			31197	06/26/19 19:13	KNC	TAL KNX
Instrument ID: DUO										
Step 5	SEP	Organic-Bound			5.000 g	75 mL	30529	06/10/19 08:00	KNC	TAL KNX
Step 5	Prep	3010A			5 mL	50 mL	30726	06/12/19 08:00	KNC	TAL KNX
Step 5	Analysis	6010B SEP		5			31197	06/26/19 20:35	KNC	TAL KNX
Instrument ID: DUO										
Step 6	SEP	Acid/Sulfide			5.000 g	250 mL	30781	06/15/19 08:00	KNC	TAL KNX
Step 6	Analysis	6010B SEP		1			31197	06/26/19 22:14	KNC	TAL KNX
Instrument ID: DUO										
Step 7	Prep	Residual			1.000 g	50 mL	30852	06/16/19 08:00	KNC	TAL KNX
Step 7	Analysis	6010B SEP		1			31255	06/28/19 13:19	KNC	TAL KNX
Instrument ID: DUO										
Step 7	Prep	Residual			1.000 g	50 mL	30852	06/16/19 08:00	KNC	TAL KNX
Step 7	Analysis	6010B SEP		10			31255	06/28/19 14:27	KNC	TAL KNX
Instrument ID: DUO										
Step 7	Prep	Residual			1.000 g	50 mL	30852	06/16/19 08:00	KNC	TAL KNX
Step 7	Analysis	6010B SEP		2			31255	06/28/19 17:53	KNC	TAL KNX
Instrument ID: DUO										
Total/NA	Prep	Total			1.000 g	50 mL	30373	05/30/19 08:00	KNC	TAL KNX
Total/NA	Prep	7470A			5.0 mL	50.0 mL	30447	05/31/19 12:19	DKW	TAL KNX
Total/NA	Analysis	7470A		1			30491	06/03/19 14:52	DKW	TAL KNX
Instrument ID: HG										

Client Sample ID: FGD-2019-1 (23-25)

Lab Sample ID: 140-15376-3

Date Collected: 05/23/19 15:20

Matrix: Solid

Date Received: 05/24/19 09:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Sum of Steps 1-7	Analysis	6010B SEP		1			31570	07/11/19 10:59	CLJ	TAL KNX
Instrument ID: NOEQUIP										
Total/NA	Analysis	Moisture		1			30352	05/28/19 16:16	BKD	TAL KNX
Instrument ID: W3										

Lab Chronicle

Client: Golder Associates Inc.
Project/Site: Oak Grove FGD Ponds - 7-Step SEP Metals

Job ID: 140-15376-1

Client Sample ID: FGD-2019-1 (23-25)

Lab Sample ID: 140-15376-3

Date Collected: 05/23/19 15:20

Matrix: Solid

Date Received: 05/24/19 09:40

Percent Solids: 77.2

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			0.534 g	50 mL	30853	06/16/19 08:00	KNC	TAL KNX
Total/NA	Analysis	6010B		1			30900	06/17/19 11:47	KNC	TAL KNX
Instrument ID: DUO										
Total/NA	Prep	Total			1.000 g	50 mL	30373	05/30/19 08:00	KNC	TAL KNX
Total/NA	Analysis	6010B		1			31255	06/28/19 15:40	KNC	TAL KNX
Instrument ID: DUO										
Total/NA	Prep	Total			1.000 g	50 mL	30373	05/30/19 08:00	KNC	TAL KNX
Total/NA	Analysis	6010B		10			31255	06/28/19 16:52	KNC	TAL KNX
Instrument ID: DUO										
Total/NA	Prep	Total			1.000 g	50 mL	31695	07/16/19 08:00	KNC	TAL KNX
Total/NA	Analysis	6010B		2			31812	07/17/19 12:03	KNC	TAL KNX
Instrument ID: DUO										
Step 1	SEP	Exchangeable			5.000 g	25 mL	30374	05/30/19 08:00	KNC	TAL KNX
Step 1	Prep	3010A			5 mL	50 mL	30422	05/31/19 08:00	KNC	TAL KNX
Step 1	Analysis	6010B SEP		4			30900	06/17/19 14:29	KNC	TAL KNX
Instrument ID: DUO										
Step 2	SEP	Carbonate			5.000 g	25 mL	30423	05/31/19 08:00	KNC	TAL KNX
Step 2	Prep	3010A			5 mL	50 mL	30452	06/03/19 08:00	KNC	TAL KNX
Step 2	Analysis	6010B SEP		3			30900	06/17/19 16:03	KNC	TAL KNX
Instrument ID: DUO										
Step 3	SEP	Non-Crystalline			5.000 g	25 mL	30453	06/03/19 08:00	KNC	TAL KNX
Step 3	Prep	3010A			5 mL	50 mL	30480	06/04/19 08:00	KNC	TAL KNX
Step 3	Analysis	6010B SEP		1			31197	06/26/19 17:45	KNC	TAL KNX
Instrument ID: DUO										
Step 3	SEP	Non-Crystalline			5.000 g	25 mL	30453	06/03/19 08:00	KNC	TAL KNX
Step 3	Prep	3010A			5 mL	50 mL	31696	07/16/19 08:00	KNC	TAL KNX
Step 3	Analysis	6010B SEP		1			31812	07/17/19 11:32	KNC	TAL KNX
Instrument ID: DUO										
Step 4	SEP	Metal Hydroxide			5.000 g	25 mL	30481	06/04/19 08:00	KNC	TAL KNX
Step 4	Prep	3010A			5 mL	50 mL	30528	06/10/19 08:00	KNC	TAL KNX
Step 4	Analysis	6010B SEP		1			31197	06/26/19 19:18	KNC	TAL KNX
Instrument ID: DUO										
Step 4	SEP	Metal Hydroxide			5.000 g	25 mL	30481	06/04/19 08:00	KNC	TAL KNX
Step 4	Prep	3010A			5 mL	50 mL	31697	07/16/19 08:00	KNC	TAL KNX
Step 4	Analysis	6010B SEP		1			31812	07/17/19 11:53	KNC	TAL KNX
Instrument ID: DUO										
Step 5	SEP	Organic-Bound			5.000 g	75 mL	30529	06/10/19 08:00	KNC	TAL KNX
Step 5	Prep	3010A			5 mL	50 mL	30726	06/12/19 08:00	KNC	TAL KNX
Step 5	Analysis	6010B SEP		5			31197	06/26/19 20:41	KNC	TAL KNX
Instrument ID: DUO										
Step 6	SEP	Acid/Sulfide			5.000 g	250 mL	30781	06/15/19 08:00	KNC	TAL KNX
Step 6	Analysis	6010B SEP		1			31197	06/26/19 22:20	KNC	TAL KNX
Instrument ID: DUO										
Step 7	Prep	Residual			1.000 g	50 mL	30852	06/16/19 08:00	KNC	TAL KNX
Step 7	Analysis	6010B SEP		1			31255	06/28/19 13:24	KNC	TAL KNX
Instrument ID: DUO										

Eurofins TestAmerica, Knoxville

Lab Chronicle

Client: Golder Associates Inc.
Project/Site: Oak Grove FGD Ponds - 7-Step SEP Metals

Job ID: 140-15376-1

Client Sample ID: FGD-2019-1 (23-25)

Lab Sample ID: 140-15376-3

Date Collected: 05/23/19 15:20

Matrix: Solid

Date Received: 05/24/19 09:40

Percent Solids: 77.2

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 7	Prep	Residual			1.000 g	50 mL	30852	06/16/19 08:00	KNC	TAL KNX
Step 7	Analysis	6010B SEP		10			31255	06/28/19 14:32	KNC	TAL KNX
Instrument ID: DUO										
Step 7	Prep	Residual			1.000 g	50 mL	30852	06/16/19 08:00	KNC	TAL KNX
Step 7	Analysis	6010B SEP		2			31255	06/28/19 17:58	KNC	TAL KNX
Instrument ID: DUO										
Total/NA	Prep	Total			1.000 g	50 mL	30373	05/30/19 08:00	KNC	TAL KNX
Total/NA	Prep	7470A			5.0 mL	50.0 mL	30447	05/31/19 12:19	DKW	TAL KNX
Total/NA	Analysis	7470A		1			30491	06/03/19 14:54	DKW	TAL KNX
Instrument ID: HG										

Client Sample ID: Method Blank

Lab Sample ID: MB 140-30373/11-A

Date Collected: N/A

Matrix: Solid

Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Total			1.000 g	50 mL	30373	05/30/19 08:00	KNC	TAL KNX
Total/NA	Analysis	6010B		1			31255	06/28/19 12:27	KNC	TAL KNX
Instrument ID: DUO										

Client Sample ID: Method Blank

Lab Sample ID: MB 140-30373/11-B

Date Collected: N/A

Matrix: Solid

Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Total			1.000 g	50 mL	30373	05/30/19 08:00	KNC	TAL KNX
Total/NA	Prep	7470A			5.0 mL	50.0 mL	30447	05/31/19 12:19	DKW	TAL KNX
Total/NA	Analysis	7470A		1			30491	06/03/19 14:34	DKW	TAL KNX
Instrument ID: HG										

Client Sample ID: Method Blank

Lab Sample ID: MB 140-30374/11-B ^4

Date Collected: N/A

Matrix: Solid

Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 1	SEP	Exchangeable			5.000 g	25 mL	30374	05/30/19 08:00	KNC	TAL KNX
Step 1	Prep	3010A			5 mL	50 mL	30422	05/31/19 08:00	KNC	TAL KNX
Step 1	Analysis	6010B SEP		4			30900	06/17/19 13:48	KNC	TAL KNX
Instrument ID: DUO										

Lab Chronicle

Client: Golder Associates Inc.
Project/Site: Oak Grove FGD Ponds - 7-Step SEP Metals

Job ID: 140-15376-1

Client Sample ID: Method Blank

Date Collected: N/A

Date Received: N/A

Lab Sample ID: MB 140-30423/11-B ^3

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 2	SEP	Carbonate			5.000 g	25 mL	30423	05/31/19 08:00	KNC	TAL KNX
Step 2	Prep	3010A			5 mL	50 mL	30452	06/03/19 08:00	KNC	TAL KNX
Step 2	Analysis	6010B SEP		3			30900	06/17/19 15:11	KNC	TAL KNX
Instrument ID: DUO										

Client Sample ID: Method Blank

Date Collected: N/A

Date Received: N/A

Lab Sample ID: MB 140-30453/11-B

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 3	SEP	Non-Crystalline			5.000 g	25 mL	30453	06/03/19 08:00	KNC	TAL KNX
Step 3	Prep	3010A			5 mL	50 mL	30480	06/04/19 08:00	KNC	TAL KNX
Step 3	Analysis	6010B SEP		1			31197	06/26/19 17:04	KNC	TAL KNX
Instrument ID: DUO										

Client Sample ID: Method Blank

Date Collected: N/A

Date Received: N/A

Lab Sample ID: MB 140-30453/11-C

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 3	SEP	Non-Crystalline			5.000 g	25 mL	30453	06/03/19 08:00	KNC	TAL KNX
Step 3	Prep	3010A			5 mL	50 mL	31696	07/16/19 08:00	KNC	TAL KNX
Step 3	Analysis	6010B SEP		1			31812	07/17/19 10:47	KNC	TAL KNX
Instrument ID: DUO										

Client Sample ID: Method Blank

Date Collected: N/A

Date Received: N/A

Lab Sample ID: MB 140-30481/11-B

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 4	SEP	Metal Hydroxide			5.000 g	25 mL	30481	06/04/19 08:00	KNC	TAL KNX
Step 4	Prep	3010A			5 mL	50 mL	30528	06/10/19 08:00	KNC	TAL KNX
Step 4	Analysis	6010B SEP		1			31197	06/26/19 18:27	KNC	TAL KNX
Instrument ID: DUO										

Client Sample ID: Method Blank

Date Collected: N/A

Date Received: N/A

Lab Sample ID: MB 140-30481/11-C

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 4	SEP	Metal Hydroxide			5.000 g	25 mL	30481	06/04/19 08:00	KNC	TAL KNX
Step 4	Prep	3010A			5 mL	50 mL	31697	07/16/19 08:00	KNC	TAL KNX
Step 4	Analysis	6010B SEP		1			31812	07/17/19 11:02	KNC	TAL KNX
Instrument ID: DUO										

Eurofins TestAmerica, Knoxville

Lab Chronicle

Client: Golder Associates Inc.
Project/Site: Oak Grove FGD Ponds - 7-Step SEP Metals

Job ID: 140-15376-1

Client Sample ID: Method Blank

Date Collected: N/A

Date Received: N/A

Lab Sample ID: MB 140-30529/11-B ^5

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 5	SEP	Organic-Bound			5.000 g	75 mL	30529	06/10/19 08:00	KNC	TAL KNX
Step 5	Prep	3010A			5 mL	50 mL	30726	06/12/19 08:00	KNC	TAL KNX
Step 5	Analysis	6010B SEP		5			31197	06/26/19 19:48	KNC	TAL KNX
Instrument ID: DUO										

Client Sample ID: Method Blank

Date Collected: N/A

Date Received: N/A

Lab Sample ID: MB 140-30781/11-A

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 6	SEP	Acid/Sulfide			5.000 g	250 mL	30781	06/15/19 08:00	KNC	TAL KNX
Step 6	Analysis	6010B SEP		1			31197	06/26/19 21:23	KNC	TAL KNX
Instrument ID: DUO										

Client Sample ID: Method Blank

Date Collected: N/A

Date Received: N/A

Lab Sample ID: MB 140-30852/11-A

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 7	Prep	Residual			1.000 g	50 mL	30852	06/16/19 08:00	KNC	TAL KNX
Step 7	Analysis	6010B SEP		1			31255	06/28/19 12:11	KNC	TAL KNX
Instrument ID: DUO										

Client Sample ID: Method Blank

Date Collected: N/A

Date Received: N/A

Lab Sample ID: MB 140-30853/8-A

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			0.500 g	50 mL	30853	06/16/19 08:00	KNC	TAL KNX
Total/NA	Analysis	6010B		1			30900	06/17/19 11:06	KNC	TAL KNX
Instrument ID: DUO										

Client Sample ID: Method Blank

Date Collected: N/A

Date Received: N/A

Lab Sample ID: MB 140-31695/2-A

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Total			1.000 g	50 mL	31695	07/16/19 08:00	KNC	TAL KNX
Total/NA	Analysis	6010B		1			31812	07/17/19 11:17	KNC	TAL KNX
Instrument ID: DUO										

Lab Chronicle

Client: Golder Associates Inc.
Project/Site: Oak Grove FGD Ponds - 7-Step SEP Metals

Job ID: 140-15376-1

Client Sample ID: Lab Control Sample

Lab Sample ID: LCS 140-30373/12-A

Date Collected: N/A

Matrix: Solid

Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Total			1.000 g	50 mL	30373	05/30/19 08:00	KNC	TAL KNX
Total/NA	Analysis	6010B		1			31255	06/28/19 12:32	KNC	TAL KNX
Instrument ID: DUO										

Client Sample ID: Lab Control Sample

Lab Sample ID: LCS 140-30373/12-B

Date Collected: N/A

Matrix: Solid

Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Total			1.000 g	50 mL	30373	05/30/19 08:00	KNC	TAL KNX
Total/NA	Prep	7470A			5.0 mL	50.0 mL	30447	05/31/19 12:19	DKW	TAL KNX
Total/NA	Analysis	7470A		1			30491	06/03/19 14:37	DKW	TAL KNX
Instrument ID: HG										

Client Sample ID: Lab Control Sample

Lab Sample ID: LCS 140-30374/12-B ^5

Date Collected: N/A

Matrix: Solid

Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 1	SEP	Exchangeable			5.000 g	25 mL	30374	05/30/19 08:00	KNC	TAL KNX
Step 1	Prep	3010A			5 mL	50 mL	30422	05/31/19 08:00	KNC	TAL KNX
Step 1	Analysis	6010B SEP		5			30900	06/17/19 13:53	KNC	TAL KNX
Instrument ID: DUO										

Client Sample ID: Lab Control Sample

Lab Sample ID: LCS 140-30423/12-B ^5

Date Collected: N/A

Matrix: Solid

Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 2	SEP	Carbonate			5.000 g	25 mL	30423	05/31/19 08:00	KNC	TAL KNX
Step 2	Prep	3010A			5 mL	50 mL	30452	06/03/19 08:00	KNC	TAL KNX
Step 2	Analysis	6010B SEP		5			30900	06/17/19 15:16	KNC	TAL KNX
Instrument ID: DUO										

Client Sample ID: Lab Control Sample

Lab Sample ID: LCS 140-30453/12-B

Date Collected: N/A

Matrix: Solid

Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 3	SEP	Non-Crystalline			5.000 g	25 mL	30453	06/03/19 08:00	KNC	TAL KNX
Step 3	Prep	3010A			5 mL	50 mL	30480	06/04/19 08:00	KNC	TAL KNX
Step 3	Analysis	6010B SEP		1			31197	06/26/19 17:09	KNC	TAL KNX
Instrument ID: DUO										

Lab Chronicle

Client: Golder Associates Inc.
Project/Site: Oak Grove FGD Ponds - 7-Step SEP Metals

Job ID: 140-15376-1

Client Sample ID: Lab Control Sample

Lab Sample ID: LCS 140-30453/12-C

Date Collected: N/A

Matrix: Solid

Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 3	SEP	Non-Crystalline			5.000 g	25 mL	30453	06/03/19 08:00	KNC	TAL KNX
Step 3	Prep	3010A			5 mL	50 mL	31696	07/16/19 08:00	KNC	TAL KNX
Step 3	Analysis	6010B SEP		1			31812	07/17/19 10:52	KNC	TAL KNX
Instrument ID: DUO										

Client Sample ID: Lab Control Sample

Lab Sample ID: LCS 140-30481/12-B

Date Collected: N/A

Matrix: Solid

Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 4	SEP	Metal Hydroxide			5.000 g	25 mL	30481	06/04/19 08:00	KNC	TAL KNX
Step 4	Prep	3010A			5 mL	50 mL	30528	06/10/19 08:00	KNC	TAL KNX
Step 4	Analysis	6010B SEP		1			31197	06/26/19 18:32	KNC	TAL KNX
Instrument ID: DUO										

Client Sample ID: Lab Control Sample

Lab Sample ID: LCS 140-30481/12-C

Date Collected: N/A

Matrix: Solid

Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 4	SEP	Metal Hydroxide			5.000 g	25 mL	30481	06/04/19 08:00	KNC	TAL KNX
Step 4	Prep	3010A			5 mL	50 mL	31697	07/16/19 08:00	KNC	TAL KNX
Step 4	Analysis	6010B SEP		1			31812	07/17/19 11:07	KNC	TAL KNX
Instrument ID: DUO										

Client Sample ID: Lab Control Sample

Lab Sample ID: LCS 140-30529/12-B ^5

Date Collected: N/A

Matrix: Solid

Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 5	SEP	Organic-Bound			5.000 g	75 mL	30529	06/10/19 08:00	KNC	TAL KNX
Step 5	Prep	3010A			5 mL	50 mL	30726	06/12/19 08:00	KNC	TAL KNX
Step 5	Analysis	6010B SEP		5			31197	06/26/19 19:54	KNC	TAL KNX
Instrument ID: DUO										

Client Sample ID: Lab Control Sample

Lab Sample ID: LCS 140-30781/12-A

Date Collected: N/A

Matrix: Solid

Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 6	SEP	Acid/Sulfide			5.000 g	250 mL	30781	06/15/19 08:00	KNC	TAL KNX
Step 6	Analysis	6010B SEP		1			31197	06/26/19 21:28	KNC	TAL KNX
Instrument ID: DUO										

Lab Chronicle

Client: Golder Associates Inc.
 Project/Site: Oak Grove FGD Ponds - 7-Step SEP Metals

Job ID: 140-15376-1

Client Sample ID: Lab Control Sample

Lab Sample ID: LCS 140-30852/12-A

Date Collected: N/A

Matrix: Solid

Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 7	Prep	Residual			1.000 g	50 mL	30852	06/16/19 08:00	KNC	TAL KNX
Step 7	Analysis	6010B SEP		1			31255	06/28/19 12:17	KNC	TAL KNX
Instrument ID: DUO										

Client Sample ID: Lab Control Sample

Lab Sample ID: LCS 140-30853/9-A

Date Collected: N/A

Matrix: Solid

Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			0.500 g	50 mL	30853	06/16/19 08:00	KNC	TAL KNX
Total/NA	Analysis	6010B		1			30900	06/17/19 11:11	KNC	TAL KNX
Instrument ID: DUO										

Client Sample ID: Lab Control Sample

Lab Sample ID: LCS 140-31695/3-A

Date Collected: N/A

Matrix: Solid

Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Total			1.000 g	50 mL	31695	07/16/19 08:00	KNC	TAL KNX
Total/NA	Analysis	6010B		1			31812	07/17/19 11:22	KNC	TAL KNX
Instrument ID: DUO										

Client Sample ID: Lab Control Sample Dup

Lab Sample ID: LCSD 140-30373/13-A

Date Collected: N/A

Matrix: Solid

Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Total			1.000 g	50 mL	30373	05/30/19 08:00	KNC	TAL KNX
Total/NA	Analysis	6010B		1			31255	06/28/19 12:37	KNC	TAL KNX
Instrument ID: DUO										

Client Sample ID: Lab Control Sample Dup

Lab Sample ID: LCSD 140-30373/13-B

Date Collected: N/A

Matrix: Solid

Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Total			1.000 g	50 mL	30373	05/30/19 08:00	KNC	TAL KNX
Total/NA	Prep	7470A			5.0 mL	50.0 mL	30447	05/31/19 12:19	DKW	TAL KNX
Total/NA	Analysis	7470A		1			30491	06/03/19 14:40	DKW	TAL KNX
Instrument ID: HG										

Lab Chronicle

Client: Golder Associates Inc.
Project/Site: Oak Grove FGD Ponds - 7-Step SEP Metals

Job ID: 140-15376-1

Client Sample ID: Lab Control Sample Dup

Lab Sample ID: LCSD 140-30374/13-B ^5

Date Collected: N/A

Matrix: Solid

Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 1	SEP	Exchangeable			5.000 g	25 mL	30374	05/30/19 08:00	KNC	TAL KNX
Step 1	Prep	3010A			5 mL	50 mL	30422	05/31/19 08:00	KNC	TAL KNX
Step 1	Analysis	6010B SEP		5			30900	06/17/19 13:58	KNC	TAL KNX
Instrument ID: DUO										

Client Sample ID: Lab Control Sample Dup

Lab Sample ID: LCSD 140-30423/13-B ^5

Date Collected: N/A

Matrix: Solid

Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 2	SEP	Carbonate			5.000 g	25 mL	30423	05/31/19 08:00	KNC	TAL KNX
Step 2	Prep	3010A			5 mL	50 mL	30452	06/03/19 08:00	KNC	TAL KNX
Step 2	Analysis	6010B SEP		5			30900	06/17/19 15:21	KNC	TAL KNX
Instrument ID: DUO										

Client Sample ID: Lab Control Sample Dup

Lab Sample ID: LCSD 140-30453/13-B

Date Collected: N/A

Matrix: Solid

Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 3	SEP	Non-Crystalline			5.000 g	25 mL	30453	06/03/19 08:00	KNC	TAL KNX
Step 3	Prep	3010A			5 mL	50 mL	30480	06/04/19 08:00	KNC	TAL KNX
Step 3	Analysis	6010B SEP		1			31197	06/26/19 17:14	KNC	TAL KNX
Instrument ID: DUO										

Client Sample ID: Lab Control Sample Dup

Lab Sample ID: LCSD 140-30453/13-C

Date Collected: N/A

Matrix: Solid

Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 3	SEP	Non-Crystalline			5.000 g	25 mL	30453	06/03/19 08:00	KNC	TAL KNX
Step 3	Prep	3010A			5 mL	50 mL	31696	07/16/19 08:00	KNC	TAL KNX
Step 3	Analysis	6010B SEP		1			31812	07/17/19 10:57	KNC	TAL KNX
Instrument ID: DUO										

Client Sample ID: Lab Control Sample Dup

Lab Sample ID: LCSD 140-30481/13-B

Date Collected: N/A

Matrix: Solid

Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 4	SEP	Metal Hydroxide			5.000 g	25 mL	30481	06/04/19 08:00	KNC	TAL KNX
Step 4	Prep	3010A			5 mL	50 mL	30528	06/10/19 08:00	KNC	TAL KNX
Step 4	Analysis	6010B SEP		1			31197	06/26/19 18:37	KNC	TAL KNX
Instrument ID: DUO										

Eurofins TestAmerica, Knoxville

Lab Chronicle

Client: Golder Associates Inc.
Project/Site: Oak Grove FGD Ponds - 7-Step SEP Metals

Job ID: 140-15376-1

Client Sample ID: Lab Control Sample Dup

Lab Sample ID: LCSD 140-30481/13-C

Date Collected: N/A

Matrix: Solid

Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 4	SEP	Metal Hydroxide			5.000 g	25 mL	30481	06/04/19 08:00	KNC	TAL KNX
Step 4	Prep	3010A			5 mL	50 mL	31697	07/16/19 08:00	KNC	TAL KNX
Step 4	Analysis	6010B SEP		1			31812	07/17/19 11:12	KNC	TAL KNX
Instrument ID: DUO										

Client Sample ID: Lab Control Sample Dup

Lab Sample ID: LCSD 140-30529/13-B ^5

Date Collected: N/A

Matrix: Solid

Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 5	SEP	Organic-Bound			5.000 g	75 mL	30529	06/10/19 08:00	KNC	TAL KNX
Step 5	Prep	3010A			5 mL	50 mL	30726	06/12/19 08:00	KNC	TAL KNX
Step 5	Analysis	6010B SEP		5			31197	06/26/19 20:09	KNC	TAL KNX
Instrument ID: DUO										

Client Sample ID: Lab Control Sample Dup

Lab Sample ID: LCSD 140-30781/13-A

Date Collected: N/A

Matrix: Solid

Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 6	SEP	Acid/Sulfide			5.000 g	250 mL	30781	06/15/19 08:00	KNC	TAL KNX
Step 6	Analysis	6010B SEP		1			31197	06/26/19 21:33	KNC	TAL KNX
Instrument ID: DUO										

Client Sample ID: Lab Control Sample Dup

Lab Sample ID: LCSD 140-30852/13-A

Date Collected: N/A

Matrix: Solid

Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 7	Prep	Residual			1.000 g	50 mL	30852	06/16/19 08:00	KNC	TAL KNX
Step 7	Analysis	6010B SEP		1			31255	06/28/19 12:22	KNC	TAL KNX
Instrument ID: DUO										

Client Sample ID: Lab Control Sample Dup

Lab Sample ID: LCSD 140-31695/4-A

Date Collected: N/A

Matrix: Solid

Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Total			1.000 g	50 mL	31695	07/16/19 08:00	KNC	TAL KNX
Total/NA	Analysis	6010B		1			31812	07/17/19 11:27	KNC	TAL KNX
Instrument ID: DUO										

Lab Chronicle

Client: Golder Associates Inc.
Project/Site: Oak Grove FGD Ponds - 7-Step SEP Metals

Job ID: 140-15376-1

Client Sample ID: FGD-15 (25-27)

Date Collected: 05/22/19 19:15

Date Received: 05/24/19 09:40

Lab Sample ID: 140-15376-1 MS

Matrix: Solid

Percent Solids: 76.6

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			0.512 g	50 mL	30853	06/16/19 08:00	KNC	TAL KNX
Total/NA	Analysis	6010B		1			30900	06/17/19 11:32	KNC	TAL KNX
Instrument ID: DUO										

Client Sample ID: FGD-15 (25-27)

Date Collected: 05/22/19 19:15

Date Received: 05/24/19 09:40

Lab Sample ID: 140-15376-1 MSD

Matrix: Solid

Percent Solids: 76.6

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			0.514 g	50 mL	30853	06/16/19 08:00	KNC	TAL KNX
Total/NA	Analysis	6010B		1			30900	06/17/19 11:37	KNC	TAL KNX
Instrument ID: DUO										

Client Sample ID: FGD-15 (25-27)

Date Collected: 05/22/19 19:15

Date Received: 05/24/19 09:40

Lab Sample ID: 140-15376-1 DU

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			30352	05/28/19 16:16	BKD	TAL KNX
Instrument ID: W3										

Client Sample ID: FGD-15 (25-27)

Date Collected: 05/22/19 19:15

Date Received: 05/24/19 09:40

Lab Sample ID: 140-15376-1 DU

Matrix: Solid

Percent Solids: 76.6

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Total			1.000 g	50 mL	30373	05/30/19 08:00	KNC	TAL KNX
Total/NA	Analysis	6010B		1			31255	06/28/19 15:29	KNC	TAL KNX
Instrument ID: DUO										
Total/NA	Prep	Total			1.000 g	50 mL	30373	05/30/19 08:00	KNC	TAL KNX
Total/NA	Analysis	6010B		10			31255	06/28/19 16:42	KNC	TAL KNX
Instrument ID: DUO										
Total/NA	Prep	Total			1.000 g	50 mL	30373	05/30/19 08:00	KNC	TAL KNX
Total/NA	Analysis	6010B		2			31255	06/28/19 18:45	KNC	TAL KNX
Instrument ID: DUO										
Step 1	SEP	Exchangeable			5.000 g	25 mL	30374	05/30/19 08:00	KNC	TAL KNX
Step 1	Prep	3010A			5 mL	50 mL	30422	05/31/19 08:00	KNC	TAL KNX
Step 1	Analysis	6010B SEP		4			30900	06/17/19 14:19	KNC	TAL KNX
Instrument ID: DUO										
Step 2	SEP	Carbonate			5.000 g	25 mL	30423	05/31/19 08:00	KNC	TAL KNX
Step 2	Prep	3010A			5 mL	50 mL	30452	06/03/19 08:00	KNC	TAL KNX
Step 2	Analysis	6010B SEP		3			30900	06/17/19 15:53	KNC	TAL KNX
Instrument ID: DUO										

Lab Chronicle

Client: Golder Associates Inc.
Project/Site: Oak Grove FGD Ponds - 7-Step SEP Metals

Job ID: 140-15376-1

Client Sample ID: FGD-15 (25-27)

Lab Sample ID: 140-15376-1 DU

Date Collected: 05/22/19 19:15

Matrix: Solid

Date Received: 05/24/19 09:40

Percent Solids: 76.6

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 3	SEP	Non-Crystalline			5.000 g	25 mL	30453	06/03/19 08:00	KNC	TAL KNX
Step 3	Prep	3010A			5 mL	50 mL	30480	06/04/19 08:00	KNC	TAL KNX
Step 3	Analysis	6010B SEP		1			31197	06/26/19 17:35	KNC	TAL KNX
Instrument ID: DUO										
Step 4	SEP	Metal Hydroxide			5.000 g	25 mL	30481	06/04/19 08:00	KNC	TAL KNX
Step 4	Prep	3010A			5 mL	50 mL	30528	06/10/19 08:00	KNC	TAL KNX
Step 4	Analysis	6010B SEP		1			31197	06/26/19 19:08	KNC	TAL KNX
Instrument ID: DUO										
Step 5	SEP	Organic-Bound			5.000 g	75 mL	30529	06/10/19 08:00	KNC	TAL KNX
Step 5	Prep	3010A			5 mL	50 mL	30726	06/12/19 08:00	KNC	TAL KNX
Step 5	Analysis	6010B SEP		5			31197	06/26/19 20:30	KNC	TAL KNX
Instrument ID: DUO										
Step 6	SEP	Acid/Sulfide			5.000 g	250 mL	30781	06/15/19 08:00	KNC	TAL KNX
Step 6	Analysis	6010B SEP		1			31197	06/26/19 21:54	KNC	TAL KNX
Instrument ID: DUO										
Step 7	Prep	Residual			1.000 g	50 mL	30852	06/16/19 08:00	KNC	TAL KNX
Step 7	Analysis	6010B SEP		1			31255	06/28/19 13:13	KNC	TAL KNX
Instrument ID: DUO										
Step 7	Prep	Residual			1.000 g	50 mL	30852	06/16/19 08:00	KNC	TAL KNX
Step 7	Analysis	6010B SEP		10			31255	06/28/19 14:22	KNC	TAL KNX
Instrument ID: DUO										
Step 7	Prep	Residual			1.000 g	50 mL	30852	06/16/19 08:00	KNC	TAL KNX
Step 7	Analysis	6010B SEP		2			31255	06/28/19 17:48	KNC	TAL KNX
Instrument ID: DUO										

Client Sample ID: 140-15376-A-1-J DU

Lab Sample ID: 140-15376-A-1-J DU

Date Collected: 05/22/19 19:15

Matrix: Solid

Date Received: 05/24/19 09:40

Percent Solids: 76.6

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Total			1.000 g	50 mL	30373	05/30/19 08:00	KNC	TAL KNX
Total/NA	Prep	7470A			5.0 mL	50.0 mL	30447	05/31/19 12:19	DKW	TAL KNX
Total/NA	Analysis	7470A		1			30491	06/03/19 14:49	DKW	TAL KNX
Instrument ID: HG										

Laboratory References:

TAL KNX = Eurofins TestAmerica, Knoxville, 5815 Middlebrook Pike, Knoxville, TN 37921, TEL (865)291-3000

Method Summary

Client: Golder Associates Inc.
Project/Site: Oak Grove FGD Ponds - 7-Step SEP Metals

Job ID: 140-15376-1

Method	Method Description	Protocol	Laboratory
6010B	Metals (ICP)	SW846	TAL KNX
6010B	SEP Metals (ICP) - Total	SW846	TAL KNX
6010B SEP	SEP Metals (ICP)	SW846	TAL KNX
7470A	SEP Mercury (CVAA) - Total	SW846	TAL KNX
Moisture	Percent Moisture	EPA	TAL KNX
3010A	Preparation, Total Metals	SW846	TAL KNX
3050B	Preparation, Metals	SW846	TAL KNX
7470A	Preparation, Mercury	SW846	TAL KNX
Acid/Sulfide	Sequential Extraction Procedure, Acid/Sulfide Fraction	TAL-KNOX	TAL KNX
Carbonate	Sequential Extraction Procedure, Carbonate Fraction	TAL-KNOX	TAL KNX
Exchangeable	Sequential Extraction Procedure, Exchangeable Fraction	TAL-KNOX	TAL KNX
Metal Hydroxide	Sequential Extraction Procedure, Metal Hydroxide Fraction	TAL-KNOX	TAL KNX
Non-Crystalline	Sequential Extraction Procedure, Non-crystalline Materials	TAL-KNOX	TAL KNX
Organic-Bound	Sequential Extraction Procedure, Organic Bound Fraction	TAL-KNOX	TAL KNX
Residual	Sequential Extraction Procedure, Residual Fraction	TAL-KNOX	TAL KNX
Total	Preparation, Total Material	TAL-KNOX	TAL KNX

Protocol References:

EPA = US Environmental Protection Agency

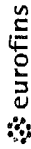
SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

TAL-KNOX = TestAmerica Laboratories, Knoxville, Facility Standard Operating Procedure.

Laboratory References:

TAL KNX = Eurofins TestAmerica, Knoxville, 5815 Middlebrook Pike, Knoxville, TN 37921, TEL (865)291-3000

Chain of Custody Record



<p>Client Information</p> <p>Client Contact: Will Vienne Company: Golder Associates Inc. Address: 2201 Double Creek Dr. Suite 4004 City: Round Rock State, Zip: TX, 78664 Phone: 512-671-3434(Tel) Email: William_Vienne@golder.com Project Name: Oak Grove FGD Ponds - SEP and Totals Site:</p>	<p>Lab PIV: Walker Wasmund, Terry E-Mail: terry.wasmund@testamericainc.com Carrier Tracking No(s): COC No: 140-6878-2224.1 Page: Page 1 of 1 Job #:</p>	<p>Sample: <i>Jacob Jarvis</i> Phone: <i>361 877 5533</i></p>	<p>Analysis Requested 140-15376 Chain of Custody</p>			
<p>Due Date Requested: TAT Requested (days): PO #: 19122434-F WO #: 1922434-F Project #: 14005266 SSOW#:</p>						
<p>Field Filtered Sample (Yes or No) <input checked="" type="checkbox"/> Field Filtered (MSD/Block) <input checked="" type="checkbox"/> 601B SEP - 7-Step SEP (12 metals) <input checked="" type="checkbox"/> 601B Total B, Cr, Pb, P <input checked="" type="checkbox"/></p>						
<p>Sample Identification</p>	<p>Sample Date</p>	<p>Sample Time</p>	<p>Sample Type (C=comp, G=grab)</p>	<p>Matrix (Water, Sewage, Chwastoff, BPE-Tissue, A=Air)</p>	<p>Preservation Code</p>	<p>Special Instructions/Note:</p>
<i>FGD-15 (25-27)</i>	<i>5/22/19</i>	<i>1415</i>	<i>C</i>	<i>S</i>	<i>N</i>	
<i>FGD-121 (30-32)</i>	<i>5/23/19</i>	<i>1040</i>	<i>C</i>	<i>ES</i>	<i>N</i>	
<i>FGD-204-1 (23-25)</i>	<i>5/23/19</i>	<i>1520</i>	<i>C</i>	<i>S</i>	<i>N</i>	
<i>RT: 0.8 °C CT: 0.8 °C</i>						
<i>1 Cooler, FedEx Pkg</i>						
<i>Custody seal intact</i>						
<i>TRK# 1874 5047 1949</i>						
<i>KWS/24/19</i>						
<p>Possible Hazard Identification <input type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological</p>						
<p>Deliverable Requested: I, II, III, IV, Other (specify) Empty Kit Relinquished by: _____ Date: _____ Relinquished by: _____ Date: <i>5/23/19 5:50P</i> Relinquished by: _____ Date/Time: _____ Relinquished by: _____ Date/Time: _____ Relinquished by: _____ Date/Time: _____</p>						
<p>Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) <input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months</p>						
<p>Special Instructions/QC Requirements:</p>						
<p>Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No</p>						



TESTAMERICA KNOXVILLE SAMPLE RECEIPT/CONDITION UPON RECEIPT ANOMALY CHECKLIST

Review Items	Yes	No	NA	If No, what was the problem?	Comments/Actions Taken
1. Are the shipping containers intact?	/			<input type="checkbox"/> Containers, Broken	
2. Were ambient air containers received intact?			/	<input type="checkbox"/> Checked in lab	
3. The coolers/containers custody seal if present, is it intact?	/			<input type="checkbox"/> Yes <input type="checkbox"/> NA	
4. Is the cooler temperature within limits? (> freezing temp. of water to 6°C, VOST: 10°C) Thermometer ID: <u>VC64</u> Correction factor: <u>7.0</u>	/			<input type="checkbox"/> Cooler Out of Temp, Client Contacted, Proceed/Cancel <input type="checkbox"/> Cooler Out of Temp, Same Day Receipt	
5. Were all of the sample containers received intact?	/			<input type="checkbox"/> Containers, Broken	
6. Were samples received in appropriate containers?	/			<input type="checkbox"/> Containers, Improper; Client Contacted; Proceed/Cancel	
7. Do sample container labels match COC? (IDs, Dates, Times)	/			<input type="checkbox"/> COC & Samples Do Not Match <input type="checkbox"/> COC Incorrect/Incomplete <input type="checkbox"/> COC Not Received	
8. Were all of the samples listed on the COC received?	/			<input type="checkbox"/> Sample Received, Not on COC <input type="checkbox"/> Sample on COC, Not Received	
9. Is the date/time of sample collection noted?	/			<input type="checkbox"/> COC; No Date/Time; Client Contacted	Labeling Verified by: _____ Date: _____
10. Was the sampler identified on the COC?	/			<input type="checkbox"/> Sampler Not Listed on COC	pH test strip lot number: _____
11. Is the client and project name/# identified?	/			<input type="checkbox"/> COC Incorrect/Incomplete	
12. Are tests/parameters listed for each sample?	/			<input type="checkbox"/> COC No tests on COC	
13. Is the matrix of the samples noted?	/			<input type="checkbox"/> COC Incorrect/Incomplete	
14. Was COC relinquished? (Signed/Dated/Timed)	/			<input type="checkbox"/> COC Incorrect/Incomplete	Box 16A: pH Preservation Box 18A: Residual Chlorine
15. Were samples received within holding time?	/			<input type="checkbox"/> Holding Time - Receipt	Preservative: _____
16. Were samples received with correct chemical preservative (excluding Encore)?	/			<input type="checkbox"/> pH Adjusted, pH Included (See box 16A) <input type="checkbox"/> Incorrect Preservative	Lot Number: _____
17. Were VOA samples received without headspace?	/		/	<input type="checkbox"/> Headspace (VOA only)	Exp Date: _____
18. Did you check for residual chlorine, if necessary? (e.g. 1613B, 1668) Chlorine test strip lot number: _____	/		/	<input type="checkbox"/> Residual Chlorine	Analyst: _____
19. For 1613B water samples is pH<9?	/		/	<input type="checkbox"/> If no, notify lab to adjust	Date: _____
20. For rad samples was sample activity info. Provided?	/		/	<input type="checkbox"/> Project missing info	Time: _____
Project #: <u>14025266</u> PM Instructions: _____					

Sample Receiving Associate: ALA Date: 5/24/19 QA026R31.doc, 112618



APPENDIX C

**GROUNDWATER SAMPLING
RECORDS**

GROUNDWATER SAMPLING RECORD

PAGE 1 of 1

Project Number: 19122262-F Project Name: LVMINANT - DGSES Date: 5-16-19

Sample Number: <u>FGD-1</u>	Starting Water Level (ft. BMP): <u>12.34</u>
Sampling Location (well ID, etc.): <u>FGD-1</u>	Casing Stickup (ft.): <u>-</u>
Sampled by: <u>JTB</u>	Starting Water Level (ft. BGL): <u>12.34</u>
Measuring Point (MP) of Well: <u>TOC/PVC</u>	Total Depth (ft. BGL): <u>-</u>
Screened Interval (ft. BGL): <u>-</u>	Casing Diameter (In ID): <u>2.0</u>
Filter Pack Interval (ft. BGL): <u>-</u>	Casing Volume (gal.): <u>-</u>

QUALITY ASSURANCE

METHODS (describe):

Cleaning Equipment: alcohol & DI water
 Purging: peristaltic / bladder Sampling: none
 Disposal of Discharged Water: on site

INSTRUMENTS (Indicate make, model, I.D.)

Water Level: KECK Thermometer: HORIBA
 pH Meter: HORIBA Field Calibration: 7.4
 Conductivity Meter: HORIBA Field Calibration: 1413
 Filter / Filter Size: - Other: -

SAMPLING MEASUREMENTS

Time	Cum. Vol (gal. or L)	Purge Rate (gal. or L/m)	Temp. (oC)	pH	Spec. Cond. (mmhos/cm)	D.O.	Redox (mV)	Turbidity & Color	Water Depth (ft BMP)
1412	-	0.2	22.6	6.71	1430	0.71	-26	4.2	12.52
1422	-	0.2	22.7	6.64	1460	0.59	-31	4.6	12.53
1426	-	0.2	22.7	6.63	1470	0.58	-32	4.7	12.52
1435	-	0.2							

Water Level (ft. BMP) at End of Purge: 12.52 Sample Intake Depth (ft. BMP): -

SAMPLE INVENTORY

Time	Bottles Collected			Filtration (Y/N)	Preservation	Remarks (quality control sample, other)
	Volume	Composition (G, P)	No.			
1450	250ml	P	1	N	-	GEN CHEM
1450	500ml	P	1	N	HNO3	METALS

Comments:

~~XXXXXXXXXX~~

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GROUNDWATER SAMPLING RECORD

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Project Number: 19122262-F Project Name: LUMINANT-DGSES Date: 5-16-19

Sample Number: FGD-3 Starting Water Level (ft. BMP): 22.13

Sampling Location (well ID, etc.): FGD-3 Casing Stickup (ft.): -

Sampled by: JTB Starting Water Level (ft. BGL): 22.13

Measuring Point (MP) of Well: TOC/PVC Total Depth (ft. BGL): -

Screened Interval (ft. BGL): - Casing Diameter (in ID): 2.0

Filter Pack Interval (ft. BGL): - Casing Volume (gal.): -

QUALITY ASSURANCE

METHODS (describe):

Cleaning Equipment: alcohol & DI water

Purging: peristaltic / bladder Sampling: none

Disposal of Discharged Water: on site

INSTRUMENTS (Indicate make, model, I.D.)

Water Level: KECK Thermometer: HORIBA

pH Meter: HORIBA Field Calibration: 7.4

Conductivity Meter: HORIBA Field Calibration: 1413

Filter / Filter Size: - Other:

SAMPLING MEASUREMENTS

1032 Time	Cum. Vol (gal. or L)	Purge Rate (gal. or L/m)	Temp. (°C)	pH	Spec. Cond. (mmhos/cm)	D.O	Redox (mV)	Turbidity & Color	Water Depth (ft BMP)
1041	-	.2	23.1	6.71	1620	0.71	-57	6.7	22.31
1047		↓	22.7	6.74	1630	0.61	-56	7.1	22.32
1053		↓	22.7	6.73	1630	0.62	-56	7.2	22.31

Water Level (ft. BMP) at End of Purge: 22.31 Sample Intake Depth (ft. BMP):

SAMPLE INVENTORY

Time	Bottles Collected			Filtration (Y/N)	Preservation	Remarks (quality control sample, other)
	Volume	Composition (G, P)	No.			
1110	250ML	P	1	N	-	GEN CHEM
1110	500ML	P	1	N	HNO3	METALS

Comments:

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GROUNDWATER SAMPLING RECORD

PAGE 1 of 1

Project Number: 19122262-F Project Name: LU MINANT - DGSES Date: 5-16-19

Sample Number: <u>FGD-4</u>	Starting Water Level (ft. BMP): <u>19.52</u>
Sampling Location (well ID, etc.): <u>FGD-4</u>	Casing Stickup (ft.): <u>-</u>
Sampled by: <u>JTB</u>	Starting Water Level (ft. BGL): <u>19.52</u>
Measuring Point (MP) of Well: <u>TOC/PVC</u>	Total Depth (ft. BGL): <u>-</u>
Screened Interval (ft. BGL): <u>-</u>	Casing Diameter (in ID): <u>2.0</u>
Filter Pack Interval (ft. BGL): <u>-</u>	Casing Volume (gal.): <u>-</u>

QUALITY ASSURANCE

METHODS (describe):

Cleaning Equipment: alcohol & DI water
 Purging: pneumatic / bladder Sampling: none
 Disposal of Discharged Water: on site

INSTRUMENTS (Indicate make, model, I.D.)

Water Level: KECK Thermometer: HORIBA
 pH Meter: HORIBA Field Calibration: 7-4
 Conductivity Meter: HORIBA Field Calibration: 1413
 Filter / Filter Size: - Other:

SAMPLING MEASUREMENTS

Time	Cum. Vol (gal. or L)	Purge Rate (gal. or L/m)	Temp. (°C)	pH	Spec. Cond. (mmhos/cm)	D.O	Redox (mV)	Turbidity & Color	Water Depth (ft BMP)
0949	-	.2	22.4	6.59	1730	0.63	-42	3.6	19.71
0954		↓	22.6	6.56	1760	0.51	-41	4.1	19.72
0958		↓	22.7	6.57	1770	0.52	-41	4.0	19.71

Water Level (ft. BMP) at End of Purge: 19.71 Sample Intake Depth (ft. BMP):

SAMPLE INVENTORY

Bottles Collected				Filtration (Y/N)	Preservation	Remarks (quality control sample, other)
Time	Volume	Composition (G, P)	No.			
1015	250ML	P	1	N	-	GEN CHEM
1015	500ML	P	1	N	HNO3	METALS

Comments:

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GROUNDWATER SAMPLING RECORD

PAGE 1 of 1

Project Number: 19122262-F Project Name: LUMINANT - OGSES Date: 5-16-19

Sample Number: <u>FGD-S</u>	Starting Water Level (ft. BMP): <u>20.41</u>
Sampling Location (well ID, etc.): <u>FGD-S</u>	Casing Stickup (ft.): <u>-</u>
Sampled by: <u>JTB</u>	Starting Water Level (ft. BGL): <u>20.41</u>
Measuring Point (MP) of Well: <u>TOC/PVC</u>	Total Depth (ft. BGL): <u>-</u>
Screened Interval (ft. BGL): <u>-</u>	Casing Diameter (in ID): <u>2.0</u>
Filter Pack Interval (ft. BGL): <u>-</u>	Casing Volume (gal.): <u>-</u>

QUALITY ASSURANCE

METHODS (describe):

Cleaning Equipment: alcohol & DI water
 Purging: peristaltic / bladder Sampling: grab
 Disposal of Discharged Water: on site

INSTRUMENTS (Indicate make, model, I.D.)

Water Level: KECK Thermometer: HORIBA
 pH Meter: HORIBA Field Calibration: 7.4
 Conductivity Meter: HORIBA Field Calibration: 1413
 Filter / Filter Size: - Other: -

SAMPLING MEASUREMENTS

Time	Cum. Vol. (gal. of L)	Purge Rate (gal. or L/m)	Temp. (°C)	pH	Spec. Cond. (mmhos/cm)	D.O.	Redox (mV)	Turbidity & Color	Water Depth (ft BMP)
1323	-	.2	22.6	6.41	1620	0.71	-26	7.4	20.69
1329		↓	22.8	6.46	1610	0.46	-31	6.7	20.71
1334		↓	22.8	6.46	1620	0.51	-31	6.8	20.70

Water Level (ft. BMP) at End of Purge: 20.70

Sample Intake Depth (ft. BMP):

SAMPLE INVENTORY

Time	Bottles Collected			Filtration (Y/N)	Preservation	Remarks (quality control sample, other)
	Volume	Composition (G, P)	No.			
1350	250ML	P	1	N	-	GEN CHEM
1350	500ML	P	1	N	HNO3	METALS

Comments:

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GROUNDWATER SAMPLING RECORD

PAGE 1 of 1

Project Number: 19122262-F Project Name: LUMINANT - OGSES Date: 5-16-19

Sample Number: <u>FGD-6</u>	Starting Water Level (ft. BMP): <u>16.37</u>
Sampling Location (well ID, etc.): <u>FGD-6</u>	Casing Stickup (ft.): <u>-</u>
Sampled by: <u>JTB</u>	Starting Water Level (ft. BGL): <u>16.37</u>
Measuring Point (MP) of Well: <u>TOC/PVC</u>	Total Depth (ft. BGL): <u>-</u>
Screened Interval (ft. BGL): <u>-</u>	Casing Diameter (in ID): <u>2.0</u>
Filter Pack Interval (ft. BGL): <u>-</u>	Casing Volume (gal.): <u>-</u>

QUALITY ASSURANCE

METHODS (describe):

Cleaning Equipment:

Purging: peristaltic / bladder

Sampling: Direct

Disposal of Discharged Water: on site

INSTRUMENTS (Indicate make, model, I.D.)

Water Level: KECK

Thermometer: HORIBA

pH Meter: HORIBA

Field Calibration: 7-4

Conductivity Meter: HORIBA

Field Calibration: 1413

Filter / Filter Size: -

Other:

SAMPLING MEASUREMENTS

Time	Cum. Vol. (gal. or L)	Purge Rate (gal. or L/m)	Temp. (°C)	pH	Spec. Cond. (mmhos/cm)	D.O.	Redox (mV)	Turbidity & Color	Water Depth (ft BMP)
0852	-	.2	22.7	6.91	1410	1.06	-31	11	16.61
0857		↓	22.8	6.86	1440	0.81	-29	6.6	16.62
0904		↓	22.9	6.85	1450	0.84	-28	6.2	16.61

Water Level (ft. BMP) at End of Purge: 16.61

Sample Intake Depth (ft. BMP):

SAMPLE INVENTORY

Bottles Collected				Filtration (Y/N)	Preservation	Remarks (quality control sample, other)
Time	Volume	Composition (G, P)	No.			
0920	250ML	P	1	N	-	GEN CHEM
0920	500ML	P	1	N	HNO3	METALS

Comments:

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GROUNDWATER SAMPLING RECORD

Project Number: 19122262-F Project Name: LUMINANT - OGSES Date: 5-16-19

Sample Number: <u>FGD-8</u>	Starting Water Level (ft. BMP): <u>29.11</u>
Sampling Location (well ID, etc.): <u>FGD-8</u>	Casing Stickup (ft.): <u>-</u>
Sampled by: <u>JTB</u>	Starting Water Level (ft. BGL): <u>29.11</u>
Measuring Point (MP) of Well: <u>TOC/PVC</u>	Total Depth (ft. BGL): <u>-</u>
Screened Interval (ft. BGL): <u>-</u>	Casing Diameter (in ID): <u>2.0</u>
Filter Pack Interval (ft. BGL): <u>-</u>	Casing Volume (gal.): <u>-</u>

QUALITY ASSURANCE

METHODS (describe):

Cleaning Equipment:

Purging: peristaltic / bladder

Sampling: none

Disposal of Discharged Water: on site

INSTRUMENTS (Indicate make, model, I.D.)

Water Level: KECK

Thermometer: HORIBA

pH Meter: HORIBA

Field Calibration: 7-4

Conductivity Meter: HORIBA

Field Calibration: 1413

Filter / Filter Size: -

Other:

SAMPLING MEASUREMENTS

Time	Cum. Vol (gal. or L)	Purge Rate (gal. or L/m)	Temp. (°C)	pH	Spec. Cond. (mmhos/cm)	D.O.	Redox (mV)	Turbidity & Color	Water Depth (ft BMP)
1513	-	.2	23.1	6.71	1320	0.76	-36	7.4	29.34
1522	-	↓	22.6	6.68	1340	0.71	-41	7.6	29.34
1527	-	↓	22.7	6.67	1340	0.70	-42	7.7	29.35
1534	-	↓							

Water Level (ft. BMP) at End of Purge: 29.35

Sample Intake Depth (ft. BMP):

SAMPLE INVENTORY

Time	Bottles Collected			Filtration (Y/N)	Preservation	Remarks (quality control sample, other)
	Volume	Composition (G, P)	No.			
1545	250ML	P	1	N	-	GEN CHEM
1545	500ML	P	1	N	HNO3	METALS

Comments:

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GROUNDWATER SAMPLING RECORD

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Project Number: 19122262-F Project Name: LUMINANT-OGSES Date: 5-16-19

Sample Number: <u>FGD-11</u>	Starting Water Level (ft. BMP): <u>38.72</u>
Sampling Location (well ID, etc.): <u>FGD-11</u>	Casing Stickup (ft.): <u>-</u>
Sampled by: <u>JTB</u>	Starting Water Level (ft. BGL): <u>38.72</u>
Measuring Point (MP) of Well: <u>TOC/PVC</u>	Total Depth (ft. BGL): <u>-</u>
Screened Interval (ft. BGL): <u>-</u>	Casing Diameter (in ID): <u>2.0</u>
Filter Pack Interval (ft. BGL): <u>-</u>	Casing Volume (gal.): <u>-</u>

QUALITY ASSURANCE

METHODS (describe):

Cleaning Equipment: alcohol & DI water
 Purging: peristaltic / bladder Sampling: DAME
 Disposal of Discharged Water: on site

INSTRUMENTS (Indicate make, model, I.D.)

Water Level: KECK Thermometer: HORIBA
 pH Meter: HORIBA Field Calibration: 7-4
 Conductivity Meter: HORIBA Field Calibration: 1413
 Filter / Filter Size: - Other: -

SAMPLING MEASUREMENTS

LOG Time	Cum. Vol. (gal. of L)	Purge Rate (gal. of L/m)	Temp. (oC)	pH	Spec. Cond. (mmhos/cm)	D.O.	Redox (mV)	Turbidity & Color	Water Depth (ft BMP)
1616	-	.2	23.4	6.81	1360	0.91	-47	9.1	38.93
1622		↓	23.5	6.82	1340	0.77	-48	6.8	38.94
1627		↓	23.5	6.83	1340	0.78	-48	6.9	38.94

Water Level (ft. BMP) at End of Purge: 38.94 Sample Intake Depth (ft. BMP):

SAMPLE INVENTORY

Bottles Collected				Filtration (Y/N)	Preservation	Remarks (quality control sample, other)
Time	Volume	Composition (G, P)	No.			
1640	250ML	P	1	N	-	GEN CHEM
1640	500ML	P	1	N	HNO3	METALS

Comments:

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GROUNDWATER SAMPLING RECORD

PAGE 1 of 1

Project Number: **19122262-F** Project Name: **LUMINANT-DGSES** Date: **5-16-19**

Sample Number: FGD-12	Starting Water Level (ft. BMP): 30.18
Sampling Location (well ID, etc.): FGD-12	Casing Stickup (ft.): -
Sampled by: JTB	Starting Water Level (ft. BGL): 30.18
Measuring Point (MP) of Well: TOC/PVC	Total Depth (ft. BGL): -
Screened Interval (ft. BGL): -	Casing Diameter (In ID): 2.0
Filter Pack Interval (ft. BGL): -	Casing Volume (gal.): -

QUALITY ASSURANCE

METHODS (describe):

Cleaning Equipment:

Purging: **peristaltic / bladder**

Sampling: **DAME**

Disposal of Discharged Water: **on site**

INSTRUMENTS (Indicate make, model, I.D.)

Water Level: **KECK**

Thermometer: **HORIBA**

pH Meter: **HORIBA**

Field Calibration: **7-4**

Conductivity Meter: **HORIBA**

Field Calibration: **1413**

Filter / Filter Size: **-**

Other:

SAMPLING MEASUREMENTS

1703 Time	Cum. Vol. (gal. or L)	Purge Rate (gal. or L/m)	Temp. (°C)	pH	Spec. Cond. (mmhos/cm)	D.O.	Redox (mV)	Turbidity & Color	Water Depth (ft BMP)
1713	-	.2	23.2	6.46	1530	0.71	-17	7.1	30.31
1717		↓	23.0	6.51	1510	0.44	-19	7.7	30.32
1724		↓	23.0	6.52	1510	0.46	-19	7.8	30.32

Water Level (ft. BMP) at End of Purge: **30.32**

Sample Intake Depth (ft. BMP):

SAMPLE INVENTORY

Time	Bottles Collected			Filtration (Y/N)	Preservation	Remarks (quality control sample, other)
	Volume	Composition (G, P)	No.			
1735	250ML	P	1	N	-	GEN CHEM
1735	500ML	P	1	N	HNO3	METALS

Comments:

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GROUNDWATER SAMPLING RECORD

Project Number: 19122262-F Project Name: LUMINANT-DGSES Date: 5-17-19

Sample Number: FGD-14 Starting Water Level (ft. BMP): 15.52

Sampling Location (well ID, etc.): FGD-14 Casing Stickup (ft.): -

Sampled by: JTB Starting Water Level (ft. BGL): 15.52

Measuring Point (MP) of Well: TOC/PVC Total Depth (ft. BGL): -

Screened Interval (ft. BGL): = Casing Diameter (In ID): 2.0

Filter Pack Interval (ft. BGL): = Casing Volume (gal.): -

QUALITY ASSURANCE

METHODS (describe):

Cleaning Equipment: alcorox & DI liner

Purging: peristaltic / bladder Sampling: none

Disposal of Discharged Water: on site

INSTRUMENTS (Indicate make, model, I.d.)

Water Level: KPCCK Thermometer: HORIBA

pH Meter: HORIBA Field Calibration: 7.4

Conductivity Meter: HORIBA Field Calibration: 1413

Filter / Filter Size: - Other: -

SAMPLING MEASUREMENTS

Time	Cum. Vol. (gal. of L)	Purge Rate (gal. of L/m)	Temp. (°C)	pH	Spec. Cond. (mmhos/cm)	D.O.	Redox (mV)	Turbidity & Color	Water Depth (ft BMP)
0724									
0733	-	.2	22.7	6.63	1410	1.24	-6	4.7	15.81
0738		↓	22.9	6.65	1440	1.07	-7	5.2	15.82
0744		↓	22.9	6.65	1430	1.06	-7	5.7	15.82

Water Level (ft. BMP) at End of Purge: 15.82 Sample Intake Depth (ft. BMP): -

SAMPLE INVENTORY

Time	Bottles Collected			Filtration (Y/N)	Preservation	Remarks (quality control sample, other)
	Volume	Composition (G, P)	No.			
0750	250ML	P	1	N	-	GEN CHEM
0750	500ML	P	1	N	HNO3	METALS

Comments:

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GROUNDWATER SAMPLING RECORD

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Project Number: 19122262-F Project Name: LUMINANT - OGSES Date: 6-6-19

Sample Number: FGD-15 Starting Water Level (ft. BMP): 25.22

Sampling Location (well ID, etc.): FGD-15 Casing Stickup (ft.): -

Sampled by: JTB Starting Water Level (ft. BGL): 25.22

Measuring Point (MP) of Well: TDC/PVC Total Depth (ft. BGL): -

Screened Interval (ft. BGL): = Casing Diameter (In ID): 2.0

Filter Pack Interval (ft. BGL): = Casing Volume (gal.): -

QUALITY ASSURANCE

METHODS (describe):

Cleaning Equipment:

Purging: peristaltic / bladder

Sampling: DAME

Disposal of Discharged Water: on site

INSTRUMENTS (Indicate make, model, I.d.)

Water Level: KECK

Thermometer: HORIBA

pH Meter: HORIBA

Field Calibration: 7.4

Conductivity Meter: HORIBA

Field Calibration: 1413

Filter / Filter Size: -

Other:

SAMPLING MEASUREMENTS

Time	Cum. Vol. (gal. or L)	Purge Rate (gal. or L/m)	Temp. (°C)	pH	Spec. Cond. (mmhos/cm)	D.O.	Redox (mV)	Turbidity & Color	Water Depth (ft BMP)
1412	-	.2	20.9	6.67	1570	1.29	-17	7.7	25.41
1426	-	↓	20.7	6.62	1560	1.06	-16	5.2	25.42
1432	-	↓	20.6	6.62	1560	1.07	-16	5.9	25.41

Water Level (ft. BMP) at End of Purge:

Sample Intake Depth (ft. BMP):

SAMPLE INVENTORY

Time	Bottles Collected			Filtration (Y/N)	Preservation	Remarks (quality control sample, other)
	Volume	Composition (G, P)	No.			
1445	250ML	P	1	N	-	GEN CHEM
1445	500ML	P	1	N	HNO3	METALS
1445	1L	P	2	N	HNO3	

Comments:

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GROUNDWATER SAMPLING RECORD

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Project Number: 19122262-F Project Name: LUMINANT - OGSES Date: 6-6-19

Sample Number: FGD-16 Starting Water Level (ft. BMP): 31.06
 Sampling Location (well ID, etc.): FGD-16 Casing Stickup (ft.): -
 Sampled by: JTB Starting Water Level (ft. BGL): 31.06
 Measuring Point (MP) of Well: TOC/PUC Total Depth (ft. BGL): -
 Screened Interval (ft. BGL): - Casing Diameter (In ID): 2.0
 Filter Pack Interval (ft. BGL): - Casing Volume (gal.): -

QUALITY ASSURANCE

METHODS (describe):

Cleaning Equipment:

Purging: peristaltic / bladder Sampling: None

Disposal of Discharged Water: on site

INSTRUMENTS (Indicate make, model, I.d.)

Water Level: KECK Thermometer: HORIBA
 pH Meter: HORIBA Field Calibration: 7-4
 Conductivity Meter: HORIBA Field Calibration: 1413
 Filter / Filter Size: - Other:

SAMPLING MEASUREMENTS

1232 Time	Cum. Vol. (gal. or L)	Purge Rate (gal. or L/m)	Temp. (°C)	pH	Spec. Cond. (mmhos/cm)	D.O	Redox (mV)	Turbidity & Color	Water Depth (ft BMP)
1241	-	.2	21.7	6.74	1760	0.71	-39	5.7	31.27
1246		↓	21.6	6.73	1740	0.56	-31	6.7	31.26
1253		↓	21.6	6.73	1740	0.57	-32	6.9	31.26

Water Level (ft. BMP) at End of Purge: 31.26

Sample Intake Depth (ft. BMP):

SAMPLE INVENTORY

Bottles Collected				Filtration (Y/N)	Preservation	Remarks (quality control sample, other)
Time	Volume	Composition (G, P)	No.			
1300	250ML	P	1	N	-	GEN CHEM
1300	500ML	P	1	N	HNO3	METALS
1300	1L	P	2	N	HNO3	

Comments:

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APPENDIX B

Tier II and Tier III Monitored Natural Attenuation Evaluation



GOLDER

REPORT

**OAK GROVE STEAM ELECTRIC STATION - FGD PONDS
TIER II AND III MNA EVALUATION**

Submitted to:

Luminant Generation Company LLC

6555 Sierra Drive
Irving, Texas 75039

Submitted by:

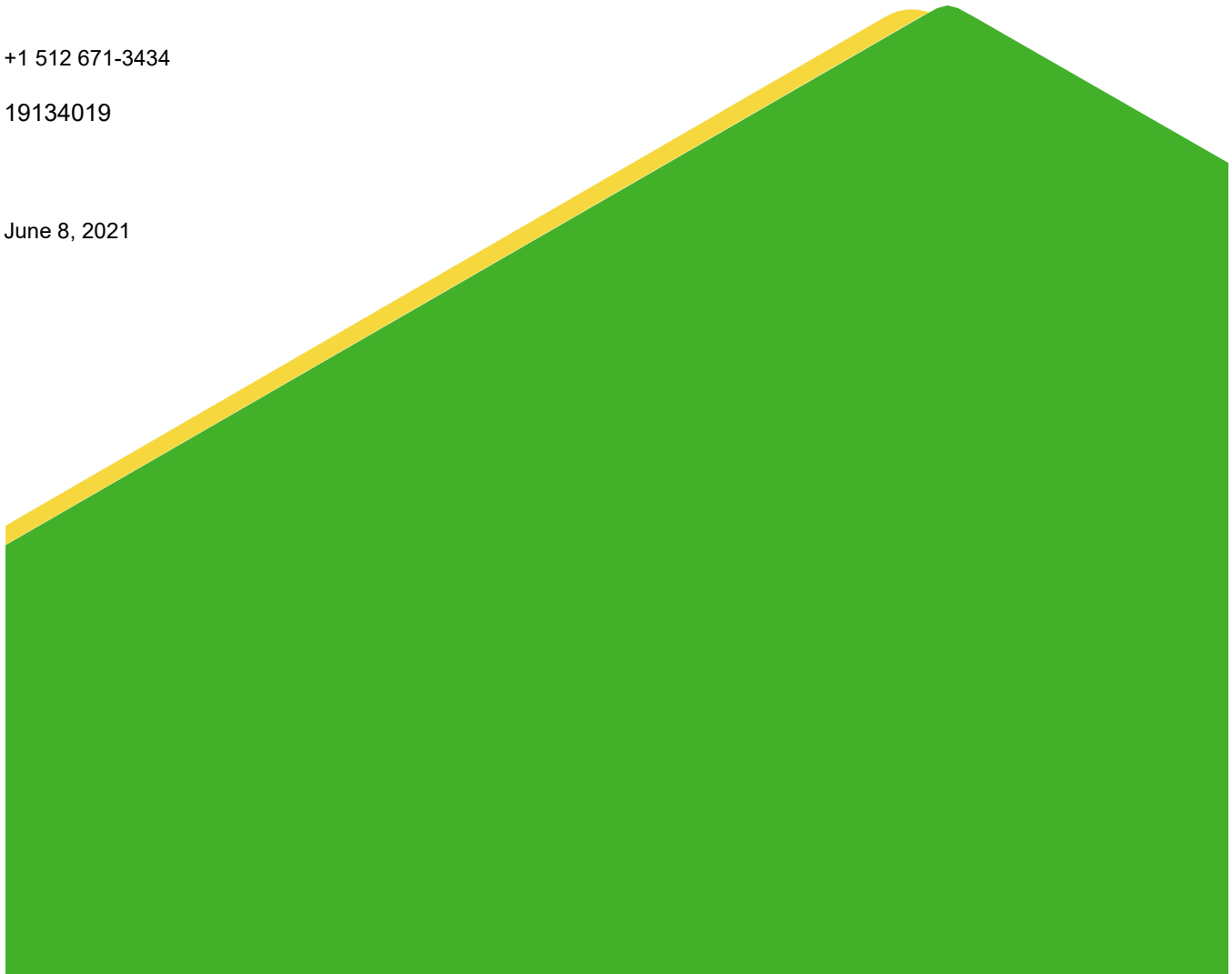
Golder Associates Inc.

2201 Double Creek Drive, Suite 4004
Round Rock, Texas 78664

+1 512 671-3434

19134019

June 8, 2021



Distribution List

Renee Collins, Luminant

David Mitchell, Luminant

Eric Chavers, Luminant

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APPENDICES**APPENDIX A**

Laboratory Analytical Reports

APPENDIX B

Groundwater Modeling

APPENDIX C

Geochemical Modeling Saturation Indices

1.0 OVERVIEW

Oak Grove Management Company LLC (Luminant) operates the FGD-A-Pond, FGD-B-Pond, and FGD-C Pond (collectively referred to as the “FGD Ponds”), approximately 0.25 miles northeast of the Oak Grove Steam Electric Station (OGSES), in Robertson County, Texas. Luminant manages Coal Combustion Residuals (CCR) generated from the OGSES in the FGD Ponds per the applicable requirements of 40 Code of Federal Regulations (CFR) Part 257 Subpart D as amended (CCR Final Rule). A map of the FGD Ponds is provided on Exhibit 1.

Statistically significant levels (SSLs) of cobalt and lithium above groundwater protection standards (GWPS) were detected in the uppermost aquifer downgradient of the FGD Ponds during 2018 assessment monitoring. In response to the 2018 cobalt and lithium SSLs, an Assessment of Corrective Measures (ACM) report was completed for the FGD Ponds in September 2019 as required by 40 CFR § 257.96 (Golder 2019a). The ACM evaluated various source control and groundwater response technologies to address the cobalt and lithium SSLs. However, an Alternate Source Demonstration (ASD) completed in accordance with 40 CFR § 257.95(g)(3)(ii) in October 2020 (Golder 2020) indicated that a source other than the FGD Ponds caused the lithium SSL and lithium has therefore been eliminated as a constituent of concern at the FGD Ponds. The ACM was updated in May 2021 (Golder 2021) to remove lithium from the list of constituents evaluated in the ACM. In addition, updated statistical analyses for cobalt incorporating 2019 and 2020 assessment monitoring data indicate that cobalt is also no longer present at SSLs above the GWPS downgradient of the FGD Ponds; however, for the purposes of the ACM, Luminant continues to evaluate potential groundwater remedies for cobalt based on the 2018 SSL.

The ACM identified monitored natural attenuation (MNA) as a potential groundwater response technology for cobalt downgradient of the FGD Ponds. To supplement the findings of the ACM, Golder was retained by Luminant to further evaluate the overall feasibility of MNA as a groundwater remedial alternative for the FGD Ponds in accordance with 40 CFR §257.97. Golder based the MNA feasibility evaluation on United States Environmental Protection Agency (USEPA) guidance for using MNA as a remedial strategy (USEPA 2007a, b) and best practices in the Interstate Technology Regulatory Council (ITRC) document: “A Decision Framework for Applying Monitored Natural Attenuation Processes to Metals and Radionuclides in Groundwater” (ITRC 2010).

USEPA guidance recommends that the overall feasibility of MNA as a groundwater response technology be evaluated based on the following multi-tier approach (USEPA 2007a, b):

- 1) Demonstrate active constituent removal from groundwater and dissolved plume stability (Tier I).
- 2) Determine the mechanisms and rates of the operative attenuation processes (Tier II).
- 3) Determine the long-term capacity for attenuation and the stability of immobilized constituents (Tier III).

A Tier I MNA Evaluation for the FGD Ponds was completed in December 2019 (Golder 2019b). The Tier I Evaluation concluded that sufficient evidence was present to satisfy the Tier I criteria for successful MNA implementation to address the cobalt SSL. Further geochemical evaluation (i.e., Tier II and Tier III Evaluation) of MNA was recommended in the Tier I report. This memorandum presents the findings of the Tier II and Tier III MNA Evaluation for the FGD Ponds area.

The results of the Tier II and III Evaluation will be used to further assess the performance and reliability of MNA as a potential remedial alternative as required by 40 CFR §257.97. Following completion of this multi-tier evaluation, the fourth and final tier of an MNA program, which involves the design of a performance monitoring program and the development of a contingency plan, will be completed.

2.0 TIER II AND TIER III EVALUATION APPROACH

In 2019, Golder collected samples of overburden, groundwater, and porewater as part of a Nature and Extent Evaluation and Tier I Evaluation in accordance with the CCR Final Rule. Groundwater data collection and analysis at the FGD Ponds continued throughout and after the completion of the Tier I Evaluation, and the water quality results are used in the Tier II and III Site Evaluation presented herein. The additional groundwater data collection consisted of three sampling events (August 2019, May 2020, and September 2020). Data from those events are included in Appendix A. The general groundwater quality and trends for constituents with SSLs (previously including lithium) were described in detail in the Tier I report (Golder 2019b). No substantial changes in groundwater quality have occurred that would change the findings of the Tier I Evaluation.

The Tier II and III Evaluation expands upon the Tier I findings as follows:

- **Plume Stability:** Based on the water quality monitoring data presented in this assessment, groundwater concentrations of cobalt outside of the FGD Ponds at monitoring wells are relatively stable or decreasing (Figure 1). As of September 2020 (the most recent sampling event), the concentration of cobalt in groundwater in all but one downgradient monitoring well (FGD-6) was below the detection limit (<0.003 mg/L). At well FGD-3, where previously an SSL of cobalt was indicated, cobalt levels have not exceeded the GWPS since September 2018.
- **Magnitude of Exceedances:** Occasional exceedances of the cobalt GWPS in some wells do not amount to levels that would be considered an SSL per the CCR Rule (Golder 2019a). Cobalt is currently not at an SSL in groundwater based on a 95% confidence interval at any CCR monitoring well (Golder 2019a; Golder 2020). The highest level of cobalt in groundwater (since monitoring began) at the FGD Ponds was observed in well FGD-1 (0.0495 mg/L on May 11, 2020). During the next sampling round, cobalt in groundwater from FGD-1 was below the detection limit (<0.003 mg/L), thus not amounting to an SSL of cobalt. Although exceeding the GWPS, the measured cobalt concentration in May 2020 is considered an outlier due to field or laboratory error rather than the presence of a continuous cobalt source affecting FGD-1.
- **FGD Pond Porewater:** Historical records are not available for ash additions or porewater concentrations over the lifespan of the CCR units. However, based on 2019 and 2020 porewater data, cobalt is not present in the FGD Ponds at levels above its GWPS (0.016 mg/L). This suggests that the FGD Ponds may not be a current source of cobalt in groundwater.
- **Groundwater Chemistry:** The groundwater monitoring results and the findings of the geochemical modeling support the potential for natural attenuation of cobalt. Equilibrium of groundwater with the mineral phase ferrihydrite, capable of adsorbing cobalt, was indicated in all groundwater samples. Further, differences in relative abundance of the major ions in groundwater indicate that porewater is geochemically distinct from groundwater. Detailed findings are presented in the Golder Tier I Evaluation (Golder 2019b).
- **Confirmation of Attenuation/Immobilization:** Based on both mineralogical and chemical analysis, it is evident that attenuation of cobalt by aquifer materials is occurring. Iron, present in the form of (hydr)oxide or amorphous phases that facilitate metals attenuation (Dzombak and Morel 1990), was identified in all overburden samples, consistent with the inferred presence of ferrihydrite based on the geochemical modeling. The ubiquitous presence of aluminum, in the form of aluminum oxides and clay minerals, provides an additional well-studied attenuation reservoir (Karamalidis and Dzombak 2011; Uddin 2017). Thus, overburden samples from the FGD Ponds demonstrate sequestration of constituents of interest is occurring.

The Tier II and III Evaluation presented in this document builds upon the results of the Tier I Evaluation by undertaking the following:

- Evaluation of temporal and geographical trends in groundwater quality data to estimate site-wide attenuation rates.
- Geochemical modeling to determine the aqueous speciation of cobalt and evaluate saturation indices of minerals relevant to its attenuation.
- Determination of the capacity of different mechanisms to attenuate cobalt, including adsorption, precipitation and co-precipitation, and physical attenuation (dilution/dispersion).
- Geochemical modeling to assess the stability and reversibility of attenuation due to adsorption.

Additionally, the results from the following analyses described in the Tier I Evaluation for aquifer solids are utilized as part of the Tier II and III Evaluation:

- Mineralogical analysis of aquifer solids to identify and quantify the major mineral components.
- Chemical analysis and sequential extraction procedure (SEP) of aquifer solids to quantify the total metal content and identify the environmentally available fractions of metals.

The approach to and results of the Tier II and Tier III Evaluation are presented in the next sections to establish a basis for the likely success of MNA at the FGD Ponds area.

3.0 MODELING APPROACH

3.1 General Approach

3.1.1 Estimation of Attenuation Rates

To evaluate the attenuation of cobalt in groundwater at the FGD Ponds and to assess the rate of attenuation, the point decay method (Newell et al. 2009) was applied. The point decay method is used to determine the rate at which a constituent's concentrations are increasing or decreasing in groundwater at a single well between sampling events. This method can thus be used to predict when the constituent's concentrations will fall back below regulatory limits.

Equation 1 describes first-order decay for a constituent:

$$\ln(C_t) = kt + \ln(C_0) \quad (\text{Equation 1})$$

where C_0 is the initial constituent concentration, C_t is the constituent concentration at time t , t is the amount of time in years that has passed since the initial measurement, and k is the first-order decay rate constant.

Equation 2 shows Equation 1 reorganized to solve for the decay rate constant:

$$k = (\ln(C_t) - \ln(C_0))/t \quad (\text{Equation 2})$$

Groundwater quality data from the upgradient and downgradient wells collected from November 2015 to September 2020 were used to determine the mean first-order decay rate for each constituent of interest. Due to variable detection limits, results that were reported as below detection were not used in the point decay analysis. Equation 1 and the mean first-order decay rate were used to calculate the number of years required for cobalt concentrations greater than the GWPS to decrease below the threshold.

3.1.2 Geochemical Speciation Modeling

Baseline geochemical modeling was conducted to evaluate general groundwater and porewater quality, determine the potential for precipitation of sorbent media, evaluate the potential for mineral precipitation or adsorption in the aquifer, and determine the speciation of cobalt. The geochemical computer code PHREEQC, developed by the United States Geological Survey (USGS), was used for these simulations (Parkhurst and Appelo 2013). PHREEQC version 3.4 is a general-purpose geochemical modeling code used to simulate reactions in water and between water and solid mineral phases (e.g., rocks and sediments). Reactions include aqueous equilibria, mineral dissolution and precipitation, ion exchange, surface complexation, solid solutions, gas-water equilibrium, and kinetic biogeochemical reactions. The widely accepted thermodynamic database Minteq.v4, 2017 edition, was used as a basis for the thermodynamic constants required for modeling (Allison et al. 1991).

3.1.3 Groundwater Modeling

Golder developed a three-dimensional numerical groundwater model based on the MODFLOW groundwater-flow source code created by the USGS (McDonald and Harbaugh 1988) using Visual MODFLOW (Version 4.6). The groundwater model simulates steady state groundwater flow conditions in the FGD Ponds. The results of the groundwater model were incorporated into the reactive transport geochemical model discussed in Section 3.1.4. The groundwater model was developed based on:

- Natural hydrologic boundaries, wherever possible.
- Ground surface topography and pond geometry.
- Geologic layers with representative structural properties based on boring logs.
- Hydraulic properties of geologic layers based on historical aquifer tests conducted at the site.
- Historical groundwater elevation measurements.

Details on key parameters used to develop the groundwater model are presented in Appendix B.

3.1.4 Reactive Transport Modeling

Additional geochemical modeling was performed to assess viable attenuation mechanisms and predict the quantity and stability of the attenuated constituents of interest. To do so, Golder used PHAST, a three-dimensional reactive transport modeling computer program developed by the USGS that simulates multicomponent reactive solute transport in a three-dimensional saturated groundwater flow system (Parkhurst et al. 2010). PHAST is a versatile groundwater flow and solute-transport simulator with capabilities to model a wide range of equilibrium and kinetic geochemical reactions. The flow and transport calculations are based on a modified version of HST3D that is restricted to constant fluid density and constant temperature. PHAST can be used to simulate both confined and unconfined flow using both a steady state and transient flow solution. The geochemical reactions are simulated with the geochemical model PHREEQC-RM (based on PHREEQC version 3.4), which is embedded in PHAST, resulting in a full three-dimensional reactive transport model. In the application used here, parameters from the site groundwater flow model developed in MODFLOW (i.e. hydraulic conductivities of layers, model layering, model architecture, water balance, groundwater velocities, and fluid head calculations) were directly used as initial and target model values to ensure seamless model coordination with

MODFLOW, without the need to rebuild a groundwater flow model independently in another software package capable of simulating geochemical reactions.

3.1.5 Source Control Modeling

For the purposes of the ACM, it was assumed that some degree of source control will be considered for the FGD Ponds, since one of the listed objectives in §257.97(b) for the corrective measures is to control the source of releases of Appendix IV constituents to the environment from the CCR Unit. The OGSES FGD Ponds are an integral part of the CCR management system at the plant and potential source control technologies will be designed to keep the FGD Ponds in operation.

FGD-B and FGD-C are constructed with composite liner systems that comply with the requirements of §257.71(a)(1)(ii) of the CCR Rule and these ponds are considered lined surface impoundments under the Rule. Since the liner systems in these ponds comply with the CCR Rule, FGD-B and FGD-C provide an appropriate level of source control as currently constructed and no modifications are necessary to these ponds.

FGD-A is constructed with a clay liner and the pond is considered an unlined surface impoundment as defined in § 257.71(a)(1)(i). The pond is currently out of service. The FGD-A is being retrofitted with a new composite liner system that complies with the requirements of §257.71(a)(1)(ii) of the CCR Rule to improve the level of source control in the pond. The new liner system will be installed in general accordance with the following procedures:

- Water will be removed from the pond and transferred to FGD-B and FGD-C;
- Solids in the pond will be dewatered, removed and transported to the OGSES Ash Landfill 1;
- A minimum of 2 feet of the existing compacted clay liner will be retained at the base of the pond;
- A 60-mil HDPE geomembrane liner will be installed over the 2 feet of compacted clay liner
- A protective layer of soil or other material will be placed over the geomembrane liner.

Retrofitting FGD-A with a new composite liner system is assumed to serve as the source control component of the potential corrective measures for the FGD Ponds. It is estimated that the FGD-A liner retrofit will be completed in 2021.

3.1.6 Mineral Precipitation and Co-precipitation

The potential for mineral precipitation was assessed in PHAST by PHREEQC using a saturation index (SI) calculated according to Equation 3.

$$SI = \log (IAP/Ksp) \quad \text{(Equation 3)}$$

The saturation index is the ratio of the ion activity product (IAP) of a mineral to the solubility product (Ksp). An SI value greater than zero indicates that the solution is supersaturated with respect to a particular mineral phase and, therefore, precipitation of this mineral may occur. An evaluation of precipitation kinetics is then required to determine whether the supersaturated mineral will indeed form. An SI value less than zero indicates the solution is undersaturated with respect to a particular mineral phase. An SI value close to zero indicates equilibrium conditions exist between the mineral and the solution. For the purpose of this evaluation, SI values between -0.5 and 0.5 were considered to represent 'equilibrium' to account for the uncertainties inherent in the analytical methods and geochemical modeling.

Co-precipitation was evaluated based on published literature and known association between minerals and the constituents of interest. For example, cobalt is known to co-precipitate with iron oxyhydroxides as well as adsorb to Hfo (Nordstrom and Alpers 1999). Therefore, minerals identified by PHAST/PHREEQC to be at equilibrium and supersaturated ($SI > -0.5$) were evaluated for their potential to host cobalt.

3.1.7 Adsorption Capacity and Attenuation

Adsorption is an important mechanism by which constituents in groundwater can be attenuated. The adsorptive partitioning between dissolved and solid phases was simulated during baseline modeling using PHREEQC and for predictive modeling using PHAST with a two-layer surface complexation model (SCM). The SCM approach is described in Davis and Kent (1990), with additional parameterization based on Dzombak and Morel (1990) and Karamalidis and Dzombak (2011), utilizing iron (hydrous ferric oxide [Hfo]) as ferrihydrite [$Fe(OH)_3(am)$], and aluminum (hydrous aluminum oxide [Hao]) as gibbsite [$Al(OH)_3(am)$], as adsorbing surfaces.

The amount of Hfo and Hao available at the site for attenuation was based on the iron and aluminum concentrations measured in the amorphous and metal hydroxide phase of the SEP as described in the Tier I Evaluation (Golder 2019b). The minimum, mean, and maximum iron and aluminum concentrations in aquifer solids samples were used in the adsorption models to capture the range of expected site concentrations. The Hfo and Hao surface properties (i.e. surface area, site density, and types of surface sites) from Dzombak and Morel (1990) and Karamalidis and Dzombak (2011) were used to quantify the iron and aluminum adsorption sites per mole of mineral.

The calculation methodology of Appelo and Postma (2010) was used to determine the specific quantity of sites on each mineral surface type as a function of the amount of mineral available to participate in these reactions. The methodology assumes the number of surface sites (sites) equals the product of the moles of iron [Fe] and the moles of sites per mole of iron ($[sites]/[Fe] = 0.2$ moles of sites per mole of iron). To determine the amount of ferrihydrite available for sorption, the Appelo and Postma methodology further assumes the mass of ferrihydrite (M_{HFO}) in grams (g) available equals the product of the [Fe] and the molecular weight of ferrihydrite ($MW_{HFO} = 88.85$ g/mole). The same approach was used to calculate the number of sites from gibbsite, assuming the $[sites]/[Al]$ is 0.41 moles of sites per mole of aluminum and the molecular weight of gibbsite is 78.003 g/mole. The range of Hfo and Hao in soils at the FGD Ponds with associated calculations is presented in Table 1.

The thermodynamic database Minteq V.4, described in Section 3.1.1, was modified for adsorption modeling because new and updated thermodynamic data have been released in the scientific literature. These new data are important to include as they allow further refinement of potential reactions, or for correction of previous data that may have been less accurate or more broadly defined. For the geochemical modeling of the FGD Ponds, numerous updates to the database were made, including the addition of data relating to partitioning coefficients for metals on gibbsite, developed by Karamalidis and Dzombak (2011).

Table 1: Calculations of ferrihydrite and gibbsite surface parameters for predictive modeling

Parameter	Units	Ferrihydrite			Gibbsite		
		Minimum	Mean	Maximum	Minimum	Mean	Maximum
Geometric Mean of Aquifer Solids Composition	mg/kg X	1458	2131	3461	623	1030	1862
	mmol X	26.11	38.16	61.98	23.09	38.17	69.01
	mol X	2.61E-02	3.82E-02	6.20E-02	2.31E-02	3.82E-02	6.90E-02
Surface Site Concentration	mol weak sites / mol X	0.2	0.2	0.2	0.41	0.41	0.41
	mol strong sites / mol X	0.005	0.005	0.005	---		
Surface Sites	mol weak	5.2E-03	7.6E-03	1.2E-02	9.5E-03	1.6E-02	2.8E-02
	mol strong	1.3E-04	1.9E-04	3.1E-04	---		
Mass of Ferrihydrite or Gibbsite	grams	2.32	3.39	5.51	2.05	3.39	6.13

Notes:

X = Fe or Al depending on the mineral

Gibbsite only has one site 'type'

3.2 Model Calibration

Calibration of the unconfined flow reactive transport model involved adjusting the flux from the FGD Ponds, the concentration of the constituents of interest (cobalt), and the starting date for ash placement in the ponds. This calibration process simulated the gradual addition of ash to the ponds and was generally based on records of pond construction and certification (PBW 2017). The preliminary hydraulic head for PHAST targeted the steady state solution imported from MODFLOW and achieved a coefficient of determination (R^2) value of 0.9999 between the PHAST and MODFLOW results based on 75 sample point locations (Figure 2).

A hypothetical source solution was developed to represent the initial water quality in the FGD Ponds. Cobalt concentrations in the hypothetical source solution were increased relative to actual reported concentrations to achieve reasonable calibration with measured values in downgradient wells. Cobalt was measured at 0.00625 mg/L or less in porewater samples during the May 2020 sampling event, but that concentration required an increase to 0.044 mg/L to achieve model calibration.

To achieve calibration of cobalt sorption to aquifer solids, the surface site densities for Hfo and Hao were adjusted within the range of the measured minimum and maximum aluminum and iron concentrations in overburden. Background water quality was based on water quality results from background monitoring well FGD-8 and FGD-11 and was set to equilibrium with adsorptive surfaces. Calibration results for cobalt demonstrated good agreement in downgradient monitoring wells (Table 2), despite likely historical variability in source composition and ash placement in the FGD Ponds area. Compositional heterogeneity in terms of aquifer characteristics is likely to be present along the groundwater flow pathway but was not captured within the model. Use of the minimum surface site concentrations of Hfo and Hao calculated in Table 1 showed the best agreement with the target cobalt concentrations presented in Table 2.

Table 2: Calibration of parameters in PHAST for predictive modeling as compared to the target values measured in 2020 in downgradient wells

Downgradient Monitoring Well	Units	Cobalt	
		Target Value	Modeled
FGD-1	mg/L	0.003	0.003
FGD-2	mg/L	0.003	0.003
FGD-3	mg/L	0.004	0.003
FGD-4	mg/L	0.003	0.003
FGD-5	mg/L	0.003	0.003
FGD-6	mg/L	0.005	0.003
FGD-12	mg/L	0.003	0.003

The Peclet and Courant numbers included in the reactive transport modeling were used to evaluate model validity and control numerical dispersion. These values are calculated based on the cell size, time step, dispersivity, and average velocity of groundwater in the model. Equation 4 was used to control numerical dispersion using an upstream-in-space and backwards-in-time differencing solution based on a derivation of the Peclet and Courant numbers:

$$\frac{\Delta X}{2} + \frac{V_x \Delta t}{2} \ll \alpha \quad (\text{Equation 4})$$

Where:

ΔX = Cell size (50ft)

V_x = Average Velocity (4 feet/year)

Δt = Timestep (1 year)

α = Longitudinal dispersivity (50 ft)

3.3 Long-Term Stability of Attenuated Constituents

The long-term stability of constituent attenuation and potential for re-mobilization was evaluated using the results of a 50-year simulation period. Specifically, the responses of the constituents of interest to modeled changes in pH and redox of groundwater at downgradient wells were evaluated. Variations in pH and redox are the most likely changes in groundwater chemistry that will occur in an aquifer over time, affecting the stability of the non-conservative constituents of interest, such as cobalt (ITRC 2010). For example, if the pH or redox should decrease substantially over time, causing the dissolution of ferrihydrite, re-mobilization of adsorbed cobalt would

be likely. In contrast, if pH were to increase substantially (>8), cobalt precipitation as cobalt carbonate may enhance the long-term stability of cobalt attenuation, possibly maintaining low levels of cobalt in groundwater (Nordstrom and Alpers 1999; Smith 1999). The long-term stability and reversibility of attenuation were also evaluated for scenarios involving complete source control (i.e., the capping of the ponds, reducing any flux from the ponds).

3.4 Data Handling and Geochemical Modeling Assumptions

Assumptions related to data handling practices and geochemical modeling were as follows:

- **Groundwater continuity:** Groundwater and porewater quality data from sampling events conducted from May 2019 to September 2020 were evaluated. These sampling events were selected because all wells related to the FGD Ponds were sampled and analyzed for the full suite of parameters described in the Tier I Evaluation (Golder 2019b); the resulting data are assumed to provide a comprehensive overview of Site conditions. Temporal trend analysis of pH and cobalt in groundwater made use of all available sampling events from a well (14 samples in total), dating back to November 2015.
- **Background groundwater chemistry:** Groundwater samples collected from FGD-8 and FGD-11 were assumed to represent natural background conditions for the purpose of geochemical and predictive modeling.
- **Porewater chemistry:** The porewater samples collected from the FGD-A and FGD-B ponds were assumed to be representative of porewater found in the FGD Ponds at the OGSES FGD Pond area.
- **Redox values:** Oxidation-reduction potential (ORP) values measured in the field were converted to redox potential (Eh) by adding 200 millivolts (mV) to the field-measured values as per YSI (2015).
- **Non-detect values:** Constituents with concentrations less than their respective method detection limits were assumed to have a concentration equal to the reporting limit in model simulations.
- **Total recoverable concentrations:** Total recoverable fraction results were used for geochemical modeling.
- **Charge balance:** Groundwater compositions with charge balance errors less than 10% were considered valid. Compositions with charge balance errors greater than 10% were included in the assessment but would be considered less reliable.

4.0 MODELING RESULTS

4.1 Hydrogeology

Based on soil borings completed at the site, the geology near the FGD Ponds generally consists of an upper zone of relatively thick, interbedded sand and clay strata, which is underlain by a lower zone of interbedded silty to clayey sand and well sorted sand (PBW 2017). The uppermost groundwater-bearing unit (GWBU) occurs under unconfined conditions within the shallow sand units at the site. Groundwater elevations are generally highest near the western side of the OGSES Ash Landfill I, which is located southeast of the FGD Ponds at the site and relatively flat in the vicinity of the FGD Ponds. Since CCR monitoring began in 2015, the inferred groundwater flow direction at the site has been to the east-northeast toward Twin Oak Reservoir.

The groundwater model consisted of three layers representing the three geological zones identified at the site. The model incorporated site-specific characteristics such as ground surface topography, groundwater elevation measurements, average elevations and thicknesses of the geological zones, geometry of the ponds, and hydraulic characteristics based on aquifer tests conducted as part of the CCR groundwater monitoring system certification (PBW 2017). Groundwater potentiometric heads in the model were calibrated based on groundwater elevations and inferred flow conditions observed at the site; specifically, to conditions observed during the May 2019 CCR groundwater monitoring event. Consistent with observations during the May 2019 and other historical groundwater monitoring events, groundwater was modeled to generally flow to the east northeast toward Twin Oaks Reservoir, with an average groundwater flow velocity of approximately 0.012 feet per day, or 4.4 feet per year. Additional groundwater model details are provided in Appendix B.

4.2 Capacity of Attenuation Mechanisms

4.2.1 Adsorption to Iron and Aluminum Oxyhydroxides

The Hfo and Hao surface area and sorption site calculations for the minimum, mean, and maximum iron and aluminum concentrations in aquifer solids are presented in Table 1. Adsorption modeling in PHAST revealed adequate capacity to attenuate cobalt based on current levels measured in downgradient monitoring wells. The term “adequate”, as used in this document, refers to the capacity needed to attenuate constituents in groundwater to a level that meets the site-specific GWPS (ITRC 2010). Figure 3 shows the modeled concentrations over time for cobalt for the seven downgradient compliance monitoring wells, accounting for adsorption to iron and aluminum oxyhydroxides and dilution/dispersion.

Cobalt attenuation measured by SEP was highly variable, ranging from 1.8 to 70 mg/kg and, therefore, was not used to evaluate modeled surface attenuation. As can be seen in Figure 3, the combination of attenuation by aluminum and iron oxyhydroxides and dilution/dispersion results in concentrations of cobalt below the GWPS from 5 years after closure. Further, the cobalt concentrations in porewater below the GWPS support the conclusion that adequate attenuation capacity exists downgradient of the CCR Units.

Modeling of mineral precipitation also identified consistent equilibrium of groundwater with ferrihydrite in all downgradient wells from May and June 2019 and May 2020 (events where iron was measured in groundwater). Thus, if the concentrations of cobalt in porewater at the FGD Ponds remain below the GWPS, the downgradient capacity to attenuate these constituents by iron and/or aluminum oxyhydroxides will not be exceeded under the current and simulated future groundwater pH and redox conditions, presented in Figures 4 and 5, respectively.

4.2.2 Co-precipitation

In addition to adsorption, co-precipitation, or the direct incorporation of trace metals such as cobalt into precipitated iron oxide-oxyhydroxides, has been well studied (e.g., Butt et al. 2000; Dzombak and Morel 1990; Smith 1999; Hem 1992). Predicted cobalt concentrations from the adsorption modeling fell within the range of cobalt for the aquifer solids analyzed by sequential extraction in the combined amorphous and metal hydroxide phases described in the Tier I Evaluation (Golder 2019b). This suggests that cobalt may also be attenuated during the formation of ferrihydrite as opposed to following its formation as crystalline mineral phase (Butt et al. 2000; Tebo et al. 2004).

4.2.3 Physical Attenuation

Figures 3 through 5 present the predicted cobalt concentration and pH and redox conditions over time at downgradient monitoring wells, accounting for physical attenuation (i.e., dilution and dispersion) in addition to

chemical attenuation downgradient of the CCR Units using PHAST. Boron, a well-known conservative tracer for CCRs, was selected for evaluation of physical attenuation. The observed boron levels in groundwater at downgradient wells in 2020 (<0.7 mg/L) and the range of boron concentrations in porewater (84.4 to 104 mg/L) suggest a decrease in CCR constituents of at least two orders of magnitude at downgradient wells due to dilution and dispersion alone.

4.2.4 Attenuation Rates

The results of the point decay analysis for groundwater at background and downgradient wells between November 2015 and September 2020 (the CCR groundwater monitoring period) are provided in Table 3, as average site attenuation rates. This evaluation indicates that cobalt concentrations in downgradient wells display decreasing (i.e. negative point decay constants) trends over time. Of note, this point decay trend does not account for any source control or mitigation options (which are currently not being implemented). Therefore, the identified decreasing trend of cobalt in downgradient wells should further benefit from source control and mitigation efforts.

Since the maximum cobalt concentration in monitoring wells has decreased below the cobalt GWPS (as of September 2020), cobalt concentrations in these wells are considered compliant. Additionally, it is considered unlikely that cobalt concentrations will continue to exceed the GWPS since predictive modeling in PHAST indicates that cobalt concentrations will reach the GWPS after source control is complete at the FGD Ponds.

Table 3: Average Point Decay Trend Constants for Cobalt at the FGD Ponds

Constituents	Background Wells (yr ⁻¹)	Downgradient Wells (yr ⁻¹)	GWPS (mg/L)	Maximum Most Recent Value (mg/L)	Time to Achieve Compliance (years)
Cobalt	0.03	-0.03	0.016	0.00615	Compliant

Predictive modeling in PHAST used a more conservative approach to estimate the time to compliance by taking into account source control and increased source concentrations needed to achieve model calibration as previously described (Table 2). Based on this approach, considering source control, the estimated time to attenuation to a concentration below the GWPS increased to 5 years for cobalt. This is due to the elevated hypothetical source values for cobalt (0.044 mg/L) required to achieve model calibration. The simulated source value used was 7 times higher than the actual measured porewater values. Therefore, PHAST modeling presents the most conservative approach to determining the rate of attenuation. The actual time in which significant attenuation can likely be achieved falls between the two approaches used (i.e., the point decay method – concentrations currently below the GWPS - and the PHAST method – concentrations below the GWPS after 5 years).

4.3 Long-Term Stability of Attenuated Constituents

The expected trends over time for pH and Eh are presented in Figures 4 and 5, respectively. Variations in pH and Eh are arguably the most important factors, other than physical attenuation, controlling the long-term stability of cobalt.

Predictive modeling in PHAST indicates that the pH and Eh in the FGD Ponds will remain stable. The pH, initially ranging from approximately 6.7 to 6.8 is simulated to remain constant (<0.15 change in pH from year 0 to year 50). The Eh, initially ranging from approximately 480 to 500 mV, will also remain stable, with a slight increase in the overall range over time (from approximately 475 to 505 mV). At these predicted pH and Eh ranges,

ferrhydrite, the mineral phase primarily responsible for attenuation of cobalt, is modeled to remain stable across the FGD Ponds.

The long-term stability of cobalt can thus be summarized as follows:

- Attenuated cobalt should remain stable or decrease based on the range of pH and Eh values predicted at the site in the 50 years after closure and source control (Figures 4 and 5, respectively). It is not anticipated that attenuated cobalt will mobilize and exceed the GWPS in the future once compliance is achieved. For the anticipated pH range of the FGD Ponds area, Stenge and Peterson (1989) list a partitioning coefficient of 1.9 to 200 L/kg for cobalt while Hfo and Hao will remain stable. Additionally, the stability of ferrhydrite will also ensure any co-precipitated cobalt will remain sequestered. Thus, with source control and stable pH and Eh, long-term stability of cobalt is anticipated.

5.0 TIER II EVALUATION

The purpose of the Tier II Evaluation is to “Identify mechanisms and rates of the operative attenuation process” (USEPA 2007a). Based on this definition, the following modeling results and observations support MNA as a viable corrective measure for the FGD Ponds CCR Units:

- **Adsorption Capacity Modeling:** PHAST modeling results show that adsorption is likely attenuating cobalt downgradient of the CCR Unit. This is concluded based on equilibration of site-specific groundwater compositions with the range of Hfo and Hao concentrations observed in SEP results of FGD Ponds aquifer solids. Predictive modeling also demonstrates the future aquifer’s capacity to adsorb constituents from the CCR Units is significant and adequate when source control has been implemented. In addition to metal oxyhydroxides, clay minerals and/or particulate organics can also act as a substrate for attenuation (Uddin 2017), but this mechanism was not included in the current evaluation. The presence of cobalt in the amorphous and metal oxyhydroxide fractions of soils indicates that adsorption is occurring across the monitored area downgradient of the CCR Unit.
- **Co-precipitation:** In addition to adsorption, co-precipitation or the direct incorporation of trace metals into precipitated iron oxide-oxyhydroxides is a well-documented process. Cobalt concentrations indicated by adsorption modeling fall within the range of cobalt for the aquifer solids analyzed by sequential extraction in the combined amorphous and metal hydroxide phases described in the Tier I Evaluation (Golder 2019b).
- **Attenuation Rates:** Cobalt concentrations in downgradient monitoring wells are already below the GWPS based upon the most recent September 2020 sampling event. Ongoing source control activities should support continued long-term attenuation. Therefore, the rate of attenuation is “adequate”, as defined in USEPA guidance.
- **Dilution/Dispersion (Physical Attenuation) Modeling:** While not directly modeled, boron concentrations in porewater and in downgradient wells can be used to infer dilution and dispersion. In 2020, boron levels in porewater were 84.4 to 104 mg/L and < 0.7 mg/L in downgradient wells. Therefore, it is likely that physical attenuation accounts for a decrease in concentration of at least two orders of magnitude between porewater and groundwater at downgradient wells.

Based on these findings, cobalt is considered to be a candidate for an MNA remedy application and deemed to meet the criteria for Tier II MNA in accordance with USEPA guidance (USEPA 2007a and 2007b).

6.0 TIER III EVALUATION

According to USEPA (USEPA 2007a), the purpose of the Tier III Evaluation is to eliminate sites for an MNA remedy where (1) “Capacity of the aquifer is insufficient to attenuate the COC mass to regulatory standards” and/or (2) “Stability of the immobilized COC is insufficient to prevent remobilization due to future changes in groundwater chemistry”. Based on this definition, the following observations support MNA as a viable corrective measure for the FGD Ponds:

- **Adsorption Capacity Modeling:** Predictive modeling has demonstrated that porewater concentrations of cobalt could increase to 0.044 mg/L and yet result in concentrations at downgradient monitoring wells below its GWPS in a reasonable time frame. The time frame is defined here as “reasonable” when it is comparable to time frames associated with other active remediation options described in an assessment of corrective measures (Golder 2019a; ITRC 2010). However, cobalt concentrations in porewater samples from the FGD Ponds only reached detectable levels once (0.00625 mg/L) and always remained below the GWPS (0.016 mg/L). Therefore, based on the current concentrations in the FGD Ponds, the current concentrations observed in downgradient monitoring wells, and the anticipated source control activities, it is concluded that the combined long-term attenuation from sorption, dilution, and dispersion is sufficient to attenuate the cobalt mass in the FGD Ponds to concentrations below the GWPS. In addition to aluminum and iron oxyhydroxides, cobalt is known to be attenuated by other sorbents (e.g., manganese (hydr)oxides, clay minerals, and particulate organic matter) not included in the modeling, providing additional sorption capacity at the FGD Ponds.
- **Stability of Constituents:** Reactive transport modeling indicates that the pH and Eh (i.e. the factors controlling adsorption, which is the primary attenuation mechanism) will remain stable over time. As such, both the sorption effectiveness as well as the stability of the ferrihydrite adsorptive surfaces will remain constant. The stability of gibbsite, another adsorptive surface considered in the modeling, is less dependent on pH and Eh and will remain constant within the expected range of groundwater conditions. The total aluminum and iron contents in aquifer solids, based on the Tier I Evaluation (Golder 2019b), range from 30,000 to 42,000 mg/kg and 5,000 to 9,000 mg/kg, respectively (by SEP Total), indicating a significant reservoir potentially available for attenuation, and a reservoir that is resilient to changes in pH and Eh. It should be noted that there is no historical basis to expect large future deviations in groundwater pH and/or redox conditions.

7.0 CONCLUSION


This report presents the results of a Tier II and III Evaluation conducted to determine the feasibility of using MNA as a remedial strategy for cobalt at the FGD Ponds. This evaluation has been completed in accordance with guidance and best practices promulgated by the USEPA (USEPA 2007a and 2007b) and the ITRC (ITRC 2010). Based on the results of this evaluation, the following is concluded regarding cobalt:

- Physical and chemical attenuation of cobalt is occurring. Cobalt levels are stable, and the aquifer has adequate capacity to attenuate cobalt in a reasonable timeframe. Modeling indicates that cobalt attenuation will be efficient and stable in the long term. Cobalt in porewater is well below the level that is observed in groundwater, including when a periodic exceedance occurs in downgradient groundwater. Therefore, cobalt is considered a candidate for MNA at the FGD Ponds.

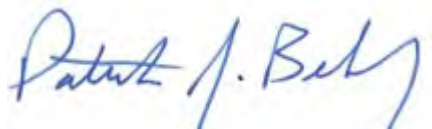
It is recommended that a Tier IV Evaluation be completed to design a long-term MNA monitoring plan in the event that MNA is selected as the final remedy for cobalt at the FGD Ponds.

Signature Page

Golder Associates Inc.



PJ Nolan, PhD
Senior Project Geochemist



Patrick J. Behling, PE
Principal Engineer



William F. Vienne
Senior Hydrogeologist

PJN/PJB/sb

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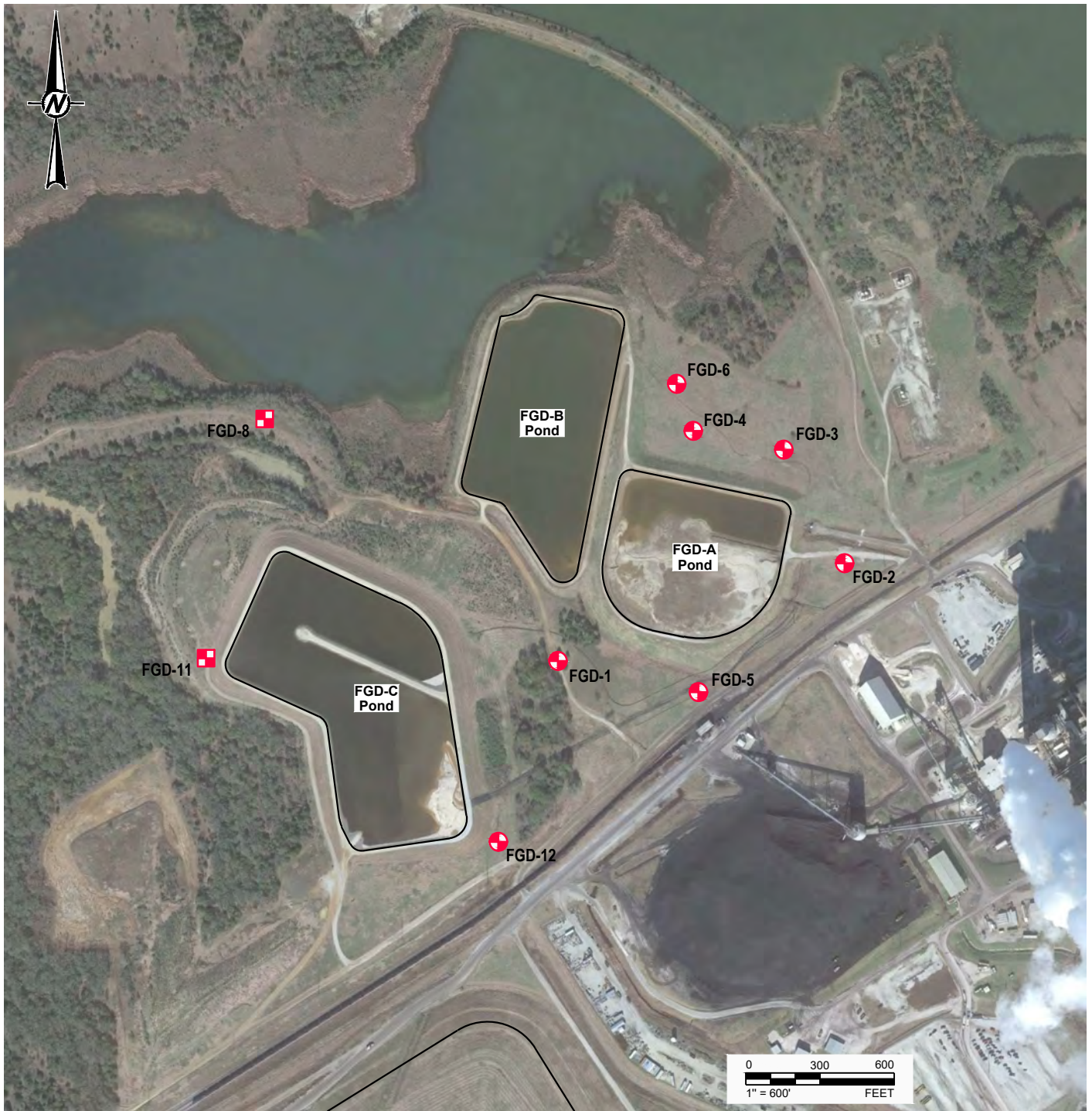
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Figures



LEGEND

-  DOWNGRADIENT CCR MONITORING WELL
-  BACKGROUND CCR MONITORING WELL

CLIENT
LUMINANT
OAK GROVE SES
FGD PONDS AREA

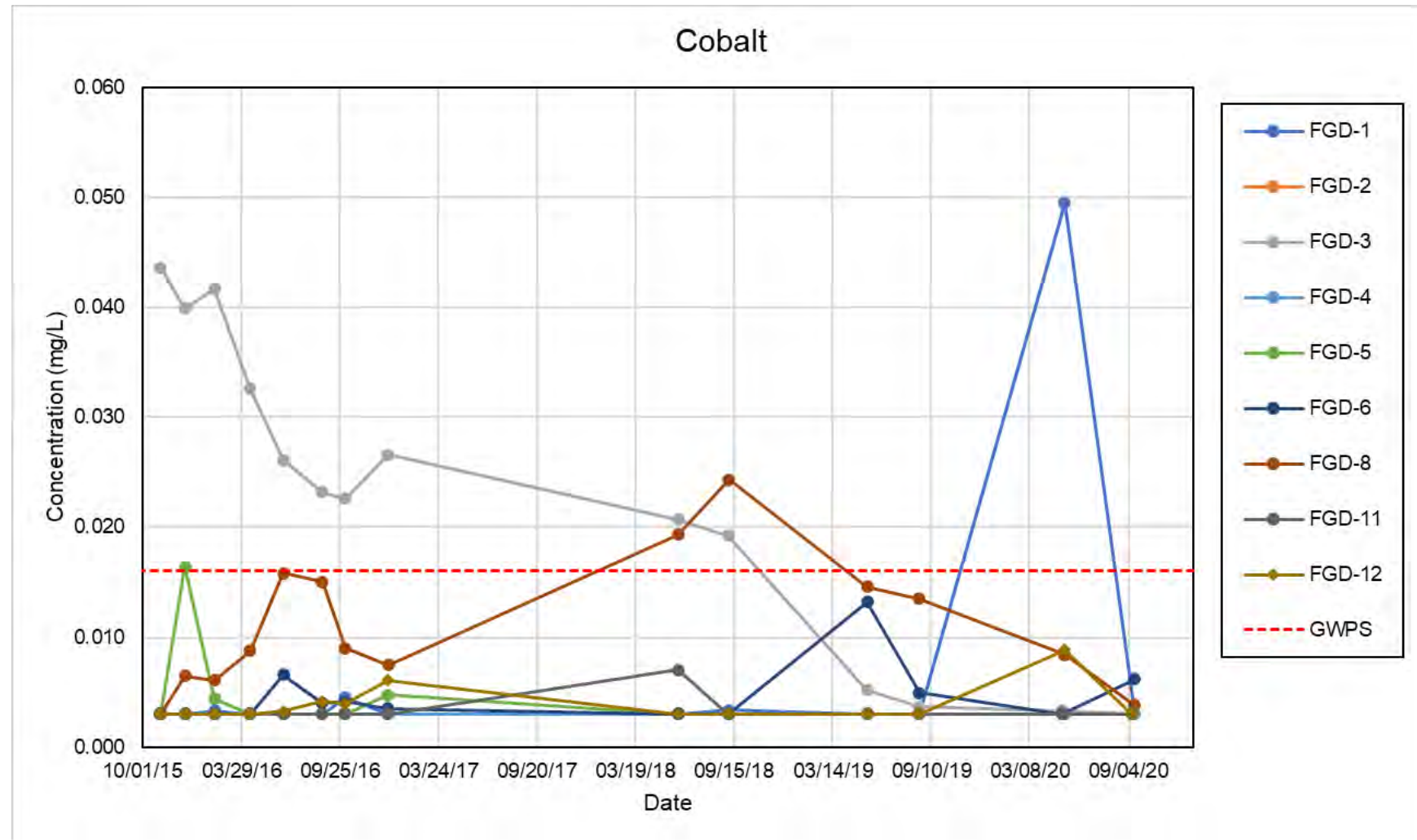
PROJECT
TIER II AND TIER III MNA GEOCHEMICAL EVALUATION

TITLE
SITE LOCATION MAP

CONSULTANT	YYYY-MM-DD	2020-01-23
	DESIGNED	AJD
	PREPARED	AJD
	REVIEWED	WFV
	APPROVED	WFV

REFERENCE(S)
 BASE MAP TAKEN FROM GOOGLE EARTH, IMAGERY DATED 12/9/18.

PROJECT NO. 19134019 REV. 0 EXHIBIT 1



CLIENT
LUMINANT
OAK GROVE SES
FGD PONDS AREA
CONSULTANT

PROJECT
TIER II AND TIER III MNA GEOCHEMICAL EVALUATION

TITLE
CONSTITUENT TRENDS

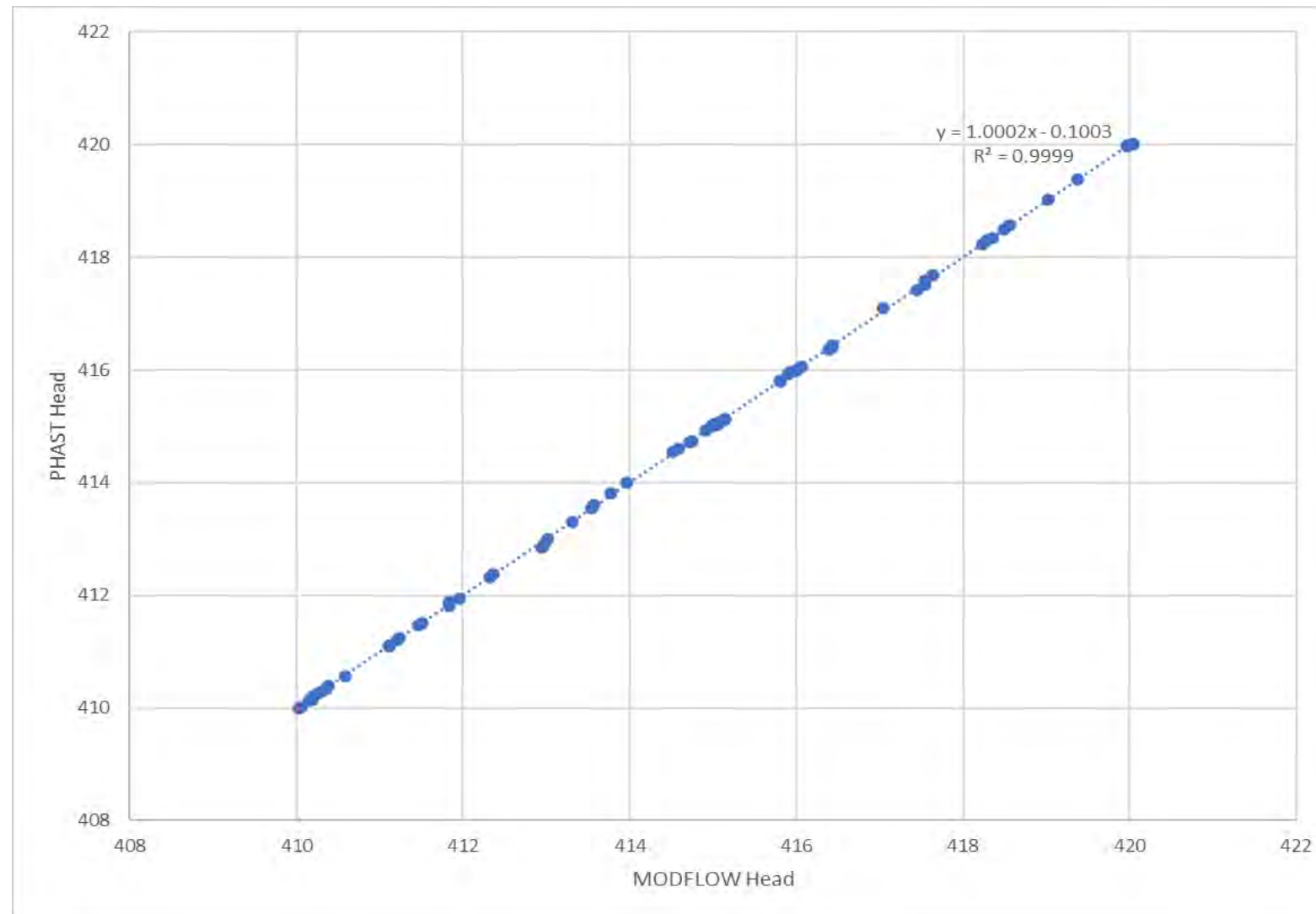


PROJECT NO.
19134019

PHASE
2000

REV.

FIGURE
1



CLIENT
LUMINANT
OAK GROVE SES
FGD PONDS AREA
CONSULTANT



PROJECT
TIER II AND TIER III MNA GEOCHEMICAL EVALUATION

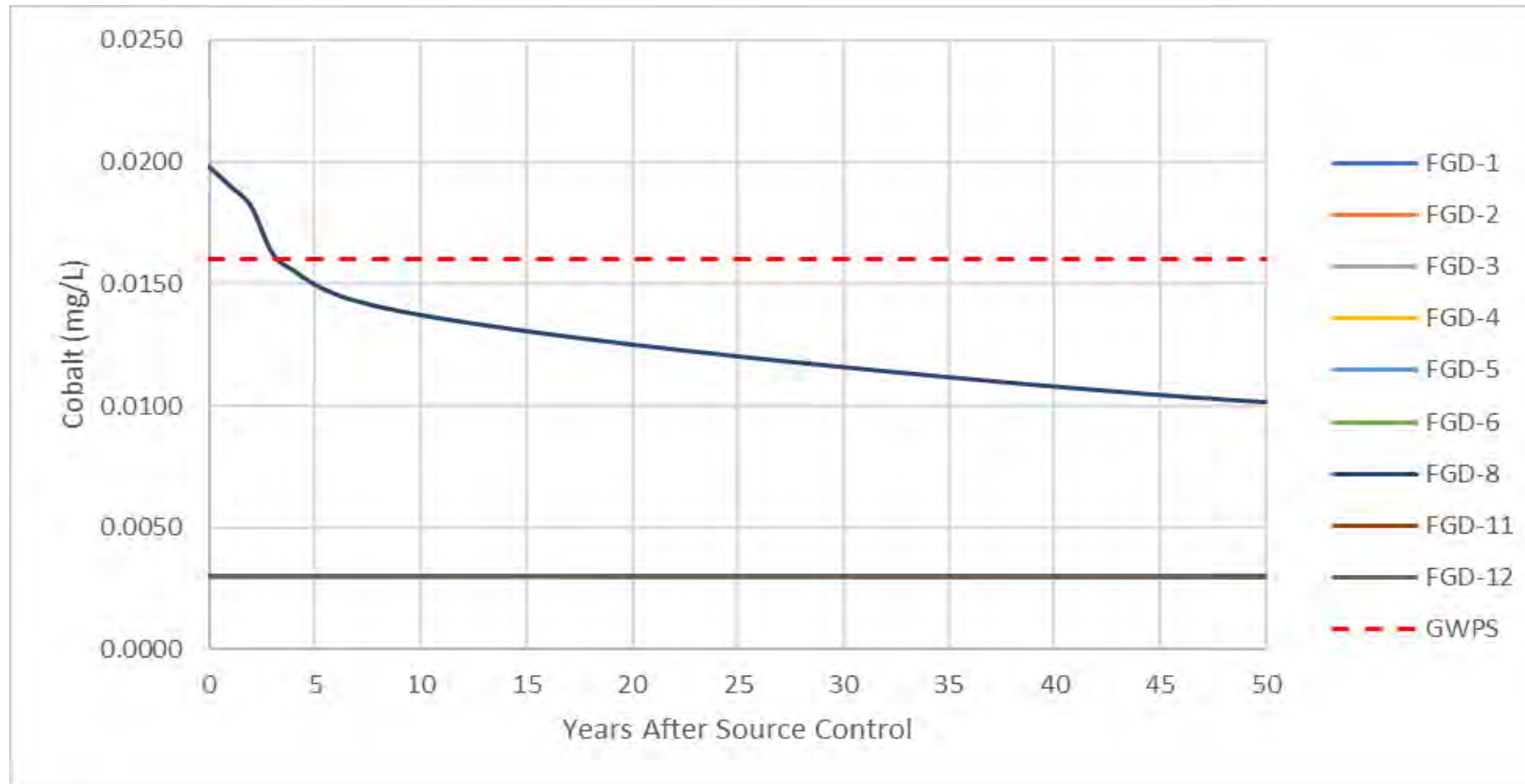
TITLE
PHAST FLUID HEAD CALIBRATION

PROJECT NO.
19134019

PHASE
2000

REV.

FIGURE
2



CLIENT
LUMINANT
OAK GROVE SES
FGD PONDS AREA
CONSULTANT



PROJECT
TIER II AND TIER III MNA GEOCHEMICAL EVALUATION

TITLE
GEOCHEMICAL MODELING RESULTS FOR COBALT

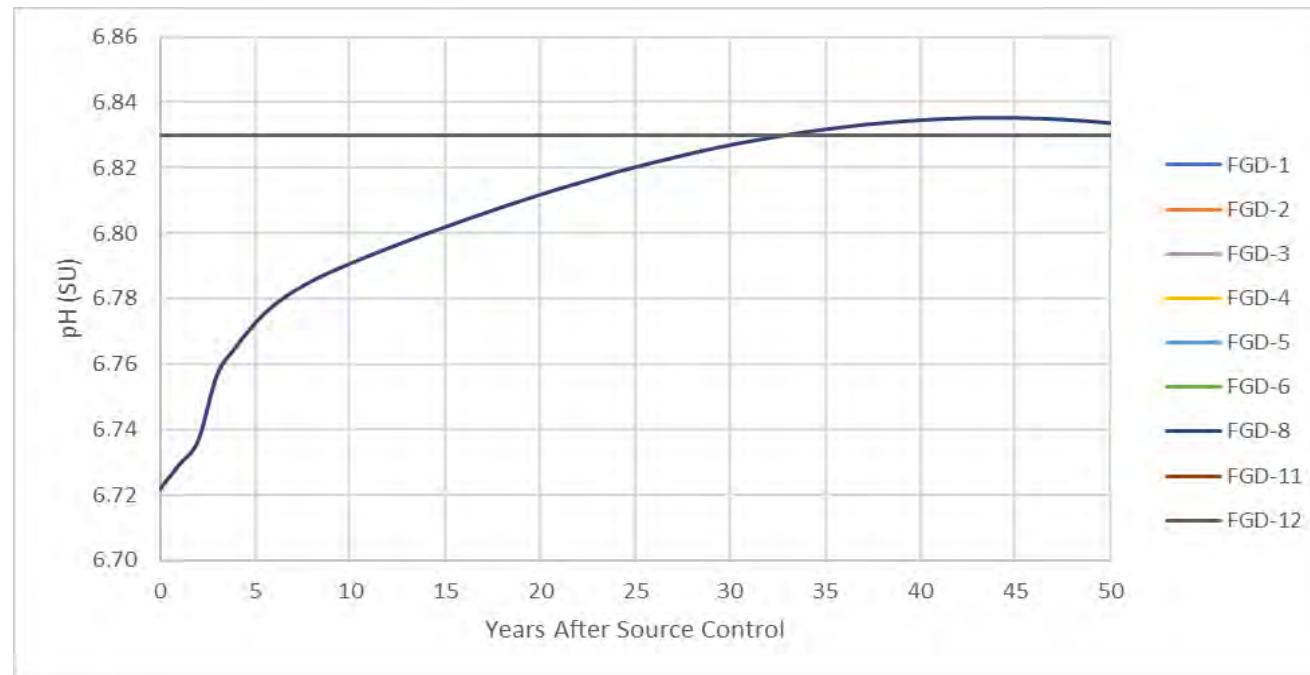
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PHASE
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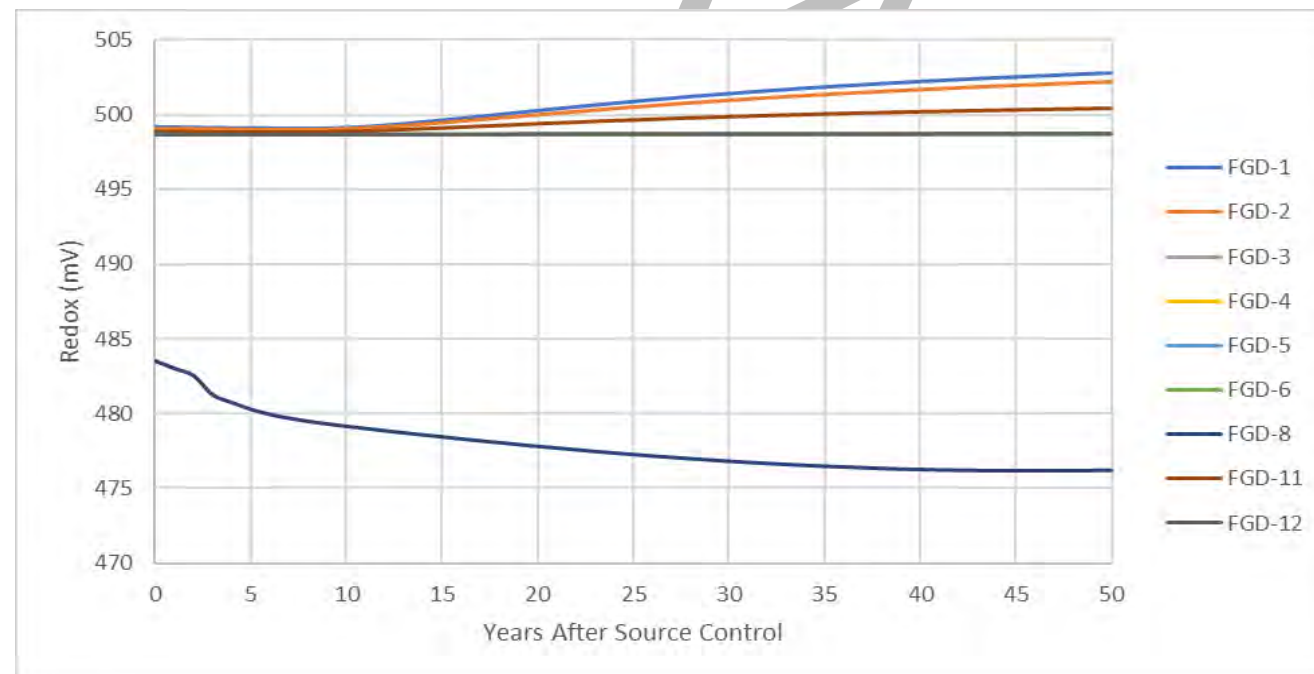
REV.

FIGURE
3

(4)



(5)



CLIENT
LUMINANT
OAK GROVE SES
FGD PONDS AREA
CONSULTANT



PROJECT
TIER II AND TIER III MNA GEOCHEMICAL EVALUATION

TITLE
GEOCHEMICAL MODELING RESULTS FOR (4) pH AND (5) REDOX

PROJECT NO.	PHASE	REV.	FIGURE
19134019	2000		4&5

APPENDIX A

Laboratory Analytical Reports



September 25, 2019

Will Vienne
Golder
2201 Double Creek Dr #4004
Round Rock, Texas 78664
TEL: (512) 671-3434
FAX (512) 671-3446
RE: Luminant-OGSES FGD Ponds

Order No.: 1908215

Dear Will Vienne:

DHL Analytical, Inc. received 12 sample(s) on 8/21/2019 for the analyses presented in the following report.

There were no problems with the analyses and all data met requirements of NELAP except where noted in the Case Narrative. All non-NELAP methods will be identified accordingly in the case narrative and all estimated uncertainties of test results are within method or EPA specifications.

If you have any questions regarding these tests results, please feel free to call. Thank you for using DHL Analytical.

Sincerely,

A handwritten signature in red ink, appearing to read "John DuPont".

John DuPont
General Manager

This report was performed under the accreditation of the State of Texas Laboratory Certification Number: T104704211-19-24



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WorkOrderSampleSummary 1908215	12
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AnalyticalDatesReport 1908215	16
Analytical Report 1908215	19
AnalyticalQCSummaryReport 1908215	31
MQLSummaryReport 1908215	50
Subcontract Report 1908215	51

ORIGIN ID:OKCA (512) 671-3434
J BRAYTON
GOLDER
2201 DOUBLE CREEK DR STE A004
ROUND ROCK, TX 78664
UNITED STATES US

SHIP DATE: 20AUG19
ACTWGT: 60.00 LB
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DIMS: 23x15x12 IN
BILL THIRD PARTY

Part # 158297-33904RBNR1492 11/19

TO DHL

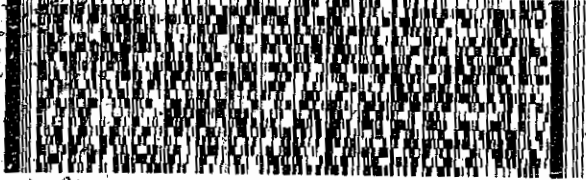
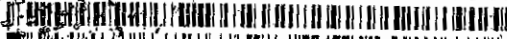
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ROUND ROCK TX 78664

(512) 388-8222

REF:

DEPT:



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Express



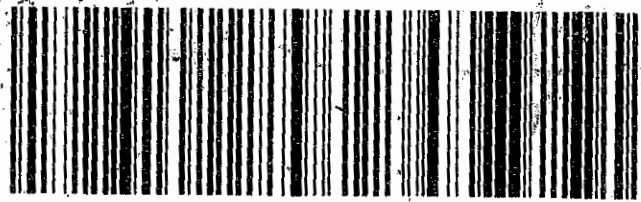
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1 of 3
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0201
MASTER

WED - 21 AUG 10:30A
PRIORITY OVERNIGHT

A8 BSMA

78664
TX-US AUS



ORIGIN ID:OKCA (512) 671-3434
J BRAYTON
GOLDER
2201 DOUBLE CREEK DR STE 4004
ROUND ROCK, TX 78664
UNITED STATES US

RT 512
10:30
D
08/21
9713

Part # 156297-4850P/230V/RT/63P 11/19

T9 DHL

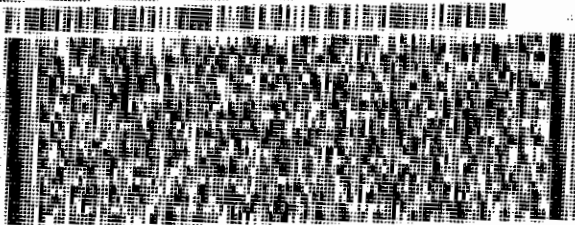
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ROUND ROCK TX 78664

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AN10144242908102611

2 of 3

MPS# 7892 6699 9713
0263

Metr# 7892 6699 9702

0201

WED - 21 AUG 10:30A
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TX-US AUS



ORIGIN ID:OKCA (512) 871-3434
J BRAYTON
GOLDER
2201 DOUBLE CREEK DR STE 4004

SHIP DATE: 20AUG19
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UNITED STATES US

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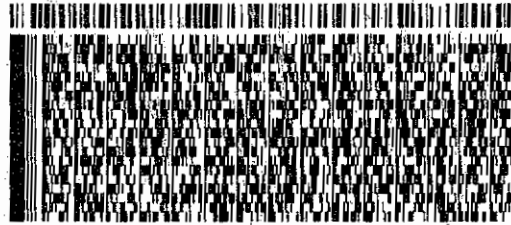
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ROUND ROCK TX 78664

(512) 388-8222

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3 of 3

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0263

Mstr# 7892 6699 9702

0201

WED - 21 AUG 10:30A
PRIORITY OVERNIGHT

A8 BSMA

78664
TX-US AUS



Sample Receipt Checklist

Client Name Golder

Date Received: 8/21/2019

Work Order Number 1908215

Received by JW

Checklist completed by: [Signature] 8/21/2019
Signature Date

Reviewed by: [Initials] 8/21/2019
Initials Date

Carrier name FedEx 1day

- Shipping container/cooler in good condition? Yes No Not Present
- Custody seals intact on shipping container/cooler? Yes No Not Present
- Custody seals intact on sample bottles? Yes No Not Present
- Chain of custody present? Yes No
- Chain of custody signed when relinquished and received? Yes No
- Chain of custody agrees with sample labels? Yes No
- Samples in proper container/bottle? Yes No
- Sample containers intact? Yes No
- Sufficient sample volume for indicated test? Yes No
- All samples received within holding time? Yes No
- Container/Temp Blank temperature in compliance? Yes No 2.2 °C
- Water - VOA vials have zero headspace? Yes No No VOA vials submitted
- Water - pH<2 acceptable upon receipt? Yes No NA LOT # 13171
- Adjusted? no Checked by EC
- Water - pH>9 (S) or pH>10 (CN) acceptable upon receipt? Yes No NA LOT #
- Adjusted? Checked by

Any No response must be detailed in the comments section below.

Client contacted _____ Date contacted: _____ Person contacted _____

Contacted by: _____ Regarding: _____

Comments: _____

Corrective Action _____

Laboratory Name: DHL Analytical, Inc.							
Laboratory Review Checklist: Reportable Data							
Project Name: Luminant-OGSES FGD Ponds			LRC Date: 9/25/19				
Reviewer Name: Carlos Castro			Laboratory Work Order: 1908215				
Prep Batch Number(s): See Prep Dates Report			Run Batch: See Analytical Dates Report				
# ¹	A ²	Description	Yes	No	NA ³	NR ⁴	ER# ⁵
		Chain-of-Custody (C-O-C)					
R1	OI	1) Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				R1-01
		2) Were all departures from standard conditions described in an exception report?			X		
R2	OI	Sample and Quality Control (QC) Identification					
		1) Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
		2) Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
R3	OI	Test Reports					
		1) Were all samples prepared and analyzed within holding times?	X				
		2) Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
		3) Were calculations checked by a peer or supervisor?	X				
		4) Were all analyte identifications checked by a peer or supervisor?	X				
		5) Were sample detection limits reported for all analytes not detected?	X				
		6) Were all results for soil and sediment samples reported on a dry weight basis?			X		
		7) Were % moisture (or solids) reported for all soil and sediment samples?			X		
		8) Were bulk soils/solids samples for volatile analysis extracted with methanol per EPA Method 5035?			X		
		9) If required for the project, TICs reported?			X		
R4	O	Surrogate Recovery Data					
		1) Were surrogates added prior to extraction?			X		
		2) Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
R5	OI	Test Reports/Summary Forms for Blank Samples					
		1) Were appropriate type(s) of blanks analyzed?	X				
		2) Were blanks analyzed at the appropriate frequency?	X				
		3) Where method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
		4) Were blank concentrations < MDL?	X				
		5) For analyte(s) detected in a blank sample, was the concentration, unadjusted for sample specific factors, in all associated field samples, greater than 10 times the concentration in the blank sample?			X		
R6	OI	Laboratory Control Samples (LCS):					
		1) Were all COCs included in the LCS?	X				
		2) Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
		3) Were LCSs analyzed at the required frequency?	X				
		4) Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
		5) Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
		6) Was the LCSD RPD within QC limits (if applicable)?	X				
R7	OI	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Data					
		1) Were the project/method specified analytes included in the MS and MSD?	X				
		2) Were MS/MSD analyzed at the appropriate frequency?	X				
		3) Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?		X			R7-03
		4) Were MS/MSD RPDs within laboratory QC limits?	X				
R8	OI	Analytical Duplicate Data					
		1) Were appropriate analytical duplicates analyzed for each matrix?			X		
		2) Were analytical duplicates analyzed at the appropriate frequency?			X		
		3) Were RPDs or relative standard deviations within the laboratory QC limits?			X		
R9	OI	Method Quantitation Limits (MQLs):					
		1) Are the MQLs for each method analyte included in the laboratory data package?	X				
		2) Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
		3) Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
R10	OI	Other Problems/Anomalies					
		1) Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
		2) Was applicable and available technology used to lower the SDL to minimize the matrix interference affects on the sample results?	X				
		3) Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices and methods associated with this laboratory data package?	X				

Laboratory Name: DHL Analytical, Inc.							
Laboratory Review Checklist (continued): Supporting Data							
Project Name: Luminant-OGSES FGD Ponds				LRC Date: 9/25/19			
Reviewer Name: Carlos Castro				Laboratory Work Order: 1908215			
Prep Batch Number(s): See Prep Dates Report				Run Batch: See Analytical Dates Report			
# ¹	A ²	Description	Yes	No	NA ³	NR ⁴	ER# ⁵
S1	OI	Initial Calibration (ICAL)					
		1) Were response factors and/or relative response factors for each analyte within QC limits?	X				
		2) Were percent RSDs or correlation coefficient criteria met?	X				
		3) Was the number of standards recommended in the method used for all analytes?	X				
		4) Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		5) Are ICAL data available for all instruments used?	X				
		6) Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	Initial and Continuing calibration Verification (ICCV and CCV) and Continuing Calibration blank (CCB):					
		1) Was the CCV analyzed at the method-required frequency?	X				
		2) Were percent differences for each analyte within the method-required QC limits?	X				
		3) Was the ICAL curve verified for each analyte?	X				
		4) Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	X				
S3	O	Mass Spectral Tuning:					
		1) Was the appropriate compound for the method used for tuning?	X				
		2) Were ion abundance data within the method-required QC limits?	X				
S4	O	Internal Standards (IS):					
		1) Were IS area counts and retention times within the method-required QC limits?	X				
S5	OI	Raw Data (NELAC Section 5.5.10)					
		1) Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		2) Were data associated with manual integrations flagged on the raw data?	X				
S6	O	Dual Column Confirmation					
		1) Did dual column confirmation results meet the method-required QC?			X		
S7	O	Tentatively Identified Compounds (TICs):					
		1) If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	Interference Check Sample (ICS) Results:					
		1) Were percent recoveries within method QC limits?	X				
S9	I	Serial Dilutions, Post Digestion Spikes, and Method of Standard Additions					
		1) Were percent differences, recoveries, and the linearity within the QC limits specified in the method?		X			S9-01
S10	OI	Method Detection Limit (MDL) Studies					
		1) Was a MDL study performed for each reported analyte?	X				
		2) Is the MDL either adjusted or supported by the analysis of DCSs?	X				
S11	OI	Proficiency Test Reports:					
		1) Was the lab's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	Standards Documentation					
		1) Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	Compound/Analyte Identification Procedures					
		1) Are the procedures for compound/analyte identification documented?	X				
S14	OI	Demonstration of Analyst Competency (DOC)					
		1) Was DOC conducted consistent with NELAC Chapter 5 – Appendix C?	X				
		2) Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	Verification/Validation Documentation for Methods (NELAC Chapter 5)					
		1) Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	Laboratory Standard Operating Procedures (SOPs):					
		1) Are laboratory SOPs current and on file for each method performed?	X				

1 Items identified by the letter "R" should be included in the laboratory data package submitted to the TCEQ in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.

2 O = organic analyses; I = inorganic analyses (and general chemistry, when applicable).

3 NA = Not applicable.

4 NR = Not Reviewed.

5 ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Data Package Signature Page – RG-366/TRRP-13

This data package consists of:

This signature page, the laboratory review checklist, and the following reportable data:

- R1 Field chain-of-custody documentation;
- R2 Sample identification cross-reference;
- R3 Test reports (analytical data sheets) for each environmental sample that includes:
 - a) Items consistent with NELAC Chapter 5,
 - b) dilution factors,
 - c) preparation methods,
 - d) cleanup methods, and
 - e) if required for the project, tentatively identified compounds (TICs).
- R4 Surrogate recovery data including:
 - a) Calculated recovery (%R), and
 - b) The laboratory's surrogate QC limits.
- R5 Test reports/summary forms for blank samples;
- R6 Test reports/summary forms for laboratory control samples (LCSs) including:
 - a) LCS spiking amounts,
 - b) Calculated %R for each analyte, and
 - c) The laboratory's LCS QC limits.
- R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
 - a) Samples associated with the MS/MSD clearly identified,
 - b) MS/MSD spiking amounts,
 - c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
 - d) Calculated %Rs and relative percent differences (RPDs), and
 - e) The laboratory's MS/MSD QC limits
- R8 Laboratory analytical duplicate (if applicable) recovery and precision:
 - a) The amount of analyte measured in the duplicate,
 - b) The calculated RPD, and
 - c) The laboratory's QC limits for analytical duplicates.
- R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix;
- R10 Other problems or anomalies.

The Exception Report for each "No" or "Not Reviewed (NR)" item in the Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory is not accredited under the Texas Laboratory Accreditation Program.

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the Exception Reports. By my signature below, I affirm to the best of my knowledge that all problems/anomalies observed by the laboratory have been identified in the Laboratory Review Checklist, and no information or data affecting the quality of the data has been knowingly withheld.

This laboratory was last inspected by TCEQ on February 25-28 2019. Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Name: John DuPont
Official Title: General Manager


Signature

09/25/19
Date

Name: Dr. Derhsing Luu
Official Title: Technical Director

CLIENT: Golder
Project: Luminant-OGSES FGD Ponds
Lab Order: 1908215

CASE NARRATIVE

Samples were analyzed using the following references:

Method SW6020A - Metals Analysis
Method SW7470A - Mercury Analysis
Method E300 - Anions Analysis
Method M2540C - TDS Analysis

Exception Report R1-01

The samples were received and log-in performed on 8/21/19. A total of 12 samples were received. The samples arrived in good condition and were properly packaged.

Exception Report R7-03

For Metals analysis performed on 8/27/19 the matrix spike and matrix spike duplicate recoveries were out of control limits for Calcium. These are flagged accordingly in the QC summary report. The sample selected for the matrix spike and matrix spike duplicate was from this work order. The LCS was within control limits for this analyte. No further corrective actions were taken.

For Anions analysis performed on 8/23/19 (batch 92504) the matrix spike and matrix spike duplicate recoveries (1908250-05 MS/MSD) were slightly below control limits for Chloride. These are flagged accordingly. The sample selected for the matrix spike and matrix spike duplicate was not from this work order. The LCS was within control limits for this analyte. No further corrective actions were taken.

Exception Report S9-01

For Metals analysis performed on 8/27/19 the RPD of the serial dilution was above control limits for Boron. This is flagged accordingly in the QC summary report. The PDS was within control limits for this analyte. No further corrective actions were taken.

CLIENT: Golder
Project: Luminant-OGSES FGD Ponds
Lab Order: 1908215

Work Order Sample Summary

Lab Smp ID	Client Sample ID	Tag Number	Date Collected	Date Recved
1908215-01	FGD-6		08/19/19 07:35 AM	8/21/2019
1908215-02	FGD-3		08/19/19 08:25 AM	8/21/2019
1908215-03	FGD-2		08/19/19 09:15 AM	8/21/2019
1908215-04	FGD-5		08/19/19 10:00 AM	8/21/2019
1908215-05	DUP-1		08/19/19 10:00 AM	8/21/2019
1908215-06	FGD-8		08/19/19 11:00 AM	8/21/2019
1908215-07	FGD-1		08/19/19 12:05 PM	8/21/2019
1908215-08	FGD-14		08/19/19 01:15 PM	8/21/2019
1908215-09	FGD-4		08/19/19 02:15 PM	8/21/2019
1908215-10	FGD-11		08/19/19 03:20 PM	8/21/2019
1908215-11	FGD-12		08/19/19 04:25 PM	8/21/2019
1908215-12	FGD-15		08/19/19 05:30 PM	8/21/2019

Lab Order: 1908215
Client: Golder
Project: Luminant-OGSES FGD Ponds

PREP DATES REPORT

Sample ID	Client Sample ID	Collection Date	Matrix	Test Number	Test Name	Prep Date	Batch ID
1908215-01A	FGD-6	08/19/19 07:35 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	08/26/19 08:34 AM	92519
	FGD-6	08/19/19 07:35 AM	Aqueous	SW7470A	Mercury Aq Prep	08/22/19 11:17 AM	92489
1908215-01B	FGD-6	08/19/19 07:35 AM	Aqueous	E300	Anion Preparation	08/22/19 09:48 AM	92485
	FGD-6	08/19/19 07:35 AM	Aqueous	E300	Anion Preparation	08/22/19 09:48 AM	92485
	FGD-6	08/19/19 07:35 AM	Aqueous	M2540C	TDS Preparation	08/22/19 01:31 PM	92494
1908215-02A	FGD-3	08/19/19 08:25 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	08/26/19 08:34 AM	92519
	FGD-3	08/19/19 08:25 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	08/26/19 08:34 AM	92519
	FGD-3	08/19/19 08:25 AM	Aqueous	SW7470A	Mercury Aq Prep	08/22/19 11:17 AM	92489
1908215-02B	FGD-3	08/19/19 08:25 AM	Aqueous	E300	Anion Preparation	08/22/19 09:48 AM	92485
	FGD-3	08/19/19 08:25 AM	Aqueous	E300	Anion Preparation	08/22/19 09:48 AM	92485
	FGD-3	08/19/19 08:25 AM	Aqueous	M2540C	TDS Preparation	08/22/19 01:31 PM	92494
1908215-03A	FGD-2	08/19/19 09:15 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	08/26/19 08:34 AM	92519
	FGD-2	08/19/19 09:15 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	08/26/19 08:34 AM	92519
	FGD-2	08/19/19 09:15 AM	Aqueous	SW7470A	Mercury Aq Prep	08/22/19 11:17 AM	92489
1908215-03B	FGD-2	08/19/19 09:15 AM	Aqueous	E300	Anion Preparation	08/22/19 09:48 AM	92485
	FGD-2	08/19/19 09:15 AM	Aqueous	E300	Anion Preparation	08/22/19 09:48 AM	92485
	FGD-2	08/19/19 09:15 AM	Aqueous	E300	Anion Preparation	08/22/19 09:48 AM	92485
	FGD-2	08/19/19 09:15 AM	Aqueous	M2540C	TDS Preparation	08/22/19 01:31 PM	92494
1908215-04A	FGD-5	08/19/19 10:00 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	08/26/19 08:34 AM	92519
	FGD-5	08/19/19 10:00 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	08/26/19 08:34 AM	92519
	FGD-5	08/19/19 10:00 AM	Aqueous	SW7470A	Mercury Aq Prep	08/22/19 11:17 AM	92489
1908215-04B	FGD-5	08/19/19 10:00 AM	Aqueous	E300	Anion Preparation	08/22/19 09:48 AM	92485
	FGD-5	08/19/19 10:00 AM	Aqueous	E300	Anion Preparation	08/22/19 09:48 AM	92485
	FGD-5	08/19/19 10:00 AM	Aqueous	M2540C	TDS Preparation	08/22/19 01:31 PM	92494
1908215-05A	DUP-1	08/19/19 10:00 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	08/26/19 08:34 AM	92519
	DUP-1	08/19/19 10:00 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	08/26/19 08:34 AM	92519
	DUP-1	08/19/19 10:00 AM	Aqueous	SW7470A	Mercury Aq Prep	08/22/19 11:17 AM	92489
1908215-05B	DUP-1	08/19/19 10:00 AM	Aqueous	E300	Anion Preparation	08/22/19 09:48 AM	92485

Lab Order: 1908215
Client: Golder
Project: Luminant-OGSES FGD Ponds

PREP DATES REPORT

Sample ID	Client Sample ID	Collection Date	Matrix	Test Number	Test Name	Prep Date	Batch ID
1908215-05B	DUP-1	08/19/19 10:00 AM	Aqueous	E300	Anion Preparation	08/22/19 09:48 AM	92485
	DUP-1	08/19/19 10:00 AM	Aqueous	M2540C	TDS Preparation	08/22/19 01:31 PM	92494
1908215-06A	FGD-8	08/19/19 11:00 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	08/26/19 08:34 AM	92519
	FGD-8	08/19/19 11:00 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	08/26/19 08:34 AM	92519
	FGD-8	08/19/19 11:00 AM	Aqueous	SW7470A	Mercury Aq Prep	08/22/19 11:17 AM	92489
1908215-06B	FGD-8	08/19/19 11:00 AM	Aqueous	E300	Anion Preparation	08/22/19 09:48 AM	92485
	FGD-8	08/19/19 11:00 AM	Aqueous	E300	Anion Preparation	08/22/19 09:48 AM	92485
	FGD-8	08/19/19 11:00 AM	Aqueous	E300	Anion Preparation	08/22/19 09:48 AM	92485
	FGD-8	08/19/19 11:00 AM	Aqueous	M2540C	TDS Preparation	08/22/19 01:31 PM	92494
1908215-07A	FGD-1	08/19/19 12:05 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	08/26/19 08:34 AM	92519
	FGD-1	08/19/19 12:05 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	08/26/19 08:34 AM	92519
	FGD-1	08/19/19 12:05 PM	Aqueous	SW7470A	Mercury Aq Prep	08/22/19 11:17 AM	92489
1908215-07B	FGD-1	08/19/19 12:05 PM	Aqueous	E300	Anion Preparation	08/22/19 09:48 AM	92485
	FGD-1	08/19/19 12:05 PM	Aqueous	E300	Anion Preparation	08/22/19 09:48 AM	92485
	FGD-1	08/19/19 12:05 PM	Aqueous	M2540C	TDS Preparation	08/22/19 01:31 PM	92494
1908215-08A	FGD-14	08/19/19 01:15 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	08/26/19 08:34 AM	92519
	FGD-14	08/19/19 01:15 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	08/26/19 08:34 AM	92519
	FGD-14	08/19/19 01:15 PM	Aqueous	SW7470A	Mercury Aq Prep	08/22/19 11:17 AM	92489
1908215-08B	FGD-14	08/19/19 01:15 PM	Aqueous	E300	Anion Preparation	08/22/19 09:48 AM	92485
	FGD-14	08/19/19 01:15 PM	Aqueous	E300	Anion Preparation	08/22/19 09:48 AM	92485
	FGD-14	08/19/19 01:15 PM	Aqueous	M2540C	TDS Preparation	08/22/19 01:31 PM	92494
1908215-09A	FGD-4	08/19/19 02:15 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	08/26/19 08:34 AM	92519
	FGD-4	08/19/19 02:15 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	08/26/19 08:34 AM	92519
	FGD-4	08/19/19 02:15 PM	Aqueous	SW7470A	Mercury Aq Prep	08/22/19 11:17 AM	92489
1908215-09B	FGD-4	08/19/19 02:15 PM	Aqueous	E300	Anion Preparation	08/22/19 09:48 AM	92485
	FGD-4	08/19/19 02:15 PM	Aqueous	E300	Anion Preparation	08/22/19 09:48 AM	92485
	FGD-4	08/19/19 02:15 PM	Aqueous	M2540C	TDS Preparation	08/22/19 01:31 PM	92494
1908215-10A	FGD-11	08/19/19 03:20 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	08/26/19 08:34 AM	92519

Lab Order: 1908215
Client: Golder
Project: Luminant-OGSES FGD Ponds

PREP DATES REPORT

Sample ID	Client Sample ID	Collection Date	Matrix	Test Number	Test Name	Prep Date	Batch ID
1908215-10A	FGD-11	08/19/19 03:20 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	08/26/19 08:34 AM	92519
	FGD-11	08/19/19 03:20 PM	Aqueous	SW7470A	Mercury Aq Prep	08/22/19 11:17 AM	92489
1908215-10B	FGD-11	08/19/19 03:20 PM	Aqueous	E300	Anion Preparation	08/22/19 09:48 AM	92485
	FGD-11	08/19/19 03:20 PM	Aqueous	E300	Anion Preparation	08/22/19 09:48 AM	92485
	FGD-11	08/19/19 03:20 PM	Aqueous	E300	Anion Preparation	08/22/19 09:48 AM	92485
	FGD-11	08/19/19 03:20 PM	Aqueous	M2540C	TDS Preparation	08/22/19 01:31 PM	92494
1908215-11A	FGD-12	08/19/19 04:25 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	08/26/19 08:34 AM	92519
	FGD-12	08/19/19 04:25 PM	Aqueous	SW7470A	Mercury Aq Prep	08/22/19 11:17 AM	92489
1908215-11B	FGD-12	08/19/19 04:25 PM	Aqueous	E300	Anion Preparation	08/22/19 09:48 AM	92485
	FGD-12	08/19/19 04:25 PM	Aqueous	E300	Anion Preparation	08/22/19 09:48 AM	92485
	FGD-12	08/19/19 04:25 PM	Aqueous	M2540C	TDS Preparation	08/22/19 01:31 PM	92494
1908215-12A	FGD-15	08/19/19 05:30 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	08/26/19 08:34 AM	92519
	FGD-15	08/19/19 05:30 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	08/26/19 08:34 AM	92519
	FGD-15	08/19/19 05:30 PM	Aqueous	SW7470A	Mercury Aq Prep	08/22/19 11:17 AM	92489
1908215-12B	FGD-15	08/19/19 05:30 PM	Aqueous	E300	Anion Preparation	08/22/19 09:48 AM	92485
	FGD-15	08/19/19 05:30 PM	Aqueous	E300	Anion Preparation	08/22/19 09:48 AM	92485
	FGD-15	08/19/19 05:30 PM	Aqueous	E300	Anion Preparation	08/23/19 09:53 AM	92504
	FGD-15	08/19/19 05:30 PM	Aqueous	M2540C	TDS Preparation	08/22/19 01:31 PM	92494

Lab Order: 1908215
 Client: Golder
 Project: Luminant-OGSES FGD Ponds

ANALYTICAL DATES REPORT

Sample ID	Client Sample ID	Matrix	Test Number	Test Name	Batch ID	Dilution	Analysis Date	Run ID
1908215-01A	FGD-6	Aqueous	SW7470A	Mercury Total: Aqueous	92489	1	08/23/19 11:05 AM	CETAC2_HG_190823 A
	FGD-6	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	92519	1	08/27/19 10:55 AM	ICP-MS4_190827B
1908215-01B	FGD-6	Aqueous	E300	Anions by IC method - Water	92485	10	08/22/19 11:55 AM	IC4_190822A
	FGD-6	Aqueous	E300	Anions by IC method - Water	92485	1	08/22/19 05:42 PM	IC4_190822A
	FGD-6	Aqueous	M2540C	Total Dissolved Solids	92494	1	08/22/19 03:40 PM	WC_190822A
1908215-02A	FGD-3	Aqueous	SW7470A	Mercury Total: Aqueous	92489	1	08/23/19 11:07 AM	CETAC2_HG_190823 A
	FGD-3	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	92519	1	08/27/19 10:57 AM	ICP-MS4_190827B
	FGD-3	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	92519	10	08/27/19 12:09 PM	ICP-MS4_190827B
1908215-02B	FGD-3	Aqueous	E300	Anions by IC method - Water	92485	10	08/22/19 12:11 PM	IC4_190822A
	FGD-3	Aqueous	E300	Anions by IC method - Water	92485	1	08/22/19 05:58 PM	IC4_190822A
	FGD-3	Aqueous	M2540C	Total Dissolved Solids	92494	1	08/22/19 03:40 PM	WC_190822A
1908215-03A	FGD-2	Aqueous	SW7470A	Mercury Total: Aqueous	92489	1	08/23/19 11:09 AM	CETAC2_HG_190823 A
	FGD-2	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	92519	1	08/27/19 10:59 AM	ICP-MS4_190827B
	FGD-2	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	92519	10	08/27/19 12:11 PM	ICP-MS4_190827B
1908215-03B	FGD-2	Aqueous	E300	Anions by IC method - Water	92485	10	08/22/19 12:27 PM	IC4_190822A
	FGD-2	Aqueous	E300	Anions by IC method - Water	92485	100	08/22/19 04:06 PM	IC4_190822A
	FGD-2	Aqueous	E300	Anions by IC method - Water	92485	1	08/22/19 06:14 PM	IC4_190822A
	FGD-2	Aqueous	M2540C	Total Dissolved Solids	92494	1	08/22/19 03:40 PM	WC_190822A
1908215-04A	FGD-5	Aqueous	SW7470A	Mercury Total: Aqueous	92489	1	08/23/19 11:11 AM	CETAC2_HG_190823 A
	FGD-5	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	92519	1	08/27/19 10:51 AM	ICP-MS4_190827B
	FGD-5	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	92519	10	08/27/19 12:05 PM	ICP-MS4_190827B
1908215-04B	FGD-5	Aqueous	E300	Anions by IC method - Water	92485	10	08/22/19 12:43 PM	IC4_190822A
	FGD-5	Aqueous	E300	Anions by IC method - Water	92485	1	08/22/19 06:30 PM	IC4_190822A
	FGD-5	Aqueous	M2540C	Total Dissolved Solids	92494	1	08/22/19 03:40 PM	WC_190822A
1908215-05A	DUP-1	Aqueous	SW7470A	Mercury Total: Aqueous	92489	1	08/23/19 11:14 AM	CETAC2_HG_190823 A
	DUP-1	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	92519	10	08/27/19 12:13 PM	ICP-MS4_190827B

Lab Order: 1908215
Client: Golder
Project: Luminant-OGSES FGD Ponds

ANALYTICAL DATES REPORT

Sample ID	Client Sample ID	Matrix	Test Number	Test Name	Batch ID	Dilution	Analysis Date	Run ID
1908215-05A	DUP-1	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	92519	1	08/27/19 11:01 AM	ICP-MS4_190827B
1908215-05B	DUP-1	Aqueous	E300	Anions by IC method - Water	92485	10	08/22/19 12:59 PM	IC4_190822A
	DUP-1	Aqueous	E300	Anions by IC method - Water	92485	1	08/22/19 09:10 PM	IC4_190822A
	DUP-1	Aqueous	M2540C	Total Dissolved Solids	92494	1	08/22/19 03:40 PM	WC_190822A
1908215-06A	FGD-8	Aqueous	SW7470A	Mercury Total: Aqueous	92489	1	08/23/19 11:16 AM	CETAC2_HG_190823 A
	FGD-8	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	92519	1	08/27/19 11:03 AM	ICP-MS4_190827B
	FGD-8	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	92519	50	08/27/19 12:15 PM	ICP-MS4_190827B
1908215-06B	FGD-8	Aqueous	E300	Anions by IC method - Water	92485	10	08/22/19 01:15 PM	IC4_190822A
	FGD-8	Aqueous	E300	Anions by IC method - Water	92485	100	08/22/19 04:22 PM	IC4_190822A
	FGD-8	Aqueous	E300	Anions by IC method - Water	92485	1	08/22/19 09:26 PM	IC4_190822A
	FGD-8	Aqueous	M2540C	Total Dissolved Solids	92494	1	08/22/19 03:40 PM	WC_190822A
1908215-07A	FGD-1	Aqueous	SW7470A	Mercury Total: Aqueous	92489	1	08/23/19 11:23 AM	CETAC2_HG_190823 A
	FGD-1	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	92519	1	08/27/19 11:05 AM	ICP-MS4_190827B
	FGD-1	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	92519	5	08/27/19 12:17 PM	ICP-MS4_190827B
1908215-07B	FGD-1	Aqueous	E300	Anions by IC method - Water	92485	10	08/22/19 01:31 PM	IC4_190822A
	FGD-1	Aqueous	E300	Anions by IC method - Water	92485	1	08/22/19 09:42 PM	IC4_190822A
	FGD-1	Aqueous	M2540C	Total Dissolved Solids	92494	1	08/22/19 03:40 PM	WC_190822A
1908215-08A	FGD-14	Aqueous	SW7470A	Mercury Total: Aqueous	92489	1	08/23/19 11:25 AM	CETAC2_HG_190823 A
	FGD-14	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	92519	10	08/27/19 12:19 PM	ICP-MS4_190827B
	FGD-14	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	92519	1	08/27/19 11:07 AM	ICP-MS4_190827B
1908215-08B	FGD-14	Aqueous	E300	Anions by IC method - Water	92485	10	08/22/19 01:47 PM	IC4_190822A
	FGD-14	Aqueous	E300	Anions by IC method - Water	92485	1	08/22/19 09:58 PM	IC4_190822A
	FGD-14	Aqueous	M2540C	Total Dissolved Solids	92494	1	08/22/19 03:40 PM	WC_190822A
1908215-09A	FGD-4	Aqueous	SW7470A	Mercury Total: Aqueous	92489	1	08/23/19 11:27 AM	CETAC2_HG_190823 A
	FGD-4	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	92519	1	08/27/19 11:09 AM	ICP-MS4_190827B
	FGD-4	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	92519	10	08/27/19 12:21 PM	ICP-MS4_190827B

Lab Order: 1908215
 Client: Golder
 Project: Luminant-OGSES FGD Ponds

ANALYTICAL DATES REPORT

Sample ID	Client Sample ID	Matrix	Test Number	Test Name	Batch ID	Dilution	Analysis Date	Run ID
1908215-09B	FGD-4	Aqueous	E300	Anions by IC method - Water	92485	10	08/22/19 02:03 PM	IC4_190822A
	FGD-4	Aqueous	E300	Anions by IC method - Water	92485	1	08/22/19 10:14 PM	IC4_190822A
	FGD-4	Aqueous	M2540C	Total Dissolved Solids	92494	1	08/22/19 03:40 PM	WC_190822A
1908215-10A	FGD-11	Aqueous	SW7470A	Mercury Total: Aqueous	92489	1	08/23/19 11:30 AM	CETAC2_HG_190823 A
	FGD-11	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	92519	1	08/27/19 11:11 AM	ICP-MS4_190827B
	FGD-11	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	92519	10	08/27/19 12:23 PM	ICP-MS4_190827B
1908215-10B	FGD-11	Aqueous	E300	Anions by IC method - Water	92485	10	08/22/19 02:19 PM	IC4_190822A
	FGD-11	Aqueous	E300	Anions by IC method - Water	92485	100	08/22/19 04:38 PM	IC4_190822A
	FGD-11	Aqueous	E300	Anions by IC method - Water	92485	1	08/22/19 10:30 PM	IC4_190822A
	FGD-11	Aqueous	M2540C	Total Dissolved Solids	92494	1	08/22/19 03:40 PM	WC_190822A
1908215-11A	FGD-12	Aqueous	SW7470A	Mercury Total: Aqueous	92489	1	08/23/19 11:32 AM	CETAC2_HG_190823 A
	FGD-12	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	92519	1	08/27/19 11:32 AM	ICP-MS4_190827B
1908215-11B	FGD-12	Aqueous	E300	Anions by IC method - Water	92485	10	08/22/19 04:54 PM	IC4_190822A
	FGD-12	Aqueous	E300	Anions by IC method - Water	92485	1	08/22/19 10:46 PM	IC4_190822A
	FGD-12	Aqueous	M2540C	Total Dissolved Solids	92494	1	08/22/19 03:40 PM	WC_190822A
1908215-12A	FGD-15	Aqueous	SW7470A	Mercury Total: Aqueous	92489	1	08/23/19 11:34 AM	CETAC2_HG_190823 A
	FGD-15	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	92519	1	08/27/19 11:34 AM	ICP-MS4_190827B
	FGD-15	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	92519	50	08/27/19 12:25 PM	ICP-MS4_190827B
1908215-12B	FGD-15	Aqueous	E300	Anions by IC method - Water	92485	10	08/22/19 05:10 PM	IC4_190822A
	FGD-15	Aqueous	E300	Anions by IC method - Water	92485	1	08/22/19 11:02 PM	IC4_190822A
	FGD-15	Aqueous	E300	Anions by IC method - Water	92504	100	08/23/19 05:00 PM	IC4_190823A
	FGD-15	Aqueous	M2540C	Total Dissolved Solids	92494	1	08/22/19 03:40 PM	WC_190822A

DHL Analytical, Inc.

Date: 25-Sep-19

CLIENT: Golder
Project: Luminant-OGSES FGD Ponds
Project No: 19122262-F
Lab Order: 1908215

Client Sample ID: FGD-6
Lab ID: 1908215-01
Collection Date: 08/19/19 07:35 AM
Matrix: AQUEOUS

Analyses	Result	SDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		SW6020A			Analyst: SP		
Antimony	<0.000800	0.000800	0.00250		mg/L	1	08/27/19 10:55 AM
Arsenic	0.0146	0.00200	0.00500		mg/L	1	08/27/19 10:55 AM
Barium	0.0903	0.00300	0.0100		mg/L	1	08/27/19 10:55 AM
Beryllium	<0.000300	0.000300	0.00100		mg/L	1	08/27/19 10:55 AM
Boron	0.102	0.0100	0.0300		mg/L	1	08/27/19 10:55 AM
Cadmium	<0.000300	0.000300	0.00100		mg/L	1	08/27/19 10:55 AM
Calcium	23.6	0.100	0.300		mg/L	1	08/27/19 10:55 AM
Chromium	<0.00200	0.00200	0.00500		mg/L	1	08/27/19 10:55 AM
Cobalt	0.00493	0.00300	0.00500	J	mg/L	1	08/27/19 10:55 AM
Lead	<0.000300	0.000300	0.00100		mg/L	1	08/27/19 10:55 AM
Lithium	0.00820	0.00500	0.0100	J	mg/L	1	08/27/19 10:55 AM
Molybdenum	0.00332	0.00200	0.00500	J	mg/L	1	08/27/19 10:55 AM
Selenium	<0.00200	0.00200	0.00500		mg/L	1	08/27/19 10:55 AM
Thallium	<0.000500	0.000500	0.00150		mg/L	1	08/27/19 10:55 AM
MERCURY TOTAL: AQUEOUS		SW7470A			Analyst: BM		
Mercury	<0.0000800	0.0000800	0.000200		mg/L	1	08/23/19 11:05 AM
ANIONS BY IC METHOD - WATER		E300			Analyst: SNM		
Chloride	158	3.00	10.0		mg/L	70	08/22/19 11:55 AM
Fluoride	0.741	0.100	0.400		mg/L	1	08/22/19 05:42 PM
Sulfate	60.3	1.00	3.00		mg/L	1	08/22/19 05:42 PM
TOTAL DISSOLVED SOLIDS		M2540C			Analyst: JS		
Total Dissolved Solids (Residue, Filterable)	754	10.0	10.0		mg/L	1	08/22/19 03:40 PM

Qualifiers: ND - Not Detected at the SDL
 J - Analyte detected between SDL and RL
 B - Analyte detected in the associated Method Blank
 DF- Dilution Factor
 N - Parameter not NELAP certified
 See Final Page of Report for MQLs and MDLs

S - Spike Recovery outside control limits
 C - Sample Result or QC discussed in Case Narrative
 RL - Reporting Limit (MQL adjusted for moisture and sample size)
 SDL - Sample Detection Limit
 E - TPH pattern not Gas or Diesel Range Pattern

DHL Analytical, Inc.

Date: 25-Sep-19

CLIENT: Golder
Project: Luminant-OGSES FGD Ponds
Project No: 19122262-F
Lab Order: 1908215

Client Sample ID: FGD-3
Lab ID: 1908215-02
Collection Date: 08/19/19 08:25 AM
Matrix: AQUEOUS

Analyses	Result	SDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		SW6020A		Analyst: SP			
Antimony	<0.000800	0.000800	0.00250		mg/L	1	08/27/19 10:57 AM
Arsenic	0.00248	0.00200	0.00500	J	mg/L	1	08/27/19 10:57 AM
Barium	0.0365	0.00300	0.0100		mg/L	1	08/27/19 10:57 AM
Beryllium	<0.000300	0.000300	0.00100		mg/L	1	08/27/19 10:57 AM
Boron	0.134	0.0100	0.0300		mg/L	1	08/27/19 10:57 AM
Cadmium	<0.000300	0.000300	0.00100		mg/L	1	08/27/19 10:57 AM
Calcium	51.1	1.00	3.00		mg/L	10	08/27/19 12:09 PM
Chromium	<0.00200	0.00200	0.00500		mg/L	1	08/27/19 10:57 AM
Cobalt	0.00364	0.00300	0.00500	J	mg/L	1	08/27/19 10:57 AM
Lead	<0.000300	0.000300	0.00100		mg/L	1	08/27/19 10:57 AM
Lithium	0.0546	0.00500	0.0100		mg/L	1	08/27/19 10:57 AM
Molybdenum	0.00231	0.00200	0.00500	J	mg/L	1	08/27/19 10:57 AM
Selenium	0.0245	0.00200	0.00500		mg/L	1	08/27/19 10:57 AM
Thallium	0.000588	0.000500	0.00150	J	mg/L	1	08/27/19 10:57 AM
MERCURY TOTAL: AQUEOUS		SW7470A		Analyst: BM			
Mercury	<0.0000800	0.0000800	0.000200		mg/L	1	08/23/19 11:07 AM
ANIONS BY IC METHOD - WATER		E300		Analyst: SNM			
Chloride	84.9	3.00	10.0		mg/L	10	08/22/19 12:11 PM
Fluoride	0.874	0.100	0.400		mg/L	1	08/22/19 05:58 PM
Sulfate	150	10.0	30.0		mg/L	10	08/22/19 12:11 PM
TOTAL DISSOLVED SOLIDS		M2540C		Analyst: JS			
Total Dissolved Solids (Residue, Filterable)	882	10.0	10.0		mg/L	1	08/22/19 03:40 PM

Qualifiers: ND - Not Detected at the SDL
 J - Analyte detected between SDL and RL
 B - Analyte detected in the associated Method Blank
 DF- Dilution Factor
 N - Parameter not NELAP certified
 See Final Page of Report for MQLs and MDLs

S - Spike Recovery outside control limits
 C - Sample Result or QC discussed in Case Narrative
 RL - Reporting Limit (MQL adjusted for moisture and sample size)
 SDL - Sample Detection Limit
 E - TPH pattern not Gas or Diesel Range Pattern

DHL Analytical, Inc.

Date: 25-Sep-19

CLIENT: Golder
Project: Luminant-OGSES FGD Ponds
Project No: 19122262-F
Lab Order: 1908215

Client Sample ID: FGD-2
Lab ID: 1908215-03
Collection Date: 08/19/19 09:15 AM
Matrix: AQUEOUS

Analyses	Result	SDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		SW6020A			Analyst: SP		
Antimony	<0.000800	0.000800	0.00250		mg/L	1	08/27/19 10:59 AM
Arsenic	<0.00200	0.00200	0.00500		mg/L	1	08/27/19 10:59 AM
Barium	0.181	0.00300	0.0100		mg/L	1	08/27/19 10:59 AM
Beryllium	<0.000300	0.000300	0.00100		mg/L	1	08/27/19 10:59 AM
Boron	0.192	0.0100	0.0300		mg/L	1	08/27/19 10:59 AM
Cadmium	<0.000300	0.000300	0.00100		mg/L	1	08/27/19 10:59 AM
Calcium	167	1.00	3.00		mg/L	10	08/27/19 12:11 PM
Chromium	<0.00200	0.00200	0.00500		mg/L	1	08/27/19 10:59 AM
Cobalt	<0.00300	0.00300	0.00500		mg/L	1	08/27/19 10:59 AM
Lead	<0.000300	0.000300	0.00100		mg/L	1	08/27/19 10:59 AM
Lithium	0.0257	0.00500	0.0100		mg/L	1	08/27/19 10:59 AM
Molybdenum	<0.00200	0.00200	0.00500		mg/L	1	08/27/19 10:59 AM
Selenium	0.0249	0.00200	0.00500		mg/L	1	08/27/19 10:59 AM
Thallium	<0.000500	0.000500	0.00150		mg/L	1	08/27/19 10:59 AM
MERCURY TOTAL: AQUEOUS		SW7470A			Analyst: BM		
Mercury	<0.0000800	0.0000800	0.000200		mg/L	1	08/23/19 11:09 AM
ANIONS BY IC METHOD - WATER		E300			Analyst: SNM		
Chloride	863	30.0	100		mg/L	100	08/22/19 04:06 PM
Fluoride	0.413	0.100	0.400		mg/L	1	08/22/19 06:14 PM
Sulfate	218	10.0	30.0		mg/L	10	08/22/19 12:27 PM
TOTAL DISSOLVED SOLIDS		M2540C			Analyst: JS		
Total Dissolved Solids (Residue, Filterable)	1890	50.0	50.0		mg/L	1	08/22/19 03:40 PM

Qualifiers: ND - Not Detected at the SDL
 J - Analyte detected between SDL and RL
 B - Analyte detected in the associated Method Blank
 DF- Dilution Factor
 N - Parameter not NELAP certified
 See Final Page of Report for MQLs and MDLs

S - Spike Recovery outside control limits
 C - Sample Result or QC discussed in Case Narrative
 RL - Reporting Limit (MQL adjusted for moisture and sample size)
 SDL - Sample Detection Limit
 E - TPH pattern not Gas or Diesel Range Pattern

DHL Analytical, Inc.

Date: 25-Sep-19

CLIENT: Golder
Project: Luminant-OGSES FGD Ponds
Project No: 19122262-F
Lab Order: 1908215

Client Sample ID: FGD-5
Lab ID: 1908215-04
Collection Date: 08/19/19 10:00 AM
Matrix: AQUEOUS

Analyses	Result	SDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		SW6020A		Analyst: SP			
Antimony	<0.000800	0.000800	0.00250		mg/L	1	08/27/19 10:51 AM
Arsenic	<0.00200	0.00200	0.00500		mg/L	1	08/27/19 10:51 AM
Barium	0.106	0.00300	0.0100		mg/L	1	08/27/19 10:51 AM
Beryllium	<0.000300	0.000300	0.00100		mg/L	1	08/27/19 10:51 AM
Boron	0.114	0.0100	0.0300		mg/L	1	08/27/19 10:51 AM
Cadmium	<0.000300	0.000300	0.00100		mg/L	1	08/27/19 10:51 AM
Calcium	90.7	1.00	3.00		mg/L	10	08/27/19 12:05 PM
Chromium	0.0103	0.00200	0.00500		mg/L	1	08/27/19 10:51 AM
Cobalt	<0.00300	0.00300	0.00500		mg/L	1	08/27/19 10:51 AM
Lead	<0.000300	0.000300	0.00100		mg/L	1	08/27/19 10:51 AM
Lithium	0.152	0.00500	0.0100		mg/L	1	08/27/19 10:51 AM
Molybdenum	<0.00200	0.00200	0.00500		mg/L	1	08/27/19 10:51 AM
Selenium	<0.00200	0.00200	0.00500		mg/L	1	08/27/19 10:51 AM
Thallium	<0.000500	0.000500	0.00150		mg/L	1	08/27/19 10:51 AM
MERCURY TOTAL: AQUEOUS		SW7470A		Analyst: BM			
Mercury	<0.0000800	0.0000800	0.000200		mg/L	1	08/23/19 11:11 AM
ANIONS BY IC METHOD - WATER		E300		Analyst: SNM			
Chloride	283	3.00	10.0		mg/L	10	08/22/19 12:43 PM
Fluoride	0.863	0.100	0.400		mg/L	1	08/22/19 06:30 PM
Sulfate	70.7	1.00	3.00		mg/L	1	08/22/19 06:30 PM
TOTAL DISSOLVED SOLIDS		M2540C		Analyst: JS			
Total Dissolved Solids (Residue, Filterable)	816	10.0	10.0		mg/L	1	08/22/19 03:40 PM

Qualifiers: ND - Not Detected at the SDL
 J - Analyte detected between SDL and RL
 B - Analyte detected in the associated Method Blank
 DF- Dilution Factor
 N - Parameter not NELAP certified
 See Final Page of Report for MQLs and MDLs

S - Spike Recovery outside control limits
 C - Sample Result or QC discussed in Case Narrative
 RL - Reporting Limit (MQL adjusted for moisture and sample size)
 SDL - Sample Detection Limit
 E - TPH pattern not Gas or Diesel Range Pattern

DHL Analytical, Inc.

Date: 25-Sep-19

CLIENT: Golder
Project: Luminant-OGSES FGD Ponds
Project No: 19122262-F
Lab Order: 1908215

Client Sample ID: DUP-1
Lab ID: 1908215-05
Collection Date: 08/19/19 10:00 AM
Matrix: AQUEOUS

Analyses	Result	SDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		SW6020A			Analyst: SP		
Antimony	<0.000800	0.000800	0.00250		mg/L	1	08/27/19 11:01 AM
Arsenic	<0.00200	0.00200	0.00500		mg/L	1	08/27/19 11:01 AM
Barium	0.0972	0.00300	0.0100		mg/L	1	08/27/19 11:01 AM
Beryllium	<0.000300	0.000300	0.00100		mg/L	1	08/27/19 11:01 AM
Boron	0.112	0.0100	0.0300		mg/L	1	08/27/19 11:01 AM
Cadmium	<0.000300	0.000300	0.00100		mg/L	1	08/27/19 11:01 AM
Calcium	91.0	1.00	3.00		mg/L	10	08/27/19 12:13 PM
Chromium	0.0115	0.00200	0.00500		mg/L	1	08/27/19 11:01 AM
Cobalt	<0.00300	0.00300	0.00500		mg/L	1	08/27/19 11:01 AM
Lead	<0.000300	0.000300	0.00100		mg/L	1	08/27/19 11:01 AM
Lithium	0.151	0.00500	0.0100		mg/L	1	08/27/19 11:01 AM
Molybdenum	<0.00200	0.00200	0.00500		mg/L	1	08/27/19 11:01 AM
Selenium	<0.00200	0.00200	0.00500		mg/L	1	08/27/19 11:01 AM
Thallium	<0.000500	0.000500	0.00150		mg/L	1	08/27/19 11:01 AM
MERCURY TOTAL: AQUEOUS		SW7470A			Analyst: BM		
Mercury	<0.0000800	0.0000800	0.000200		mg/L	1	08/23/19 11:14 AM
ANIONS BY IC METHOD - WATER		E300			Analyst: SNM		
Chloride	283	3.00	10.0		mg/L	10	08/22/19 12:59 PM
Fluoride	0.915	0.100	0.400		mg/L	1	08/22/19 09:10 PM
Sulfate	70.1	1.00	3.00		mg/L	1	08/22/19 09:10 PM
TOTAL DISSOLVED SOLIDS		M2540C			Analyst: JS		
Total Dissolved Solids (Residue, Filterable)	816	10.0	10.0		mg/L	1	08/22/19 03:40 PM

Qualifiers: ND - Not Detected at the SDL
 J - Analyte detected between SDL and RL
 B - Analyte detected in the associated Method Blank
 DF- Dilution Factor
 N - Parameter not NELAP certified
 See Final Page of Report for MQLs and MDLs

S - Spike Recovery outside control limits
 C - Sample Result or QC discussed in Case Narrative
 RL - Reporting Limit (MQL adjusted for moisture and sample size)
 SDL - Sample Detection Limit
 E - TPH pattern not Gas or Diesel Range Pattern

DHL Analytical, Inc.

Date: 25-Sep-19

CLIENT: Golder
Project: Luminant-OGSES FGD Ponds
Project No: 19122262-F
Lab Order: 1908215

Client Sample ID: FGD-8
Lab ID: 1908215-06
Collection Date: 08/19/19 11:00 AM
Matrix: AQUEOUS

Analyses	Result	SDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		SW6020A			Analyst: SP		
Antimony	<0.000800	0.000800	0.00250		mg/L	1	08/27/19 11:03 AM
Arsenic	0.00645	0.00200	0.00500		mg/L	1	08/27/19 11:03 AM
Barium	0.608	0.00300	0.0100		mg/L	1	08/27/19 11:03 AM
Beryllium	<0.000300	0.000300	0.00100		mg/L	1	08/27/19 11:03 AM
Boron	0.0756	0.0100	0.0300		mg/L	1	08/27/19 11:03 AM
Cadmium	<0.000300	0.000300	0.00100		mg/L	1	08/27/19 11:03 AM
Calcium	427	5.00	15.0		mg/L	50	08/27/19 12:15 PM
Chromium	<0.00200	0.00200	0.00500		mg/L	1	08/27/19 11:03 AM
Cobalt	0.0135	0.00300	0.00500		mg/L	1	08/27/19 11:03 AM
Lead	0.00134	0.000300	0.00100		mg/L	1	08/27/19 11:03 AM
Lithium	0.0144	0.00500	0.0100		mg/L	1	08/27/19 11:03 AM
Molybdenum	<0.00200	0.00200	0.00500		mg/L	1	08/27/19 11:03 AM
Selenium	0.00252	0.00200	0.00500	J	mg/L	1	08/27/19 11:03 AM
Thallium	<0.000500	0.000500	0.00150		mg/L	1	08/27/19 11:03 AM
MERCURY TOTAL: AQUEOUS		SW7470A			Analyst: BM		
Mercury	<0.0000800	0.0000800	0.000200		mg/L	1	08/23/19 11:16 AM
ANIONS BY IC METHOD - WATER		E300			Analyst: SNM		
Chloride	2260	30.0	100		mg/L	100	08/22/19 04:22 PM
Fluoride	<0.100	0.100	0.400		mg/L	1	08/22/19 09:26 PM
Sulfate	452	10.0	30.0		mg/L	10	08/22/19 01:15 PM
TOTAL DISSOLVED SOLIDS		M2540C			Analyst: JS		
Total Dissolved Solids (Residue, Filterable)	4600	50.0	50.0		mg/L	1	08/22/19 03:40 PM

Qualifiers: ND - Not Detected at the SDL
 J - Analyte detected between SDL and RL
 B - Analyte detected in the associated Method Blank
 DF- Dilution Factor
 N - Parameter not NELAP certified
 See Final Page of Report for MQLs and MDLs

S - Spike Recovery outside control limits
 C - Sample Result or QC discussed in Case Narrative
 RL - Reporting Limit (MQL adjusted for moisture and sample size)
 SDL - Sample Detection Limit
 E - TPH pattern not Gas or Diesel Range Pattern

DHL Analytical, Inc.

Date: 25-Sep-19

CLIENT: Golder
Project: Luminant-OGSES FGD Ponds
Project No: 19122262-F
Lab Order: 1908215

Client Sample ID: FGD-1
Lab ID: 1908215-07
Collection Date: 08/19/19 12:05 PM
Matrix: AQUEOUS

Analyses	Result	SDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		SW6020A		Analyst: SP			
Antimony	<0.000800	0.000800	0.00250		mg/L	1	08/27/19 11:05 AM
Arsenic	<0.00200	0.00200	0.00500		mg/L	1	08/27/19 11:05 AM
Barium	0.0538	0.00300	0.0100		mg/L	1	08/27/19 11:05 AM
Beryllium	<0.000300	0.000300	0.00100		mg/L	1	08/27/19 11:05 AM
Boron	0.0864	0.0100	0.0300		mg/L	1	08/27/19 11:05 AM
Cadmium	<0.000300	0.000300	0.00100		mg/L	1	08/27/19 11:05 AM
Calcium	26.1	0.500	1.50		mg/L	5	08/27/19 12:17 PM
Chromium	<0.00200	0.00200	0.00500		mg/L	1	08/27/19 11:05 AM
Cobalt	<0.00300	0.00300	0.00500		mg/L	1	08/27/19 11:05 AM
Lead	<0.000300	0.000300	0.00100		mg/L	1	08/27/19 11:05 AM
Lithium	0.0441	0.00500	0.0100		mg/L	1	08/27/19 11:05 AM
Molybdenum	<0.00200	0.00200	0.00500		mg/L	1	08/27/19 11:05 AM
Selenium	<0.00200	0.00200	0.00500		mg/L	1	08/27/19 11:05 AM
Thallium	<0.000500	0.000500	0.00150		mg/L	1	08/27/19 11:05 AM
MERCURY TOTAL: AQUEOUS		SW7470A		Analyst: BM			
Mercury	<0.0000800	0.0000800	0.000200		mg/L	1	08/23/19 11:23 AM
ANIONS BY IC METHOD - WATER		E300		Analyst: SNM			
Chloride	69.3	3.00	10.0		mg/L	70	08/22/19 01:31 PM
Fluoride	0.486	0.100	0.400		mg/L	1	08/22/19 09:42 PM
Sulfate	80.9	1.00	3.00		mg/L	1	08/22/19 09:42 PM
TOTAL DISSOLVED SOLIDS		M2540C		Analyst: JS			
Total Dissolved Solids (Residue, Filterable)	328	10.0	10.0		mg/L	1	08/22/19 03:40 PM

Qualifiers: ND - Not Detected at the SDL
 J - Analyte detected between SDL and RL
 B - Analyte detected in the associated Method Blank
 DF- Dilution Factor
 N - Parameter not NELAP certified
 See Final Page of Report for MQLs and MDLs

S - Spike Recovery outside control limits
 C - Sample Result or QC discussed in Case Narrative
 RL - Reporting Limit (MQL adjusted for moisture and sample size)
 SDL - Sample Detection Limit
 E - TPH pattern not Gas or Diesel Range Pattern

DHL Analytical, Inc.

Date: 25-Sep-19

CLIENT: Golder
Project: Luminant-OGSES FGD Ponds
Project No: 19122262-F
Lab Order: 1908215

Client Sample ID: FGD-14
Lab ID: 1908215-08
Collection Date: 08/19/19 01:15 PM
Matrix: AQUEOUS

Analyses	Result	SDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		SW6020A			Analyst: SP		
Antimony	<0.000800	0.000800	0.00250		mg/L	1	08/27/19 11:07 AM
Arsenic	<0.00200	0.00200	0.00500		mg/L	1	08/27/19 11:07 AM
Barium	0.426	0.00300	0.0100		mg/L	1	08/27/19 11:07 AM
Beryllium	<0.000300	0.000300	0.00100		mg/L	1	08/27/19 11:07 AM
Boron	0.0714	0.0100	0.0300		mg/L	1	08/27/19 11:07 AM
Cadmium	<0.000300	0.000300	0.00100		mg/L	1	08/27/19 11:07 AM
Calcium	84.4	1.00	3.00		mg/L	10	08/27/19 12:19 PM
Chromium	<0.00200	0.00200	0.00500		mg/L	1	08/27/19 11:07 AM
Cobalt	<0.00300	0.00300	0.00500		mg/L	1	08/27/19 11:07 AM
Lead	<0.000300	0.000300	0.00100		mg/L	1	08/27/19 11:07 AM
Lithium	0.00542	0.00500	0.0100	J	mg/L	1	08/27/19 11:07 AM
Molybdenum	<0.00200	0.00200	0.00500		mg/L	1	08/27/19 11:07 AM
Selenium	<0.00200	0.00200	0.00500		mg/L	1	08/27/19 11:07 AM
Thallium	<0.000500	0.000500	0.00150		mg/L	1	08/27/19 11:07 AM
MERCURY TOTAL: AQUEOUS		SW7470A			Analyst: BM		
Mercury	<0.0000800	0.0000800	0.000200		mg/L	1	08/23/19 11:25 AM
ANIONS BY IC METHOD - WATER		E300			Analyst: SNM		
Chloride	387	3.00	10.0		mg/L	10	08/22/19 01:47 PM
Fluoride	0.318	0.100	0.400	J	mg/L	1	08/22/19 09:58 PM
Sulfate	33.2	1.00	3.00		mg/L	1	08/22/19 09:58 PM
TOTAL DISSOLVED SOLIDS		M2540C			Analyst: JS		
Total Dissolved Solids (Residue, Filterable)	925	50.0	50.0		mg/L	1	08/22/19 03:40 PM

Qualifiers: ND - Not Detected at the SDL
 J - Analyte detected between SDL and RL
 B - Analyte detected in the associated Method Blank
 DF- Dilution Factor
 N - Parameter not NELAP certified
 See Final Page of Report for MQLs and MDLs

S - Spike Recovery outside control limits
 C - Sample Result or QC discussed in Case Narrative
 RL - Reporting Limit (MQL adjusted for moisture and sample size)
 SDL - Sample Detection Limit
 E - TPH pattern not Gas or Diesel Range Pattern

DHL Analytical, Inc.

Date: 25-Sep-19

CLIENT: Golder
Project: Luminant-OGSES FGD Ponds
Project No: 19122262-F
Lab Order: 1908215

Client Sample ID: FGD-4
Lab ID: 1908215-09
Collection Date: 08/19/19 02:15 PM
Matrix: AQUEOUS

Analyses	Result	SDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		SW6020A		Analyst: SP			
Antimony	<0.000800	0.000800	0.00250		mg/L	1	08/27/19 11:09 AM
Arsenic	<0.00200	0.00200	0.00500		mg/L	1	08/27/19 11:09 AM
Barium	0.100	0.00300	0.0100		mg/L	1	08/27/19 11:09 AM
Beryllium	<0.000300	0.000300	0.00100		mg/L	1	08/27/19 11:09 AM
Boron	0.0850	0.0100	0.0300		mg/L	1	08/27/19 11:09 AM
Cadmium	<0.000300	0.000300	0.00100		mg/L	1	08/27/19 11:09 AM
Calcium	42.5	1.00	3.00		mg/L	10	08/27/19 12:21 PM
Chromium	<0.00200	0.00200	0.00500		mg/L	1	08/27/19 11:09 AM
Cobalt	<0.00300	0.00300	0.00500		mg/L	1	08/27/19 11:09 AM
Lead	<0.000300	0.000300	0.00100		mg/L	1	08/27/19 11:09 AM
Lithium	0.0190	0.00500	0.0100		mg/L	1	08/27/19 11:09 AM
Molybdenum	<0.00200	0.00200	0.00500		mg/L	1	08/27/19 11:09 AM
Selenium	<0.00200	0.00200	0.00500		mg/L	1	08/27/19 11:09 AM
Thallium	<0.000500	0.000500	0.00150		mg/L	1	08/27/19 11:09 AM
MERCURY TOTAL: AQUEOUS		SW7470A		Analyst: BM			
Mercury	<0.0000800	0.0000800	0.000200		mg/L	1	08/23/19 11:27 AM
ANIONS BY IC METHOD - WATER		E300		Analyst: SNM			
Chloride	188	3.00	10.0		mg/L	10	08/22/19 02:03 PM
Fluoride	0.670	0.100	0.400		mg/L	1	08/22/19 10:14 PM
Sulfate	55.4	1.00	3.00		mg/L	1	08/22/19 10:14 PM
TOTAL DISSOLVED SOLIDS		M2540C		Analyst: JS			
Total Dissolved Solids (Residue, Filterable)	681	10.0	10.0		mg/L	1	08/22/19 03:40 PM

Qualifiers: ND - Not Detected at the SDL
 J - Analyte detected between SDL and RL
 B - Analyte detected in the associated Method Blank
 DF- Dilution Factor
 N - Parameter not NELAP certified
 See Final Page of Report for MQLs and MDLs

S - Spike Recovery outside control limits
 C - Sample Result or QC discussed in Case Narrative
 RL - Reporting Limit (MQL adjusted for moisture and sample size)
 SDL - Sample Detection Limit
 E - TPH pattern not Gas or Diesel Range Pattern

DHL Analytical, Inc.

Date: 25-Sep-19

CLIENT: Golder
Project: Luminant-OGSES FGD Ponds
Project No: 19122262-F
Lab Order: 1908215

Client Sample ID: FGD-11
Lab ID: 1908215-10
Collection Date: 08/19/19 03:20 PM
Matrix: AQUEOUS

Analyses	Result	SDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		SW6020A			Analyst: SP		
Antimony	<0.000800	0.000800	0.00250		mg/L	1	08/27/19 11:11 AM
Arsenic	<0.00200	0.00200	0.00500		mg/L	1	08/27/19 11:11 AM
Barium	0.310	0.00300	0.0100		mg/L	1	08/27/19 11:11 AM
Beryllium	<0.000300	0.000300	0.00100		mg/L	1	08/27/19 11:11 AM
Boron	0.120	0.0100	0.0300		mg/L	1	08/27/19 11:11 AM
Cadmium	<0.000300	0.000300	0.00100		mg/L	1	08/27/19 11:11 AM
Calcium	92.5	1.00	3.00		mg/L	10	08/27/19 12:23 PM
Chromium	0.00391	0.00200	0.00500	J	mg/L	1	08/27/19 11:11 AM
Cobalt	<0.00300	0.00300	0.00500		mg/L	1	08/27/19 11:11 AM
Lead	<0.000300	0.000300	0.00100		mg/L	1	08/27/19 11:11 AM
Lithium	0.0136	0.00500	0.0100		mg/L	1	08/27/19 11:11 AM
Molybdenum	0.00238	0.00200	0.00500	J	mg/L	1	08/27/19 11:11 AM
Selenium	<0.00200	0.00200	0.00500		mg/L	1	08/27/19 11:11 AM
Thallium	<0.000500	0.000500	0.00150		mg/L	1	08/27/19 11:11 AM
MERCURY TOTAL: AQUEOUS		SW7470A			Analyst: BM		
Mercury	<0.0000800	0.0000800	0.000200		mg/L	1	08/23/19 11:30 AM
ANIONS BY IC METHOD - WATER		E300			Analyst: SNM		
Chloride	535	30.0	100		mg/L	100	08/22/19 04:38 PM
Fluoride	0.630	0.100	0.400		mg/L	1	08/22/19 10:30 PM
Sulfate	44.7	1.00	3.00		mg/L	1	08/22/19 10:30 PM
TOTAL DISSOLVED SOLIDS		M2540C			Analyst: JS		
Total Dissolved Solids (Residue, Filterable)	1430	50.0	50.0		mg/L	1	08/22/19 03:40 PM

Qualifiers: ND - Not Detected at the SDL
 J - Analyte detected between SDL and RL
 B - Analyte detected in the associated Method Blank
 DF- Dilution Factor
 N - Parameter not NELAP certified
 See Final Page of Report for MQLs and MDLs

S - Spike Recovery outside control limits
 C - Sample Result or QC discussed in Case Narrative
 RL - Reporting Limit (MQL adjusted for moisture and sample size)
 SDL - Sample Detection Limit
 E - TPH pattern not Gas or Diesel Range Pattern

DHL Analytical, Inc.

Date: 25-Sep-19

CLIENT: Golder
Project: Luminant-OGSES FGD Ponds
Project No: 19122262-F
Lab Order: 1908215

Client Sample ID: FGD-12
Lab ID: 1908215-11
Collection Date: 08/19/19 04:25 PM
Matrix: AQUEOUS

Analyses	Result	SDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		SW6020A		Analyst: SP			
Antimony	<0.000800	0.000800	0.00250		mg/L	1	08/27/19 11:32 AM
Arsenic	<0.00200	0.00200	0.00500		mg/L	1	08/27/19 11:32 AM
Barium	0.0631	0.00300	0.0100		mg/L	1	08/27/19 11:32 AM
Beryllium	<0.000300	0.000300	0.00100		mg/L	1	08/27/19 11:32 AM
Boron	0.0794	0.0100	0.0300		mg/L	1	08/27/19 11:32 AM
Cadmium	<0.000300	0.000300	0.00100		mg/L	1	08/27/19 11:32 AM
Calcium	10.5	0.100	0.300		mg/L	1	08/27/19 11:32 AM
Chromium	0.00218	0.00200	0.00500	J	mg/L	1	08/27/19 11:32 AM
Cobalt	<0.00300	0.00300	0.00500		mg/L	1	08/27/19 11:32 AM
Lead	0.00139	0.000300	0.00100		mg/L	1	08/27/19 11:32 AM
Lithium	0.0251	0.00500	0.0100		mg/L	1	08/27/19 11:32 AM
Molybdenum	<0.00200	0.00200	0.00500		mg/L	1	08/27/19 11:32 AM
Selenium	<0.00200	0.00200	0.00500		mg/L	1	08/27/19 11:32 AM
Thallium	<0.000500	0.000500	0.00150		mg/L	1	08/27/19 11:32 AM
MERCURY TOTAL: AQUEOUS		SW7470A		Analyst: BM			
Mercury	<0.0000800	0.0000800	0.000200		mg/L	1	08/23/19 11:32 AM
ANIONS BY IC METHOD - WATER		E300		Analyst: SNM			
Chloride	16.1	0.300	1.00		mg/L	1	08/22/19 10:46 PM
Fluoride	0.145	0.100	0.400	J	mg/L	1	08/22/19 10:46 PM
Sulfate	17.1	1.00	3.00		mg/L	1	08/22/19 10:46 PM
TOTAL DISSOLVED SOLIDS		M2540C		Analyst: JS			
Total Dissolved Solids (Residue, Filterable)	209	10.0	10.0		mg/L	1	08/22/19 03:40 PM

Qualifiers: ND - Not Detected at the SDL
 J - Analyte detected between SDL and RL
 B - Analyte detected in the associated Method Blank
 DF- Dilution Factor
 N - Parameter not NELAP certified
 See Final Page of Report for MQLs and MDLs

S - Spike Recovery outside control limits
 C - Sample Result or QC discussed in Case Narrative
 RL - Reporting Limit (MQL adjusted for moisture and sample size)
 SDL - Sample Detection Limit
 E - TPH pattern not Gas or Diesel Range Pattern

DHL Analytical, Inc.

Date: 25-Sep-19

CLIENT: Golder
Project: Luminant-OGSES FGD Ponds
Project No: 19122262-F
Lab Order: 1908215

Client Sample ID: FGD-15
Lab ID: 1908215-12
Collection Date: 08/19/19 05:30 PM
Matrix: AQUEOUS

Analyses	Result	SDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		SW6020A			Analyst: SP		
Antimony	<0.000800	0.000800	0.00250		mg/L	1	08/27/19 11:34 AM
Arsenic	<0.00200	0.00200	0.00500		mg/L	1	08/27/19 11:34 AM
Barium	0.0236	0.00300	0.0100		mg/L	1	08/27/19 11:34 AM
Beryllium	<0.000300	0.000300	0.00100		mg/L	1	08/27/19 11:34 AM
Boron	0.631	0.0100	0.0300		mg/L	1	08/27/19 11:34 AM
Cadmium	0.000838	0.000300	0.00100	J	mg/L	1	08/27/19 11:34 AM
Calcium	335	5.00	15.0		mg/L	50	08/27/19 12:25 PM
Chromium	<0.00200	0.00200	0.00500		mg/L	1	08/27/19 11:34 AM
Cobalt	<0.00300	0.00300	0.00500		mg/L	1	08/27/19 11:34 AM
Lead	0.000934	0.000300	0.00100	J	mg/L	1	08/27/19 11:34 AM
Lithium	0.0823	0.00500	0.0100		mg/L	1	08/27/19 11:34 AM
Molybdenum	<0.00200	0.00200	0.00500		mg/L	1	08/27/19 11:34 AM
Selenium	0.0221	0.00200	0.00500		mg/L	1	08/27/19 11:34 AM
Thallium	<0.000500	0.000500	0.00150		mg/L	1	08/27/19 11:34 AM
MERCURY TOTAL: AQUEOUS		SW7470A			Analyst: BM		
Mercury	<0.0000800	0.0000800	0.000200		mg/L	1	08/23/19 11:34 AM
ANIONS BY IC METHOD - WATER		E300			Analyst: SNM		
Chloride	1030	30.0	100		mg/L	100	08/23/19 05:00 PM
Fluoride	0.483	0.100	0.400		mg/L	1	08/22/19 11:02 PM
Sulfate	985	10.0	30.0		mg/L	10	08/22/19 05:10 PM
TOTAL DISSOLVED SOLIDS		M2540C			Analyst: JS		
Total Dissolved Solids (Residue, Filterable)	3180	50.0	50.0		mg/L	1	08/22/19 03:40 PM

Qualifiers: ND - Not Detected at the SDL
 J - Analyte detected between SDL and RL
 B - Analyte detected in the associated Method Blank
 DF- Dilution Factor
 N - Parameter not NELAP certified
 See Final Page of Report for MQLs and MDLs

S - Spike Recovery outside control limits
 C - Sample Result or QC discussed in Case Narrative
 RL - Reporting Limit (MQL adjusted for moisture and sample size)
 SDL - Sample Detection Limit
 E - TPH pattern not Gas or Diesel Range Pattern

CLIENT: Golder
Work Order: 1908215
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: CETAC2_HG_190611B

Sample ID	DCS-91284	Batch ID:	91284	TestNo:	SW7470A	Units:	mg/L				
SampType:	DCS	Run ID:	CETAC2_HG_190611	Analysis Date:	6/11/2019 5:01:26 PM	Prep Date:	6/11/2019				
Analyte		Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury		0.000206	0.000200	0.000200	0	103	82	119	0	0	

Qualifiers:

- B Analyte detected in the associated Method Blank
- J Analyte detected between MDL and RL
- ND Not Detected at the Method Detection Limit
- RL Reporting Limit
- J Analyte detected between SDL and RL

- DF Dilution Factor
- MDL Method Detection Limit
- R RPD outside accepted control limits
- S Spike Recovery outside control limits
- N Parameter not NELAP certified

CLIENT: Golder
Work Order: 1908215
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: CETAC2_HG_190823A

The QC data in batch 92489 applies to the following samples: 1908215-01A, 1908215-02A, 1908215-03A, 1908215-04A, 1908215-05A, 1908215-06A, 1908215-07A, 1908215-08A, 1908215-09A, 1908215-10A, 1908215-11A, 1908215-12A

Sample ID MB-92489	Batch ID: 92489	TestNo: SW7470A	Units: mg/L							
SampType: MBLK	Run ID: CETAC2_HG_190823A	Analysis Date: 8/23/2019 10:37:58 AM	Prep Date: 8/22/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	<0.0000800	0.000200								

Sample ID LCS-92489	Batch ID: 92489	TestNo: SW7470A	Units: mg/L							
SampType: LCS	Run ID: CETAC2_HG_190823A	Analysis Date: 8/23/2019 10:42:30 AM	Prep Date: 8/22/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.00188	0.000200	0.00200	0	94.0	85	115			

Sample ID LCS-92489	Batch ID: 92489	TestNo: SW7470A	Units: mg/L							
SampType: LCS	Run ID: CETAC2_HG_190823A	Analysis Date: 8/23/2019 10:44:46 AM	Prep Date: 8/22/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.00186	0.000200	0.00200	0	93.0	85	115	1.07	15	

Sample ID 1908173-01B MS	Batch ID: 92489	TestNo: SW7470A	Units: mg/L							
SampType: MS	Run ID: CETAC2_HG_190823A	Analysis Date: 8/23/2019 10:49:18 AM	Prep Date: 8/22/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.00940	0.00100	0.0100	0	94.0	80	120			

Sample ID 1908173-01B MSD	Batch ID: 92489	TestNo: SW7470A	Units: mg/L							
SampType: MSD	Run ID: CETAC2_HG_190823A	Analysis Date: 8/23/2019 10:51:33 AM	Prep Date: 8/22/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.00915	0.00100	0.0100	0	91.5	80	120	2.70	15	

Sample ID 1908173-01B SD	Batch ID: 92489	TestNo: SW7470A	Units: mg/L							
SampType: SD	Run ID: CETAC2_HG_190823A	Analysis Date: 8/23/2019 10:53:49 AM	Prep Date: 8/22/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	<0.00200	0.00500	0	0				0	10	

Sample ID 1908173-01B PDS	Batch ID: 92489	TestNo: SW7470A	Units: mg/L							
SampType: PDS	Run ID: CETAC2_HG_190823A	Analysis Date: 8/23/2019 10:56:05 AM	Prep Date: 8/22/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.0116	0.00100	0.0125	0	92.8	85	115			

- | | |
|--|---|
| <p>Qualifiers:</p> <ul style="list-style-type: none"> B Analyte detected in the associated Method Blank J Analyte detected between MDL and RL ND Not Detected at the Method Detection Limit RL Reporting Limit J Analyte detected between SDL and RL | <ul style="list-style-type: none"> DF Dilution Factor MDL Method Detection Limit R RPD outside accepted control limits S Spike Recovery outside control limits N Parameter not NELAP certified |
|--|---|

CLIENT: Golder
Work Order: 1908215
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: CETAC2_HG_190823A

Sample ID ICV-190823	Batch ID: R106002	TestNo: SW7470A	Units: mg/L
SampType: ICV	Run ID: CETAC2_HG_190823A	Analysis Date: 8/23/2019 10:33:24 AM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
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Mercury	0.00384	0.000200	0.00400	0	96.0	90	110			
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Sample ID CCV1-190823	Batch ID: R106002	TestNo: SW7470A	Units: mg/L
SampType: CCV	Run ID: CETAC2_HG_190823A	Analysis Date: 8/23/2019 11:18:47 AM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
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Mercury	0.00199	0.000200	0.00200	0	99.5	90	110			
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Sample ID CCV2-190823	Batch ID: R106002	TestNo: SW7470A	Units: mg/L
SampType: CCV	Run ID: CETAC2_HG_190823A	Analysis Date: 8/23/2019 11:39:17 AM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
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Mercury	0.00199	0.000200	0.00200	0	99.5	90	110			
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Qualifiers:	B Analyte detected in the associated Method Blank	DF Dilution Factor
	J Analyte detected between MDL and RL	MDL Method Detection Limit
	ND Not Detected at the Method Detection Limit	R RPD outside accepted control limits
	RL Reporting Limit	S Spike Recovery outside control limits
	J Analyte detected between SDL and RL	N Parameter not NELAP certified

CLIENT: Golder
Work Order: 1908215
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS4_190621B

Sample ID DCS2-91398	Batch ID: 91398	TestNo: SW6020A	Units: mg/L							
SampType: DCS2	Run ID: ICP-MS4_190621B	Analysis Date: 6/21/2019 1:24:00 PM	Prep Date: 6/20/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	0.321	0.300	0.300	0	107	70	130	0	0	

Sample ID DCS3-91398	Batch ID: 91398	TestNo: SW6020A	Units: mg/L							
SampType: DCS3	Run ID: ICP-MS4_190621B	Analysis Date: 6/21/2019 1:27:00 PM	Prep Date: 6/20/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.00522	0.00500	0.00500	0	104	70	130	0	0	
Barium	0.00479	0.0100	0.00500	0	95.8	70	130	0	0	
Chromium	0.00523	0.00500	0.00500	0	105	70	130	0	0	
Cobalt	0.00564	0.00500	0.00500	0	113	70	130	0	0	
Lithium	0.00602	0.0100	0.00500	0	120	70	130	0	0	
Molybdenum	0.00480	0.00500	0.00500	0	95.9	70	130	0	0	
Selenium	0.00569	0.00500	0.00500	0	114	70	130	0	0	

Sample ID DCS4-91398	Batch ID: 91398	TestNo: SW6020A	Units: mg/L							
SampType: DCS4	Run ID: ICP-MS4_190621B	Analysis Date: 6/21/2019 1:30:00 PM	Prep Date: 6/20/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Boron	0.0311	0.0300	0.0300	0	104	70	130	0	0	

Sample ID DCS1-91398	Batch ID: 91398	TestNo: SW6020A	Units: mg/L							
SampType: DCS	Run ID: ICP-MS4_190621B	Analysis Date: 6/21/2019 1:34:00 PM	Prep Date: 6/20/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.000904	0.00250	0.00100	0	90.4	70	130	0	0	
Beryllium	0.000493	0.00100	0.000500	0	98.6	70	130	0	0	
Cadmium	0.000516	0.00100	0.000500	0	103	70	130	0	0	
Lead	0.000475	0.00100	0.000500	0	95.0	70	130	0	0	
Thallium	0.000471	0.00150	0.000500	0	94.2	70	130	0	0	

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1908215
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS4_190827B

The QC data in batch 92519 applies to the following samples: 1908215-01A, 1908215-02A, 1908215-03A, 1908215-04A, 1908215-05A, 1908215-06A, 1908215-07A, 1908215-08A, 1908215-09A, 1908215-10A, 1908215-11A, 1908215-12A

Sample ID MB-92519	Batch ID: 92519	TestNo: SW6020A	Units: mg/L
SampType: MBLK	Run ID: ICP-MS4_190827B	Analysis Date: 8/27/2019 10:43:00 AM	Prep Date: 8/26/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	<0.000800	0.00250								
Arsenic	<0.00200	0.00500								
Barium	<0.00300	0.0100								
Beryllium	<0.000300	0.00100								
Boron	<0.0100	0.0300								
Cadmium	<0.000300	0.00100								
Calcium	<0.100	0.300								
Chromium	<0.00200	0.00500								
Cobalt	<0.00300	0.00500								
Lead	<0.000300	0.00100								
Lithium	<0.00500	0.0100								
Molybdenum	<0.00200	0.00500								
Selenium	<0.00200	0.00500								
Thallium	<0.000500	0.00150								

Sample ID LCS-92519	Batch ID: 92519	TestNo: SW6020A	Units: mg/L
SampType: LCS	Run ID: ICP-MS4_190827B	Analysis Date: 8/27/2019 10:45:00 AM	Prep Date: 8/26/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.203	0.00250	0.200	0	102	80	120			
Arsenic	0.200	0.00500	0.200	0	99.8	80	120			
Barium	0.198	0.0100	0.200	0	99.1	80	120			
Beryllium	0.200	0.00100	0.200	0	100	80	120			
Boron	0.215	0.0300	0.200	0	107	80	120			
Cadmium	0.200	0.00100	0.200	0	99.8	80	120			
Calcium	4.93	0.300	5.00	0	98.7	80	120			
Chromium	0.206	0.00500	0.200	0	103	80	120			
Cobalt	0.206	0.00500	0.200	0	103	80	120			
Lead	0.198	0.00100	0.200	0	99.0	80	120			
Lithium	0.204	0.0100	0.200	0	102	80	120			
Molybdenum	0.203	0.00500	0.200	0	101	80	120			
Selenium	0.195	0.00500	0.200	0	97.7	80	120			
Thallium	0.197	0.00150	0.200	0	98.6	80	120			

Sample ID LCSD-92519	Batch ID: 92519	TestNo: SW6020A	Units: mg/L
SampType: LCSD	Run ID: ICP-MS4_190827B	Analysis Date: 8/27/2019 10:47:00 AM	Prep Date: 8/26/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.202	0.00250	0.200	0	101	80	120	0.325	15	

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|--|---|
| <p>Qualifiers:</p> <ul style="list-style-type: none"> B Analyte detected in the associated Method Blank J Analyte detected between MDL and RL ND Not Detected at the Method Detection Limit RL Reporting Limit J Analyte detected between SDL and RL | <ul style="list-style-type: none"> DF Dilution Factor MDL Method Detection Limit R RPD outside accepted control limits S Spike Recovery outside control limits N Parameter not NELAP certified |
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CLIENT: Golder
Work Order: 1908215
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS4_190827B

Sample ID: LCSD-92519	Batch ID: 92519	TestNo: SW6020A	Units: mg/L
SampType: LCSD	Run ID: ICP-MS4_190827B	Analysis Date: 8/27/2019 10:47:00 AM	Prep Date: 8/26/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.200	0.00500	0.200	0	100	80	120	0.372	15	
Barium	0.199	0.0100	0.200	0	99.6	80	120	0.515	15	
Beryllium	0.197	0.00100	0.200	0	98.5	80	120	1.57	15	
Boron	0.202	0.0300	0.200	0	101	80	120	5.99	15	
Cadmium	0.198	0.00100	0.200	0	99.2	80	120	0.663	15	
Calcium	4.91	0.300	5.00	0	98.2	80	120	0.485	15	
Chromium	0.204	0.00500	0.200	0	102	80	120	0.986	15	
Cobalt	0.208	0.00500	0.200	0	104	80	120	1.01	15	
Lead	0.198	0.00100	0.200	0	98.8	80	120	0.219	15	
Lithium	0.199	0.0100	0.200	0	99.3	80	120	2.71	15	
Molybdenum	0.203	0.00500	0.200	0	102	80	120	0.275	15	
Selenium	0.204	0.00500	0.200	0	102	80	120	4.26	15	
Thallium	0.195	0.00150	0.200	0	97.7	80	120	0.896	15	

Sample ID: 1908215-04A SD	Batch ID: 92519	TestNo: SW6020A	Units: mg/L
SampType: SD	Run ID: ICP-MS4_190827B	Analysis Date: 8/27/2019 10:53:00 AM	Prep Date: 8/26/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	<0.00400	0.0125	0	0				0	10	
Arsenic	<0.0100	0.0250	0	0				0	10	
Barium	0.108	0.0500	0	0.106				2.23	10	
Beryllium	<0.00150	0.00500	0	0				0	10	
Boron	0.157	0.150	0	0.114				32.1	10	R
Cadmium	<0.00150	0.00500	0	0				0	10	
Chromium	0.0107	0.0250	0	0.0103				4.05	10	
Cobalt	<0.0150	0.0250	0	0				0	10	
Lead	<0.00150	0.00500	0	0				0	10	
Lithium	0.160	0.0500	0	0.152				4.97	10	
Molybdenum	<0.0100	0.0250	0	0				0	10	
Selenium	<0.0100	0.0250	0	0				0	10	
Thallium	<0.00250	0.00750	0	0				0	10	

Sample ID: 1908215-04A PDS	Batch ID: 92519	TestNo: SW6020A	Units: mg/L
SampType: PDS	Run ID: ICP-MS4_190827B	Analysis Date: 8/27/2019 11:13:00 AM	Prep Date: 8/26/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.211	0.00250	0.200	0	106	80	120			
Arsenic	0.200	0.00500	0.200	0	100	80	120			
Barium	0.301	0.0100	0.200	0.106	97.6	80	120			
Beryllium	0.192	0.00100	0.200	0	96.1	80	120			
Boron	0.301	0.0300	0.200	0.114	93.4	80	120			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1908215
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS4_190827B

Sample ID 1908215-04A PDS	Batch ID: 92519	TestNo: SW6020A	Units: mg/L
SampType: PDS	Run ID: ICP-MS4_190827B	Analysis Date: 8/27/2019 11:13:00 AM	Prep Date: 8/26/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Cadmium	0.199	0.00100	0.200	0	99.4	80	120			
Chromium	0.216	0.00500	0.200	0.0103	103	80	120			
Cobalt	0.205	0.00500	0.200	0	102	80	120			
Lead	0.205	0.00100	0.200	0	102	80	120			
Lithium	0.329	0.0100	0.200	0.152	88.5	80	120			
Molybdenum	0.202	0.00500	0.200	0	101	80	120			
Selenium	0.201	0.00500	0.200	0	100	80	120			
Thallium	0.202	0.00150	0.200	0	101	80	120			

Sample ID 1908215-04A MS	Batch ID: 92519	TestNo: SW6020A	Units: mg/L
SampType: MS	Run ID: ICP-MS4_190827B	Analysis Date: 8/27/2019 11:15:00 AM	Prep Date: 8/26/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.205	0.00250	0.200	0	102	80	120			
Arsenic	0.200	0.00500	0.200	0	99.8	80	120			
Barium	0.303	0.0100	0.200	0.106	98.4	80	120			
Beryllium	0.189	0.00100	0.200	0	94.5	80	120			
Boron	0.303	0.0300	0.200	0.114	94.9	80	120			
Cadmium	0.192	0.00100	0.200	0	96.0	80	120			
Calcium	90.5	0.300	5.00	86.7	75.4	80	120			S
Chromium	0.207	0.00500	0.200	0.0103	98.3	80	120			
Cobalt	0.199	0.00500	0.200	0	99.5	80	120			
Lead	0.201	0.00100	0.200	0	101	80	120			
Lithium	0.335	0.0100	0.200	0.152	91.6	80	120			
Molybdenum	0.205	0.00500	0.200	0	102	80	120			
Selenium	0.203	0.00500	0.200	0	101	80	120			
Thallium	0.200	0.00150	0.200	0	99.8	80	120			

Sample ID 1908215-04A MSD	Batch ID: 92519	TestNo: SW6020A	Units: mg/L
SampType: MSD	Run ID: ICP-MS4_190827B	Analysis Date: 8/27/2019 11:17:00 AM	Prep Date: 8/26/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.208	0.00250	0.200	0	104	80	120	1.58	15	
Arsenic	0.203	0.00500	0.200	0	102	80	120	1.95	15	
Barium	0.310	0.0100	0.200	0.106	102	80	120	2.30	15	
Beryllium	0.192	0.00100	0.200	0	96.1	80	120	1.61	15	
Boron	0.307	0.0300	0.200	0.114	96.9	80	120	1.27	15	
Cadmium	0.198	0.00100	0.200	0	98.8	80	120	2.81	15	
Calcium	92.8	0.300	5.00	86.7	122	80	120	2.55	15	S
Chromium	0.212	0.00500	0.200	0.0103	101	80	120	2.58	15	
Cobalt	0.204	0.00500	0.200	0	102	80	120	2.49	15	

Qualifiers: B Analyte detected in the associated Method Blank DF Dilution Factor
J Analyte detected between MDL and RL MDL Method Detection Limit
ND Not Detected at the Method Detection Limit R RPD outside accepted control limits
RL Reporting Limit S Spike Recovery outside control limits
J Analyte detected between SDL and RL N Parameter not NELAP certified

CLIENT: Golder
Work Order: 1908215
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS4_190827B

Sample ID 1908215-04A MSD	Batch ID: 92519	TestNo: SW6020A	Units: mg/L
SampType: MSD	Run ID: ICP-MS4_190827B	Analysis Date: 8/27/2019 11:17:00 AM	Prep Date: 8/26/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Lead	0.204	0.00100	0.200	0	102	80	120	1.47	15	
Lithium	0.339	0.0100	0.200	0.152	93.6	80	120	1.18	15	
Molybdenum	0.212	0.00500	0.200	0	106	80	120	3.60	15	
Selenium	0.206	0.00500	0.200	0	103	80	120	1.84	15	
Thallium	0.202	0.00150	0.200	0	101	80	120	1.20	15	

Sample ID 1908215-04A SD	Batch ID: 92519	TestNo: SW6020A	Units: mg/L
SampType: SD	Run ID: ICP-MS4_190827B	Analysis Date: 8/27/2019 12:07:00 PM	Prep Date: 8/26/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	90.7	15.0	0	90.7				0.035	10	

Sample ID 1908215-04A PDS	Batch ID: 92519	TestNo: SW6020A	Units: mg/L
SampType: PDS	Run ID: ICP-MS4_190827B	Analysis Date: 8/27/2019 12:27:00 PM	Prep Date: 8/26/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	141	3.00	50.0	90.7	101	80	120			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1908215
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS4_190827B

Sample ID ICV-190827	Batch ID: R106089	TestNo: SW6020A	Units: mg/L
SampType: ICV	Run ID: ICP-MS4_190827B	Analysis Date: 8/27/2019 10:30:00 AM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.105	0.00250	0.100	0	105	90	110			
Arsenic	0.0984	0.00500	0.100	0	98.4	90	110			
Barium	0.101	0.0100	0.100	0	101	90	110			
Beryllium	0.102	0.00100	0.100	0	102	90	110			
Boron	0.108	0.0300	0.100	0	108	90	110			
Cadmium	0.102	0.00100	0.100	0	102	90	110			
Calcium	2.61	0.300	2.50	0	105	90	110			
Chromium	0.108	0.00500	0.100	0	108	90	110			
Cobalt	0.105	0.00500	0.100	0	105	90	110			
Lead	0.101	0.00100	0.100	0	101	90	110			
Lithium	0.102	0.0100	0.100	0	102	90	110			
Molybdenum	0.0968	0.00500	0.100	0	96.8	90	110			
Selenium	0.100	0.00500	0.100	0	100	90	110			
Thallium	0.102	0.00150	0.100	0	102	90	110			

Sample ID LCVL-190827	Batch ID: R106089	TestNo: SW6020A	Units: mg/L
SampType: LCVL	Run ID: ICP-MS4_190827B	Analysis Date: 8/27/2019 10:36:00 AM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.00217	0.00250	0.00200	0	108	70	130			
Arsenic	0.00534	0.00500	0.00500	0	107	70	130			
Barium	0.00530	0.0100	0.00500	0	106	70	130			
Beryllium	0.00109	0.00100	0.00100	0	109	70	130			
Boron	0.0259	0.0300	0.0200	0	129	70	130			
Cadmium	0.00108	0.00100	0.00100	0	108	70	130			
Calcium	0.105	0.300	0.100	0	105	70	130			
Chromium	0.00547	0.00500	0.00500	0	109	70	130			
Cobalt	0.00550	0.00500	0.00500	0	110	70	130			
Lead	0.00103	0.00100	0.00100	0	103	70	130			
Lithium	0.0106	0.0100	0.0100	0	106	70	130			
Molybdenum	0.00536	0.00500	0.00500	0	107	70	130			
Selenium	0.00522	0.00500	0.00500	0	104	70	130			
Thallium	0.00103	0.00150	0.00100	0	103	70	130			

Sample ID CCV1-190827	Batch ID: R106089	TestNo: SW6020A	Units: mg/L
SampType: CCV	Run ID: ICP-MS4_190827B	Analysis Date: 8/27/2019 11:20:00 AM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.202	0.00250	0.200	0	101	90	110			
Arsenic	0.199	0.00500	0.200	0	99.5	90	110			
Barium	0.200	0.0100	0.200	0	100	90	110			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1908215
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS4_190827B

Sample ID CCV1-190827	Batch ID: R106089	TestNo: SW6020A	Units: mg/L
SampType: CCV	Run ID: ICP-MS4_190827B	Analysis Date: 8/27/2019 11:20:00 AM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Beryllium	0.201	0.00100	0.200	0	100	90	110			
Boron	0.219	0.0300	0.200	0	110	90	110			
Cadmium	0.198	0.00100	0.200	0	98.9	90	110			
Calcium	4.85	0.300	5.00	0	97.0	90	110			
Chromium	0.202	0.00500	0.200	0	101	90	110			
Cobalt	0.207	0.00500	0.200	0	104	90	110			
Lead	0.198	0.00100	0.200	0	99.1	90	110			
Lithium	0.198	0.0100	0.200	0	99.2	90	110			
Molybdenum	0.201	0.00500	0.200	0	100	90	110			
Selenium	0.205	0.00500	0.200	0	102	90	110			
Thallium	0.201	0.00150	0.200	0	101	90	110			

Sample ID LCVL1-190827	Batch ID: R106089	TestNo: SW6020A	Units: mg/L
SampType: LCVL	Run ID: ICP-MS4_190827B	Analysis Date: 8/27/2019 11:27:00 AM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.00209	0.00250	0.00200	0	104	70	130			
Arsenic	0.00508	0.00500	0.00500	0	102	70	130			
Barium	0.00528	0.0100	0.00500	0	106	70	130			
Beryllium	0.000921	0.00100	0.00100	0	92.1	70	130			
Boron	0.0236	0.0300	0.0200	0	118	70	130			
Cadmium	0.00107	0.00100	0.00100	0	107	70	130			
Calcium	0.111	0.300	0.100	0	111	70	130			
Chromium	0.00533	0.00500	0.00500	0	107	70	130			
Cobalt	0.00534	0.00500	0.00500	0	107	70	130			
Lead	0.000965	0.00100	0.00100	0	96.5	70	130			
Lithium	0.0103	0.0100	0.0100	0	103	70	130			
Molybdenum	0.00512	0.00500	0.00500	0	102	70	130			
Selenium	0.00554	0.00500	0.00500	0	111	70	130			
Thallium	0.000957	0.00150	0.00100	0	95.7	70	130			

Sample ID CCV2-190827	Batch ID: R106089	TestNo: SW6020A	Units: mg/L
SampType: CCV	Run ID: ICP-MS4_190827B	Analysis Date: 8/27/2019 11:57:00 AM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.201	0.00250	0.200	0	101	90	110			
Arsenic	0.194	0.00500	0.200	0	97.2	90	110			
Barium	0.198	0.0100	0.200	0	99.2	90	110			
Beryllium	0.202	0.00100	0.200	0	101	90	110			
Boron	0.205	0.0300	0.200	0	102	90	110			
Cadmium	0.198	0.00100	0.200	0	99.2	90	110			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
 Work Order: 1908215
 Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS4_190827B

Sample ID: CCV2-190827	Batch ID: R106089	TestNo: SW6020A	Units: mg/L
SampType: CCV	Run ID: ICP-MS4_190827B	Analysis Date: 8/27/2019 11:57:00 AM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	4.88	0.300	5.00	0	97.5	90	110			
Chromium	0.207	0.00500	0.200	0	104	90	110			
Cobalt	0.204	0.00500	0.200	0	102	90	110			
Lead	0.194	0.00100	0.200	0	97.0	90	110			
Lithium	0.198	0.0100	0.200	0	99.0	90	110			
Molybdenum	0.198	0.00500	0.200	0	98.9	90	110			
Selenium	0.196	0.00500	0.200	0	98.2	90	110			
Thallium	0.193	0.00150	0.200	0	96.4	90	110			

Sample ID: LCVL2-190827	Batch ID: R106089	TestNo: SW6020A	Units: mg/L
SampType: LCVL	Run ID: ICP-MS4_190827B	Analysis Date: 8/27/2019 12:01:00 PM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.00211	0.00250	0.00200	0	106	70	130			
Arsenic	0.00509	0.00500	0.00500	0	102	70	130			
Barium	0.00507	0.0100	0.00500	0	101	70	130			
Beryllium	0.000874	0.00100	0.00100	0	87.4	70	130			
Boron	0.0232	0.0300	0.0200	0	116	70	130			
Cadmium	0.00108	0.00100	0.00100	0	108	70	130			
Calcium	0.104	0.300	0.100	0	104	70	130			
Chromium	0.00529	0.00500	0.00500	0	106	70	130			
Cobalt	0.00536	0.00500	0.00500	0	107	70	130			
Lead	0.000973	0.00100	0.00100	0	97.3	70	130			
Lithium	0.0106	0.0100	0.0100	0	106	70	130			
Molybdenum	0.00522	0.00500	0.00500	0	104	70	130			
Selenium	0.00513	0.00500	0.00500	0	103	70	130			
Thallium	0.000980	0.00150	0.00100	0	98.0	70	130			

Sample ID: CCV3-190827	Batch ID: R106089	TestNo: SW6020A	Units: mg/L
SampType: CCV	Run ID: ICP-MS4_190827B	Analysis Date: 8/27/2019 12:29:00 PM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	4.92	0.300	5.00	0	98.4	90	110			

Sample ID: LCVL3-190827	Batch ID: R106089	TestNo: SW6020A	Units: mg/L
SampType: LCVL	Run ID: ICP-MS4_190827B	Analysis Date: 8/27/2019 12:33:00 PM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	0.109	0.300	0.100	0	109	70	130			

- Qualifiers:**
- B Analyte detected in the associated Method Blank
 - J Analyte detected between MDL and RL
 - ND Not Detected at the Method Detection Limit
 - RL Reporting Limit
 - J Analyte detected between SDL and RL
 - DF Dilution Factor
 - MDL Method Detection Limit
 - R RPD outside accepted control limits
 - S Spike Recovery outside control limits
 - N Parameter not NELAP certified

CLIENT: Golder
Work Order: 1908215
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: IC4_190815B

Sample ID	DCS2-92363	Batch ID:	92363	TestNo:	E300	Units:	mg/L
SampType:	DCS2	Run ID:	IC4_190815B	Analysis Date:	8/15/2019 2:55:31 PM	Prep Date:	8/15/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	0.490	1.00	0.5000	0	98.0	65	135	0	0	
Fluoride	0.244	0.400	0.2000	0	122	65	135	0	0	
Sulfate	1.57	3.00	1.500	0	104	65	135	0	0	

Qualifiers:	B Analyte detected in the associated Method Blank	DF Dilution Factor	
	J Analyte detected between MDL and RL	MDL Method Detection Limit	
	ND Not Detected at the Method Detection Limit	R RPD outside accepted control limits	
	RL Reporting Limit	S Spike Recovery outside control limits	
	J Analyte detected between SDL and RL	N Parameter not NELAP certified	

CLIENT: Golder
Work Order: 1908215
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: IC4_190822A

The QC data in batch 92485 applies to the following samples: 1908215-01B, 1908215-02B, 1908215-03B, 1908215-04B, 1908215-05B, 1908215-06B, 1908215-07B, 1908215-08B, 1908215-09B, 1908215-10B, 1908215-11B, 1908215-12B

Sample ID MB-92485	Batch ID: 92485	TestNo: E300	Units: mg/L							
SampType: MBLK	Run ID: IC4_190822A	Analysis Date: 8/22/2019 11:01:32 AM	Prep Date: 8/22/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Chloride	<0.300	1.00								
Fluoride	<0.100	0.400								
Sulfate	<1.00	3.00								

Sample ID LCS-92485	Batch ID: 92485	TestNo: E300	Units: mg/L							
SampType: LCS	Run ID: IC4_190822A	Analysis Date: 8/22/2019 11:17:32 AM	Prep Date: 8/22/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Chloride	9.76	1.00	10.00	0	97.6	90	110			
Fluoride	4.13	0.400	4.000	0	103	90	110			
Sulfate	29.2	3.00	30.00	0	97.5	90	110			

Sample ID LCS-92485	Batch ID: 92485	TestNo: E300	Units: mg/L							
SampType: LCS	Run ID: IC4_190822A	Analysis Date: 8/22/2019 11:33:32 AM	Prep Date: 8/22/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Chloride	9.69	1.00	10.00	0	96.9	90	110	0.732	20	
Fluoride	4.03	0.400	4.000	0	101	90	110	2.46	20	
Sulfate	29.4	3.00	30.00	0	98.0	90	110	0.517	20	

Sample ID 1908215-01BMS	Batch ID: 92485	TestNo: E300	Units: mg/L							
SampType: MS	Run ID: IC4_190822A	Analysis Date: 8/22/2019 8:06:15 PM	Prep Date: 8/22/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Chloride	343	10.0	200.0	158.1	92.5	90	110			
Fluoride	212	4.00	200.0	1.743	105	90	110			
Sulfate	248	30.0	200.0	59.02	94.7	90	110			

Sample ID 1908215-01BMSD	Batch ID: 92485	TestNo: E300	Units: mg/L							
SampType: MSD	Run ID: IC4_190822A	Analysis Date: 8/22/2019 8:22:15 PM	Prep Date: 8/22/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Chloride	342	10.0	200.0	158.1	92.0	90	110	0.283	20	
Fluoride	212	4.00	200.0	1.743	105	90	110	0.201	20	
Sulfate	249	30.0	200.0	59.02	94.8	90	110	0.020	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 1908215
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: IC4_190822A

Sample ID: 1908215-02BMS	Batch ID: 92485	TestNo: E300	Units: mg/L
SampType: MS	Run ID: IC4_190822A	Analysis Date: 8/22/2019 8:38:15 PM	Prep Date: 8/22/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	276	10.0	200.0	84.87	95.7	90	110			
Fluoride	214	4.00	200.0	1.927	106	90	110			
Sulfate	340	30.0	200.0	149.7	95.3	90	110			

Sample ID: 1908215-02BMSD	Batch ID: 92485	TestNo: E300	Units: mg/L
SampType: MSD	Run ID: IC4_190822A	Analysis Date: 8/22/2019 8:54:15 PM	Prep Date: 8/22/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	277	10.0	200.0	84.87	96.0	90	110	0.164	20	
Fluoride	216	4.00	200.0	1.927	107	90	110	0.814	20	
Sulfate	340	30.0	200.0	149.7	95.2	90	110	0.093	20	

<p>Qualifiers:</p> <p>B Analyte detected in the associated Method Blank</p> <p>J Analyte detected between MDL and RL</p> <p>ND Not Detected at the Method Detection Limit</p> <p>RL Reporting Limit</p> <p>J Analyte detected between SDL and RL</p>	<p>DF Dilution Factor</p> <p>MDL Method Detection Limit</p> <p>R RPD outside accepted control limits</p> <p>S Spike Recovery outside control limits</p> <p>N Parameter not NELAP certified</p>
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CLIENT: Golder
Work Order: 1908215
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: IC4_190822A

Sample ID ICV-190822	Batch ID: R105997	TestNo: E300	Units: mg/L
SampType: ICV	Run ID: IC4_190822A	Analysis Date: 8/22/2019 10:29:32 AM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	25.0	1.00	25.00	0	100	90	110			
Fluoride	10.4	0.400	10.00	0	104	90	110			
Sulfate	75.7	3.00	75.00	0	101	90	110			

Sample ID CCV1-190822	Batch ID: R105997	TestNo: E300	Units: mg/L
SampType: CCV	Run ID: IC4_190822A	Analysis Date: 8/22/2019 3:23:51 PM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	9.66	1.00	10.00	0	96.6	90	110			
Fluoride	4.18	0.400	4.000	0	104	90	110			
Sulfate	29.4	3.00	30.00	0	97.9	90	110			

Sample ID CCV2-190822	Batch ID: R105997	TestNo: E300	Units: mg/L
SampType: CCV	Run ID: IC4_190822A	Analysis Date: 8/22/2019 7:34:15 PM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	9.74	1.00	10.00	0	97.4	90	110			
Fluoride	4.24	0.400	4.000	0	106	90	110			
Sulfate	29.6	3.00	30.00	0	98.7	90	110			

Sample ID CCV3-190822	Batch ID: R105997	TestNo: E300	Units: mg/L
SampType: CCV	Run ID: IC4_190822A	Analysis Date: 8/23/2019 12:22:15 AM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	9.66	1.00	10.00	0	96.6	90	110			
Fluoride	4.26	0.400	4.000	0	106	90	110			
Sulfate	29.5	3.00	30.00	0	98.2	90	110			

Qualifiers:

B Analyte detected in the associated Method Blank	DF Dilution Factor
J Analyte detected between MDL and RL	MDL Method Detection Limit
ND Not Detected at the Method Detection Limit	R RPD outside accepted control limits
RL Reporting Limit	S Spike Recovery outside control limits
J Analyte detected between SDL and RL	N Parameter not NELAP certified

CLIENT: Golder
Work Order: 1908215
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: IC4_190823A

The QC data in batch 92504 applies to the following samples: 1908215-12B

Sample ID MB-92504	Batch ID: 92504	TestNo: E300	Units: mg/L							
SampType: MBLK	Run ID: IC4_190823A	Analysis Date: 8/23/2019 11:05:54 AM	Prep Date: 8/23/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	<0.300	1.00								
Fluoride	<0.100	0.400								
Sulfate	<1.00	3.00								

Sample ID LCS-92504	Batch ID: 92504	TestNo: E300	Units: mg/L							
SampType: LCS	Run ID: IC4_190823A	Analysis Date: 8/23/2019 11:21:54 AM	Prep Date: 8/23/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	9.57	1.00	10.00	0	95.7	90	110			
Fluoride	4.12	0.400	4.000	0	103	90	110			
Sulfate	29.1	3.00	30.00	0	97.0	90	110			

Sample ID LCSD-92504	Batch ID: 92504	TestNo: E300	Units: mg/L							
SampType: LCSD	Run ID: IC4_190823A	Analysis Date: 8/23/2019 11:37:54 AM	Prep Date: 8/23/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	9.41	1.00	10.00	0	94.1	90	110	1.68	20	
Fluoride	4.06	0.400	4.000	0	101	90	110	1.56	20	
Sulfate	29.3	3.00	30.00	0	97.5	90	110	0.598	20	

Sample ID 1908215-12BMS	Batch ID: 92504	TestNo: E300	Units: mg/L							
SampType: MS	Run ID: IC4_190823A	Analysis Date: 8/23/2019 5:16:48 PM	Prep Date: 8/23/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	2950	100	2000	1032	96.1	90	110			
Fluoride	2150	40.0	2000	0	108	90	110			
Sulfate	2880	300	2000	977.6	95.0	90	110			

Sample ID 1908215-12BMSD	Batch ID: 92504	TestNo: E300	Units: mg/L							
SampType: MSD	Run ID: IC4_190823A	Analysis Date: 8/23/2019 5:32:48 PM	Prep Date: 8/23/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	2930	100	2000	1032	95.0	90	110	0.718	20	
Fluoride	2130	40.0	2000	0	107	90	110	0.802	20	
Sulfate	2870	300	2000	977.6	94.4	90	110	0.414	20	

Sample ID 1908250-05EMS	Batch ID: 92504	TestNo: E300	Units: mg/L							
SampType: MS	Run ID: IC4_190823A	Analysis Date: 8/23/2019 5:48:48 PM	Prep Date: 8/23/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Qualifiers:

B Analyte detected in the associated Method Blank	DF Dilution Factor
J Analyte detected between MDL and RL	MDL Method Detection Limit
ND Not Detected at the Method Detection Limit	R RPD outside accepted control limits
RL Reporting Limit	S Spike Recovery outside control limits
J Analyte detected between SDL and RL	N Parameter not NELAP certified

CLIENT: Golder
Work Order: 1908215
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: IC4_190823A

Sample ID: 1908250-05EMS	Batch ID: 92504	TestNo: E300	Units: mg/L							
SampType: MS	Run ID: IC4_190823A	Analysis Date: 8/23/2019 5:48:48 PM	Prep Date: 8/23/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	50.8	1.00	20.00	34.64	80.6	90	110			S
Fluoride	23.5	0.400	20.00	2.518	105	90	110			
Sulfate	66.9	3.00	20.00	48.35	92.9	90	110			

Sample ID: 1908250-05EMSD	Batch ID: 92504	TestNo: E300	Units: mg/L							
SampType: MSD	Run ID: IC4_190823A	Analysis Date: 8/23/2019 6:04:48 PM	Prep Date: 8/23/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	50.9	1.00	20.00	34.64	81.1	90	110	0.228	20	S
Fluoride	23.6	0.400	20.00	2.518	105	90	110	0.391	20	
Sulfate	66.8	3.00	20.00	48.35	92.4	90	110	0.148	20	

Qualifiers: B Analyte detected in the associated Method Blank J Analyte detected between MDL and RL ND Not Detected at the Method Detection Limit RL Reporting Limit J Analyte detected between SDL and RL	DF Dilution Factor MDL Method Detection Limit R RPD outside accepted control limits S Spike Recovery outside control limits N Parameter not NELAP certified
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CLIENT: Golder
Work Order: 1908215
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: IC4_190823A

Sample ID ICV-190823	Batch ID: R106018	TestNo: E300	Units: mg/L
SampType: ICV	Run ID: IC4_190823A	Analysis Date: 8/23/2019 10:33:55 AM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	24.4	1.00	25.00	0	97.8	90	110			
Fluoride	10.2	0.400	10.00	0	102	90	110			
Sulfate	75.3	3.00	75.00	0	100	90	110			

Sample ID CCV1-190823	Batch ID: R106018	TestNo: E300	Units: mg/L
SampType: CCV	Run ID: IC4_190823A	Analysis Date: 8/23/2019 3:24:19 PM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	9.61	1.00	10.00	0	96.1	90	110			
Fluoride	4.23	0.400	4.000	0	106	90	110			
Sulfate	29.3	3.00	30.00	0	97.6	90	110			

Sample ID CCV2-190823	Batch ID: R106018	TestNo: E300	Units: mg/L
SampType: CCV	Run ID: IC4_190823A	Analysis Date: 8/23/2019 8:44:48 PM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	9.68	1.00	10.00	0	96.8	90	110			
Fluoride	4.26	0.400	4.000	0	106	90	110			
Sulfate	29.2	3.00	30.00	0	97.5	90	110			

Qualifiers:

B Analyte detected in the associated Method Blank	DF Dilution Factor
J Analyte detected between MDL and RL	MDL Method Detection Limit
ND Not Detected at the Method Detection Limit	R RPD outside accepted control limits
RL Reporting Limit	S Spike Recovery outside control limits
J Analyte detected between SDL and RL	N Parameter not NELAP certified

CLIENT: Golder
Work Order: 1908215
Project: Luminant-OGSES FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: WC_190822A

The QC data in batch 92494 applies to the following samples: 1908215-01B, 1908215-02B, 1908215-03B, 1908215-04B, 1908215-05B, 1908215-06B, 1908215-07B, 1908215-08B, 1908215-09B, 1908215-10B, 1908215-11B, 1908215-12B

Sample ID MB-92944	Batch ID: 92494	TestNo: M2540C	Units: mg/L							
SampType: MBLK	Run ID: WC_190822A	Analysis Date: 8/22/2019 3:40:00 PM	Prep Date: 8/22/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera										
	<10.0	10.0								

Sample ID LCS-92494	Batch ID: 92494	TestNo: M2540C	Units: mg/L							
SampType: LCS	Run ID: WC_190822A	Analysis Date: 8/22/2019 3:40:00 PM	Prep Date: 8/22/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera										
	737	10.0	745.6	0	98.8	90	113			

Sample ID 1908215-03B-DUP	Batch ID: 92494	TestNo: M2540C	Units: mg/L							
SampType: DUP	Run ID: WC_190822A	Analysis Date: 8/22/2019 3:40:00 PM	Prep Date: 8/22/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera										
	1880	50.0	0	1885				0.532	5	

Sample ID 1908215-06B-DUP	Batch ID: 92494	TestNo: M2540C	Units: mg/L							
SampType: DUP	Run ID: WC_190822A	Analysis Date: 8/22/2019 3:40:00 PM	Prep Date: 8/22/2019							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera										
	4530	50.0	0	4595				1.42	5	

Qualifiers:	<p>B Analyte detected in the associated Method Blank</p> <p>J Analyte detected between MDL and RL</p> <p>ND Not Detected at the Method Detection Limit</p> <p>RL Reporting Limit</p> <p>J Analyte detected between SDL and RL</p>	<p>DF Dilution Factor</p> <p>MDL Method Detection Limit</p> <p>R RPD outside accepted control limits</p> <p>S Spike Recovery outside control limits</p> <p>N Parameter not NELAP certified</p>
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CLIENT: Golder
Work Order: 1908215
Project: Luminant-OGSES FGD Ponds

MQL SUMMARY REPORT

TestNo: E300	MDL	MQL
Analyte	mg/L	mg/L
Chloride	0.300	1.00
Fluoride	0.100	0.400
Sulfate	1.00	3.00

TestNo: SW6020A	MDL	MQL
Analyte	mg/L	mg/L
Antimony	0.000800	0.00250
Arsenic	0.00200	0.00500
Barium	0.00300	0.0100
Beryllium	0.000300	0.00100
Boron	0.0100	0.0300
Cadmium	0.000300	0.00100
Calcium	0.100	0.300
Chromium	0.00200	0.00500
Cobalt	0.00300	0.00500
Lead	0.000300	0.00100
Lithium	0.00500	0.0100
Molybdenum	0.00200	0.00500
Selenium	0.00200	0.00500
Thallium	0.000500	0.00150

TestNo: SW7470A	MDL	MQL
Analyte	mg/L	mg/L
Mercury	0.0000800	0.000200

TestNo: M2540C	MDL	MQL
Analyte	mg/L	mg/L
Total Dissolved Solids (Residue, Filt	10.0	10.0

Qualifiers: MQL -Method Quantitation Limit as defined by TRRP
MDL -Method Detection Limit as defined by TRRP

ANALYTICAL REPORT

September 13, 2019

- ²Tc
- ³Ss
- ⁴Cn
- ⁵Sr
- ⁶Qc
- ⁷Gl
- ⁸Al
- ⁹Sc

DHL Analytical, Inc.

Sample Delivery Group: L1133289
 Samples Received: 08/27/2019
 Project Number: 1908215
 Description:

Report To: John DuPont
 2300 Double Creek Drive
 Round Rock, TX 78664

Entire Report Reviewed By:



Donna Eidson
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and on the samples are received.

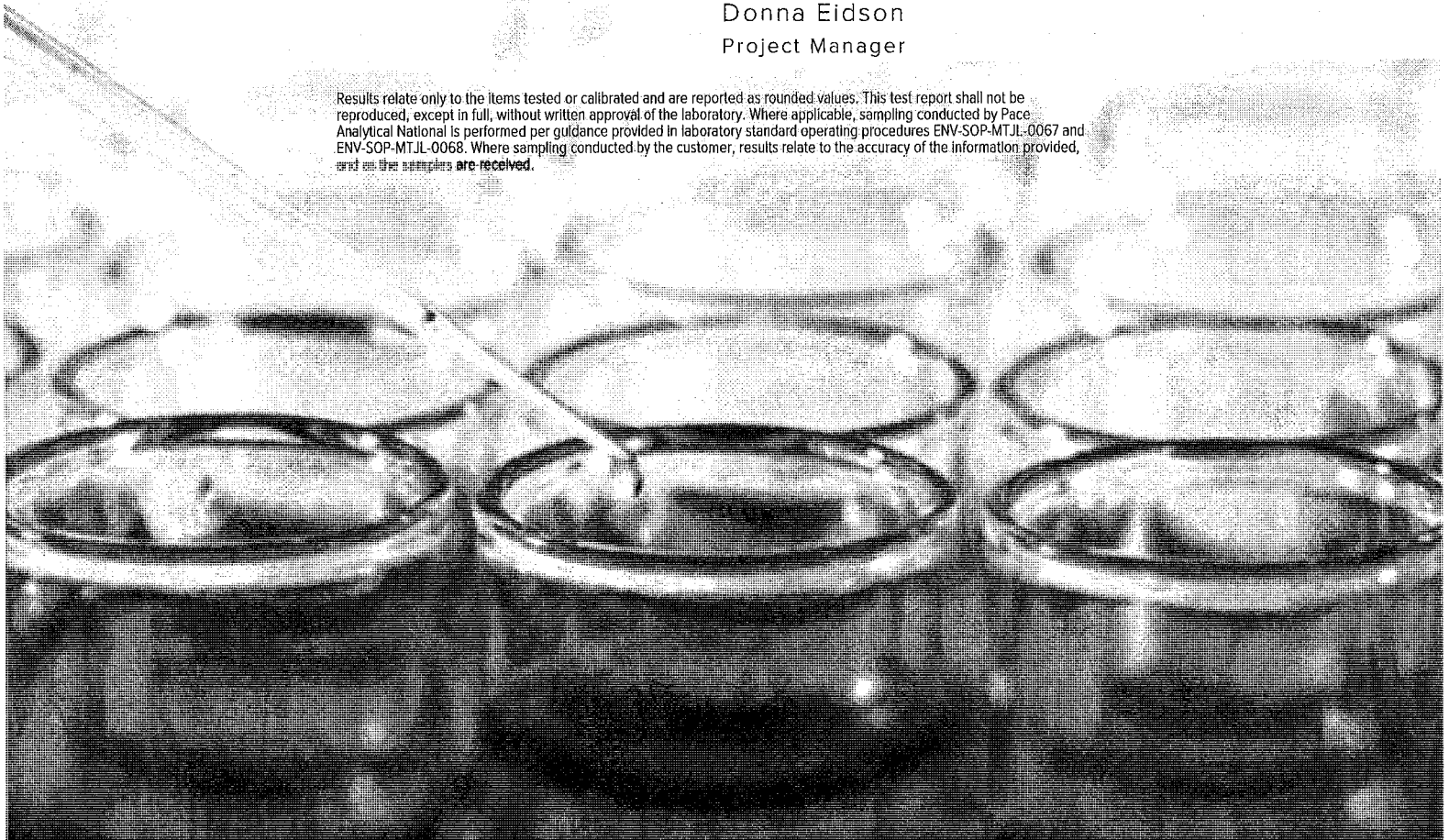


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SAMPLE SUMMARY

ONE LAB. NATIONWIDE.

Collected by _____ Collected date/time _____ Received date/time _____
 08/19/19 07:35 08/27/19 08:45

FGD-6 L1133289-01 Non-Potable Water

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1340987	1	09/06/19 10:27	09/11/19 11:06	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1337055	1	08/29/19 13:56	09/11/19 11:06	JMR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1337055	1	08/29/19 13:56	08/30/19 14:54	RGT	Mt. Juliet, TN

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc

Collected by _____ Collected date/time _____ Received date/time _____
 08/19/19 08:25 08/27/19 08:45

FGD-3 L1133289-02 Non-Potable Water

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1340987	1	09/06/19 10:27	09/11/19 11:06	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1337055	1	08/29/19 13:56	09/11/19 11:06	JMR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1337055	1	08/29/19 13:56	08/30/19 14:54	RGT	Mt. Juliet, TN

Collected by _____ Collected date/time _____ Received date/time _____
 08/19/19 09:15 08/27/19 08:45

FGD-2 L1133289-03 Non-Potable Water

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1340987	1	09/06/19 10:27	09/11/19 11:06	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1337055	1	08/29/19 13:56	09/11/19 11:06	JMR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1337055	1	08/29/19 13:56	08/30/19 14:54	RGT	Mt. Juliet, TN

Collected by _____ Collected date/time _____ Received date/time _____
 08/19/19 10:00 08/27/19 08:45

FGD-5 L1133289-04 Non-Potable Water

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1340987	1	09/06/19 10:27	09/11/19 11:06	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1337055	1	08/29/19 13:56	09/11/19 11:06	JMR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1337055	1	08/29/19 13:56	08/30/19 14:54	RGT	Mt. Juliet, TN

Collected by _____ Collected date/time _____ Received date/time _____
 08/19/19 10:00 08/27/19 08:45

DUP-1 L1133289-05 Non-Potable Water

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1340987	1	09/06/19 10:27	09/11/19 11:06	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1337055	1	08/29/19 13:56	09/11/19 11:06	JMR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1337055	1	08/29/19 13:56	08/30/19 14:54	RGT	Mt. Juliet, TN

Collected by _____ Collected date/time _____ Received date/time _____
 08/19/19 11:00 08/27/19 08:45

FGD-8 L1133289-06 Non-Potable Water

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1340987	1	09/06/19 10:27	09/11/19 11:06	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1337055	1	08/29/19 13:56	09/11/19 11:06	JMR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1337055	1	08/29/19 13:56	09/10/19 17:42	RGT	Mt. Juliet, TN

SAMPLE SUMMARY

ONE LAB. NATIONWIDE.

Collected by
FGD-1 L1133289-07 Non-Potable Water
Collected date/time: 08/19/19 12:05
Received date/time: 08/27/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1340987	1	09/06/19 10:27	09/11/19 11:06	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1337055	1	08/29/19 13:56	09/11/19 11:06	JMR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1337055	1	08/29/19 13:56	08/30/19 14:54	RGT	Mt. Juliet, TN

1
Cp

2
Tc

3
Ss

4
Cn

5
Sr

6
Qc

7
Gl

8
Al

9
Sc

Collected by
FGD-14 L1133289-08 Non-Potable Water
Collected date/time: 08/19/19 13:15
Received date/time: 08/27/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1340987	1	09/06/19 10:27	09/11/19 11:06	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1337055	1	08/29/19 13:56	09/11/19 11:06	JMR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1337055	1	08/29/19 13:56	08/30/19 14:54	RGT	Mt. Juliet, TN

Collected by
FGD-4 L1133289-09 Non-Potable Water
Collected date/time: 08/19/19 14:15
Received date/time: 08/27/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1340987	1	09/06/19 10:27	09/11/19 15:45	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1337055	1	08/29/19 13:56	09/11/19 15:45	JMR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1337055	1	08/29/19 13:56	08/30/19 14:54	RGT	Mt. Juliet, TN

Collected by
FGD-11 L1133289-10 Non-Potable Water
Collected date/time: 08/19/19 15:20
Received date/time: 08/27/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1340987	1	09/06/19 10:27	09/11/19 15:45	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1337055	1	09/03/19 11:00	09/11/19 15:45	JMR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1337055	1	09/03/19 11:00	09/04/19 17:23	RGT	Mt. Juliet, TN

Collected by
FGD-12 L1133289-11 Non-Potable Water
Collected date/time: 08/19/19 16:25
Received date/time: 08/27/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1340987	1	09/06/19 10:27	09/11/19 15:45	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1337055	1	08/29/19 13:56	09/11/19 15:45	JMR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1337055	1	08/29/19 13:56	08/30/19 14:55	RGT	Mt. Juliet, TN

Collected by
FGD-15 L1133289-12 Non-Potable Water
Collected date/time: 08/19/19 17:30
Received date/time: 08/27/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1340987	1	09/06/19 10:27	09/11/19 15:45	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1337055	1	09/04/19 12:00	09/11/19 15:45	JMR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1337055	1	09/04/19 12:00	09/04/19 17:23	RGT	Mt. Juliet, TN



All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All radiochemical sample results for solids are reported on a dry weight basis with the exception of tritium, carbon-14 and radon, unless wet weight was requested by the client. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Donna Eidson
Project Manager

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc



Collected date/time: 08/19/19 07:35

L1133289

Radiochemistry by Method 904

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	2.55		0.597	0.902	09/11/2019 11:06	WG1340987
(T) Barium	98.1			62.0-143	09/11/2019 11:06	WG1340987
(T) Yttrium	109			79.0-136	09/11/2019 11:06	WG1340987

1 Cp

2 Tc

3 Ss

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	2.93		0.844	1.12	09/11/2019 11:06	WG1337055

4 Cn

5 Sr

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.385		0.247	0.214	08/30/2019 14:54	WG1337055
(T) Barium-133	95.1			30.0-143	08/30/2019 14:54	WG1337055

6 Qc

7 Gl

8 Al

9 Sc



Collected date/time: 08/19/19 08:25

L1133289

Radiochemistry by Method 904

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-228	0.858		0.443	0.782	09/11/2019 11:06	WG1340987
(T) Barium	83.7			62.0-143	09/11/2019 11:06	WG1340987
(T) Yttrium	97.4			79.0-136	09/11/2019 11:06	WG1340987

1 Cp

2 Tc

3 Ss

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	1.38		0.748	1.05	09/11/2019 11:06	WG1337055

4 Cn

5 Sr

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-226	0.523		0.305	0.266	08/30/2019 14:54	WG1337055
(T) Barium-133	71.0			30.0-143	08/30/2019 14:54	WG1337055

6 Qc

7 Gl

8 Al

9 Sc



Collected date/time: 08/19/19 09:15

L1133289

Radiochemistry by Method 904

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-228	2.80		0.477	0.761	09/11/2019 11:06	WG1340987
(T) Barium	87.3			62.0-143	09/11/2019 11:06	WG1340987
(T) Yttrium	101			79.0-136	09/11/2019 11:06	WG1340987

1 Cp

2 Tc

3 Ss

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	3.26		1.07	1.6	09/11/2019 11:06	WG1337055

4 Cn

5 Sr

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-226	0.456		0.596	0.841	08/30/2019 14:54	WG1337055
(T) Barium-133	35.3			30.0-143	08/30/2019 14:54	WG1337055

6 Qc

7 Gl

8 Al

9 Sc

Radiochemistry by Method 904

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-228	0.659		0.360	0.677	09/11/2019 11:06	WG1340987
(T) Barium	93.6			62.0-143	09/11/2019 11:06	WG1340987
(T) Yttrium	103			79.0-136	09/11/2019 11:06	WG1340987

1 Cp

2 Tc

3 Ss

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	1.21		0.874	1.27	09/11/2019 11:06	WG1337055

4 Cn

5 Sr

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-226	0.551		0.514	0.591	08/30/2019 14:54	WG1337055
(T) Barium-133	33.9			30.0-143	08/30/2019 14:54	WG1337055

6 Qc

7 Gl

8 Al

9 Sc



Collected date/time: 08/19/19 10:00

L1133289

Radiochemistry by Method 904

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	0.251		0.441	0.67	09/11/2019 11:06	WG1340987
(T) Barium	92.3			62.0-143	09/11/2019 11:06	WG1340987
(T) Yttrium	106			79.0-136	09/11/2019 11:06	WG1340987

1 Cp

2 Tc

3 Ss

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	0.251		0.815	1.36	09/11/2019 11:06	WG1337055

4 Cn

5 Sr

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-226	-0.130		0.374	0.693	08/30/2019 14:54	WG1337055
(T) Barium-133	46.9			30.0-143	08/30/2019 14:54	WG1337055

6 Qc

7 Gl

8 Al

9 Sc

Radiochemistry by Method 904

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-228	6.82		0.503	0.674	09/11/2019 11:06	WG1340987
(T) Barium	85.4			62.0-143	09/11/2019 11:06	WG1340987
(T) Yttrium	107			79.0-136	09/11/2019 11:06	WG1340987

¹ Cp

² Tc

³ Ss

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	8.61		1.17	1.14	09/11/2019 11:06	WG1337055

⁴ Cn

⁵ Sr

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-226	1.79		0.667	0.467	09/10/2019 17:42	WG1337055
(T) Barium-133	19.5	C2		30.0-143	09/10/2019 17:42	WG1337055

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc

Radiochemistry by Method 904

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-228	1.09		0.429	0.686	09/11/2019 11:06	WG1340987
(T) Barium	89.6			62.0-143	09/11/2019 11:06	WG1340987
(T) Yttrium	111			79.0-136	09/11/2019 11:06	WG1340987

1 Cp

2 Tc

3 Ss

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	1.57		0.712	0.877	09/11/2019 11:06	WG1337055

4 Cn

5 Sr

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-226	0.489		0.283	0.191	08/30/2019 14:54	WG1337055
(T) Barium-133	76.6			30.0-143	08/30/2019 14:54	WG1337055

6 Qc

7 Gl

8 Al

9 Sc

Radiochemistry by Method 904

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-228	2.22		0.444	0.775	09/11/2019 11:06	WG1340987
(T) Barium	93.0			62.0-143	09/11/2019 11:06	WG1340987
(T) Yttrium	109			79.0-136	09/11/2019 11:06	WG1340987

1 Cp

2 Tc

3 Ss

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	3.57		0.893	1.01	09/11/2019 11:06	WG1337055

4 Cn

5 Sr

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-226	1.35		0.449	0.232	08/30/2019 14:54	WG1337055
(T) Barium-133	90.4			30.0-143	08/30/2019 14:54	WG1337055

6 Qc

7 Gl

8 Al

9 Sc

Radiochemistry by Method 904

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	1.58		0.406	0.601	09/11/2019 15:45	WG1340987
(T) Barium	103			62.0-143	09/11/2019 15:45	WG1340987
(T) Yttrium	106			79.0-136	09/11/2019 15:45	WG1340987

¹ Cp

² Tc

³ Ss

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	1.97		0.752	1.03	09/11/2019 15:45	WG1337055

⁴ Cn

⁵ Sr

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.390		0.346	0.429	08/30/2019 14:54	WG1337055
(T) Barium-133	79.3			30.0-143	08/30/2019 14:54	WG1337055

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc

Radiochemistry by Method 904

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-228	2.55		0.409	0.552	09/11/2019 15:45	WG1340987
(T) Barium	99.4			62.0-143	09/11/2019 15:45	WG1340987
(T) Yttrium	113			79.0-136	09/11/2019 15:45	WG1340987

1 Cp

2 Tc

3 Ss

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	3.95		0.861	0.802	09/11/2019 15:45	WG1337055

4 Cn

5 Sr

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-226	1.39		0.452	0.25	09/04/2019 17:23	WG1337055
(T) Barium-133	97.1			30.0-143	09/04/2019 17:23	WG1337055

6 Qc

7 Gl

8 Al

9 Sc

Radiochemistry by Method 904

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-228	3.52		0.491	0.672	09/11/2019 15:45	WG1340987
(T) Barium	105			62.0-143	09/11/2019 15:45	WG1340987
(T) Yttrium	107			79.0-136	09/11/2019 15:45	WG1340987

1 Cp

2 Tc

3 Ss

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	4.64		0.940	0.947	09/11/2019 15:45	WG1337055

4 Cn

5 Sr

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-226	1.12		0.449	0.275	08/30/2019 14:55	WG1337055
(T) Barium-133	82.2			30.0-143	08/30/2019 14:55	WG1337055

6 Qc

7 Gl

8 Al

9 Sc



Radiochemistry by Method 904

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-228	1.55		0.414	0.707	09/11/2019 15:45	WG1340987
(T) Barium	96.7			62.0-143	09/11/2019 15:45	WG1340987
(T) Yttrium	111			79.0-136	09/11/2019 15:45	WG1340987

¹ Cp

² Tc

³ Ss

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	2.15		0.757	1.04	09/11/2019 15:45	WG1337055

⁴ Cn

⁵ Sr

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-226	0.604		0.343	0.332	09/04/2019 17:23	WG1337055
(T) Barium-133	82.4			30.0-143	09/04/2019 17:23	WG1337055

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc

WG1340987

Radiochemistry by Method 904

QUALITY CONTROL SUMMARY

L1133289-01,02,03,04,05,06,07,08,09,10,11,12

ONE LAB. NATIONWIDE.



Method Blank (MB)

(MB) R3449949-1 09/11/19 11:06

Analyte	MB Result pCi/l	MB Qualifier	MB MDA pCi/l
Radium-228	0.176		0.453
(T) Barium	92.6		
(T) Yttrium	114		

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc

L1133289-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1133289-01 09/11/19 11:06 • (DUP) R3449949-5 09/11/19 11:06

Analyte	Original Result pCi/l	DUP Result pCi/l	Dilution	DUP RPD %	DUP RER	DUP Qualifier	DUP RPD Limits %	DUP RER Limit
Radium-228	2.55	3.06	1	18.2	0.553		20	3
(T) Barium	98.1	95.8						
(T) Yttrium	109	88.5						

Laboratory Control Sample (LCS)

(LCS) R3449949-2 09/11/19 11:06

Analyte	Spike Amount pCi/l	LCS Result pCi/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Radium-228	5.00	5.46	109	80.0-120	
(T) Barium			99.0		
(T) Yttrium			106		

L1133317-11 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1133317-11 09/11/19 15:45 • (MS) R3449949-3 09/11/19 11:06 • (MSD) R3449949-4 09/11/19 11:06

Analyte	Spike Amount pCi/l	Original Result pCi/l	MS Result pCi/l	MSD Result pCi/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	MS RER	RPD Limits %
Radium-228	10.0	1.25	9.53	11.1	82.8	98.9	1	70.0-130			15.6		20
(T) Barium		102			95.7	111							
(T) Yttrium		111			108	97.9							

Method Blank (MB)

(MB) R3447929-1 08/30/19 14:54

Analyte	MB Result pCi/l	MB Qualifier	MB MDA pCi/l
Radium-226	0.000		0.0661
(T) Barium-133	83.8		

L1133289-08 Original Sample (OS) • Duplicate (DUP)

(OS) L1133289-08 08/30/19 14:54 • (DUP) R3447929-5 08/30/19 14:54

Analyte	Original Result pCi/l	DUP Result pCi/l	Dilution	DUP RPD %	DUP RER	DUP Qualifier	DUP RPD Limits	DUP RER Limit
Radium-226	1.35	1.14	1	16.5	0.296		20	3
(T) Barium-133	90.4	63.2						

Laboratory Control Sample (LCS)

(LCS) R3447929-2 08/30/19 14:54

Analyte	Spike Amount pCi/l	LCS Result pCi/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Radium-226	5.02	4.81	95.8	80.0-120	
(T) Barium-133			63.8		

L1134015-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1134015-01 08/30/19 14:55 • (MS) R3447929-3 08/30/19 14:54 • (MSD) R3447929-4 08/30/19 14:54

Analyte	Spike Amount pCi/l	Original Result pCi/l	MS Result pCi/l	MSD Result pCi/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	MS RER	RPD Limits %
Radium-226	20.1	0.290	21.5	20.4	105	100	1	75.0-125			5.06		20
(T) Barium-133		25.5			75.8	66.2							

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gf
- 8 Al
- 9 Sc



Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDA	Minimum Detectable Activity.
Rec.	Recovery.
RER	Replicate Error Ratio.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(T)	Tracer - A radioisotope of known concentration added to a solution of chemically equivalent radioisotopes at a known concentration to assist in monitoring the yield of the chemical separation.
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state "ND" (Not Detected) or "BDL" (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ G

⁸ Al

⁹ Sc

Qualifier Description

C2 Tracer recovery limits have been exceeded; values are outside lower control limits.

ACCREDITATIONS & LOCATIONS

ONE LAB. NATIONWIDE.



Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
 * Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

State Accreditations

Alabama	40660	Nebraska	NE-05-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey-NELAP	TN002
California	2932	New Mexico ¹	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina ¹	DW21704
Georgia	NELAP	North Carolina ³	41
Georgia ¹	923	North Dakota	R-140
Idaho	TN00003	Ohio-VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LA000356
Kentucky ¹⁶	90010	South Carolina	84004
Kentucky ²	16	South Dakota	n/a
Louisiana	AI30792	Tennessee ¹⁴	2006
Louisiana ¹	LA180010	Texas	T104704245-18-15
Maine	TN0002	Texas ⁵	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

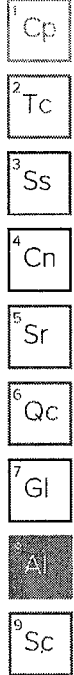
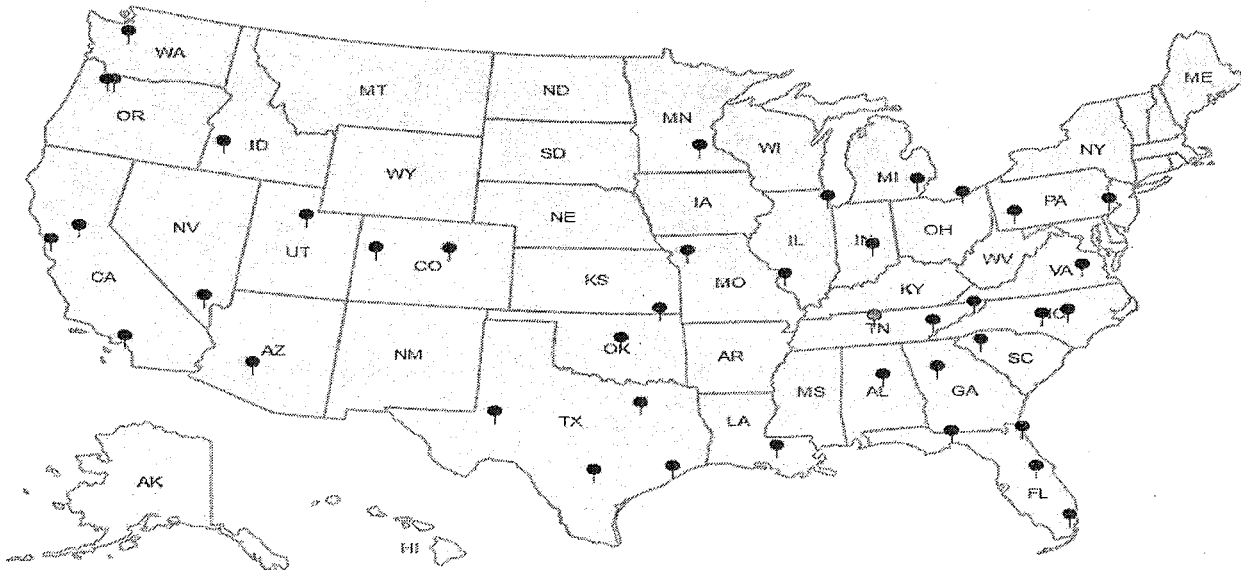
Third Party Federal Accreditations

A2LA - ISO 17025	1461.01	AIHA-LAP, LLC EMLAP	100789
A2LA - ISO 17025 ⁵	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA-Crypto	TN00003		

¹ Drinking Water ² Underground Storage Tanks ³ Aquatic Toxicity ⁴ Chemical/Microbiological ⁵ Mold ⁶ Wastewater n/a Accreditation not applicable

Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.



**Pace Analytical National Center for Testing & Innovation
Cooler Receipt Form**

Client: <i>DHLRRTX</i>	SDG#:	<i>1130289</i>		
Cooler Received/Opened On: <i>8/27/19</i>	Temperature:	<i>Amb</i>		
Received By: <i>Lexxi Romero</i>				
Signature: <i>[Signature]</i>				
Receipt Check List		NP	Yes	No
COC Seal Present / Intact?		<input checked="" type="checkbox"/>		
COC Signed / Accurate?			<input checked="" type="checkbox"/>	
Bottles arrive intact?			<input checked="" type="checkbox"/>	
Correct bottles used?			<input checked="" type="checkbox"/>	
Sufficient volume sent?			<input checked="" type="checkbox"/>	
If Applicable				
VOA Zero headspace?				
Preservation Correct / Checked?			<input checked="" type="checkbox"/>	

DHL Analytical, Inc.

2300 Double Creek Drive
Round Rock, TX 78664

TEL: (512) 388-8222

FAX: (512) 388-8229

Work Order: 1908215

CHAIN-OF-CUSTODY RECORD

H008

Subcontractor:

Pace Analytical
12065 Lebanon Rd
Mt Juliet, TN 37122

TEL: (615) 773-5923

FAX:

Acct #: DHLRRTX

62

1133209

21-Aug-19

Sample Id	Matrix	DHL#	Date Collected	Bottle Type	Requested Tests		
					Ra 228 E904.0	Ra 226 M7500 Ra B M	
FGD-6	Aqueous	-01C	08/19/19 07:35 AM	1LHDPEHNO3	1		-01
FGD-6	Aqueous	-01D	08/19/19 07:35 AM	1LHDPEHNO3		1	
FGD-3	Aqueous	-02C	08/19/19 08:25 AM	1LHDPEHNO3	1		02
FGD-3	Aqueous	-02D	08/19/19 08:25 AM	1LHDPEHNO3		1	
FGD-2	Aqueous	-03C	08/19/19 09:15 AM	1LHDPEHNO3	1		03
FGD-2	Aqueous	-03D	08/19/19 09:15 AM	1LHDPEHNO3		1	
FGD-5	Aqueous	-04C	08/19/19 10:00 AM	1LHDPEHNO3	1		04
FGD-5	Aqueous	-04D	08/19/19 10:00 AM	1LHDPEHNO3		1	
DUP-1	Aqueous	-05C	08/19/19 10:00 AM	1LHDPEHNO3	1		05
DUP-1	Aqueous	-05D	08/19/19 10:00 AM	1LHDPEHNO3		1	
FGD-8	Aqueous	-06C	08/19/19 11:00 AM	1LHDPEHNO3	1		06
FGD-8	Aqueous	-06D	08/19/19 11:00 AM	1LHDPEHNO3		1	
FGD-1	Aqueous	-07C	08/19/19 12:05 PM	1LHDPEHNO3	1		07
FGD-1	Aqueous	-07D	08/19/19 12:05 PM	1LHDPEHNO3		1	
FGD-14	Aqueous	-08C	08/19/19 01:15 PM	1LHDPEHNO3	1		08
FGD-14	Aqueous	-08D	08/19/19 01:15 PM	1LHDPEHNO3		1	
FGD-4	Aqueous	-09C	08/19/19 02:15 PM	1LHDPEHNO3	1		09
FGD-4	Aqueous	-09D	08/19/19 02:15 PM	1LHDPEHNO3		1	

General Comments:

Please analyze these samples with Normal Turnaround Time.
Report RA-226, Ra-228 & Combined per Specs.
Quality Control Package Needed: Standard - NELAC Rad Test compliant
Email to cao@dhlanalytical.com & dupont@dhlanalytical.com

Relinquished by:

Date/Time

Received by:

Date/Time

8-27-19 10:00

Relinquished by:

Received by:

DHL Analytical, Inc.

3300 Double Creek Drive

Round Rock, TX 78664

TEL: (512) 388-8222

FAX: (512) 388-8229

Work Order: 1908215

CHAIN-OF-CUSTODY RECORD

Subcontractor:

Pace Analytical

12065 Lebanon Rd

Mt. Juliet, TN 37122

TEL: (615) 773-5923

FAX:

Acct #: DHLRRTX

1133289

21-Aug-19

Sample Id	Matrix	DHL#	Date Collected	Bottle Type	Requested Tests				
					Re 228 E904.0	Re 226 M7500 Ra B M			
FGD-11	Aqueous	-10C	08/19/19 03:20 PM	1LHDPEHNO3	1				20
FGD-11	Aqueous	-10D	08/19/19 03:20 PM	1LHDPEHNO3		1			"
FGD-12	Aqueous	-11C	08/19/19 04:25 PM	1LHDPEHNO3	1				"
FGD-12	Aqueous	-11D	08/19/19 04:25 PM	1LHDPEHNO3		1			"
FGD-15	Aqueous	-12C	08/19/19 05:30 PM	1LHDPEHNO3	1				12
FGD-15	Aqueous	-12D	08/19/19 05:30 PM	1LHDPEHNO3		1			

General Comments:

Please analyze these samples with Normal Turnaround Time.
 Report RA-226, Ra-228 & Combined per Specs.
 Quality Control Package Needed: Standard - NELAC Rad Test compliant
 Email to cac@dhlanalytical.com & dupont@dhlanalytical.com

Relinquished by:

Date/Time

Received by:

Date/Time

8-21-19 10:00

Relinquished by:

Received by:



July 10, 2020

Will Vienne
Golder
2201 Double Creek Dr #4004
Round Rock, Texas 78664
TEL: (512) 671-3434
FAX: (512) 671-3446
RE: Luminant-OGSES-MNA

Order No.: 2005038

Dear Will Vienne:

DHL Analytical, Inc. received 5 sample(s) on 5/7/2020 for the analyses presented in the following report.

Revision Number 1 for Work Order 2005038: This revision consists of changing the target analyte list for 3 samples per the client's request. Please replace the original Data Report with this revision.

There were no problems with the analyses and all data met requirements of NELAP except where noted in the Case Narrative. All non-NELAP methods will be identified accordingly in the case narrative and all estimated uncertainties of test results are within method or EPA specifications.

If you have any questions regarding these tests results, please feel free to call. Thank you for using DHL Analytical.

Sincerely,

A handwritten signature in red ink, appearing to read "John DuPont".

John DuPont
General Manager

This report was performed under the accreditation of the State of Texas Laboratory Certification Number: T104704211-20-25



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CUSTODY

DATE 5-7-20

SIGNATURE John

SEAL

DHL
ANALYTICAL

Bray

Sample Receipt Checklist


Client Name **Golder**

Date Received: **5/7/2020**

Work Order Number **2005038**

Received by: **EL**

Checklist completed by:  5/7/2020
Signature Date

Reviewed by:  5/7/2020
Initials Date

Carrier name: Hand Delivered

- Shipping container/cooler in good condition? Yes No Not Present
- Custody seals intact on shipping container/cooler? Yes No Not Present
- Custody seals intact on sample bottles? Yes No Not Present
- Chain of custody present? Yes No
- Chain of custody signed when relinquished and received? Yes No
- Chain of custody agrees with sample labels? Yes No
- Samples in proper container/bottle? Yes No
- Sample containers intact? Yes No
- Sufficient sample volume for indicated test? Yes No
- All samples received within holding time? Yes No
- Container/Temp Blank temperature in compliance? Yes No 0.9 °C
- Water - VOA vials have zero headspace? Yes No No VOA vials submitted
- Water - pH<2 acceptable upon receipt? Yes No NA LOT # 13171
- Adjusted? no Checked by EL
- Water - pH>9 (S) or pH>10 (CN) acceptable upon receipt? Yes No NA LOT #
- Adjusted? _____ Checked by _____

Any No response must be detailed in the comments section below.

Client contacted: _____ Date contacted: _____ Person contacted _____

Contacted by: _____ Regarding: _____

Comments: _____

Corrective Action _____

Laboratory Name: DHL Analytical, Inc.							
Laboratory Review Checklist: Reportable Data							
Project Name: Luminant-OGSES-MNA				LRC Date: 5/15/2020			
Reviewer Name: Angie O'Donnell				Laboratory Work Order: 2005038			
Prep Batch Number(s): See Prep Dates Report				Run Batch: See Analytical Dates Report			
# ¹	A ²	Description	Yes	No	NA ³	NR ⁴	ER# ⁵
		Chain-of-Custody (C-O-C)					
R1	OI	1) Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				R1-01
		2) Were all departures from standard conditions described in an exception report?			X		
R2	OI	Sample and Quality Control (QC) Identification					
		1) Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
		2) Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
R3	OI	Test Reports					
		1) Were all samples prepared and analyzed within holding times?	X				
		2) Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
		3) Were calculations checked by a peer or supervisor?	X				
		4) Were all analyte identifications checked by a peer or supervisor?	X				
		5) Were sample detection limits reported for all analytes not detected?	X				
		6) Were all results for soil and sediment samples reported on a dry weight basis?			X		
		7) Were % moisture (or solids) reported for all soil and sediment samples?			X		
		8) Were bulk soils/solids samples for volatile analysis extracted with methanol per EPA Method 5035?			X		
		9) If required for the project, TICs reported?			X		
R4	O	Surrogate Recovery Data					
		1) Were surrogates added prior to extraction?			X		
		2) Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
R5	OI	Test Reports/Summary Forms for Blank Samples					
		1) Were appropriate type(s) of blanks analyzed?	X				
		2) Were blanks analyzed at the appropriate frequency?	X				
		3) Where method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
		4) Were blank concentrations < MDL?	X				
		5) For analyte(s) detected in a blank sample, was the concentration, unadjusted for sample specific factors, in all associated field samples, greater than 10 times the concentration in the blank sample?			X		
R6	OI	Laboratory Control Samples (LCS):					
		1) Were all COCs included in the LCS?	X				
		2) Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
		3) Were LCSs analyzed at the required frequency?	X				
		4) Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
		5) Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
		6) Was the LCSD RPD within QC limits (if applicable)?	X				
R7	OI	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Data					
		1) Were the project/method specified analytes included in the MS and MSD?	X				
		2) Were MS/MSD analyzed at the appropriate frequency?	X				
		3) Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?		X			R7-03
		4) Were MS/MSD RPDs within laboratory QC limits?	X				
R8	OI	Analytical Duplicate Data					
		1) Were appropriate analytical duplicates analyzed for each matrix?	X				
		2) Were analytical duplicates analyzed at the appropriate frequency?	X				
		3) Were RPDs or relative standard deviations within the laboratory QC limits?	X				
R9	OI	Method Quantitation Limits (MQLs):					
		1) Are the MQLs for each method analyte included in the laboratory data package?	X				
		2) Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
		3) Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
R10	OI	Other Problems/Anomalies					
		1) Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				R10-01
		2) Was applicable and available technology used to lower the SDL to minimize the matrix interference affects on the sample results?	X				
		3) Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices and methods associated with this laboratory data package?	X				

Laboratory Name: DHL Analytical, Inc.							
Laboratory Review Checklist (continued): Supporting Data							
Project Name: Luminant-OGSES-MNA				LRC Date: 5/15/2020			
Reviewer Name: Angie O'Donnell				Laboratory Work Order: 2005038			
Prep Batch Number(s): See Prep Dates Report				Run Batch: See Analytical Dates Report			
# ¹	A ²	Description	Yes	No	NA ³	NR ⁴	ER# ⁵
S1	OI	Initial Calibration (ICAL)					
		1) Were response factors and/or relative response factors for each analyte within QC limits?	X				
		2) Were percent RSDs or correlation coefficient criteria met?	X				
		3) Was the number of standards recommended in the method used for all analytes?	X				
		4) Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		5) Are ICAL data available for all instruments used?	X				
		6) Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	Initial and Continuing calibration Verification (ICCV and CCV) and Continuing Calibration blank (CCB):					
		1) Was the CCV analyzed at the method-required frequency?	X				
		2) Were percent differences for each analyte within the method-required QC limits?	X				
		3) Was the ICAL curve verified for each analyte?	X				
		4) Was the absolute value of the analyte concentration in the inorganic CCB < MDL?		X			S2-04
S3	O	Mass Spectral Tuning:					
		1) Was the appropriate compound for the method used for tuning?	X				
		2) Were ion abundance data within the method-required QC limits?	X				
S4	O	Internal Standards (IS):					
		1) Were IS area counts and retention times within the method-required QC limits?	X				
S5	OI	Raw Data (NELAC Section 5.5.10)					
		1) Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		2) Were data associated with manual integrations flagged on the raw data?	X				
S6	O	Dual Column Confirmation					
		1) Did dual column confirmation results meet the method-required QC?			X		
S7	O	Tentatively Identified Compounds (TICs):					
		1) If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	Interference Check Sample (ICS) Results:					
		1) Were percent recoveries within method QC limits?	X				
S9	I	Serial Dilutions, Post Digestion Spikes, and Method of Standard Additions					
		1) Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	X				
S10	OI	Method Detection Limit (MDL) Studies					
		1) Was a MDL study performed for each reported analyte?	X				
		2) Is the MDL either adjusted or supported by the analysis of DCSs?	X				
S11	OI	Proficiency Test Reports:					
		1) Was the lab's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	Standards Documentation					
		1) Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	Compound/Analyte Identification Procedures					
		1) Are the procedures for compound/analyte identification documented?	X				
S14	OI	Demonstration of Analyst Competency (DOC)					
		1) Was DOC conducted consistent with NELAC Chapter 5 – Appendix C?	X				
		2) Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	Verification/Validation Documentation for Methods (NELAC Chapter 5)					
		1) Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	Laboratory Standard Operating Procedures (SOPs):					
		1) Are laboratory SOPs current and on file for each method performed?	X				

- 1 Items identified by the letter "R" should be included in the laboratory data package submitted to the TCEQ in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
- 2 O = organic analyses; I = inorganic analyses (and general chemistry, when applicable).
- 3 NA = Not applicable.
- 4 NR = Not Reviewed.
- 5 ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Data Package Signature Page – RG-366/TRRP-13

This data package consists of:

This signature page, the laboratory review checklist, and the following reportable data:

- R1 Field chain-of-custody documentation;
- R2 Sample identification cross-reference;
- R3 Test reports (analytical data sheets) for each environmental sample that includes:
 - a) Items consistent with NELAC Chapter 5,
 - b) dilution factors,
 - c) preparation methods,
 - d) cleanup methods, and
 - e) if required for the project, tentatively identified compounds (TICs).
- R4 Surrogate recovery data including:
 - a) Calculated recovery (%R), and
 - b) The laboratory's surrogate QC limits.
- R5 Test reports/summary forms for blank samples;
- R6 Test reports/summary forms for laboratory control samples (LCSs) including:
 - a) LCS spiking amounts,
 - b) Calculated %R for each analyte, and
 - c) The laboratory's LCS QC limits.
- R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
 - a) Samples associated with the MS/MSD clearly identified,
 - b) MS/MSD spiking amounts,
 - c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
 - d) Calculated %Rs and relative percent differences (RPDs), and
 - e) The laboratory's MS/MSD QC limits
- R8 Laboratory analytical duplicate (if applicable) recovery and precision:
 - a) The amount of analyte measured in the duplicate,
 - b) The calculated RPD, and
 - c) The laboratory's QC limits for analytical duplicates.
- R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix;
- R10 Other problems or anomalies.

The Exception Report for each "No" or "Not Reviewed (NR)" item in the Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory is not accredited under the Texas Laboratory Accreditation Program.

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the Exception Reports. By my signature below, I affirm to the best of my knowledge that all problems/anomalies observed by the laboratory have been identified in the Laboratory Review Checklist, and no information or data affecting the quality of the data has been knowingly withheld.

This laboratory was last inspected by TCEQ on February 25-28, 2019. Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Name: John DuPont
Official Title: General Manager


Signature

07/10/20
Date

Name: Dr. Derhsing Luu
Official Title: Technical Director

CLIENT: Golder
Project: Luminant-OGSES-MNA
Lab Order: 2005038

CASE NARRATIVE

Samples were analyzed using the methods outlined in the following references:

- Method SW6020B - Metals Analysis
- Method E300 - Anions Analysis
- Method M2320 B - Alkalinity Analysis
- Method M3500-FE D - Ferrous Iron Analysis (This parameter is not NELAP Certified)
- Method M3500-FE D - Ferrous Iron Analysis (Calculated) (This parameter is not NELAP Certified)
- Method M4500-P E - Orthophosphate Analysis

Exception Report R1-01

The samples were received and log-in performed on 5/7/2020. A total of 5 samples were received and analyzed. The samples arrived in good condition and were properly packaged.

Exception Report R7-03

For Metals Analysis, the recovery of Sodium for the Matrix Spike and Matrix Spike Duplicate (2005013-01 MS/MSD) was below the method control limits. This is flagged accordingly in the QC Summary Report. This analyte was within method control limits in the associated LCS. No further corrective action was taken.

For Ferrous Iron Analysis, the recovery of the Matrix Spike (2005038-01 MS) was above the method control limits. This is flagged accordingly in the QC Summary Report. The associated LCS/MSD was within method control limits. No further corrective action was taken.

Exception Report R10-01

The Ferric Iron is calculated as the Total Iron minus the Ferrous Iron.

Exception Report S2-04

For Metals Analysis, Sodium was detected below the reporting limit for the Continuing Calibration Blank (CCB3-200511). This analyte was reported in QC samples only, no field samples affected. No further corrective actions were taken.

CLIENT: Golder
Project: Luminant-OGSES-MNA
Lab Order: 2005038

Work Order Sample Summary

Lab Smp ID	Client Sample ID	Tag Number	Date Collected	Date Recved
2005038-01	FGD-6		05/06/20 01:20 PM	5/7/2020
2005038-02	FGD-3		05/06/20 02:20 PM	5/7/2020
2005038-03	FGD-14		05/06/20 03:05 PM	5/7/2020
2005038-04	FGD-15		05/06/20 03:45 PM	5/7/2020
2005038-05	FGD-16		05/06/20 04:30 PM	5/7/2020

Lab Order: 2005038
 Client: Golder
 Project: Luminant-OGSES-MNA

PREP DATES REPORT

Sample ID	Client Sample ID	Collection Date	Matrix	Test Number	Test Name	Prep Date	Batch ID
2005038-01A	FGD-6	05/06/20 01:20 PM	Aqueous	M3500-Fe	Ferrous Iron Prep Water	05/13/20 08:00 AM	96316
2005038-01B	FGD-6	05/06/20 01:20 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/08/20 10:34 AM	96270
	FGD-6	05/06/20 01:20 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/08/20 10:34 AM	96270
2005038-01C	FGD-6	05/06/20 01:20 PM	Aqueous	M2320 B	Alkalinity Preparation	05/11/20 10:01 AM	96290
	FGD-6	05/06/20 01:20 PM	Aqueous	E300	Anion Preparation	05/07/20 08:41 AM	96213
	FGD-6	05/06/20 01:20 PM	Aqueous	M4500-P E	Orthophosphate Prep	05/07/20 02:01 PM	96253
2005038-02A	FGD-3	05/06/20 02:20 PM	Aqueous	M3500-Fe	Ferrous Iron Prep Water	05/13/20 08:00 AM	96316
2005038-02B	FGD-3	05/06/20 02:20 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/08/20 10:34 AM	96270
	FGD-3	05/06/20 02:20 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/08/20 10:34 AM	96270
2005038-02C	FGD-3	05/06/20 02:20 PM	Aqueous	M2320 B	Alkalinity Preparation	05/11/20 10:01 AM	96290
	FGD-3	05/06/20 02:20 PM	Aqueous	E300	Anion Preparation	05/07/20 08:41 AM	96213
	FGD-3	05/06/20 02:20 PM	Aqueous	M4500-P E	Orthophosphate Prep	05/07/20 02:01 PM	96253
2005038-03A	FGD-14	05/06/20 03:05 PM	Aqueous	M3500-Fe	Ferrous Iron Prep Water	05/13/20 08:00 AM	96316
2005038-03B	FGD-14	05/06/20 03:05 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/08/20 10:34 AM	96270
	FGD-14	05/06/20 03:05 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/08/20 10:34 AM	96270
2005038-03C	FGD-14	05/06/20 03:05 PM	Aqueous	M2320 B	Alkalinity Preparation	05/11/20 10:01 AM	96290
	FGD-14	05/06/20 03:05 PM	Aqueous	E300	Anion Preparation	05/07/20 08:41 AM	96213
	FGD-14	05/06/20 03:05 PM	Aqueous	E300	Anion Preparation	05/07/20 08:41 AM	96213
	FGD-14	05/06/20 03:05 PM	Aqueous	E300	Anion Preparation	05/07/20 08:41 AM	96213
	FGD-14	05/06/20 03:05 PM	Aqueous	M4500-P E	Orthophosphate Prep	05/07/20 02:01 PM	96253
2005038-04A	FGD-15	05/06/20 03:45 PM	Aqueous	M3500-Fe	Ferrous Iron Prep Water	05/13/20 08:00 AM	96316
2005038-04B	FGD-15	05/06/20 03:45 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/08/20 10:34 AM	96270
	FGD-15	05/06/20 03:45 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/08/20 10:34 AM	96270
2005038-04C	FGD-15	05/06/20 03:45 PM	Aqueous	M2320 B	Alkalinity Preparation	05/11/20 10:01 AM	96290
	FGD-15	05/06/20 03:45 PM	Aqueous	E300	Anion Preparation	05/07/20 08:41 AM	96213
	FGD-15	05/06/20 03:45 PM	Aqueous	E300	Anion Preparation	05/07/20 08:41 AM	96213
	FGD-15	05/06/20 03:45 PM	Aqueous	M4500-P E	Orthophosphate Prep	05/07/20 02:01 PM	96253
2005038-05A	FGD-16	05/06/20 04:30 PM	Aqueous	M3500-Fe	Ferrous Iron Prep Water	05/13/20 08:00 AM	96316

Lab Order: 2005038
Client: Golder
Project: Luminant-OGSES-MNA

PREP DATES REPORT

Sample ID	Client Sample ID	Collection Date	Matrix	Test Number	Test Name	Prep Date	Batch ID
2005038-05B	FGD-16	05/06/20 04:30 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/08/20 10:34 AM	96270
	FGD-16	05/06/20 04:30 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/08/20 10:34 AM	96270
2005038-05C	FGD-16	05/06/20 04:30 PM	Aqueous	M2320 B	Alkalinity Preparation	05/11/20 10:01 AM	96290
	FGD-16	05/06/20 04:30 PM	Aqueous	E300	Anion Preparation	05/07/20 08:41 AM	96213
	FGD-16	05/06/20 04:30 PM	Aqueous	E300	Anion Preparation	05/07/20 08:41 AM	96213
	FGD-16	05/06/20 04:30 PM	Aqueous	M4500-P E	Orthophosphate Prep	05/07/20 02:01 PM	96253

Lab Order: 2005038
 Client: Golder
 Project: Luminant-OGSES-MNA

ANALYTICAL DATA REPORT

Sample ID	Client Sample ID	Matrix	Test Number	Test Name	Batch ID	Dilution	Analysis Date	Run ID
2005038-01A	FGD-6	Aqueous	M3500-Fe D	Ferric Iron (Calculated)	R110498	1	05/15/20	UV/VIS_2_200515A
	FGD-6	Aqueous	M3500-Fe D	Ferrous Iron	96316	1	05/13/20 10:49 AM	UV/VIS_2_200513B
2005038-01B	FGD-6	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	96270	1	05/11/20 01:59 PM	ICP-MS5_200511B
	FGD-6	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	96270	20	05/11/20 03:56 PM	ICP-MS5_200511B
2005038-01C	FGD-6	Aqueous	M2320 B	Alkalinity	96290	1	05/11/20 01:40 PM	TITRATOR_200511A
	FGD-6	Aqueous	E300	Anions by IC method - Water	96213	1	05/07/20 01:55 PM	IC4_200507A
	FGD-6	Aqueous	M4500-P E	Orthophosphate	96253	1	05/07/20 02:22 PM	UV/VIS_2_200507C
2005038-02A	FGD-3	Aqueous	M3500-Fe D	Ferric Iron (Calculated)	R110498	1	05/15/20	UV/VIS_2_200515A
	FGD-3	Aqueous	M3500-Fe D	Ferrous Iron	96316	1	05/13/20 10:49 AM	UV/VIS_2_200513B
2005038-02B	FGD-3	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	96270	1	05/11/20 02:01 PM	ICP-MS5_200511B
	FGD-3	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	96270	20	05/11/20 03:59 PM	ICP-MS5_200511B
2005038-02C	FGD-3	Aqueous	M2320 B	Alkalinity	96290	1	05/11/20 02:00 PM	TITRATOR_200511A
	FGD-3	Aqueous	E300	Anions by IC method - Water	96213	1	05/07/20 02:11 PM	IC4_200507A
	FGD-3	Aqueous	M4500-P E	Orthophosphate	96253	1	05/07/20 02:23 PM	UV/VIS_2_200507C
2005038-03A	FGD-14	Aqueous	M3500-Fe D	Ferric Iron (Calculated)	R110498	1	05/15/20	UV/VIS_2_200515A
	FGD-14	Aqueous	M3500-Fe D	Ferrous Iron	96316	1	05/13/20 10:51 AM	UV/VIS_2_200513B
2005038-03B	FGD-14	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	96270	1	05/11/20 02:03 PM	ICP-MS5_200511B
	FGD-14	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	96270	20	05/11/20 04:01 PM	ICP-MS5_200511B
2005038-03C	FGD-14	Aqueous	M2320 B	Alkalinity	96290	1	05/11/20 02:08 PM	TITRATOR_200511A
	FGD-14	Aqueous	E300	Anions by IC method - Water	96213	10	05/07/20 01:39 PM	IC4_200507A
	FGD-14	Aqueous	E300	Anions by IC method - Water	96213	100	05/07/20 06:01 PM	IC4_200507A
	FGD-14	Aqueous	E300	Anions by IC method - Water	96213	1	05/07/20 02:27 PM	IC4_200507A
	FGD-14	Aqueous	M4500-P E	Orthophosphate	96253	1	05/07/20 02:23 PM	UV/VIS_2_200507C
2005038-04A	FGD-15	Aqueous	M3500-Fe D	Ferric Iron (Calculated)	R110498	1	05/15/20	UV/VIS_2_200515A
	FGD-15	Aqueous	M3500-Fe D	Ferrous Iron	96316	1	05/13/20 10:51 AM	UV/VIS_2_200513B
2005038-04B	FGD-15	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	96270	1	05/11/20 02:05 PM	ICP-MS5_200511B
	FGD-15	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	96270	50	05/11/20 04:03 PM	ICP-MS5_200511B
2005038-04C	FGD-15	Aqueous	M2320 B	Alkalinity	96290	1	05/11/20 02:17 PM	TITRATOR_200511A

Lab Order: 2005038
Client: Golder
Project: Luminant-OGSES-MNA

ANALYTICAL DATES REPORT

Sample ID	Client Sample ID	Matrix	Test Number	Test Name	Batch ID	Dilution	Analysis Date	Run ID
2005038-04C	FGD-15	Aqueous	E300	Anions by IC method - Water	96213	50	05/07/20 01:07 PM	IC4_200507A
	FGD-15	Aqueous	E300	Anions by IC method - Water	96213	1	05/07/20 02:43 PM	IC4_200507A
	FGD-15	Aqueous	M4500-P E	Orthophosphate	96253	1	05/07/20 02:23 PM	UV/VIS_2_200507C
2005038-05A	FGD-16	Aqueous	M3500-Fe D	Ferric Iron (Calculated)	R110498	1	05/15/20	UV/VIS_2_200515A
	FGD-16	Aqueous	M3500-Fe D	Ferrous Iron	96316	1	05/13/20 10:53 AM	UV/VIS_2_200513B
2005038-05B	FGD-16	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	96270	1	05/11/20 02:08 PM	ICP-MS5_200511B
	FGD-16	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	96270	10	05/11/20 04:05 PM	ICP-MS5_200511B
2005038-05C	FGD-16	Aqueous	M2320 B	Alkalinity	96290	1	05/11/20 02:24 PM	TITRATOR_200511A
	FGD-16	Aqueous	E300	Anions by IC method - Water	96213	1	05/07/20 02:59 PM	IC4_200507A
	FGD-16	Aqueous	E300	Anions by IC method - Water	96213	10	05/07/20 07:21 PM	IC4_200507A
	FGD-16	Aqueous	M4500-P E	Orthophosphate	96253	1	05/07/20 02:24 PM	UV/VIS_2_200507C

DHL Analytical, Inc.

Date: 10-Jul-20

CLIENT: Golder
Project: Luminant-OGSES-MNA
Project No: 19134019-1000
Lab Order: 2005038

Client Sample ID: FGD-6
Lab ID: 2005038-01
Collection Date: 05/06/20 01:20 PM
Matrix: AQUEOUS

Analyses	Result	SDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		SW6020B		Analyst: RO			
Iron	0.582	0.0300	0.100		mg/L	1	05/11/20 01:59 PM
Magnesium	7.17	0.100	0.300		mg/L	1	05/11/20 01:59 PM
Potassium	0.743	0.100	0.300		mg/L	1	05/11/20 01:59 PM
Sodium	235	2.00	6.00		mg/L	20	05/11/20 03:56 PM
ANIONS BY IC METHOD - WATER		E300		Analyst: SNM			
Nitrate-N	0.129	0.100	0.500	J	mg/L	1	05/07/20 01:55 PM
ALKALINITY		M2320 B		Analyst: BTJ			
Alkalinity, Bicarbonate (As CaCO3)	275	10.0	20.0		mg/L @ pH 4.53	1	05/11/20 01:40 PM
Alkalinity, Carbonate (As CaCO3)	<10.0	10.0	20.0		mg/L @ pH 4.53	1	05/11/20 01:40 PM
Alkalinity, Hydroxide (As CaCO3)	<10.0	10.0	20.0		mg/L @ pH 4.53	1	05/11/20 01:40 PM
Alkalinity, Total (As CaCO3)	275	20.0	20.0		mg/L @ pH 4.53	1	05/11/20 01:40 PM
FERRIC IRON (CALCULATED)		M3500-FE D		Analyst: AO			
Iron, Ferric	0.582	0.0500	0.100	N	mg/L	1	05/15/20
FERROUS IRON		M3500-FE D		Analyst: CC			
Iron, Ferrous	<0.0500	0.0500	0.100	N	mg/L	1	05/13/20 10:49 AM
ORTHOPHOSPHATE		M4500-P E		Analyst: BTJ			
Phosphorus, Total Orthophosphate (As P)	0.0760	0.0300	0.100	J	mg/L	1	05/07/20 02:22 PM

Qualifiers: ND - Not Detected at the SDL
 J - Analyte detected between SDL and RL
 B - Analyte detected in the associated Method Blank
 DF- Dilution Factor
 N - Parameter not NELAP certified
 See Final Page of Report for MQLs and MDLs

S - Spike Recovery outside control limits
 C - Sample Result or QC discussed in Case Narrative
 RL - Reporting Limit (MQL adjusted for moisture and sample size)
 SDL - Sample Detection Limit
 E - TPH pattern not Gas or Diesel Range Pattern

DHL Analytical, Inc.

Date: 10-Jul-20

CLIENT: Golder
Project: Luminant-OGSES-MNA
Project No: 19134019-1000
Lab Order: 2005038

Client Sample ID: FGD-3
Lab ID: 2005038-02
Collection Date: 05/06/20 02:20 PM
Matrix: AQUEOUS

Analyses	Result	SDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		SW6020B		Analyst: RO			
Iron	0.0395	0.0300	0.100	J	mg/L	1	05/11/20 02:01 PM
Magnesium	23.5	0.100	0.300		mg/L	1	05/11/20 02:01 PM
Potassium	2.14	0.100	0.300		mg/L	1	05/11/20 02:01 PM
Sodium	230	2.00	6.00		mg/L	20	05/11/20 03:59 PM
ANIONS BY IC METHOD - WATER		E300		Analyst: SNM			
Nitrate-N	0.535	0.100	0.500		mg/L	1	05/07/20 02:11 PM
ALKALINITY		M2320 B		Analyst: BTJ			
Alkalinity, Bicarbonate (As CaCO3)	434	10.0	20.0		mg/L @ pH 4.54	1	05/11/20 02:00 PM
Alkalinity, Carbonate (As CaCO3)	<10.0	10.0	20.0		mg/L @ pH 4.54	1	05/11/20 02:00 PM
Alkalinity, Hydroxide (As CaCO3)	<10.0	10.0	20.0		mg/L @ pH 4.54	1	05/11/20 02:00 PM
Alkalinity, Total (As CaCO3)	434	20.0	20.0		mg/L @ pH 4.54	1	05/11/20 02:00 PM
FERRIC IRON (CALCULATED)		M3500-FE D		Analyst: AO			
Iron, Ferric	<0.0500	0.0500	0.100	N	mg/L	1	05/15/20
FERROUS IRON		M3500-FE D		Analyst: CC			
Iron, Ferrous	<0.0500	0.0500	0.100	N	mg/L	1	05/13/20 10:49 AM
ORTHOPHOSPHATE		M4500-P E		Analyst: BTJ			
Phosphorus, Total Orthophosphate (As P)	0.0530	0.0300	0.100	J	mg/L	1	05/07/20 02:23 PM

Qualifiers: ND - Not Detected at the SDL
 J - Analyte detected between SDL and RL
 B - Analyte detected in the associated Method Blank
 DF- Dilution Factor
 N - Parameter not NELAP certified
 See Final Page of Report for MQLs and MDLs

S - Spike Recovery outside control limits
 C - Sample Result or QC discussed in Case Narrative
 RL - Reporting Limit (MQL adjusted for moisture and sample size)
 SDL - Sample Detection Limit
 E - TPH pattern not Gas or Diesel Range Pattern

DHL Analytical, Inc.

Date: 10-Jul-20

CLIENT: Golder
Project: Luminant-OGSES-MNA
Project No: 19134019-1000
Lab Order: 2005038

Client Sample ID: FGD-14
Lab ID: 2005038-03
Collection Date: 05/06/20 03:05 PM
Matrix: AQUEOUS

Analyses	Result	SDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		SW6020B		Analyst: RO			
Calcium	121	2.00	6.00		mg/L	20	05/11/20 04:01 PM
Iron	0.0574	0.0300	0.100	J	mg/L	1	05/11/20 02:03 PM
Magnesium	35.0	2.00	6.00		mg/L	20	05/11/20 04:01 PM
Potassium	8.91	0.100	0.300		mg/L	1	05/11/20 02:03 PM
Sodium	201	2.00	6.00		mg/L	20	05/11/20 04:01 PM
ANIONS BY IC METHOD - WATER		E300		Analyst: SNM			
Chloride	587	30.0	100		mg/L	100	05/07/20 06:01 PM
Fluoride	<0.100	0.100	0.400		mg/L	1	05/07/20 02:27 PM
Nitrate-N	0.460	0.100	0.500	J	mg/L	1	05/07/20 02:27 PM
Sulfate	28.7	1.00	3.00		mg/L	1	05/07/20 02:27 PM
ALKALINITY		M2320 B		Analyst: BTJ			
Alkalinity, Bicarbonate (As CaCO3)	104	10.0	20.0		mg/L @ pH 4.52	1	05/11/20 02:08 PM
Alkalinity, Carbonate (As CaCO3)	<10.0	10.0	20.0		mg/L @ pH 4.52	1	05/11/20 02:08 PM
Alkalinity, Hydroxide (As CaCO3)	<10.0	10.0	20.0		mg/L @ pH 4.52	1	05/11/20 02:08 PM
Alkalinity, Total (As CaCO3)	104	20.0	20.0		mg/L @ pH 4.52	1	05/11/20 02:08 PM
FERRIC IRON (CALCULATED)		M3500-FE D		Analyst: AO			
Iron, Ferric	0.0574	0.0500	0.100	JN	mg/L	1	05/15/20
FERROUS IRON		M3500-FE D		Analyst: CC			
Iron, Ferrous	<0.0500	0.0500	0.100	N	mg/L	1	05/13/20 10:51 AM
ORTHOPHOSPHATE		M4500-P E		Analyst: BTJ			
Phosphorus, Total Orthophosphate (As P)	<0.0300	0.0300	0.100		mg/L	1	05/07/20 02:23 PM

Qualifiers: ND - Not Detected at the SDL
 J - Analyte detected between SDL and RL
 B - Analyte detected in the associated Method Blank
 DF- Dilution Factor
 N - Parameter not NELAP certified
 See Final Page of Report for MQLs and MDLs

S - Spike Recovery outside control limits
 C - Sample Result or QC discussed in Case Narrative
 RL - Reporting Limit (MQL adjusted for moisture and sample size)
 SDL - Sample Detection Limit
 E - TPH pattern not Gas or Diesel Range Pattern

DHL Analytical, Inc.

Date: 10-Jul-20

CLIENT: Golder
Project: Luminant-OGSES-MNA
Project No: 19134019-1000
Lab Order: 2005038

Client Sample ID: FGD-15
Lab ID: 2005038-04
Collection Date: 05/06/20 03:45 PM
Matrix: AQUEOUS

Analyses	Result	SDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		SW6020B		Analyst: RO			
Calcium	399	5.00	15.0		mg/L	50	05/11/20 04:03 PM
Iron	0.0414	0.0300	0.100	J	mg/L	1	05/11/20 02:05 PM
Magnesium	130	5.00	15.0		mg/L	50	05/11/20 04:03 PM
Potassium	4.37	0.100	0.300		mg/L	1	05/11/20 02:05 PM
Sodium	499	5.00	15.0		mg/L	50	05/11/20 04:03 PM
ANIONS BY IC METHOD - WATER		E300		Analyst: SNM			
Chloride	1060	15.0	50.0		mg/L	50	05/07/20 01:07 PM
Fluoride	<0.100	0.100	0.400		mg/L	1	05/07/20 02:43 PM
Nitrate-N	<0.100	0.100	0.500		mg/L	1	05/07/20 02:43 PM
Sulfate	1020	50.0	150		mg/L	50	05/07/20 01:07 PM
ALKALINITY		M2320 B		Analyst: BTJ			
Alkalinity, Bicarbonate (As CaCO3)	119	10.0	20.0		mg/L @ pH 4.52	1	05/11/20 02:17 PM
Alkalinity, Carbonate (As CaCO3)	<10.0	10.0	20.0		mg/L @ pH 4.52	1	05/11/20 02:17 PM
Alkalinity, Hydroxide (As CaCO3)	<10.0	10.0	20.0		mg/L @ pH 4.52	1	05/11/20 02:17 PM
Alkalinity, Total (As CaCO3)	119	20.0	20.0		mg/L @ pH 4.52	1	05/11/20 02:17 PM
FERRIC IRON (CALCULATED)		M3500-FE D		Analyst: AO			
Iron, Ferric	<0.0500	0.0500	0.100	N	mg/L	1	05/15/20
FERROUS IRON		M3500-FE D		Analyst: CC			
Iron, Ferrous	<0.0500	0.0500	0.100	N	mg/L	1	05/13/20 10:51 AM
ORTHOPHOSPHATE		M4500-P E		Analyst: BTJ			
Phosphorus, Total Orthophosphate (As P)	0.0840	0.0300	0.100	J	mg/L	1	05/07/20 02:23 PM

Qualifiers: ND - Not Detected at the SDL
 J - Analyte detected between SDL and RL
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 DF- Dilution Factor
 N - Parameter not NELAP certified
 See Final Page of Report for MQLs and MDLs

S - Spike Recovery outside control limits
 C - Sample Result or QC discussed in Case Narrative
 RL - Reporting Limit (MQL adjusted for moisture and sample size)
 SDL - Sample Detection Limit
 E - TPH pattern not Gas or Diesel Range Pattern

DHL Analytical, Inc.

Date: 10-Jul-20

CLIENT: Golder
Project: Luminant-OGSES-MNA
Project No: 19134019-1000
Lab Order: 2005038

Client Sample ID: FGD-16
Lab ID: 2005038-05
Collection Date: 05/06/20 04:30 PM
Matrix: AQUEOUS

Analyses	Result	SDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		SW6020B		Analyst: RO			
Calcium	19.2	1.00	3.00		mg/L	10	05/11/20 04:05 PM
Iron	0.371	0.0300	0.100		mg/L	1	05/11/20 02:08 PM
Magnesium	4.09	0.100	0.300		mg/L	1	05/11/20 02:08 PM
Potassium	3.65	0.100	0.300		mg/L	1	05/11/20 02:08 PM
Sodium	75.7	1.00	3.00		mg/L	10	05/11/20 04:05 PM
ANIONS BY IC METHOD - WATER		E300		Analyst: SNM			
Chloride	85.7	3.00	10.0		mg/L	10	05/07/20 07:21 PM
Fluoride	<0.100	0.100	0.400		mg/L	1	05/07/20 02:59 PM
Nitrate-N	0.974	0.100	0.500		mg/L	1	05/07/20 02:59 PM
Sulfate	15.5	1.00	3.00		mg/L	1	05/07/20 02:59 PM
ALKALINITY		M2320 B		Analyst: BTJ			
Alkalinity, Bicarbonate (As CaCO3)	99.2	10.0	20.0		mg/L @ pH 4.51	1	05/11/20 02:24 PM
Alkalinity, Carbonate (As CaCO3)	<10.0	10.0	20.0		mg/L @ pH 4.51	1	05/11/20 02:24 PM
Alkalinity, Hydroxide (As CaCO3)	<10.0	10.0	20.0		mg/L @ pH 4.51	1	05/11/20 02:24 PM
Alkalinity, Total (As CaCO3)	99.2	20.0	20.0		mg/L @ pH 4.51	1	05/11/20 02:24 PM
FERRIC IRON (CALCULATED)		M3500-FE D		Analyst: AO			
Iron, Ferric	0.371	0.0500	0.100	N	mg/L	1	05/15/20
FERROUS IRON		M3500-FE D		Analyst: CC			
Iron, Ferrous	<0.0500	0.0500	0.100	N	mg/L	1	05/13/20 10:53 AM
ORTHOPHOSPHATE		M4500-P E		Analyst: BTJ			
Phosphorus, Total Orthophosphate (As P)	<0.0300	0.0300	0.100		mg/L	1	05/07/20 02:24 PM

Qualifiers: ND - Not Detected at the SDL
 J - Analyte detected between SDL and RL
 B - Analyte detected in the associated Method Blank
 DF- Dilution Factor
 N - Parameter not NELAP certified
 See Final Page of Report for MQLs and MDLs

S - Spike Recovery outside control limits
 C - Sample Result or QC discussed in Case Narrative
 RL - Reporting Limit (MQL adjusted for moisture and sample size)
 SDL - Sample Detection Limit
 E - TPH pattern not Gas or Diesel Range Pattern

CLIENT: Golder
Work Order: 2005038
Project: Luminant-OGSES-MNA

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS5_200408C

Sample ID: DCS2-95814	Batch ID: 95814	TestNo: SW6020B	Units: mg/L
SampType: DCS2	Run ID: ICP-MS5_200408C	Analysis Date: 4/8/2020 11:19:00 AM	Prep Date: 4/7/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	0.310	0.300	0.300	0	103	70	130	0	0	
Iron	0.0591	0.100	0.0500	0	118	70	130	0	0	
Magnesium	0.298	0.300	0.300	0	99.3	70	130	0	0	
Potassium	0.285	0.300	0.300	0	95.1	70	130	0	0	
Sodium	0.295	0.300	0.300	0	98.4	70	130	0	0	

Qualifiers:

- B Analyte detected in the associated Method Blank
- J Analyte detected between MDL and RL
- ND Not Detected at the Method Detection Limit
- RL Reporting Limit
- J Analyte detected between SDL and RL

- DF Dilution Factor
- MDL Method Detection Limit
- R RPD outside accepted control limits
- S Spike Recovery outside control limits
- N Parameter not NELAP certified

CLIENT: Golder
 Work Order: 2005038
 Project: Luminant-OGSES-MNA

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS5_200511B

The QC data in batch 96270 applies to the following samples: 2005038-01B, 2005038-02B, 2005038-03B, 2005038-04B, 2005038-05B

Sample ID: MB-96270	Batch ID: 96270	TestNo: SW6020B	Units: mg/L
SampType: MBLK	Run ID: ICP-MS5_200511B	Analysis Date: 5/11/2020 1:41:00 PM	Prep Date: 5/8/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	<0.100	0.300								
Iron	<0.0300	0.100								
Magnesium	<0.100	0.300								
Potassium	<0.100	0.300								
Sodium	<0.100	0.300								

Sample ID: LCS-96270	Batch ID: 96270	TestNo: SW6020B	Units: mg/L
SampType: LCS	Run ID: ICP-MS5_200511B	Analysis Date: 5/11/2020 1:43:00 PM	Prep Date: 5/8/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	5.10	0.300	5.00	0	102	80	120			
Iron	5.19	0.100	5.00	0	104	80	120			
Magnesium	5.04	0.300	5.00	0	101	80	120			
Potassium	5.04	0.300	5.00	0	101	80	120			
Sodium	4.99	0.300	5.00	0	99.9	80	120			

Sample ID: LCS-96270	Batch ID: 96270	TestNo: SW6020B	Units: mg/L
SampType: LCS	Run ID: ICP-MS5_200511B	Analysis Date: 5/11/2020 1:45:00 PM	Prep Date: 5/8/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	5.05	0.300	5.00	0	101	80	120	0.928	15	
Iron	5.22	0.100	5.00	0	104	80	120	0.534	15	
Magnesium	5.09	0.300	5.00	0	102	80	120	0.816	15	
Potassium	5.06	0.300	5.00	0	101	80	120	0.463	15	
Sodium	5.05	0.300	5.00	0	101	80	120	1.08	15	

Sample ID: 2005013-01B SD	Batch ID: 96270	TestNo: SW6020B	Units: mg/L
SampType: SD	Run ID: ICP-MS5_200511B	Analysis Date: 5/11/2020 1:52:00 PM	Prep Date: 5/8/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	3.98	1.50	0	4.00				0.590	20	
Iron	0.238	0.500	0	0.237				0.532	20	
Magnesium	0.884	1.50	0	0.892				0.818	20	
Potassium	2.56	1.50	0	2.57				0.207	20	

Sample ID: 2005013-01B PDS	Batch ID: 96270	TestNo: SW6020B	Units: mg/L
SampType: PDS	Run ID: ICP-MS5_200511B	Analysis Date: 5/11/2020 2:23:00 PM	Prep Date: 5/8/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	8.99	0.300	5.00	4.00	99.7	75	125			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005038
Project: Luminant-OGSES-MNA

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS5_200511B

Sample ID: 2005013-01B PDS		Batch ID: 96270		TestNo: SW6020B		Units: mg/L				
SampType: PDS		Run ID: ICP-MS5_200511B		Analysis Date: 5/11/2020 2:23:00 PM		Prep Date: 5/8/2020				
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron	5.38	0.100	5.00	0.237	103	75	125			
Magnesium	5.71	0.300	5.00	0.892	96.3	75	125			
Potassium	7.36	0.300	5.00	2.57	95.9	75	125			

Sample ID: 2005013-01B MS		Batch ID: 96270		TestNo: SW6020B		Units: mg/L				
SampType: MS		Run ID: ICP-MS5_200511B		Analysis Date: 5/11/2020 2:26:00 PM		Prep Date: 5/8/2020				
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	9.22	0.300	5.00	4.00	104	75	125			
Iron	5.38	0.100	5.00	0.237	103	75	125			
Magnesium	5.95	0.300	5.00	0.892	101	75	125			
Potassium	7.60	0.300	5.00	2.57	101	75	125			
Sodium	154	0.300	5.00	151	58.1	75	125			S

Sample ID: 2005013-01B MSD		Batch ID: 96270		TestNo: SW6020B		Units: mg/L				
SampType: MSD		Run ID: ICP-MS5_200511B		Analysis Date: 5/11/2020 2:28:00 PM		Prep Date: 5/8/2020				
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	9.09	0.300	5.00	4.00	102	75	125	1.39	15	
Iron	5.39	0.100	5.00	0.237	103	75	125	0.208	15	
Magnesium	5.94	0.300	5.00	0.892	101	75	125	0.189	15	
Potassium	7.60	0.300	5.00	2.57	101	75	125	0.114	15	
Sodium	154	0.300	5.00	151	61.1	75	125	0.096	15	S

Sample ID: 2005013-01B SD		Batch ID: 96270		TestNo: SW6020B		Units: mg/L				
SampType: SD		Run ID: ICP-MS5_200511B		Analysis Date: 5/11/2020 3:52:00 PM		Prep Date: 5/8/2020				
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Sodium	149	15.0	0	155				4.28	20	

Sample ID: 2005013-01B PDS		Batch ID: 96270		TestNo: SW6020B		Units: mg/L				
SampType: PDS		Run ID: ICP-MS5_200511B		Analysis Date: 5/11/2020 4:14:00 PM		Prep Date: 5/8/2020				
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Sodium	207	3.00	50.0	155	104	75	125			

Qualifiers:

B Analyte detected in the associated Method Blank	DF Dilution Factor
J Analyte detected between MDL and RL	MDL Method Detection Limit
ND Not Detected at the Method Detection Limit	R RPD outside accepted control limits
RL Reporting Limit	S Spike Recovery outside control limits
J Analyte detected between SDL and RL	N Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005038
Project: Luminant-OGSES-MNA

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS5_200511B

Sample ID: ICV-200511	Batch ID: R110424	TestNo: SW6020B	Units: mg/L
SampType: ICV	Run ID: ICP-MS5_200511B	Analysis Date: 5/11/2020 11:23:00 AM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	2.55	0.300	2.50	0	102	90	110			
Iron	2.56	0.100	2.50	0	103	90	110			
Magnesium	2.51	0.300	2.50	0	100	90	110			
Potassium	2.54	0.300	2.50	0	101	90	110			
Sodium	2.56	0.300	2.50	0	102	90	110			

Sample ID: LCVL-200511	Batch ID: R110424	TestNo: SW6020B	Units: mg/L
SampType: LCVL	Run ID: ICP-MS5_200511B	Analysis Date: 5/11/2020 11:33:00 AM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	0.112	0.300	0.100	0	112	80	120			
Iron	0.102	0.100	0.100	0	102	80	120			
Magnesium	0.100	0.300	0.100	0	100	80	120			
Potassium	0.0988	0.300	0.100	0	98.8	80	120			
Sodium	0.0998	0.300	0.100	0	99.8	80	120			

Sample ID: CCV2-200409	Batch ID: R110424	TestNo: SW6020B	Units: mg/L
SampType: CCV	Run ID: ICP-MS5_200511B	Analysis Date: 5/11/2020 1:33:00 PM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	5.08	0.300	5.00	0	102	90	110			
Iron	5.11	0.100	5.00	0	102	90	110			
Magnesium	5.08	0.300	5.00	0	102	90	110			
Potassium	5.02	0.300	5.00	0	100	90	110			
Sodium	5.03	0.300	5.00	0	101	90	110			

Sample ID: CCV3-200511	Batch ID: R110424	TestNo: SW6020B	Units: mg/L
SampType: CCV	Run ID: ICP-MS5_200511B	Analysis Date: 5/11/2020 2:39:00 PM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	5.20	0.300	5.00	0	104	90	110			
Iron	5.25	0.100	5.00	0	105	90	110			
Magnesium	5.12	0.300	5.00	0	102	90	110			
Potassium	5.12	0.300	5.00	0	102	90	110			
Sodium	5.07	0.300	5.00	0	101	90	110			

Sample ID: CCV5-200511	Batch ID: R110424	TestNo: SW6020B	Units: mg/L
SampType: CCV	Run ID: ICP-MS5_200511B	Analysis Date: 5/11/2020 3:41:00 PM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	5.18	0.300	5.00	0	104	90	110			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005038
Project: Luminant-OGSES-MNA

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS5_200511B

Sample ID: CCV5-200511	Batch ID: R110424	TestNo: SW6020B	Units: mg/L							
SampType: CCV	Run ID: ICP-MS5_200511B	Analysis Date: 5/11/2020 3:41:00 PM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Magnesium	5.12	0.300	5.00	0	102	90	110			
Sodium	5.06	0.300	5.00	0	101	90	110			

Sample ID: CCV6-200511	Batch ID: R110424	TestNo: SW6020B	Units: mg/L							
SampType: CCV	Run ID: ICP-MS5_200511B	Analysis Date: 5/11/2020 4:17:00 PM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	5.23	0.300	5.00	0	105	90	110			
Magnesium	5.16	0.300	5.00	0	103	90	110			
Sodium	5.10	0.300	5.00	0	102	90	110			

<p>Qualifiers:</p> <p>B Analyte detected in the associated Method Blank</p> <p>J Analyte detected between MDL and RL</p> <p>ND Not Detected at the Method Detection Limit</p> <p>RL Reporting Limit</p> <p>J Analyte detected between SDL and RL</p>	<p>DF Dilution Factor</p> <p>MDL Method Detection Limit</p> <p>R RPD outside accepted control limits</p> <p>S Spike Recovery outside control limits</p> <p>N Parameter not NELAP certified</p>
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CLIENT: Golder
Work Order: 2005038
Project: Luminant-OGSES-MNA

ANALYTICAL QC SUMMARY REPORT

RunID: IC4_200430A

Sample ID: DCS2-96153	Batch ID: 96153	TestNo: E300	Units: mg/L							
SampType: DCS2	Run ID: IC4_200430A	Analysis Date: 4/30/2020 11:31:49 AM	Prep Date: 4/30/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	0.473	1.00	0.5000	0	94.7	70	130	0	0	
Fluoride	0.191	0.400	0.2000	0	95.6	70	130	0	0	
Nitrate-N	0.243	0.0500	0.2500	0	97.0	70	130	0	0	
Sulfate	1.34	3.00	1.500	0	89.6	70	130	0	0	

Qualifiers: B Analyte detected in the associated Method Blank DF Dilution Factor
 J Analyte detected between MDL and RL MDL Method Detection Limit
 ND Not Detected at the Method Detection Limit R RPD outside accepted control limits
 RL Reporting Limit S Spike Recovery outside control limits
 J Analyte detected between SDL and RL N Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005038
Project: Luminant-OGSES-MNA

ANALYTICAL QC SUMMARY REPORT

RunID: IC4_200507A

The QC data in batch 96213 applies to the following samples: 2005038-01C, 2005038-02C, 2005038-03C, 2005038-04C, 2005038-05C

Sample ID: MB-96213	Batch ID: 96213	TestNo: E300	Units: mg/L
SampType: MBLK	Run ID: IC4_200507A	Analysis Date: 5/7/2020 10:26:10 AM	Prep Date: 5/7/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	<0.300	1.00								
Fluoride	<0.100	0.400								
Nitrate-N	<0.100	0.500								
Sulfate	<1.00	3.00								

Sample ID: LCS-96213	Batch ID: 96213	TestNo: E300	Units: mg/L
SampType: LCS	Run ID: IC4_200507A	Analysis Date: 5/7/2020 10:42:10 AM	Prep Date: 5/7/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	9.97	1.00	10.00	0	99.7	90	110			
Fluoride	3.70	0.400	4.000	0	92.6	90	110			
Nitrate-N	4.99	0.500	5.000	0	99.9	90	110			
Sulfate	29.2	3.00	30.00	0	97.5	90	110			

Sample ID: LCSD-96213	Batch ID: 96213	TestNo: E300	Units: mg/L
SampType: LCSD	Run ID: IC4_200507A	Analysis Date: 5/7/2020 10:58:10 AM	Prep Date: 5/7/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	9.95	1.00	10.00	0	99.5	90	110	0.142	20	
Fluoride	3.69	0.400	4.000	0	92.3	90	110	0.300	20	
Nitrate-N	5.43	0.500	5.000	0	109	90	110	8.45	20	
Sulfate	29.3	3.00	30.00	0	97.7	90	110	0.199	20	

Sample ID: 2005032-01CMS	Batch ID: 96213	TestNo: E300	Units: mg/L
SampType: MS	Run ID: IC4_200507A	Analysis Date: 5/7/2020 6:17:07 PM	Prep Date: 5/7/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	2090	100	2000	152.7	97.0	90	110			
Fluoride	1990	40.0	2000	0	99.4	90	110			
Nitrate-N	435	50.0	451.6	0	96.3	90	110			
Sulfate	2060	300	2000	104.8	97.7	90	110			

Sample ID: 2005032-01CMSD	Batch ID: 96213	TestNo: E300	Units: mg/L
SampType: MSD	Run ID: IC4_200507A	Analysis Date: 5/7/2020 6:33:07 PM	Prep Date: 5/7/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	2100	100	2000	152.7	97.2	90	110	0.222	20	
Fluoride	2000	40.0	2000	0	100	90	110	0.595	20	
Nitrate-N	437	50.0	451.6	0	96.7	90	110	0.417	20	
Sulfate	2050	300	2000	104.8	97.4	90	110	0.233	20	

- Qualifiers:**
- B Analyte detected in the associated Method Blank
 - J Analyte detected between MDL and RL
 - ND Not Detected at the Method Detection Limit
 - RL Reporting Limit
 - J Analyte detected between SDL and RL
 - DF Dilution Factor
 - MDL Method Detection Limit
 - R RPD outside accepted control limits
 - S Spike Recovery outside control limits
 - N Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005038
Project: Luminant-OGSES-MNA

ANALYTICAL QC SUMMARY REPORT

RunID: IC4_200507A

Sample ID: 2005022-01BMS	Batch ID: 96213	TestNo: E300	Units: mg/L
SampType: MS	Run ID: IC4_200507A	Analysis Date: 5/7/2020 6:49:07 PM	Prep Date: 5/7/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	243	10.0	200.0	46.49	98.2	90	110			
Fluoride	223	4.00	200.0	21.81	101	90	110			
Nitrate-N	45.7	5.00	45.16	1.937	97.0	90	110			
Sulfate	458	30.0	200.0	267.4	95.5	90	110			

Sample ID: 2005022-01BMSD	Batch ID: 96213	TestNo: E300	Units: mg/L
SampType: MSD	Run ID: IC4_200507A	Analysis Date: 5/7/2020 7:05:07 PM	Prep Date: 5/7/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	240	10.0	200.0	46.49	97.0	90	110	0.970	20	
Fluoride	223	4.00	200.0	21.81	100	90	110	0.247	20	
Nitrate-N	45.5	5.00	45.16	1.937	96.6	90	110	0.456	20	
Sulfate	458	30.0	200.0	267.4	95.1	90	110	0.187	20	

Qualifiers:

B Analyte detected in the associated Method Blank	DF Dilution Factor
J Analyte detected between MDL and RL	MDL Method Detection Limit
ND Not Detected at the Method Detection Limit	R RPD outside accepted control limits
RL Reporting Limit	S Spike Recovery outside control limits
J Analyte detected between SDL and RL	N Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005038
Project: Luminant-OGSES-MNA

ANALYTICAL QC SUMMARY REPORT

RunID: IC4_200507A

Sample ID: ICV-200507	Batch ID: R110392	TestNo: E300	Units: mg/L							
SampType: ICV	Run ID: IC4_200507A	Analysis Date: 5/7/2020 9:54:10 AM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	24.7	1.00	25.00	0	98.9	90	110			
Fluoride	9.55	0.400	10.00	0	95.5	90	110			
Nitrate-N	12.2	0.500	12.50	0	97.4	90	110			
Sulfate	74.8	3.00	75.00	0	99.7	90	110			

Sample ID: CCV1-200507	Batch ID: R110392	TestNo: E300	Units: mg/L							
SampType: CCV	Run ID: IC4_200507A	Analysis Date: 5/7/2020 5:29:07 PM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	9.94	1.00	10.00	0	99.4	90	110			
Fluoride	3.75	0.400	4.000	0	93.6	90	110			
Nitrate-N	4.95	0.500	5.000	0	98.9	90	110			
Sulfate	29.3	3.00	30.00	0	97.8	90	110			

Sample ID: CCV2-200507	Batch ID: R110392	TestNo: E300	Units: mg/L							
SampType: CCV	Run ID: IC4_200507A	Analysis Date: 5/7/2020 10:33:07 PM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	10.0	1.00	10.00	0	100	90	110			
Fluoride	3.81	0.400	4.000	0	95.3	90	110			
Nitrate-N	4.97	0.500	5.000	0	99.4	90	110			
Sulfate	29.4	3.00	30.00	0	98.0	90	110			

Qualifiers: B Analyte detected in the associated Method Blank DF Dilution Factor
 J Analyte detected between MDL and RL MDL Method Detection Limit
 ND Not Detected at the Method Detection Limit R RPD outside accepted control limits
 RL Reporting Limit S Spike Recovery outside control limits
 J Analyte detected between SDL and RL N Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005038
Project: Luminant-OGSES-MNA

ANALYTICAL QC SUMMARY REPORT

RunID: TITRATOR_200511A

The QC data in batch 96290 applies to the following samples: 2005038-01C, 2005038-02C, 2005038-03C, 2005038-04C, 2005038-05C

Sample ID: MB-96290	Batch ID: 96290	TestNo: M2320 B	Units: mg/L @ pH 4.43
SampType: MBLK	Run ID: TITRATOR_200511A	Analysis Date: 5/11/2020 11:32:00 AM	Prep Date: 5/11/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Alkalinity, Bicarbonate (As CaCO3)	<10.0	20.0								
Alkalinity, Carbonate (As CaCO3)	<10.0	20.0								
Alkalinity, Hydroxide (As CaCO3)	<10.0	20.0								
Alkalinity, Total (As CaCO3)	<20.0	20.0								

Sample ID: LCS-96290	Batch ID: 96290	TestNo: M2320 B	Units: mg/L @ pH 4.23
SampType: LCS	Run ID: TITRATOR_200511A	Analysis Date: 5/11/2020 11:36:00 AM	Prep Date: 5/11/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	53.4	20.0	50.00	0	107	74	129			

Sample ID: 2005013-01G-DUP	Batch ID: 96290	TestNo: M2320 B	Units: mg/L @ pH 4.52
SampType: DUP	Run ID: TITRATOR_200511A	Analysis Date: 5/11/2020 1:18:00 PM	Prep Date: 5/11/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Alkalinity, Bicarbonate (As CaCO3)	242	20.0	0	243.0				0.578	20	
Alkalinity, Carbonate (As CaCO3)	<10.0	20.0	0	0				0	20	
Alkalinity, Hydroxide (As CaCO3)	<10.0	20.0	0	0				0	20	
Alkalinity, Total (As CaCO3)	242	20.0	0	243.0				0.578	20	

<p>Qualifiers:</p> <p>B Analyte detected in the associated Method Blank</p> <p>J Analyte detected between MDL and RL</p> <p>ND Not Detected at the Method Detection Limit</p> <p>RL Reporting Limit</p> <p>J Analyte detected between SDL and RL</p>	<p>DF Dilution Factor</p> <p>MDL Method Detection Limit</p> <p>R RPD outside accepted control limits</p> <p>S Spike Recovery outside control limits</p> <p>N Parameter not NELAP certified</p>
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CLIENT: Golder
Work Order: 2005038
Project: Luminant-OGSES-MNA

ANALYTICAL QC SUMMARY REPORT

RunID: TITRATOR_200511A

Sample ID: ICV-200511	Batch ID: R110433	TestNo: M2320 B	Units: mg/L @ pH 4.33
SampType: ICV	Run ID: TITRATOR_200511A	Analysis Date: 5/11/2020 11:30:00 AM	Prep Date: 5/11/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Alkalinity, Bicarbonate (As CaCO3)	29.4	20.0	0							
Alkalinity, Carbonate (As CaCO3)	69.8	20.0	0							
Alkalinity, Hydroxide (As CaCO3)	<10.0	20.0	0							
Alkalinity, Total (As CaCO3)	99.1	20.0	100.0	0	99.1	98	102			

Sample ID: CCV1-200511	Batch ID: R110433	TestNo: M2320 B	Units: mg/L @ pH 4.26
SampType: CCV	Run ID: TITRATOR_200511A	Analysis Date: 5/11/2020 2:29:00 PM	Prep Date: 5/11/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Alkalinity, Bicarbonate (As CaCO3)	39.6	20.0	0							
Alkalinity, Carbonate (As CaCO3)	59.2	20.0	0							
Alkalinity, Hydroxide (As CaCO3)	<10.0	20.0	0							
Alkalinity, Total (As CaCO3)	98.8	20.0	100.0	0	98.8	90	110			

<p>Qualifiers:</p> <p>B Analyte detected in the associated Method Blank</p> <p>J Analyte detected between MDL and RL</p> <p>ND Not Detected at the Method Detection Limit</p> <p>RL Reporting Limit</p> <p>J Analyte detected between SDL and RL</p>	<p>DF Dilution Factor</p> <p>MDL Method Detection Limit</p> <p>R RPD outside accepted control limits</p> <p>S Spike Recovery outside control limits</p> <p>N Parameter not NELAP certified</p>
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CLIENT: Golder
Work Order: 2005038
Project: Luminant-OGSES-MNA

ANALYTICAL QC SUMMARY REPORT

RunID: UV/VIS_2_200323B

Sample ID: DCS-95613	Batch ID: 95613	TestNo: M3500-Fe D	Units: mg/L							
SampType: DCS	Run ID: UV/VIS_2_200323B	Analysis Date: 3/23/2020 1:30:00 PM	Prep Date: 3/23/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron, Ferrous	0.0580	0.100	0.05000	0	116	65	135	0	0	N

Qualifiers:

B Analyte detected in the associated Method Blank	DF Dilution Factor
J Analyte detected between MDL and RL	MDL Method Detection Limit
ND Not Detected at the Method Detection Limit	R RPD outside accepted control limits
RL Reporting Limit	S Spike Recovery outside control limits
J Analyte detected between SDL and RL	N Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005038
Project: Luminant-OGSES-MNA

ANALYTICAL QC SUMMARY REPORT

RunID: UV/VIS_2_200507C

The QC data in batch 96253 applies to the following samples: 2005038-01C, 2005038-02C, 2005038-03C, 2005038-04C, 2005038-05C

Sample ID: MB-96253	Batch ID: 96253	TestNo: M4500-P E	Units: mg/L							
SampType: MBLK	Run ID: UV/VIS_2_200507C	Analysis Date: 5/7/2020 2:21:00 PM	Prep Date: 5/7/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Phosphorus, Total Orthophosphate (As <0.0300 0.100

Sample ID: LCS-96253	Batch ID: 96253	TestNo: M4500-P E	Units: mg/L							
SampType: LCS	Run ID: UV/VIS_2_200507C	Analysis Date: 5/7/2020 2:21:00 PM	Prep Date: 5/7/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Phosphorus, Total Orthophosphate (As 0.499 0.100 0.5000 0 99.8 80 120

Sample ID: LCSD-96253	Batch ID: 96253	TestNo: M4500-P E	Units: mg/L							
SampType: LCSD	Run ID: UV/VIS_2_200507C	Analysis Date: 5/7/2020 2:21:00 PM	Prep Date: 5/7/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Phosphorus, Total Orthophosphate (As 0.498 0.100 0.5000 0 99.6 80 120 0.201 15

Sample ID: DCS-96253	Batch ID: 96253	TestNo: M4500-P E	Units: mg/L							
SampType: DCS	Run ID: UV/VIS_2_200507C	Analysis Date: 5/7/2020 2:22:00 PM	Prep Date: 5/7/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Phosphorus, Total Orthophosphate (As 0.0480 0.100 0.05000 0 96.0 50 200

Sample ID: 2005038-01CMS	Batch ID: 96253	TestNo: M4500-P E	Units: mg/L							
SampType: MS	Run ID: UV/VIS_2_200507C	Analysis Date: 5/7/2020 2:22:00 PM	Prep Date: 5/7/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Phosphorus, Total Orthophosphate (As 0.582 0.100 0.5000 0.07600 101 80 120

Sample ID: 2005038-01CMSD	Batch ID: 96253	TestNo: M4500-P E	Units: mg/L							
SampType: MSD	Run ID: UV/VIS_2_200507C	Analysis Date: 5/7/2020 2:22:00 PM	Prep Date: 5/7/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Phosphorus, Total Orthophosphate (As 0.583 0.100 0.5000 0.07600 101 80 120 0.172 15

Qualifiers: B Analyte detected in the associated Method Blank
J Analyte detected between MDL and RL
ND Not Detected at the Method Detection Limit
RL Reporting Limit
J Analyte detected between SDL and RL
DF Dilution Factor
MDL Method Detection Limit
R RPD outside accepted control limits
S Spike Recovery outside control limits
N Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005038
Project: Luminant-OGSES-MNA

ANALYTICAL QC SUMMARY REPORT

RunID: UV/VIS_2_200507C

Sample ID: ICV-200507	Batch ID: R110386	TestNo: M4500-P E	Units: mg/L							
SampType: ICV	Run ID: UV/VIS_2_200507C	Analysis Date: 5/7/2020 2:20:00 PM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Phosphorus, Total Orthophosphate (As	0.198	0.100	0.2000	0	99.0	85	115			

Sample ID: CCV1-200507	Batch ID: R110386	TestNo: M4500-P E	Units: mg/L							
SampType: CCV	Run ID: UV/VIS_2_200507C	Analysis Date: 5/7/2020 2:24:00 PM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Phosphorus, Total Orthophosphate (As	0.506	0.100	0.5000	0	101	85	115			

Qualifiers:

B Analyte detected in the associated Method Blank	DF Dilution Factor
J Analyte detected between MDL and RL	MDL Method Detection Limit
ND Not Detected at the Method Detection Limit	R RPD outside accepted control limits
RL Reporting Limit	S Spike Recovery outside control limits
J Analyte detected between SDL and RL	N Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005038
Project: Luminant-OGSES-MNA

ANALYTICAL QC SUMMARY REPORT

RunID: UV/VIS_2_200513B

The QC data in batch 96316 applies to the following samples: 2005038-01A, 2005038-02A, 2005038-03A, 2005038-04A, 2005038-05A

Sample ID: MB-96316	Batch ID: 96316	TestNo: M3500-Fe D	Units: mg/L
SampType: MBLK	Run ID: UV/VIS_2_200513B	Analysis Date: 5/13/2020 10:41:00 AM	Prep Date: 5/13/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron, Ferrous	<0.0500	0.100								N

Sample ID: LCS-96316	Batch ID: 96316	TestNo: M3500-Fe D	Units: mg/L
SampType: LCS	Run ID: UV/VIS_2_200513B	Analysis Date: 5/13/2020 10:41:00 AM	Prep Date: 5/13/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron, Ferrous	0.106	0.100	0.1000	0	106	85	115			N

Sample ID: LCSD-96316	Batch ID: 96316	TestNo: M3500-Fe D	Units: mg/L
SampType: LCSD	Run ID: UV/VIS_2_200513B	Analysis Date: 5/13/2020 10:42:00 AM	Prep Date: 5/13/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron, Ferrous	0.105	0.100	0.1000	0	105	85	115	0.720	15	N

Sample ID: 2005038-01AMS	Batch ID: 96316	TestNo: M3500-Fe D	Units: mg/L
SampType: MS	Run ID: UV/VIS_2_200513B	Analysis Date: 5/13/2020 11:29:00 AM	Prep Date: 5/13/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron, Ferrous	0.120	0.100	0.1000	0	120	85	115			SN

Sample ID: 2005038-01AMSD	Batch ID: 96316	TestNo: M3500-Fe D	Units: mg/L
SampType: MSD	Run ID: UV/VIS_2_200513B	Analysis Date: 5/13/2020 11:29:00 AM	Prep Date: 5/13/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron, Ferrous	0.109	0.100	0.1000	0	109	85	115	8.97	15	N

Qualifiers:	B Analyte detected in the associated Method Blank	DF Dilution Factor
	J Analyte detected between MDL and RL	MDL Method Detection Limit
	ND Not Detected at the Method Detection Limit	R RPD outside accepted control limits
	RL Reporting Limit	S Spike Recovery outside control limits
	J Analyte detected between SDL and RL	N Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005038
Project: Luminant-OGSES-MNA

ANALYTICAL QC SUMMARY REPORT

RunID: UV/VIS_2_200513B

Sample ID: ICV-200513	Batch ID: R110472	TestNo: M3500-Fe D	Units: mg/L							
SampType: ICV	Run ID: UV/VIS_2_200513B	Analysis Date: 5/13/2020 10:40:00 AM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron, Ferrous	0.112	0.100	0.1000	0	112	85	115			N

Sample ID: CCV1-200513	Batch ID: R110472	TestNo: M3500-Fe D	Units: mg/L							
SampType: CCV	Run ID: UV/VIS_2_200513B	Analysis Date: 5/13/2020 11:02:00 AM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron, Ferrous	0.192	0.100	0.2000	0	96.2	85	115			N

Sample ID: CCV2-200513	Batch ID: R110472	TestNo: M3500-Fe D	Units: mg/L							
SampType: CCV	Run ID: UV/VIS_2_200513B	Analysis Date: 5/13/2020 11:15:00 AM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron, Ferrous	0.187	0.100	0.2000	0	93.5	85	115			N

Sample ID: CCV3-200513	Batch ID: R110472	TestNo: M3500-Fe D	Units: mg/L							
SampType: CCV	Run ID: UV/VIS_2_200513B	Analysis Date: 5/13/2020 11:31:00 AM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron, Ferrous	0.205	0.100	0.2000	0	103	85	115			N

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005038
Project: Luminant-OGSES-MNA

SQL SUMMARY REPORT

TestNo: E300	MDL	SQL
Analyte	mg/L	mg/L
Chloride	0.300	1.00
Fluoride	0.100	0.400
Nitrate-N	0.100	0.500
Sulfate	1.00	3.00

TestNo: SW6020B	MDL	SQL
Analyte	mg/L	mg/L
Calcium	0.100	0.300
Iron	0.0300	0.100
Magnesium	0.100	0.300
Potassium	0.100	0.300
Sodium	0.100	0.300

TestNo: M2320 B	MDL	SQL
Analyte	g/L @ pH 4.4	g/L @ pH 4.4
Alkalinity, Bicarbonate (As CaCO ₃)	10.0	20.0
Alkalinity, Carbonate (As CaCO ₃)	10.0	20.0
Alkalinity, Hydroxide (As CaCO ₃)	10.0	20.0
Alkalinity, Total (As CaCO ₃)	20.0	20.0

TestNo: M3500-Fe D	MDL	SQL
Analyte	mg/L	mg/L
Iron, Ferrous	0.0500	0.100

TestNo: M4500-P E	MDL	SQL
Analyte	mg/L	mg/L
Phosphorus, Total Orthophosphate (0.0300	0.100

Qualifiers: SQL -Method Quantitation Limit as defined by TRRP
MDL -Method Detection Limit as defined by TRRP



June 10, 2020

Will Vienne
Golder
2201 Double Creek Dr #4004
Round Rock, Texas 78664
TEL: (512) 671-3434
FAX (512) 671-3446
RE: Luminant-OGSES-CCR

Order No.: 2005040

Dear Will Vienne:

DHL Analytical, Inc. received 2 sample(s) on 5/7/2020 for the analyses presented in the following report.

There were no problems with the analyses and all data met requirements of NELAP except where noted in the Case Narrative. All non-NELAP methods will be identified accordingly in the case narrative and all estimated uncertainties of test results are within method or EPA specifications.

If you have any questions regarding these tests results, please feel free to call. Thank you for using DHL Analytical.

Sincerely,

A handwritten signature in red ink, appearing to read "John DuPont".

John DuPont
General Manager

This report was performed under the accreditation of the State of Texas Laboratory Certification Number: T104704211-20-25



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Eric Lau

From: John DuPont
Sent: Tuesday, May 28, 2019 11:35 AM
To: Eric Lau
Subject: FW: CCR Analysis

Appendix III Parameters:

Metals (Ca and B)
Anions (Cl, F, and SO4)
TDS

Appendix IV Parameters:

Metals (As, Ba, Be, Cd, Co, Cr, Hg, Li, Mo, Pb, Sb, Se, and Tl)
Ra-226
Ra-228


From: Vienne, Will [mailto:William_Vienne@golder.com]
Sent: Tuesday, April 09, 2019 12:48 PM
To: John DuPont <dupont@dhlanalytical.com>
Subject: CCR Analysis

CUSTODY

DATE 5-7-20

SIGNATURE John

SEAL

 **DHL**
ANALYTICAL

Bray

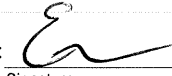
Sample Receipt Checklist


Client Name **Golder**

Date Received: **5/7/2020**

Work Order Number **2005040**

Received by: **EL**

Checklist completed by:  5/7/2020
Signature Date

Reviewed by  5/7/2020
Initials Date

Carrier name: Hand Delivered

- Shipping container/cooler in good condition? Yes No Not Present
- Custody seals intact on shipping container/cooler? Yes No Not Present
- Custody seals intact on sample bottles? Yes No Not Present
- Chain of custody present? Yes No
- Chain of custody signed when relinquished and received? Yes No
- Chain of custody agrees with sample labels? Yes No
- Samples in proper container/bottle? Yes No
- Sample containers intact? Yes No
- Sufficient sample volume for indicated test? Yes No
- All samples received within holding time? Yes No
- Container/Temp Blank temperature in compliance? Yes No **0.9 °C**
- Water - VOA vials have zero headspace? Yes No No VOA vials submitted
- Water - pH<2 acceptable upon receipt? Yes No NA LOT # 13171
- Adjusted? no Checked by EL
- Water - pH>9 (S) or pH>10 (CN) acceptable upon receipt? Yes No NA LOT #
- Adjusted? _____ Checked by _____

Any No response must be detailed in the comments section below.

Client contacted: _____ Date contacted: _____ Person contacted _____

Contacted by: _____ Regarding: _____

Comments: _____

Corrective Action _____

Laboratory Name: DHL Analytical, Inc.							
Laboratory Review Checklist: Reportable Data							
Project Name: Luminant-OGSES-CCR				LRC Date: 6/10/20			
Reviewer Name: Carlos Castro				Laboratory Work Order: 2005040			
Prep Batch Number(s): See Prep Dates Report				Run Batch: See Analytical Dates Report			
# ¹	A ²	Description	Yes	No	NA ³	NR ⁴	ER# ⁵
		Chain-of-Custody (C-O-C)					
R1	OI	1) Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				R1-01
		2) Were all departures from standard conditions described in an exception report?			X		
R2	OI	Sample and Quality Control (QC) Identification					
		1) Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
		2) Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
R3	OI	Test Reports					
		1) Were all samples prepared and analyzed within holding times?	X				
		2) Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
		3) Were calculations checked by a peer or supervisor?	X				
		4) Were all analyte identifications checked by a peer or supervisor?	X				
		5) Were sample detection limits reported for all analytes not detected?	X				
		6) Were all results for soil and sediment samples reported on a dry weight basis?			X		
		7) Were % moisture (or solids) reported for all soil and sediment samples?			X		
		8) Were bulk soils/solids samples for volatile analysis extracted with methanol per EPA Method 5035?			X		
		9) If required for the project, TICs reported?			X		
R4	O	Surrogate Recovery Data					
		1) Were surrogates added prior to extraction?			X		
		2) Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
R5	OI	Test Reports/Summary Forms for Blank Samples					
		1) Were appropriate type(s) of blanks analyzed?	X				
		2) Were blanks analyzed at the appropriate frequency?	X				
		3) Where method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
		4) Were blank concentrations < MDL?	X				
		5) For analyte(s) detected in a blank sample, was the concentration, unadjusted for sample specific factors, in all associated field samples, greater than 10 times the concentration in the blank sample?			X		
R6	OI	Laboratory Control Samples (LCS):					
		1) Were all COCs included in the LCS?	X				
		2) Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
		3) Were LCSs analyzed at the required frequency?	X				
		4) Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
		5) Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
		6) Was the LCSD RPD within QC limits (if applicable)?	X				
R7	OI	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Data					
		1) Were the project/method specified analytes included in the MS and MSD?	X				
		2) Were MS/MSD analyzed at the appropriate frequency?	X				
		3) Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	X				
		4) Were MS/MSD RPDs within laboratory QC limits?	X				
R8	OI	Analytical Duplicate Data					
		1) Were appropriate analytical duplicates analyzed for each matrix?	X				
		2) Were analytical duplicates analyzed at the appropriate frequency?	X				
		3) Were RPDs or relative standard deviations within the laboratory QC limits?	X				
R9	OI	Method Quantitation Limits (MQLs):					
		1) Are the MQLs for each method analyte included in the laboratory data package?	X				
		2) Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
		3) Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
R10	OI	Other Problems/Anomalies					
		1) Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
		2) Was applicable and available technology used to lower the SDL to minimize the matrix interference affects on the sample results?	X				
		3) Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices and methods associated with this laboratory data package?	X				

Laboratory Name: DHL Analytical, Inc.							
Laboratory Review Checklist (continued): Supporting Data							
Project Name: Luminant-OGSES-CCR				LRC Date: 6/10/20			
Reviewer Name: Carlos Castro				Laboratory Work Order: 2005040			
Prep Batch Number(s): See Prep Dates Report				Run Batch: See Analytical Dates Report			
# ¹	A ²	Description	Yes	No	NA ³	NR ⁴	ER# ⁵
S1	OI	Initial Calibration (ICAL)					
		1) Were response factors and/or relative response factors for each analyte within QC limits?	X				
		2) Were percent RSDs or correlation coefficient criteria met?	X				
		3) Was the number of standards recommended in the method used for all analytes?	X				
		4) Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		5) Are ICAL data available for all instruments used?	X				
		6) Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	Initial and Continuing calibration Verification (ICCV and CCV) and Continuing Calibration blank (CCB):					
		1) Was the CCV analyzed at the method-required frequency?	X				
		2) Were percent differences for each analyte within the method-required QC limits?	X				
		3) Was the ICAL curve verified for each analyte?	X				
		4) Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	X				
S3	O	Mass Spectral Tuning:					
		1) Was the appropriate compound for the method used for tuning?	X				
		2) Were ion abundance data within the method-required QC limits?	X				
S4	O	Internal Standards (IS):					
		1) Were IS area counts and retention times within the method-required QC limits?	X				
S5	OI	Raw Data (NELAC Section 5.5.10)					
		1) Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		2) Were data associated with manual integrations flagged on the raw data?	X				
S6	O	Dual Column Confirmation					
		1) Did dual column confirmation results meet the method-required QC?			X		
S7	O	Tentatively Identified Compounds (TICs):					
		1) If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	Interference Check Sample (ICS) Results:					
		1) Were percent recoveries within method QC limits?	X				
S9	I	Serial Dilutions, Post Digestion Spikes, and Method of Standard Additions					
		1) Were percent differences, recoveries, and the linearity within the QC limits specified in the method?		X			S9-01
S10	OI	Method Detection Limit (MDL) Studies					
		1) Was a MDL study performed for each reported analyte?	X				
		2) Is the MDL either adjusted or supported by the analysis of DCSs?	X				
S11	OI	Proficiency Test Reports:					
		1) Was the lab's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	Standards Documentation					
		1) Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	Compound/Analyte Identification Procedures					
		1) Are the procedures for compound/analyte identification documented?	X				
S14	OI	Demonstration of Analyst Competency (DOC)					
		1) Was DOC conducted consistent with NELAC Chapter 5 – Appendix C?	X				
		2) Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	Verification/Validation Documentation for Methods (NELAC Chapter 5)					
		1) Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	Laboratory Standard Operating Procedures (SOPs):					
		1) Are laboratory SOPs current and on file for each method performed?	X				

1 Items identified by the letter "R" should be included in the laboratory data package submitted to the TCEQ in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.

2 O = organic analyses; I = inorganic analyses (and general chemistry, when applicable).

3 NA = Not applicable.

4 NR = Not Reviewed.

5 ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Data Package Signature Page – RG-366/TRRP-13

This data package consists of:

This signature page, the laboratory review checklist, and the following reportable data:


- R1 Field chain-of-custody documentation;
- R2 Sample identification cross-reference;
- R3 Test reports (analytical data sheets) for each environmental sample that includes:
 - a) Items consistent with NELAC Chapter 5,
 - b) dilution factors,
 - c) preparation methods,
 - d) cleanup methods, and
 - e) if required for the project, tentatively identified compounds (TICs).
- R4 Surrogate recovery data including:
 - a) Calculated recovery (%R), and
 - b) The laboratory's surrogate QC limits.
- R5 Test reports/summary forms for blank samples;
- R6 Test reports/summary forms for laboratory control samples (LCSs) including:
 - a) LCS spiking amounts,
 - b) Calculated %R for each analyte, and
 - c) The laboratory's LCS QC limits.
- R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
 - a) Samples associated with the MS/MSD clearly identified,
 - b) MS/MSD spiking amounts,
 - c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
 - d) Calculated %Rs and relative percent differences (RPDs), and
 - e) The laboratory's MS/MSD QC limits
- R8 Laboratory analytical duplicate (if applicable) recovery and precision:
 - a) The amount of analyte measured in the duplicate,
 - b) The calculated RPD, and
 - c) The laboratory's QC limits for analytical duplicates.
- R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix;
- R10 Other problems or anomalies.

The Exception Report for each "No" or "Not Reviewed (NR)" item in the Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory is not accredited under the Texas Laboratory Accreditation Program.

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the Exception Reports. By my signature below, I affirm to the best of my knowledge that all problems/anomalies observed by the laboratory have been identified in the Laboratory Review Checklist, and no information or data affecting the quality of the data has been knowingly withheld.

This laboratory was last inspected by TCEQ on February 25-28 2019. Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Name: John DuPont
Official Title: General Manager


Signature

06/10/20
Date

Name: Dr. Derhsing Luu
Official Title: Technical Director

CLIENT: Golder
Project: Luminant-OGSES-CCR
Lab Order: 2005040

CASE NARRATIVE

Samples were analyzed using the methods outlined in the following references:

- Method SW6020B - Metals Analysis
- Method SW7470A - Mercury Analysis
- Method E300 - Anions Analysis
- Method M2540C - TDS Analysis

Exception Report R1-01

The samples were received and log-in performed on 5/7/20. A total of 2 samples were received. The samples arrived in good condition and were properly packaged.

Exception Report S9-01

For Metals analysis performed on 5/11/20 the RPD for the serial dilution was slightly above control limits for Boron. This is flagged accordingly in the QC summary report. The PDS was within control limits for this analyte. No further corrective actions were taken.

CLIENT: Golder
Project: Luminant-OGSES-CCR
Lab Order: 2005040

Work Order Sample Summary

Lab Smp ID	Client Sample ID	Tag Number	Date Collected	Date Recved
2005040-01	FGD-6		05/06/20 01:20 PM	5/7/2020
2005040-02	FGD-3		05/06/20 02:20 PM	5/7/2020

Lab Order: 2005040
 Client: Golder
 Project: Luminant-OGSES-CCR

PREP DATES REPORT

Sample ID	Client Sample ID	Collection Date	Matrix	Test Number	Test Name	Prep Date	Batch ID
2005040-01A	FGD-6	05/06/20 01:20 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/08/20 10:34 AM	96270
	FGD-6	05/06/20 01:20 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/08/20 10:34 AM	96270
	FGD-6	05/06/20 01:20 PM	Aqueous	SW7470A	Mercury Aq Prep	05/12/20 01:39 PM	96317
2005040-01B	FGD-6	05/06/20 01:20 PM	Aqueous	E300	Anion Preparation	05/07/20 08:41 AM	96213
	FGD-6	05/06/20 01:20 PM	Aqueous	E300	Anion Preparation	05/07/20 08:41 AM	96213
	FGD-6	05/06/20 01:20 PM	Aqueous	M2540C	TDS Preparation	05/07/20 01:32 PM	96250
2005040-02A	FGD-3	05/06/20 02:20 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/08/20 10:34 AM	96270
	FGD-3	05/06/20 02:20 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/08/20 10:34 AM	96270
	FGD-3	05/06/20 02:20 PM	Aqueous	SW7470A	Mercury Aq Prep	05/12/20 01:39 PM	96317
2005040-02B	FGD-3	05/06/20 02:20 PM	Aqueous	E300	Anion Preparation	05/07/20 08:41 AM	96213
	FGD-3	05/06/20 02:20 PM	Aqueous	E300	Anion Preparation	05/07/20 08:41 AM	96213
	FGD-3	05/06/20 02:20 PM	Aqueous	M2540C	TDS Preparation	05/07/20 01:32 PM	96250

Lab Order: 2005040
 Client: Golder
 Project: Luminant-OGSES-CCR

ANALYTICAL DATES REPORT

Sample ID	Client Sample ID	Matrix	Test Number	Test Name	Batch ID	Dilution	Analysis Date	Run ID
2005040-01A	FGD-6	Aqueous	SW7470A	Mercury Total: Aqueous	96317	1	05/13/20 12:19 PM	CETAC2_HG_200513 A
	FGD-6	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	96270	5	05/11/20 04:08 PM	ICP-MS5_200511B
	FGD-6	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	96270	1	05/11/20 02:50 PM	ICP-MS5_200511B
2005040-01B	FGD-6	Aqueous	E300	Anions by IC method - Water	96213	1	05/07/20 08:25 PM	IC4_200507A
	FGD-6	Aqueous	E300	Anions by IC method - Water	96213	10	05/07/20 07:53 PM	IC4_200507A
	FGD-6	Aqueous	M2540C	Total Dissolved Solids	96250	1	05/07/20 04:50 PM	WC_200507D
2005040-02A	FGD-3	Aqueous	SW7470A	Mercury Total: Aqueous	96317	1	05/13/20 12:21 PM	CETAC2_HG_200513 A
	FGD-3	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	96270	5	05/11/20 04:10 PM	ICP-MS5_200511B
	FGD-3	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	96270	1	05/11/20 02:52 PM	ICP-MS5_200511B
2005040-02B	FGD-3	Aqueous	E300	Anions by IC method - Water	96213	1	05/07/20 08:41 PM	IC4_200507A
	FGD-3	Aqueous	E300	Anions by IC method - Water	96213	10	05/07/20 08:09 PM	IC4_200507A
	FGD-3	Aqueous	M2540C	Total Dissolved Solids	96250	1	05/07/20 04:50 PM	WC_200507D

DHL Analytical, Inc.

Date: 10-Jun-20

CLIENT: Golder
Project: Luminant-OGSES-CCR
Project No: 19122262-F2020
Lab Order: 2005040

Client Sample ID: FGD-6
Lab ID: 2005040-01
Collection Date: 05/06/20 01:20 PM
Matrix: AQUEOUS

Analyses	Result	SDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		SW6020B		Analyst: RO			
Antimony	<0.000800	0.000800	0.00250		mg/L	1	05/11/20 02:50 PM
Arsenic	0.00286	0.00200	0.00500	J	mg/L	1	05/11/20 02:50 PM
Barium	0.0814	0.00300	0.0100		mg/L	1	05/11/20 02:50 PM
Beryllium	<0.000300	0.000300	0.00100		mg/L	1	05/11/20 02:50 PM
Boron	0.109	0.0100	0.0300		mg/L	1	05/11/20 02:50 PM
Cadmium	<0.000300	0.000300	0.00100		mg/L	1	05/11/20 02:50 PM
Calcium	27.4	0.500	1.50		mg/L	5	05/11/20 04:08 PM
Chromium	<0.00200	0.00200	0.00500		mg/L	1	05/11/20 02:50 PM
Cobalt	<0.00300	0.00300	0.00500		mg/L	1	05/11/20 02:50 PM
Lead	<0.000300	0.000300	0.00100		mg/L	1	05/11/20 02:50 PM
Lithium	0.00877	0.00500	0.0100	J	mg/L	1	05/11/20 02:50 PM
Molybdenum	0.00205	0.00200	0.00500	J	mg/L	1	05/11/20 02:50 PM
Selenium	<0.00200	0.00200	0.00500		mg/L	1	05/11/20 02:50 PM
Thallium	<0.000500	0.000500	0.00150		mg/L	1	05/11/20 02:50 PM
MERCURY TOTAL: AQUEOUS		SW7470A		Analyst: BM			
Mercury	<0.0000800	0.0000800	0.000200		mg/L	1	05/13/20 12:19 PM
ANIONS BY IC METHOD - WATER		E300		Analyst: SNM			
Chloride	189	3.00	10.0		mg/L	70	05/07/20 07:53 PM
Fluoride	0.292	0.100	0.400	J	mg/L	1	05/07/20 08:25 PM
Sulfate	70.7	1.00	3.00		mg/L	1	05/07/20 08:25 PM
TOTAL DISSOLVED SOLIDS		M2540C		Analyst: JS			
Total Dissolved Solids (Residue, Filterable)	746	10.0	10.0		mg/L	1	05/07/20 04:50 PM

Qualifiers: ND - Not Detected at the SDL
 J - Analyte detected between SDL and RL
 B - Analyte detected in the associated Method Blank
 DF- Dilution Factor
 N - Parameter not NELAP certified
 See Final Page of Report for MQLs and MDLs

S - Spike Recovery outside control limits
 C - Sample Result or QC discussed in Case Narrative
 RL - Reporting Limit (MQL adjusted for moisture and sample size)
 SDL - Sample Detection Limit
 E - TPH pattern not Gas or Diesel Range Pattern

DHL Analytical, Inc.

Date: 10-Jun-20

CLIENT: Golder
Project: Luminant-OGSES-CCR
Project No: 19122262-F2020
Lab Order: 2005040

Client Sample ID: FGD-3
Lab ID: 2005040-02
Collection Date: 05/06/20 02:20 PM
Matrix: AQUEOUS

Analyses	Result	SDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		SW6020B		Analyst: RO			
Antimony	<0.000800	0.000800	0.00250		mg/L	1	05/11/20 02:52 PM
Arsenic	0.00209	0.00200	0.00500	J	mg/L	1	05/11/20 02:52 PM
Barium	0.0353	0.00300	0.0100		mg/L	1	05/11/20 02:52 PM
Beryllium	<0.000300	0.000300	0.00100		mg/L	1	05/11/20 02:52 PM
Boron	0.152	0.0100	0.0300		mg/L	1	05/11/20 02:52 PM
Cadmium	<0.000300	0.000300	0.00100		mg/L	1	05/11/20 02:52 PM
Calcium	42.3	0.500	1.50		mg/L	5	05/11/20 04:10 PM
Chromium	0.0117	0.00200	0.00500		mg/L	1	05/11/20 02:52 PM
Cobalt	0.00332	0.00300	0.00500	J	mg/L	1	05/11/20 02:52 PM
Lead	<0.000300	0.000300	0.00100		mg/L	1	05/11/20 02:52 PM
Lithium	0.0498	0.00500	0.0100		mg/L	1	05/11/20 02:52 PM
Molybdenum	0.00284	0.00200	0.00500	J	mg/L	1	05/11/20 02:52 PM
Selenium	0.00993	0.00200	0.00500		mg/L	1	05/11/20 02:52 PM
Thallium	0.000556	0.000500	0.00150	J	mg/L	1	05/11/20 02:52 PM
MERCURY TOTAL: AQUEOUS		SW7470A		Analyst: BM			
Mercury	<0.0000800	0.0000800	0.000200		mg/L	1	05/13/20 12:21 PM
ANIONS BY IC METHOD - WATER		E300		Analyst: SNM			
Chloride	70.2	3.00	10.0		mg/L	70	05/07/20 08:09 PM
Fluoride	0.800	0.100	0.400		mg/L	1	05/07/20 08:41 PM
Sulfate	129	1.00	3.00		mg/L	1	05/07/20 08:41 PM
TOTAL DISSOLVED SOLIDS		M2540C		Analyst: JS			
Total Dissolved Solids (Residue, Filterable)	777	10.0	10.0		mg/L	1	05/07/20 04:50 PM

Qualifiers: ND - Not Detected at the SDL
 J - Analyte detected between SDL and RL
 B - Analyte detected in the associated Method Blank
 DF- Dilution Factor
 N - Parameter not NELAP certified
 See Final Page of Report for MQLs and MDLs

S - Spike Recovery outside control limits
 C - Sample Result or QC discussed in Case Narrative
 RL - Reporting Limit (MQL adjusted for moisture and sample size)
 SDL - Sample Detection Limit
 E - TPH pattern not Gas or Diesel Range Pattern

CLIENT: Golder
Work Order: 2005040
Project: Luminant-OGSES-CCR

ANALYTICAL QC SUMMARY REPORT

RunID: CETAC2_HG_200304C

Sample ID: DCS-95289	Batch ID: 95289	TestNo: SW7470A	Units: mg/L							
SampType: DCS	Run ID: CETAC2_HG_200304C	Analysis Date: 3/4/2020 12:11:09 PM	Prep Date: 3/4/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.000175	0.000200	0.000200	0	87.5	82	119	0	0	

Qualifiers: B Analyte detected in the associated Method Blank
 J Analyte detected between MDL and RL
 ND Not Detected at the Method Detection Limit
 RL Reporting Limit
 J Analyte detected between SDL and RL

DF Dilution Factor
 MDL Method Detection Limit
 R RPD outside accepted control limits
 S Spike Recovery outside control limits
 N Parameter not NELAP certified

CLIENT: Golder
 Work Order: 2005040
 Project: Luminant-OGSES-CCR

ANALYTICAL QC SUMMARY REPORT

RunID: CETAC2_HG_200513A

The QC data in batch 96317 applies to the following samples: 2005040-01A, 2005040-02A

Sample ID: MB-96317	Batch ID: 96317	TestNo: SW7470A	Units: mg/L							
SampType: MBLK	Run ID: CETAC2_HG_200513A	Analysis Date: 5/13/2020 12:09:44 PM	Prep Date: 5/12/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Mercury	<0.0000800	0.000200								
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Sample ID: LCS-96317	Batch ID: 96317	TestNo: SW7470A	Units: mg/L							
SampType: LCS	Run ID: CETAC2_HG_200513A	Analysis Date: 5/13/2020 12:14:44 PM	Prep Date: 5/12/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Mercury	0.00195	0.000200	0.00200	0	97.5	85	115			
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Sample ID: LCSD-96317	Batch ID: 96317	TestNo: SW7470A	Units: mg/L							
SampType: LCSD	Run ID: CETAC2_HG_200513A	Analysis Date: 5/13/2020 12:17:01 PM	Prep Date: 5/12/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Mercury	0.00206	0.000200	0.00200	0	103	85	115	5.49	15	
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Sample ID: 2005048-02A MS	Batch ID: 96317	TestNo: SW7470A	Units: mg/L							
SampType: MS	Run ID: CETAC2_HG_200513A	Analysis Date: 5/13/2020 12:28:20 PM	Prep Date: 5/12/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Mercury	0.0104	0.00100	0.0100	0	104	80	120			
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Sample ID: 2005048-02A MSD	Batch ID: 96317	TestNo: SW7470A	Units: mg/L							
SampType: MSD	Run ID: CETAC2_HG_200513A	Analysis Date: 5/13/2020 12:30:36 PM	Prep Date: 5/12/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Mercury	0.0105	0.00100	0.0100	0	104	80	120	0.480	15	
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Sample ID: 2005048-02A SD	Batch ID: 96317	TestNo: SW7470A	Units: mg/L							
SampType: SD	Run ID: CETAC2_HG_200513A	Analysis Date: 5/13/2020 12:32:52 PM	Prep Date: 5/12/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Mercury	<0.00200	0.00500	0	0				0	10	
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Sample ID: 2005048-02A PDS	Batch ID: 96317	TestNo: SW7470A	Units: mg/L							
SampType: PDS	Run ID: CETAC2_HG_200513A	Analysis Date: 5/13/2020 12:35:07 PM	Prep Date: 5/12/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Mercury	0.0124	0.00100	0.0125	0	99.2	85	115			
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- Qualifiers:**
- B Analyte detected in the associated Method Blank
 - J Analyte detected between MDL and RL
 - ND Not Detected at the Method Detection Limit
 - RL Reporting Limit
 - J Analyte detected between SDL and RL
 - DF Dilution Factor
 - MDL Method Detection Limit
 - R RPD outside accepted control limits
 - S Spike Recovery outside control limits
 - N Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005040
Project: Luminant-OGSES-CCR

ANALYTICAL QC SUMMARY REPORT

RunID: CETAC2_HG_200513A

Sample ID: ICV-200513	Batch ID: R110466	TestNo: SW7470A	Units: mg/L							
SampType: ICV	Run ID: CETAC2_HG_200513A	Analysis Date: 5/13/2020 10:49:14 AM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.00383	0.000200	0.00400	0	95.8	90	110			

Sample ID: CCV1-200513	Batch ID: R110466	TestNo: SW7470A	Units: mg/L							
SampType: CCV	Run ID: CETAC2_HG_200513A	Analysis Date: 5/13/2020 1:06:55 PM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.00202	0.000200	0.00200	0	101	90	110			

Qualifiers: B Analyte detected in the associated Method Blank J Analyte detected between MDL and RL ND Not Detected at the Method Detection Limit RL Reporting Limit J Analyte detected between SDL and RL	DF Dilution Factor MDL Method Detection Limit R RPD outside accepted control limits S Spike Recovery outside control limits N Parameter not NELAP certified
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CLIENT: Golder
Work Order: 2005040
Project: Luminant-OGSES-CCR

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS5_200408C

Sample ID: DCS1-95814	Batch ID: 95814	TestNo: SW6020B	Units: mg/L
SampType: DCS	Run ID: ICP-MS5_200408C	Analysis Date: 4/8/2020 11:16:00 AM	Prep Date: 4/7/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.000932	0.00250	0.00100	0	93.2	70	130	0	0	
Beryllium	0.000472	0.00100	0.000500	0	94.4	70	130	0	0	
Cadmium	0.000492	0.00100	0.000500	0	98.4	70	130	0	0	
Lead	0.000496	0.00100	0.000500	0	99.2	70	130	0	0	
Thallium	0.000468	0.00150	0.000500	0	93.6	70	130	0	0	

Sample ID: DCS2-95814	Batch ID: 95814	TestNo: SW6020B	Units: mg/L
SampType: DCS2	Run ID: ICP-MS5_200408C	Analysis Date: 4/8/2020 11:19:00 AM	Prep Date: 4/7/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	0.310	0.300	0.300	0	103	70	130	0	0	

Sample ID: DCS3-95814	Batch ID: 95814	TestNo: SW6020B	Units: mg/L
SampType: DCS3	Run ID: ICP-MS5_200408C	Analysis Date: 4/8/2020 11:21:00 AM	Prep Date: 4/7/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.00466	0.00500	0.00500	0	93.2	70	130	0	0	
Barium	0.00478	0.0100	0.00500	0	95.6	70	130	0	0	
Chromium	0.00600	0.00500	0.00500	0	120	70	130	0	0	
Cobalt	0.00473	0.00500	0.00500	0	94.6	70	130	0	0	
Lithium	0.00473	0.0100	0.00500	0	94.6	70	130	0	0	
Molybdenum	0.00466	0.00500	0.00500	0	93.2	70	130	0	0	
Selenium	0.00517	0.00500	0.00500	0	103	70	130	0	0	

Sample ID: DCS4-95814	Batch ID: 95814	TestNo: SW6020B	Units: mg/L
SampType: DCS4	Run ID: ICP-MS5_200408C	Analysis Date: 4/8/2020 11:28:00 AM	Prep Date: 4/7/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Boron	0.0286	0.0300	0.0300	0	95.2	70	130	0	0	

Qualifiers:

B Analyte detected in the associated Method Blank	DF Dilution Factor
J Analyte detected between MDL and RL	MDL Method Detection Limit
ND Not Detected at the Method Detection Limit	R RPD outside accepted control limits
RL Reporting Limit	S Spike Recovery outside control limits
J Analyte detected between SDL and RL	N Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005040
Project: Luminant-OGSES-CCR

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS5_200511B

The QC data in batch 96270 applies to the following samples: 2005040-01A, 2005040-02A

Sample ID: MB-96270	Batch ID: 96270	TestNo: SW6020B	Units: mg/L
SampType: MBLK	Run ID: ICP-MS5_200511B	Analysis Date: 5/11/2020 1:41:00 PM	Prep Date: 5/8/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	<0.000800	0.00250								
Arsenic	<0.00200	0.00500								
Barium	<0.00300	0.0100								
Beryllium	<0.000300	0.00100								
Boron	<0.0100	0.0300								
Cadmium	<0.000300	0.00100								
Calcium	<0.100	0.300								
Chromium	<0.00200	0.00500								
Cobalt	<0.00300	0.00500								
Lead	<0.000300	0.00100								
Lithium	<0.00500	0.0100								
Molybdenum	<0.00200	0.00500								
Selenium	<0.00200	0.00500								
Thallium	<0.000500	0.00150								

Sample ID: LCS-96270	Batch ID: 96270	TestNo: SW6020B	Units: mg/L
SampType: LCS	Run ID: ICP-MS5_200511B	Analysis Date: 5/11/2020 1:43:00 PM	Prep Date: 5/8/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.206	0.00250	0.200	0	103	80	120			
Arsenic	0.206	0.00500	0.200	0	103	80	120			
Barium	0.198	0.0100	0.200	0	99.0	80	120			
Beryllium	0.199	0.00100	0.200	0	99.5	80	120			
Boron	0.191	0.0300	0.200	0	95.7	80	120			
Cadmium	0.203	0.00100	0.200	0	101	80	120			
Calcium	5.10	0.300	5.00	0	102	80	120			
Chromium	0.199	0.00500	0.200	0	99.3	80	120			
Cobalt	0.199	0.00500	0.200	0	99.6	80	120			
Lead	0.191	0.00100	0.200	0	95.6	80	120			
Lithium	0.202	0.0100	0.200	0	101	80	120			
Molybdenum	0.202	0.00500	0.200	0	101	80	120			
Selenium	0.206	0.00500	0.200	0	103	80	120			
Thallium	0.190	0.00150	0.200	0	95.0	80	120			

Sample ID: LCSD-96270	Batch ID: 96270	TestNo: SW6020B	Units: mg/L
SampType: LCSD	Run ID: ICP-MS5_200511B	Analysis Date: 5/11/2020 1:45:00 PM	Prep Date: 5/8/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.204	0.00250	0.200	0	102	80	120	0.748	15	
Arsenic	0.204	0.00500	0.200	0	102	80	120	0.625	15	

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
 Work Order: 2005040
 Project: Luminant-OGSES-CCR

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS5_200511B

Sample ID: LCSD-96270	Batch ID: 96270	TestNo: SW6020B	Units: mg/L
SampType: LCSD	Run ID: ICP-MS5_200511B	Analysis Date: 5/11/2020 1:45:00 PM	Prep Date: 5/8/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	0.199	0.0100	0.200	0	99.3	80	120	0.306	15	
Beryllium	0.201	0.00100	0.200	0	100	80	120	0.891	15	
Boron	0.207	0.0300	0.200	0	104	80	120	7.99	15	
Cadmium	0.201	0.00100	0.200	0	101	80	120	0.817	15	
Calcium	5.05	0.300	5.00	0	101	80	120	0.928	15	
Chromium	0.200	0.00500	0.200	0	100	80	120	0.855	15	
Cobalt	0.201	0.00500	0.200	0	100	80	120	0.747	15	
Lead	0.190	0.00100	0.200	0	95.2	80	120	0.416	15	
Lithium	0.204	0.0100	0.200	0	102	80	120	1.37	15	
Molybdenum	0.200	0.00500	0.200	0	100	80	120	0.702	15	
Selenium	0.207	0.00500	0.200	0	103	80	120	0.402	15	
Thallium	0.189	0.00150	0.200	0	94.6	80	120	0.385	15	

Sample ID: 2005013-01B SD	Batch ID: 96270	TestNo: SW6020B	Units: mg/L
SampType: SD	Run ID: ICP-MS5_200511B	Analysis Date: 5/11/2020 1:52:00 PM	Prep Date: 5/8/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	<0.00400	0.0125	0	0				0	20	
Arsenic	<0.0100	0.0250	0	0				0	20	
Barium	0.0953	0.0500	0	0.0961				0.857	20	
Beryllium	<0.00150	0.00500	0	0				0	20	
Boron	0.287	0.150	0	0.221				26.1	20	R
Cadmium	<0.00150	0.00500	0	0				0	20	
Calcium	3.98	1.50	0	4.00				0.590	20	
Chromium	<0.0100	0.0250	0	0				0	20	
Cobalt	<0.0150	0.0250	0	0				0	20	
Lead	<0.00150	0.00500	0	0				0	20	
Lithium	0.0284	0.0500	0	0.0274				3.58	20	
Molybdenum	<0.0100	0.0250	0	0				0	20	
Selenium	<0.0100	0.0250	0	0				0	20	
Thallium	<0.00250	0.00750	0	0				0	20	

Sample ID: 2005013-01B PDS	Batch ID: 96270	TestNo: SW6020B	Units: mg/L
SampType: PDS	Run ID: ICP-MS5_200511B	Analysis Date: 5/11/2020 2:23:00 PM	Prep Date: 5/8/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.198	0.00250	0.200	0	99.1	75	125			
Arsenic	0.193	0.00500	0.200	0	96.4	75	125			
Barium	0.292	0.0100	0.200	0.0961	97.9	75	125			
Beryllium	0.200	0.00100	0.200	0	99.8	75	125			
Boron	0.409	0.0300	0.200	0.221	94.2	75	125			

Qualifiers: B Analyte detected in the associated Method Blank DF Dilution Factor
 J Analyte detected between MDL and RL MDL Method Detection Limit
 ND Not Detected at the Method Detection Limit R RPD outside accepted control limits
 RL Reporting Limit S Spike Recovery outside control limits
 J Analyte detected between SDL and RL N Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005040
Project: Luminant-OGSES-CCR

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS5_200511B

Sample ID: 2005013-01B PDS	Batch ID: 96270	TestNo: SW6020B	Units: mg/L
SampType: PDS	Run ID: ICP-MS5_200511B	Analysis Date: 5/11/2020 2:23:00 PM	Prep Date: 5/8/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Cadmium	0.203	0.00100	0.200	0	101	75	125			
Calcium	8.99	0.300	5.00	4.00	99.7	75	125			
Chromium	0.203	0.00500	0.200	0	102	75	125			
Cobalt	0.192	0.00500	0.200	0	96.2	75	125			
Lead	0.197	0.00100	0.200	0	98.3	75	125			
Lithium	0.231	0.0100	0.200	0.0274	102	75	125			
Molybdenum	0.200	0.00500	0.200	0	99.8	75	125			
Selenium	0.190	0.00500	0.200	0	95.0	75	125			
Thallium	0.192	0.00150	0.200	0	95.9	75	125			

Sample ID: 2005013-01B MS	Batch ID: 96270	TestNo: SW6020B	Units: mg/L
SampType: MS	Run ID: ICP-MS5_200511B	Analysis Date: 5/11/2020 2:26:00 PM	Prep Date: 5/8/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.205	0.00250	0.200	0	102	75	125			
Arsenic	0.193	0.00500	0.200	0	96.6	75	125			
Barium	0.294	0.0100	0.200	0.0961	99.0	75	125			
Beryllium	0.199	0.00100	0.200	0	99.5	75	125			
Boron	0.442	0.0300	0.200	0.221	111	75	125			
Cadmium	0.198	0.00100	0.200	0	99.2	75	125			
Calcium	9.22	0.300	5.00	4.00	104	75	125			
Chromium	0.196	0.00500	0.200	0	98.0	75	125			
Cobalt	0.188	0.00500	0.200	0	94.1	75	125			
Lead	0.193	0.00100	0.200	0	96.5	75	125			
Lithium	0.235	0.0100	0.200	0.0274	104	75	125			
Molybdenum	0.203	0.00500	0.200	0	102	75	125			
Selenium	0.193	0.00500	0.200	0	96.5	75	125			
Thallium	0.191	0.00150	0.200	0	95.3	75	125			

Sample ID: 2005013-01B MSD	Batch ID: 96270	TestNo: SW6020B	Units: mg/L
SampType: MSD	Run ID: ICP-MS5_200511B	Analysis Date: 5/11/2020 2:28:00 PM	Prep Date: 5/8/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.205	0.00250	0.200	0	102	75	125	0.105	15	
Arsenic	0.194	0.00500	0.200	0	97.2	75	125	0.685	15	
Barium	0.296	0.0100	0.200	0.0961	100	75	125	0.795	15	
Beryllium	0.197	0.00100	0.200	0	98.7	75	125	0.818	15	
Boron	0.441	0.0300	0.200	0.221	110	75	125	0.181	15	
Cadmium	0.199	0.00100	0.200	0	99.5	75	125	0.312	15	
Calcium	9.09	0.300	5.00	4.00	102	75	125	1.39	15	
Chromium	0.196	0.00500	0.200	0	97.9	75	125	0.093	15	

Qualifiers:

B Analyte detected in the associated Method Blank	DF Dilution Factor
J Analyte detected between MDL and RL	MDL Method Detection Limit
ND Not Detected at the Method Detection Limit	R RPD outside accepted control limits
RL Reporting Limit	S Spike Recovery outside control limits
J Analyte detected between SDL and RL	N Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005040
Project: Luminant-OGSES-CCR

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS5_200511B

Sample ID: 2005013-01B MSD	Batch ID: 96270	TestNo: SW6020B	Units: mg/L
SampType: MSD	Run ID: ICP-MS5_200511B	Analysis Date: 5/11/2020 2:28:00 PM	Prep Date: 5/8/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Cobalt	0.190	0.00500	0.200	0	95.2	75	125	1.15	15	
Lead	0.195	0.00100	0.200	0	97.3	75	125	0.844	15	
Lithium	0.236	0.0100	0.200	0.0274	104	75	125	0.311	15	
Molybdenum	0.205	0.00500	0.200	0	102	75	125	0.717	15	
Selenium	0.190	0.00500	0.200	0	95.2	75	125	1.42	15	
Thallium	0.193	0.00150	0.200	0	96.3	75	125	1.03	15	

Qualifiers:	B Analyte detected in the associated Method Blank J Analyte detected between MDL and RL ND Not Detected at the Method Detection Limit RL Reporting Limit J Analyte detected between SDL and RL	DF Dilution Factor MDL Method Detection Limit R RPD outside accepted control limits S Spike Recovery outside control limits N Parameter not NELAP certified
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CLIENT: Golder
 Work Order: 2005040
 Project: Luminant-OGSES-CCR

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS5_200511B

Sample ID: ICV-200511	Batch ID: R110424	TestNo: SW6020B	Units: mg/L
SampType: ICV	Run ID: ICP-MS5_200511B	Analysis Date: 5/11/2020 11:23:00 AM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.103	0.00250	0.100	0	103	90	110			
Arsenic	0.0999	0.00500	0.100	0	99.9	90	110			
Barium	0.0995	0.0100	0.100	0	99.5	90	110			
Beryllium	0.0992	0.00100	0.100	0	99.2	90	110			
Boron	0.0999	0.0300	0.100	0	99.9	90	110			
Cadmium	0.102	0.00100	0.100	0	102	90	110			
Calcium	2.55	0.300	2.50	0	102	90	110			
Chromium	0.103	0.00500	0.100	0	103	90	110			
Cobalt	0.101	0.00500	0.100	0	101	90	110			
Lead	0.0990	0.00100	0.100	0	99.0	90	110			
Lithium	0.0991	0.0100	0.100	0	99.1	90	110			
Molybdenum	0.0981	0.00500	0.100	0	98.1	90	110			
Selenium	0.106	0.00500	0.100	0	106	90	110			
Thallium	0.0964	0.00150	0.100	0	96.4	90	110			

Sample ID: LCVL-200511	Batch ID: R110424	TestNo: SW6020B	Units: mg/L
SampType: LCVL	Run ID: ICP-MS5_200511B	Analysis Date: 5/11/2020 11:33:00 AM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.00204	0.00250	0.00200	0	102	80	120			
Arsenic	0.00519	0.00500	0.00500	0	104	80	120			
Barium	0.00522	0.0100	0.00500	0	104	80	120			
Beryllium	0.00103	0.00100	0.00100	0	103	80	120			
Boron	0.0205	0.0300	0.0200	0	103	80	120			
Cadmium	0.000999	0.00100	0.00100	0	99.9	80	120			
Calcium	0.112	0.300	0.100	0	112	80	120			
Chromium	0.00504	0.00500	0.00500	0	101	80	120			
Cobalt	0.00505	0.00500	0.00500	0	101	80	120			
Lead	0.000980	0.00100	0.00100	0	98.0	80	120			
Lithium	0.00989	0.0100	0.0100	0	98.9	80	120			
Molybdenum	0.00502	0.00500	0.00500	0	100	80	120			
Selenium	0.00584	0.00500	0.00500	0	117	80	120			
Thallium	0.000967	0.00150	0.00100	0	96.7	80	120			

Sample ID: CCV2-200409	Batch ID: R110424	TestNo: SW6020B	Units: mg/L
SampType: CCV	Run ID: ICP-MS5_200511B	Analysis Date: 5/11/2020 1:33:00 PM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.203	0.00250	0.200	0	102	90	110			
Arsenic	0.199	0.00500	0.200	0	99.7	90	110			
Barium	0.196	0.0100	0.200	0	97.8	90	110			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005040
Project: Luminant-OGSES-CCR

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS5_200511B

Sample ID: CCV2-200409	Batch ID: R110424	TestNo: SW6020B	Units: mg/L
SampType: CCV	Run ID: ICP-MS5_200511B	Analysis Date: 5/11/2020 1:33:00 PM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Beryllium	0.198	0.00100	0.200	0	99.1	90	110			
Boron	0.197	0.0300	0.200	0	98.5	90	110			
Cadmium	0.199	0.00100	0.200	0	99.7	90	110			
Calcium	5.08	0.300	5.00	0	102	90	110			
Chromium	0.196	0.00500	0.200	0	98.1	90	110			
Cobalt	0.195	0.00500	0.200	0	97.7	90	110			
Lead	0.192	0.00100	0.200	0	95.8	90	110			
Lithium	0.206	0.0100	0.200	0	103	90	110			
Molybdenum	0.199	0.00500	0.200	0	99.4	90	110			
Selenium	0.197	0.00500	0.200	0	98.5	90	110			
Thallium	0.190	0.00150	0.200	0	94.8	90	110			

Sample ID: CCV3-200511	Batch ID: R110424	TestNo: SW6020B	Units: mg/L
SampType: CCV	Run ID: ICP-MS5_200511B	Analysis Date: 5/11/2020 2:39:00 PM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.205	0.00250	0.200	0	103	90	110			
Arsenic	0.206	0.00500	0.200	0	103	90	110			
Barium	0.199	0.0100	0.200	0	99.5	90	110			
Beryllium	0.199	0.00100	0.200	0	99.6	90	110			
Boron	0.196	0.0300	0.200	0	98.1	90	110			
Cadmium	0.202	0.00100	0.200	0	101	90	110			
Calcium	5.20	0.300	5.00	0	104	90	110			
Chromium	0.200	0.00500	0.200	0	99.9	90	110			
Cobalt	0.200	0.00500	0.200	0	99.9	90	110			
Lead	0.193	0.00100	0.200	0	96.6	90	110			
Lithium	0.205	0.0100	0.200	0	103	90	110			
Molybdenum	0.201	0.00500	0.200	0	100	90	110			
Selenium	0.204	0.00500	0.200	0	102	90	110			
Thallium	0.192	0.00150	0.200	0	95.8	90	110			

Sample ID: CCV4-200511	Batch ID: R110424	TestNo: SW6020B	Units: mg/L
SampType: CCV	Run ID: ICP-MS5_200511B	Analysis Date: 5/11/2020 3:08:00 PM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.204	0.00250	0.200	0	102	90	110			
Arsenic	0.204	0.00500	0.200	0	102	90	110			
Barium	0.201	0.0100	0.200	0	100	90	110			
Beryllium	0.200	0.00100	0.200	0	100	90	110			
Boron	0.199	0.0300	0.200	0	99.3	90	110			
Cadmium	0.202	0.00100	0.200	0	101	90	110			

Qualifiers:

B Analyte detected in the associated Method Blank	DF Dilution Factor
J Analyte detected between MDL and RL	MDL Method Detection Limit
ND Not Detected at the Method Detection Limit	R RPD outside accepted control limits
RL Reporting Limit	S Spike Recovery outside control limits
J Analyte detected between SDL and RL	N Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005040
Project: Luminant-OGSES-CCR

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS5_200511B

Sample ID: CCV4-200511	Batch ID: R110424	TestNo: SW6020B	Units: mg/L
SampType: CCV	Run ID: ICP-MS5_200511B	Analysis Date: 5/11/2020 3:08:00 PM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chromium	0.199	0.00500	0.200	0	99.4	90	110			
Cobalt	0.201	0.00500	0.200	0	100	90	110			
Lead	0.192	0.00100	0.200	0	96.2	90	110			
Lithium	0.208	0.0100	0.200	0	104	90	110			
Molybdenum	0.202	0.00500	0.200	0	101	90	110			
Selenium	0.206	0.00500	0.200	0	103	90	110			
Thallium	0.190	0.00150	0.200	0	95.1	90	110			

Sample ID: CCV5-200511	Batch ID: R110424	TestNo: SW6020B	Units: mg/L
SampType: CCV	Run ID: ICP-MS5_200511B	Analysis Date: 5/11/2020 3:41:00 PM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	5.18	0.300	5.00	0	104	90	110			

Sample ID: CCV6-200511	Batch ID: R110424	TestNo: SW6020B	Units: mg/L
SampType: CCV	Run ID: ICP-MS5_200511B	Analysis Date: 5/11/2020 4:17:00 PM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	5.23	0.300	5.00	0	105	90	110			

Qualifiers:

B Analyte detected in the associated Method Blank	DF Dilution Factor
J Analyte detected between MDL and RL	MDL Method Detection Limit
ND Not Detected at the Method Detection Limit	R RPD outside accepted control limits
RL Reporting Limit	S Spike Recovery outside control limits
J Analyte detected between SDL and RL	N Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005040
Project: Luminant-OGSES-CCR

ANALYTICAL QC SUMMARY REPORT

RunID: IC4_200430A

Sample ID: DCS2-96153	Batch ID: 96153	TestNo: E300	Units: mg/L							
SampType: DCS2	Run ID: IC4_200430A	Analysis Date: 4/30/2020 11:31:49 AM	Prep Date: 4/30/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	0.473	1.00	0.5000	0	94.7	70	130	0	0	
Fluoride	0.191	0.400	0.2000	0	95.6	70	130	0	0	
Sulfate	1.34	3.00	1.500	0	89.6	70	130	0	0	

Qualifiers:

B Analyte detected in the associated Method Blank	DF Dilution Factor
J Analyte detected between MDL and RL	MDL Method Detection Limit
ND Not Detected at the Method Detection Limit	R RPD outside accepted control limits
RL Reporting Limit	S Spike Recovery outside control limits
J Analyte detected between SDL and RL	N Parameter not NELAP certified

CLIENT: Golder
 Work Order: 2005040
 Project: Luminant-OGSES-CCR

ANALYTICAL QC SUMMARY REPORT

RunID: IC4_200507A

The QC data in batch 96213 applies to the following samples: 2005040-01B, 2005040-02B

Sample ID: MB-96213	Batch ID: 96213	TestNo: E300	Units: mg/L							
SampType: MBLK	Run ID: IC4_200507A	Analysis Date: 5/7/2020 10:26:10 AM	Prep Date: 5/7/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	<0.300	1.00								
Fluoride	<0.100	0.400								
Sulfate	<1.00	3.00								

Sample ID: LCS-96213	Batch ID: 96213	TestNo: E300	Units: mg/L							
SampType: LCS	Run ID: IC4_200507A	Analysis Date: 5/7/2020 10:42:10 AM	Prep Date: 5/7/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	9.97	1.00	10.00	0	99.7	90	110			
Fluoride	3.70	0.400	4.000	0	92.6	90	110			
Sulfate	29.2	3.00	30.00	0	97.5	90	110			

Sample ID: LCS-96213	Batch ID: 96213	TestNo: E300	Units: mg/L							
SampType: LCS	Run ID: IC4_200507A	Analysis Date: 5/7/2020 10:58:10 AM	Prep Date: 5/7/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	9.95	1.00	10.00	0	99.5	90	110	0.142	20	
Fluoride	3.69	0.400	4.000	0	92.3	90	110	0.300	20	
Sulfate	29.3	3.00	30.00	0	97.7	90	110	0.199	20	

Sample ID: 2005032-01CMS	Batch ID: 96213	TestNo: E300	Units: mg/L							
SampType: MS	Run ID: IC4_200507A	Analysis Date: 5/7/2020 6:17:07 PM	Prep Date: 5/7/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	2090	100	2000	152.7	97.0	90	110			
Fluoride	1990	40.0	2000	0	99.4	90	110			
Sulfate	2060	300	2000	104.8	97.7	90	110			

Sample ID: 2005032-01CMSD	Batch ID: 96213	TestNo: E300	Units: mg/L							
SampType: MSD	Run ID: IC4_200507A	Analysis Date: 5/7/2020 6:33:07 PM	Prep Date: 5/7/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	2100	100	2000	152.7	97.2	90	110	0.222	20	
Fluoride	2000	40.0	2000	0	100	90	110	0.595	20	
Sulfate	2050	300	2000	104.8	97.4	90	110	0.233	20	

Sample ID: 2005022-01BMS	Batch ID: 96213	TestNo: E300	Units: mg/L							
SampType: MS	Run ID: IC4_200507A	Analysis Date: 5/7/2020 6:49:07 PM	Prep Date: 5/7/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005040
Project: Luminant-OGSES-CCR

ANALYTICAL QC SUMMARY REPORT

RunID: IC4_200507A

Sample ID: 2005022-01BMS	Batch ID: 96213	TestNo: E300	Units: mg/L							
SampType: MS	Run ID: IC4_200507A	Analysis Date: 5/7/2020 6:49:07 PM	Prep Date: 5/7/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	243	10.0	200.0	46.49	98.2	90	110			
Fluoride	223	4.00	200.0	21.81	101	90	110			
Sulfate	458	30.0	200.0	267.4	95.5	90	110			

Sample ID: 2005022-01BMSD	Batch ID: 96213	TestNo: E300	Units: mg/L							
SampType: MSD	Run ID: IC4_200507A	Analysis Date: 5/7/2020 7:05:07 PM	Prep Date: 5/7/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	240	10.0	200.0	46.49	97.0	90	110	0.970	20	
Fluoride	223	4.00	200.0	21.81	100	90	110	0.247	20	
Sulfate	458	30.0	200.0	267.4	95.1	90	110	0.187	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005040
Project: Luminant-OGSES-CCR

ANALYTICAL QC SUMMARY REPORT

RunID: IC4_200507A

Sample ID: ICV-200507	Batch ID: R110392	TestNo: E300	Units: mg/L
SampType: ICV	Run ID: IC4_200507A	Analysis Date: 5/7/2020 9:54:10 AM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	24.7	1.00	25.00	0	98.9	90	110			
Fluoride	9.55	0.400	10.00	0	95.5	90	110			
Sulfate	74.8	3.00	75.00	0	99.7	90	110			

Sample ID: CCV1-200507	Batch ID: R110392	TestNo: E300	Units: mg/L
SampType: CCV	Run ID: IC4_200507A	Analysis Date: 5/7/2020 5:29:07 PM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	9.94	1.00	10.00	0	99.4	90	110			
Fluoride	3.75	0.400	4.000	0	93.6	90	110			
Sulfate	29.3	3.00	30.00	0	97.8	90	110			

Sample ID: CCV2-200507	Batch ID: R110392	TestNo: E300	Units: mg/L
SampType: CCV	Run ID: IC4_200507A	Analysis Date: 5/7/2020 10:33:07 PM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	10.0	1.00	10.00	0	100	90	110			
Fluoride	3.81	0.400	4.000	0	95.3	90	110			
Sulfate	29.4	3.00	30.00	0	98.0	90	110			

Qualifiers:

B Analyte detected in the associated Method Blank	DF Dilution Factor
J Analyte detected between MDL and RL	MDL Method Detection Limit
ND Not Detected at the Method Detection Limit	R RPD outside accepted control limits
RL Reporting Limit	S Spike Recovery outside control limits
J Analyte detected between SDL and RL	N Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005040
Project: Luminant-OGSES-CCR

ANALYTICAL QC SUMMARY REPORT

RunID: WC_200507D

The QC data in batch 96250 applies to the following samples: 2005040-01B, 2005040-02B

Sample ID: MB-96250	Batch ID: 96250	TestNo: M2540C	Units: mg/L							
SampType: MBLK	Run ID: WC_200507D	Analysis Date: 5/7/2020 4:50:00 PM	Prep Date: 5/7/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Total Dissolved Solids (Residue, Filtera	<10.0	10.0
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Sample ID: LCS-96250	Batch ID: 96250	TestNo: M2540C	Units: mg/L							
SampType: LCS	Run ID: WC_200507D	Analysis Date: 5/7/2020 4:50:00 PM	Prep Date: 5/7/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Total Dissolved Solids (Residue, Filtera	746	10.0	745.6	0	100	90	113
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Sample ID: 2005023-01A-DUP	Batch ID: 96250	TestNo: M2540C	Units: mg/L							
SampType: DUP	Run ID: WC_200507D	Analysis Date: 5/7/2020 4:50:00 PM	Prep Date: 5/7/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Total Dissolved Solids (Residue, Filtera	1040	50.0	0	1055		1.43	5
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Qualifiers:	B Analyte detected in the associated Method Blank	DF Dilution Factor
	J Analyte detected between MDL and RL	MDL Method Detection Limit
	ND Not Detected at the Method Detection Limit	R RPD outside accepted control limits
	RL Reporting Limit	S Spike Recovery outside control limits
	J Analyte detected between SDL and RL	N Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005040
Project: Luminant-OGSES-CCR

MQL SUMMARY REPORT

TestNo: E300	MDL	MQL
Analyte	mg/L	mg/L
Chloride	0.300	1.00
Fluoride	0.100	0.400
Sulfate	1.00	3.00

TestNo: SW6020B	MDL	MQL
Analyte	mg/L	mg/L
Antimony	0.000800	0.00250
Arsenic	0.00200	0.00500
Barium	0.00300	0.0100
Beryllium	0.000300	0.00100
Boron	0.0100	0.0300
Cadmium	0.000300	0.00100
Calcium	0.100	0.300
Chromium	0.00200	0.00500
Cobalt	0.00300	0.00500
Lead	0.000300	0.00100
Lithium	0.00500	0.0100
Molybdenum	0.00200	0.00500
Selenium	0.00200	0.00500
Thallium	0.000500	0.00150

TestNo: SW7470A	MDL	MQL
Analyte	mg/L	mg/L
Mercury	0.0000800	0.000200

TestNo: M2540C	MDL	MQL
Analyte	mg/L	mg/L
Total Dissolved Solids (Residue, Filt	10.0	10.0

Qualifiers: MQL -Method Quantitation Limit as defined by TRRP
 MDL -Method Detection Limit as defined by TRRP

June 10, 2020

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

DHL Analytical, Inc.

Sample Delivery Group: L1217407
Samples Received: 05/12/2020
Project Number: 2005040
Description:

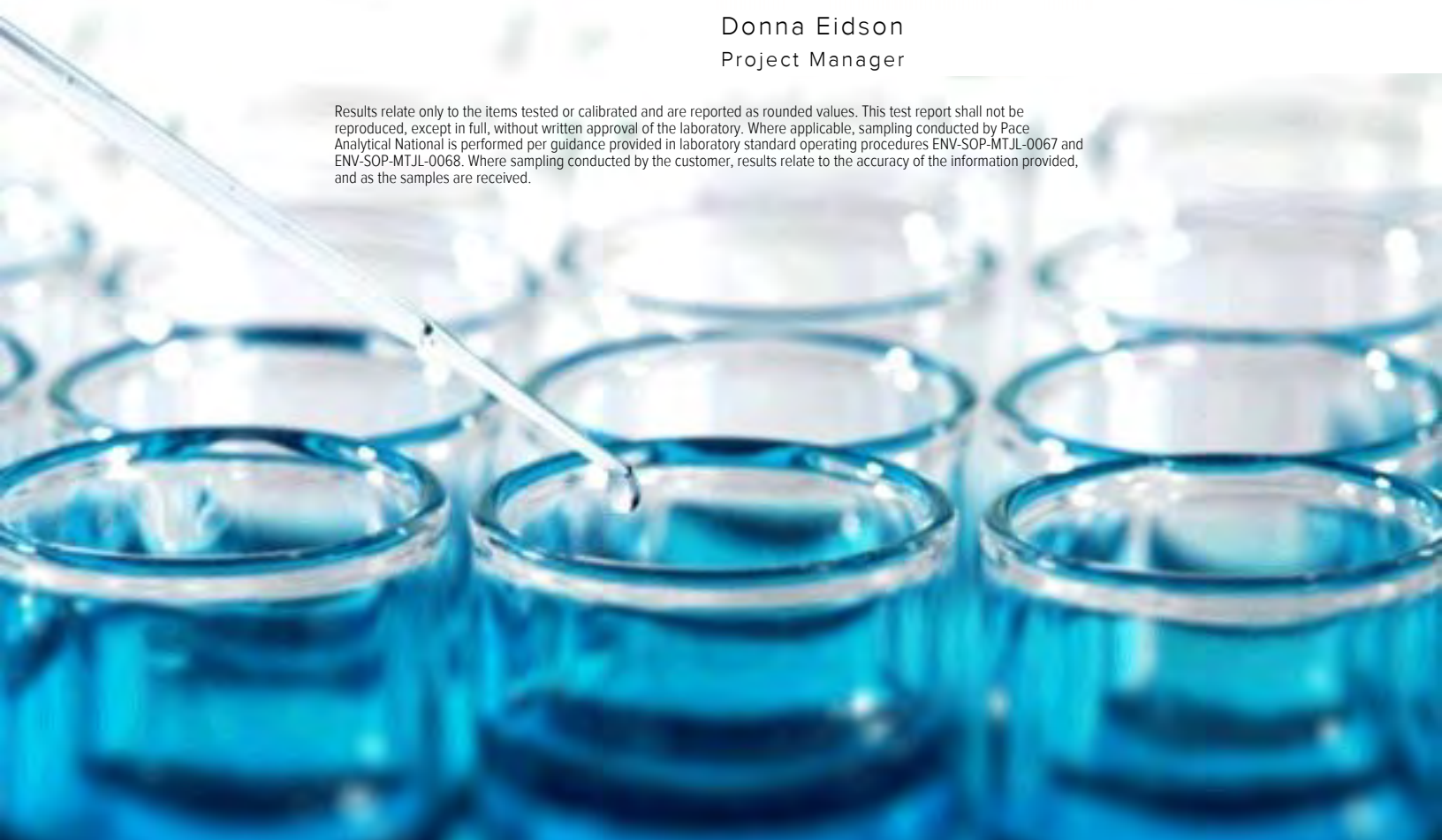
Report To: John DuPont
2300 Double Creek Drive
Round Rock, TX 78664

Entire Report Reviewed By:



Donna Eidson
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.





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FGD-6 L1217407-01 Non-Potable Water

Collected by
Collected date/time
Received date/time

05/06/20 13:20 05/12/20 10:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1475267	1	05/18/20 12:10	05/28/20 10:30	SNR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1483326	1	05/28/20 11:33	06/04/20 13:38	SNR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1483326	1	05/28/20 11:33	06/04/20 13:38	RGT	Mt. Juliet, TN

1
Cp

2
Tc

3
Ss

4
Cn

5
Sr

6
Qc

7
Gl

8
Al

9
Sc

FGD-3 L1217407-02 Non-Potable Water

Collected by
Collected date/time
Received date/time

05/06/20 14:20 05/12/20 10:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1475267	1	05/18/20 12:10	05/28/20 10:30	SNR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1483326	1	05/28/20 11:33	05/29/20 15:55	SNR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1483326	1	05/28/20 11:33	05/29/20 15:55	RGT	Mt. Juliet, TN



All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All radiochemical sample results for solids are reported on a dry weight basis with the exception of tritium, carbon-14 and radon, unless wet weight was requested by the client. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Donna Eidson
Project Manager

- ¹ Cp
- ² Tc
- ³ Ss
- ⁴ Cn
- ⁵ Sr
- ⁶ Qc
- ⁷ Gl
- ⁸ Al
- ⁹ Sc



Radiochemistry by Method 904

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-228	0.845		0.520	0.976	05/28/2020 10:30	WG1475267
(T) Barium	87.4			62.0-143	05/28/2020 10:30	WG1475267
(T) Yttrium	115			79.0-136	05/28/2020 10:30	WG1475267

1 Cp

2 Tc

3 Ss

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	1.36		0.765	1.13	06/04/2020 13:38	WG1483326

4 Cn

5 Sr

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-226	0.513		0.245	0.154	06/04/2020 13:38	WG1483326
(T) Barium-133	120			30.0-143	06/04/2020 13:38	WG1483326

6 Qc

7 Gl

8 Al

9 Sc



Radiochemistry by Method 904

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-228	0.463		0.606	1.07	05/28/2020 10:30	WG1475267
(T) Barium	90.5			62.0-143	05/28/2020 10:30	WG1475267
(T) Yttrium	117			79.0-136	05/28/2020 10:30	WG1475267

1 Cp

2 Tc

3 Ss

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	0.857		0.859	1.31	05/29/2020 15:55	WG1483326

4 Cn

5 Sr

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-226	0.394		0.253	0.237	05/29/2020 15:55	WG1483326
(T) Barium-133	116			30.0-143	05/29/2020 15:55	WG1483326

6 Qc

7 Gl

8 Al

9 Sc



Method Blank (MB)

(MB) R3530968-1 05/22/20 10:30

Analyte	MB Result pCi/l	MB Qualifier	MB MDA pCi/l
Radium-228	0.194		0.455
(T) Barium	90.0		
(T) Yttrium	108		

Laboratory Control Sample (LCS)

(LCS) R3530968-2 05/22/20 10:30

Analyte	Spike Amount pCi/l	LCS Result pCi/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Radium-228	5.00	4.86	97.2	80.0-120	
(T) Barium			82.1		
(T) Yttrium			106		

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc



Method Blank (MB)

(MB) R3535339-1 06/03/20 14:24

Analyte	MB Result pCi/l	MB Qualifier	MB MDA pCi/l
Radium-226	0.000		0.0602
(T) Barium-133	98.2		

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

Laboratory Control Sample (LCS)

(LCS) R3535339-2 06/03/20 14:24

Analyte	Spike Amount pCi/l	LCS Result pCi/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Radium-226	5.02	5.19	103	80.0-120	
(T) Barium-133			102		



Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDA	Minimum Detectable Activity.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(T)	Tracer - A radioisotope of known concentration added to a solution of chemically equivalent radioisotopes at a known concentration to assist in monitoring the yield of the chemical separation.
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state "ND" (Not Detected) or "BDL" (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc

Qualifier Description

The remainder of this page intentionally left blank, there are no qualifiers applied to this SDG.



Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
 * Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey-NELAP	TN002
California	2932	New Mexico ¹	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina ¹	DW21704
Georgia	NELAP	North Carolina ³	41
Georgia ¹	923	North Dakota	R-140
Idaho	TN00003	Ohio-VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LA000356
Kentucky ^{1,6}	90010	South Carolina	84004
Kentucky ²	16	South Dakota	n/a
Louisiana	AI30792	Tennessee ^{1,4}	2006
Louisiana ¹	LA180010	Texas	T104704245-18-15
Maine	TN0002	Texas ⁵	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

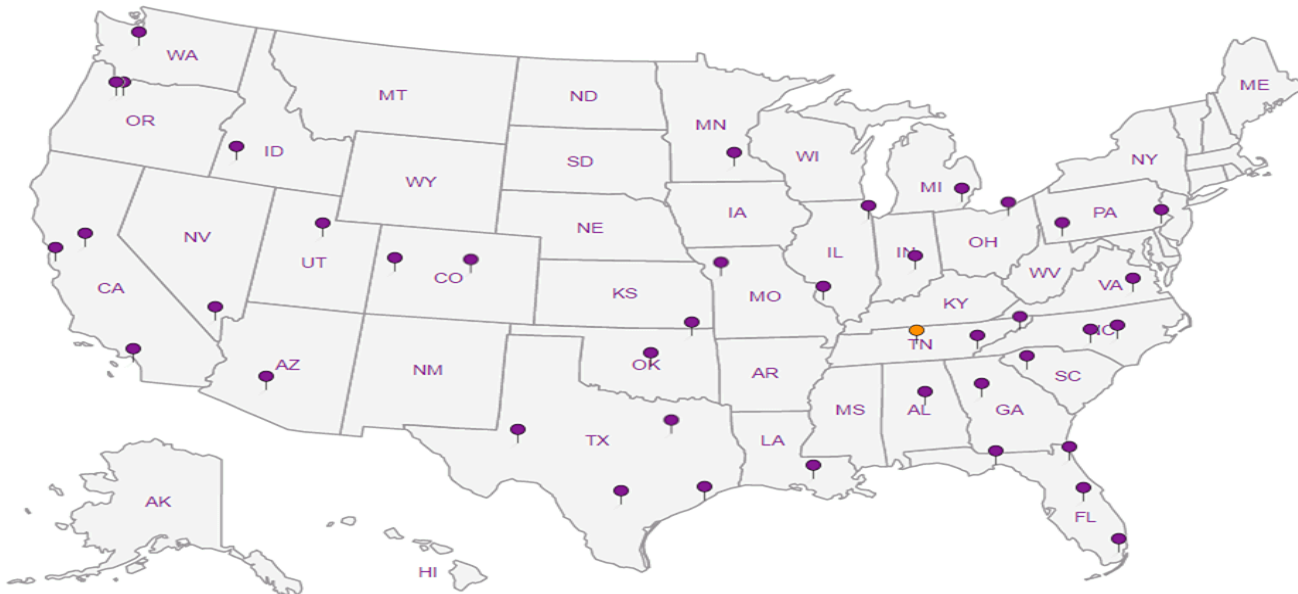
Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 ⁵	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA-Crypto	TN00003		

¹ Drinking Water ² Underground Storage Tanks ³ Aquatic Toxicity ⁴ Chemical/Microbiological ⁵ Mold ⁶ Wastewater n/a Accreditation not applicable

Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.



1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

DHL Analytical, Inc.

2300 Double Creek Drive
Round Rock, TX 78664

TEL: (512) 388-8222

FAX: (512) 388-8229

Work Order: 2005040

CHAIN-OF-CUSTODY RECORD

G138

Subcontractor:

Pace Analytical
12065 Lebanon Rd
Mt. Juliet, TN 37122

TEL: (615) 773-5923

FAX:

Acct #: DHLRRTX

1217407

07-May-20

Sample ID	Matrix	DHL#	Date Collected	Bottle Type	Requested Tests			
					Ra-228 E904.0	Ra-226 M7500 Ra B M		
FGD-6	Aqueous	01C	05/06/20 01:20 PM	1LHDPEHNO3	1			
FGD-6	Aqueous	01D	05/06/20 01:20 PM	1LHDPEHNO3		1		
FGD-3	Aqueous	02C	05/06/20 02:20 PM	1LHDPEHNO3	1			
FGD-3	Aqueous	02D	05/06/20 02:20 PM	1LHDPEHNO3		1		

General Comments:

Please analyze these samples with Normal Turnaround Time.
Report RA-226, Ra-228 & Combined per Specs.
Quality Control Package Needed: Standard - NELAC Rad Test compliant
Email to cac@dhlanalytical.com & dupont@dhlanalytical.com

Relinquished by: <u><i>Ea</i></u>	Date/Time: <u>5/8/20 17:00</u>	Received by: <u><i>Carol Kemp</i></u>	Date/Time: <u>5/11/20 10:30</u>
Relinquished by: _____	Date/Time: _____	Received by: _____	Date/Time: _____

Amb

**Pace Analytical National Center for Testing & Innovation
Cooler Receipt Form**

Client: <i>DHLRRTX</i>	1217407		
Cooler Received/Opened On: <i>5/11/20</i>	Temperature: <i>Amb</i>		
Received By: <i>Carol Kemp</i>			
Signature: <i>Carol Kemp</i>			
Receipt Check List	NP	Yes	No
COC Seal Present / Intact?	/		
COC Signed / Accurate?		/	
Bottles arrive intact?		/	
Correct bottles used?		/	
Sufficient volume sent?			
If Applicable			
VOA Zero headspace?		/	
Preservation Correct / Checked?			



June 12, 2020

Will Vienne
Golder
2201 Double Creek Dr #4004
Round Rock, Texas 78664
TEL: (512) 671-3434
FAX (512) 671-3446
RE: Luminant-OGSES-FGD Ponds

Order No.: 2005076

Dear Will Vienne:

DHL Analytical, Inc. received 2 sample(s) on 5/12/2020 for the analyses presented in the following report.

There were no problems with the analyses and all data met requirements of NELAP except where noted in the Case Narrative. All non-NELAP methods will be identified accordingly in the case narrative and all estimated uncertainties of test results are within method or EPA specifications.

If you have any questions regarding these tests results, please feel free to call. Thank you for using DHL Analytical.

Sincerely,

A handwritten signature in red ink, appearing to read "John DuPont".

John DuPont
General Manager

This report was performed under the accreditation of the State of Texas Laboratory Certification Number: T104704211-20-25



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Eric Lau

From: John DuPont
Sent: Tuesday, May 28, 2019 11:35 AM
To: Eric Lau
Subject: FW: CCR Analysis

Appendix III Parameters:

Metals (Ca and B)
Anions (Cl, F, and SO4)
TDS

Appendix IV Parameters:

Metals (As, Ba, Be, Cd, Co, Cr, Hg, Li, Mo, Pb, Sb, Se, and Tl)
Ra-226
Ra-228

From: Vienne, Will [mailto:William_Vienne@golder.com]
Sent: Tuesday, April 09, 2019 12:48 PM
To: John DuPont <dupont@dhlanalytical.com>
Subject: CCR Analysis

Sample Receipt Checklist

Client Name Golder

Date Received: 5/12/2020

Work Order Number 2005076

Received by: JH

Checklist completed by: [Signature] 5/12/2020
Signature Date

Reviewed by: [Initials] 5/12/2020
Initials Date

Carrier name: FedEx 1day

- Shipping container/cooler in good condition? Yes [checked] No [] Not Present []
Custody seals intact on shipping container/cooler? Yes [checked] No [] Not Present []
Custody seals intact on sample bottles? Yes [] No [] Not Present [checked]
Chain of custody present? Yes [checked] No []
Chain of custody signed when relinquished and received? Yes [checked] No []
Chain of custody agrees with sample labels? Yes [checked] No []
Samples in proper container/bottle? Yes [checked] No []
Sample containers intact? Yes [checked] No []
Sufficient sample volume for indicated test? Yes [checked] No []
All samples received within holding time? Yes [checked] No []
Container/Temp Blank temperature in compliance? Yes [checked] No [] 1.5 °C
Water - VOA vials have zero headspace? Yes [checked] No [] No VOA vials submitted []
Water - pH<2 acceptable upon receipt? Yes [checked] No [] NA [] LOT # 13171
Adjusted? no Checked by [Signature]
Water - pH>9 (S) or pH>10 (CN) acceptable upon receipt? Yes [] No [] NA [checked] LOT #
Adjusted? Checked by

Any No response must be detailed in the comments section below.

Client contacted: Date contacted: Person contacted

Contacted by: Regarding:

Comments:

Corrective Action

Laboratory Name: DHL Analytical, Inc.							
Laboratory Review Checklist: Reportable Data							
Project Name: Luminant-OGSES-FGD Ponds				LRC Date: 6/12/20			
Reviewer Name: Carlos Castro				Laboratory Work Order: 2005076			
Prep Batch Number(s): See Prep Dates Report				Run Batch: See Analytical Dates Report			
# ¹	A ²	Description	Yes	No	NA ³	NR ⁴	ER# ⁵
		Chain-of-Custody (C-O-C)					
R1	OI	1) Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				R1-01
		2) Were all departures from standard conditions described in an exception report?			X		
R2	OI	Sample and Quality Control (QC) Identification					
		1) Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
		2) Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
R3	OI	Test Reports					
		1) Were all samples prepared and analyzed within holding times?	X				
		2) Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
		3) Were calculations checked by a peer or supervisor?	X				
		4) Were all analyte identifications checked by a peer or supervisor?	X				
		5) Were sample detection limits reported for all analytes not detected?	X				
		6) Were all results for soil and sediment samples reported on a dry weight basis?			X		
		7) Were % moisture (or solids) reported for all soil and sediment samples?			X		
		8) Were bulk soils/solids samples for volatile analysis extracted with methanol per EPA Method 5035?			X		
		9) If required for the project, TICs reported?			X		
R4	O	Surrogate Recovery Data					
		1) Were surrogates added prior to extraction?			X		
		2) Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
R5	OI	Test Reports/Summary Forms for Blank Samples					
		1) Were appropriate type(s) of blanks analyzed?	X				
		2) Were blanks analyzed at the appropriate frequency?	X				
		3) Where method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
		4) Were blank concentrations < MDL?	X				
		5) For analyte(s) detected in a blank sample, was the concentration, unadjusted for sample specific factors, in all associated field samples, greater than 10 times the concentration in the blank sample?			X		
R6	OI	Laboratory Control Samples (LCS):					
		1) Were all COCs included in the LCS?	X				
		2) Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
		3) Were LCSs analyzed at the required frequency?	X				
		4) Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
		5) Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
		6) Was the LCSD RPD within QC limits (if applicable)?	X				
R7	OI	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Data					
		1) Were the project/method specified analytes included in the MS and MSD?	X				
		2) Were MS/MSD analyzed at the appropriate frequency?	X				
		3) Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?		X			R7-03
		4) Were MS/MSD RPDs within laboratory QC limits?	X				
R8	OI	Analytical Duplicate Data					
		1) Were appropriate analytical duplicates analyzed for each matrix?	X				
		2) Were analytical duplicates analyzed at the appropriate frequency?	X				
		3) Were RPDs or relative standard deviations within the laboratory QC limits?	X				
R9	OI	Method Quantitation Limits (MQLs):					
		1) Are the MQLs for each method analyte included in the laboratory data package?	X				
		2) Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
		3) Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
R10	OI	Other Problems/Anomalies					
		1) Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
		2) Was applicable and available technology used to lower the SDL to minimize the matrix interference affects on the sample results?	X				
		3) Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices and methods associated with this laboratory data package?	X				

Laboratory Name: DHL Analytical, Inc.							
Laboratory Review Checklist (continued): Supporting Data							
Project Name: Luminant-OGSES-FGD Ponds				LRC Date: 6/12/20			
Reviewer Name: Carlos Castro				Laboratory Work Order: 2005076			
Prep Batch Number(s): See Prep Dates Report				Run Batch: See Analytical Dates Report			
# ¹	A ²	Description	Yes	No	NA ³	NR ⁴	ER# ⁵
S1	OI	Initial Calibration (ICAL)					
		1) Were response factors and/or relative response factors for each analyte within QC limits?	X				
		2) Were percent RSDs or correlation coefficient criteria met?	X				
		3) Was the number of standards recommended in the method used for all analytes?	X				
		4) Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		5) Are ICAL data available for all instruments used?	X				
		6) Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	Initial and Continuing calibration Verification (ICCV and CCV) and Continuing Calibration blank (CCB):					
		1) Was the CCV analyzed at the method-required frequency?	X				
		2) Were percent differences for each analyte within the method-required QC limits?	X				
		3) Was the ICAL curve verified for each analyte?	X				
		4) Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	X				
S3	O	Mass Spectral Tuning:					
		1) Was the appropriate compound for the method used for tuning?	X				
		2) Were ion abundance data within the method-required QC limits?	X				
S4	O	Internal Standards (IS):					
		1) Were IS area counts and retention times within the method-required QC limits?	X				
S5	OI	Raw Data (NELAC Section 5.5.10)					
		1) Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		2) Were data associated with manual integrations flagged on the raw data?	X				
S6	O	Dual Column Confirmation					
		1) Did dual column confirmation results meet the method-required QC?			X		
S7	O	Tentatively Identified Compounds (TICs):					
		1) If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	Interference Check Sample (ICS) Results:					
		1) Were percent recoveries within method QC limits?	X				
S9	I	Serial Dilutions, Post Digestion Spikes, and Method of Standard Additions					
		1) Were percent differences, recoveries, and the linearity within the QC limits specified in the method?		X			S9-09
S10	OI	Method Detection Limit (MDL) Studies					
		1) Was a MDL study performed for each reported analyte?	X				
		2) Is the MDL either adjusted or supported by the analysis of DCSs?	X				
S11	OI	Proficiency Test Reports:					
		1) Was the lab's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	Standards Documentation					
		1) Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	Compound/Analyte Identification Procedures					
		1) Are the procedures for compound/analyte identification documented?	X				
S14	OI	Demonstration of Analyst Competency (DOC)					
		1) Was DOC conducted consistent with NELAC Chapter 5 – Appendix C?	X				
		2) Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	Verification/Validation Documentation for Methods (NELAC Chapter 5)					
		1) Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	Laboratory Standard Operating Procedures (SOPs):					
		1) Are laboratory SOPs current and on file for each method performed?	X				

- 1 Items identified by the letter "R" should be included in the laboratory data package submitted to the TCEQ in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
- 2 O = organic analyses; I = inorganic analyses (and general chemistry, when applicable).
- 3 NA = Not applicable.
- 4 NR = Not Reviewed.
- 5 ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Data Package Signature Page – RG-366/TRRP-13

This data package consists of:

This signature page, the laboratory review checklist, and the following reportable data:

- R1 Field chain-of-custody documentation;
- R2 Sample identification cross-reference;
- R3 Test reports (analytical data sheets) for each environmental sample that includes:
 - a) Items consistent with NELAC Chapter 5,
 - b) dilution factors,
 - c) preparation methods,
 - d) cleanup methods, and
 - e) if required for the project, tentatively identified compounds (TICs).
- R4 Surrogate recovery data including:
 - a) Calculated recovery (%R), and
 - b) The laboratory's surrogate QC limits.
- R5 Test reports/summary forms for blank samples;
- R6 Test reports/summary forms for laboratory control samples (LCSs) including:
 - a) LCS spiking amounts,
 - b) Calculated %R for each analyte, and
 - c) The laboratory's LCS QC limits.
- R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
 - a) Samples associated with the MS/MSD clearly identified,
 - b) MS/MSD spiking amounts,
 - c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
 - d) Calculated %Rs and relative percent differences (RPDs), and
 - e) The laboratory's MS/MSD QC limits
- R8 Laboratory analytical duplicate (if applicable) recovery and precision:
 - a) The amount of analyte measured in the duplicate,
 - b) The calculated RPD, and
 - c) The laboratory's QC limits for analytical duplicates.
- R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix;
- R10 Other problems or anomalies.

The Exception Report for each "No" or "Not Reviewed (NR)" item in the Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory is not accredited under the Texas Laboratory Accreditation Program.

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the Exception Reports. By my signature below, I affirm to the best of my knowledge that all problems/anomalies observed by the laboratory have been identified in the Laboratory Review Checklist, and no information or data affecting the quality of the data has been knowingly withheld.

This laboratory was last inspected by TCEQ on February 25-28 2019. Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Name: John DuPont
Official Title: General Manager


Signature

06/12/20
Date

Name: Dr. Derhsing Luu
Official Title: Technical Director

CLIENT: Golder
Project: Luminant-OGSES-FGD Ponds
Lab Order: 2005076

CASE NARRATIVE

Samples were analyzed using the methods outlined in the following references:

Method SW6020B - Metals Analysis
Method SW7470A - Mercury Analysis
Method E300 - Anions Analysis
Method M2320 B - Alkalinity Analysis
Method M3500-Fe D - Ferrous Iron Analysis (this parameter is not NELAP certified)
Method M3500-Fe D - Ferric Iron (calculation) (this calculation is not NELAP certified)
Method M4500-P E - Orthophosphate Analysis
Method M2540C - TDS Analysis

Exception Report R1-01

The samples were received and log-in performed on 5/12/20. A total of 2 samples were received. The samples arrived in good condition and were properly packaged.

Exception Report R7-03

For Anions analysis performed on 5/12/20 the matrix spike and matrix spike duplicate recoveries (2005076-01 MS/MSD) were slightly below control limits for Chloride. These are flagged accordingly in the QC summary report. The sample selected for the matrix spike and matrix spike duplicate was from this work order. The LCS was within control limits for this analyte. No further corrective actions were taken.

For Metals analysis performed on 5/14/20 and 5/15/20 the matrix spike and/or matrix spike duplicate recoveries were out of control limits for a total of three analytes. These are flagged accordingly. The sample selected for the matrix spike and matrix spike duplicate was not from this work order. The LCS was within control limits for these analytes. No further corrective actions were taken.

For Ferrous Iron analysis performed on 5/13/20 the matrix spike recovery was slightly above control limits. This was due to matrix effect. This is flagged accordingly. The sample selected for the matrix spike and matrix spike duplicate was not from this work order. The LCS was within control limits. No further corrective actions were taken.

Exception Report S9-01

For Metals analysis performed on 5/14/20 the PDS recovery was out of control limits for a total of three analytes. These are flagged accordingly in the QC summary report. The serial dilution was within control limits for these analytes. No further corrective actions were taken.

CLIENT: Golder
Project: Luminant-OGSES-FGD Ponds
Lab Order: 2005076

Work Order Sample Summary

Lab Smp ID	Client Sample ID	Tag Number	Date Collected	Date Recved
2005076-01	FGD-A-POND		05/11/20 02:05 PM	5/12/2020
2005076-02	FGD-B-POND		05/11/20 02:25 PM	5/12/2020

Lab Order: 2005076
Client: Golder
Project: Luminant-OGSES-FGD Ponds

PREP DATES REPORT

Sample ID	Client Sample ID	Collection Date	Matrix	Test Number	Test Name	Prep Date	Batch ID
2005076-01A	FGD-A-POND	05/11/20 02:05 PM	Aqueous	M3500-Fe	Ferrous Iron Prep Water	05/13/20 08:00 AM	96316
2005076-01B	FGD-A-POND	05/11/20 02:05 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/13/20 09:48 AM	96330
	FGD-A-POND	05/11/20 02:05 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/13/20 09:48 AM	96330
	FGD-A-POND	05/11/20 02:05 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/13/20 09:48 AM	96330
	FGD-A-POND	05/11/20 02:05 PM	Aqueous	SW7470A	Mercury Aq Prep	05/17/20 12:32 PM	96370
2005076-01C	FGD-A-POND	05/11/20 02:05 PM	Aqueous	M2320 B	Alkalinity Preparation	05/14/20 09:44 AM	96346
	FGD-A-POND	05/11/20 02:05 PM	Aqueous	E300	Anion Preparation	05/12/20 09:07 AM	96308
	FGD-A-POND	05/11/20 02:05 PM	Aqueous	E300	Anion Preparation	05/12/20 09:07 AM	96308
	FGD-A-POND	05/11/20 02:05 PM	Aqueous	M4500-P E	Orthophosphate Prep	05/12/20 11:20 AM	96315
	FGD-A-POND	05/11/20 02:05 PM	Aqueous	M2540C	TDS Preparation	05/12/20 03:13 PM	96320
2005076-02A	FGD-B-POND	05/11/20 02:25 PM	Aqueous	M3500-Fe	Ferrous Iron Prep Water	05/13/20 08:00 AM	96316
2005076-02B	FGD-B-POND	05/11/20 02:25 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/13/20 09:48 AM	96330
	FGD-B-POND	05/11/20 02:25 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/13/20 09:48 AM	96330
	FGD-B-POND	05/11/20 02:25 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/13/20 09:48 AM	96330
	FGD-B-POND	05/11/20 02:25 PM	Aqueous	SW7470A	Mercury Aq Prep	05/17/20 12:32 PM	96370
2005076-02C	FGD-B-POND	05/11/20 02:25 PM	Aqueous	M2320 B	Alkalinity Preparation	05/14/20 09:44 AM	96346
	FGD-B-POND	05/11/20 02:25 PM	Aqueous	E300	Anion Preparation	05/12/20 09:07 AM	96308
	FGD-B-POND	05/11/20 02:25 PM	Aqueous	E300	Anion Preparation	05/12/20 09:07 AM	96308
	FGD-B-POND	05/11/20 02:25 PM	Aqueous	M4500-P E	Orthophosphate Prep	05/12/20 11:20 AM	96315
	FGD-B-POND	05/11/20 02:25 PM	Aqueous	M2540C	TDS Preparation	05/12/20 03:13 PM	96320

Lab Order: 2005076
 Client: Golder
 Project: Luminant-OGSES-FGD Ponds

ANALYTICAL DATES REPORT

Sample ID	Client Sample ID	Matrix	Test Number	Test Name	Batch ID	Dilution	Analysis Date	Run ID
2005076-01A	FGD-A-POND	Aqueous	M3500-Fe D	Ferric Iron (Calculated)	96316	1	05/13/20 08:05 AM	UV/VIS_2_200513C
	FGD-A-POND	Aqueous	M3500-Fe D	Ferrous Iron	96316	1	05/13/20 10:53 AM	UV/VIS_2_200513B
2005076-01B	FGD-A-POND	Aqueous	SW7470A	Mercury Total: Aqueous	96370	1	05/19/20 11:54 AM	CETAC2_HG_200519 B
	FGD-A-POND	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	96330	1	05/14/20 02:46 PM	ICP-MS5_200514A
	FGD-A-POND	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	96330	500	05/15/20 12:18 PM	ICP-MS5_200515B
	FGD-A-POND	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	96330	100	05/15/20 12:20 PM	ICP-MS5_200515B
2005076-01C	FGD-A-POND	Aqueous	M2320 B	Alkalinity	96346	1	05/14/20 11:41 AM	TITRATOR_200514B
	FGD-A-POND	Aqueous	E300	Anions by IC method - Water	96308	2	05/12/20 12:56 PM	IC2_200512A
	FGD-A-POND	Aqueous	E300	Anions by IC method - Water	96308	100	05/12/20 06:00 PM	IC2_200512A
	FGD-A-POND	Aqueous	M4500-P E	Orthophosphate	96315	1	05/12/20 04:05 PM	UV/VIS_2_200512D
	FGD-A-POND	Aqueous	M2540C	Total Dissolved Solids	96320	1	05/12/20 05:00 PM	WC_200512D
2005076-02A	FGD-B-POND	Aqueous	M3500-Fe D	Ferric Iron (Calculated)	96316	1	05/13/20 08:05 AM	UV/VIS_2_200513C
	FGD-B-POND	Aqueous	M3500-Fe D	Ferrous Iron	96316	1	05/13/20 10:55 AM	UV/VIS_2_200513B
2005076-02B	FGD-B-POND	Aqueous	SW7470A	Mercury Total: Aqueous	96370	1	05/19/20 11:56 AM	CETAC2_HG_200519 B
	FGD-B-POND	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	96330	1	05/14/20 02:48 PM	ICP-MS5_200514A
	FGD-B-POND	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	96330	200	05/15/20 12:29 PM	ICP-MS5_200515B
	FGD-B-POND	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	96330	100	05/15/20 12:32 PM	ICP-MS5_200515B
2005076-02C	FGD-B-POND	Aqueous	M2320 B	Alkalinity	96346	1	05/14/20 11:49 AM	TITRATOR_200514B
	FGD-B-POND	Aqueous	E300	Anions by IC method - Water	96308	2	05/12/20 01:12 PM	IC2_200512A
	FGD-B-POND	Aqueous	E300	Anions by IC method - Water	96308	100	05/12/20 06:48 PM	IC2_200512A
	FGD-B-POND	Aqueous	M4500-P E	Orthophosphate	96315	1	05/12/20 04:05 PM	UV/VIS_2_200512D
	FGD-B-POND	Aqueous	M2540C	Total Dissolved Solids	96320	1	05/12/20 05:00 PM	WC_200512D

DHL Analytical, Inc.

Date: 12-Jun-20

CLIENT: Golder
Project: Luminant-OGSES-FGD Ponds
Project No: 19122262-F2020
Lab Order: 2005076

Client Sample ID: FGD-A-POND
Lab ID: 2005076-01
Collection Date: 05/11/20 02:05 PM
Matrix: AQUEOUS

Analyses	Result	SDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		SW6020B		Analyst: RO			
Antimony	0.00548	0.000800	0.00250		mg/L	1	05/14/20 02:46 PM
Arsenic	0.00420	0.00200	0.00500	J	mg/L	1	05/14/20 02:46 PM
Barium	0.278	0.00300	0.0100		mg/L	1	05/14/20 02:46 PM
Beryllium	<0.000300	0.000300	0.00100		mg/L	1	05/14/20 02:46 PM
Boron	104	5.00	15.0		mg/L	500	05/15/20 12:18 PM
Cadmium	0.00132	0.000300	0.00100		mg/L	1	05/14/20 02:46 PM
Calcium	895	10.0	30.0		mg/L	100	05/15/20 12:20 PM
Chromium	0.00244	0.00200	0.00500	J	mg/L	1	05/14/20 02:46 PM
Cobalt	0.00625	0.00300	0.00500		mg/L	1	05/14/20 02:46 PM
Iron	0.150	0.0300	0.100		mg/L	1	05/14/20 02:46 PM
Lead	<0.000300	0.000300	0.00100		mg/L	1	05/14/20 02:46 PM
Lithium	0.422	0.00500	0.0100		mg/L	1	05/14/20 02:46 PM
Magnesium	1490	10.0	30.0		mg/L	100	05/15/20 12:20 PM
Molybdenum	0.216	0.00200	0.00500		mg/L	1	05/14/20 02:46 PM
Potassium	195	10.0	30.0		mg/L	100	05/15/20 12:20 PM
Selenium	4.71	0.200	0.500		mg/L	100	05/15/20 12:20 PM
Sodium	563	10.0	30.0		mg/L	100	05/15/20 12:20 PM
Thallium	0.00326	0.000500	0.00150		mg/L	1	05/14/20 02:46 PM
MERCURY TOTAL: AQUEOUS		SW7470A		Analyst: BM			
Mercury	0.000672	0.0000800	0.000200		mg/L	1	05/19/20 11:54 AM
ANIONS BY IC METHOD - WATER		E300		Analyst: SNM			
Chloride	3440	30.0	100		mg/L	100	05/12/20 06:00 PM
Fluoride	20.6	0.200	0.800		mg/L	2	05/12/20 12:56 PM
Nitrate-N	6.27	0.200	1.00		mg/L	2	05/12/20 12:56 PM
Sulfate	4680	100	300		mg/L	100	05/12/20 06:00 PM
ALKALINITY		M2320 B		Analyst: BTJ			
Alkalinity, Bicarbonate (As CaCO3)	134	10.0	20.0		mg/L @ pH 4.54	1	05/14/20 11:41 AM
Alkalinity, Carbonate (As CaCO3)	<10.0	10.0	20.0		mg/L @ pH 4.54	1	05/14/20 11:41 AM
Alkalinity, Hydroxide (As CaCO3)	<10.0	10.0	20.0		mg/L @ pH 4.54	1	05/14/20 11:41 AM
Alkalinity, Total (As CaCO3)	134	20.0	20.0		mg/L @ pH 4.54	1	05/14/20 11:41 AM
FERRIC IRON (CALCULATED)		M3500-FE D		Analyst: CAC			
Iron, Ferric	0.150	0.0500	0.100	N	mg/L	1	05/13/20 08:05 AM
FERROUS IRON		M3500-FE D		Analyst: CC			
Iron, Ferrous	<0.0500	0.0500	0.100	N	mg/L	1	05/13/20 10:53 AM

Qualifiers: ND - Not Detected at the SDL
 J - Analyte detected between SDL and RL
 B - Analyte detected in the associated Method Blank
 DF- Dilution Factor
 N - Parameter not NELAP certified
 See Final Page of Report for MQLs and MDLs

S - Spike Recovery outside control limits
 C - Sample Result or QC discussed in Case Narrative
 RL - Reporting Limit (MQL adjusted for moisture and sample size)
 SDL - Sample Detection Limit
 E - TPH pattern not Gas or Diesel Range Pattern

DHL Analytical, Inc.

Date: 12-Jun-20

CLIENT: Golder
Project: Luminant-OGSES-FGD Ponds
Project No: 19122262-F2020
Lab Order: 2005076

Client Sample ID: FGD-A-POND
Lab ID: 2005076-01
Collection Date: 05/11/20 02:05 PM
Matrix: AQUEOUS

Analyses	Result	SDL	RL	Qual	Units	DF	Date Analyzed
ORTHOPHOSPHATE		M4500-P E					Analyst: BTJ
Phosphorus, Total Orthophosphate (As P)	<0.0300	0.0300	0.100		mg/L	1	05/12/20 04:05 PM
TOTAL DISSOLVED SOLIDS		M2540C					Analyst: JS
Total Dissolved Solids (Residue, Filterable)	13200	200	200		mg/L	1	05/12/20 05:00 PM

Qualifiers: ND - Not Detected at the SDL
 J - Analyte detected between SDL and RL
 B - Analyte detected in the associated Method Blank
 DF- Dilution Factor
 N - Parameter not NELAP certified
 See Final Page of Report for MQLs and MDLs

S - Spike Recovery outside control limits
 C - Sample Result or QC discussed in Case Narrative
 RL - Reporting Limit (MQL adjusted for moisture and sample size)
 SDL - Sample Detection Limit
 E - TPH pattern not Gas or Diesel Range Pattern

DHL Analytical, Inc.

Date: 12-Jun-20

CLIENT: Golder
Project: Luminant-OGSES-FGD Ponds
Project No: 19122262-F2020
Lab Order: 2005076

Client Sample ID: FGD-B-POND
Lab ID: 2005076-02
Collection Date: 05/11/20 02:25 PM
Matrix: AQUEOUS

Analyses	Result	SDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		SW6020B			Analyst: RO		
Antimony	<0.000800	0.000800	0.00250		mg/L	1	05/14/20 02:48 PM
Arsenic	<0.00200	0.00200	0.00500		mg/L	1	05/14/20 02:48 PM
Barium	0.0583	0.00300	0.0100		mg/L	1	05/14/20 02:48 PM
Beryllium	<0.000300	0.000300	0.00100		mg/L	1	05/14/20 02:48 PM
Boron	84.4	2.00	6.00		mg/L	200	05/15/20 12:29 PM
Cadmium	<0.000300	0.000300	0.00100		mg/L	1	05/14/20 02:48 PM
Calcium	696	10.0	30.0		mg/L	100	05/15/20 12:32 PM
Chromium	0.00246	0.00200	0.00500	J	mg/L	1	05/14/20 02:48 PM
Cobalt	<0.00300	0.00300	0.00500		mg/L	1	05/14/20 02:48 PM
Iron	0.170	0.0300	0.100		mg/L	1	05/14/20 02:48 PM
Lead	<0.000300	0.000300	0.00100		mg/L	1	05/14/20 02:48 PM
Lithium	0.182	0.00500	0.0100		mg/L	1	05/14/20 02:48 PM
Magnesium	1020	10.0	30.0		mg/L	100	05/15/20 12:32 PM
Molybdenum	0.244	0.00200	0.00500		mg/L	1	05/14/20 02:48 PM
Potassium	106	10.0	30.0		mg/L	100	05/15/20 12:32 PM
Selenium	0.681	0.00200	0.00500		mg/L	1	05/14/20 02:48 PM
Sodium	351	10.0	30.0		mg/L	100	05/15/20 12:32 PM
Thallium	0.000818	0.000500	0.00150	J	mg/L	1	05/14/20 02:48 PM
MERCURY TOTAL: AQUEOUS		SW7470A			Analyst: BM		
Mercury	0.000545	0.0000800	0.000200		mg/L	1	05/19/20 11:56 AM
ANIONS BY IC METHOD - WATER		E300			Analyst: SNM		
Chloride	1940	30.0	100		mg/L	100	05/12/20 06:48 PM
Fluoride	15.6	0.200	0.800		mg/L	2	05/12/20 01:12 PM
Nitrate-N	2.23	0.200	1.00		mg/L	2	05/12/20 01:12 PM
Sulfate	3930	100	300		mg/L	100	05/12/20 06:48 PM
ALKALINITY		M2320 B			Analyst: BTJ		
Alkalinity, Bicarbonate (As CaCO3)	68.8	10.0	20.0		mg/L @ pH 4.51	1	05/14/20 11:49 AM
Alkalinity, Carbonate (As CaCO3)	<10.0	10.0	20.0		mg/L @ pH 4.51	1	05/14/20 11:49 AM
Alkalinity, Hydroxide (As CaCO3)	<10.0	10.0	20.0		mg/L @ pH 4.51	1	05/14/20 11:49 AM
Alkalinity, Total (As CaCO3)	68.8	20.0	20.0		mg/L @ pH 4.51	1	05/14/20 11:49 AM
FERRIC IRON (CALCULATED)		M3500-FE D			Analyst: CAC		
Iron, Ferric	0.170	0.0500	0.100	N	mg/L	1	05/13/20 08:05 AM
FERROUS IRON		M3500-FE D			Analyst: CC		
Iron, Ferrous	<0.0500	0.0500	0.100	N	mg/L	1	05/13/20 10:55 AM

Qualifiers: ND - Not Detected at the SDL
 J - Analyte detected between SDL and RL
 B - Analyte detected in the associated Method Blank
 DF- Dilution Factor
 N - Parameter not NELAP certified
 See Final Page of Report for MQLs and MDLs

S - Spike Recovery outside control limits
 C - Sample Result or QC discussed in Case Narrative
 RL - Reporting Limit (MQL adjusted for moisture and sample size)
 SDL - Sample Detection Limit
 E - TPH pattern not Gas or Diesel Range Pattern

DHL Analytical, Inc.**Date:** 12-Jun-20

CLIENT: Golder
Project: Luminant-OGSES-FGD Ponds
Project No: 19122262-F2020
Lab Order: 2005076

Client Sample ID: FGD-B-POND
Lab ID: 2005076-02
Collection Date: 05/11/20 02:25 PM
Matrix: AQUEOUS

Analyses	Result	SDL	RL	Qual	Units	DF	Date Analyzed
ORTHOPHOSPHATE		M4500-P E					Analyst: BTJ
Phosphorus, Total Orthophosphate (As P)	<0.0300	0.0300	0.100		mg/L	1	05/12/20 04:05 PM
TOTAL DISSOLVED SOLIDS		M2540C					Analyst: JS
Total Dissolved Solids (Residue, Filterable)	8890	50.0	50.0		mg/L	1	05/12/20 05:00 PM

Qualifiers: ND - Not Detected at the SDL
J - Analyte detected between SDL and RL
B - Analyte detected in the associated Method Blank
DF- Dilution Factor
N - Parameter not NELAP certified
See Final Page of Report for MQLs and MDLs

S - Spike Recovery outside control limits
C - Sample Result or QC discussed in Case Narrative
RL - Reporting Limit (MQL adjusted for moisture and sample size)
SDL - Sample Detection Limit
E - TPH pattern not Gas or Diesel Range Pattern

CLIENT: Golder
Work Order: 2005076
Project: Luminant-OGSES-FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: CETAC2_HG_200304C

Sample ID: DCS-95289	Batch ID: 95289	TestNo: SW7470A	Units: mg/L							
SampType: DCS	Run ID: CETAC2_HG_200304C	Analysis Date: 3/4/2020 12:11:09 PM	Prep Date: 3/4/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.000175	0.000200	0.000200	0	87.5	82	119	0	0	

Qualifiers: B Analyte detected in the associated Method Blank
 J Analyte detected between MDL and RL
 ND Not Detected at the Method Detection Limit
 RL Reporting Limit
 J Analyte detected between SDL and RL

DF Dilution Factor
 MDL Method Detection Limit
 R RPD outside accepted control limits
 S Spike Recovery outside control limits
 N Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005076
Project: Luminant-OGSES-FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: CETAC2_HG_200519B

The QC data in batch 96370 applies to the following samples: 2005076-01B, 2005076-02B

Sample ID: MB-96370	Batch ID: 96370	TestNo: SW7470A	Units: mg/L							
SampType: MBLK	Run ID: CETAC2_HG_200519B	Analysis Date: 5/19/2020 11:47:54 AM	Prep Date: 5/17/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	<0.0000800	0.000200								

Sample ID: LCS-96370	Batch ID: 96370	TestNo: SW7470A	Units: mg/L							
SampType: LCS	Run ID: CETAC2_HG_200519B	Analysis Date: 5/19/2020 11:50:10 AM	Prep Date: 5/17/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.00205	0.000200	0.00200	0	103	85	115			

Sample ID: LCSD-96370	Batch ID: 96370	TestNo: SW7470A	Units: mg/L							
SampType: LCSD	Run ID: CETAC2_HG_200519B	Analysis Date: 5/19/2020 11:52:26 AM	Prep Date: 5/17/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.00194	0.000200	0.00200	0	97.0	85	115	5.51	15	

Sample ID: 2005079-01A MS	Batch ID: 96370	TestNo: SW7470A	Units: mg/L							
SampType: MS	Run ID: CETAC2_HG_200519B	Analysis Date: 5/19/2020 12:01:30 PM	Prep Date: 5/17/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.00191	0.000200	0.00200	0	95.5	80	120			

Sample ID: 2005079-01A MSD	Batch ID: 96370	TestNo: SW7470A	Units: mg/L							
SampType: MSD	Run ID: CETAC2_HG_200519B	Analysis Date: 5/19/2020 12:03:46 PM	Prep Date: 5/17/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.00209	0.000200	0.00200	0	104	80	120	9.00	15	

Sample ID: 2005079-01A SD	Batch ID: 96370	TestNo: SW7470A	Units: mg/L							
SampType: SD	Run ID: CETAC2_HG_200519B	Analysis Date: 5/19/2020 12:06:02 PM	Prep Date: 5/17/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	<0.000400	0.00100	0	0				0	10	

Sample ID: 2005079-01A PDS	Batch ID: 96370	TestNo: SW7470A	Units: mg/L							
SampType: PDS	Run ID: CETAC2_HG_200519B	Analysis Date: 5/19/2020 12:08:18 PM	Prep Date: 5/17/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.00226	0.000200	0.00250	0	90.4	85	115			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005076
Project: Luminant-OGSES-FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: CETAC2_HG_200519B

Sample ID: ICV-200519	Batch ID: R110550	TestNo: SW7470A	Units: mg/L							
SampType: ICV	Run ID: CETAC2_HG_200519B	Analysis Date: 5/19/2020 10:31:55 AM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Mercury	0.00391	0.000200	0.00400	0	97.8	90	110			
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Sample ID: CCV2-200519	Batch ID: R110550	TestNo: SW7470A	Units: mg/L							
SampType: CCV	Run ID: CETAC2_HG_200519B	Analysis Date: 5/19/2020 11:42:21 AM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Mercury	0.00213	0.000200	0.00200	0	106	90	110			
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Sample ID: CCV3-200519	Batch ID: R110550	TestNo: SW7470A	Units: mg/L							
SampType: CCV	Run ID: CETAC2_HG_200519B	Analysis Date: 5/19/2020 12:26:27 PM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Mercury	0.00214	0.000200	0.00200	0	107	90	110			
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Qualifiers: B Analyte detected in the associated Method Blank J Analyte detected between MDL and RL ND Not Detected at the Method Detection Limit RL Reporting Limit J Analyte detected between SDL and RL	DF Dilution Factor MDL Method Detection Limit R RPD outside accepted control limits S Spike Recovery outside control limits N Parameter not NELAP certified
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CLIENT: Golder
Work Order: 2005076
Project: Luminant-OGSES-FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS5_200408C

Sample ID: DCS1-95814	Batch ID: 95814	TestNo: SW6020B	Units: mg/L
SampType: DCS	Run ID: ICP-MS5_200408C	Analysis Date: 4/8/2020 11:16:00 AM	Prep Date: 4/7/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.000932	0.00250	0.00100	0	93.2	70	130	0	0	
Beryllium	0.000472	0.00100	0.000500	0	94.4	70	130	0	0	
Cadmium	0.000492	0.00100	0.000500	0	98.4	70	130	0	0	
Lead	0.000496	0.00100	0.000500	0	99.2	70	130	0	0	
Thallium	0.000468	0.00150	0.000500	0	93.6	70	130	0	0	

Sample ID: DCS2-95814	Batch ID: 95814	TestNo: SW6020B	Units: mg/L
SampType: DCS2	Run ID: ICP-MS5_200408C	Analysis Date: 4/8/2020 11:19:00 AM	Prep Date: 4/7/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	0.310	0.300	0.300	0	103	70	130	0	0	
Iron	0.0591	0.100	0.0500	0	118	70	130	0	0	
Magnesium	0.298	0.300	0.300	0	99.3	70	130	0	0	
Potassium	0.285	0.300	0.300	0	95.1	70	130	0	0	
Sodium	0.295	0.300	0.300	0	98.4	70	130	0	0	

Sample ID: DCS3-95814	Batch ID: 95814	TestNo: SW6020B	Units: mg/L
SampType: DCS3	Run ID: ICP-MS5_200408C	Analysis Date: 4/8/2020 11:21:00 AM	Prep Date: 4/7/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.00466	0.00500	0.00500	0	93.2	70	130	0	0	
Barium	0.00478	0.0100	0.00500	0	95.6	70	130	0	0	
Chromium	0.00600	0.00500	0.00500	0	120	70	130	0	0	
Cobalt	0.00473	0.00500	0.00500	0	94.6	70	130	0	0	
Lithium	0.00473	0.0100	0.00500	0	94.6	70	130	0	0	
Molybdenum	0.00466	0.00500	0.00500	0	93.2	70	130	0	0	
Selenium	0.00517	0.00500	0.00500	0	103	70	130	0	0	

Sample ID: DCS4-95814	Batch ID: 95814	TestNo: SW6020B	Units: mg/L
SampType: DCS4	Run ID: ICP-MS5_200408C	Analysis Date: 4/8/2020 11:28:00 AM	Prep Date: 4/7/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Boron	0.0286	0.0300	0.0300	0	95.2	70	130	0	0	

Qualifiers:

B Analyte detected in the associated Method Blank	DF Dilution Factor
J Analyte detected between MDL and RL	MDL Method Detection Limit
ND Not Detected at the Method Detection Limit	R RPD outside accepted control limits
RL Reporting Limit	S Spike Recovery outside control limits
J Analyte detected between SDL and RL	N Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005076

ANALYTICAL QC SUMMARY REPORT

Project: Luminant-OGSES-FGD Ponds

RunID: ICP-MS5_200514A

The QC data in batch 96330 applies to the following samples: 2005076-01B, 2005076-02B

Sample ID: MB-96330	Batch ID: 96330	TestNo: SW6020B	Units: mg/L
SampType: MBLK	Run ID: ICP-MS5_200514A	Analysis Date: 5/14/2020 1:24:00 PM	Prep Date: 5/13/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	<0.000800	0.00250								
Arsenic	<0.00200	0.00500								
Barium	<0.00300	0.0100								
Beryllium	<0.000300	0.00100								
Cadmium	<0.000300	0.00100								
Calcium	<0.100	0.300								
Chromium	<0.00200	0.00500								
Cobalt	<0.00300	0.00500								
Iron	<0.0300	0.100								
Lead	<0.000300	0.00100								
Lithium	<0.00500	0.0100								
Magnesium	<0.100	0.300								
Molybdenum	<0.00200	0.00500								
Potassium	<0.100	0.300								
Selenium	<0.00200	0.00500								
Sodium	<0.100	0.300								
Thallium	<0.000500	0.00150								

Sample ID: LCS-96330	Batch ID: 96330	TestNo: SW6020B	Units: mg/L
SampType: LCS	Run ID: ICP-MS5_200514A	Analysis Date: 5/14/2020 1:26:00 PM	Prep Date: 5/13/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.203	0.00250	0.200	0	101	80	120			
Arsenic	0.208	0.00500	0.200	0	104	80	120			
Barium	0.202	0.0100	0.200	0	101	80	120			
Beryllium	0.205	0.00100	0.200	0	102	80	120			
Cadmium	0.204	0.00100	0.200	0	102	80	120			
Calcium	5.22	0.300	5.00	0	104	80	120			
Chromium	0.206	0.00500	0.200	0	103	80	120			
Cobalt	0.202	0.00500	0.200	0	101	80	120			
Iron	5.10	0.100	5.00	0	102	80	120			
Lead	0.200	0.00100	0.200	0	99.9	80	120			
Lithium	0.207	0.0100	0.200	0	103	80	120			
Magnesium	5.13	0.300	5.00	0	103	80	120			
Molybdenum	0.201	0.00500	0.200	0	101	80	120			
Potassium	5.11	0.300	5.00	0	102	80	120			
Selenium	0.202	0.00500	0.200	0	101	80	120			
Sodium	5.14	0.300	5.00	0	103	80	120			
Thallium	0.199	0.00150	0.200	0	99.5	80	120			

Qualifiers:	<p>B Analyte detected in the associated Method Blank</p> <p>J Analyte detected between MDL and RL</p> <p>ND Not Detected at the Method Detection Limit</p> <p>RL Reporting Limit</p> <p>J Analyte detected between SDL and RL</p>	<p>DF Dilution Factor</p> <p>MDL Method Detection Limit</p> <p>R RPD outside accepted control limits</p> <p>S Spike Recovery outside control limits</p> <p>N Parameter not NELAP certified</p>
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CLIENT: Golder
Work Order: 2005076
Project: Luminant-OGSES-FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS5_200514A

Sample ID: LCSD-96330	Batch ID: 96330	TestNo: SW6020B	Units: mg/L
SampType: LCSD	Run ID: ICP-MS5_200514A	Analysis Date: 5/14/2020 1:28:00 PM	Prep Date: 5/13/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.206	0.00250	0.200	0	103	80	120	1.84	15	
Arsenic	0.205	0.00500	0.200	0	103	80	120	1.10	15	
Barium	0.203	0.0100	0.200	0	102	80	120	0.481	15	
Beryllium	0.206	0.00100	0.200	0	103	80	120	0.883	15	
Cadmium	0.204	0.00100	0.200	0	102	80	120	0.123	15	
Calcium	5.17	0.300	5.00	0	103	80	120	1.01	15	
Chromium	0.206	0.00500	0.200	0	103	80	120	0.421	15	
Cobalt	0.202	0.00500	0.200	0	101	80	120	0.015	15	
Iron	5.12	0.100	5.00	0	102	80	120	0.297	15	
Lead	0.202	0.00100	0.200	0	101	80	120	0.968	15	
Lithium	0.207	0.0100	0.200	0	103	80	120	0.103	15	
Magnesium	5.19	0.300	5.00	0	104	80	120	1.09	15	
Molybdenum	0.202	0.00500	0.200	0	101	80	120	0.287	15	
Potassium	5.10	0.300	5.00	0	102	80	120	0.208	15	
Selenium	0.202	0.00500	0.200	0	101	80	120	0.151	15	
Sodium	5.15	0.300	5.00	0	103	80	120	0.222	15	
Thallium	0.201	0.00150	0.200	0	100	80	120	0.933	15	

Sample ID: 2005081-01A SD	Batch ID: 96330	TestNo: SW6020B	Units: mg/L
SampType: SD	Run ID: ICP-MS5_200514A	Analysis Date: 5/14/2020 1:35:00 PM	Prep Date: 5/13/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.00688	0.0125	0	0.00692				0.580	20	
Arsenic	<0.0100	0.0250	0	0				0	20	
Barium	0.0797	0.0500	0	0.0823				3.25	20	
Beryllium	<0.00150	0.00500	0	0				0	20	
Cadmium	<0.00150	0.00500	0	0.000566				0	20	
Calcium	112	1.50	0	111				0.280	20	
Chromium	<0.0100	0.0250	0	0.00535				0	20	
Cobalt	<0.0150	0.0250	0	0				0	20	
Iron	<0.150	0.500	0	0				0	20	
Lead	<0.00150	0.00500	0	0.000354				0	20	
Lithium	0.369	0.0500	0	0.364				1.16	20	
Magnesium	4.91	1.50	0	4.87				0.868	20	
Molybdenum	<0.0100	0.0250	0	0.00457				0	20	
Potassium	37.7	1.50	0	37.5				0.705	20	
Selenium	<0.0100	0.0250	0	0				0	20	
Sodium	165	1.50	0	163				1.61	20	
Thallium	<0.00250	0.00750	0	0				0	20	

Qualifiers: B Analyte detected in the associated Method Blank
J Analyte detected between MDL and RL
ND Not Detected at the Method Detection Limit
RL Reporting Limit
J Analyte detected between SDL and RL

DF Dilution Factor
MDL Method Detection Limit
R RPD outside accepted control limits
S Spike Recovery outside control limits
N Parameter not NELAP certified

CLIENT: Golder
 Work Order: 2005076
 Project: Luminant-OGSES-FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS5_200514A

Sample ID: 2005081-01A PDS	Batch ID: 96330	TestNo: SW6020B	Units: mg/L
SampType: PDS	Run ID: ICP-MS5_200514A	Analysis Date: 5/14/2020 2:02:00 PM	Prep Date: 5/13/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.205	0.00250	0.200	0.00692	98.8	75	125			
Arsenic	0.193	0.00500	0.200	0	96.3	75	125			
Barium	0.282	0.0100	0.200	0.0823	100	75	125			
Beryllium	0.198	0.00100	0.200	0	99.2	75	125			
Cadmium	0.201	0.00100	0.200	0.000566	100	75	125			
Calcium	110	0.300	5.00	111	-23.2	75	125			S
Chromium	0.214	0.00500	0.200	0.00535	104	75	125			
Cobalt	0.193	0.00500	0.200	0	96.6	75	125			
Iron	5.07	0.100	5.00	0	101	75	125			
Lead	0.204	0.00100	0.200	0.000354	102	75	125			
Lithium	0.538	0.0100	0.200	0.364	86.8	75	125			
Magnesium	9.54	0.300	5.00	4.87	93.4	75	125			
Molybdenum	0.202	0.00500	0.200	0.00457	98.5	75	125			
Potassium	40.5	0.300	5.00	37.5	61.4	75	125			S
Selenium	0.197	0.00500	0.200	0	98.4	75	125			
Sodium	159	0.300	5.00	163	-74.0	75	125			S
Thallium	0.202	0.00150	0.200	0	101	75	125			

Sample ID: 2005081-01A MS	Batch ID: 96330	TestNo: SW6020B	Units: mg/L
SampType: MS	Run ID: ICP-MS5_200514A	Analysis Date: 5/14/2020 2:04:00 PM	Prep Date: 5/13/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.212	0.00250	0.200	0.00692	102	75	125			
Arsenic	0.200	0.00500	0.200	0	99.9	75	125			
Barium	0.286	0.0100	0.200	0.0823	102	75	125			
Beryllium	0.199	0.00100	0.200	0	99.7	75	125			
Cadmium	0.200	0.00100	0.200	0.000566	99.9	75	125			
Calcium	118	0.300	5.00	111	129	75	125			S
Chromium	0.209	0.00500	0.200	0.00535	102	75	125			
Cobalt	0.192	0.00500	0.200	0	96.2	75	125			
Iron	5.13	0.100	5.00	0	103	75	125			
Lead	0.200	0.00100	0.200	0.000354	99.9	75	125			
Lithium	0.561	0.0100	0.200	0.364	98.2	75	125			
Magnesium	9.98	0.300	5.00	4.87	102	75	125			
Molybdenum	0.208	0.00500	0.200	0.00457	102	75	125			
Potassium	43.2	0.300	5.00	37.5	114	75	125			
Selenium	0.190	0.00500	0.200	0	94.8	75	125			
Sodium	169	0.300	5.00	163	129	75	125			S
Thallium	0.200	0.00150	0.200	0	100	75	125			

Qualifiers: B Analyte detected in the associated Method Blank DF Dilution Factor
 J Analyte detected between MDL and RL MDL Method Detection Limit
 ND Not Detected at the Method Detection Limit R RPD outside accepted control limits
 RL Reporting Limit S Spike Recovery outside control limits
 J Analyte detected between SDL and RL N Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005076
Project: Luminant-OGSES-FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS5_200514A

Sample ID: 2005081-01A MSD	Batch ID: 96330	TestNo: SW6020B	Units: mg/L
SampType: MSD	Run ID: ICP-MS5_200514A	Analysis Date: 5/14/2020 2:07:00 PM	Prep Date: 5/13/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.210	0.00250	0.200	0.00692	102	75	125	0.899	15	
Arsenic	0.200	0.00500	0.200	0	99.9	75	125	0.042	15	
Barium	0.279	0.0100	0.200	0.0823	98.1	75	125	2.57	15	
Beryllium	0.199	0.00100	0.200	0	99.3	75	125	0.406	15	
Cadmium	0.199	0.00100	0.200	0.000566	99.2	75	125	0.713	15	
Calcium	116	0.300	5.00	111	89.4	75	125	1.68	15	
Chromium	0.207	0.00500	0.200	0.00535	101	75	125	1.26	15	
Cobalt	0.191	0.00500	0.200	0	95.6	75	125	0.653	15	
Iron	5.00	0.100	5.00	0	99.9	75	125	2.68	15	
Lead	0.200	0.00100	0.200	0.000354	100	75	125	0.147	15	
Lithium	0.556	0.0100	0.200	0.364	95.6	75	125	0.928	15	
Magnesium	9.83	0.300	5.00	4.87	99.2	75	125	1.45	15	
Molybdenum	0.206	0.00500	0.200	0.00457	101	75	125	0.965	15	
Potassium	42.5	0.300	5.00	37.5	100	75	125	1.60	15	
Selenium	0.187	0.00500	0.200	0	93.4	75	125	1.53	15	
Sodium	166	0.300	5.00	163	71.3	75	125	1.71	15	S
Thallium	0.200	0.00150	0.200	0	100	75	125	0.031	15	

<p>Qualifiers:</p> <p>B Analyte detected in the associated Method Blank</p> <p>J Analyte detected between MDL and RL</p> <p>ND Not Detected at the Method Detection Limit</p> <p>RL Reporting Limit</p> <p>J Analyte detected between SDL and RL</p>	<p>DF Dilution Factor</p> <p>MDL Method Detection Limit</p> <p>R RPD outside accepted control limits</p> <p>S Spike Recovery outside control limits</p> <p>N Parameter not NELAP certified</p>
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CLIENT: Golder
Work Order: 2005076
Project: Luminant-OGSES-FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS5_200514A

Sample ID: ICV-200514	Batch ID: R110496	TestNo: SW6020B	Units: mg/L
SampType: ICV	Run ID: ICP-MS5_200514A	Analysis Date: 5/14/2020 11:28:00 AM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.101	0.00250	0.100	0	101	90	110			
Arsenic	0.101	0.00500	0.100	0	101	90	110			
Barium	0.101	0.0100	0.100	0	101	90	110			
Beryllium	0.101	0.00100	0.100	0	101	90	110			
Cadmium	0.103	0.00100	0.100	0	103	90	110			
Calcium	2.62	0.300	2.50	0	105	90	110			
Chromium	0.103	0.00500	0.100	0	103	90	110			
Cobalt	0.102	0.00500	0.100	0	102	90	110			
Iron	2.44	0.100	2.50	0	97.4	90	110			
Lead	0.0999	0.00100	0.100	0	99.9	90	110			
Lithium	0.0987	0.0100	0.100	0	98.7	90	110			
Magnesium	2.41	0.300	2.50	0	96.2	90	110			
Molybdenum	0.0956	0.00500	0.100	0	95.6	90	110			
Potassium	2.47	0.300	2.50	0	98.7	90	110			
Selenium	0.104	0.00500	0.100	0	104	90	110			
Sodium	2.47	0.300	2.50	0	98.8	90	110			
Thallium	0.0980	0.00150	0.100	0	98.0	90	110			

Sample ID: LCVL-200514	Batch ID: R110496	TestNo: SW6020B	Units: mg/L
SampType: LCVL	Run ID: ICP-MS5_200514A	Analysis Date: 5/14/2020 11:38:00 AM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.00214	0.00250	0.00200	0	107	80	120			
Arsenic	0.00532	0.00500	0.00500	0	106	80	120			
Barium	0.00521	0.0100	0.00500	0	104	80	120			
Beryllium	0.00110	0.00100	0.00100	0	110	80	120			
Cadmium	0.00105	0.00100	0.00100	0	105	80	120			
Calcium	0.105	0.300	0.100	0	105	80	120			
Chromium	0.00522	0.00500	0.00500	0	104	80	120			
Cobalt	0.00512	0.00500	0.00500	0	102	80	120			
Iron	0.0998	0.100	0.100	0	99.8	80	120			
Lead	0.00104	0.00100	0.00100	0	104	80	120			
Lithium	0.0102	0.0100	0.0100	0	102	80	120			
Magnesium	0.0929	0.300	0.100	0	92.9	80	120			
Molybdenum	0.00521	0.00500	0.00500	0	104	80	120			
Potassium	0.0946	0.300	0.100	0	94.6	80	120			
Selenium	0.00554	0.00500	0.00500	0	111	80	120			
Sodium	0.103	0.300	0.100	0	103	80	120			
Thallium	0.000989	0.00150	0.00100	0	98.9	80	120			

Qualifiers:

B Analyte detected in the associated Method Blank	DF Dilution Factor
J Analyte detected between MDL and RL	MDL Method Detection Limit
ND Not Detected at the Method Detection Limit	R RPD outside accepted control limits
RL Reporting Limit	S Spike Recovery outside control limits
J Analyte detected between SDL and RL	N Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005076
Project: Luminant-OGSES-FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS5_200514A

Sample ID: CCV2-200514	Batch ID: R110496	TestNo: SW6020B	Units: mg/L
SampType: CCV	Run ID: ICP-MS5_200514A	Analysis Date: 5/14/2020 1:19:00 PM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.200	0.00250	0.200	0	100	90	110			
Arsenic	0.208	0.00500	0.200	0	104	90	110			
Barium	0.203	0.0100	0.200	0	101	90	110			
Beryllium	0.204	0.00100	0.200	0	102	90	110			
Cadmium	0.205	0.00100	0.200	0	103	90	110			
Calcium	5.15	0.300	5.00	0	103	90	110			
Chromium	0.210	0.00500	0.200	0	105	90	110			
Cobalt	0.204	0.00500	0.200	0	102	90	110			
Iron	5.07	0.100	5.00	0	101	90	110			
Lead	0.199	0.00100	0.200	0	99.5	90	110			
Lithium	0.207	0.0100	0.200	0	103	90	110			
Magnesium	5.08	0.300	5.00	0	102	90	110			
Molybdenum	0.201	0.00500	0.200	0	101	90	110			
Potassium	5.08	0.300	5.00	0	102	90	110			
Selenium	0.212	0.00500	0.200	0	106	90	110			
Sodium	5.07	0.300	5.00	0	101	90	110			
Thallium	0.197	0.00150	0.200	0	98.7	90	110			

Sample ID: CCV3-200514	Batch ID: R110496	TestNo: SW6020B	Units: mg/L
SampType: CCV	Run ID: ICP-MS5_200514A	Analysis Date: 5/14/2020 2:22:00 PM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.200	0.00250	0.200	0	100	90	110			
Arsenic	0.208	0.00500	0.200	0	104	90	110			
Barium	0.203	0.0100	0.200	0	101	90	110			
Beryllium	0.205	0.00100	0.200	0	103	90	110			
Cadmium	0.206	0.00100	0.200	0	103	90	110			
Calcium	5.15	0.300	5.00	0	103	90	110			
Chromium	0.211	0.00500	0.200	0	106	90	110			
Cobalt	0.203	0.00500	0.200	0	102	90	110			
Iron	5.15	0.100	5.00	0	103	90	110			
Lead	0.197	0.00100	0.200	0	98.7	90	110			
Lithium	0.207	0.0100	0.200	0	103	90	110			
Magnesium	5.13	0.300	5.00	0	103	90	110			
Molybdenum	0.201	0.00500	0.200	0	101	90	110			
Potassium	5.07	0.300	5.00	0	101	90	110			
Selenium	0.206	0.00500	0.200	0	103	90	110			
Sodium	5.13	0.300	5.00	0	103	90	110			
Thallium	0.196	0.00150	0.200	0	98.0	90	110			

Qualifiers: B Analyte detected in the associated Method Blank DF Dilution Factor
J Analyte detected between MDL and RL MDL Method Detection Limit
ND Not Detected at the Method Detection Limit R RPD outside accepted control limits
RL Reporting Limit S Spike Recovery outside control limits
J Analyte detected between SDL and RL N Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005076
Project: Luminant-OGSES-FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS5_200514A

Sample ID: CCV4-200514	Batch ID: R110496	TestNo: SW6020B	Units: mg/L
SampType: CCV	Run ID: ICP-MS5_200514A	Analysis Date: 5/14/2020 3:17:00 PM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.200	0.00250	0.200	0	100	90	110			
Arsenic	0.208	0.00500	0.200	0	104	90	110			
Barium	0.200	0.0100	0.200	0	100	90	110			
Beryllium	0.209	0.00100	0.200	0	105	90	110			
Cadmium	0.210	0.00100	0.200	0	105	90	110			
Chromium	0.213	0.00500	0.200	0	107	90	110			
Cobalt	0.206	0.00500	0.200	0	103	90	110			
Iron	5.17	0.100	5.00	0	103	90	110			
Lead	0.200	0.00100	0.200	0	99.8	90	110			
Lithium	0.207	0.0100	0.200	0	103	90	110			
Molybdenum	0.204	0.00500	0.200	0	102	90	110			
Selenium	0.215	0.00500	0.200	0	107	90	110			
Thallium	0.199	0.00150	0.200	0	99.4	90	110			

Qualifiers: B Analyte detected in the associated Method Blank J Analyte detected between MDL and RL ND Not Detected at the Method Detection Limit RL Reporting Limit J Analyte detected between SDL and RL	DF Dilution Factor MDL Method Detection Limit R RPD outside accepted control limits S Spike Recovery outside control limits N Parameter not NELAP certified
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CLIENT: Golder
 Work Order: 2005076
 Project: Luminant-OGSES-FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS5_200515B

The QC data in batch 96330 applies to the following samples: 2005076-01B, 2005076-02B

Sample ID: MB-96330	Batch ID: 96330	TestNo: SW6020B	Units: mg/L							
SampType: MBLK	Run ID: ICP-MS5_200515B	Analysis Date: 5/15/2020 12:54:00 PM	Prep Date: 5/13/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Boron	<0.0100	0.0300								
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Sample ID: LCS-96330	Batch ID: 96330	TestNo: SW6020B	Units: mg/L							
SampType: LCS	Run ID: ICP-MS5_200515B	Analysis Date: 5/15/2020 12:57:00 PM	Prep Date: 5/13/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Boron	0.197	0.0300	0.200	0	98.3	80	120			
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Sample ID: LCSD-96330	Batch ID: 96330	TestNo: SW6020B	Units: mg/L							
SampType: LCSD	Run ID: ICP-MS5_200515B	Analysis Date: 5/15/2020 12:59:00 PM	Prep Date: 5/13/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Boron	0.213	0.0300	0.200	0	106	80	120	7.86	15	
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Sample ID: 2005081-01A SD	Batch ID: 96330	TestNo: SW6020B	Units: mg/L							
SampType: SD	Run ID: ICP-MS5_200515B	Analysis Date: 5/15/2020 1:10:00 PM	Prep Date: 5/13/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Boron	0.963	0.750	0	0.908				5.89	20	
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Sample ID: 2005081-01A PDS	Batch ID: 96330	TestNo: SW6020B	Units: mg/L							
SampType: PDS	Run ID: ICP-MS5_200515B	Analysis Date: 5/15/2020 1:37:00 PM	Prep Date: 5/13/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Boron	1.84	0.150	1.00	0.908	93.3	75	125			
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Sample ID: 2005081-01A MS	Batch ID: 96330	TestNo: SW6020B	Units: mg/L							
SampType: MS	Run ID: ICP-MS5_200515B	Analysis Date: 5/15/2020 1:39:00 PM	Prep Date: 5/13/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Boron	1.17	0.150	0.200	0.908	133	75	125			S
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Sample ID: 2005081-01A MSD	Batch ID: 96330	TestNo: SW6020B	Units: mg/L							
SampType: MSD	Run ID: ICP-MS5_200515B	Analysis Date: 5/15/2020 1:42:00 PM	Prep Date: 5/13/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Boron	1.15	0.150	0.200	0.908	121	75	125	2.14	15	
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Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005076
Project: Luminant-OGSES-FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS5_200515B

Sample ID: ICV-200515	Batch ID: R110514	TestNo: SW6020B	Units: mg/L							
SampType: ICV	Run ID: ICP-MS5_200515B	Analysis Date: 5/15/2020 10:34:00 AM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Boron	0.0999	0.0300	0.100	0	99.9	90	110			
Calcium	2.58	0.300	2.50	0	103	90	110			
Magnesium	2.45	0.300	2.50	0	98.0	90	110			
Potassium	2.50	0.300	2.50	0	100	90	110			
Selenium	0.104	0.00500	0.100	0	104	90	110			
Sodium	2.48	0.300	2.50	0	99.2	90	110			

Sample ID: LCVL-200515	Batch ID: R110514	TestNo: SW6020B	Units: mg/L							
SampType: LCVL	Run ID: ICP-MS5_200515B	Analysis Date: 5/15/2020 10:48:00 AM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Boron	0.0221	0.0300	0.0200	0	111	80	120			
Calcium	0.114	0.300	0.100	0	114	80	120			
Magnesium	0.0979	0.300	0.100	0	97.9	80	120			
Potassium	0.102	0.300	0.100	0	102	80	120			
Selenium	0.00506	0.00500	0.00500	0	101	80	120			
Sodium	0.104	0.300	0.100	0	104	80	120			

Sample ID: CCV1-200515	Batch ID: R110514	TestNo: SW6020B	Units: mg/L							
SampType: CCV	Run ID: ICP-MS5_200515B	Analysis Date: 5/15/2020 11:31:00 AM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Boron	0.201	0.0300	0.200	0	101	90	110			
Calcium	5.18	0.300	5.00	0	104	90	110			
Magnesium	5.10	0.300	5.00	0	102	90	110			
Potassium	5.15	0.300	5.00	0	103	90	110			
Selenium	0.213	0.00500	0.200	0	106	90	110			
Sodium	5.01	0.300	5.00	0	100	90	110			

Sample ID: CCV2-200515	Batch ID: R110514	TestNo: SW6020B	Units: mg/L							
SampType: CCV	Run ID: ICP-MS5_200515B	Analysis Date: 5/15/2020 12:45:00 PM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Boron	0.197	0.0300	0.200	0	98.3	90	110			
Calcium	5.24	0.300	5.00	0	105	90	110			
Magnesium	5.15	0.300	5.00	0	103	90	110			
Potassium	5.18	0.300	5.00	0	104	90	110			
Selenium	0.212	0.00500	0.200	0	106	90	110			
Sodium	5.04	0.300	5.00	0	101	90	110			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005076
Project: Luminant-OGSES-FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS5_200515B

Sample ID: CCV3-200515	Batch ID: R110514	TestNo: SW6020B	Units: mg/L							
SampType: CCV	Run ID: ICP-MS5_200515B	Analysis Date: 5/15/2020 1:53:00 PM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Boron	0.192	0.0300	0.200	0	95.9	90	110			

Qualifiers:
B Analyte detected in the associated Method Blank
DF Dilution Factor
J Analyte detected between MDL and RL
MDL Method Detection Limit
ND Not Detected at the Method Detection Limit
R RPD outside accepted control limits
RL Reporting Limit
S Spike Recovery outside control limits
J Analyte detected between SDL and RL
N Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005076
Project: Luminant-OGSES-FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: IC2_200421A

Sample ID: DCS2-96036	Batch ID: 96036	TestNo: E300	Units: mg/L							
SampType: DCS2	Run ID: IC2_200421A	Analysis Date: 4/21/2020 11:47:08 AM	Prep Date: 4/21/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	0.420	1.00	0.5000	0	84.1	70	130	0	0	
Fluoride	0.154	0.400	0.2000	0	77.1	70	130	0	0	
Nitrate-N	0.246	0.0500	0.2500	0	98.5	70	130	0	0	
Sulfate	1.43	3.00	1.500	0	95.3	70	130	0	0	

Qualifiers: B Analyte detected in the associated Method Blank J Analyte detected between MDL and RL ND Not Detected at the Method Detection Limit RL Reporting Limit J Analyte detected between SDL and RL	DF Dilution Factor MDL Method Detection Limit R RPD outside accepted control limits S Spike Recovery outside control limits N Parameter not NELAP certified
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CLIENT: Golder
Work Order: 2005076
Project: Luminant-OGSES-FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: IC2_200512A

The QC data in batch 96308 applies to the following samples: 2005076-01C, 2005076-02C

Sample ID: MB-96308	Batch ID: 96308	TestNo: E300	Units: mg/L
SampType: MBLK	Run ID: IC2_200512A	Analysis Date: 5/12/2020 10:34:16 AM	Prep Date: 5/12/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	<0.300	1.00								
Fluoride	<0.100	0.400								
Nitrate-N	<0.100	0.500								
Sulfate	<1.00	3.00								

Sample ID: LCS-96308	Batch ID: 96308	TestNo: E300	Units: mg/L
SampType: LCS	Run ID: IC2_200512A	Analysis Date: 5/12/2020 10:50:15 AM	Prep Date: 5/12/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	9.96	1.00	10.00	0	99.6	90	110			
Fluoride	3.81	0.400	4.000	0	95.3	90	110			
Nitrate-N	4.95	0.500	5.000	0	98.9	90	110			
Sulfate	29.8	3.00	30.00	0	99.3	90	110			

Sample ID: LCSD-96308	Batch ID: 96308	TestNo: E300	Units: mg/L
SampType: LCSD	Run ID: IC2_200512A	Analysis Date: 5/12/2020 11:06:15 AM	Prep Date: 5/12/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	9.87	1.00	10.00	0	98.7	90	110	0.924	20	
Fluoride	3.78	0.400	4.000	0	94.4	90	110	0.950	20	
Nitrate-N	4.91	0.500	5.000	0	98.2	90	110	0.758	20	
Sulfate	29.5	3.00	30.00	0	98.4	90	110	1.00	20	

Sample ID: 2005076-01CMS	Batch ID: 96308	TestNo: E300	Units: mg/L
SampType: MS	Run ID: IC2_200512A	Analysis Date: 5/12/2020 6:16:24 PM	Prep Date: 5/12/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	5090	100	2000	3444	82.5	90	110			S
Fluoride	2060	40.0	2000	21.91	102	90	110			
Nitrate-N	438	50.0	451.6	0	97.0	90	110			
Sulfate	6550	300	2000	4678	93.4	90	110			

Sample ID: 2005076-01CMSD	Batch ID: 96308	TestNo: E300	Units: mg/L
SampType: MSD	Run ID: IC2_200512A	Analysis Date: 5/12/2020 6:32:24 PM	Prep Date: 5/12/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	5090	100	2000	3444	82.4	90	110	0.032	20	S
Fluoride	2070	40.0	2000	21.91	102	90	110	0.353	20	
Nitrate-N	439	50.0	451.6	0	97.2	90	110	0.161	20	
Sulfate	6540	300	2000	4678	93.0	90	110	0.142	20	

Qualifiers: B Analyte detected in the associated Method Blank DF Dilution Factor
J Analyte detected between MDL and RL MDL Method Detection Limit
ND Not Detected at the Method Detection Limit R RPD outside accepted control limits
RL Reporting Limit S Spike Recovery outside control limits
J Analyte detected between SDL and RL N Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005076
Project: Luminant-OGSES-FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: IC2_200512A

Sample ID: 2005076-02CMS	Batch ID: 96308	TestNo: E300	Units: mg/L							
SampType: MS	Run ID: IC2_200512A	Analysis Date: 5/12/2020 7:04:24 PM	Prep Date: 5/12/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	3880	100	2000	1944	96.7	90	110			
Fluoride	2130	40.0	2000	15.27	106	90	110			
Nitrate-N	455	50.0	451.6	0	101	90	110			
Sulfate	5870	300	2000	3932	96.8	90	110			

Sample ID: 2005076-02CMSD	Batch ID: 96308	TestNo: E300	Units: mg/L							
SampType: MSD	Run ID: IC2_200512A	Analysis Date: 5/12/2020 7:20:24 PM	Prep Date: 5/12/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	3880	100	2000	1944	96.9	90	110	0.096	20	
Fluoride	2130	40.0	2000	15.27	106	90	110	0.174	20	
Nitrate-N	456	50.0	451.6	0	101	90	110	0.070	20	
Sulfate	5880	300	2000	3932	97.2	90	110	0.163	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005076
Project: Luminant-OGSES-FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: IC2_200512A

Sample ID: ICV-200512	Batch ID: R110449	TestNo: E300	Units: mg/L							
SampType: ICV	Run ID: IC2_200512A	Analysis Date: 5/12/2020 10:02:16 AM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	25.7	1.00	25.00	0	103	90	110			
Fluoride	9.97	0.400	10.00	0	99.7	90	110			
Nitrate-N	13.0	0.500	12.50	0	104	90	110			
Sulfate	77.8	3.00	75.00	0	104	90	110			

Sample ID: CCV1-200512	Batch ID: R110449	TestNo: E300	Units: mg/L							
SampType: CCV	Run ID: IC2_200512A	Analysis Date: 5/12/2020 4:08:23 PM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	10.5	1.00	10.00	0	105	90	110			
Fluoride	3.81	0.400	4.000	0	95.2	90	110			
Nitrate-N	4.94	0.500	5.000	0	98.9	90	110			
Sulfate	29.8	3.00	30.00	0	99.2	90	110			

Sample ID: CCV2-200512	Batch ID: R110449	TestNo: E300	Units: mg/L							
SampType: CCV	Run ID: IC2_200512A	Analysis Date: 5/12/2020 10:16:24 PM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	10.1	1.00	10.00	0	101	90	110			
Fluoride	3.86	0.400	4.000	0	96.6	90	110			
Nitrate-N	4.99	0.500	5.000	0	99.8	90	110			
Sulfate	29.9	3.00	30.00	0	99.8	90	110			

Qualifiers:

B Analyte detected in the associated Method Blank	DF Dilution Factor
J Analyte detected between MDL and RL	MDL Method Detection Limit
ND Not Detected at the Method Detection Limit	R RPD outside accepted control limits
RL Reporting Limit	S Spike Recovery outside control limits
J Analyte detected between SDL and RL	N Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005076
Project: Luminant-OGSES-FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: TITRATOR_200514B

The QC data in batch 96346 applies to the following samples: 2005076-01C, 2005076-02C

Sample ID: MB-96346	Batch ID: 96346	TestNo: M2320 B	Units: mg/L @ pH 4.23							
SampType: MBLK	Run ID: TITRATOR_200514B	Analysis Date: 5/14/2020 11:22:00 AM	Prep Date: 5/14/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Alkalinity, Bicarbonate (As CaCO3)	<10.0	20.0								
Alkalinity, Carbonate (As CaCO3)	<10.0	20.0								
Alkalinity, Hydroxide (As CaCO3)	<10.0	20.0								
Alkalinity, Total (As CaCO3)	<20.0	20.0								

Sample ID: LCS-96346	Batch ID: 96346	TestNo: M2320 B	Units: mg/L @ pH 4.22							
SampType: LCS	Run ID: TITRATOR_200514B	Analysis Date: 5/14/2020 11:26:00 AM	Prep Date: 5/14/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Alkalinity, Total (As CaCO3)	53.2	20.0	50.00	0	106	74	129			
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Sample ID: 2005076-01C-DUP	Batch ID: 96346	TestNo: M2320 B	Units: mg/L @ pH 4.53							
SampType: DUP	Run ID: TITRATOR_200514B	Analysis Date: 5/14/2020 11:46:00 AM	Prep Date: 5/14/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Alkalinity, Bicarbonate (As CaCO3)	130	20.0	0	133.8				3.11	20	
Alkalinity, Carbonate (As CaCO3)	<10.0	20.0	0	0				0	20	
Alkalinity, Hydroxide (As CaCO3)	<10.0	20.0	0	0				0	20	
Alkalinity, Total (As CaCO3)	130	20.0	0	133.8				3.11	20	

Sample ID: 2005110-01C-DUP	Batch ID: 96346	TestNo: M2320 B	Units: mg/L @ pH 4.5							
SampType: DUP	Run ID: TITRATOR_200514B	Analysis Date: 5/14/2020 1:18:00 PM	Prep Date: 5/14/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Alkalinity, Bicarbonate (As CaCO3)	32.0	20.0	0	32.90				2.77	20	
Alkalinity, Carbonate (As CaCO3)	<10.0	20.0	0	0				0	20	
Alkalinity, Hydroxide (As CaCO3)	<10.0	20.0	0	0				0	20	
Alkalinity, Total (As CaCO3)	32.0	20.0	0	32.90				2.77	20	

Qualifiers:	<p>B Analyte detected in the associated Method Blank</p> <p>J Analyte detected between MDL and RL</p> <p>ND Not Detected at the Method Detection Limit</p> <p>RL Reporting Limit</p> <p>J Analyte detected between SDL and RL</p>	<p>DF Dilution Factor</p> <p>MDL Method Detection Limit</p> <p>R RPD outside accepted control limits</p> <p>S Spike Recovery outside control limits</p> <p>N Parameter not NELAP certified</p>
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CLIENT: Golder
Work Order: 2005076
Project: Luminant-OGSES-FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: TITRATOR_200514B

Sample ID: ICV-200514	Batch ID: R110504	TestNo: M2320 B	Units: mg/L @ pH 4.36
SampType: ICV	Run ID: TITRATOR_200514B	Analysis Date: 5/14/2020 11:20:00 AM	Prep Date: 5/14/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Alkalinity, Bicarbonate (As CaCO3)	31.5	20.0	0							
Alkalinity, Carbonate (As CaCO3)	67.8	20.0	0							
Alkalinity, Hydroxide (As CaCO3)	<10.0	20.0	0							
Alkalinity, Total (As CaCO3)	99.4	20.0	100.0	0	99.4	98	102			

Sample ID: CCV1-200514	Batch ID: R110504	TestNo: M2320 B	Units: mg/L @ pH 4.33
SampType: CCV	Run ID: TITRATOR_200514B	Analysis Date: 5/14/2020 1:10:00 PM	Prep Date: 5/14/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Alkalinity, Bicarbonate (As CaCO3)	39.8	20.0	0							
Alkalinity, Carbonate (As CaCO3)	60.2	20.0	0							
Alkalinity, Hydroxide (As CaCO3)	<10.0	20.0	0							
Alkalinity, Total (As CaCO3)	99.9	20.0	100.0	0	99.9	90	110			

Sample ID: CCV2-200514	Batch ID: R110504	TestNo: M2320 B	Units: mg/L @ pH 4.32
SampType: CCV	Run ID: TITRATOR_200514B	Analysis Date: 5/14/2020 2:01:00 PM	Prep Date: 5/14/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Alkalinity, Bicarbonate (As CaCO3)	42.2	20.0	0							
Alkalinity, Carbonate (As CaCO3)	58.1	20.0	0							
Alkalinity, Hydroxide (As CaCO3)	<10.0	20.0	0							
Alkalinity, Total (As CaCO3)	100	20.0	100.0	0	100	90	110			

<p>Qualifiers:</p> <p>B Analyte detected in the associated Method Blank</p> <p>J Analyte detected between MDL and RL</p> <p>ND Not Detected at the Method Detection Limit</p> <p>RL Reporting Limit</p> <p>J Analyte detected between SDL and RL</p>	<p>DF Dilution Factor</p> <p>MDL Method Detection Limit</p> <p>R RPD outside accepted control limits</p> <p>S Spike Recovery outside control limits</p> <p>N Parameter not NELAP certified</p>
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CLIENT: Golder
Work Order: 2005076
Project: Luminant-OGSES-FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: UV/VIS_2_200323B

Sample ID: DCS-95613	Batch ID: 95613	TestNo: M3500-Fe D	Units: mg/L							
SampType: DCS	Run ID: UV/VIS_2_200323B	Analysis Date: 3/23/2020 1:30:00 PM	Prep Date: 3/23/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron, Ferrous	0.0580	0.100	0.05000	0	116	65	135	0	0	N

Qualifiers: B Analyte detected in the associated Method Blank DF Dilution Factor
 J Analyte detected between MDL and RL MDL Method Detection Limit
 ND Not Detected at the Method Detection Limit R RPD outside accepted control limits
 RL Reporting Limit S Spike Recovery outside control limits
 J Analyte detected between SDL and RL N Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005076
Project: Luminant-OGSES-FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: UV/VIS_2_200507C

Sample ID: DCS-96253	Batch ID: 96253	TestNo: M4500-P E	Units: mg/L							
SampType: DCS	Run ID: UV/VIS_2_200507C	Analysis Date: 5/7/2020 2:22:00 PM	Prep Date: 5/7/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Phosphorus, Total Orthophosphate (As	0.0480	0.100	0.05000	0	96.0	50	200	0	0	

Qualifiers:	B Analyte detected in the associated Method Blank J Analyte detected between MDL and RL ND Not Detected at the Method Detection Limit RL Reporting Limit J Analyte detected between SDL and RL	DF Dilution Factor MDL Method Detection Limit R RPD outside accepted control limits S Spike Recovery outside control limits N Parameter not NELAP certified
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CLIENT: Golder
Work Order: 2005076
Project: Luminant-OGSES-FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: UV/VIS_2_200512D

The QC data in batch 96315 applies to the following samples: 2005076-01C, 2005076-02C

Sample ID: MB-96315	Batch ID: 96315	TestNo: M4500-P E	Units: mg/L							
SampType: MBLK	Run ID: UV/VIS_2_200512D	Analysis Date: 5/12/2020 4:04:00 PM	Prep Date: 5/12/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Phosphorus, Total Orthophosphate (As <0.0300 0.100

Sample ID: LCS-96315	Batch ID: 96315	TestNo: M4500-P E	Units: mg/L							
SampType: LCS	Run ID: UV/VIS_2_200512D	Analysis Date: 5/12/2020 4:04:00 PM	Prep Date: 5/12/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Phosphorus, Total Orthophosphate (As 0.498 0.100 0.5000 0 99.6 80 120

Sample ID: LCSD-96315	Batch ID: 96315	TestNo: M4500-P E	Units: mg/L							
SampType: LCSD	Run ID: UV/VIS_2_200512D	Analysis Date: 5/12/2020 4:04:00 PM	Prep Date: 5/12/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Phosphorus, Total Orthophosphate (As 0.499 0.100 0.5000 0 99.8 80 120 0.201 15

Sample ID: 2005076-02CMS	Batch ID: 96315	TestNo: M4500-P E	Units: mg/L							
SampType: MS	Run ID: UV/VIS_2_200512D	Analysis Date: 5/12/2020 4:08:00 PM	Prep Date: 5/12/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Phosphorus, Total Orthophosphate (As 0.495 0.100 0.5000 0 99.0 80 120

Sample ID: 2005076-02CMSD	Batch ID: 96315	TestNo: M4500-P E	Units: mg/L							
SampType: MSD	Run ID: UV/VIS_2_200512D	Analysis Date: 5/12/2020 4:08:00 PM	Prep Date: 5/12/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Phosphorus, Total Orthophosphate (As 0.491 0.100 0.5000 0 98.2 80 120 0.811 15

- | | |
|--|---|
| <p>Qualifiers:</p> <ul style="list-style-type: none"> B Analyte detected in the associated Method Blank J Analyte detected between MDL and RL ND Not Detected at the Method Detection Limit RL Reporting Limit J Analyte detected between SDL and RL | <ul style="list-style-type: none"> DF Dilution Factor MDL Method Detection Limit R RPD outside accepted control limits S Spike Recovery outside control limits N Parameter not NELAP certified |
|--|---|

CLIENT: Golder
Work Order: 2005076
Project: Luminant-OGSES-FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: UV/VIS_2_200512D

Sample ID: ICV-200512	Batch ID: R110462	TestNo: M4500-P E	Units: mg/L							
SampType: ICV	Run ID: UV/VIS_2_200512D	Analysis Date: 5/12/2020 4:03:00 PM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Phosphorus, Total Orthophosphate (As	0.200	0.100	0.2000	0	100	85	115			
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Sample ID: CCV1-200512	Batch ID: R110462	TestNo: M4500-P E	Units: mg/L							
SampType: CCV	Run ID: UV/VIS_2_200512D	Analysis Date: 5/12/2020 4:09:00 PM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Phosphorus, Total Orthophosphate (As	0.516	0.100	0.5000	0	103	85	115			
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<p>Qualifiers:</p> <p>B Analyte detected in the associated Method Blank</p> <p>J Analyte detected between MDL and RL</p> <p>ND Not Detected at the Method Detection Limit</p> <p>RL Reporting Limit</p> <p>J Analyte detected between SDL and RL</p>	<p>DF Dilution Factor</p> <p>MDL Method Detection Limit</p> <p>R RPD outside accepted control limits</p> <p>S Spike Recovery outside control limits</p> <p>N Parameter not NELAP certified</p>
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CLIENT: Golder
Work Order: 2005076
Project: Luminant-OGSES-FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: UV/VIS_2_200513B

The QC data in batch 96316 applies to the following samples: 2005076-01A, 2005076-02A

Sample ID: MB-96316	Batch ID: 96316	TestNo: M3500-Fe D	Units: mg/L							
SampType: MBLK	Run ID: UV/VIS_2_200513B	Analysis Date: 5/13/2020 10:41:00 AM	Prep Date: 5/13/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron, Ferrous	<0.0500	0.100								N

Sample ID: LCS-96316	Batch ID: 96316	TestNo: M3500-Fe D	Units: mg/L							
SampType: LCS	Run ID: UV/VIS_2_200513B	Analysis Date: 5/13/2020 10:41:00 AM	Prep Date: 5/13/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron, Ferrous	0.106	0.100	0.1000	0	106	85	115			N

Sample ID: LCSD-96316	Batch ID: 96316	TestNo: M3500-Fe D	Units: mg/L							
SampType: LCSD	Run ID: UV/VIS_2_200513B	Analysis Date: 5/13/2020 10:42:00 AM	Prep Date: 5/13/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron, Ferrous	0.105	0.100	0.1000	0	105	85	115	0.720	15	N

Sample ID: 2005038-01AMS	Batch ID: 96316	TestNo: M3500-Fe D	Units: mg/L							
SampType: MS	Run ID: UV/VIS_2_200513B	Analysis Date: 5/13/2020 11:29:00 AM	Prep Date: 5/13/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron, Ferrous	0.120	0.100	0.1000	0	120	85	115			SN

Sample ID: 2005038-01AMSD	Batch ID: 96316	TestNo: M3500-Fe D	Units: mg/L							
SampType: MSD	Run ID: UV/VIS_2_200513B	Analysis Date: 5/13/2020 11:29:00 AM	Prep Date: 5/13/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron, Ferrous	0.109	0.100	0.1000	0	109	85	115	8.97	15	N

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005076
Project: Luminant-OGSES-FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: UV/VIS_2_200513B

Sample ID: ICV-200513	Batch ID: R110472	TestNo: M3500-Fe D	Units: mg/L							
SampType: ICV	Run ID: UV/VIS_2_200513B	Analysis Date: 5/13/2020 10:40:00 AM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron, Ferrous	0.112	0.100	0.1000	0	112	85	115			N

Sample ID: CCV1-200513	Batch ID: R110472	TestNo: M3500-Fe D	Units: mg/L							
SampType: CCV	Run ID: UV/VIS_2_200513B	Analysis Date: 5/13/2020 11:02:00 AM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron, Ferrous	0.192	0.100	0.2000	0	96.2	85	115			N

Sample ID: CCV2-200513	Batch ID: R110472	TestNo: M3500-Fe D	Units: mg/L							
SampType: CCV	Run ID: UV/VIS_2_200513B	Analysis Date: 5/13/2020 11:15:00 AM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron, Ferrous	0.187	0.100	0.2000	0	93.5	85	115			N

Sample ID: CCV3-200513	Batch ID: R110472	TestNo: M3500-Fe D	Units: mg/L							
SampType: CCV	Run ID: UV/VIS_2_200513B	Analysis Date: 5/13/2020 11:31:00 AM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron, Ferrous	0.205	0.100	0.2000	0	103	85	115			N

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005076
Project: Luminant-OGSES-FGD Ponds

ANALYTICAL QC SUMMARY REPORT

RunID: WC_200512D

The QC data in batch 96320 applies to the following samples: 2005076-01C, 2005076-02C

Sample ID: MB-96320	Batch ID: 96320	TestNo: M2540C	Units: mg/L							
SampType: MBLK	Run ID: WC_200512D	Analysis Date: 5/12/2020 5:00:00 PM	Prep Date: 5/12/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Total Dissolved Solids (Residue, Filtera	<10.0	10.0
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Sample ID: LCS-96320	Batch ID: 96320	TestNo: M2540C	Units: mg/L							
SampType: LCS	Run ID: WC_200512D	Analysis Date: 5/12/2020 5:00:00 PM	Prep Date: 5/12/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Total Dissolved Solids (Residue, Filtera	761	10.0	745.6	0	102	90	113
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Sample ID: 2005073-01D-DUP	Batch ID: 96320	TestNo: M2540C	Units: mg/L							
SampType: DUP	Run ID: WC_200512D	Analysis Date: 5/12/2020 5:00:00 PM	Prep Date: 5/12/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Total Dissolved Solids (Residue, Filtera	10600	200	0	10640			0.377	5
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- | | |
|--|---|
| <p>Qualifiers:</p> <ul style="list-style-type: none"> B Analyte detected in the associated Method Blank J Analyte detected between MDL and RL ND Not Detected at the Method Detection Limit RL Reporting Limit J Analyte detected between SDL and RL | <ul style="list-style-type: none"> DF Dilution Factor MDL Method Detection Limit R RPD outside accepted control limits S Spike Recovery outside control limits N Parameter not NELAP certified |
|--|---|

CLIENT: Golder
Work Order: 2005076
Project: Luminant-OGSES-FGD Ponds

MQL SUMMARY REPORT

TestNo: E300	MDL	MQL
Analyte	mg/L	mg/L
Chloride	0.300	1.00
Fluoride	0.100	0.400
Nitrate-N	0.100	0.500
Sulfate	1.00	3.00

TestNo: M4500-P E	MDL	MQL
Analyte	mg/L	mg/L
Phosphorus, Total Orthophosphate	0.0300	0.100

TestNo: SW6020B	MDL	MQL
Analyte	mg/L	mg/L
Antimony	0.000800	0.00250
Arsenic	0.00200	0.00500
Barium	0.00300	0.0100
Beryllium	0.000300	0.00100
Boron	0.0100	0.0300
Cadmium	0.000300	0.00100
Calcium	0.100	0.300
Chromium	0.00200	0.00500
Cobalt	0.00300	0.00500
Iron	0.0300	0.100
Lead	0.000300	0.00100
Lithium	0.00500	0.0100
Magnesium	0.100	0.300
Molybdenum	0.00200	0.00500
Potassium	0.100	0.300
Selenium	0.00200	0.00500
Sodium	0.100	0.300
Thallium	0.000500	0.00150

TestNo: M2540C	MDL	MQL
Analyte	mg/L	mg/L
Total Dissolved Solids (Residue, Filt	10.0	10.0

TestNo: M2320 B	MDL	MQL
Analyte	g/L @ pH 4.1	g/L @ pH 4.1
Alkalinity, Bicarbonate (As CaCO3)	10.0	20.0
Alkalinity, Carbonate (As CaCO3)	10.0	20.0
Alkalinity, Hydroxide (As CaCO3)	10.0	20.0
Alkalinity, Total (As CaCO3)	20.0	20.0

TestNo: M3500-Fe D	MDL	MQL
Analyte	mg/L	mg/L
Iron, Ferrous	0.0500	0.100

TestNo: SW7470A	MDL	MQL
Analyte	mg/L	mg/L
Mercury	0.0000800	0.000200

Qualifiers: MQL -Method Quantitation Limit as defined by TRRP
 MDL -Method Detection Limit as defined by TRRP

June 12, 2020

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc

DHL Analytical, Inc.

Sample Delivery Group: L1219697
Samples Received: 05/18/2020
Project Number: 2005076
Description:

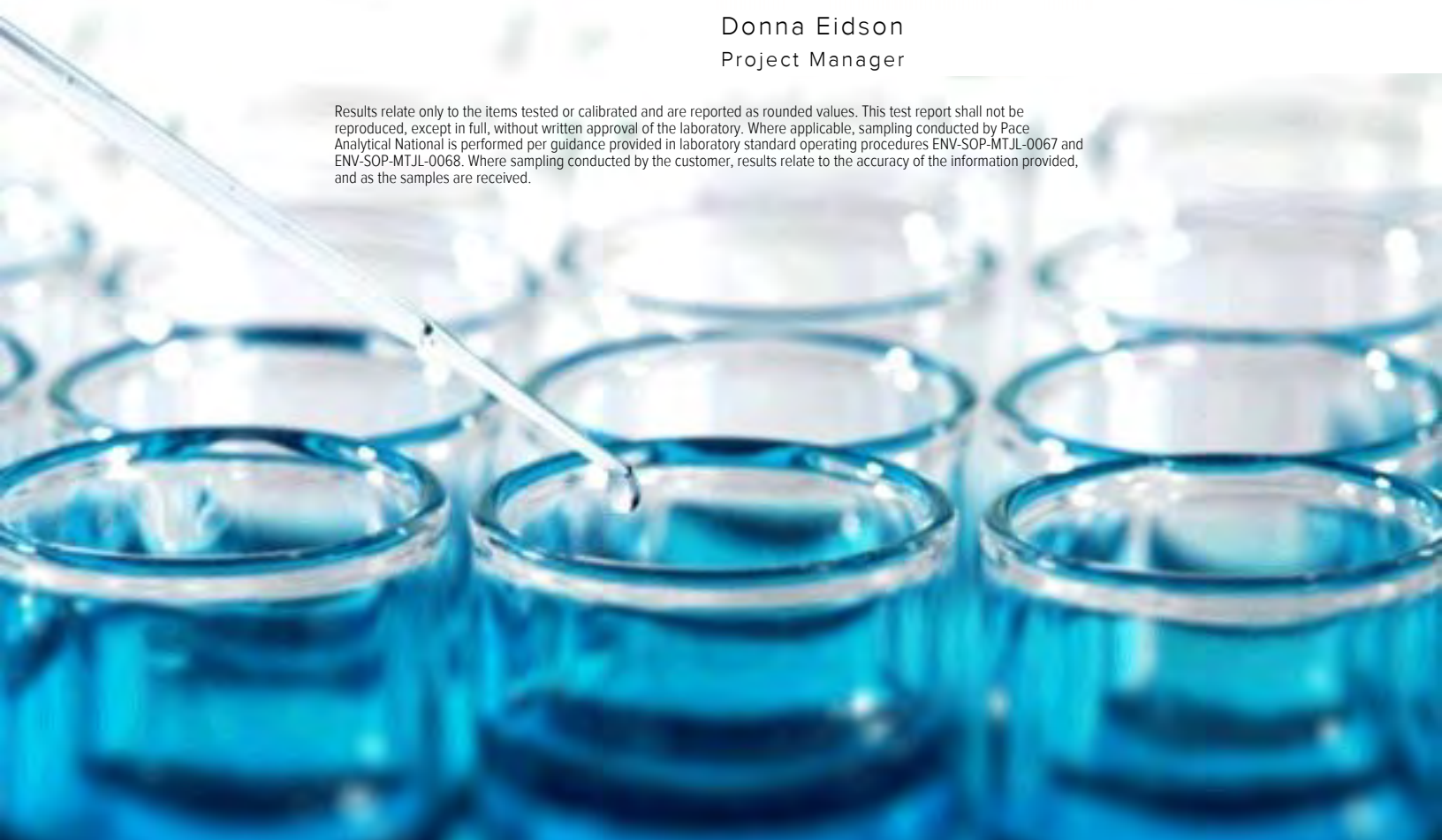
Report To: John DuPont
2300 Double Creek Drive
Round Rock, TX 78664

Entire Report Reviewed By:



Donna Eidson
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.





Cp: Cover Page	1	¹Cp
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Sc: Sample Chain of Custody	11	

FGD-A-POND L1219697-01 Non-Potable Water

Collected by
Collected date/time
Received date/time

05/11/20 14:05 05/18/20 09:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1478122	1	05/19/20 12:05	05/27/20 15:20	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1487018	1	06/04/20 15:41	06/05/20 15:02	RGT	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1487018	1	06/04/20 15:41	06/05/20 15:02	RGT	Mt. Juliet, TN

1
Cp

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Tc

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Ss

4
Cn

5
Sr

6
Qc

7
Gl

8
Al

9
Sc

FGD-B-POND L1219697-02 Non-Potable Water

Collected by
Collected date/time
Received date/time

05/11/20 14:25 05/18/20 09:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1478122	1	05/19/20 12:05	05/27/20 15:20	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1487018	1	06/04/20 15:41	06/05/20 15:02	RGT	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1487018	1	06/04/20 15:41	06/05/20 15:02	RGT	Mt. Juliet, TN



All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All radiochemical sample results for solids are reported on a dry weight basis with the exception of tritium, carbon-14 and radon, unless wet weight was requested by the client. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Donna Eidson
Project Manager

- ¹ Cp
- ² Tc
- ³ Ss
- ⁴ Cn
- ⁵ Sr
- ⁶ Qc
- ⁷ Gl
- ⁸ Al
- ⁹ Sc



Radiochemistry by Method 904

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-228	-0.709		0.565	0.882	05/27/2020 15:20	WG1478122
(T) Barium	119			62.0-143	05/27/2020 15:20	WG1478122
(T) Yttrium	98.8			79.0-136	05/27/2020 15:20	WG1478122

1 Cp

2 Tc

3 Ss

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	0.885		0.950	1.22	06/05/2020 15:02	WG1487018

4 Cn

5 Sr

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-226	0.885		0.385	0.339	06/05/2020 15:02	WG1487018
(T) Barium-133	93.3			30.0-143	06/05/2020 15:02	WG1487018

6 Qc

7 Gl

8 Al

9 Sc



Radiochemistry by Method 904

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-228	0.104		0.497	0.767	05/27/2020 15:20	WG1478122
(T) Barium	141			62.0-143	05/27/2020 15:20	WG1478122
(T) Yttrium	103			79.0-136	05/27/2020 15:20	WG1478122

1 Cp

2 Tc

3 Ss

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	0.193		0.718	1.13	06/05/2020 15:02	WG1487018

4 Cn

5 Sr

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-226	0.0890		0.221	0.365	06/05/2020 15:02	WG1487018
(T) Barium-133	90.7			30.0-143	06/05/2020 15:02	WG1487018

6 Qc

7 Gl

8 Al

9 Sc



Method Blank (MB)

(MB) R3532575-1 05/27/20 10:15

Analyte	MB Result pCi/l	MB Qualifier	MB MDA pCi/l
Radium-228	-0.0177		0.386
(T) Barium	99.9		
(T) Yttrium	114		

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

Original Sample (OS) • Duplicate (DUP)

(OS) • (DUP) R3532575-5 05/27/20 10:15

Analyte	Original Result pCi/l	DUP Result pCi/l	Dilution	DUP RPD %	DUP RER	DUP Qualifier	DUP RPD Limits %	DUP RER Limit
Radium-228	1.33	1.33	1	32.4	0.463		20	3
(T) Barium	106	106						
(T) Yttrium	104	104						

Laboratory Control Sample (LCS)

(LCS) R3532575-2 05/27/20 10:15

Analyte	Spike Amount pCi/l	LCS Result pCi/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Radium-228	5.00	5.43	109	80.0-120	
(T) Barium			105		
(T) Yttrium			104		

Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) • (MS) R3532575-3 05/27/20 10:15 • (MSD) R3532575-4 05/27/20 10:15

Analyte	Spike Amount pCi/l	Original Result pCi/l	MS Result pCi/l	MSD Result pCi/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	MS RER	RPD Limits %
Radium-228	10.0	11.8	11.8	12.3	109	113	1	70.0-130			3.90		20
(T) Barium					115	104							
(T) Yttrium					102	110							



Method Blank (MB)

(MB) R3537395-1 06/05/20 15:02

Analyte	MB Result pCi/l	MB Qualifier	MB MDA pCi/l
Radium-226	-0.0212		0.0760
(T) Barium-133	101		

1 Cp

2 Tc

3 Ss

4 Cn

L1224651-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1224651-01 06/05/20 15:02 • (DUP) R3537395-5 06/05/20 15:02

Analyte	Original Result pCi/l	DUP Result pCi/l	Dilution	DUP RPD %	DUP RER	DUP Qualifier	DUP RPD Limits	DUP RER Limit
Radium-226	0.289	0.269	1	7.21	0.0681		20	3
(T) Barium-133	104	94.0						

5 Sr

6 Qc

Laboratory Control Sample (LCS)

(LCS) R3537395-2 06/05/20 15:02

Analyte	Spike Amount pCi/l	LCS Result pCi/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Radium-226	5.02	4.75	94.5	80.0-120	
(T) Barium-133			99.4		

7 Gl

8 Al

9 Sc

L1221007-13 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1221007-13 06/05/20 15:02 • (MS) R3537395-3 06/05/20 15:02 • (MSD) R3537395-4 06/05/20 15:02

Analyte	Spike Amount pCi/l	Original Result pCi/l	MS Result pCi/l	MSD Result pCi/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	MS RER	RPD Limits %
Radium-226	20.1	0.201	19.7	23.7	96.9	117	1	75.0-125			18.4		20
(T) Barium-133		96.1			99.0	85.9							



Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDA	Minimum Detectable Activity.
Rec.	Recovery.
RER	Replicate Error Ratio.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(T)	Tracer - A radioisotope of known concentration added to a solution of chemically equivalent radioisotopes at a known concentration to assist in monitoring the yield of the chemical separation.
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state "ND" (Not Detected) or "BDL" (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc

Qualifier Description

The remainder of this page intentionally left blank, there are no qualifiers applied to this SDG.



Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
 * Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey-NELAP	TN002
California	2932	New Mexico ¹	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina ¹	DW21704
Georgia	NELAP	North Carolina ³	41
Georgia ¹	923	North Dakota	R-140
Idaho	TN00003	Ohio-VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LA000356
Kentucky ^{1,6}	90010	South Carolina	84004
Kentucky ²	16	South Dakota	n/a
Louisiana	AI30792	Tennessee ^{1,4}	2006
Louisiana ¹	LA180010	Texas	T104704245-18-15
Maine	TN0002	Texas ⁵	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

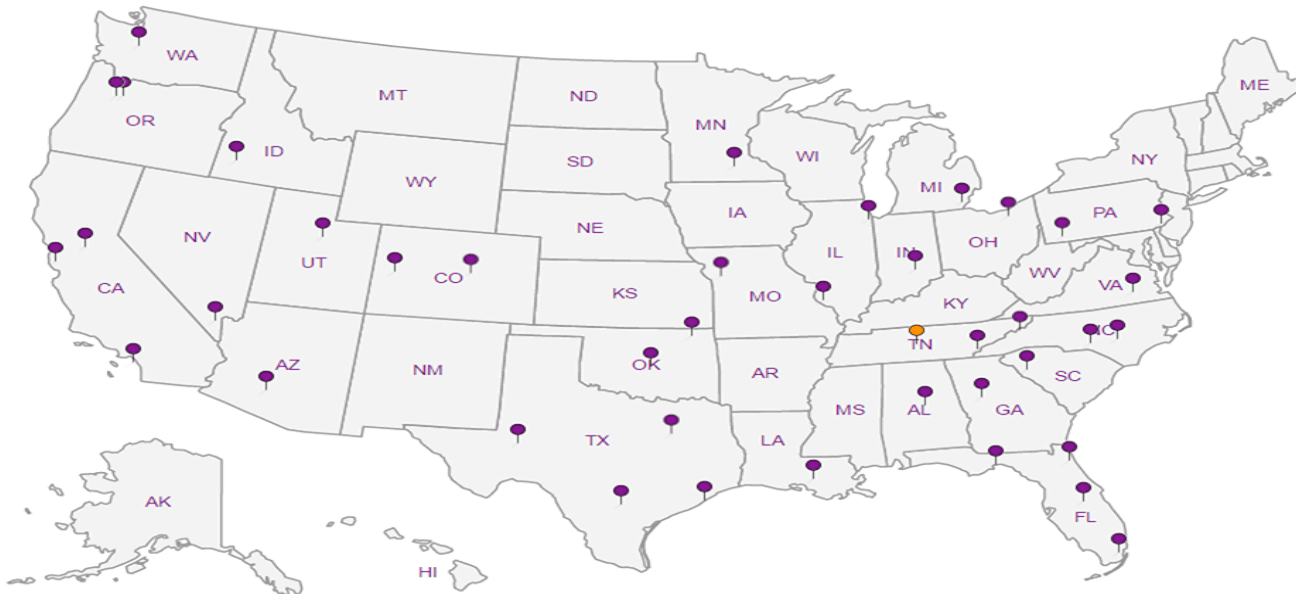
Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 ⁵	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA-Crypto	TN00003		

¹ Drinking Water ² Underground Storage Tanks ³ Aquatic Toxicity ⁴ Chemical/Microbiological ⁵ Mold ⁶ Wastewater n/a Accreditation not applicable

Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.



1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

DHL Analytical, Inc.
 2300 Double Creek Drive
 Round Rock, TX 78664

TEL: (512) 388-8222

FAX: (512) 388-8229

Work Order: 2005076

CHAIN-OF-CUSTODY RECORD

G109

1219697

Subcontractor:

Pace Analytical
 12065 Lebanon Rd
 Mt. Juliet, TN 37122

TEL: (615) 773-5923
 FAX:
 Acct #: DHLRRTX

14-May-20

Sample ID	Matrix	DHL#	Date Collected	Bottle Type	Requested Tests						
					Ra-228	Ra-226					
					E904.0	M7500 Ra B M					
FGD-A-POND	Aqueous	01D	05/11/20 02:05 PM	1LHDPEHNO3		1					01
FGD-A-POND	Aqueous	01E	05/11/20 02:05 PM	1LHDPEHNO3	1						01
FGD-B-POND	Aqueous	02D	05/11/20 02:25 PM	1LHDPEHNO3		1					02
FGD-B-POND	Aqueous	02E	05/11/20 02:25 PM	1LHDPEHNO3	1						02

General Comments:

Please analyze these samples with Normal Turnaround Time.
 Report RA-226, Ra-228 & Combined per Specs.
 Quality Control Package Needed: Standard - NELAC Rad Test compliant
 Email to cac@dhlanalytical.com & dupont@dhlanalytical.com

Relinquished by: <u><i>E</i></u>	Date/Time: <u>5/14/20 1700</u>	Received by: <u><i>Carol Kemp</i></u>	Date/Time: <u>5/18/20 9:45</u>
Relinquished by: _____	Date/Time: _____	Received by: _____	Date/Time: _____

**Pace Analytical National Center for Testing & Innovation
Cooler Receipt Form**

Client:	DHLERTy	1219697	
Cooler Received/Opened On:	5 / 18 / 20	Temperature: Amb	
Received By: Carol Kemp			
Signature: <i>Carol Kemp</i>			
Receipt Check List	NP	Yes	No
COC Seal Present / Intact?	/		
COC Signed / Accurate?		/	
Bottles arrive intact?		/	
Correct bottles used?		/	
Sufficient volume sent?		/	
If Applicable			
VOA Zero headspace?		/	
Preservation Correct / Checked?		/	



Login #:1219697	Client: DHLRRTX	Date:5/18/2020	Evaluated by:Carol K
-----------------	-----------------	----------------	----------------------

Non-Conformance (check applicable items)

Sample Integrity	Chain of Custody Clarification	
Parameter(s) past holding time	Login Clarification Needed	If Broken Container:
Temperature not in range	Chain of custody is incomplete	Insufficient packing material around container
Improper container type	Please specify Metals requested.	Insufficient packing material inside cooler
x pH not in range.	Please specify TCLP requested.	Improper handling by carrier (FedEx / UPS / Couri
Insufficient sample volume.	Received additional samples not listed on coc.	Sample was frozen
Sample is biphasic.	Sample ids on containers do not match ids on coc	Container lid not intact
Vials received with headspace.	Trip Blank not received.	If no Chain of Custody:
Broken container	Client did not "X" analysis.	Received by:
Broken container:	Chain of Custody is missing	Date/Time:
Sufficient sample remains		Temp./Cont. Rec./pH:
		Carrier:
		Tracking#

Login Comments: 3 of 4 bottles received at a ph of 8. Preserved in lab

HNO3 Lot # 19L04452

Client informed by:	Call	Email	Voice Mail	Date:	Time:
TSR Initials:DE 5/18/20 1500	Client Contact:				

Login Instructions:



May 21, 2020

Will Vienne
Golder
2201 Double Creek Dr #4004
Round Rock, Texas 78664
TEL: (512) 671-3434
FAX: (512) 671-3446
RE: Luminant-OGSES-FGD PONDS

Order No.: 2005078

Dear Will Vienne:

DHL Analytical, Inc. received 7 sample(s) on 5/12/2020 for the analyses presented in the following report.

There were no problems with the analyses and all data met requirements of NELAP except where noted in the Case Narrative. All non-NELAP methods will be identified accordingly in the case narrative and all estimated uncertainties of test results are within method or EPA specifications.

If you have any questions regarding these tests results, please feel free to call. Thank you for using DHL Analytical.

Sincerely,

A handwritten signature in red ink, appearing to read 'John DuPont', written in a cursive style.

John DuPont
General Manager

This report was performed under the accreditation of the State of Texas Laboratory Certification Number: T104704211-20-25



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Sample Receipt Checklist

Client Name **Golder**
Work Order Number **2005078**

Date Received: **5/12/2020**
Received by: **JH**

Checklist completed by:  5/12/2020
Signature Date

Reviewed by:  5/12/2020
Initials Date

Carrier name: FedEx 1day

- Shipping container/cooler in good condition? Yes No Not Present
- Custody seals intact on shipping container/cooler? Yes No Not Present
- Custody seals intact on sample bottles? Yes No Not Present
- Chain of custody present? Yes No
- Chain of custody signed when relinquished and received? Yes No
- Chain of custody agrees with sample labels? Yes No
- Samples in proper container/bottle? Yes No
- Sample containers intact? Yes No
- Sufficient sample volume for indicated test? Yes No
- All samples received within holding time? Yes No
- Container/Temp Blank temperature in compliance? Yes No **1.5 °C**
- Water - VOA vials have zero headspace? Yes No No VOA vials submitted
- Water - pH<2 acceptable upon receipt? Yes No NA LOT # 13171
- Adjusted? no Checked by JK
- Water - ph>9 (S) or ph>10 (CN) acceptable upon receipt? Yes No NA LOT #
- Adjusted? _____ Checked by _____

Any No response must be detailed in the comments section below.

Client contacted: _____ Date contacted: _____ Person contacted _____

Contacted by: _____ Regarding: _____

Comments: _____

Corrective Action _____

Laboratory Name: DHL Analytical, Inc.							
Laboratory Review Checklist: Reportable Data							
Project Name: Luminant-OGSES-FGD PONDS				LRC Date: 5/21/2020			
Reviewer Name: Angie O'Donnell				Laboratory Work Order: 2005078			
Prep Batch Number(s): See Prep Dates Report				Run Batch: See Analytical Dates Report			
# ¹	A ²	Description	Yes	No	NA ³	NR ⁴	ER# ⁵
		Chain-of-Custody (C-O-C)					
R1	OI	1) Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				R1-01
		2) Were all departures from standard conditions described in an exception report?			X		
R2	OI	Sample and Quality Control (QC) Identification					
		1) Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
		2) Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
R3	OI	Test Reports					
		1) Were all samples prepared and analyzed within holding times?	X				
		2) Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
		3) Were calculations checked by a peer or supervisor?	X				
		4) Were all analyte identifications checked by a peer or supervisor?	X				
		5) Were sample detection limits reported for all analytes not detected?	X				
		6) Were all results for soil and sediment samples reported on a dry weight basis?			X		
		7) Were % moisture (or solids) reported for all soil and sediment samples?			X		
		8) Were bulk soils/solids samples for volatile analysis extracted with methanol per EPA Method 5035?			X		
		9) If required for the project, TICs reported?			X		
R4	O	Surrogate Recovery Data					
		1) Were surrogates added prior to extraction?			X		
		2) Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
R5	OI	Test Reports/Summary Forms for Blank Samples					
		1) Were appropriate type(s) of blanks analyzed?	X				
		2) Were blanks analyzed at the appropriate frequency?	X				
		3) Where method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
		4) Were blank concentrations < MDL?	X				
		5) For analyte(s) detected in a blank sample, was the concentration, unadjusted for sample specific factors, in all associated field samples, greater than 10 times the concentration in the blank sample?			X		
R6	OI	Laboratory Control Samples (LCS):					
		1) Were all COCs included in the LCS?	X				
		2) Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
		3) Were LCSs analyzed at the required frequency?	X				
		4) Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
		5) Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
		6) Was the LCSD RPD within QC limits (if applicable)?	X				
R7	OI	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Data					
		1) Were the project/method specified analytes included in the MS and MSD?	X				
		2) Were MS/MSD analyzed at the appropriate frequency?	X				
		3) Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?		X			R7-03
		4) Were MS/MSD RPDs within laboratory QC limits?	X				
R8	OI	Analytical Duplicate Data					
		1) Were appropriate analytical duplicates analyzed for each matrix?	X				
		2) Were analytical duplicates analyzed at the appropriate frequency?	X				
		3) Were RPDs or relative standard deviations within the laboratory QC limits?	X				
R9	OI	Method Quantitation Limits (MQLs):					
		1) Are the MQLs for each method analyte included in the laboratory data package?	X				
		2) Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
		3) Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
R10	OI	Other Problems/Anomalies					
		1) Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				R10-01
		2) Was applicable and available technology used to lower the SDL to minimize the matrix interference affects on the sample results?	X				
		3) Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices and methods associated with this laboratory data package?	X				

Laboratory Name: DHL Analytical, Inc.							
Laboratory Review Checklist (continued): Supporting Data							
Project Name: Luminant-OGSES-FGD PONDS				LRC Date: 5/21/2020			
Reviewer Name: Angie O'Donnell				Laboratory Work Order: 2005078			
Prep Batch Number(s): See Prep Dates Report				Run Batch: See Analytical Dates Report			
# ¹	A ²	Description	Yes	No	NA ³	NR ⁴	ER# ⁵
S1	OI	Initial Calibration (ICAL)					
		1) Were response factors and/or relative response factors for each analyte within QC limits?	X				
		2) Were percent RSDs or correlation coefficient criteria met?	X				
		3) Was the number of standards recommended in the method used for all analytes?	X				
		4) Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		5) Are ICAL data available for all instruments used?	X				
		6) Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	Initial and Continuing calibration Verification (ICCV and CCV) and Continuing Calibration blank (CCB):					
		1) Was the CCV analyzed at the method-required frequency?	X				
		2) Were percent differences for each analyte within the method-required QC limits?	X				
		3) Was the ICAL curve verified for each analyte?	X				
		4) Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	X				
S3	O	Mass Spectral Tuning:					
		1) Was the appropriate compound for the method used for tuning?	X				
		2) Were ion abundance data within the method-required QC limits?	X				
S4	O	Internal Standards (IS):					
		1) Were IS area counts and retention times within the method-required QC limits?	X				
S5	OI	Raw Data (NELAC Section 5.5.10)					
		1) Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		2) Were data associated with manual integrations flagged on the raw data?	X				
S6	O	Dual Column Confirmation					
		1) Did dual column confirmation results meet the method-required QC?			X		
S7	O	Tentatively Identified Compounds (TICs):					
		1) If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	Interference Check Sample (ICS) Results:					
		1) Were percent recoveries within method QC limits?	X				
S9	I	Serial Dilutions, Post Digestion Spikes, and Method of Standard Additions					
		1) Were percent differences, recoveries, and the linearity within the QC limits specified in the method?		X			S9-01
S10	OI	Method Detection Limit (MDL) Studies					
		1) Was a MDL study performed for each reported analyte?	X				
		2) Is the MDL either adjusted or supported by the analysis of DCSs?	X				
S11	OI	Proficiency Test Reports:					
		1) Was the lab's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	Standards Documentation					
		1) Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	Compound/Analyte Identification Procedures					
		1) Are the procedures for compound/analyte identification documented?	X				
S14	OI	Demonstration of Analyst Competency (DOC)					
		1) Was DOC conducted consistent with NELAC Chapter 5 – Appendix C?	X				
		2) Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	Verification/Validation Documentation for Methods (NELAC Chapter 5)					
		1) Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	Laboratory Standard Operating Procedures (SOPs):					
		1) Are laboratory SOPs current and on file for each method performed?	X				

- 1 Items identified by the letter "R" should be included in the laboratory data package submitted to the TCEQ in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
- 2 O = organic analyses; I = inorganic analyses (and general chemistry, when applicable).
- 3 NA = Not applicable.
- 4 NR = Not Reviewed.
- 5 ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Data Package Signature Page – RG-366/TRRP-13

This data package consists of:

This signature page, the laboratory review checklist, and the following reportable data:

- R1 Field chain-of-custody documentation;
- R2 Sample identification cross-reference;
- R3 Test reports (analytical data sheets) for each environmental sample that includes:
 - a) Items consistent with NELAC Chapter 5,
 - b) dilution factors,
 - c) preparation methods,
 - d) cleanup methods, and
 - e) if required for the project, tentatively identified compounds (TICs).
- R4 Surrogate recovery data including:
 - a) Calculated recovery (%R), and
 - b) The laboratory's surrogate QC limits.
- R5 Test reports/summary forms for blank samples;
- R6 Test reports/summary forms for laboratory control samples (LCSs) including:
 - a) LCS spiking amounts,
 - b) Calculated %R for each analyte, and
 - c) The laboratory's LCS QC limits.
- R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
 - a) Samples associated with the MS/MSD clearly identified,
 - b) MS/MSD spiking amounts,
 - c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
 - d) Calculated %Rs and relative percent differences (RPDs), and
 - e) The laboratory's MS/MSD QC limits
- R8 Laboratory analytical duplicate (if applicable) recovery and precision:
 - a) The amount of analyte measured in the duplicate,
 - b) The calculated RPD, and
 - c) The laboratory's QC limits for analytical duplicates.
- R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix;
- R10 Other problems or anomalies.

The Exception Report for each "No" or "Not Reviewed (NR)" item in the Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory is not accredited under the Texas Laboratory Accreditation Program.

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the Exception Reports. By my signature below, I affirm to the best of my knowledge that all problems/anomalies observed by the laboratory have been identified in the Laboratory Review Checklist, and no information or data affecting the quality of the data has been knowingly withheld.

This laboratory was last inspected by TCEQ on February 25-28, 2019. Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Name: John DuPont
Official Title: General Manager


Signature

05/21/20
Date

Name: Dr. Derhsing Luu
Official Title: Technical Director

CLIENT: Golder
Project: Luminant-OGSES-FGD PONDS
Lab Order: 2005078

CASE NARRATIVE

Samples were analyzed using the methods outlined in the following references:

- Method SW6020B - Metals Analysis
- Method E300 - Anions Analysis
- Method M2320 B - Alkalinity Analysis
- Method M3500-FE D - Ferrous Iron Analysis (This parameter is not NELAP Certified)
- Method M3500-FE D - Ferrous Iron Analysis (Calculated) (This parameter is not NELAP Certified)
- Method M4500-P E - Orthophosphate Analysis

Exception Report R1-01

The samples were received and log-in performed on 5/12/2020. A total of 7 samples were received and analyzed. The samples arrived in good condition and were properly packaged.

Exception Report R7-03

For Ferrous Iron Analysis, the recovery of the Matrix Spike (2005038-01 MS) was above the method control limits. This is flagged accordingly in the QC Summary Report. The associated LCS/MSD was within method control limits. No further corrective action was taken.

Exception Report R10-01

The Ferric Iron is calculated as the Total Iron minus the Ferrous Iron.

Exception Report S9-01

For Metals Analysis, the recovery of Sodium for the Post Digestion Spike (2005077-05 PDS) was below the method control limits. This is flagged accordingly in the QC Summary Report. This analyte was within method control limits in the associated Serial Dilution. No further corrective action was taken.

CLIENT: Golder
Project: Luminant-OGSES-FGD PONDS
Lab Order: 2005078

Work Order Sample Summary

Lab Smp ID	Client Sample ID	Tag Number	Date Collected	Date Recved
2005078-01	FGD-4		05/11/20 07:45 AM	5/12/2020
2005078-02	FGD-2		05/11/20 08:35 AM	5/12/2020
2005078-03	FGD-5		05/11/20 09:25 AM	5/12/2020
2005078-04	FGD-1		05/11/20 10:15 AM	5/12/2020
2005078-05	FGD-8		05/11/20 11:10 AM	5/12/2020
2005078-06	FGD-11		05/11/20 12:45 PM	5/12/2020
2005078-07	FGD-12		05/11/20 01:45 PM	5/12/2020

Lab Order: 2005078
Client: Golder
Project: Luminant-OGSES-FGD PONDS

PREP DATES REPORT

Sample ID	Client Sample ID	Collection Date	Matrix	Test Number	Test Name	Prep Date	Batch ID
2005078-01A	FGD-4	05/11/20 07:45 AM	Aqueous	M3500-Fe	Ferrous Iron Prep Water	05/13/20 08:00 AM	96316
2005078-01B	FGD-4	05/11/20 07:45 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/14/20 09:57 AM	96348
	FGD-4	05/11/20 07:45 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/14/20 09:57 AM	96348
2005078-01C	FGD-4	05/11/20 07:45 AM	Aqueous	M2320 B	Alkalinity Preparation	05/14/20 09:44 AM	96346
	FGD-4	05/11/20 07:45 AM	Aqueous	E300	Anion Preparation	05/12/20 09:07 AM	96308
	FGD-4	05/11/20 07:45 AM	Aqueous	M4500-P E	Orthophosphate Prep	05/12/20 11:20 AM	96315
2005078-02A	FGD-2	05/11/20 08:35 AM	Aqueous	M3500-Fe	Ferrous Iron Prep Water	05/13/20 08:00 AM	96316
2005078-02B	FGD-2	05/11/20 08:35 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/14/20 09:57 AM	96348
	FGD-2	05/11/20 08:35 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/14/20 09:57 AM	96348
2005078-02C	FGD-2	05/11/20 08:35 AM	Aqueous	M2320 B	Alkalinity Preparation	05/14/20 09:44 AM	96346
	FGD-2	05/11/20 08:35 AM	Aqueous	E300	Anion Preparation	05/12/20 09:07 AM	96308
	FGD-2	05/11/20 08:35 AM	Aqueous	M4500-P E	Orthophosphate Prep	05/12/20 11:20 AM	96315
2005078-03A	FGD-5	05/11/20 09:25 AM	Aqueous	M3500-Fe	Ferrous Iron Prep Water	05/13/20 08:00 AM	96316
2005078-03B	FGD-5	05/11/20 09:25 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/14/20 09:57 AM	96348
	FGD-5	05/11/20 09:25 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/14/20 09:57 AM	96348
2005078-03C	FGD-5	05/11/20 09:25 AM	Aqueous	M2320 B	Alkalinity Preparation	05/14/20 09:44 AM	96346
	FGD-5	05/11/20 09:25 AM	Aqueous	E300	Anion Preparation	05/12/20 09:07 AM	96308
	FGD-5	05/11/20 09:25 AM	Aqueous	M4500-P E	Orthophosphate Prep	05/12/20 11:20 AM	96315
2005078-04A	FGD-1	05/11/20 10:15 AM	Aqueous	M3500-Fe	Ferrous Iron Prep Water	05/13/20 08:00 AM	96316
2005078-04B	FGD-1	05/11/20 10:15 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/14/20 09:57 AM	96348
	FGD-1	05/11/20 10:15 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/14/20 09:57 AM	96348
2005078-04C	FGD-1	05/11/20 10:15 AM	Aqueous	M2320 B	Alkalinity Preparation	05/14/20 09:44 AM	96346
	FGD-1	05/11/20 10:15 AM	Aqueous	E300	Anion Preparation	05/12/20 09:07 AM	96308
	FGD-1	05/11/20 10:15 AM	Aqueous	M4500-P E	Orthophosphate Prep	05/12/20 11:20 AM	96315
2005078-05A	FGD-8	05/11/20 11:10 AM	Aqueous	M3500-Fe	Ferrous Iron Prep Water	05/13/20 08:00 AM	96316
2005078-05B	FGD-8	05/11/20 11:10 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/14/20 09:57 AM	96348
	FGD-8	05/11/20 11:10 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/14/20 09:57 AM	96348
2005078-05C	FGD-8	05/11/20 11:10 AM	Aqueous	M2320 B	Alkalinity Preparation	05/14/20 09:44 AM	96346

Lab Order: 2005078
Client: Golder
Project: Luminant-OGSES-FGD PONDS

PREP DATES REPORT

Sample ID	Client Sample ID	Collection Date	Matrix	Test Number	Test Name	Prep Date	Batch ID
2005078-05C	FGD-8	05/11/20 11:10 AM	Aqueous	E300	Anion Preparation	05/12/20 09:07 AM	96308
	FGD-8	05/11/20 11:10 AM	Aqueous	M4500-P E	Orthophosphate Prep	05/12/20 11:20 AM	96315
2005078-06A	FGD-11	05/11/20 12:45 PM	Aqueous	M3500-Fe	Ferrous Iron Prep Water	05/13/20 08:00 AM	96316
2005078-06B	FGD-11	05/11/20 12:45 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/14/20 09:57 AM	96348
	FGD-11	05/11/20 12:45 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/14/20 09:57 AM	96348
2005078-06C	FGD-11	05/11/20 12:45 PM	Aqueous	M2320 B	Alkalinity Preparation	05/14/20 09:44 AM	96346
	FGD-11	05/11/20 12:45 PM	Aqueous	E300	Anion Preparation	05/12/20 09:07 AM	96308
	FGD-11	05/11/20 12:45 PM	Aqueous	M4500-P E	Orthophosphate Prep	05/12/20 11:20 AM	96315
2005078-07A	FGD-12	05/11/20 01:45 PM	Aqueous	M3500-Fe	Ferrous Iron Prep Water	05/13/20 08:00 AM	96316
2005078-07B	FGD-12	05/11/20 01:45 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/14/20 09:57 AM	96348
	FGD-12	05/11/20 01:45 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/14/20 09:57 AM	96348
2005078-07C	FGD-12	05/11/20 01:45 PM	Aqueous	M2320 B	Alkalinity Preparation	05/14/20 09:44 AM	96346
	FGD-12	05/11/20 01:45 PM	Aqueous	E300	Anion Preparation	05/12/20 09:07 AM	96308
	FGD-12	05/11/20 01:45 PM	Aqueous	M4500-P E	Orthophosphate Prep	05/12/20 11:20 AM	96315

Lab Order: 2005078
Client: Golder
Project: Luminant-OGSES-FGD PONDS

ANALYTICAL DATES REPORT

Sample ID	Client Sample ID	Matrix	Test Number	Test Name	Batch ID	Dilution	Analysis Date	Run ID
2005078-01A	FGD-4	Aqueous	M3500-Fe D	Ferric Iron (Calculated)	R110589	1	05/21/20	UV/VIS_2_200521B
	FGD-4	Aqueous	M3500-Fe D	Ferrous Iron	96316	1	05/13/20 10:56 AM	UV/VIS_2_200513B
2005078-01B	FGD-4	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	96348	1	05/15/20 03:14 PM	ICP-MS5_200515B
	FGD-4	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	96348	10	05/20/20 02:23 PM	ICP-MS5_200520B
2005078-01C	FGD-4	Aqueous	M2320 B	Alkalinity	96346	1	05/14/20 12:02 PM	TITRATOR_200514B
	FGD-4	Aqueous	E300	Anions by IC method - Water	96308	1	05/12/20 01:28 PM	IC2_200512A
	FGD-4	Aqueous	M4500-P E	Orthophosphate	96315	1	05/12/20 04:06 PM	UV/VIS_2_200512D
2005078-02A	FGD-2	Aqueous	M3500-Fe D	Ferric Iron (Calculated)	R110589	1	05/21/20	UV/VIS_2_200521B
	FGD-2	Aqueous	M3500-Fe D	Ferrous Iron	96316	1	05/13/20 11:00 AM	UV/VIS_2_200513B
2005078-02B	FGD-2	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	96348	1	05/15/20 02:07 PM	ICP-MS5_200515B
	FGD-2	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	96348	50	05/20/20 02:25 PM	ICP-MS5_200520B
2005078-02C	FGD-2	Aqueous	M2320 B	Alkalinity	96346	1	05/14/20 12:10 PM	TITRATOR_200514B
	FGD-2	Aqueous	E300	Anions by IC method - Water	96308	1	05/12/20 01:44 PM	IC2_200512A
	FGD-2	Aqueous	M4500-P E	Orthophosphate	96315	1	05/12/20 04:06 PM	UV/VIS_2_200512D
2005078-03A	FGD-5	Aqueous	M3500-Fe D	Ferric Iron (Calculated)	R110589	1	05/21/20	UV/VIS_2_200521B
	FGD-5	Aqueous	M3500-Fe D	Ferrous Iron	96316	1	05/13/20 11:00 AM	UV/VIS_2_200513B
2005078-03B	FGD-5	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	96348	1	05/15/20 02:09 PM	ICP-MS5_200515B
	FGD-5	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	96348	10	05/20/20 02:27 PM	ICP-MS5_200520B
2005078-03C	FGD-5	Aqueous	M2320 B	Alkalinity	96346	1	05/14/20 12:21 PM	TITRATOR_200514B
	FGD-5	Aqueous	E300	Anions by IC method - Water	96308	1	05/12/20 02:00 PM	IC2_200512A
	FGD-5	Aqueous	M4500-P E	Orthophosphate	96315	1	05/12/20 04:06 PM	UV/VIS_2_200512D
2005078-04A	FGD-1	Aqueous	M3500-Fe D	Ferric Iron (Calculated)	R110589	1	05/21/20	UV/VIS_2_200521B
	FGD-1	Aqueous	M3500-Fe D	Ferrous Iron	96316	1	05/13/20 11:04 AM	UV/VIS_2_200513B
2005078-04B	FGD-1	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	96348	10	05/20/20 02:29 PM	ICP-MS5_200520B
	FGD-1	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	96348	1	05/15/20 02:12 PM	ICP-MS5_200515B
2005078-04C	FGD-1	Aqueous	M2320 B	Alkalinity	96346	1	05/14/20 12:26 PM	TITRATOR_200514B
	FGD-1	Aqueous	E300	Anions by IC method - Water	96308	1	05/12/20 02:16 PM	IC2_200512A
	FGD-1	Aqueous	M4500-P E	Orthophosphate	96315	1	05/12/20 04:07 PM	UV/VIS_2_200512D

Lab Order: 2005078
 Client: Golder
 Project: Luminant-OGSES-FGD PONDS

ANALYTICAL DATES REPORT

Sample ID	Client Sample ID	Matrix	Test Number	Test Name	Batch ID	Dilution	Analysis Date	Run ID
2005078-05A	FGD-8	Aqueous	M3500-Fe D	Ferric Iron (Calculated)	R110589	1	05/21/20	UV/VIS_2_200521B
	FGD-8	Aqueous	M3500-Fe D	Ferrous Iron	96316	1000	05/13/20 11:14 AM	UV/VIS_2_200513B
2005078-05B	FGD-8	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	96348	1	05/15/20 02:14 PM	ICP-MS5_200515B
	FGD-8	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	96348	50	05/20/20 02:32 PM	ICP-MS5_200520B
2005078-05C	FGD-8	Aqueous	M2320 B	Alkalinity	96346	1	05/14/20 12:49 PM	TITRATOR_200514B
	FGD-8	Aqueous	E300	Anions by IC method - Water	96308	1	05/12/20 03:04 PM	IC2_200512A
	FGD-8	Aqueous	M4500-P E	Orthophosphate	96315	1	05/12/20 04:07 PM	UV/VIS_2_200512D
2005078-06A	FGD-11	Aqueous	M3500-Fe D	Ferric Iron (Calculated)	R110589	1	05/21/20	UV/VIS_2_200521B
	FGD-11	Aqueous	M3500-Fe D	Ferrous Iron	96316	1	05/13/20 11:05 AM	UV/VIS_2_200513B
2005078-06B	FGD-11	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	96348	50	05/20/20 02:34 PM	ICP-MS5_200520B
	FGD-11	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	96348	1	05/15/20 02:16 PM	ICP-MS5_200515B
2005078-06C	FGD-11	Aqueous	M2320 B	Alkalinity	96346	1	05/14/20 01:01 PM	TITRATOR_200514B
	FGD-11	Aqueous	E300	Anions by IC method - Water	96308	1	05/12/20 02:32 PM	IC2_200512A
	FGD-11	Aqueous	M4500-P E	Orthophosphate	96315	1	05/12/20 04:07 PM	UV/VIS_2_200512D
2005078-07A	FGD-12	Aqueous	M3500-Fe D	Ferric Iron (Calculated)	R110589	1	05/21/20	UV/VIS_2_200521B
	FGD-12	Aqueous	M3500-Fe D	Ferrous Iron	96316	1	05/13/20 11:14 AM	UV/VIS_2_200513B
2005078-07B	FGD-12	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	96348	1	05/15/20 02:18 PM	ICP-MS5_200515B
	FGD-12	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	96348	10	05/20/20 02:36 PM	ICP-MS5_200520B
2005078-07C	FGD-12	Aqueous	M2320 B	Alkalinity	96346	1	05/14/20 01:05 PM	TITRATOR_200514B
	FGD-12	Aqueous	E300	Anions by IC method - Water	96308	1	05/12/20 02:48 PM	IC2_200512A
	FGD-12	Aqueous	M4500-P E	Orthophosphate	96315	1	05/12/20 04:08 PM	UV/VIS_2_200512D

DHL Analytical, Inc.

Date: 21-May-20

CLIENT: Golder
Project: Luminant-OGSES-FGD PONDS
Project No: 19134019-1000
Lab Order: 2005078

Client Sample ID: FGD-4
Lab ID: 2005078-01
Collection Date: 05/11/20 07:45 AM
Matrix: AQUEOUS

Analyses	Result	SDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		SW6020B		Analyst: RO			
Iron	0.120	0.0300	0.100		mg/L	1	05/15/20 03:14 PM
Magnesium	14.7	0.100	0.300		mg/L	1	05/15/20 03:14 PM
Potassium	1.53	0.100	0.300		mg/L	1	05/15/20 03:14 PM
Sodium	204	1.00	3.00		mg/L	10	05/20/20 02:23 PM
ANIONS BY IC METHOD - WATER		E300		Analyst: SNM			
Nitrate-N	<0.100	0.100	0.500		mg/L	1	05/12/20 01:28 PM
ALKALINITY		M2320 B		Analyst: BTJ			
Alkalinity, Bicarbonate (As CaCO3)	247	10.0	20.0		mg/L @ pH 4.53	1	05/14/20 12:02 PM
Alkalinity, Carbonate (As CaCO3)	<10.0	10.0	20.0		mg/L @ pH 4.53	1	05/14/20 12:02 PM
Alkalinity, Hydroxide (As CaCO3)	<10.0	10.0	20.0		mg/L @ pH 4.53	1	05/14/20 12:02 PM
Alkalinity, Total (As CaCO3)	247	20.0	20.0		mg/L @ pH 4.53	1	05/14/20 12:02 PM
FERRIC IRON (CALCULATED)		M3500-FE D		Analyst: AO			
Iron, Ferric	0.120	0.0500	0.100	N	mg/L	1	05/21/20
FERROUS IRON		M3500-FE D		Analyst: CC			
Iron, Ferrous	<0.0500	0.0500	0.100	N	mg/L	1	05/13/20 10:56 AM
ORTHOPHOSPHATE		M4500-P E		Analyst: BTJ			
Phosphorus, Total Orthophosphate (As P)	0.139	0.0300	0.100		mg/L	1	05/12/20 04:06 PM

Qualifiers: ND - Not Detected at the SDL
 J - Analyte detected between SDL and RL
 B - Analyte detected in the associated Method Blank
 DF- Dilution Factor
 N - Parameter not NELAP certified
 See Final Page of Report for MQLs and MDLs

S - Spike Recovery outside control limits
 C - Sample Result or QC discussed in Case Narrative
 RL - Reporting Limit (MQL adjusted for moisture and sample size)
 SDL - Sample Detection Limit
 E - TPH pattern not Gas or Diesel Range Pattern

DHL Analytical, Inc.

Date: 21-May-20

CLIENT: Golder
Project: Luminant-OGSES-FGD PONDS
Project No: 19134019-1000
Lab Order: 2005078

Client Sample ID: FGD-2
Lab ID: 2005078-02
Collection Date: 05/11/20 08:35 AM
Matrix: AQUEOUS

Analyses	Result	SDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		SW6020B		Analyst: RO			
Iron	0.0636	0.0300	0.100	J	mg/L	1	05/15/20 02:07 PM
Magnesium	74.2	5.00	15.0		mg/L	50	05/20/20 02:25 PM
Potassium	5.73	0.100	0.300		mg/L	1	05/15/20 02:07 PM
Sodium	507	5.00	15.0		mg/L	50	05/20/20 02:25 PM
ANIONS BY IC METHOD - WATER		E300		Analyst: SNM			
Nitrate-N	2.52	0.100	0.500		mg/L	1	05/12/20 01:44 PM
ALKALINITY		M2320 B		Analyst: BTJ			
Alkalinity, Bicarbonate (As CaCO3)	114	10.0	20.0		mg/L @ pH 4.51	1	05/14/20 12:10 PM
Alkalinity, Carbonate (As CaCO3)	<10.0	10.0	20.0		mg/L @ pH 4.51	1	05/14/20 12:10 PM
Alkalinity, Hydroxide (As CaCO3)	<10.0	10.0	20.0		mg/L @ pH 4.51	1	05/14/20 12:10 PM
Alkalinity, Total (As CaCO3)	114	20.0	20.0		mg/L @ pH 4.51	1	05/14/20 12:10 PM
FERRIC IRON (CALCULATED)		M3500-FE D		Analyst: AO			
Iron, Ferric	0.0636	0.0500	0.100	JN	mg/L	1	05/21/20
FERROUS IRON		M3500-FE D		Analyst: CC			
Iron, Ferrous	<0.0500	0.0500	0.100	N	mg/L	1	05/13/20 11:00 AM
ORTHOPHOSPHATE		M4500-P E		Analyst: BTJ			
Phosphorus, Total Orthophosphate (As P)	0.0520	0.0300	0.100	J	mg/L	1	05/12/20 04:06 PM

Qualifiers: ND - Not Detected at the SDL
 J - Analyte detected between SDL and RL
 B - Analyte detected in the associated Method Blank
 DF- Dilution Factor
 N - Parameter not NELAP certified
 See Final Page of Report for MQLs and MDLs

S - Spike Recovery outside control limits
 C - Sample Result or QC discussed in Case Narrative
 RL - Reporting Limit (MQL adjusted for moisture and sample size)
 SDL - Sample Detection Limit
 E - TPH pattern not Gas or Diesel Range Pattern

DHL Analytical, Inc.

Date: 21-May-20

CLIENT: Golder
Project: Luminant-OGSES-FGD PONDS
Project No: 19134019-1000
Lab Order: 2005078

Client Sample ID: FGD-5
Lab ID: 2005078-03
Collection Date: 05/11/20 09:25 AM
Matrix: AQUEOUS

Analyses	Result	SDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		SW6020B		Analyst: RO			
Iron	0.0483	0.0300	0.100	J	mg/L	1	05/15/20 02:09 PM
Magnesium	52.0	1.00	3.00		mg/L	10	05/20/20 02:27 PM
Potassium	3.64	0.100	0.300		mg/L	1	05/15/20 02:09 PM
Sodium	125	1.00	3.00		mg/L	10	05/20/20 02:27 PM
ANIONS BY IC METHOD - WATER		E300		Analyst: SNM			
Nitrate-N	0.563	0.100	0.500		mg/L	1	05/12/20 02:00 PM
ALKALINITY		M2320 B		Analyst: BTJ			
Alkalinity, Bicarbonate (As CaCO3)	232	10.0	20.0		mg/L @ pH 4.52	1	05/14/20 12:21 PM
Alkalinity, Carbonate (As CaCO3)	<10.0	10.0	20.0		mg/L @ pH 4.52	1	05/14/20 12:21 PM
Alkalinity, Hydroxide (As CaCO3)	<10.0	10.0	20.0		mg/L @ pH 4.52	1	05/14/20 12:21 PM
Alkalinity, Total (As CaCO3)	232	20.0	20.0		mg/L @ pH 4.52	1	05/14/20 12:21 PM
FERRIC IRON (CALCULATED)		M3500-FE D		Analyst: AO			
Iron, Ferric	<0.0500	0.0500	0.100	N	mg/L	1	05/21/20
FERROUS IRON		M3500-FE D		Analyst: CC			
Iron, Ferrous	<0.0500	0.0500	0.100	N	mg/L	1	05/13/20 11:00 AM
ORTHOPHOSPHATE		M4500-P E		Analyst: BTJ			
Phosphorus, Total Orthophosphate (As P)	<0.0300	0.0300	0.100		mg/L	1	05/12/20 04:06 PM

Qualifiers: ND - Not Detected at the SDL
 J - Analyte detected between SDL and RL
 B - Analyte detected in the associated Method Blank
 DF- Dilution Factor
 N - Parameter not NELAP certified
 See Final Page of Report for MQLs and MDLs

S - Spike Recovery outside control limits
 C - Sample Result or QC discussed in Case Narrative
 RL - Reporting Limit (MQL adjusted for moisture and sample size)
 SDL - Sample Detection Limit
 E - TPH pattern not Gas or Diesel Range Pattern

DHL Analytical, Inc.

Date: 21-May-20

CLIENT: Golder
Project: Luminant-OGSES-FGD PONDS
Project No: 19134019-1000
Lab Order: 2005078

Client Sample ID: FGD-1
Lab ID: 2005078-04
Collection Date: 05/11/20 10:15 AM
Matrix: AQUEOUS

Analyses	Result	SDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		SW6020B		Analyst: RO			
Iron	1.09	0.0300	0.100		mg/L	1	05/15/20 02:12 PM
Magnesium	17.1	0.100	0.300		mg/L	1	05/15/20 02:12 PM
Potassium	2.56	0.100	0.300		mg/L	1	05/15/20 02:12 PM
Sodium	82.0	1.00	3.00		mg/L	10	05/20/20 02:29 PM
ANIONS BY IC METHOD - WATER		E300		Analyst: SNM			
Nitrate-N	<0.100	0.100	0.500		mg/L	1	05/12/20 02:16 PM
ALKALINITY		M2320 B		Analyst: BTJ			
Alkalinity, Bicarbonate (As CaCO3)	67.6	10.0	20.0		mg/L @ pH 4.49	1	05/14/20 12:26 PM
Alkalinity, Carbonate (As CaCO3)	<10.0	10.0	20.0		mg/L @ pH 4.49	1	05/14/20 12:26 PM
Alkalinity, Hydroxide (As CaCO3)	<10.0	10.0	20.0		mg/L @ pH 4.49	1	05/14/20 12:26 PM
Alkalinity, Total (As CaCO3)	67.6	20.0	20.0		mg/L @ pH 4.49	1	05/14/20 12:26 PM
FERRIC IRON (CALCULATED)		M3500-FE D		Analyst: AO			
Iron, Ferric	0.732	0.0500	0.100	N	mg/L	1	05/21/20
FERROUS IRON		M3500-FE D		Analyst: CC			
Iron, Ferrous	0.358	0.0500	0.100	N	mg/L	1	05/13/20 11:04 AM
ORTHOPHOSPHATE		M4500-P E		Analyst: BTJ			
Phosphorus, Total Orthophosphate (As P)	0.370	0.0300	0.100		mg/L	1	05/12/20 04:07 PM

Qualifiers: ND - Not Detected at the SDL
 J - Analyte detected between SDL and RL
 B - Analyte detected in the associated Method Blank
 DF- Dilution Factor
 N - Parameter not NELAP certified
 See Final Page of Report for MQLs and MDLs

S - Spike Recovery outside control limits
 C - Sample Result or QC discussed in Case Narrative
 RL - Reporting Limit (MQL adjusted for moisture and sample size)
 SDL - Sample Detection Limit
 E - TPH pattern not Gas or Diesel Range Pattern

DHL Analytical, Inc.

Date: 21-May-20

CLIENT: Golder
Project: Luminant-OGSES-FGD PONDS
Project No: 19134019-1000
Lab Order: 2005078

Client Sample ID: FGD-8
Lab ID: 2005078-05
Collection Date: 05/11/20 11:10 AM
Matrix: AQUEOUS

Analyses	Result	SDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		SW6020B		Analyst: RO			
Iron	220	1.50	5.00		mg/L	50	05/20/20 02:32 PM
Magnesium	198	5.00	15.0		mg/L	50	05/20/20 02:32 PM
Potassium	19.9	0.100	0.300		mg/L	1	05/15/20 02:14 PM
Sodium	801	5.00	15.0		mg/L	50	05/20/20 02:32 PM
ANIONS BY IC METHOD - WATER		E300		Analyst: SNM			
Nitrate-N	1.64	0.100	0.500		mg/L	1	05/12/20 03:04 PM
ALKALINITY		M2320 B		Analyst: BTJ			
Alkalinity, Bicarbonate (As CaCO3)	518	10.0	20.0		mg/L @ pH 4.54	1	05/14/20 12:49 PM
Alkalinity, Carbonate (As CaCO3)	<10.0	10.0	20.0		mg/L @ pH 4.54	1	05/14/20 12:49 PM
Alkalinity, Hydroxide (As CaCO3)	<10.0	10.0	20.0		mg/L @ pH 4.54	1	05/14/20 12:49 PM
Alkalinity, Total (As CaCO3)	518	20.0	20.0		mg/L @ pH 4.54	1	05/14/20 12:49 PM
FERRIC IRON (CALCULATED)		M3500-FE D		Analyst: AO			
Iron, Ferric	68.0	0.0500	0.100	N	mg/L	1	05/21/20
FERROUS IRON		M3500-FE D		Analyst: CC			
Iron, Ferrous	152	50.0	100	N	mg/L	1000	05/13/20 11:14 AM
ORTHOPHOSPHATE		M4500-P E		Analyst: BTJ			
Phosphorus, Total Orthophosphate (As P)	<0.0300	0.0300	0.100		mg/L	1	05/12/20 04:07 PM

Qualifiers: ND - Not Detected at the SDL
 J - Analyte detected between SDL and RL
 B - Analyte detected in the associated Method Blank
 DF- Dilution Factor
 N - Parameter not NELAP certified
 See Final Page of Report for MQLs and MDLs

S - Spike Recovery outside control limits
 C - Sample Result or QC discussed in Case Narrative
 RL - Reporting Limit (MQL adjusted for moisture and sample size)
 SDL - Sample Detection Limit
 E - TPH pattern not Gas or Diesel Range Pattern

DHL Analytical, Inc.

Date: 21-May-20

CLIENT: Golder
Project: Luminant-OGSES-FGD PONDS
Project No: 19134019-1000
Lab Order: 2005078

Client Sample ID: FGD-11
Lab ID: 2005078-06
Collection Date: 05/11/20 12:45 PM
Matrix: AQUEOUS

Analyses	Result	SDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		SW6020B		Analyst: RO			
Iron	0.225	0.0300	0.100		mg/L	1	05/15/20 02:16 PM
Magnesium	28.5	5.00	15.0		mg/L	50	05/20/20 02:34 PM
Potassium	4.42	0.100	0.300		mg/L	1	05/15/20 02:16 PM
Sodium	306	5.00	15.0		mg/L	50	05/20/20 02:34 PM
ANIONS BY IC METHOD - WATER		E300		Analyst: SNM			
Nitrate-N	<0.100	0.100	0.500		mg/L	1	05/12/20 02:32 PM
ALKALINITY		M2320 B		Analyst: BTJ			
Alkalinity, Bicarbonate (As CaCO3)	230	10.0	20.0		mg/L @ pH 4.52	1	05/14/20 01:01 PM
Alkalinity, Carbonate (As CaCO3)	<10.0	10.0	20.0		mg/L @ pH 4.52	1	05/14/20 01:01 PM
Alkalinity, Hydroxide (As CaCO3)	<10.0	10.0	20.0		mg/L @ pH 4.52	1	05/14/20 01:01 PM
Alkalinity, Total (As CaCO3)	230	20.0	20.0		mg/L @ pH 4.52	1	05/14/20 01:01 PM
FERRIC IRON (CALCULATED)		M3500-FE D		Analyst: AO			
Iron, Ferric	0.225	0.0500	0.100	N	mg/L	1	05/21/20
FERROUS IRON		M3500-FE D		Analyst: CC			
Iron, Ferrous	<0.0500	0.0500	0.100	N	mg/L	1	05/13/20 11:05 AM
ORTHOPHOSPHATE		M4500-P E		Analyst: BTJ			
Phosphorus, Total Orthophosphate (As P)	0.0640	0.0300	0.100	J	mg/L	1	05/12/20 04:07 PM

Qualifiers: ND - Not Detected at the SDL
 J - Analyte detected between SDL and RL
 B - Analyte detected in the associated Method Blank
 DF- Dilution Factor
 N - Parameter not NELAP certified
 See Final Page of Report for MQLs and MDLs

S - Spike Recovery outside control limits
 C - Sample Result or QC discussed in Case Narrative
 RL - Reporting Limit (MQL adjusted for moisture and sample size)
 SDL - Sample Detection Limit
 E - TPH pattern not Gas or Diesel Range Pattern

DHL Analytical, Inc.

Date: 21-May-20

CLIENT: Golder
Project: Luminant-OGSES-FGD PONDS
Project No: 19134019-1000
Lab Order: 2005078

Client Sample ID: FGD-12
Lab ID: 2005078-07
Collection Date: 05/11/20 01:45 PM
Matrix: AQUEOUS

Analyses	Result	SDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		SW6020B		Analyst: RO			
Iron	32.5	0.300	1.00		mg/L	10	05/20/20 02:36 PM
Magnesium	8.03	0.100	0.300		mg/L	1	05/15/20 02:18 PM
Potassium	5.31	0.100	0.300		mg/L	1	05/15/20 02:18 PM
Sodium	22.1	0.100	0.300		mg/L	1	05/15/20 02:18 PM
ANIONS BY IC METHOD - WATER		E300		Analyst: SNM			
Nitrate-N	1.22	0.100	0.500		mg/L	1	05/12/20 02:48 PM
ALKALINITY		M2320 B		Analyst: BTJ			
Alkalinity, Bicarbonate (As CaCO3)	34.6	10.0	20.0		mg/L @ pH 4.49	1	05/14/20 01:05 PM
Alkalinity, Carbonate (As CaCO3)	<10.0	10.0	20.0		mg/L @ pH 4.49	1	05/14/20 01:05 PM
Alkalinity, Hydroxide (As CaCO3)	<10.0	10.0	20.0		mg/L @ pH 4.49	1	05/14/20 01:05 PM
Alkalinity, Total (As CaCO3)	34.6	20.0	20.0		mg/L @ pH 4.49	1	05/14/20 01:05 PM
FERRIC IRON (CALCULATED)		M3500-FE D		Analyst: AO			
Iron, Ferric	32.5	0.0500	0.100	N	mg/L	1	05/21/20
FERROUS IRON		M3500-FE D		Analyst: CC			
Iron, Ferrous	<0.0500	0.0500	0.100	N	mg/L	1	05/13/20 11:14 AM
ORTHOPHOSPHATE		M4500-P E		Analyst: BTJ			
Phosphorus, Total Orthophosphate (As P)	0.0560	0.0300	0.100	J	mg/L	1	05/12/20 04:08 PM

Qualifiers: ND - Not Detected at the SDL
 J - Analyte detected between SDL and RL
 B - Analyte detected in the associated Method Blank
 DF- Dilution Factor
 N - Parameter not NELAP certified
 See Final Page of Report for MQLs and MDLs

S - Spike Recovery outside control limits
 C - Sample Result or QC discussed in Case Narrative
 RL - Reporting Limit (MQL adjusted for moisture and sample size)
 SDL - Sample Detection Limit
 E - TPH pattern not Gas or Diesel Range Pattern

CLIENT: Golder
Work Order: 2005078
Project: Luminant-OGSES-FGD PONDS

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS5_200408C

Sample ID: DCS2-95814	Batch ID: 95814	TestNo: SW6020B	Units: mg/L
SampType: DCS2	Run ID: ICP-MS5_200408C	Analysis Date: 4/8/2020 11:19:00 AM	Prep Date: 4/7/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron	0.0591	0.100	0.0500	0	118	70	130	0	0	
Magnesium	0.298	0.300	0.300	0	99.3	70	130	0	0	
Potassium	0.285	0.300	0.300	0	95.1	70	130	0	0	
Sodium	0.295	0.300	0.300	0	98.4	70	130	0	0	

Qualifiers: B Analyte detected in the associated Method Blank
 J Analyte detected between MDL and RL
 ND Not Detected at the Method Detection Limit
 RL Reporting Limit
 J Analyte detected between SDL and RL

DF Dilution Factor
 MDL Method Detection Limit
 R RPD outside accepted control limits
 S Spike Recovery outside control limits
 N Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005078
Project: Luminant-OGSES-FGD PONDS

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS5_200515B

The QC data in batch 96348 applies to the following samples: 2005078-01B, 2005078-02B, 2005078-03B, 2005078-04B, 2005078-05B, 2005078-06B, 2005078-07B

Sample ID: MB-96348	Batch ID: 96348	TestNo: SW6020B	Units: mg/L
SampType: MBLK	Run ID: ICP-MS5_200515B	Analysis Date: 5/15/2020 2:38:00 PM	Prep Date: 5/14/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron	<0.0300	0.100								
Magnesium	<0.100	0.300								
Potassium	<0.100	0.300								
Sodium	<0.100	0.300								

Sample ID: LCS-96348	Batch ID: 96348	TestNo: SW6020B	Units: mg/L
SampType: LCS	Run ID: ICP-MS5_200515B	Analysis Date: 5/15/2020 2:41:00 PM	Prep Date: 5/14/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron	5.18	0.100	5.00	0	104	80	120			
Magnesium	5.07	0.300	5.00	0	101	80	120			
Potassium	5.14	0.300	5.00	0	103	80	120			
Sodium	5.00	0.300	5.00	0	100	80	120			

Sample ID: LCSD-96348	Batch ID: 96348	TestNo: SW6020B	Units: mg/L
SampType: LCSD	Run ID: ICP-MS5_200515B	Analysis Date: 5/15/2020 2:43:00 PM	Prep Date: 5/14/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron	5.19	0.100	5.00	0	104	80	120	0.142	15	
Magnesium	5.18	0.300	5.00	0	104	80	120	2.28	15	
Potassium	5.24	0.300	5.00	0	105	80	120	2.03	15	
Sodium	5.09	0.300	5.00	0	102	80	120	1.86	15	

Sample ID: 2005077-05A SD	Batch ID: 96348	TestNo: SW6020B	Units: mg/L
SampType: SD	Run ID: ICP-MS5_200515B	Analysis Date: 5/15/2020 2:54:00 PM	Prep Date: 5/14/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron	1.18	0.500	0	1.16				2.13	20	
Magnesium	16.9	1.50	0	16.7				1.48	20	
Potassium	2.57	1.50	0	2.56				0.542	20	
Sodium	83.2	1.50	0	79.6				4.37	20	

Sample ID: 2005077-05A PDS	Batch ID: 96348	TestNo: SW6020B	Units: mg/L
SampType: PDS	Run ID: ICP-MS5_200515B	Analysis Date: 5/15/2020 3:21:00 PM	Prep Date: 5/14/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron	6.28	0.100	5.00	1.15	103	75	125			
Magnesium	20.8	0.300	5.00	16.7	81.8	75	125			
Potassium	7.62	0.300	5.00	2.56	101	75	125			

- | | |
|--|---|
| <p>Qualifiers:</p> <ul style="list-style-type: none"> B Analyte detected in the associated Method Blank J Analyte detected between MDL and RL ND Not Detected at the Method Detection Limit RL Reporting Limit J Analyte detected between SDL and RL | <ul style="list-style-type: none"> DF Dilution Factor MDL Method Detection Limit R RPD outside accepted control limits S Spike Recovery outside control limits N Parameter not NELAP certified |
|--|---|

CLIENT: Golder
 Work Order: 2005078
 Project: Luminant-OGSES-FGD PONDS

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS5_200515B

Sample ID: 2005077-05A PDS	Batch ID: 96348	TestNo: SW6020B	Units: mg/L							
SampType: PDS	Run ID: ICP-MS5_200515B	Analysis Date: 5/15/2020 3:21:00 PM	Prep Date: 5/14/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Sodium	80.8	0.300	5.00	79.6	24.4	75	125			S

Sample ID: 2005077-05A MS	Batch ID: 96348	TestNo: SW6020B	Units: mg/L							
SampType: MS	Run ID: ICP-MS5_200515B	Analysis Date: 5/15/2020 3:23:00 PM	Prep Date: 5/14/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron	6.35	0.100	5.00	1.15	104	75	125			
Magnesium	21.9	0.300	5.00	16.7	105	75	125			
Potassium	7.83	0.300	5.00	2.56	105	75	125			
Sodium	84.9	0.300	5.00	79.6	105	75	125			

Sample ID: 2005077-05A MSD	Batch ID: 96348	TestNo: SW6020B	Units: mg/L							
SampType: MSD	Run ID: ICP-MS5_200515B	Analysis Date: 5/15/2020 3:25:00 PM	Prep Date: 5/14/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron	6.36	0.100	5.00	1.15	104	75	125	0.153	15	
Magnesium	21.8	0.300	5.00	16.7	103	75	125	0.476	15	
Potassium	7.73	0.300	5.00	2.56	103	75	125	1.21	15	
Sodium	85.6	0.300	5.00	79.6	118	75	125	0.796	15	

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005078
Project: Luminant-OGSES-FGD PONDS

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS5_200515B

Sample ID: ICV-200515	Batch ID: R110514	TestNo: SW6020B	Units: mg/L
SampType: ICV	Run ID: ICP-MS5_200515B	Analysis Date: 5/15/2020 10:34:00 AM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron	2.50	0.100	2.50	0	99.8	90	110			
Magnesium	2.45	0.300	2.50	0	98.0	90	110			
Potassium	2.50	0.300	2.50	0	100	90	110			
Sodium	2.48	0.300	2.50	0	99.2	90	110			

Sample ID: LCVL-200515	Batch ID: R110514	TestNo: SW6020B	Units: mg/L
SampType: LCVL	Run ID: ICP-MS5_200515B	Analysis Date: 5/15/2020 10:48:00 AM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron	0.101	0.100	0.100	0	101	80	120			
Magnesium	0.0979	0.300	0.100	0	97.9	80	120			
Potassium	0.102	0.300	0.100	0	102	80	120			
Sodium	0.104	0.300	0.100	0	104	80	120			

Sample ID: CCV3-200515	Batch ID: R110514	TestNo: SW6020B	Units: mg/L
SampType: CCV	Run ID: ICP-MS5_200515B	Analysis Date: 5/15/2020 1:53:00 PM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron	5.31	0.100	5.00	0	106	90	110			
Magnesium	5.13	0.300	5.00	0	103	90	110			
Potassium	5.21	0.300	5.00	0	104	90	110			
Sodium	5.04	0.300	5.00	0	101	90	110			

Sample ID: CCV4-200515	Batch ID: R110514	TestNo: SW6020B	Units: mg/L
SampType: CCV	Run ID: ICP-MS5_200515B	Analysis Date: 5/15/2020 2:30:00 PM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron	5.30	0.100	5.00	0	106	90	110			
Magnesium	5.19	0.300	5.00	0	104	90	110			
Potassium	5.23	0.300	5.00	0	105	90	110			
Sodium	5.15	0.300	5.00	0	103	90	110			

Sample ID: CCV5-200409	Batch ID: R110514	TestNo: SW6020B	Units: mg/L
SampType: CCV	Run ID: ICP-MS5_200515B	Analysis Date: 5/15/2020 3:36:00 PM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron	5.20	0.100	5.00	0	104	90	110			
Magnesium	5.08	0.300	5.00	0	102	90	110			
Potassium	5.12	0.300	5.00	0	102	90	110			
Sodium	5.01	0.300	5.00	0	100	90	110			

Qualifiers:

B Analyte detected in the associated Method Blank	DF Dilution Factor
J Analyte detected between MDL and RL	MDL Method Detection Limit
ND Not Detected at the Method Detection Limit	R RPD outside accepted control limits
RL Reporting Limit	S Spike Recovery outside control limits
J Analyte detected between SDL and RL	N Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005078
Project: Luminant-OGSES-FGD PONDS

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS5_200520B

Sample ID: ICV-200520	Batch ID: R110581	TestNo: SW6020B	Units: mg/L
SampType: ICV	Run ID: ICP-MS5_200520B	Analysis Date: 5/20/2020 10:52:00 AM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron	2.54	0.100	2.50	0	102	90	110			
Magnesium	2.47	0.300	2.50	0	98.6	90	110			
Sodium	2.50	0.300	2.50	0	99.9	90	110			

Sample ID: LCVL-200520	Batch ID: R110581	TestNo: SW6020B	Units: mg/L
SampType: LCVL	Run ID: ICP-MS5_200520B	Analysis Date: 5/20/2020 11:04:00 AM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron	0.0988	0.100	0.100	0	98.8	80	120			
Magnesium	0.0961	0.300	0.100	0	96.1	80	120			
Sodium	0.100	0.300	0.100	0	100	80	120			

Sample ID: CCV3-200520	Batch ID: R110581	TestNo: SW6020B	Units: mg/L
SampType: CCV	Run ID: ICP-MS5_200520B	Analysis Date: 5/20/2020 2:09:00 PM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron	5.09	0.100	5.00	0	102	90	110			
Magnesium	5.09	0.300	5.00	0	102	90	110			
Sodium	5.01	0.300	5.00	0	100	90	110			

Sample ID: CCV4-200520	Batch ID: R110581	TestNo: SW6020B	Units: mg/L
SampType: CCV	Run ID: ICP-MS5_200520B	Analysis Date: 5/20/2020 2:38:00 PM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron	5.09	0.100	5.00	0	102	90	110			
Magnesium	5.03	0.300	5.00	0	101	90	110			
Sodium	4.96	0.300	5.00	0	99.2	90	110			

Qualifiers:	<p>B Analyte detected in the associated Method Blank</p> <p>J Analyte detected between MDL and RL</p> <p>ND Not Detected at the Method Detection Limit</p> <p>RL Reporting Limit</p> <p>J Analyte detected between SDL and RL</p>	<p>DF Dilution Factor</p> <p>MDL Method Detection Limit</p> <p>R RPD outside accepted control limits</p> <p>S Spike Recovery outside control limits</p> <p>N Parameter not NELAP certified</p>
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CLIENT: Golder
Work Order: 2005078
Project: Luminant-OGSES-FGD PONDS

ANALYTICAL QC SUMMARY REPORT

RunID: IC2_200421A

Sample ID: DCS2-96036	Batch ID: 96036	TestNo: E300	Units: mg/L							
SampType: DCS2	Run ID: IC2_200421A	Analysis Date: 4/21/2020 11:47:08 AM	Prep Date: 4/21/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Nitrate-N	0.246	0.0500	0.2500	0	98.5	70	130	0	0	

Qualifiers:

B Analyte detected in the associated Method Blank	DF Dilution Factor
J Analyte detected between MDL and RL	MDL Method Detection Limit
ND Not Detected at the Method Detection Limit	R RPD outside accepted control limits
RL Reporting Limit	S Spike Recovery outside control limits
J Analyte detected between SDL and RL	N Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005078
Project: Luminant-OGSES-FGD PONDS

ANALYTICAL QC SUMMARY REPORT

RunID: IC2_200512A

The QC data in batch 96308 applies to the following samples: 2005078-01C, 2005078-02C, 2005078-03C, 2005078-04C, 2005078-05C, 2005078-06C, 2005078-07C

Sample ID: MB-96308	Batch ID: 96308	TestNo: E300	Units: mg/L							
SampType: MBLK	Run ID: IC2_200512A	Analysis Date: 5/12/2020 10:34:16 AM	Prep Date: 5/12/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Nitrate-N	<0.100	0.500								

Sample ID: LCS-96308	Batch ID: 96308	TestNo: E300	Units: mg/L							
SampType: LCS	Run ID: IC2_200512A	Analysis Date: 5/12/2020 10:50:15 AM	Prep Date: 5/12/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Nitrate-N	4.95	0.500	5.000	0	98.9	90	110			

Sample ID: LCSD-96308	Batch ID: 96308	TestNo: E300	Units: mg/L							
SampType: LCSD	Run ID: IC2_200512A	Analysis Date: 5/12/2020 11:06:15 AM	Prep Date: 5/12/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Nitrate-N	4.91	0.500	5.000	0	98.2	90	110	0.758	20	

Sample ID: 2005076-01CMS	Batch ID: 96308	TestNo: E300	Units: mg/L							
SampType: MS	Run ID: IC2_200512A	Analysis Date: 5/12/2020 6:16:24 PM	Prep Date: 5/12/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Nitrate-N	438	50.0	451.6	0	97.0	90	110			

Sample ID: 2005076-01CMSD	Batch ID: 96308	TestNo: E300	Units: mg/L							
SampType: MSD	Run ID: IC2_200512A	Analysis Date: 5/12/2020 6:32:24 PM	Prep Date: 5/12/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Nitrate-N	439	50.0	451.6	0	97.2	90	110	0.161	20	

Sample ID: 2005076-02CMS	Batch ID: 96308	TestNo: E300	Units: mg/L							
SampType: MS	Run ID: IC2_200512A	Analysis Date: 5/12/2020 7:04:24 PM	Prep Date: 5/12/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Nitrate-N	455	50.0	451.6	0	101	90	110			

Sample ID: 2005076-02CMSD	Batch ID: 96308	TestNo: E300	Units: mg/L							
SampType: MSD	Run ID: IC2_200512A	Analysis Date: 5/12/2020 7:20:24 PM	Prep Date: 5/12/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Nitrate-N	456	50.0	451.6	0	101	90	110	0.070	20	

Qualifiers: B Analyte detected in the associated Method Blank DF Dilution Factor
J Analyte detected between MDL and RL MDL Method Detection Limit
ND Not Detected at the Method Detection Limit R RPD outside accepted control limits
RL Reporting Limit S Spike Recovery outside control limits
J Analyte detected between SDL and RL N Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005078
Project: Luminant-OGSES-FGD PONDS

ANALYTICAL QC SUMMARY REPORT

RunID: IC2_200512A

Sample ID: ICV-200512	Batch ID: R110449	TestNo: E300	Units: mg/L
SampType: ICV	Run ID: IC2_200512A	Analysis Date: 5/12/2020 10:02:16 AM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Nitrate-N	13.0	0.500	12.50	0	104	90	110			

Sample ID: CCV1-200512	Batch ID: R110449	TestNo: E300	Units: mg/L
SampType: CCV	Run ID: IC2_200512A	Analysis Date: 5/12/2020 4:08:23 PM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Nitrate-N	4.94	0.500	5.000	0	98.9	90	110			

Sample ID: CCV2-200512	Batch ID: R110449	TestNo: E300	Units: mg/L
SampType: CCV	Run ID: IC2_200512A	Analysis Date: 5/12/2020 10:16:24 PM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Nitrate-N	4.99	0.500	5.000	0	99.8	90	110			

Qualifiers:

- B Analyte detected in the associated Method Blank
- J Analyte detected between MDL and RL
- ND Not Detected at the Method Detection Limit
- RL Reporting Limit
- J Analyte detected between SDL and RL

- DF Dilution Factor
- MDL Method Detection Limit
- R RPD outside accepted control limits
- S Spike Recovery outside control limits
- N Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005078
Project: Luminant-OGSES-FGD PONDS

ANALYTICAL QC SUMMARY REPORT

RunID: TITRATOR_200514B

The QC data in batch 96346 applies to the following samples: 2005078-01C, 2005078-02C, 2005078-03C, 2005078-04C, 2005078-05C, 2005078-06C, 2005078-07C

Sample ID: MB-96346	Batch ID: 96346	TestNo: M2320 B	Units: mg/L @ pH 4.23
SampType: MBLK	Run ID: TITRATOR_200514B	Analysis Date: 5/14/2020 11:22:00 AM	Prep Date: 5/14/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Alkalinity, Bicarbonate (As CaCO3)	<10.0	20.0								
Alkalinity, Carbonate (As CaCO3)	<10.0	20.0								
Alkalinity, Hydroxide (As CaCO3)	<10.0	20.0								
Alkalinity, Total (As CaCO3)	<20.0	20.0								

Sample ID: LCS-96346	Batch ID: 96346	TestNo: M2320 B	Units: mg/L @ pH 4.22
SampType: LCS	Run ID: TITRATOR_200514B	Analysis Date: 5/14/2020 11:26:00 AM	Prep Date: 5/14/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	53.2	20.0	50.00	0	106	74	129			

Sample ID: 2005076-01C-DUP	Batch ID: 96346	TestNo: M2320 B	Units: mg/L @ pH 4.53
SampType: DUP	Run ID: TITRATOR_200514B	Analysis Date: 5/14/2020 11:46:00 AM	Prep Date: 5/14/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Alkalinity, Bicarbonate (As CaCO3)	130	20.0	0	133.8				3.11	20	
Alkalinity, Carbonate (As CaCO3)	<10.0	20.0	0	0				0	20	
Alkalinity, Hydroxide (As CaCO3)	<10.0	20.0	0	0				0	20	
Alkalinity, Total (As CaCO3)	130	20.0	0	133.8				3.11	20	

Sample ID: 2005110-01C-DUP	Batch ID: 96346	TestNo: M2320 B	Units: mg/L @ pH 4.5
SampType: DUP	Run ID: TITRATOR_200514B	Analysis Date: 5/14/2020 1:18:00 PM	Prep Date: 5/14/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Alkalinity, Bicarbonate (As CaCO3)	32.0	20.0	0	32.90				2.77	20	
Alkalinity, Carbonate (As CaCO3)	<10.0	20.0	0	0				0	20	
Alkalinity, Hydroxide (As CaCO3)	<10.0	20.0	0	0				0	20	
Alkalinity, Total (As CaCO3)	32.0	20.0	0	32.90				2.77	20	

Qualifiers: B Analyte detected in the associated Method Blank J Analyte detected between MDL and RL ND Not Detected at the Method Detection Limit RL Reporting Limit J Analyte detected between SDL and RL	DF Dilution Factor MDL Method Detection Limit R RPD outside accepted control limits S Spike Recovery outside control limits N Parameter not NELAP certified
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CLIENT: Golder
Work Order: 2005078
Project: Luminant-OGSES-FGD PONDS

ANALYTICAL QC SUMMARY REPORT

RunID: TITRATOR_200514B

Sample ID: ICV-200514	Batch ID: R110504	TestNo: M2320 B	Units: mg/L @ pH 4.36
SampType: ICV	Run ID: TITRATOR_200514B	Analysis Date: 5/14/2020 11:20:00 AM	Prep Date: 5/14/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Alkalinity, Bicarbonate (As CaCO3)	31.5	20.0	0							
Alkalinity, Carbonate (As CaCO3)	67.8	20.0	0							
Alkalinity, Hydroxide (As CaCO3)	<10.0	20.0	0							
Alkalinity, Total (As CaCO3)	99.4	20.0	100.0	0	99.4	98	102			

Sample ID: CCV1-200514	Batch ID: R110504	TestNo: M2320 B	Units: mg/L @ pH 4.33
SampType: CCV	Run ID: TITRATOR_200514B	Analysis Date: 5/14/2020 1:10:00 PM	Prep Date: 5/14/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Alkalinity, Bicarbonate (As CaCO3)	39.8	20.0	0							
Alkalinity, Carbonate (As CaCO3)	60.2	20.0	0							
Alkalinity, Hydroxide (As CaCO3)	<10.0	20.0	0							
Alkalinity, Total (As CaCO3)	99.9	20.0	100.0	0	99.9	90	110			

Sample ID: CCV2-200514	Batch ID: R110504	TestNo: M2320 B	Units: mg/L @ pH 4.32
SampType: CCV	Run ID: TITRATOR_200514B	Analysis Date: 5/14/2020 2:01:00 PM	Prep Date: 5/14/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Alkalinity, Bicarbonate (As CaCO3)	42.2	20.0	0							
Alkalinity, Carbonate (As CaCO3)	58.1	20.0	0							
Alkalinity, Hydroxide (As CaCO3)	<10.0	20.0	0							
Alkalinity, Total (As CaCO3)	100	20.0	100.0	0	100	90	110			

<p>Qualifiers:</p> <p>B Analyte detected in the associated Method Blank</p> <p>J Analyte detected between MDL and RL</p> <p>ND Not Detected at the Method Detection Limit</p> <p>RL Reporting Limit</p> <p>J Analyte detected between SDL and RL</p>	<p>DF Dilution Factor</p> <p>MDL Method Detection Limit</p> <p>R RPD outside accepted control limits</p> <p>S Spike Recovery outside control limits</p> <p>N Parameter not NELAP certified</p>
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CLIENT: Golder
Work Order: 2005078
Project: Luminant-OGSES-FGD PONDS

ANALYTICAL QC SUMMARY REPORT

RunID: UV/VIS_2_200323B

Sample ID: DCS-95613	Batch ID: 95613	TestNo: M3500-Fe D	Units: mg/L							
SampType: DCS	Run ID: UV/VIS_2_200323B	Analysis Date: 3/23/2020 1:30:00 PM	Prep Date: 3/23/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron, Ferrous	0.0580	0.100	0.05000	0	116	65	135	0	0	N

Qualifiers:

B Analyte detected in the associated Method Blank	DF Dilution Factor
J Analyte detected between MDL and RL	MDL Method Detection Limit
ND Not Detected at the Method Detection Limit	R RPD outside accepted control limits
RL Reporting Limit	S Spike Recovery outside control limits
J Analyte detected between SDL and RL	N Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005078
Project: Luminant-OGSES-FGD PONDS

ANALYTICAL QC SUMMARY REPORT

RunID: UV/VIS_2_200507C

Sample ID: DCS-96253	Batch ID: 96253	TestNo: M4500-P E	Units: mg/L							
SampType: DCS	Run ID: UV/VIS_2_200507C	Analysis Date: 5/7/2020 2:22:00 PM	Prep Date: 5/7/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Phosphorus, Total Orthophosphate (As	0.0480	0.100	0.05000	0	96.0	50	200	0	0	

Qualifiers:

B Analyte detected in the associated Method Blank	DF Dilution Factor
J Analyte detected between MDL and RL	MDL Method Detection Limit
ND Not Detected at the Method Detection Limit	R RPD outside accepted control limits
RL Reporting Limit	S Spike Recovery outside control limits
J Analyte detected between SDL and RL	N Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005078
Project: Luminant-OGSES-FGD PONDS

ANALYTICAL QC SUMMARY REPORT

RunID: UV/VIS_2_200512D

The QC data in batch 96315 applies to the following samples: 2005078-01C, 2005078-02C, 2005078-03C, 2005078-04C, 2005078-05C, 2005078-06C, 2005078-07C

Sample ID: MB-96315	Batch ID: 96315	TestNo: M4500-P E	Units: mg/L							
SampType: MBLK	Run ID: UV/VIS_2_200512D	Analysis Date: 5/12/2020 4:04:00 PM	Prep Date: 5/12/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Phosphorus, Total Orthophosphate (As	<0.0300	0.100								

Sample ID: LCS-96315	Batch ID: 96315	TestNo: M4500-P E	Units: mg/L							
SampType: LCS	Run ID: UV/VIS_2_200512D	Analysis Date: 5/12/2020 4:04:00 PM	Prep Date: 5/12/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Phosphorus, Total Orthophosphate (As	0.498	0.100	0.5000	0	99.6	80	120			

Sample ID: LCSD-96315	Batch ID: 96315	TestNo: M4500-P E	Units: mg/L							
SampType: LCSD	Run ID: UV/VIS_2_200512D	Analysis Date: 5/12/2020 4:04:00 PM	Prep Date: 5/12/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Phosphorus, Total Orthophosphate (As	0.499	0.100	0.5000	0	99.8	80	120	0.201	15	

Sample ID: 2005076-02CMS	Batch ID: 96315	TestNo: M4500-P E	Units: mg/L							
SampType: MS	Run ID: UV/VIS_2_200512D	Analysis Date: 5/12/2020 4:08:00 PM	Prep Date: 5/12/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Phosphorus, Total Orthophosphate (As	0.495	0.100	0.5000	0	99.0	80	120			

Sample ID: 2005076-02CMSD	Batch ID: 96315	TestNo: M4500-P E	Units: mg/L							
SampType: MSD	Run ID: UV/VIS_2_200512D	Analysis Date: 5/12/2020 4:08:00 PM	Prep Date: 5/12/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Phosphorus, Total Orthophosphate (As	0.491	0.100	0.5000	0	98.2	80	120	0.811	15	

Qualifiers:	<p>B Analyte detected in the associated Method Blank</p> <p>J Analyte detected between MDL and RL</p> <p>ND Not Detected at the Method Detection Limit</p> <p>RL Reporting Limit</p> <p>J Analyte detected between SDL and RL</p>	<p>DF Dilution Factor</p> <p>MDL Method Detection Limit</p> <p>R RPD outside accepted control limits</p> <p>S Spike Recovery outside control limits</p> <p>N Parameter not NELAP certified</p>
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CLIENT: Golder
Work Order: 2005078
Project: Luminant-OGSES-FGD PONDS

ANALYTICAL QC SUMMARY REPORT

RunID: UV/VIS_2_200512D

Sample ID: ICV-200512	Batch ID: R110462	TestNo: M4500-P E	Units: mg/L							
SampType: ICV	Run ID: UV/VIS_2_200512D	Analysis Date: 5/12/2020 4:03:00 PM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Phosphorus, Total Orthophosphate (As	0.200	0.100	0.2000	0	100	85	115			
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Sample ID: CCV1-200512	Batch ID: R110462	TestNo: M4500-P E	Units: mg/L							
SampType: CCV	Run ID: UV/VIS_2_200512D	Analysis Date: 5/12/2020 4:09:00 PM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Phosphorus, Total Orthophosphate (As	0.516	0.100	0.5000	0	103	85	115			
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<p>Qualifiers:</p> <p>B Analyte detected in the associated Method Blank</p> <p>J Analyte detected between MDL and RL</p> <p>ND Not Detected at the Method Detection Limit</p> <p>RL Reporting Limit</p> <p>J Analyte detected between SDL and RL</p>	<p>DF Dilution Factor</p> <p>MDL Method Detection Limit</p> <p>R RPD outside accepted control limits</p> <p>S Spike Recovery outside control limits</p> <p>N Parameter not NELAP certified</p>
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CLIENT: Golder
Work Order: 2005078
Project: Luminant-OGSES-FGD PONDS

ANALYTICAL QC SUMMARY REPORT

RunID: UV/VIS_2_200513B

The QC data in batch 96316 applies to the following samples: 2005078-01A, 2005078-02A, 2005078-03A, 2005078-04A, 2005078-05A, 2005078-06A, 2005078-07A

Sample ID: MB-96316	Batch ID: 96316	TestNo: M3500-Fe D	Units: mg/L
SampType: MBLK	Run ID: UV/VIS_2_200513B	Analysis Date: 5/13/2020 10:41:00 AM	Prep Date: 5/13/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron, Ferrous	<0.0500	0.100								N

Sample ID: LCS-96316	Batch ID: 96316	TestNo: M3500-Fe D	Units: mg/L
SampType: LCS	Run ID: UV/VIS_2_200513B	Analysis Date: 5/13/2020 10:41:00 AM	Prep Date: 5/13/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron, Ferrous	0.106	0.100	0.1000	0	106	85	115			N

Sample ID: LCSD-96316	Batch ID: 96316	TestNo: M3500-Fe D	Units: mg/L
SampType: LCSD	Run ID: UV/VIS_2_200513B	Analysis Date: 5/13/2020 10:42:00 AM	Prep Date: 5/13/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron, Ferrous	0.105	0.100	0.1000	0	105	85	115	0.720	15	N

Sample ID: 2005038-01AMS	Batch ID: 96316	TestNo: M3500-Fe D	Units: mg/L
SampType: MS	Run ID: UV/VIS_2_200513B	Analysis Date: 5/13/2020 11:29:00 AM	Prep Date: 5/13/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron, Ferrous	0.120	0.100	0.1000	0	120	85	115			SN

Sample ID: 2005038-01AMSD	Batch ID: 96316	TestNo: M3500-Fe D	Units: mg/L
SampType: MSD	Run ID: UV/VIS_2_200513B	Analysis Date: 5/13/2020 11:29:00 AM	Prep Date: 5/13/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron, Ferrous	0.109	0.100	0.1000	0	109	85	115	8.97	15	N

<p>Qualifiers:</p> <p>B Analyte detected in the associated Method Blank</p> <p>J Analyte detected between MDL and RL</p> <p>ND Not Detected at the Method Detection Limit</p> <p>RL Reporting Limit</p> <p>J Analyte detected between SDL and RL</p>	<p>DF Dilution Factor</p> <p>MDL Method Detection Limit</p> <p>R RPD outside accepted control limits</p> <p>S Spike Recovery outside control limits</p> <p>N Parameter not NELAP certified</p>
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CLIENT: Golder
Work Order: 2005078
Project: Luminant-OGSES-FGD PONDS

ANALYTICAL QC SUMMARY REPORT

RunID: UV/VIS_2_200513B

Sample ID: ICV-200513	Batch ID: R110472	TestNo: M3500-Fe D	Units: mg/L							
SampType: ICV	Run ID: UV/VIS_2_200513B	Analysis Date: 5/13/2020 10:40:00 AM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron, Ferrous	0.112	0.100	0.1000	0	112	85	115			N

Sample ID: CCV1-200513	Batch ID: R110472	TestNo: M3500-Fe D	Units: mg/L							
SampType: CCV	Run ID: UV/VIS_2_200513B	Analysis Date: 5/13/2020 11:02:00 AM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron, Ferrous	0.192	0.100	0.2000	0	96.2	85	115			N

Sample ID: CCV2-200513	Batch ID: R110472	TestNo: M3500-Fe D	Units: mg/L							
SampType: CCV	Run ID: UV/VIS_2_200513B	Analysis Date: 5/13/2020 11:15:00 AM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron, Ferrous	0.187	0.100	0.2000	0	93.5	85	115			N

Sample ID: CCV3-200513	Batch ID: R110472	TestNo: M3500-Fe D	Units: mg/L							
SampType: CCV	Run ID: UV/VIS_2_200513B	Analysis Date: 5/13/2020 11:31:00 AM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron, Ferrous	0.205	0.100	0.2000	0	103	85	115			N

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005078
Project: Luminant-OGSES-FGD PONDS

MQL SUMMARY REPORT

TestNo: E300	MDL	MQL
Analyte	mg/L	mg/L
Nitrate-N	0.100	0.500

TestNo: SW6020B	MDL	MQL
Analyte	mg/L	mg/L
Iron	0.0300	0.100
Magnesium	0.100	0.300
Potassium	0.100	0.300
Sodium	0.100	0.300

TestNo: M2320 B	MDL	MQL
Analyte	g/L @ pH 4.1	g/L @ pH 4.1
Alkalinity, Bicarbonate (As CaCO ₃)	10.0	20.0
Alkalinity, Carbonate (As CaCO ₃)	10.0	20.0
Alkalinity, Hydroxide (As CaCO ₃)	10.0	20.0
Alkalinity, Total (As CaCO ₃)	20.0	20.0

TestNo: M3500-Fe D	MDL	MQL
Analyte	mg/L	mg/L
Iron, Ferrous	0.0500	0.100

TestNo: M4500-P E	MDL	MQL
Analyte	mg/L	mg/L
Phosphorus, Total Orthophosphate (0.0300	0.100

Qualifiers: MQL -Method Quantitation Limit as defined by TRRP
MDL -Method Detection Limit as defined by TRRP



June 12, 2020

Will Vienne
Golder
2201 Double Creek Dr #4004
Round Rock, Texas 78664
TEL: (512) 671-3434
FAX (512) 671-3446
RE: Luminant-OGSES FGD PONDS

Order No.: 2005079

Dear Will Vienne:

DHL Analytical, Inc. received 7 sample(s) on 5/12/2020 for the analyses presented in the following report.

There were no problems with the analyses and all data met requirements of NELAP except where noted in the Case Narrative. All non-NELAP methods will be identified accordingly in the case narrative and all estimated uncertainties of test results are within method or EPA specifications.

If you have any questions regarding these tests results, please feel free to call. Thank you for using DHL Analytical.

Sincerely,

A handwritten signature in red ink, appearing to read 'John DuPont'.

John DuPont
General Manager

This report was performed under the accreditation of the State of Texas Laboratory Certification Number: T104704211-20-25



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AnalyticalQCSummaryReport 2005079	26
MQLSummaryReport 2005079	44
Subcontract Report 2005079	45

Eric Lau

From: John DuPont
Sent: Tuesday, May 28, 2019 11:35 AM
To: Eric Lau
Subject: FW: CCR Analysis

Appendix III Parameters:

Metals (Ca and B)
Anions (Cl, F, and SO4)
TDS

Appendix IV Parameters:

Metals (As, Ba, Be, Cd, Co, Cr, Hg, Li, Mo, Pb, Sb, Se, and Tl)
Ra-226
Ra-228

From: Vienne, Will [mailto:William_Vienne@golder.com]
Sent: Tuesday, April 09, 2019 12:48 PM
To: John DuPont <dupont@dhlanalytical.com>
Subject: CCR Analysis

ORIGIN ID:FWHA (512) 671-3434
J BRAYTON
GOLDER
2201 DOUBLE CREEK DR STE 4004
ROUND ROCK, TX 78664
UNITED STATES US

SHIP DATE: 11MAY20
ACTWGT: 45.55 LB
CAD: 6990223/SSFE2110
DIMS: 24x13x13 IN
BILL THIRD PARTY

Part # 158297 46314562/6195 04/21

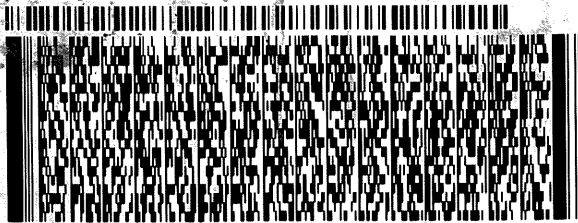
TO
DHL
2300 DOUBLE CREEK DR
ROUND ROCK TX 78664

(512) 388-8222

REF:

PO:

DEPT:



FedEx
Express



1082300211127

3 of 4
MPS# 3927 5344 3852
0263
Metr# 3927 5344 3830

0201

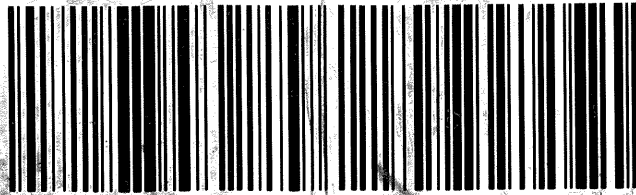
A8 BSMA

TUE - 12 MAY 10:30A
PRIORITY OVERNIGHT

AHS

78664

TX-US AUS



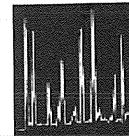
1.5
290

CUSTODY SEAL

DATE

5/11/20

SIGNATURE



DHL
ANALYTICAL

ORIGIN ID:FWHA (512) 671-3434
J BRAYTON
GOLDER
2201 DOUBLE CREEK DR STE 4004
ROUND ROCK, TX 78664
UNITED STATES US

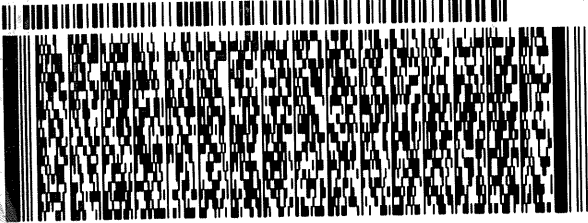
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BILL THIRD PARTY

Part # 156297-4631/5527/17895 04/21

TO
DHL
2300 DOUBLE CREEK DR

ROUND ROCK TX 78664

(512) 388-8222 REF: DEPT:

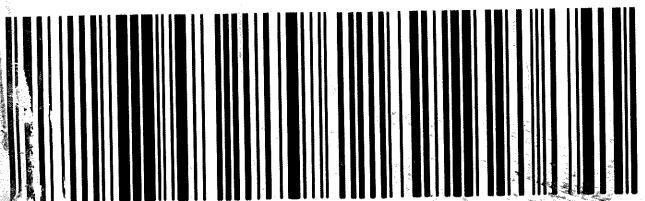


4 of 4
IPS# 3927 5344 3863
263
str# 3927 5344 3830

TUE - 12 MAY 10:30A
PRIORITY OVERNIGHT

A8 BSMA

AHS
78664
TX-US AUS



1.8
500

CUSTODY SEAL

DATE 5-11-20
SIGNATURE [Signature]



ORIGIN ID:FWHA (512) 671-3434
J BRAYTON
GOLDER
2201 DOUBLE CREEK DR STE 4004
ROUND ROCK, TX 78664
UNITED STATES US

SHIP DATE: 11MAY20
ACTWT: 45.55 LB
CAD: 5990223/SSFE2 10
DIMS: 24x13x13 IN
BILL THIRD PARTY

Part # 156297-063/SSFE/FE95 04/21

TO

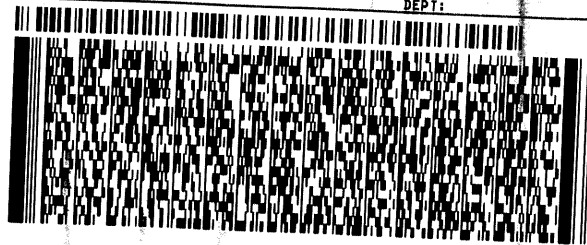
DHL
2300 DOUBLE CREEK DR
ROUND ROCK TX 78664

(512) 388-8222

REF:

INVT
PO:

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FedEx
Express



AN106200211027

2 of 4

MPS# 3927 5344 3841
0263

Mstr# 3927 5344 3830

0201

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TUE - 12 MAY 10:30A
PRIORITY OVERNIGHT

AHS

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TX-US AUS



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CUSTODY SE

DATE

5-11-20

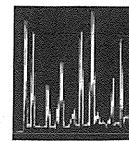
SIGNATURE

[Handwritten Signature]

AL

20

2



DHL
ANALYTICAL

ORIGIN ID: FWA (512) 671-3434
J BRAYTON
GOLDER
2201 DOUBLE CREEK DR STE 4004
ROUND ROCK TX 78664
UNITED STATES US

SHIP DATE: 11MAY20
ACTWGT: 49.20 LB
CAD: 6990223/SSFE2110
DIMS: 24x13x13 IN
BILL THIRD PARTY

Part #: 130297-033/562/ETRS 04/01

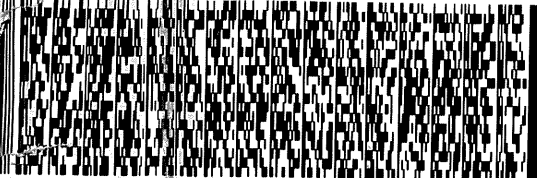
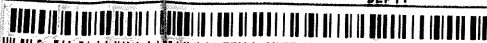
DHL
2300 DOUBLE CREEK DR
ROUND ROCK TX 78664

(512) 388-0222

REF:

NUM:

DEPT:



FedEx
Express



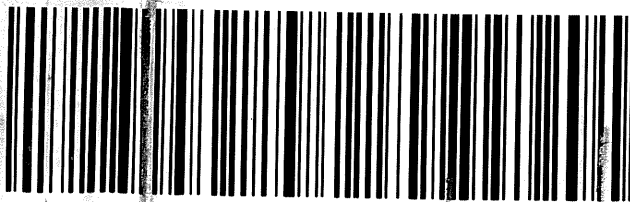
AN100242303110ZT

1 of 4
TRK# 0201 3927 5344 3830
MASTER

A8 BSMA

TUE - 12 MAY 10:30A
PRIORITY OVERNIGHT

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CUSTODY S

DATE

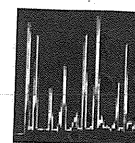
5-11-21

SIGNATURE

SEAL

2

2



DH
ANALYT

Sample Receipt Checklist

Client Name **Golder**

Date Received: **5/12/2020**

Work Order Number **2005079**

Received by: **JH**

Checklist completed by:  5/12/2020
Signature Date

Reviewed by  5/12/2020
Initials Date

Carrier name: FedEx 1day

- Shipping container/cooler in good condition? Yes No Not Present
- Custody seals intact on shipping container/cooler? Yes No Not Present
- Custody seals intact on sample bottles? Yes No Not Present
- Chain of custody present? Yes No
- Chain of custody signed when relinquished and received? Yes No
- Chain of custody agrees with sample labels? Yes No
- Samples in proper container/bottle? Yes No
- Sample containers intact? Yes No
- Sufficient sample volume for indicated test? Yes No
- All samples received within holding time? Yes No

- Container/Temp Blank temperature in compliance? Yes No **1.5 °C**
- Water - VOA vials have zero headspace? Yes No No VOA vials submitted
- Water - pH<2 acceptable upon receipt? Yes No NA LOT # **13171**
Adjusted? no Checked by EC
- Water - pH>9 (S) or pH>10 (CN) acceptable upon receipt? Yes No NA LOT #
Adjusted? _____ Checked by _____

Any No response must be detailed in the comments section below.

Client contacted: _____ Date contacted: _____ Person contacted: _____

Contacted by: _____ Regarding: _____

Comments: _____

Corrective Action _____

Laboratory Name: DHL Analytical, Inc.							
Laboratory Review Checklist: Reportable Data							
Project Name: Luminant-OGSES FGD PONDS				LRC Date: 6/12/20			
Reviewer Name: Carlos Castro				Laboratory Work Order: 2005079			
Prep Batch Number(s): See Prep Dates Report				Run Batch: See Analytical Dates Report			
# ¹	A ²	Description	Yes	No	NA ³	NR ⁴	ER# ⁵
		Chain-of-Custody (C-O-C)					
R1	OI	1) Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				R1-01
		2) Were all departures from standard conditions described in an exception report?			X		
R2	OI	Sample and Quality Control (QC) Identification					
		1) Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
		2) Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
R3	OI	Test Reports					
		1) Were all samples prepared and analyzed within holding times?	X				
		2) Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
		3) Were calculations checked by a peer or supervisor?	X				
		4) Were all analyte identifications checked by a peer or supervisor?	X				
		5) Were sample detection limits reported for all analytes not detected?	X				
		6) Were all results for soil and sediment samples reported on a dry weight basis?			X		
		7) Were % moisture (or solids) reported for all soil and sediment samples?			X		
		8) Were bulk soils/solids samples for volatile analysis extracted with methanol per EPA Method 5035?			X		
		9) If required for the project, TICs reported?			X		
R4	O	Surrogate Recovery Data					
		1) Were surrogates added prior to extraction?			X		
		2) Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
R5	OI	Test Reports/Summary Forms for Blank Samples					
		1) Were appropriate type(s) of blanks analyzed?	X				
		2) Were blanks analyzed at the appropriate frequency?	X				
		3) Where method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
		4) Were blank concentrations < MDL?	X				
		5) For analyte(s) detected in a blank sample, was the concentration, unadjusted for sample specific factors, in all associated field samples, greater than 10 times the concentration in the blank sample?			X		
R6	OI	Laboratory Control Samples (LCS):					
		1) Were all COCs included in the LCS?	X				
		2) Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
		3) Were LCSs analyzed at the required frequency?	X				
		4) Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
		5) Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
		6) Was the LCSD RPD within QC limits (if applicable)?	X				
R7	OI	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Data					
		1) Were the project/method specified analytes included in the MS and MSD?	X				
		2) Were MS/MSD analyzed at the appropriate frequency?	X				
		3) Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?		X			R7-03
		4) Were MS/MSD RPDs within laboratory QC limits?	X				
R8	OI	Analytical Duplicate Data					
		1) Were appropriate analytical duplicates analyzed for each matrix?	X				
		2) Were analytical duplicates analyzed at the appropriate frequency?	X				
		3) Were RPDs or relative standard deviations within the laboratory QC limits?	X				
R9	OI	Method Quantitation Limits (MQLs):					
		1) Are the MQLs for each method analyte included in the laboratory data package?	X				
		2) Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
		3) Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
R10	OI	Other Problems/Anomalies					
		1) Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
		2) Was applicable and available technology used to lower the SDL to minimize the matrix interference affects on the sample results?	X				
		3) Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices and methods associated with this laboratory data package?	X				

Laboratory Name: DHL Analytical, Inc.							
Laboratory Review Checklist (continued): Supporting Data							
Project Name: Luminant-OGSES FGD PONDS				LRC Date: 6/12/20			
Reviewer Name: Carlos Castro				Laboratory Work Order: 2005079			
Prep Batch Number(s): See Prep Dates Report				Run Batch: See Analytical Dates Report			
# ¹	A ²	Description	Yes	No	NA ³	NR ⁴	ER# ⁵
S1	OI	Initial Calibration (ICAL)					
		1) Were response factors and/or relative response factors for each analyte within QC limits?	X				
		2) Were percent RSDs or correlation coefficient criteria met?	X				
		3) Was the number of standards recommended in the method used for all analytes?	X				
		4) Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		5) Are ICAL data available for all instruments used?	X				
		6) Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	Initial and Continuing calibration Verification (ICCV and CCV) and Continuing Calibration blank (CCB):					
		1) Was the CCV analyzed at the method-required frequency?	X				
		2) Were percent differences for each analyte within the method-required QC limits?	X				
		3) Was the ICAL curve verified for each analyte?	X				
		4) Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	X				
S3	O	Mass Spectral Tuning:					
		1) Was the appropriate compound for the method used for tuning?	X				
		2) Were ion abundance data within the method-required QC limits?	X				
S4	O	Internal Standards (IS):					
		1) Were IS area counts and retention times within the method-required QC limits?	X				
S5	OI	Raw Data (NELAC Section 5.5.10)					
		1) Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		2) Were data associated with manual integrations flagged on the raw data?	X				
S6	O	Dual Column Confirmation					
		1) Did dual column confirmation results meet the method-required QC?			X		
S7	O	Tentatively Identified Compounds (TICs):					
		1) If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	Interference Check Sample (ICS) Results:					
		1) Were percent recoveries within method QC limits?	X				
S9	I	Serial Dilutions, Post Digestion Spikes, and Method of Standard Additions					
		1) Were percent differences, recoveries, and the linearity within the QC limits specified in the method?		X			S9-09
S10	OI	Method Detection Limit (MDL) Studies					
		1) Was a MDL study performed for each reported analyte?	X				
		2) Is the MDL either adjusted or supported by the analysis of DCSs?	X				
S11	OI	Proficiency Test Reports:					
		1) Was the lab's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	Standards Documentation					
		1) Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	Compound/Analyte Identification Procedures					
		1) Are the procedures for compound/analyte identification documented?	X				
S14	OI	Demonstration of Analyst Competency (DOC)					
		1) Was DOC conducted consistent with NELAC Chapter 5 – Appendix C?	X				
		2) Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	Verification/Validation Documentation for Methods (NELAC Chapter 5)					
		1) Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	Laboratory Standard Operating Procedures (SOPs):					
		1) Are laboratory SOPs current and on file for each method performed?	X				

- 1 Items identified by the letter "R" should be included in the laboratory data package submitted to the TCEQ in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
- 2 O = organic analyses; I = inorganic analyses (and general chemistry, when applicable).
- 3 NA = Not applicable.
- 4 NR = Not Reviewed.
- 5 ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Data Package Signature Page – RG-366/TRRP-13

This data package consists of:

This signature page, the laboratory review checklist, and the following reportable data:


- R1 Field chain-of-custody documentation;
- R2 Sample identification cross-reference;
- R3 Test reports (analytical data sheets) for each environmental sample that includes:
 - a) Items consistent with NELAC Chapter 5,
 - b) dilution factors,
 - c) preparation methods,
 - d) cleanup methods, and
 - e) if required for the project, tentatively identified compounds (TICs).
- R4 Surrogate recovery data including:
 - a) Calculated recovery (%R), and
 - b) The laboratory's surrogate QC limits.
- R5 Test reports/summary forms for blank samples;
- R6 Test reports/summary forms for laboratory control samples (LCSs) including:
 - a) LCS spiking amounts,
 - b) Calculated %R for each analyte, and
 - c) The laboratory's LCS QC limits.
- R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
 - a) Samples associated with the MS/MSD clearly identified,
 - b) MS/MSD spiking amounts,
 - c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
 - d) Calculated %Rs and relative percent differences (RPDs), and
 - e) The laboratory's MS/MSD QC limits
- R8 Laboratory analytical duplicate (if applicable) recovery and precision:
 - a) The amount of analyte measured in the duplicate,
 - b) The calculated RPD, and
 - c) The laboratory's QC limits for analytical duplicates.
- R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix;
- R10 Other problems or anomalies.

The Exception Report for each "No" or "Not Reviewed (NR)" item in the Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory is not accredited under the Texas Laboratory Accreditation Program.

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the Exception Reports. By my signature below, I affirm to the best of my knowledge that all problems/anomalies observed by the laboratory have been identified in the Laboratory Review Checklist, and no information or data affecting the quality of the data has been knowingly withheld.

This laboratory was last inspected by TCEQ on February 25-28 2019. Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Name: John DuPont
Official Title: General Manager


Signature

06/12/20
Date

Name: Dr. Derhsing Luu
Official Title: Technical Director

CLIENT: Golder
Project: Luminant-OGSES FGD PONDS
Lab Order: 2005079

CASE NARRATIVE

Samples were analyzed using the methods outlined in the following references:

Method SW6020B - Metals Analysis
Method SW7470A - Mercury Analysis
Method E300 - Anions Analysis
Method M2540C - TDS Analysis

Exception Report R1-01

The samples were received and log-in performed on 5/12/20. A total of 7 samples were received. The samples arrived in good condition and were properly packaged.

Exception Report R7-03

For Anions analysis performed on 5/13/20 (batch 96331) the matrix spikes and matrix spike duplicates recoveries (2005007-01 MS/MSD & 2005077-02 MS/MSD) were out of control limits for Chloride and/or Sulfate. This was due to matrix effect. These are flagged accordingly in the QC summary report. The samples selected for the matrix spikes and matrix spike duplicates were not from this work order. The LCS was within control limits for these analytes. No further corrective actions were taken.

For Metals analysis performed on 5/20/20 the matrix spike and matrix spike duplicate recoveries were above control limits for Boron. These are flagged accordingly. The sample selected for the matrix spike and matrix spike duplicate was not from this work order. The LCS was within control limits for this analyte. No further corrective actions were taken.

Exception Report S9-01

For Metals analysis performed on 5/19/20 the PDS recovery was out of control limits for Calcium. This is flagged accordingly in the QC summary report. The serial dilution was within control limits for this analyte. No further corrective actions were taken.

CLIENT: Golder
Project: Luminant-OGSES FGD PONDS
Lab Order: 2005079

Work Order Sample Summary

Lab Smp ID	Client Sample ID	Tag Number	Date Collected	Date Recved
2005079-01	FGD-4		05/11/20 07:45 AM	5/12/2020
2005079-02	FGD-2		05/11/20 08:35 AM	5/12/2020
2005079-03	FGD-5		05/11/20 09:25 AM	5/12/2020
2005079-04	FGD-1		05/11/20 10:15 AM	5/12/2020
2005079-05	FGD-8		05/11/20 11:10 AM	5/12/2020
2005079-06	FGD-11		05/11/20 12:45 PM	5/12/2020
2005079-07	FGD-12		05/11/20 01:45 PM	5/12/2020

Lab Order: 2005079
 Client: Golder
 Project: Luminant-OGSES FGD PONDS

PREP DATES REPORT

Sample ID	Client Sample ID	Collection Date	Matrix	Test Number	Test Name	Prep Date	Batch ID
2005079-01A	FGD-4	05/11/20 07:45 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/15/20 08:56 AM	96359
	FGD-4	05/11/20 07:45 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/15/20 08:56 AM	96359
	FGD-4	05/11/20 07:45 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/15/20 08:56 AM	96359
	FGD-4	05/11/20 07:45 AM	Aqueous	SW7470A	Mercury Aq Prep	05/17/20 12:32 PM	96370
2005079-01B	FGD-4	05/11/20 07:45 AM	Aqueous	E300	Anion Preparation	05/13/20 10:21 AM	96331
	FGD-4	05/11/20 07:45 AM	Aqueous	E300	Anion Preparation	05/13/20 10:21 AM	96331
	FGD-4	05/11/20 07:45 AM	Aqueous	M2540C	TDS Preparation	05/13/20 10:43 AM	96333
2005079-02A	FGD-2	05/11/20 08:35 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/15/20 08:56 AM	96359
	FGD-2	05/11/20 08:35 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/15/20 08:56 AM	96359
	FGD-2	05/11/20 08:35 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/15/20 08:56 AM	96359
	FGD-2	05/11/20 08:35 AM	Aqueous	SW7470A	Mercury Aq Prep	05/17/20 12:32 PM	96370
2005079-02B	FGD-2	05/11/20 08:35 AM	Aqueous	E300	Anion Preparation	05/13/20 10:21 AM	96331
	FGD-2	05/11/20 08:35 AM	Aqueous	E300	Anion Preparation	05/13/20 10:21 AM	96331
	FGD-2	05/11/20 08:35 AM	Aqueous	E300	Anion Preparation	05/13/20 10:21 AM	96331
	FGD-2	05/11/20 08:35 AM	Aqueous	M2540C	TDS Preparation	05/13/20 10:43 AM	96333
2005079-03A	FGD-5	05/11/20 09:25 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/15/20 08:56 AM	96359
	FGD-5	05/11/20 09:25 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/15/20 08:56 AM	96359
	FGD-5	05/11/20 09:25 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/15/20 08:56 AM	96359
	FGD-5	05/11/20 09:25 AM	Aqueous	SW7470A	Mercury Aq Prep	05/17/20 12:32 PM	96370
2005079-03B	FGD-5	05/11/20 09:25 AM	Aqueous	E300	Anion Preparation	05/13/20 10:21 AM	96331
	FGD-5	05/11/20 09:25 AM	Aqueous	E300	Anion Preparation	05/13/20 10:21 AM	96331
	FGD-5	05/11/20 09:25 AM	Aqueous	M2540C	TDS Preparation	05/13/20 10:43 AM	96333
2005079-04A	FGD-1	05/11/20 10:15 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/15/20 08:56 AM	96359
	FGD-1	05/11/20 10:15 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/15/20 08:56 AM	96359
	FGD-1	05/11/20 10:15 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/15/20 08:56 AM	96359
	FGD-1	05/11/20 10:15 AM	Aqueous	SW7470A	Mercury Aq Prep	05/17/20 12:32 PM	96370
2005079-04B	FGD-1	05/11/20 10:15 AM	Aqueous	E300	Anion Preparation	05/13/20 10:21 AM	96331
	FGD-1	05/11/20 10:15 AM	Aqueous	E300	Anion Preparation	05/13/20 10:21 AM	96331

Lab Order: 2005079
Client: Golder
Project: Luminant-OGSES FGD PONDS

PREP DATES REPORT

Sample ID	Client Sample ID	Collection Date	Matrix	Test Number	Test Name	Prep Date	Batch ID
2005079-04B	FGD-1	05/11/20 10:15 AM	Aqueous	M2540C	TDS Preparation	05/13/20 10:43 AM	96333
2005079-05A	FGD-8	05/11/20 11:10 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/15/20 08:56 AM	96359
	FGD-8	05/11/20 11:10 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/15/20 08:56 AM	96359
	FGD-8	05/11/20 11:10 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/15/20 08:56 AM	96359
	FGD-8	05/11/20 11:10 AM	Aqueous	SW7470A	Mercury Aq Prep	05/17/20 12:32 PM	96370
2005079-05B	FGD-8	05/11/20 11:10 AM	Aqueous	E300	Anion Preparation	05/13/20 10:21 AM	96331
	FGD-8	05/11/20 11:10 AM	Aqueous	E300	Anion Preparation	05/13/20 10:21 AM	96331
	FGD-8	05/11/20 11:10 AM	Aqueous	E300	Anion Preparation	05/13/20 10:21 AM	96331
	FGD-8	05/11/20 11:10 AM	Aqueous	M2540C	TDS Preparation	05/13/20 10:43 AM	96333
2005079-06A	FGD-11	05/11/20 12:45 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/15/20 08:56 AM	96359
	FGD-11	05/11/20 12:45 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/15/20 08:56 AM	96359
	FGD-11	05/11/20 12:45 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/15/20 08:56 AM	96359
	FGD-11	05/11/20 12:45 PM	Aqueous	SW7470A	Mercury Aq Prep	05/17/20 12:32 PM	96370
2005079-06B	FGD-11	05/11/20 12:45 PM	Aqueous	E300	Anion Preparation	05/13/20 10:21 AM	96331
	FGD-11	05/11/20 12:45 PM	Aqueous	E300	Anion Preparation	05/13/20 10:21 AM	96331
	FGD-11	05/11/20 12:45 PM	Aqueous	E300	Anion Preparation	05/15/20 10:09 AM	96363
	FGD-11	05/11/20 12:45 PM	Aqueous	M2540C	TDS Preparation	05/13/20 10:43 AM	96333
2005079-07A	FGD-12	05/11/20 01:45 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/15/20 08:56 AM	96359
	FGD-12	05/11/20 01:45 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	05/15/20 08:56 AM	96359
	FGD-12	05/11/20 01:45 PM	Aqueous	SW7470A	Mercury Aq Prep	05/17/20 12:32 PM	96370
2005079-07B	FGD-12	05/11/20 01:45 PM	Aqueous	E300	Anion Preparation	05/13/20 10:21 AM	96331
	FGD-12	05/11/20 01:45 PM	Aqueous	E300	Anion Preparation	05/13/20 10:21 AM	96331
	FGD-12	05/11/20 01:45 PM	Aqueous	M2540C	TDS Preparation	05/13/20 10:43 AM	96333

Lab Order: 2005079
 Client: Golder
 Project: Luminant-OGSES FGD PONDS

ANALYTICAL DATES REPORT

Sample ID	Client Sample ID	Matrix	Test Number	Test Name	Batch ID	Dilution	Analysis Date	Run ID
2005079-01A	FGD-4	Aqueous	SW7470A	Mercury Total: Aqueous	96370	1	05/19/20 11:59 AM	CETAC2_HG_200519 B
	FGD-4	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	96359	1	05/19/20 12:55 PM	ICP-MS5_200519B
	FGD-4	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	96359	1	05/20/20 12:27 PM	ICP-MS5_200520B
	FGD-4	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	96359	10	05/20/20 01:28 PM	ICP-MS5_200520B
2005079-01B	FGD-4	Aqueous	E300	Anions by IC method - Water	96331	10	05/13/20 08:08 PM	IC2_200513A
	FGD-4	Aqueous	E300	Anions by IC method - Water	96331	1	05/13/20 11:20 PM	IC2_200513A
	FGD-4	Aqueous	M2540C	Total Dissolved Solids	96333	1	05/13/20 05:00 PM	WC_200513A
2005079-02A	FGD-2	Aqueous	SW7470A	Mercury Total: Aqueous	96370	1	05/19/20 12:10 PM	CETAC2_HG_200519 B
	FGD-2	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	96359	1	05/19/20 12:57 PM	ICP-MS5_200519B
	FGD-2	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	96359	1	05/20/20 12:30 PM	ICP-MS5_200520B
	FGD-2	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	96359	20	05/20/20 01:30 PM	ICP-MS5_200520B
2005079-02B	FGD-2	Aqueous	E300	Anions by IC method - Water	96331	100	05/13/20 06:48 PM	IC2_200513A
	FGD-2	Aqueous	E300	Anions by IC method - Water	96331	10	05/13/20 08:24 PM	IC2_200513A
	FGD-2	Aqueous	E300	Anions by IC method - Water	96331	1	05/13/20 11:36 PM	IC2_200513A
	FGD-2	Aqueous	M2540C	Total Dissolved Solids	96333	1	05/13/20 05:00 PM	WC_200513A
2005079-03A	FGD-5	Aqueous	SW7470A	Mercury Total: Aqueous	96370	1	05/19/20 12:12 PM	CETAC2_HG_200519 B
	FGD-5	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	96359	1	05/19/20 01:00 PM	ICP-MS5_200519B
	FGD-5	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	96359	1	05/20/20 12:32 PM	ICP-MS5_200520B
	FGD-5	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	96359	10	05/20/20 01:33 PM	ICP-MS5_200520B
2005079-03B	FGD-5	Aqueous	E300	Anions by IC method - Water	96331	10	05/13/20 08:40 PM	IC2_200513A
	FGD-5	Aqueous	E300	Anions by IC method - Water	96331	1	05/13/20 11:52 PM	IC2_200513A
	FGD-5	Aqueous	M2540C	Total Dissolved Solids	96333	1	05/13/20 05:00 PM	WC_200513A
2005079-04A	FGD-1	Aqueous	SW7470A	Mercury Total: Aqueous	96370	1	05/19/20 12:15 PM	CETAC2_HG_200519 B
	FGD-1	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	96359	10	05/20/20 01:35 PM	ICP-MS5_200520B
	FGD-1	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	96359	1	05/19/20 01:02 PM	ICP-MS5_200519B
	FGD-1	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	96359	1	05/20/20 12:34 PM	ICP-MS5_200520B

Lab Order: 2005079
 Client: Golder
 Project: Luminant-OGSES FGD PONDS

ANALYTICAL DATES REPORT

Sample ID	Client Sample ID	Matrix	Test Number	Test Name	Batch ID	Dilution	Analysis Date	Run ID
2005079-04B	FGD-1	Aqueous	E300	Anions by IC method - Water	96331	1	05/14/20 12:08 AM	IC2_200513A
	FGD-1	Aqueous	E300	Anions by IC method - Water	96331	10	05/13/20 08:56 PM	IC2_200513A
	FGD-1	Aqueous	M2540C	Total Dissolved Solids	96333	1	05/13/20 05:00 PM	WC_200513A
2005079-05A	FGD-8	Aqueous	SW7470A	Mercury Total: Aqueous	96370	1	05/19/20 12:17 PM	CETAC2_HG_200519 B
	FGD-8	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	96359	1	05/19/20 01:04 PM	ICP-MS5_200519B
	FGD-8	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	96359	1	05/20/20 12:36 PM	ICP-MS5_200520B
	FGD-8	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	96359	50	05/20/20 01:37 PM	ICP-MS5_200520B
2005079-05B	FGD-8	Aqueous	E300	Anions by IC method - Water	96331	100	05/13/20 07:04 PM	IC2_200513A
	FGD-8	Aqueous	E300	Anions by IC method - Water	96331	10	05/13/20 09:12 PM	IC2_200513A
	FGD-8	Aqueous	E300	Anions by IC method - Water	96331	1	05/14/20 12:24 AM	IC2_200513A
	FGD-8	Aqueous	M2540C	Total Dissolved Solids	96333	1	05/13/20 05:00 PM	WC_200513A
2005079-06A	FGD-11	Aqueous	SW7470A	Mercury Total: Aqueous	96370	1	05/19/20 12:19 PM	CETAC2_HG_200519 B
	FGD-11	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	96359	10	05/20/20 01:39 PM	ICP-MS5_200520B
	FGD-11	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	96359	1	05/19/20 01:06 PM	ICP-MS5_200519B
	FGD-11	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	96359	1	05/20/20 12:38 PM	ICP-MS5_200520B
2005079-06B	FGD-11	Aqueous	E300	Anions by IC method - Water	96331	10	05/13/20 10:48 PM	IC2_200513A
	FGD-11	Aqueous	E300	Anions by IC method - Water	96331	1	05/14/20 12:40 AM	IC2_200513A
	FGD-11	Aqueous	E300	Anions by IC method - Water	96363	100	05/15/20 03:28 PM	IC2_200515A
	FGD-11	Aqueous	M2540C	Total Dissolved Solids	96333	1	05/13/20 05:00 PM	WC_200513A
2005079-07A	FGD-12	Aqueous	SW7470A	Mercury Total: Aqueous	96370	1	05/19/20 12:21 PM	CETAC2_HG_200519 B
	FGD-12	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	96359	1	05/19/20 01:09 PM	ICP-MS5_200519B
	FGD-12	Aqueous	SW6020B	Trace Metals: ICP-MS - Water	96359	1	05/20/20 12:41 PM	ICP-MS5_200520B
2005079-07B	FGD-12	Aqueous	E300	Anions by IC method - Water	96331	10	05/13/20 11:04 PM	IC2_200513A
	FGD-12	Aqueous	E300	Anions by IC method - Water	96331	1	05/14/20 12:56 AM	IC2_200513A
	FGD-12	Aqueous	M2540C	Total Dissolved Solids	96333	1	05/13/20 05:00 PM	WC_200513A

DHL Analytical, Inc.

Date: 12-Jun-20

CLIENT: Golder
Project: Luminant-OGSES FGD PONDS
Project No: 19122262-F2020
Lab Order: 2005079

Client Sample ID: FGD-4
Lab ID: 2005079-01
Collection Date: 05/11/20 07:45 AM
Matrix: AQUEOUS

Analyses	Result	SDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		SW6020B		Analyst: RO			
Antimony	<0.000800	0.000800	0.00250		mg/L	1	05/19/20 12:55 PM
Arsenic	<0.00200	0.00200	0.00500		mg/L	1	05/19/20 12:55 PM
Barium	0.104	0.00300	0.0100		mg/L	1	05/19/20 12:55 PM
Beryllium	<0.000300	0.000300	0.00100		mg/L	1	05/19/20 12:55 PM
Boron	0.145	0.0100	0.0300		mg/L	1	05/20/20 12:27 PM
Cadmium	<0.000300	0.000300	0.00100		mg/L	1	05/19/20 12:55 PM
Calcium	40.6	1.00	3.00		mg/L	10	05/20/20 01:28 PM
Chromium	<0.00200	0.00200	0.00500		mg/L	1	05/19/20 12:55 PM
Cobalt	<0.00300	0.00300	0.00500		mg/L	1	05/19/20 12:55 PM
Lead	<0.000300	0.000300	0.00100		mg/L	1	05/19/20 12:55 PM
Lithium	0.0166	0.00500	0.0100		mg/L	1	05/19/20 12:55 PM
Molybdenum	<0.00200	0.00200	0.00500		mg/L	1	05/19/20 12:55 PM
Selenium	<0.00200	0.00200	0.00500		mg/L	1	05/19/20 12:55 PM
Thallium	<0.000500	0.000500	0.00150		mg/L	1	05/19/20 12:55 PM
MERCURY TOTAL: AQUEOUS		SW7470A		Analyst: BM			
Mercury	<0.0000800	0.0000800	0.000200		mg/L	1	05/19/20 11:59 AM
ANIONS BY IC METHOD - WATER		E300		Analyst: SNM			
Chloride	198	3.00	10.0		mg/L	10	05/13/20 08:08 PM
Fluoride	0.300	0.100	0.400	J	mg/L	1	05/13/20 11:20 PM
Sulfate	52.9	1.00	3.00		mg/L	1	05/13/20 11:20 PM
TOTAL DISSOLVED SOLIDS		M2540C		Analyst: JS			
Total Dissolved Solids (Residue, Filterable)	702	10.0	10.0		mg/L	1	05/13/20 05:00 PM

Qualifiers: ND - Not Detected at the SDL
 J - Analyte detected between SDL and RL
 B - Analyte detected in the associated Method Blank
 DF- Dilution Factor
 N - Parameter not NELAP certified
 See Final Page of Report for MQLs and MDLs

S - Spike Recovery outside control limits
 C - Sample Result or QC discussed in Case Narrative
 RL - Reporting Limit (MQL adjusted for moisture and sample size)
 SDL - Sample Detection Limit
 E - TPH pattern not Gas or Diesel Range Pattern

DHL Analytical, Inc.

Date: 12-Jun-20

CLIENT: Golder
Project: Luminant-OGSES FGD PONDS
Project No: 19122262-F2020
Lab Order: 2005079

Client Sample ID: FGD-2
Lab ID: 2005079-02
Collection Date: 05/11/20 08:35 AM
Matrix: AQUEOUS

Analyses	Result	SDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		SW6020B			Analyst: RO		
Antimony	<0.000800	0.000800	0.00250		mg/L	1	05/19/20 12:57 PM
Arsenic	<0.00200	0.00200	0.00500		mg/L	1	05/19/20 12:57 PM
Barium	0.108	0.00300	0.0100		mg/L	1	05/19/20 12:57 PM
Beryllium	<0.000300	0.000300	0.00100		mg/L	1	05/19/20 12:57 PM
Boron	0.605	0.0100	0.0300		mg/L	1	05/20/20 12:30 PM
Cadmium	<0.000300	0.000300	0.00100		mg/L	1	05/19/20 12:57 PM
Calcium	217	2.00	6.00		mg/L	20	05/20/20 01:30 PM
Chromium	0.00234	0.00200	0.00500	J	mg/L	1	05/19/20 12:57 PM
Cobalt	<0.00300	0.00300	0.00500		mg/L	1	05/19/20 12:57 PM
Lead	<0.000300	0.000300	0.00100		mg/L	1	05/19/20 12:57 PM
Lithium	0.0280	0.00500	0.0100		mg/L	1	05/19/20 12:57 PM
Molybdenum	<0.00200	0.00200	0.00500		mg/L	1	05/19/20 12:57 PM
Selenium	0.0208	0.00200	0.00500		mg/L	1	05/19/20 12:57 PM
Thallium	<0.000500	0.000500	0.00150		mg/L	1	05/19/20 12:57 PM
MERCURY TOTAL: AQUEOUS		SW7470A			Analyst: BM		
Mercury	<0.0000800	0.0000800	0.000200		mg/L	1	05/19/20 12:10 PM
ANIONS BY IC METHOD - WATER		E300			Analyst: SNM		
Chloride	1150	30.0	100		mg/L	100	05/13/20 06:48 PM
Fluoride	<0.100	0.100	0.400		mg/L	1	05/13/20 11:36 PM
Sulfate	286	10.0	30.0		mg/L	10	05/13/20 08:24 PM
TOTAL DISSOLVED SOLIDS		M2540C			Analyst: JS		
Total Dissolved Solids (Residue, Filterable)	2300	50.0	50.0		mg/L	1	05/13/20 05:00 PM

Qualifiers: ND - Not Detected at the SDL
 J - Analyte detected between SDL and RL
 B - Analyte detected in the associated Method Blank
 DF- Dilution Factor
 N - Parameter not NELAP certified
 See Final Page of Report for MQLs and MDLs

S - Spike Recovery outside control limits
 C - Sample Result or QC discussed in Case Narrative
 RL - Reporting Limit (MQL adjusted for moisture and sample size)
 SDL - Sample Detection Limit
 E - TPH pattern not Gas or Diesel Range Pattern

DHL Analytical, Inc.

Date: 12-Jun-20

CLIENT: Golder
Project: Luminant-OGSES FGD PONDS
Project No: 19122262-F2020
Lab Order: 2005079

Client Sample ID: FGD-5
Lab ID: 2005079-03
Collection Date: 05/11/20 09:25 AM
Matrix: AQUEOUS

Analyses	Result	SDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		SW6020B			Analyst: RO		
Antimony	<0.000800	0.000800	0.00250		mg/L	1	05/19/20 01:00 PM
Arsenic	<0.00200	0.00200	0.00500		mg/L	1	05/19/20 01:00 PM
Barium	0.0959	0.00300	0.0100		mg/L	1	05/19/20 01:00 PM
Beryllium	<0.000300	0.000300	0.00100		mg/L	1	05/19/20 01:00 PM
Boron	0.165	0.0100	0.0300		mg/L	1	05/20/20 12:32 PM
Cadmium	<0.000300	0.000300	0.00100		mg/L	1	05/19/20 01:00 PM
Calcium	100	1.00	3.00		mg/L	10	05/20/20 01:33 PM
Chromium	0.0374	0.00200	0.00500		mg/L	1	05/19/20 01:00 PM
Cobalt	<0.00300	0.00300	0.00500		mg/L	1	05/19/20 01:00 PM
Lead	<0.000300	0.000300	0.00100		mg/L	1	05/19/20 01:00 PM
Lithium	0.156	0.00500	0.0100		mg/L	1	05/19/20 01:00 PM
Molybdenum	0.00561	0.00200	0.00500		mg/L	1	05/19/20 01:00 PM
Selenium	<0.00200	0.00200	0.00500		mg/L	1	05/19/20 01:00 PM
Thallium	<0.000500	0.000500	0.00150		mg/L	1	05/19/20 01:00 PM
MERCURY TOTAL: AQUEOUS		SW7470A			Analyst: BM		
Mercury	<0.0000800	0.0000800	0.000200		mg/L	1	05/19/20 12:12 PM
ANIONS BY IC METHOD - WATER		E300			Analyst: SNM		
Chloride	307	3.00	10.0		mg/L	10	05/13/20 08:40 PM
Fluoride	0.413	0.100	0.400		mg/L	1	05/13/20 11:52 PM
Sulfate	83.8	1.00	3.00		mg/L	1	05/13/20 11:52 PM
TOTAL DISSOLVED SOLIDS		M2540C			Analyst: JS		
Total Dissolved Solids (Residue, Filterable)	836	10.0	10.0		mg/L	1	05/13/20 05:00 PM

Qualifiers: ND - Not Detected at the SDL
 J - Analyte detected between SDL and RL
 B - Analyte detected in the associated Method Blank
 DF- Dilution Factor
 N - Parameter not NELAP certified
 See Final Page of Report for MQLs and MDLs

S - Spike Recovery outside control limits
 C - Sample Result or QC discussed in Case Narrative
 RL - Reporting Limit (MQL adjusted for moisture and sample size)
 SDL - Sample Detection Limit
 E - TPH pattern not Gas or Diesel Range Pattern

DHL Analytical, Inc.

Date: 12-Jun-20

CLIENT: Golder
Project: Luminant-OGSES FGD PONDS
Project No: 19122262-F2020
Lab Order: 2005079

Client Sample ID: FGD-1
Lab ID: 2005079-04
Collection Date: 05/11/20 10:15 AM
Matrix: AQUEOUS

Analyses	Result	SDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		SW6020B			Analyst: RO		
Antimony	<0.000800	0.000800	0.00250		mg/L	1	05/19/20 01:02 PM
Arsenic	<0.00200	0.00200	0.00500		mg/L	1	05/19/20 01:02 PM
Barium	0.131	0.00300	0.0100		mg/L	1	05/19/20 01:02 PM
Beryllium	<0.000300	0.000300	0.00100		mg/L	1	05/19/20 01:02 PM
Boron	0.121	0.0100	0.0300		mg/L	1	05/20/20 12:34 PM
Cadmium	<0.000300	0.000300	0.00100		mg/L	1	05/19/20 01:02 PM
Calcium	37.8	1.00	3.00		mg/L	10	05/20/20 01:35 PM
Chromium	<0.00200	0.00200	0.00500		mg/L	1	05/19/20 01:02 PM
Cobalt	0.0495	0.00300	0.00500		mg/L	1	05/19/20 01:02 PM
Lead	<0.000300	0.000300	0.00100		mg/L	1	05/19/20 01:02 PM
Lithium	0.0548	0.00500	0.0100		mg/L	1	05/19/20 01:02 PM
Molybdenum	<0.00200	0.00200	0.00500		mg/L	1	05/19/20 01:02 PM
Selenium	<0.00200	0.00200	0.00500		mg/L	1	05/19/20 01:02 PM
Thallium	<0.000500	0.000500	0.00150		mg/L	1	05/19/20 01:02 PM
MERCURY TOTAL: AQUEOUS		SW7470A			Analyst: BM		
Mercury	<0.0000800	0.0000800	0.000200		mg/L	1	05/19/20 12:15 PM
ANIONS BY IC METHOD - WATER		E300			Analyst: SNM		
Chloride	146	3.00	10.0		mg/L	10	05/13/20 08:56 PM
Fluoride	0.231	0.100	0.400	J	mg/L	1	05/14/20 12:08 AM
Sulfate	79.5	1.00	3.00		mg/L	1	05/14/20 12:08 AM
TOTAL DISSOLVED SOLIDS		M2540C			Analyst: JS		
Total Dissolved Solids (Residue, Filterable)	448	10.0	10.0		mg/L	1	05/13/20 05:00 PM

Qualifiers: ND - Not Detected at the SDL
 J - Analyte detected between SDL and RL
 B - Analyte detected in the associated Method Blank
 DF- Dilution Factor
 N - Parameter not NELAP certified
 See Final Page of Report for MQLs and MDLs

S - Spike Recovery outside control limits
 C - Sample Result or QC discussed in Case Narrative
 RL - Reporting Limit (MQL adjusted for moisture and sample size)
 SDL - Sample Detection Limit
 E - TPH pattern not Gas or Diesel Range Pattern

DHL Analytical, Inc.

Date: 12-Jun-20

CLIENT: Golder
Project: Luminant-OGSES FGD PONDS
Project No: 19122262-F2020
Lab Order: 2005079

Client Sample ID: FGD-8
Lab ID: 2005079-05
Collection Date: 05/11/20 11:10 AM
Matrix: AQUEOUS

Analyses	Result	SDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		SW6020B			Analyst: RO		
Antimony	<0.000800	0.000800	0.00250		mg/L	1	05/19/20 01:04 PM
Arsenic	0.00663	0.00200	0.00500		mg/L	1	05/19/20 01:04 PM
Barium	0.732	0.00300	0.0100		mg/L	1	05/19/20 01:04 PM
Beryllium	<0.000300	0.000300	0.00100		mg/L	1	05/19/20 01:04 PM
Boron	0.129	0.0100	0.0300		mg/L	1	05/20/20 12:36 PM
Cadmium	<0.000300	0.000300	0.00100		mg/L	1	05/19/20 01:04 PM
Calcium	381	5.00	15.0		mg/L	50	05/20/20 01:37 PM
Chromium	<0.00200	0.00200	0.00500		mg/L	1	05/19/20 01:04 PM
Cobalt	0.00840	0.00300	0.00500		mg/L	1	05/19/20 01:04 PM
Lead	0.000415	0.000300	0.00100	J	mg/L	1	05/19/20 01:04 PM
Lithium	0.0152	0.00500	0.0100		mg/L	1	05/19/20 01:04 PM
Molybdenum	<0.00200	0.00200	0.00500		mg/L	1	05/19/20 01:04 PM
Selenium	0.00210	0.00200	0.00500	J	mg/L	1	05/19/20 01:04 PM
Thallium	<0.000500	0.000500	0.00150		mg/L	1	05/19/20 01:04 PM
MERCURY TOTAL: AQUEOUS		SW7470A			Analyst: BM		
Mercury	<0.0000800	0.0000800	0.000200		mg/L	1	05/19/20 12:17 PM
ANIONS BY IC METHOD - WATER		E300			Analyst: SNM		
Chloride	2240	30.0	100		mg/L	100	05/13/20 07:04 PM
Fluoride	<0.100	0.100	0.400		mg/L	1	05/14/20 12:24 AM
Sulfate	188	10.0	30.0		mg/L	10	05/13/20 09:12 PM
TOTAL DISSOLVED SOLIDS		M2540C			Analyst: JS		
Total Dissolved Solids (Residue, Filterable)	4090	50.0	50.0		mg/L	1	05/13/20 05:00 PM

Qualifiers: ND - Not Detected at the SDL
 J - Analyte detected between SDL and RL
 B - Analyte detected in the associated Method Blank
 DF- Dilution Factor
 N - Parameter not NELAP certified
 See Final Page of Report for MQLs and MDLs

S - Spike Recovery outside control limits
 C - Sample Result or QC discussed in Case Narrative
 RL - Reporting Limit (MQL adjusted for moisture and sample size)
 SDL - Sample Detection Limit
 E - TPH pattern not Gas or Diesel Range Pattern

DHL Analytical, Inc.

Date: 12-Jun-20

CLIENT: Golder
Project: Luminant-OGSES FGD PONDS
Project No: 19122262-F2020
Lab Order: 2005079

Client Sample ID: FGD-11
Lab ID: 2005079-06
Collection Date: 05/11/20 12:45 PM
Matrix: AQUEOUS

Analyses	Result	SDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		SW6020B			Analyst: RO		
Antimony	<0.000800	0.000800	0.00250		mg/L	1	05/19/20 01:06 PM
Arsenic	<0.00200	0.00200	0.00500		mg/L	1	05/19/20 01:06 PM
Barium	0.347	0.00300	0.0100		mg/L	1	05/19/20 01:06 PM
Beryllium	<0.000300	0.000300	0.00100		mg/L	1	05/19/20 01:06 PM
Boron	0.166	0.0100	0.0300		mg/L	1	05/20/20 12:38 PM
Cadmium	<0.000300	0.000300	0.00100		mg/L	1	05/19/20 01:06 PM
Calcium	103	1.00	3.00		mg/L	10	05/20/20 01:39 PM
Chromium	0.0146	0.00200	0.00500		mg/L	1	05/19/20 01:06 PM
Cobalt	<0.00300	0.00300	0.00500		mg/L	1	05/19/20 01:06 PM
Lead	0.000658	0.000300	0.00100	J	mg/L	1	05/19/20 01:06 PM
Lithium	0.0132	0.00500	0.0100		mg/L	1	05/19/20 01:06 PM
Molybdenum	<0.00200	0.00200	0.00500		mg/L	1	05/19/20 01:06 PM
Selenium	<0.00200	0.00200	0.00500		mg/L	1	05/19/20 01:06 PM
Thallium	<0.000500	0.000500	0.00150		mg/L	1	05/19/20 01:06 PM
MERCURY TOTAL: AQUEOUS		SW7470A			Analyst: BM		
Mercury	<0.0000800	0.0000800	0.000200		mg/L	1	05/19/20 12:19 PM
ANIONS BY IC METHOD - WATER		E300			Analyst: SNM		
Chloride	560	30.0	100		mg/L	100	05/15/20 03:28 PM
Fluoride	0.365	0.100	0.400	J	mg/L	1	05/14/20 12:40 AM
Sulfate	43.3	1.00	3.00		mg/L	1	05/14/20 12:40 AM
TOTAL DISSOLVED SOLIDS		M2540C			Analyst: JS		
Total Dissolved Solids (Residue, Filterable)	1300	50.0	50.0		mg/L	1	05/13/20 05:00 PM

Qualifiers: ND - Not Detected at the SDL
 J - Analyte detected between SDL and RL
 B - Analyte detected in the associated Method Blank
 DF- Dilution Factor
 N - Parameter not NELAP certified
 See Final Page of Report for MQLs and MDLs

S - Spike Recovery outside control limits
 C - Sample Result or QC discussed in Case Narrative
 RL - Reporting Limit (MQL adjusted for moisture and sample size)
 SDL - Sample Detection Limit
 E - TPH pattern not Gas or Diesel Range Pattern

DHL Analytical, Inc.

Date: 12-Jun-20

CLIENT: Golder
Project: Luminant-OGSES FGD PONDS
Project No: 19122262-F2020
Lab Order: 2005079

Client Sample ID: FGD-12
Lab ID: 2005079-07
Collection Date: 05/11/20 01:45 PM
Matrix: AQUEOUS

Analyses	Result	SDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		SW6020B		Analyst: RO			
Antimony	<0.000800	0.000800	0.00250		mg/L	1	05/19/20 01:09 PM
Arsenic	0.0116	0.00200	0.00500		mg/L	1	05/19/20 01:09 PM
Barium	0.230	0.00300	0.0100		mg/L	1	05/19/20 01:09 PM
Beryllium	0.00166	0.000300	0.00100		mg/L	1	05/19/20 01:09 PM
Boron	0.149	0.0100	0.0300		mg/L	1	05/20/20 12:41 PM
Cadmium	<0.000300	0.000300	0.00100		mg/L	1	05/19/20 01:09 PM
Calcium	15.6	0.100	0.300		mg/L	1	05/20/20 12:41 PM
Chromium	0.0370	0.00200	0.00500		mg/L	1	05/19/20 01:09 PM
Cobalt	0.00883	0.00300	0.00500		mg/L	1	05/19/20 01:09 PM
Lead	0.0249	0.000300	0.00100		mg/L	1	05/19/20 01:09 PM
Lithium	0.0371	0.00500	0.0100		mg/L	1	05/19/20 01:09 PM
Molybdenum	<0.00200	0.00200	0.00500		mg/L	1	05/19/20 01:09 PM
Selenium	0.00678	0.00200	0.00500		mg/L	1	05/19/20 01:09 PM
Thallium	0.000651	0.000500	0.00150	J	mg/L	1	05/19/20 01:09 PM
MERCURY TOTAL: AQUEOUS		SW7470A		Analyst: BM			
Mercury	<0.0000800	0.0000800	0.000200		mg/L	1	05/19/20 12:21 PM
ANIONS BY IC METHOD - WATER		E300		Analyst: SNM			
Chloride	19.3	0.300	1.00		mg/L	1	05/14/20 12:56 AM
Fluoride	<0.100	0.100	0.400		mg/L	1	05/14/20 12:56 AM
Sulfate	19.9	1.00	3.00		mg/L	1	05/14/20 12:56 AM
TOTAL DISSOLVED SOLIDS		M2540C		Analyst: JS			
Total Dissolved Solids (Residue, Filterable)	198	10.0	10.0		mg/L	1	05/13/20 05:00 PM

Qualifiers: ND - Not Detected at the SDL
 J - Analyte detected between SDL and RL
 B - Analyte detected in the associated Method Blank
 DF- Dilution Factor
 N - Parameter not NELAP certified
 See Final Page of Report for MQLs and MDLs

S - Spike Recovery outside control limits
 C - Sample Result or QC discussed in Case Narrative
 RL - Reporting Limit (MQL adjusted for moisture and sample size)
 SDL - Sample Detection Limit
 E - TPH pattern not Gas or Diesel Range Pattern

CLIENT: Golder
Work Order: 2005079
Project: Luminant-OGSES FGD PONDS

ANALYTICAL QC SUMMARY REPORT

RunID: CETAC2_HG_200304C

Sample ID: DCS-95289	Batch ID: 95289	TestNo: SW7470A	Units: mg/L							
SampType: DCS	Run ID: CETAC2_HG_200304C	Analysis Date: 3/4/2020 12:11:09 PM	Prep Date: 3/4/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.000175	0.000200	0.000200	0	87.5	82	119	0	0	

Qualifiers:
 B Analyte detected in the associated Method Blank
 J Analyte detected between MDL and RL
 ND Not Detected at the Method Detection Limit
 RL Reporting Limit
 J Analyte detected between SDL and RL

DF Dilution Factor
 MDL Method Detection Limit
 R RPD outside accepted control limits
 S Spike Recovery outside control limits
 N Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005079
Project: Luminant-OGSES FGD PONDS

ANALYTICAL QC SUMMARY REPORT

RunID: CETAC2_HG_200519B

The QC data in batch 96370 applies to the following samples: 2005079-01A, 2005079-02A, 2005079-03A, 2005079-04A, 2005079-05A, 2005079-06A, 2005079-07A

Sample ID: MB-96370	Batch ID: 96370	TestNo: SW7470A	Units: mg/L							
SampType: MBLK	Run ID: CETAC2_HG_200519B	Analysis Date: 5/19/2020 11:47:54 AM	Prep Date: 5/17/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	<0.0000800	0.000200								

Sample ID: LCS-96370	Batch ID: 96370	TestNo: SW7470A	Units: mg/L							
SampType: LCS	Run ID: CETAC2_HG_200519B	Analysis Date: 5/19/2020 11:50:10 AM	Prep Date: 5/17/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.00205	0.000200	0.00200	0	103	85	115			

Sample ID: LCS-96370	Batch ID: 96370	TestNo: SW7470A	Units: mg/L							
SampType: LCS	Run ID: CETAC2_HG_200519B	Analysis Date: 5/19/2020 11:52:26 AM	Prep Date: 5/17/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.00194	0.000200	0.00200	0	97.0	85	115	5.51	15	

Sample ID: 2005079-01A MS	Batch ID: 96370	TestNo: SW7470A	Units: mg/L							
SampType: MS	Run ID: CETAC2_HG_200519B	Analysis Date: 5/19/2020 12:01:30 PM	Prep Date: 5/17/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.00191	0.000200	0.00200	0	95.5	80	120			

Sample ID: 2005079-01A MSD	Batch ID: 96370	TestNo: SW7470A	Units: mg/L							
SampType: MSD	Run ID: CETAC2_HG_200519B	Analysis Date: 5/19/2020 12:03:46 PM	Prep Date: 5/17/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.00209	0.000200	0.00200	0	104	80	120	9.00	15	

Sample ID: 2005079-01A SD	Batch ID: 96370	TestNo: SW7470A	Units: mg/L							
SampType: SD	Run ID: CETAC2_HG_200519B	Analysis Date: 5/19/2020 12:06:02 PM	Prep Date: 5/17/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	<0.000400	0.00100	0	0				0	10	

Sample ID: 2005079-01A PDS	Batch ID: 96370	TestNo: SW7470A	Units: mg/L							
SampType: PDS	Run ID: CETAC2_HG_200519B	Analysis Date: 5/19/2020 12:08:18 PM	Prep Date: 5/17/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.00226	0.000200	0.00250	0	90.4	85	115			

Qualifiers: B Analyte detected in the associated Method Blank DF Dilution Factor
J Analyte detected between MDL and RL MDL Method Detection Limit
ND Not Detected at the Method Detection Limit R RPD outside accepted control limits
RL Reporting Limit S Spike Recovery outside control limits
J Analyte detected between SDL and RL N Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005079
Project: Luminant-OGSES FGD PONDS

ANALYTICAL QC SUMMARY REPORT

RunID: CETAC2_HG_200519B

Sample ID: ICV-200519	Batch ID: R110550	TestNo: SW7470A	Units: mg/L							
SampType: ICV	Run ID: CETAC2_HG_200519B	Analysis Date: 5/19/2020 10:31:55 AM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Mercury	0.00391	0.000200	0.00400	0	97.8	90	110			
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Sample ID: CCV2-200519	Batch ID: R110550	TestNo: SW7470A	Units: mg/L							
SampType: CCV	Run ID: CETAC2_HG_200519B	Analysis Date: 5/19/2020 11:42:21 AM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Mercury	0.00213	0.000200	0.00200	0	106	90	110			
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Sample ID: CCV3-200519	Batch ID: R110550	TestNo: SW7470A	Units: mg/L							
SampType: CCV	Run ID: CETAC2_HG_200519B	Analysis Date: 5/19/2020 12:26:27 PM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Mercury	0.00214	0.000200	0.00200	0	107	90	110			
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<p>Qualifiers:</p> <p>B Analyte detected in the associated Method Blank</p> <p>J Analyte detected between MDL and RL</p> <p>ND Not Detected at the Method Detection Limit</p> <p>RL Reporting Limit</p> <p>J Analyte detected between SDL and RL</p>	<p>DF Dilution Factor</p> <p>MDL Method Detection Limit</p> <p>R RPD outside accepted control limits</p> <p>S Spike Recovery outside control limits</p> <p>N Parameter not NELAP certified</p>
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CLIENT: Golder
 Work Order: 2005079
 Project: Luminant-OGSES FGD PONDS

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS5_200408C

Sample ID: DCS1-95814	Batch ID: 95814	TestNo: SW6020B	Units: mg/L
SampType: DCS	Run ID: ICP-MS5_200408C	Analysis Date: 4/8/2020 11:16:00 AM	Prep Date: 4/7/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.000932	0.00250	0.00100	0	93.2	70	130	0	0	
Beryllium	0.000472	0.00100	0.000500	0	94.4	70	130	0	0	
Cadmium	0.000492	0.00100	0.000500	0	98.4	70	130	0	0	
Lead	0.000496	0.00100	0.000500	0	99.2	70	130	0	0	
Thallium	0.000468	0.00150	0.000500	0	93.6	70	130	0	0	

Sample ID: DCS2-95814	Batch ID: 95814	TestNo: SW6020B	Units: mg/L
SampType: DCS2	Run ID: ICP-MS5_200408C	Analysis Date: 4/8/2020 11:19:00 AM	Prep Date: 4/7/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	0.310	0.300	0.300	0	103	70	130	0	0	

Sample ID: DCS3-95814	Batch ID: 95814	TestNo: SW6020B	Units: mg/L
SampType: DCS3	Run ID: ICP-MS5_200408C	Analysis Date: 4/8/2020 11:21:00 AM	Prep Date: 4/7/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.00466	0.00500	0.00500	0	93.2	70	130	0	0	
Barium	0.00478	0.0100	0.00500	0	95.6	70	130	0	0	
Chromium	0.00600	0.00500	0.00500	0	120	70	130	0	0	
Cobalt	0.00473	0.00500	0.00500	0	94.6	70	130	0	0	
Lithium	0.00473	0.0100	0.00500	0	94.6	70	130	0	0	
Molybdenum	0.00466	0.00500	0.00500	0	93.2	70	130	0	0	
Selenium	0.00517	0.00500	0.00500	0	103	70	130	0	0	

Sample ID: DCS4-95814	Batch ID: 95814	TestNo: SW6020B	Units: mg/L
SampType: DCS4	Run ID: ICP-MS5_200408C	Analysis Date: 4/8/2020 11:28:00 AM	Prep Date: 4/7/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Boron	0.0286	0.0300	0.0300	0	95.2	70	130	0	0	

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005079
Project: Luminant-OGSES FGD PONDS

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS5_200519B

The QC data in batch 96359 applies to the following samples: 2005079-01A, 2005079-02A, 2005079-03A, 2005079-04A, 2005079-05A, 2005079-06A, 2005079-07A

Sample ID: MB-96359	Batch ID: 96359	TestNo: SW6020B	Units: mg/L
SampType: MBLK	Run ID: ICP-MS5_200519B	Analysis Date: 5/19/2020 12:37:00 PM	Prep Date: 5/15/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	<0.000800	0.00250								
Arsenic	<0.00200	0.00500								
Barium	<0.00300	0.0100								
Beryllium	<0.000300	0.00100								
Cadmium	<0.000300	0.00100								
Calcium	<0.100	0.300								
Chromium	<0.00200	0.00500								
Cobalt	<0.00300	0.00500								
Lead	<0.000300	0.00100								
Lithium	<0.00500	0.0100								
Molybdenum	<0.00200	0.00500								
Selenium	<0.00200	0.00500								
Thallium	<0.000500	0.00150								

Sample ID: LCS-96359	Batch ID: 96359	TestNo: SW6020B	Units: mg/L
SampType: LCS	Run ID: ICP-MS5_200519B	Analysis Date: 5/19/2020 12:40:00 PM	Prep Date: 5/15/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.204	0.00250	0.200	0	102	80	120			
Arsenic	0.208	0.00500	0.200	0	104	80	120			
Barium	0.202	0.0100	0.200	0	101	80	120			
Beryllium	0.201	0.00100	0.200	0	100	80	120			
Cadmium	0.206	0.00100	0.200	0	103	80	120			
Calcium	5.42	0.300	5.00	0	108	80	120			
Chromium	0.200	0.00500	0.200	0	100	80	120			
Cobalt	0.205	0.00500	0.200	0	102	80	120			
Lead	0.201	0.00100	0.200	0	100	80	120			
Lithium	0.204	0.0100	0.200	0	102	80	120			
Molybdenum	0.205	0.00500	0.200	0	102	80	120			
Selenium	0.213	0.00500	0.200	0	107	80	120			
Thallium	0.200	0.00150	0.200	0	99.9	80	120			

Sample ID: LCSD-96359	Batch ID: 96359	TestNo: SW6020B	Units: mg/L
SampType: LCSD	Run ID: ICP-MS5_200519B	Analysis Date: 5/19/2020 12:42:00 PM	Prep Date: 5/15/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.204	0.00250	0.200	0	102	80	120	0.135	15	
Arsenic	0.207	0.00500	0.200	0	103	80	120	0.366	15	
Barium	0.206	0.0100	0.200	0	103	80	120	1.84	15	

<p>Qualifiers:</p> <p>B Analyte detected in the associated Method Blank</p> <p>J Analyte detected between MDL and RL</p> <p>ND Not Detected at the Method Detection Limit</p> <p>RL Reporting Limit</p> <p>J Analyte detected between SDL and RL</p>	<p>DF Dilution Factor</p> <p>MDL Method Detection Limit</p> <p>R RPD outside accepted control limits</p> <p>S Spike Recovery outside control limits</p> <p>N Parameter not NELAP certified</p>
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CLIENT: Golder
 Work Order: 2005079
 Project: Luminant-OGSES FGD PONDS

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS5_200519B

Sample ID: LCSD-96359	Batch ID: 96359	TestNo: SW6020B	Units: mg/L
SampType: LCSD	Run ID: ICP-MS5_200519B	Analysis Date: 5/19/2020 12:42:00 PM	Prep Date: 5/15/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Beryllium	0.202	0.00100	0.200	0	101	80	120	0.541	15	
Cadmium	0.209	0.00100	0.200	0	104	80	120	1.41	15	
Calcium	5.32	0.300	5.00	0	106	80	120	2.00	15	
Chromium	0.201	0.00500	0.200	0	100	80	120	0.209	15	
Cobalt	0.206	0.00500	0.200	0	103	80	120	0.548	15	
Lead	0.199	0.00100	0.200	0	99.6	80	120	0.766	15	
Lithium	0.201	0.0100	0.200	0	100	80	120	1.71	15	
Molybdenum	0.205	0.00500	0.200	0	103	80	120	0.262	15	
Selenium	0.212	0.00500	0.200	0	106	80	120	0.751	15	
Thallium	0.198	0.00150	0.200	0	99.2	80	120	0.704	15	

Sample ID: 2005111-01B SD	Batch ID: 96359	TestNo: SW6020B	Units: mg/L
SampType: SD	Run ID: ICP-MS5_200519B	Analysis Date: 5/19/2020 12:53:00 PM	Prep Date: 5/15/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	<0.00400	0.0125	0	0				0	20	
Arsenic	<0.0100	0.0250	0	0.00893				0	20	
Barium	0.0171	0.0500	0	0.0170				0.492	20	
Beryllium	0.0169	0.00500	0	0.0164				3.12	20	
Cadmium	<0.00150	0.00500	0	0				0	20	
Calcium	260	1.50	0	257				0.815	20	
Chromium	<0.0100	0.0250	0	0.00205				0	20	
Cobalt	0.449	0.0250	0	0.439				2.12	20	
Lead	<0.00150	0.00500	0	0				0	20	
Lithium	0.248	0.0500	0	0.249				0.282	20	
Molybdenum	<0.0100	0.0250	0	0				0	20	
Selenium	0.0328	0.0250	0	0.0299				9.36	20	
Thallium	<0.00250	0.00750	0	0				0	20	

Sample ID: 2005111-01B PDS	Batch ID: 96359	TestNo: SW6020B	Units: mg/L
SampType: PDS	Run ID: ICP-MS5_200519B	Analysis Date: 5/19/2020 1:20:00 PM	Prep Date: 5/15/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.204	0.00250	0.200	0	102	75	125			
Arsenic	0.200	0.00500	0.200	0.00893	95.3	75	125			
Barium	0.225	0.0100	0.200	0.0170	104	75	125			
Beryllium	0.203	0.00100	0.200	0.0164	93.4	75	125			
Cadmium	0.195	0.00100	0.200	0	97.5	75	125			
Calcium	248	0.300	5.00	257	-182	75	125			S
Chromium	0.202	0.00500	0.200	0.00205	99.7	75	125			
Cobalt	0.606	0.00500	0.200	0.439	83.3	75	125			

Qualifiers: B Analyte detected in the associated Method Blank DF Dilution Factor
 J Analyte detected between MDL and RL MDL Method Detection Limit
 ND Not Detected at the Method Detection Limit R RPD outside accepted control limits
 RL Reporting Limit S Spike Recovery outside control limits
 J Analyte detected between SDL and RL N Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005079
Project: Luminant-OGSES FGD PONDS

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS5_200519B

Sample ID: 2005111-01B PDS	Batch ID: 96359	TestNo: SW6020B	Units: mg/L
SampType: PDS	Run ID: ICP-MS5_200519B	Analysis Date: 5/19/2020 1:20:00 PM	Prep Date: 5/15/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Lead	0.203	0.00100	0.200	0	102	75	125			
Lithium	0.417	0.0100	0.200	0.249	84.4	75	125			
Molybdenum	0.205	0.00500	0.200	0	103	75	125			
Selenium	0.217	0.00500	0.200	0.0299	93.6	75	125			
Thallium	0.201	0.00150	0.200	0	101	75	125			

Sample ID: 2005111-01B MS	Batch ID: 96359	TestNo: SW6020B	Units: mg/L
SampType: MS	Run ID: ICP-MS5_200519B	Analysis Date: 5/19/2020 1:22:00 PM	Prep Date: 5/15/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.202	0.00250	0.200	0	101	75	125			
Arsenic	0.203	0.00500	0.200	0.00893	97.3	75	125			
Barium	0.223	0.0100	0.200	0.0170	103	75	125			
Beryllium	0.206	0.00100	0.200	0.0164	94.7	75	125			
Cadmium	0.194	0.00100	0.200	0	96.8	75	125			
Calcium	263	0.300	5.00	257	118	75	125			
Chromium	0.194	0.00500	0.200	0.00205	96.1	75	125			
Cobalt	0.633	0.00500	0.200	0.439	96.8	75	125			
Lead	0.198	0.00100	0.200	0	99.1	75	125			
Lithium	0.430	0.0100	0.200	0.249	90.6	75	125			
Molybdenum	0.211	0.00500	0.200	0	106	75	125			
Selenium	0.225	0.00500	0.200	0.0299	97.4	75	125			
Thallium	0.199	0.00150	0.200	0	99.4	75	125			

Sample ID: 2005111-01B MSD	Batch ID: 96359	TestNo: SW6020B	Units: mg/L
SampType: MSD	Run ID: ICP-MS5_200519B	Analysis Date: 5/19/2020 1:24:00 PM	Prep Date: 5/15/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.200	0.00250	0.200	0	100	75	125	0.929	15	
Arsenic	0.203	0.00500	0.200	0.00893	97.0	75	125	0.261	15	
Barium	0.219	0.0100	0.200	0.0170	101	75	125	2.08	15	
Beryllium	0.206	0.00100	0.200	0.0164	95.0	75	125	0.323	15	
Cadmium	0.193	0.00100	0.200	0	96.5	75	125	0.269	15	
Calcium	262	0.300	5.00	257	92.8	75	125	0.471	15	
Chromium	0.193	0.00500	0.200	0.00205	95.7	75	125	0.411	15	
Cobalt	0.632	0.00500	0.200	0.439	96.4	75	125	0.138	15	
Lead	0.200	0.00100	0.200	0	100	75	125	1.06	15	
Lithium	0.437	0.0100	0.200	0.249	94.3	75	125	1.66	15	
Molybdenum	0.208	0.00500	0.200	0	104	75	125	1.36	15	
Selenium	0.227	0.00500	0.200	0.0299	98.3	75	125	0.785	15	
Thallium	0.201	0.00150	0.200	0	100	75	125	0.951	15	

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005079
Project: Luminant-OGSES FGD PONDS

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS5_200519B

Sample ID: ICV-200519	Batch ID: R110549	TestNo: SW6020B	Units: mg/L
SampType: ICV	Run ID: ICP-MS5_200519B	Analysis Date: 5/19/2020 10:48:00 AM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.101	0.00250	0.100	0	101	90	110			
Arsenic	0.0990	0.00500	0.100	0	99.0	90	110			
Barium	0.102	0.0100	0.100	0	102	90	110			
Beryllium	0.0981	0.00100	0.100	0	98.1	90	110			
Cadmium	0.102	0.00100	0.100	0	102	90	110			
Calcium	2.60	0.300	2.50	0	104	90	110			
Chromium	0.101	0.00500	0.100	0	101	90	110			
Cobalt	0.100	0.00500	0.100	0	100	90	110			
Lead	0.0993	0.00100	0.100	0	99.3	90	110			
Lithium	0.0998	0.0100	0.100	0	99.8	90	110			
Molybdenum	0.0975	0.00500	0.100	0	97.5	90	110			
Selenium	0.103	0.00500	0.100	0	103	90	110			
Thallium	0.0973	0.00150	0.100	0	97.3	90	110			

Sample ID: LCVL-200519	Batch ID: R110549	TestNo: SW6020B	Units: mg/L
SampType: LCVL	Run ID: ICP-MS5_200519B	Analysis Date: 5/19/2020 11:00:00 AM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.00203	0.00250	0.00200	0	102	80	120			
Arsenic	0.00510	0.00500	0.00500	0	102	80	120			
Barium	0.00527	0.0100	0.00500	0	105	80	120			
Beryllium	0.00109	0.00100	0.00100	0	109	80	120			
Cadmium	0.00102	0.00100	0.00100	0	102	80	120			
Calcium	0.115	0.300	0.100	0	115	80	120			
Chromium	0.00502	0.00500	0.00500	0	100	80	120			
Cobalt	0.00510	0.00500	0.00500	0	102	80	120			
Lead	0.00103	0.00100	0.00100	0	103	80	120			
Lithium	0.0100	0.0100	0.0100	0	100	80	120			
Molybdenum	0.00524	0.00500	0.00500	0	105	80	120			
Selenium	0.00565	0.00500	0.00500	0	113	80	120			
Thallium	0.000986	0.00150	0.00100	0	98.6	80	120			

Sample ID: CCV2-200519	Batch ID: R110549	TestNo: SW6020B	Units: mg/L
SampType: CCV	Run ID: ICP-MS5_200519B	Analysis Date: 5/19/2020 12:26:00 PM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.201	0.00250	0.200	0	101	90	110			
Arsenic	0.207	0.00500	0.200	0	103	90	110			
Barium	0.200	0.0100	0.200	0	99.8	90	110			
Beryllium	0.202	0.00100	0.200	0	101	90	110			
Cadmium	0.204	0.00100	0.200	0	102	90	110			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
 Work Order: 2005079
 Project: Luminant-OGSES FGD PONDS

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS5_200519B

Sample ID: CCV2-200519	Batch ID: R110549	TestNo: SW6020B	Units: mg/L
SampType: CCV	Run ID: ICP-MS5_200519B	Analysis Date: 5/19/2020 12:26:00 PM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	5.20	0.300	5.00	0	104	90	110			
Chromium	0.198	0.00500	0.200	0	99.1	90	110			
Cobalt	0.204	0.00500	0.200	0	102	90	110			
Lead	0.197	0.00100	0.200	0	98.3	90	110			
Lithium	0.206	0.0100	0.200	0	103	90	110			
Molybdenum	0.204	0.00500	0.200	0	102	90	110			
Selenium	0.214	0.00500	0.200	0	107	90	110			
Thallium	0.196	0.00150	0.200	0	97.8	90	110			

Sample ID: CCV3-200519	Batch ID: R110549	TestNo: SW6020B	Units: mg/L
SampType: CCV	Run ID: ICP-MS5_200519B	Analysis Date: 5/19/2020 1:44:00 PM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.200	0.00250	0.200	0	99.8	90	110			
Arsenic	0.206	0.00500	0.200	0	103	90	110			
Barium	0.201	0.0100	0.200	0	101	90	110			
Beryllium	0.202	0.00100	0.200	0	101	90	110			
Cadmium	0.206	0.00100	0.200	0	103	90	110			
Calcium	5.19	0.300	5.00	0	104	90	110			
Chromium	0.199	0.00500	0.200	0	99.3	90	110			
Cobalt	0.206	0.00500	0.200	0	103	90	110			
Lead	0.196	0.00100	0.200	0	98.0	90	110			
Lithium	0.206	0.0100	0.200	0	103	90	110			
Molybdenum	0.205	0.00500	0.200	0	103	90	110			
Selenium	0.215	0.00500	0.200	0	107	90	110			
Thallium	0.196	0.00150	0.200	0	97.8	90	110			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005079
Project: Luminant-OGSES FGD PONDS

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS5_200520B

The QC data in batch 96359 applies to the following samples: 2005079-01A, 2005079-02A, 2005079-03A, 2005079-04A, 2005079-05A, 2005079-06A, 2005079-07A

Sample ID: MB-96359	Batch ID: 96359	TestNo: SW6020B	Units: mg/L							
SampType: MBLK	Run ID: ICP-MS5_200520B	Analysis Date: 5/20/2020 1:10:00 PM	Prep Date: 5/15/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Boron	<0.0100	0.0300								

Sample ID: LCS-96359	Batch ID: 96359	TestNo: SW6020B	Units: mg/L							
SampType: LCS	Run ID: ICP-MS5_200520B	Analysis Date: 5/20/2020 1:13:00 PM	Prep Date: 5/15/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Boron	0.193	0.0300	0.200	0	96.4	80	120			

Sample ID: LCS-96359	Batch ID: 96359	TestNo: SW6020B	Units: mg/L							
SampType: LCS	Run ID: ICP-MS5_200520B	Analysis Date: 5/20/2020 1:15:00 PM	Prep Date: 5/15/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Boron	0.208	0.0300	0.200	0	104	80	120	7.81	15	

Sample ID: 2005111-01B SD	Batch ID: 96359	TestNo: SW6020B	Units: mg/L							
SampType: SD	Run ID: ICP-MS5_200520B	Analysis Date: 5/20/2020 1:26:00 PM	Prep Date: 5/15/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Boron	20.5	7.50	0	19.0				7.43	20	

Sample ID: 2005111-01B PDS	Batch ID: 96359	TestNo: SW6020B	Units: mg/L							
SampType: PDS	Run ID: ICP-MS5_200520B	Analysis Date: 5/20/2020 1:53:00 PM	Prep Date: 5/15/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Boron	28.5	1.50	10.0	19.0	95.5	75	125			

Sample ID: 2005111-01B MS	Batch ID: 96359	TestNo: SW6020B	Units: mg/L							
SampType: MS	Run ID: ICP-MS5_200520B	Analysis Date: 5/20/2020 1:55:00 PM	Prep Date: 5/15/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Boron	21.0	1.50	0.200	19.0	1020	75	125			S

Sample ID: 2005111-01B MSD	Batch ID: 96359	TestNo: SW6020B	Units: mg/L							
SampType: MSD	Run ID: ICP-MS5_200520B	Analysis Date: 5/20/2020 1:57:00 PM	Prep Date: 5/15/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Boron	21.3	1.50	0.200	19.0	1160	75	125	1.40	15	S

Qualifiers: B Analyte detected in the associated Method Blank DF Dilution Factor
J Analyte detected between MDL and RL MDL Method Detection Limit
ND Not Detected at the Method Detection Limit R RPD outside accepted control limits
RL Reporting Limit S Spike Recovery outside control limits
J Analyte detected between SDL and RL N Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005079
Project: Luminant-OGSES FGD PONDS

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS5_200520B

Sample ID: ICV-200520	Batch ID: R110581	TestNo: SW6020B	Units: mg/L							
SampType: ICV	Run ID: ICP-MS5_200520B	Analysis Date: 5/20/2020 10:52:00 AM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Boron	0.0987	0.0300	0.100	0	98.7	90	110			
Calcium	2.60	0.300	2.50	0	104	90	110			

Sample ID: LCVL-200520	Batch ID: R110581	TestNo: SW6020B	Units: mg/L							
SampType: LCVL	Run ID: ICP-MS5_200520B	Analysis Date: 5/20/2020 11:04:00 AM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Boron	0.0216	0.0300	0.0200	0	108	80	120			
Calcium	0.106	0.300	0.100	0	106	80	120			

Sample ID: CCV1-200520	Batch ID: R110581	TestNo: SW6020B	Units: mg/L							
SampType: CCV	Run ID: ICP-MS5_200520B	Analysis Date: 5/20/2020 12:00:00 PM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Boron	0.200	0.0300	0.200	0	100	90	110			
Calcium	4.94	0.300	5.00	0	98.9	90	110			

Sample ID: CCV2-200520	Batch ID: R110581	TestNo: SW6020B	Units: mg/L							
SampType: CCV	Run ID: ICP-MS5_200520B	Analysis Date: 5/20/2020 12:52:00 PM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Boron	0.195	0.0300	0.200	0	97.3	90	110			
Calcium	4.98	0.300	5.00	0	99.7	90	110			

Sample ID: CCV3-200520	Batch ID: R110581	TestNo: SW6020B	Units: mg/L							
SampType: CCV	Run ID: ICP-MS5_200520B	Analysis Date: 5/20/2020 2:09:00 PM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Boron	0.198	0.0300	0.200	0	98.9	90	110			
Calcium	5.09	0.300	5.00	0	102	90	110			

Qualifiers:

B Analyte detected in the associated Method Blank	DF Dilution Factor
J Analyte detected between MDL and RL	MDL Method Detection Limit
ND Not Detected at the Method Detection Limit	R RPD outside accepted control limits
RL Reporting Limit	S Spike Recovery outside control limits
J Analyte detected between SDL and RL	N Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005079
Project: Luminant-OGSES FGD PONDS

ANALYTICAL QC SUMMARY REPORT

RunID: IC2_200421A

Sample ID: DCS2-96036	Batch ID: 96036	TestNo: E300	Units: mg/L
SampType: DCS2	Run ID: IC2_200421A	Analysis Date: 4/21/2020 11:47:08 AM	Prep Date: 4/21/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	0.420	1.00	0.5000	0	84.1	70	130	0	0	
Fluoride	0.154	0.400	0.2000	0	77.1	70	130	0	0	
Sulfate	1.43	3.00	1.500	0	95.3	70	130	0	0	

Qualifiers:

B Analyte detected in the associated Method Blank	DF Dilution Factor
J Analyte detected between MDL and RL	MDL Method Detection Limit
ND Not Detected at the Method Detection Limit	R RPD outside accepted control limits
RL Reporting Limit	S Spike Recovery outside control limits
J Analyte detected between SDL and RL	N Parameter not NELAP certified

CLIENT: Golder
 Work Order: 2005079
 Project: Luminant-OGSES FGD PONDS

ANALYTICAL QC SUMMARY REPORT

RunID: IC2_200513A

The QC data in batch 96331 applies to the following samples: 2005079-01B, 2005079-02B, 2005079-03B, 2005079-04B, 2005079-05B, 2005079-06B, 2005079-07B

Sample ID: MB-96331	Batch ID: 96331	TestNo: E300	Units: mg/L							
SampType: MBLK	Run ID: IC2_200513A	Analysis Date: 5/13/2020 12:03:31 PM	Prep Date: 5/13/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Chloride	<0.300	1.00								
Fluoride	<0.100	0.400								
Sulfate	<1.00	3.00								

Sample ID: LCS-96331	Batch ID: 96331	TestNo: E300	Units: mg/L							
SampType: LCS	Run ID: IC2_200513A	Analysis Date: 5/13/2020 12:19:31 PM	Prep Date: 5/13/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Chloride	10.2	1.00	10.00	0	102	90	110			
Fluoride	3.73	0.400	4.000	0	93.2	90	110			
Sulfate	30.2	3.00	30.00	0	101	90	110			

Sample ID: LCS-96331	Batch ID: 96331	TestNo: E300	Units: mg/L							
SampType: LCS	Run ID: IC2_200513A	Analysis Date: 5/13/2020 12:35:31 PM	Prep Date: 5/13/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Chloride	10.2	1.00	10.00	0	102	90	110	0.114	20	
Fluoride	3.75	0.400	4.000	0	93.8	90	110	0.683	20	
Sulfate	30.2	3.00	30.00	0	101	90	110	0.039	20	

Sample ID: 2005077-02BMS	Batch ID: 96331	TestNo: E300	Units: mg/L							
SampType: MS	Run ID: IC2_200513A	Analysis Date: 5/14/2020 1:28:07 AM	Prep Date: 5/13/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Chloride	825	10.0	200.0	800.5	12.5	90	110			S
Fluoride	216	4.00	200.0	0	108	90	110			
Sulfate	494	30.0	200.0	288.5	103	90	110			

Sample ID: 2005077-02BMSD	Batch ID: 96331	TestNo: E300	Units: mg/L							
SampType: MSD	Run ID: IC2_200513A	Analysis Date: 5/14/2020 1:44:07 AM	Prep Date: 5/13/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Chloride	822	10.0	200.0	800.5	10.6	90	110	0.450	20	S
Fluoride	217	4.00	200.0	0	108	90	110	0.480	20	
Sulfate	494	30.0	200.0	288.5	103	90	110	0.008	20	

Qualifiers: B Analyte detected in the associated Method Blank DF Dilution Factor
 J Analyte detected between MDL and RL MDL Method Detection Limit
 ND Not Detected at the Method Detection Limit R RPD outside accepted control limits
 RL Reporting Limit S Spike Recovery outside control limits
 J Analyte detected between SDL and RL N Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005079
Project: Luminant-OGSES FGD PONDS

ANALYTICAL QC SUMMARY REPORT

RunID: IC2_200513A

Sample ID: 2005077-01BMS	Batch ID: 96331	TestNo: E300	Units: mg/L							
SampType: MS	Run ID: IC2_200513A	Analysis Date: 5/14/2020 2:00:07 AM	Prep Date: 5/13/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	105	1.00	20.00	108.6	-16.4	90	110			S
Fluoride	19.4	0.400	20.00	0.2859	95.7	90	110			
Sulfate	70.1	3.00	20.00	52.44	88.2	90	110			S

Sample ID: 2005077-01BMSD	Batch ID: 96331	TestNo: E300	Units: mg/L							
SampType: MSD	Run ID: IC2_200513A	Analysis Date: 5/14/2020 2:16:07 AM	Prep Date: 5/13/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	<0.300	1.00	20.00	108.6	-543	90	110	0	20	S
Fluoride	19.4	0.400	20.00	0.2859	95.7	90	110	0.065	20	
Sulfate	70.1	3.00	20.00	52.44	88.5	90	110	0.074	20	S

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
 Work Order: 2005079
 Project: Luminant-OGSES FGD PONDS

ANALYTICAL QC SUMMARY REPORT

RunID: IC2_200513A

Sample ID: ICV-200513	Batch ID: R110479	TestNo: E300	Units: mg/L
SampType: ICV	Run ID: IC2_200513A	Analysis Date: 5/13/2020 11:31:31 AM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	26.2	1.00	25.00	0	105	90	110			
Fluoride	9.86	0.400	10.00	0	98.6	90	110			
Sulfate	78.8	3.00	75.00	0	105	90	110			

Sample ID: CCV1-200513	Batch ID: R110479	TestNo: E300	Units: mg/L
SampType: CCV	Run ID: IC2_200513A	Analysis Date: 5/13/2020 6:16:07 PM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	10.3	1.00	10.00	0	103	90	110			
Fluoride	3.88	0.400	4.000	0	97.0	90	110			
Sulfate	30.2	3.00	30.00	0	101	90	110			

Sample ID: CCV2-200513	Batch ID: R110479	TestNo: E300	Units: mg/L
SampType: CCV	Run ID: IC2_200513A	Analysis Date: 5/13/2020 10:16:07 PM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	10.2	1.00	10.00	0	102	90	110			
Fluoride	3.87	0.400	4.000	0	96.8	90	110			
Sulfate	30.1	3.00	30.00	0	100	90	110			

Sample ID: CCV3-200513	Batch ID: R110479	TestNo: E300	Units: mg/L
SampType: CCV	Run ID: IC2_200513A	Analysis Date: 5/14/2020 3:20:07 AM	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	10.5	1.00	10.00	0	105	90	110			
Fluoride	3.96	0.400	4.000	0	99.0	90	110			
Sulfate	30.6	3.00	30.00	0	102	90	110			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005079
Project: Luminant-OGSES FGD PONDS

ANALYTICAL QC SUMMARY REPORT

RunID: IC2_200515A

The QC data in batch 96363 applies to the following samples: 2005079-06B

Sample ID: MB-96363	Batch ID: 96363	TestNo: E300	Units: mg/L							
SampType: MBLK	Run ID: IC2_200515A	Analysis Date: 5/15/2020 11:51:21 AM	Prep Date: 5/15/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	<0.300	1.00								

Sample ID: LCS-96363	Batch ID: 96363	TestNo: E300	Units: mg/L							
SampType: LCS	Run ID: IC2_200515A	Analysis Date: 5/15/2020 12:07:21 PM	Prep Date: 5/15/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	10.2	1.00	10.00	0	102	90	110			

Sample ID: LCSD-96363	Batch ID: 96363	TestNo: E300	Units: mg/L							
SampType: LCSD	Run ID: IC2_200515A	Analysis Date: 5/15/2020 12:23:21 PM	Prep Date: 5/15/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	10.2	1.00	10.00	0	102	90	110	0.117	20	

Sample ID: 2005112-01BMS	Batch ID: 96363	TestNo: E300	Units: mg/L							
SampType: MS	Run ID: IC2_200515A	Analysis Date: 5/15/2020 4:00:25 PM	Prep Date: 5/15/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	2220	100	2000	206.2	101	90	110			

Sample ID: 2005112-01BMSD	Batch ID: 96363	TestNo: E300	Units: mg/L							
SampType: MSD	Run ID: IC2_200515A	Analysis Date: 5/15/2020 4:16:25 PM	Prep Date: 5/15/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	2230	100	2000	206.2	101	90	110	0.373	20	

<p>Qualifiers:</p> <p>B Analyte detected in the associated Method Blank</p> <p>J Analyte detected between MDL and RL</p> <p>ND Not Detected at the Method Detection Limit</p> <p>RL Reporting Limit</p> <p>J Analyte detected between SDL and RL</p>	<p>DF Dilution Factor</p> <p>MDL Method Detection Limit</p> <p>R RPD outside accepted control limits</p> <p>S Spike Recovery outside control limits</p> <p>N Parameter not NELAP certified</p>
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CLIENT: Golder
Work Order: 2005079
Project: Luminant-OGSES FGD PONDS

ANALYTICAL QC SUMMARY REPORT

RunID: IC2_200515A

Sample ID: ICV-200515	Batch ID: R110519	TestNo: E300	Units: mg/L							
SampType: ICV	Run ID: IC2_200515A	Analysis Date: 5/15/2020 11:19:21 AM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	26.2	1.00	25.00	0	105	90	110			

Sample ID: CCV1-200515	Batch ID: R110519	TestNo: E300	Units: mg/L							
SampType: CCV	Run ID: IC2_200515A	Analysis Date: 5/15/2020 7:12:25 PM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	10.3	1.00	10.00	0	103	90	110			

Qualifiers:

- B Analyte detected in the associated Method Blank
- J Analyte detected between MDL and RL
- ND Not Detected at the Method Detection Limit
- RL Reporting Limit
- J Analyte detected between SDL and RL

- DF Dilution Factor
- MDL Method Detection Limit
- R RPD outside accepted control limits
- S Spike Recovery outside control limits
- N Parameter not NELAP certified

CLIENT: Golder
Work Order: 2005079
Project: Luminant-OGSES FGD PONDS

ANALYTICAL QC SUMMARY REPORT

RunID: WC_200513A

The QC data in batch 96333 applies to the following samples: 2005079-01B, 2005079-02B, 2005079-03B, 2005079-04B, 2005079-05B, 2005079-06B, 2005079-07B

Sample ID: MB-96333	Batch ID: 96333	TestNo: M2540C	Units: mg/L							
SampType: MBLK	Run ID: WC_200513A	Analysis Date: 5/13/2020 5:00:00 PM	Prep Date: 5/13/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera										
	<10.0	10.0								

Sample ID: LCS-96333	Batch ID: 96333	TestNo: M2540C	Units: mg/L							
SampType: LCS	Run ID: WC_200513A	Analysis Date: 5/13/2020 5:00:00 PM	Prep Date: 5/13/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera										
	756	10.0	745.6	0	101	90	113			

Sample ID: 2005079-05B-DUP	Batch ID: 96333	TestNo: M2540C	Units: mg/L							
SampType: DUP	Run ID: WC_200513A	Analysis Date: 5/13/2020 5:00:00 PM	Prep Date: 5/13/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera										
	4120	50.0	0	4090				0.609	5	

Sample ID: 2005079-06B-DUP	Batch ID: 96333	TestNo: M2540C	Units: mg/L							
SampType: DUP	Run ID: WC_200513A	Analysis Date: 5/13/2020 5:00:00 PM	Prep Date: 5/13/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera										
	1250	50.0	0	1295				3.94	5	

- | | | |
|--------------------|---|---|
| Qualifiers: | B Analyte detected in the associated Method Blank | DF Dilution Factor |
| | J Analyte detected between MDL and RL | MDL Method Detection Limit |
| | ND Not Detected at the Method Detection Limit | R RPD outside accepted control limits |
| | RL Reporting Limit | S Spike Recovery outside control limits |
| | J Analyte detected between SDL and RL | N Parameter not NELAP certified |

CLIENT: Golder
Work Order: 2005079
Project: Luminant-OGSES FGD PONDS

MQL SUMMARY REPORT

TestNo: E300	MDL	MQL
Analyte	mg/L	mg/L
Chloride	0.300	1.00
Fluoride	0.100	0.400
Sulfate	1.00	3.00

TestNo: SW6020B	MDL	MQL
Analyte	mg/L	mg/L
Antimony	0.000800	0.00250
Arsenic	0.00200	0.00500
Barium	0.00300	0.0100
Beryllium	0.000300	0.00100
Boron	0.0100	0.0300
Cadmium	0.000300	0.00100
Calcium	0.100	0.300
Chromium	0.00200	0.00500
Cobalt	0.00300	0.00500
Lead	0.000300	0.00100
Lithium	0.00500	0.0100
Molybdenum	0.00200	0.00500
Selenium	0.00200	0.00500
Thallium	0.000500	0.00150

TestNo: SW7470A	MDL	MQL
Analyte	mg/L	mg/L
Mercury	0.0000800	0.000200

TestNo: M2540C	MDL	MQL
Analyte	mg/L	mg/L
Total Dissolved Solids (Residue, Filt	10.0	10.0

Qualifiers: MQL -Method Quantitation Limit as defined by TRRP
 MDL -Method Detection Limit as defined by TRRP

June 10, 2020

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc

DHL Analytical, Inc.

Sample Delivery Group: L1219695
Samples Received: 05/18/2020
Project Number: 2005079
Description:

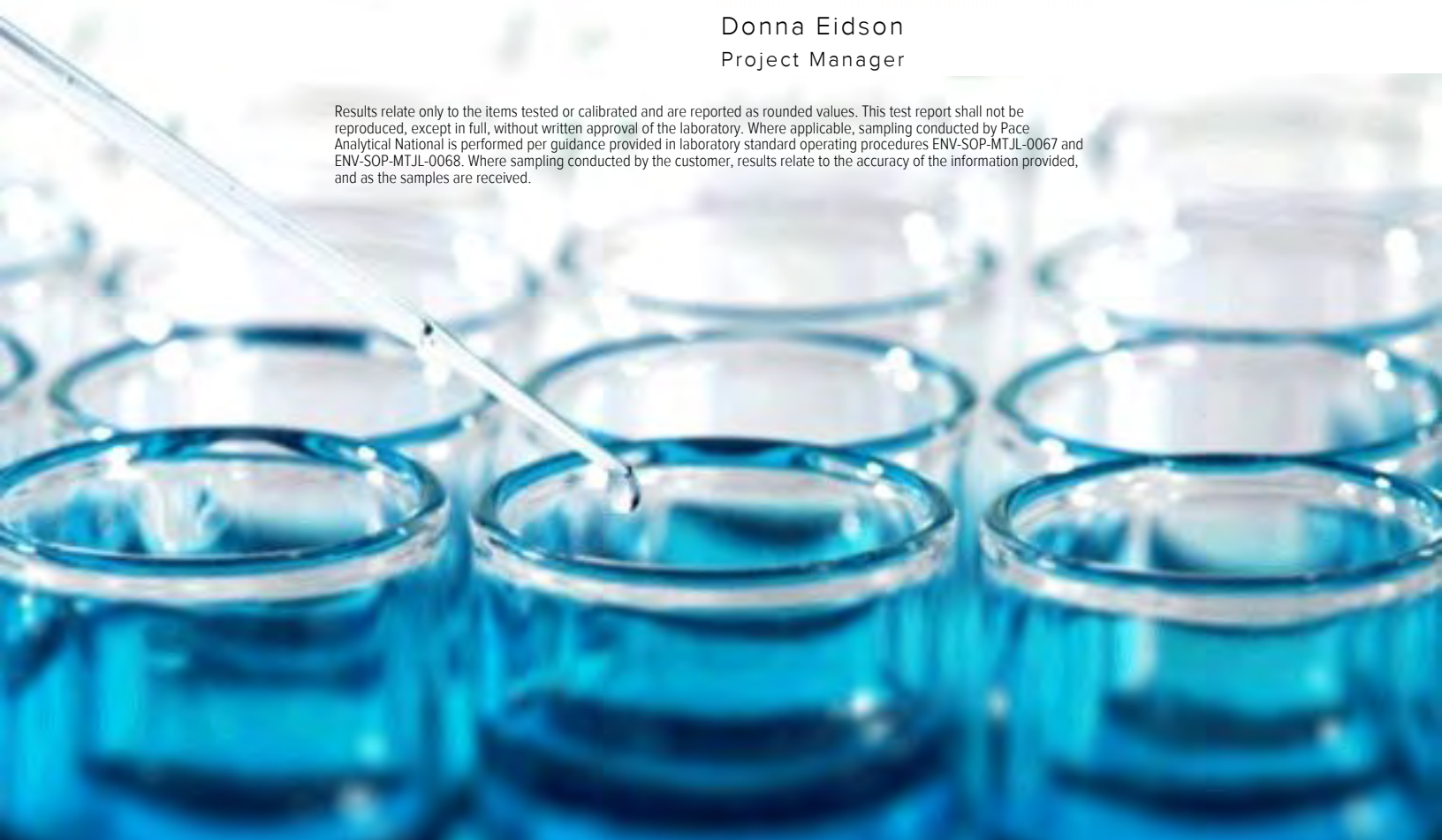
Report To: John DuPont
2300 Double Creek Drive
Round Rock, TX 78664

Entire Report Reviewed By:



Donna Eidson
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.





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FGD-4 L1219695-01 Non-Potable Water

Collected by
Collected date/time
Received date/time
05/11/20 07:45 05/18/20 09:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1479430	1	05/21/20 14:37	06/05/20 13:30	SNR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1480228	1	05/26/20 11:14	06/05/20 13:30	RRE	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1480228	1	05/26/20 11:14	05/27/20 16:43	RGT	Mt. Juliet, TN

¹Cp

²Tc

³Ss

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⁶Qc

⁷Gl

⁸Al

⁹Sc

FGD-2 L1219695-02 Non-Potable Water

Collected by
Collected date/time
Received date/time
05/11/20 08:35 05/18/20 09:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1479430	1	05/21/20 14:37	06/04/20 10:10	SNR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1480228	1	05/26/20 11:14	06/04/20 10:10	RRE	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1480228	1	05/26/20 11:14	05/27/20 16:43	RGT	Mt. Juliet, TN

FGD-5 L1219695-03 Non-Potable Water

Collected by
Collected date/time
Received date/time
05/11/20 09:25 05/18/20 09:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1479430	1	05/21/20 14:37	06/05/20 13:30	SNR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1480228	1	05/26/20 11:14	06/05/20 13:30	RRE	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1480228	1	05/26/20 11:14	05/27/20 16:43	RGT	Mt. Juliet, TN

FGD-1 L1219695-04 Non-Potable Water

Collected by
Collected date/time
Received date/time
05/11/20 10:15 05/18/20 09:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1479430	1	05/21/20 14:37	06/05/20 13:30	SNR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1480228	1	05/26/20 11:14	06/05/20 13:30	RRE	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1480228	1	05/26/20 11:14	05/28/20 13:43	RGT	Mt. Juliet, TN

FGD-8 L1219695-05 Non-Potable Water

Collected by
Collected date/time
Received date/time
05/11/20 11:10 05/18/20 09:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1479430	1	05/21/20 14:37	06/05/20 13:30	SNR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1480228	1	05/26/20 11:14	06/05/20 13:30	RRE	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1480228	1	05/26/20 11:14	05/28/20 13:43	RGT	Mt. Juliet, TN

FGD-11 L1219695-06 Non-Potable Water

Collected by
Collected date/time
Received date/time
05/11/20 12:45 05/18/20 09:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1479430	1	05/21/20 14:37	06/05/20 13:30	SNR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1480228	1	05/26/20 11:14	06/05/20 13:30	RRE	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1480228	1	05/26/20 11:14	05/28/20 13:43	RGT	Mt. Juliet, TN



FGD-12 L1219695-07 Non-Potable Water

Collected by: _____ Collected date/time: 05/11/20 13:45 Received date/time: 05/18/20 09:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1479430	1	05/21/20 14:37	06/05/20 13:30	SNR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1480228	1	05/26/20 11:14	06/05/20 13:30	RRE	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1480228	1	05/26/20 11:14	05/28/20 13:43	RGT	Mt. Juliet, TN

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc



All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All radiochemical sample results for solids are reported on a dry weight basis with the exception of tritium, carbon-14 and radon, unless wet weight was requested by the client. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Donna Eidson
Project Manager

- ¹ Cp
- ² Tc
- ³ Ss
- ⁴ Cn
- ⁵ Sr
- ⁶ Qc
- ⁷ Gl
- ⁸ Al
- ⁹ Sc



Radiochemistry by Method 904

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-228	1.20		0.681	1.49	06/05/2020 13:30	WG1479430
(T) Barium	70.1			62.0-143	06/05/2020 13:30	WG1479430
(T) Yttrium	104			79.0-136	06/05/2020 13:30	WG1479430

1 Cp

2 Tc

3 Ss

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	1.35		1.14	2.17	06/05/2020 13:30	WG1480228

4 Cn

5 Sr

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-226	0.150		0.462	0.679	05/27/2020 16:43	WG1480228
(T) Barium-133	91.9			30.0-143	05/27/2020 16:43	WG1480228

6 Qc

7 Gl

8 Al

9 Sc



Radiochemistry by Method 904

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-228	2.08		0.643	1.34	06/04/2020 10:10	WG1479430
(T) Barium	78.1			62.0-143	06/04/2020 10:10	WG1479430
(T) Yttrium	112			79.0-136	06/04/2020 10:10	WG1479430

1 Cp

2 Tc

3 Ss

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	2.76		0.993	1.55	06/04/2020 10:10	WG1480228

4 Cn

5 Sr

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-226	0.677		0.350	0.211	05/27/2020 16:43	WG1480228
(T) Barium-133	89.7			30.0-143	05/27/2020 16:43	WG1480228

6 Qc

7 Gl

8 Al

9 Sc



Radiochemistry by Method 904

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-228	5.18		0.667	1.35	06/05/2020 13:30	WG1479430
(T) Barium	73.7			62.0-143	06/05/2020 13:30	WG1479430
(T) Yttrium	110			79.0-136	06/05/2020 13:30	WG1479430

1 Cp

2 Tc

3 Ss

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	5.28		0.860	1.67	06/05/2020 13:30	WG1480228

4 Cn

5 Sr

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-226	0.0983		0.193	0.324	05/27/2020 16:43	WG1480228
(T) Barium-133	83.4			30.0-143	05/27/2020 16:43	WG1480228

6 Qc

7 Gl

8 Al

9 Sc



Radiochemistry by Method 904

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-228	0.808		0.616	1.03	06/05/2020 13:30	WG1479430
(T) Barium	83.8			62.0-143	06/05/2020 13:30	WG1479430
(T) Yttrium	107			79.0-136	06/05/2020 13:30	WG1479430

¹Cp

²Tc

³Ss

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	1.89		1.03	1.29	06/05/2020 13:30	WG1480228

⁴Cn

⁵Sr

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-226	1.08		0.415	0.256	05/28/2020 13:43	WG1480228
(T) Barium-133	91.4			30.0-143	05/28/2020 13:43	WG1480228

⁶Qc

⁷Gl

⁸Al

⁹Sc



Radiochemistry by Method 904

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-228	6.58		0.683	1.25	06/05/2020 13:30	WG1479430
(T) Barium	68.3			62.0-143	06/05/2020 13:30	WG1479430
(T) Yttrium	105			79.0-136	06/05/2020 13:30	WG1479430

1 Cp

2 Tc

3 Ss

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	8.65		1.18	1.57	06/05/2020 13:30	WG1480228

4 Cn

5 Sr

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-226	2.07		0.499	0.323	05/28/2020 13:43	WG1480228
(T) Barium-133	96.8			30.0-143	05/28/2020 13:43	WG1480228

6 Qc

7 Gl

8 Al

9 Sc



Radiochemistry by Method 904

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-228	4.00		0.583	0.835	06/05/2020 13:30	WG1479430
(T) Barium	87.2			62.0-143	06/05/2020 13:30	WG1479430
(T) Yttrium	107			79.0-136	06/05/2020 13:30	WG1479430

1 Cp

2 Tc

3 Ss

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	6.40		1.17	1.08	06/05/2020 13:30	WG1480228

4 Cn

5 Sr

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-226	2.39		0.591	0.243	05/28/2020 13:43	WG1480228
(T) Barium-133	89.3			30.0-143	05/28/2020 13:43	WG1480228

6 Qc

7 Gl

8 Al

9 Sc



Radiochemistry by Method 904

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-228	10.7		0.708	1.03	06/05/2020 13:30	WG1479430
(T) Barium	81.0			62.0-143	06/05/2020 13:30	WG1479430
(T) Yttrium	110			79.0-136	06/05/2020 13:30	WG1479430

¹ Cp

² Tc

³ Ss

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	16.6		1.65	1.27	06/05/2020 13:30	WG1480228

⁴ Cn

⁵ Sr

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-226	5.96		0.946	0.241	05/28/2020 13:43	WG1480228
(T) Barium-133	84.7			30.0-143	05/28/2020 13:43	WG1480228

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc



Method Blank (MB)

(MB) R3534480-6 06/04/20 10:10

Analyte	MB Result pCi/l	MB Qualifier	MB MDA pCi/l
Radium-228	-0.637		0.528
(T) Barium	89.8		
(T) Yttrium	105		

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

L1219695-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1219695-02 06/04/20 10:10 • (DUP) R3534480-10 06/04/20 10:10

Analyte	Original Result pCi/l	DUP Result pCi/l	Dilution	DUP RPD %	DUP RER	DUP Qualifier	DUP RPD Limits %	DUP RER Limit
Radium-228	2.08	1.67	1	22.0	0.453		20	3
(T) Barium	78.1	83.8						
(T) Yttrium	112	110						

Laboratory Control Sample (LCS)

(LCS) R3534480-7 06/04/20 10:10

Analyte	Spike Amount pCi/l	LCS Result pCi/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Radium-228	5.00	5.60	112	80.0-120	
(T) Barium			84.5		
(T) Yttrium			110		



Method Blank (MB)

(MB) R3533718-5 05/28/20 17:55

Analyte	MB Result pCi/l	MB Qualifier	MB MDA pCi/l
Radium-226	0.0282		0.0620
(T) Barium-133	95.4		

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

L1219695-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1219695-01 05/27/20 16:43 • (DUP) R3533718-1 05/27/20 16:45

Analyte	Original Result pCi/l	DUP Result pCi/l	Dilution	DUP RPD %	DUP RER	DUP Qualifier	DUP RPD Limits	DUP RER Limit
Radium-226	0.150	0.477	1	104	0.622		20	3
(T) Barium-133	91.9	89.3						

Laboratory Control Sample (LCS)

(LCS) R3533718-2 05/28/20 13:53

Analyte	Spike Amount pCi/l	LCS Result pCi/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Radium-226	5.02	5.42	108	80.0-120	
(T) Barium-133			92.9		

L1219695-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1219695-04 05/28/20 13:43 • (MS) R3533718-3 05/28/20 13:53 • (MSD) R3533718-4 05/28/20 13:53

Analyte	Spike Amount pCi/l	Original Result pCi/l	MS Result pCi/l	MSD Result pCi/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	MS RER	RPD Limits %
Radium-226	20.1	1.08	22.8	23.6	108	112	1	75.0-125			3.32		20
(T) Barium-133		91.4			84.6	87.2							



Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDA	Minimum Detectable Activity.
Rec.	Recovery.
RER	Replicate Error Ratio.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(T)	Tracer - A radioisotope of known concentration added to a solution of chemically equivalent radioisotopes at a known concentration to assist in monitoring the yield of the chemical separation.
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state "ND" (Not Detected) or "BDL" (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc

Qualifier Description

The remainder of this page intentionally left blank, there are no qualifiers applied to this SDG.



Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
 * Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey-NELAP	TN002
California	2932	New Mexico ¹	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina ¹	DW21704
Georgia	NELAP	North Carolina ³	41
Georgia ¹	923	North Dakota	R-140
Idaho	TN00003	Ohio-VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LA000356
Kentucky ^{1,6}	90010	South Carolina	84004
Kentucky ²	16	South Dakota	n/a
Louisiana	AI30792	Tennessee ^{1,4}	2006
Louisiana ¹	LA180010	Texas	T104704245-18-15
Maine	TN0002	Texas ⁵	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

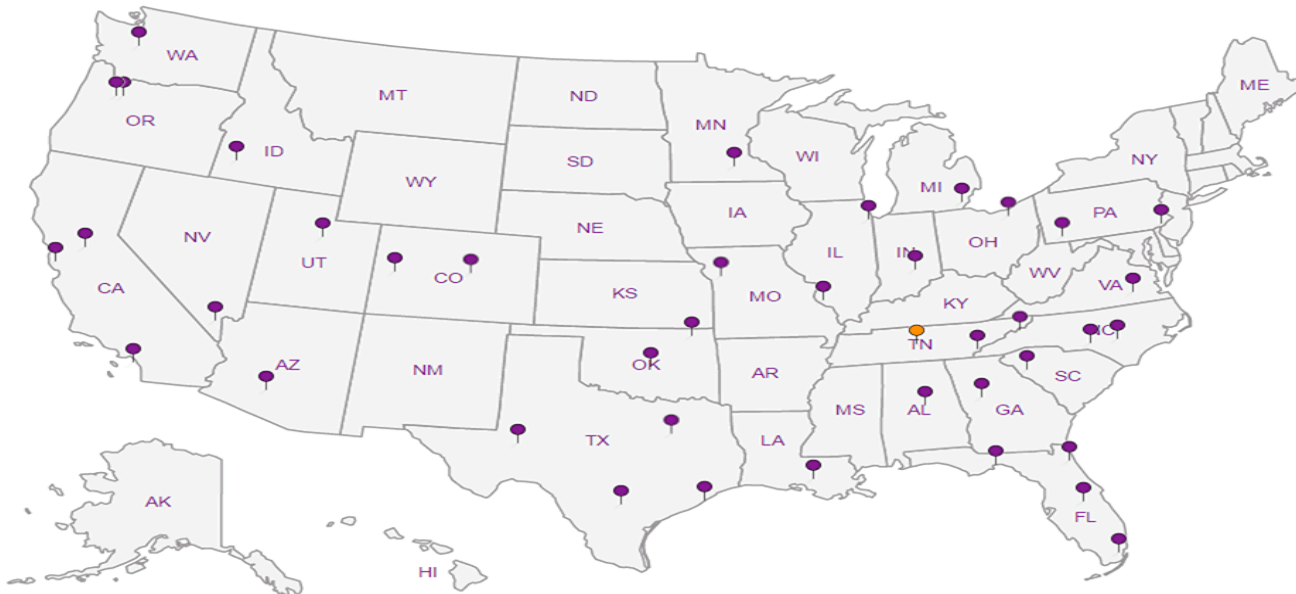
Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 ⁵	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA-Crypto	TN00003		

¹ Drinking Water ² Underground Storage Tanks ³ Aquatic Toxicity ⁴ Chemical/Microbiological ⁵ Mold ⁶ Wastewater n/a Accreditation not applicable

Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.



1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

DHL Analytical, Inc.
 2300 Double Creek Drive
 Round Rock, TX 78664

TEL: (512) 388-8222

FAX: (512) 388-8229

Work Order: 2005079

CHAIN-OF-CUSTODY RECORD

G108

Subcontractor:

Pace Analytical
 12065 Lebanon Rd
 Mt. Juliet, TN 37122

TEL: (615) 773-5923
 FAX:
 Acct #: DHLRRTX

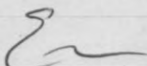
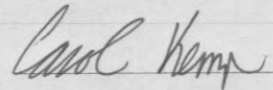
1219695

12-May-20

Sample ID	Matrix	DHL#	Date Collected	Bottle Type	Requested Tests						
					LL		LL				
					Ra-228	Ra-226					
					E904.0	M7500 Ra B M					
FGD-4	Aqueous	01C	05/11/20 07:45 AM	1LHDPEHNO3	1						01
FGD-4	Aqueous	01D	05/11/20 07:45 AM	1LHDPEHNO3		1					01
FGD-2	Aqueous	02C	05/11/20 08:35 AM	1LHDPEHNO3	1						02
FGD-2	Aqueous	02D	05/11/20 08:35 AM	1LHDPEHNO3		1					02
FGD-5	Aqueous	03C	05/11/20 09:25 AM	1LHDPEHNO3	1						03
FGD-5	Aqueous	03D	05/11/20 09:25 AM	1LHDPEHNO3		1					03
FGD-1	Aqueous	04C	05/11/20 10:15 AM	1LHDPEHNO3	1						04
FGD-1	Aqueous	04D	05/11/20 10:15 AM	1LHDPEHNO3		1					04
FGD-8	Aqueous	05C	05/11/20 11:10 AM	1LHDPEHNO3	1						05
FGD-8	Aqueous	05D	05/11/20 11:10 AM	1LHDPEHNO3		1					05
FGD-11	Aqueous	06C	05/11/20 12:45 PM	1LHDPEHNO3	1						06
FGD-11	Aqueous	06D	05/11/20 12:45 PM	1LHDPEHNO3		1					06
FGD-12	Aqueous	07C	05/11/20 01:45 PM	1LHDPEHNO3	1						07
FGD-12	Aqueous	07D	05/11/20 01:45 PM	1LHDPEHNO3		1					07

General Comments:

Please analyze these samples with Normal Turnaround Time.
 Report RA-226, Ra-228 & Combined per Specs.
 Quality Control Package Needed: Standard - NELAC Rad Test compliant
 Email to cac@dhlanalytical.com & dupont@dhlanalytical.com

	Date/Time		Date/Time
Relinquished by: 	5/14/20 1700	Received by: 	5/18/20 9:45
Relinquished by: _____		Received by: _____	

**Pace Analytical National Center for Testing & Innovation
Cooler Receipt Form**

Client:	DHLRRTC	1219695	
Cooler Received/Opened On:	5 / 18 / 20	Temperature: Amb	
Received By: Carol Kemp			
Signature: <i>Carol Kemp</i>			
Receipt Check List	NP	Yes	No
COC Seal Present / Intact?	/		
COC Signed / Accurate?		/	
Bottles arrive intact?		/	
Correct bottles used?		/	
Sufficient volume sent?		/	
If Applicable			
VOA Zero headspace?			
Preservation Correct / Checked?		/	

APPENDIX B

Groundwater Modeling Notes

APPENDIX B: OAK GROVE GROUNDWATER MODELING NOTES

By: William Vienne, Golder

Date: March 2021

Objective: Create a groundwater model using Visual Modflow to setup steady-state hydrogeological conditions for use in PHREEQC geochemical model.

Units

length:	feet	pumping rate:	gal/min
time:	day	recharge:	in/year
concentration:	mg/L	mass:	kg
conductivity:	cm/s		

Default Parameters

Kx:	9E-4 cm/s	Sy:	0.22	(value for sand in Heath 1983)
Ky:	9E-4 cm/s	eff. Porosity:	0.25	(typical of sand aquifer)
Kz:	9E-5 cm/s	tot. porosity:	0.40	(typical of sand aquifer)
(K based on 2015 slug tests in wells FGD-5 and FGD-12 (PBW 2017))		SS simulation time :	1 day	
Ss:	2.3E-4 ft ⁻¹ (value for sand in Dominico and Miffilin 1965)	No recharge or evapotranspiration		

Base Map

Base map: May 2019 groundwater potentiometric surface map

Two-point georeference:

<u>Model Coordinates</u>	<u>Georeferenced Coordinates</u>
Model origin (0, 0 ft)	N11321403/E2419094
MW-8R	N11326288/E2423313

Model Setup

3 layers:

- Upper sandy silt/clay: Ground surface to 405 feet amsl (thickness varies with ground elevation -- generally ~20 feet thick)
 - Kxy = 1E-4 cm/s; Kz = 1E-5 cm/s
 - All other hydro parameters set to default values
 - All ponds are completed in Layer 1
- Middle sand (uppermost GWBU): 405 feet amsl to 370 feet amsl
 - All monitoring wells are completed in Layer 2
 - All hydro parameters set to default values, including conductivity
 - Kxy = 9E-4 cm/s; Kz = 9E-5 cm/s
- Lower confining clay: 370 feet amsl to 360 feet amsl
 - Kxy = 1E-5 cm/s; Kz = 1E-6 cm/s
 - All other hydro parameters set to default values

Model extent: 9000 ft x 9000 ft

<u>Columns</u>	<u>Rows</u>
90	90 (100-ft grid cells)

- Refined cells to 50 ft in FGD Area
- Generated ground surface elevation grid using well ground surface elevations
 - Imported excel file with model coordinates and elevations. Used Natural Neighbor function for interpolation.
 - Adjusted ground elevation of single cells in Layer 1 around FGD Ponds to reflect berm heights on engineer drawings (Pond-A = 450', Pond-B = 430', Pond-C = 455').
 - Set interior pond areas to the berm elevations (allows use of Lake package for ponds)

Boundary Conditions

- Constant head boundary or 420 feet set in Layer 2 along western edge of Ash Landfill 1 based on water elevations in wells in that area.
- Constant head boundary of 410 feet set in Layer 2 for Twin Oak Reservoir. Did not use Lake package because primary concern is leakage from ponds, not the reservoir. Normal level of lake is 401 feet, but 410 feet matched better with May 2019 groundwater elevation contours.
- Constant head boundaries created gw gradient similar to the one shown on May 2019 pot map, with groundwater flowing toward reservoir.
- Lake Package used for ponds FGD-A, B, and C. Assumed constant water levels of 10 feet above bottom of ponds. Pond bottoms based on engineering drawings. Lake Package parameters:

Pond ID	Start	Stop (days)	Lake Stage	Bottom (ft	Precip	Runoff	Evap	Lake	K of Lake Bed (cm/s)
			(ft amsl)	amsl)				Bed (ft)	
A	0	10950	432	422	0	0	0	3	1E-06
B	0	10950	428	418	0	0	0	3	1E-06
C	0	10950	449	439	0	0	0	3	1E-06

Calibration

Model vs. Observed Head in CCR wells (May 2019):

Residual Mean: 0.135 ft
Standard Error of the Estimate: 0.367 ft
Correlation Coefficient: 0.873

Deliverables for PHREEQC Model

- VMOD head files (x, y, z, and head)
- Surface elevation grid
- Shapefile showing pond outlines

References

Pastor, Behling & Wheeler, LLC (PBW), 2017. Coal Combustion Residual Rule Groundwater Monitoring System Certification, Oak Grove Steam Electric Station.

APPENDIX C

Geochemical Modeling Saturation Indices

APPENDIX C
GEOCHEMICAL MODELING
RELEVANT MINERAL PHASES - Saturation Indices
OAK GROVE SES FGD PONDS AREA



MINERAL PHASES - Saturation Indices		FGD-1 05-2019	FGD-2 05-2019	FGD-3 05-2019	FGD-4 05-2019	FGD-5 05-2019	FGD-6 05-2019	FGD-8 05-2019	FGD-11 05-2019	FGD-12 05-2019	FGD-15 06-2019	FGD-16 06-2019	FGD-A-POND 06-2019	FGD-B-POND 06-2019	FGD-1 05-2020	FGD-2 05-2020	FGD-3 05-2020	FGD-4 05-2020	FGD-5 05-2020	FGD-6 05-2020	FGD-8 05-2020	FGD-11 05-2020	FGD-12 05-2020	FGD-A-POND 05-2020	FGD-B-POND 05-2020	
Otavite	CdCO ₃	-3.52	-3.00	-2.59	-3.13	-3.25	-2.72	-3.36	-3.00	-3.65	-2.77	-1.88	-2.03	-4.45	-4.38	-3.18	-3.82	-2.72	-3.00	-2.93	-2.82	-3.38	-3.13	-3.66	-3.79	-4.44
Ferrihydrite	Fe(OH) ₃	2.50	2.34	2.41	2.18	1.75	4.12	4.99	3.50	2.77	1.88	2.03	1.75	0.73	3.39	1.97	1.90	2.29	2.09	3.10	5.06	2.66	4.71	2.27	2.39	
Siderite	FeCO ₃	-2.73	-2.12	-1.82	-2.28	-2.37	-1.89	1.37	-2.02	-2.88	-2.64	-2.12	-3.58	-3.45	-1.49	-2.76	-1.96	-2.15	-2.04	-1.98	1.25	-2.16	-2.88	-3.40	-3.49	
Melanterite	FeSO ₄ ·7H ₂ O	-7.31	-7.52	-7.25	-7.72	-7.64	-7.62	-4.24	-7.82	-7.86	-6.91	-8.03	-6.87	-6.88	-6.54	-7.34	-7.32	-7.64	-7.57	-7.50	-4.35	-7.89	-7.80	-7.05	-6.92	
Anglesite	PbSO ₄	-4.82	-5.32	-5.34	-5.51	-5.41	-5.99	-4.87	-5.43	-5.31	-4.23	-4.26	-5.03	-4.89	-5.33	-5.49	-5.44	-5.44	-5.44	-5.44	-5.52	-5.38	-3.33	-4.42	-4.27	
Gypsum	CaSO ₄ ·2H ₂ O	-2.16	-2.05	-1.60	-2.23	-1.86	-2.44	-1.32	-1.99	-3.17	-0.57	-2.95	-0.13	-0.17	-1.94	-1.05	-1.82	-2.16	-1.69	-2.19	-1.22	-1.98	-2.75	0.11	0.03	
Jarosite-H	(H ₂ O)Fe ₃ (SO ₄) ₂ (OH) ₆	-3.88	-5.55	-4.12	-5.33	-5.91	0.40	3.24	-2.40	-3.92	-4.18	-1.19	-3.50	-6.81	-2.59	-4.86	-5.41	-4.99	-6.16	-2.80	3.42	-4.72	1.80	-2.16	-2.01	
Jarosite-K	KFe ₃ (SO ₄) ₂ (OH) ₆	1.15	-0.23	1.05	-0.50	-0.86	4.36	9.20	3.09	0.87	1.16	-1.90	2.91	-0.33	2.84	0.52	-0.41	-0.13	-0.73	1.88	9.41	0.71	7.19	4.68	4.62	
Jarosite-Na	NaFe ₃ (SO ₄) ₂ (OH) ₆	-0.85	-1.71	-0.28	-1.87	-2.68	3.49	7.45	1.62	-1.38	-0.25	-3.84	0.06	-3.17	0.97	-0.90	-1.75	-1.38	-2.57	1.01	7.64	-0.82	4.44	1.77	1.78	
Calcite	CaCO ₃	-1.73	-0.81	-0.32	-0.95	-0.76	-0.87	0.12	0.36	-2.36	0.46	-1.21	-1.00	-0.90	-1.06	-0.64	-0.63	-0.83	-0.32	-0.84	0.22	-0.41	-2.00	0.41	-0.71	
Magnesite	MgCO ₃	-2.77	-1.97	-1.35	-2.09	-1.75	-2.15	-0.85	-1.59	-3.52	-1.65	-2.70	-1.56	-1.44	-2.19	-1.90	-1.66	-2.06	-1.39	-2.20	-0.86	-1.76	-3.09	-0.97	-1.32	
Barite	BaSO ₄	0.12	0.22	0.23	0.08	0.08	0.15	0.98	0.48	-0.48			1.10	1.10	0.47	0.53	-0.01	0.12	0.16	0.15	0.93	0.40	0.26	1.61	0.97	
Witherite	BaCO ₃	-4.74	-3.82	-3.77	-3.92	-4.10	-3.56	-2.85	-3.17	-4.95	-3.56	-5.06	-4.91	-3.93	-4.35	-4.09	-3.84	-3.75	-3.77	-2.91	-3.31	-4.26	-4.19	-5.05		
Fluorite	CaF ₂	-2.54	-2.30	-1.63	-2.39	-1.74	-2.06	-3.11	-2.08	-3.98	-1.47	-3.26	1.04	1.04	-2.70	-3.02	-1.69	-2.49	-1.94	-2.67	-3.03	-2.02	-3.67	1.14	0.99	
CoCO ₃	CoCO ₃	-4.24	-3.67	-3.20	-3.84	-3.95	-2.83	-3.14	-3.60	-4.40	-5.08	-4.96	-2.65	-4.30	-3.53	-3.73	-3.61	-3.57	-3.38	-3.73	-3.93	-3.93	-4.60	-4.99		
Cerrusite	PbCO ₃	-2.93	-2.61	-2.59	-2.76	-2.84	-2.55	-1.95	-2.32	-3.03			-3.64	-3.52	-2.68	-3.02	-2.66	-2.70	-2.61	-2.61	-2.62	-2.33	-1.10	-3.48	-3.54	
Carbon Dioxide	pCO ₂ (g) ^(b)	-1.83	-1.60	-0.95	-1.20	-1.04	-1.37	-0.98	-1.38	-1.86	-1.36	-1.45	-1.81	-1.80	-2.05	-1.54	-0.93	-1.17	-1.41	-1.25	-1.01	-1.34	-1.98	-1.58	-1.89	

Notes:
Saturation indices > -0.5 identified by bold type and grey shading
^(b) pCO₂(g) values presented at 10⁻⁴ atm



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APPENDIX C

Tier IV Monitored Natural Attenuation Performance Monitoring Plan



REPORT

Tier IV MNA Performance Monitoring Plan

Oak Grove Steam Electric Station - FGD Ponds

Robertson County, Texas

Submitted to:

Oak Grove Management Company LLC

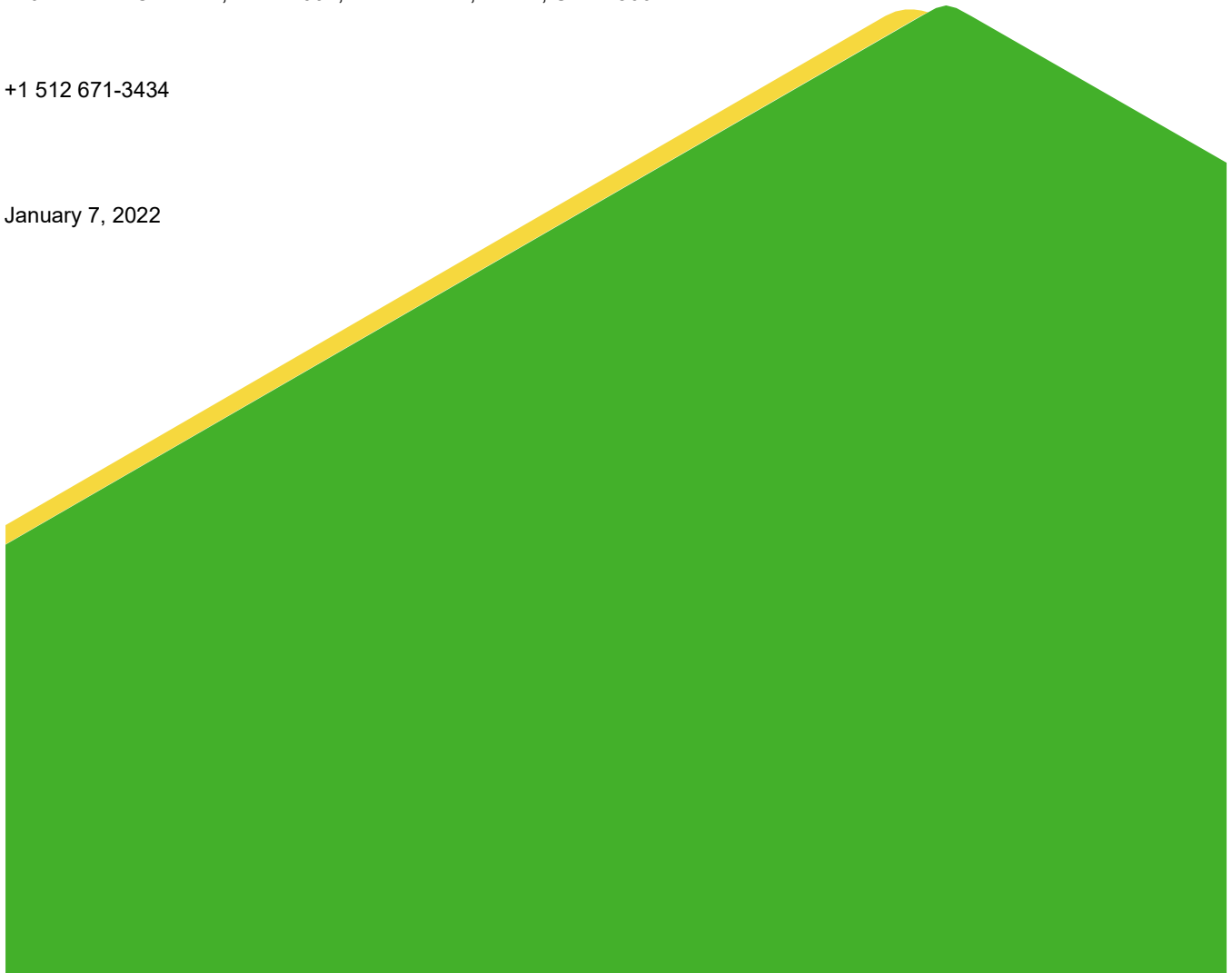
Submitted by:

Golder Associates Inc.

2201 Double Creek Dr, Suite 4004, Round Rock, Texas, USA 78664

+1 512 671-3434

January 7, 2022



Distribution List

Renee Collins, Luminant

David Mitchell, Luminant

Eric Chavers, Luminant

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FIGURES

Figure 1 Detailed Site Plan

1.0 INTRODUCTION

On behalf of Oak Grove Management Company (Luminant), Golder Associates, Inc. (Golder), Member of WSP, has prepared this Tier IV Monitored Natural Attenuation (MNA) Performance Monitoring Plan for the FGD-A Pond, FGD-B Pond, and FGD-C Pond (collectively referred to as the “FGD Ponds”) located at the Oak Grove Steam Electric Station (OGSES) in Robertson County, Texas (hereafter, the “Site”). Luminant manages coal combustion residuals (CCR) in the FGD Ponds, which are subject to applicable requirements of 40 Code of Federal Regulations (CFR) Part 257 Subpart D as amended (CCR Final Rule).

Statistically significant levels (SSLs) of cobalt and lithium above groundwater protection standards (GWPSs) were detected in the uppermost aquifer hydraulically downgradient of the FGD Ponds during 2018 assessment monitoring. In response to the 2018 cobalt and lithium SSLs, an Assessment of Corrective Measures (ACM) report was completed for the FGD Ponds in September 2019 as required by 40 CFR § 257.96 (Golder 2019). The ACM demonstrated that groundwater concentrations of cobalt and lithium were stable or decreasing at all wells and the extent of cobalt and lithium SSLs was delineated on-site (i.e., no offsite migration was indicated). An Alternate Source Demonstration (ASD) was completed in accordance with 40 CFR § 257.95(g)(3)(ii) in October 2020 (Golder 2020), which indicated that a source other than the FGD Ponds caused the lithium SSL. Lithium has therefore been eliminated as a constituent of concern at the FGD Ponds. The ACM was updated in May 2021 (Golder 2021a) to remove lithium from the list of constituents evaluated in the ACM.

As documented in the Remedy Selection Report for the FGD Ponds (Golder 2021b), MNA in conjunction with source control measures (i.e., retrofitting the liner in FGD-A Pond) was selected as the remedy to address cobalt SSLs at the Site. MNA refers to the reliance on natural attenuation processes (within the context of a carefully controlled and monitored approach) to achieve site-specific groundwater remediation objectives. MNA relies on a range of natural processes, including sorption, (co)precipitation, radioactive decay, dispersion, dilution, and abiotic degradation/transformation to achieve remediation objectives. A Tier I MNA evaluation report was completed in December 2019 (Golder 2019b) and a Tier II/III MNA evaluation report was completed in June 2021 (Golder 2021c). Based on the results of these MNA evaluations, the following was concluded regarding cobalt:

- Physical and chemical attenuation of cobalt is occurring at the Site. Cobalt levels are stable and the aquifer has adequate capacity to attenuate cobalt in a reasonable timeframe. Modeling indicates that cobalt attenuation will be efficient and stable in the long term. Cobalt in the CCR unit porewater is well below the level that is observed in groundwater, including when a periodic exceedance occurs in downgradient groundwater. Therefore, MNA would be effective in remediating cobalt in groundwater beneath and downgradient of the FGD Ponds.

The purpose of this Tier IV MNA Performance and Monitoring Plan is to describe the groundwater monitoring network, sampling and analysis methods, procedures for assessing long-term MNA effectiveness, and reporting for the MNA monitoring program.

2.0 SITE SETTING

The OGSES is located approximately 10 miles north of the city of Franklin in Robertson County, Texas. The FGD Ponds are located approximately 2,500 feet northwest of the OGSES power generation units (**Figure 1**). Construction of the OGSES began in the mid-1980s; however, plant construction was suspended in the mid-1980s prior to completion. OGSES construction resumed in 2007 and the plant was commissioned in 2010. The OGSES is expected to remain in operation for the foreseeable future, depending on future power demands.

2.1 Site Hydrogeology and CCR Monitoring Well Network

The OGSES is located in the outcrop area of the Eocene-aged Wilcox Group (Barnes 1970), which is divided into three formations in the region: the Calvert Bluff, Simsboro, and Hooper Formations (in order from youngest to oldest). The FGD Ponds are completed in the Calvert Bluff Formation, which consists of unconsolidated to moderately consolidated clay and silt, with various amounts of interbedded sand and lignite.

Based on soil borings completed at the Site, the geology near the FGD Ponds generally consists of an upper zone of relatively thick, interbedded sand and clay strata underlain by a lower zone of interbedded silty to clayey sand and well sorted sand (PBW 2017). The uppermost groundwater-bearing unit (GWBU) occurs under unconfined conditions within the shallow interbedded sand units of the Calvert Bluff Formation. Groundwater elevations have generally been highest southeast of the FGD Ponds and relatively flat in the vicinity of the FGD Ponds. Since CCR monitoring began in 2015, the inferred groundwater flow direction at the Site has been to the east-northeast toward Twin Oak Reservoir, which borders the FGD Pond area to the north and east.

The CCR groundwater monitoring well network at the FGD Ponds was established in 2015 using Site monitoring wells screened in the uppermost GWBU (FGD-1, FGD-2, FGD-3, FGD-4, FGD-5, FGD-6, FGD-8, FGD-11, and FGD-12). A map of the CCR groundwater monitoring network is provided on **Figure 1**.

3.0 CCR GROUNDWATER SAMPLING AND ANALYSIS PROGRAM

The CCR Rule establishes groundwater sampling and analysis criteria that are designed to create consistency and ensure that monitoring results provide accurate representations of groundwater quality at the CCR groundwater monitoring wells. The groundwater monitoring program at the FGD Ponds consists of a combination of detection monitoring of Appendix III constituents in accordance with 40 CFR §257.94 and assessment monitoring of Appendix IV constituents in accordance with 40 CFR §257.95. The current CCR groundwater monitoring program includes the sampling and analysis of cobalt (an Appendix IV constituent) and satisfies the sampling and analysis requirements of the MNA monitoring program.

4.0 MNA MONITORING PROGRAM

Routine groundwater monitoring is required to verify that the MNA component of the selected Site remedy is achieving the site-specific groundwater remediation objectives. The MNA monitoring well network will be the same as the CCR monitoring network, and includes the CCR wells listed in Section 2.1 and shown on **Figure 1**. The assessment monitoring program groundwater samples, which are collected semi-annually, will be used to assess the effectiveness of the MNA remedy in addressing SSLs observed at the Site.

4.1 MNA Groundwater Sampling Procedures

This section describes groundwater sampling and analysis procedures to comply with the requirements of 40 CFR §257.90 - §257.95 of the CCR Rule and to additionally satisfy requirements of the MNA monitoring program.

4.1.1 General Groundwater Sampling Procedures

Prior to collecting groundwater samples, each well is inspected for signs of damage to the well protective casing and well pad. Each field instrument is calibrated according to the manufacturer's instructions prior to use. Special care should be exercised to prevent contamination of the groundwater and extracted samples during the sampling activities. The primary way in which such contamination can occur is contact with improperly cleaned equipment. To prevent such contamination, all non-dedicated sampling equipment is thoroughly cleaned before and between use at different sampling locations.

4.1.2 Groundwater Level Measurements

Groundwater levels are measured prior to purging the wells. Using a pre-cleaned water level meter, the groundwater surface is measured from the casing datum to the nearest 0.01-foot. Total depth measurements should also be collected periodically to assess potential occlusion of the well screen.

4.1.3 Well Purging and Sampling

Well purging and sampling are conducted using either a submersible pump, peristaltic pump, or other similar device in accordance with standard low-flow sampling procedures. The sampler withdraws water in a manner that minimizes stress (drawdown) to the system to the extent practicable. When the pump intake is located within the screened interval, the water pumped is drawn in directly from the formation with little mixing of casing water or disturbance to the sampling zone. Thus, sample results are more representative of the constituents present in the groundwater than when pumping at higher rates.

Purging rates during sample collection are generally performed at 0.5 liters per minute (L/min) or less. Field parameters (pH, temperature, conductivity, turbidity, dissolved oxygen (DO), and oxidation-reduction potential (ORP)) are measured to evaluate when the well is adequately purged. pH, DO, and ORP are also considered key MNA parameters important for evaluating geochemical conditions in the groundwater-bearing unit. Turbidity in the samples should be minimized as much as possible by using minimal pumping rates, dedicated equipment whenever possible, and positioning the intake for the sample tubing or submersible pump off of the bottom of the well.

At least three field measurements should be taken during the course of purging the well. If the parameters have not stabilized at that time, field measurements and purging will continue until two consecutive readings have stabilized to within the following limits:

- Temperature: +/-1° C
- pH: +/-0.1 pH units
- Conductivity: +/-10%
- Turbidity: +/- 10%
- Dissolved oxygen: +/- 10%
- Oxidation-reduction potential: +/- 10%

Sample extraction is accomplished by using the pump that was previously used to purge the well. The sample bottle is filled directly from the pump line. The pumping rate and parameter measurements are recorded on groundwater sampling forms in the field. If a well goes dry during purging, sampling is performed after the well has sufficiently recharged to allow sample collection. Groundwater samples are not filtered in the field prior to collection in accordance with Section 257.93(i) of the CCR Rule.

4.1.4 Chain-of-Custody Control

Samples are collected in laboratory-supplied containers and chain-of-custody procedures are followed to establish a written record concerning sample movement between the sampling site and the testing laboratory. Each shipping container has a chain-of-custody form completed by the sampling personnel packing the samples. The chain-of-custody form for each container is completed and sealed in the shipping container.

4.2 MNA Analytical Procedures

The laboratory analytical methods are appropriate and commonly utilized U.S. Environmental Protection Agency (EPA) methodologies, or other similar standard methodologies. Typical methodologies used to analyze the MNA constituents are presented below:

- Cobalt by EPA Method SW6010/6020 (evaluated during each MNA sampling event).
- General geochemical parameters (evaluated periodically):
 - Major cations: calcium, magnesium, potassium, and sodium by EPA Method SW6010/6020;
 - Major anions: chloride and sulfate by Standard Method E300; and
 - Alkalinity (bicarbonate, carbonate, hydroxide, and total) by Standard Method M2320.

4.3 MNA Data Assessment

The MNA monitoring program is a long-term performance monitoring program designed to confirm concentration reductions and document trends due to attenuation mechanisms. The MNA program will assess the effectiveness of the remedy by:

- Evaluating whether cobalt concentrations are present in groundwater at SSLs above the GWPS.
- Evaluating long-term trends in cobalt concentrations in CCR wells where SSLs have been identified to demonstrate that the groundwater plume is stable or decreasing and not expanding; and
- Evaluating geochemical parameters measured in the field (e.g., pH, DO, and ORP) during each sampling event and periodically collecting the general geochemistry parameter data listed in Section 4.2 to assess changes to the general geochemical conditions of the aquifer.

Per 40 CFR §257.98(c), the selected remedy will be considered complete when: (1) The owner or operator of the CCR unit demonstrates compliance with the GWPS established under 40 CFR § 257.95(h) has been achieved at all points within the plume of contamination that lie beyond the groundwater monitoring well system established under 40 CFR § 257.91, (2) Compliance with the GWPS established under 40 CFR § 257.95(h) has been achieved by demonstrating that concentrations of constituents listed in appendix IV to this part have not exceeded the GWPSs for a period of three consecutive years using the statistical procedures and performance standards in 40 CFR § 257.93(f) and (g), and (3) All actions required to complete the remedy have been satisfied.

4.4 Reporting

A summary of the MNA data assessment will be included in the *Annual Groundwater Monitoring and Corrective Action Report* each year. The report will: 1) confirm whether the groundwater plume is stable, shrinking, or expanding; 2) contain data summaries including Appendix III and Appendix IV constituent concentrations and geochemical data summaries, and 3) evaluate the general effectiveness of attenuation processes with trend analysis and other statistical evaluations of the data, as appropriate.

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Signature Page

Golder Associates Inc.



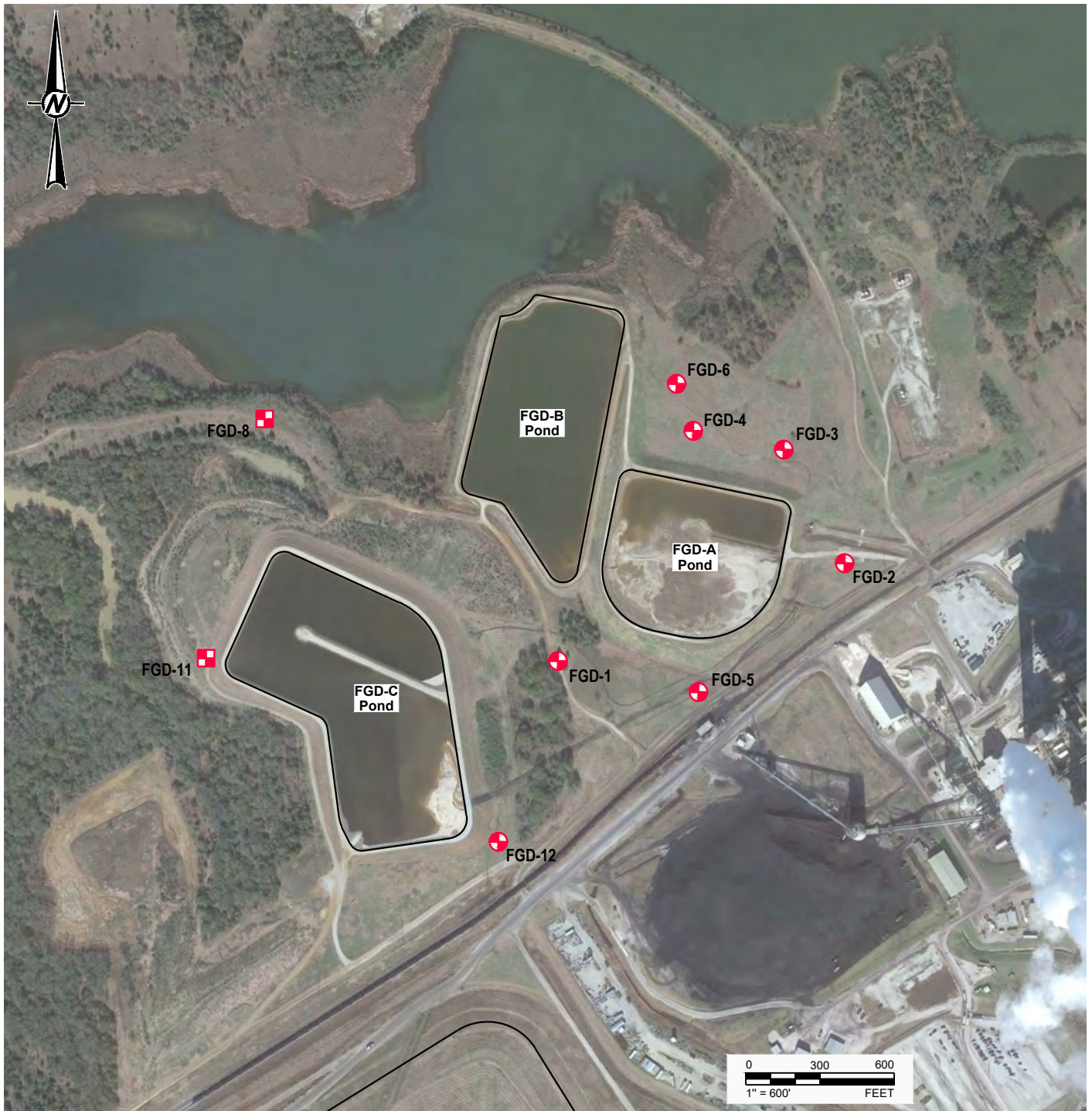
Roberta Russell
Senior Geologist





William Vienne
Senior Consulting Hydrogeologist

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LEGEND

-  DOWNGRADIENT CCR MONITORING WELL
-  BACKGROUND CCR MONITORING WELL

CLIENT
LUMINANT

PROJECT
**OAK GROVE STEAM ELECTRIC STATION
ROBERTSON COUNTY, TEXAS**

TITLE
DETAILED SITE PLAN - FGD POND AREA

CONSULTANT	YYYY-MM-DD	2020-01-23
	DESIGNED	AJD
	PREPARED	AJD
	REVIEWED	WVW
	APPROVED	WVW

REFERENCE(S)
BASE MAP TAKEN FROM GOOGLE EARTH, IMAGERY DATED 12/9/18.

PROJECT NO.
19134019

REV.
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FIGURE
1



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