Groundwater Monitoring Report, September 2020
Butler Green Industrial Landfill, Parcel 175(5)
(Permit No. 08-02)
McClellan, Anniston, Alabama

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LIST OF ABBREVIATIONS AND ACRONYMS

ADEM	Alabama Department of Environmental Management
ADEM Division 7 Regulations	*Alabama Department of Environmental Management Water Division Water Supply Program Division 335-7*
ADEM Division 13 Regulations	*Alabama Department of Environmental Management (ADEM) Land Division Solid Waste Program Division 13 Regulations*
AGMRG	*Alabama Groundwater Monitoring Reporting Guidance for Solid Waste Facilities*
ARBCA	*Alabama Risk-Based Corrective Action Guidance Manual*
Army	United States Department of the Army
BTOC	Below top of casing
CA	Cleanup agreement
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CUSUM	Shewhart Cumulative Sum
DO	Dissolved oxygen
DQS	Data Quality Summary
EPA	United States Environmental Protection Agency
ESCA	Environmental Services Cooperative Agreement
Fill Area Definition Report	*Draft Final Site Investigation and Fill Area Definition Report, Parcels 78(6), 79(6), 80(6), 81(5), 175(5), 230(7), 227(7), 126(7), 229(7), 231(7), 233(7), and 82(7), Fort McClellan, Calhoun County, Alabama, Revision 1*
Final EE/CA	*Final Revision 1 Engineering Evaluation/Cost Analysis Landfills and Fill Areas, Landfills 1, 2, 4, and Industrial Landfill, Parcels 78(6), 79(6), 81(5), 175(5), McClellan, Anniston, Alabama*
ft	feet
ft/ft	feet per foot
GWMR	Groundwater monitoring report
h	decision internal value
ICP	Inductively-coupled plasma
Industrial Landfill	Butler Green Industrial Landfill, Parcel 175(5)
IT	IT Corporation
k	reference value
Landfill 4	Landfill 4, Parcel 81(5)
McClellan	McClellan, Anniston, Alabama
MCL	Maximum contaminant level
MDA	McClellan Development Authority
MDL	Method detection limit
MES	Matrix Environmental Services, LLC
µg/L	micrograms per liter
ORP	Oxidation-reduction potential
Permit	Solid Waste Disposal Facility Permit No. 08-02
QAP	*Quality Assurance Plan*
RBTL	Risk-based target level
RL	Reporting limit
SCL	Shewhart control limit

Shaw	Shaw Environmental, Inc.
Site	Landfill 4, Parcel 81(5) and the Butler Green Industrial Landfill, 175(5)
SSI	Statistically Significant Increase
TCE	trichloroethene
TDS	Total dissolved solids
U.S.	United States
VOC	Volatile Organic Compound
Zi	standardized means

EXECUTIVE SUMMARY

Matrix Environmental Services, L.L.C. (MES) has prepared this groundwater monitoring report (GWMR) on behalf of the McClellan Development Authority (MDA) to meet the requirements of the Solid Waste Disposal Facility Permit No. 08-02 (permit) for the Butler Green Industrial Landfill, formerly the McClellan Industrial Landfill, Parcel 175(5) located within McClellan, Anniston, Alabama (McClellan), formerly known as Fort McClellan. Figure 1-1 shows a map of McClellan and Figure 1-2 shows the parcel location. As shown in Figure 1-2, the Butler Green Industrial Landfill, Parcel 175(5) (Industrial Landfill) is located in the northeast corner of Landfill 4, Parcel 81(5) (Landfill 4). The area was permitted as the McClellan Industrial Landfill (Permit No. 08-02). In July 2017, the MDA requested the Alabama Department of Environmental Management (ADEM) to change the name of the Industrial Landfill from the McClellan Industrial Landfill to the Butler Green Industrial Landfill. This request was granted in a letter from the Department dated August 23, 2017. In this GWMR Landfill 4 and the Industrial Landfill will collectively be referred to as "the Site".

This GWMR presents results related to the implementation of groundwater monitoring under the requirements of the permit and the *Alabama Department of Environmental Management Land Division Solid Waste Program Division 13 Regulations* (*ADEM Division 13 Regulations*) for solid waste facilities.

The September 2020 monitoring event was performed under the Assessment Monitoring program, described in Section 2.4.3. Groundwater samples were collected from five residuum monitoring wells at the Site on September 15, 2020. The groundwater samples were analyzed for the constituents listed in *Appendix I* of ADEM Admin. Code r 335-13-4-27 of the *ADEM Division 13 Regulations* (Table 2-2).

Groundwater elevations showed groundwater at the Site flowed in a north and northwesterly direction. The horizontal hydraulic gradients were low over the Site, ranging from 0.008 feet per foot (ft/ft) to 0.018 ft/ft, averaging 0.013 ft/ft Site-wide.

During the September 2020 monitoring event, volatile organic compounds chlorobenzene, cis-1,2-dichloroethene, and trichloroethene were detected in well LF4-MW4. All VOC detections are considered statistically significant increase (SSI) occurrences. VOC concentrations detected in LF4-MW4 were consistent with historical results and below maximum contaminant levels (MCLs).

To evaluate whether there were any SSI occurrences for metal constituents in groundwater at the Site, a statistical analysis was performed on the metals data using Shewhart Cumulative Sum (CUSUM) control charts in accordance with Code Rule 335-13-4-27, subparagraph (2) of the *ADEM Division 13 Regulations* and applicable United States Environmental Protection Agency (EPA) guidance. The statistical analysis showed SSI occurrences for cobalt and nickel in well LF4-MW1 and cobalt, nickel and zinc in well LF4-MW2. All results were consistent with historical data.

The concentrations of the SSI constituents were compared to the groundwater protection

standards for the Site. MCLs, as listed in the *Alabama Department of Environmental Management Water Division Water Supply Program Division 335-7 Regulations* (*ADEM Division 7 Regulations*), were used as the groundwater protection standards for the SSIs. Nickel, zinc, chlorobenzene, cis-1,2-dichloroethene, and trichloroethene concentrations were all below MCLs. Because there is no promulgated MCL for cobalt, the concentration for the cobalt SSI in wells LF4-MW1 and LF4-MW2 were compared to the cobalt concentration for background well LF4-MW5. The concentration for metal SSI constituent cobalt in LF4-MW1 (38 µg/L) and LF4-MW2 (130 µg/L) were greater than the background concentration (10.5 µg/L).

MDA recommends that natural attenuation and land use controls be allowed to continue, and the site continue to be monitored on a semi-annual basis under the assessment monitoring program.

1.0 INTRODUCTION

Matrix Environmental Services, L.L.C. (MES) has prepared this groundwater monitoring report (GWMR) on behalf of the McClellan Development Authority (MDA) to meet the requirements of the Solid Waste Disposal Facility Permit No. 08-02 (permit) for the Butler Green Industrial Landfill, formerly the McClellan Industrial Landfill, Parcel 175(5) located within McClellan, Anniston, Alabama (McClellan), formerly known as Fort McClellan. Figure 1-1 shows a map of McClellan and Figure 1-2 shows the parcel location. As shown in Figure 1-2, the Butler Green Industrial Landfill, Parcel 175(5) (Industrial Landfill) is located in the northeast corner of Landfill 4, Parcel 81(5) (Landfill 4). The area was permitted as the McClellan Industrial Landfill (Permit No. 08-02). In July 2017, the MDA requested the Alabama Department of Environmental Management (ADEM) to change the name of the Industrial Landfill from the McClellan Industrial Landfill to the Butler Green Industrial Landfill. This request was granted in a letter from the Department dated August 23, 2017(ADEM, 2017). In this GWMR Landfill 4 and the Industrial Landfill will collectively be referred to as "the Site".

This GWMR presents results related to the implementation of groundwater monitoring under the requirements of the permit and the *Alabama Department of Environmental Management (ADEM) Land Division Solid Waste Program Division 13 Regulations* (*ADEM Division 13 Regulations*) for solid waste facilities.

1.1 Purpose and Objectives

The purpose of this GWMR is to describe the activities performed and present the results of the September 2020 groundwater monitoring event. The objectives of the September 2020 groundwater monitoring event and this GWMR include the following:

- Summarize data from previous monitoring events and present analytical results for the September 2020 monitoring event.
- Evaluate the groundwater analytical data and demonstrate compliance with the permit and the *ADEM Division 13 Regulations*.

1.2 Report Organization

Section 2.0 of this report presents a summary of the background information including the parcel location, description, and physical characteristics. Section 3.0 presents a summary of the September 2020 sampling activities. Section 4.0 describes the results of the September 2020 sampling activities. Section 5.0 presents the evaluation of the groundwater data. Section 6.0 presents the conclusions and recommendations. Section 7.0 provides the references cited in this report. Tables and figures follow the text and the appendices are organized as follow:

Appendix A Groundwater Sample Collection Logs, September 2020
Appendix B Chains-of-Custody, September 2020
Appendix C Data Quality Summary and Laboratory Report
Appendix D Statistical Evaluation of Metals Data, September 2020

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2.0 BACKGROUND

This section provides background information about the Site. Parts of this section are adapted from the *Final Revision 1 Engineering Evaluation/Cost Analysis Landfills and Fill Areas, Landfills 1, 2, 4, and Industrial Landfill, Parcels 78(6), 79(6), 81(5), 175(5), McClellan, Anniston, Alabama* (*Final EE/CA*) (MES, 2006) and the *Draft Final Site Investigation and Fill Area Definition Report, Parcels 78(6), 79(6), 80(6), 81(5), 175(5), 230(7), 227(7), 126(7), 229(7), 231(7), 233(7), and 82(7), Fort McClellan, Calhoun County, Alabama, Revision 1* (*Fill Area Definition Report*) (IT Corporation [IT], 2002a).

2.1 Site Location and Description

Landfill 4 operated as the main sanitary landfill for McClellan from 1967 to 1994. The unlined landfill used trench and fill as the method of disposal and was not equipped with a leachate collection system. The landfill reportedly received the McClellan household garbage, construction and demolition debris, oil-contaminated soil, and dead animals. One pound of waste Diazinon dust (pesticide) was also reportedly disposed at Landfill 4 and the Industrial Landfill (IT, 2002).

The landfill was closed in April 1994 because of changes in the permit requirements governing sanitary landfills, including that sanitary landfills be lined. A temporary permit was issued to the Army in 1993 to dispose of industrial and construction debris at the landfill. A permanent industrial landfill permit allowing the disposal of waste with a 30-ton per day limit in a previously unused section of the landfill property was issued in October 1995. This permit was transferred from the Army to the MDA (MES, 2006). The permit was renewed by the MDA on January 5, 2016, effective January 9, 2016, and will expire on January 8, 2021. The revised permit for the Industrial Landfill allows 3,204 cubic yards per day of disposal. The total permitted disposal area for the Industrial Landfill is approximately 53 acres. In the near future, the MDA plans to formally cap the remaining approximately 12 acres that are still active.

2.2 Site Characterization

This subsection summarizes the physical setting, geology and hydrogeology at the Site.

2.2.1 Physical Setting

With the exception of the Industrial Landfill, Landfill 4 is covered with an engineered, low-permeability clay cover that met the landfill closure requirements at the time of closure. Landfill 4 is devoid of natural vegetation, but is currently covered with seeded grasses and vegetation. A concrete-lined drainage swale runs from west to east across most of the Site. The Site is bound on the north by mixed coniferous/deciduous forest and the Fill Area Northwest of Reilly Airfield, Parcel 229(7) (FANWR), on the east by mixed coniferous/deciduous forest, on the south by a soil borrow area, on the west by a road, and on the northwest by Landfill 3, Parcel 80(6) (Landfill 3). Much of the perimeter of the Site is enclosed by chain-link fence that restricts access to the Site (MES, 2006).

Surface water generally follows the sloping surface topography collecting in drainage ditches on the south, east and north sides of the landfill before converging into an unnamed creek that flows toward the northwest. Surface water is also diverted through a concrete ditch that runs through the center of the landfill toward the east and converging into the unnamed creek.

2.2.2 Site Geology and Hydrogeology

The bedrock mapped beneath the Site is the Cambrian Conasauga Formation. The Cambrian Conasauga Formation is comprised of dark gray, finely to coarsely crystalline medium- to thick-bedded dolomite with minor shale and chert (IT, 2002). A geologic map of the Site is presented in Figure 2-1.

Underlying soils at the Site include the Cumberland loam, Purdy silt loam, Tyler silt loam, and the Anniston Gravelly loam. These soils were derived mainly from limestone, shale, and sandstone and are classified generally as silts to silty and clayey sands. The color of these soils are generally brown to dark brown with lesser amount of reddish-brown, grayish-brown, and yellowish-brown (IT, 2002).

The topography of the combined Landfill 4 and Industrial Landfill area is relatively flat of which a portion is within the floodplain of Cave Creek (Figure 2-2). Groundwater flow has generally been to the northwest and north (MES, 2006). Static groundwater levels measured during the historical monitoring events at the Site are presented in Table 4-1. See Section 4.1 for further details concerning groundwater elevations, groundwater flow, and gradients at the Site.

2.3 Groundwater Monitoring System

Five monitoring wells (LF4-MW1, LF4-MW2, LF4-MW3, LF4-MW4, and LF4-MW5) were installed at the Site in 1994 and completed in the residuum zone, i.e., first zone of saturation. None of the borings for these wells penetrated fill material (IT, 2002). A monitoring well construction summary is included in Table 2-1. Figure 1-2 shows the well locations.

Well LF4-MW5 is the upgradient background monitoring well used for the detection of representative background groundwater quality at the Site. Wells LF4-MW1, LF4-MW2, LF4-MW3, and LF4-MW4 are the downgradient monitoring wells used for the detection of representative groundwater quality at the Site.

2.4 Groundwater Monitoring History

The groundwater monitoring history of the Site including detection monitoring and assessment monitoring sampling events are summarized in this section.

2.4.1 Previous Monitoring Events

Semi-annual groundwater monitoring was conducted at the Site by the Army, pursuant to the permit, from March 2000 through September 2003. The MDA assumed the semi-annual groundwater monitoring at the Site in March 2004 and has continued the long-term groundwater

monitoring to the present. The MDA conducted a detection monitoring program at the Site from March 2004 through September 2009 and an assessment monitoring program from March 2010 to the present. A summary of the historical detected volatile organic compound (VOC) and metals data are presented in Tables 4-4 and 4-5 (see Section 4.4 for details concerning Tables 4-4 and 4-5). A summary of the Detection Monitoring and Assessment Monitoring programs performed at the Site is described below.

2.4.2 Detection Monitoring Program

During the detection monitoring events from March 2004 through September 2009, groundwater samples were collected at wells LF4-MW1, LF4-MW2, LF4-MW3, LF4-MW4, and LF4-MW5 and analyzed for the constituents listed in *Appendix I* of ADEM Admin. Code r 335-13-4-27 of the *ADEM Division 13 Regulations* (ADEM, 2016). The *Appendix I* constituents are shown in Table 2-2 of this report.

The detection monitoring data at the Site demonstrated compliance with the permit and *ADEM Division 13 Regulations* until the March 2009 sampling event when a SSI occurred for zinc in downgradient well LF4-MW2. Please see Section 5.1 for details concerning the statistical analysis performed on the semi-annual groundwater monitoring results collected. Pursuant to subparagraph (2)(n) of Rule 335-13-4-27, a letter was sent by the MDA informing ADEM of the SSI. Because this was the first SSI occurrence, and because the groundwater sample with the SSI showed a high level of turbidity (145 NTU), the detection monitoring program continued with the September 2009 monitoring event to confirm whether the SSI from the March 2009 monitoring event was an isolated occurrence, a result of an error in sampling or analysis, or due to natural variation in groundwater quality. The September 2009 sampling round confirmed the SSI occurrence of zinc in downgradient well LF4-MW2. In accordance with Rule 335-13-4-27 subparagraph (3)(c) of the *ADEM Division 13 Regulations*, an assessment monitoring program was initiated pursuant to subparagraphs (4)(a) through (4)(j).

2.4.3 Assessment Monitoring Program

An Assessment Monitoring program was initiated during the March 2010 groundwater monitoring event and conducted in accordance with the permit and *ADEM Division 13 Regulations*, which continues to the present.

Pursuant to subparagraph (4)(b)1 of the *ADEM Division 13 Regulations*, during an Assessment Monitoring program groundwater must be sampled and analyzed for the constituents listed in *Appendix II* of the *ADEM Division 13 Regulations*. However, the Industrial Landfill is a nonhazardous solid waste disposal facility that allows for the disposal of only nonhazardous industrial wastes and construction/demolition wastes, pursuant to the permit (Permit No. 08-02). No additional constituents from the *Appendix II* list that were not already on the *Appendix I* list were detected during previous groundwater sampling events performed by the Army and the MDA, as indicated in the *Final EE/CA* (MES, 2006). Therefore, during the assessment monitoring March 2010 and September 2010 events at the Industrial Landfill, the *Appendix I* list of constituents were sampled and analyzed in lieu of the *Appendix II* list, as allowed by subparagraph (4)(b)2 of the *ADEM Division 13 Regulations*.

For the March 2010 and September 2010 groundwater monitoring events, metal constituents cobalt, nickel, and zinc were determined to be SSIs in well LF4-MW2. Although there were some VOC detections, no organic constituents were considered to be SSIs during any of the previous monitoring events at the Site. Because historical statistical analyses showed SSIs for only metal constituents, only metals were sampled and analyzed during the March 2011 monitoring event. The concentrations of constituents detected in groundwater samples collected during past and current monitoring events are presented in Tables 4-4 (VOCs) and 4-5 (metals).

In March 2011 ADEM issued the *Alabama Groundwater Monitoring Reporting Guidance for Solid Waste Facilities* (*AGMRG*) (ADEM, 2011) to be used in conjunction with the *ADEM Division 13 Regulations*. Subparagraph 2.2.10.3.7 of the *AGMRG* stated "the detection of any organic constituents is considered an SSI". Because historical sampling events showed metal and VOC detections in groundwater at the Site, in a letter dated August 5, 2011 the MDA proposed to analyze groundwater samples collected at the Site under the Assessment Monitoring program for the *Appendix I* list of constituents (Table 2-2), which include metals and VOCs, starting with the September 2011 monitoring event. The MDA received concurrence from ADEM in a letter dated August 16, 2011 to use the *Appendix I* list of constituents (Table 2-2) for the Assessment Monitoring program at the Site.

In a letter dated September 13, 2016, ADEM issued comments on the March 2016 GWMR requesting MDA conduct an assessment of corrective measures (ACM) in accordance with ADEM Admin. Code r. 335-13-4-.27(4)(g) related to the detection of cobalt in LF4-MW2 and trichloroethene in LF4-MW4 and include surface water samples from the stream downgradient of LF4-MW4. In December 2016, MDA responded to ADEM comments and explained the stream is an ephemeral feature that channels storm water around the site and does not influence groundwater flow to which ADEM concurred on April 20, 2017. MDA also collected three surface water samples in January 2017 for *Appendix I* constituents and all were non-detect for chlorinated VOCs. Cobalt was detected at 11.6 µg/L which is well below the site-wide surface water risk-based target level (RBTL) of 30 µg/L. These findings were provided to ADEM in a letter dated February 8, 2017.

In the December 2016 response to ADEM comments, MDA proposed an alternate groundwater protection standard (GWPS) for cobalt of 5400 µg/L based on a site-specific risk-based evaluation of exposure pathways. ADEM responded in a letter dated April 20, 2017 that the proposed 5400 ug/L GWPS was not applicable and cobalt concentration should be compared to the highest detected concentration in background well LF4-MW5. The highest detected cobalt concentration in LF4-MW5 is 10.5 µg/L sampled on September 21, 2010. ADEM also requested that MDA comply with ADEM Admin. Code r. 335-13-4-.27(4)(g) and conduct an ACM. In June 2017, MDA responded to ADEM and summarized the ACM conducted to date and existing land use controls and proposed that natural attenuation be allowed to continue and the site continue to be monitored on a semi-annual basis under the assessment monitoring program. ADEM concurred with MDA's proposal in June 2017.

3.0 SUMMARY OF SEPTEMBER 2020 ACTIVITIES

During the September 2020 monitoring event, groundwater samples were collected and analyzed for the parameters on the *Appendix I* of ADEM Admin. Code r 335-13-4-27 of the *ADEM Division 13 Regulations* (Table 2-2). The September 2020 monitoring event was performed under the Assessment Monitoring program, discussed in Section 2.4.3.

To meet the recommended actions outlined in the permit, *ADEM Division 13 Regulations,* and applicable United States Environmental Protection Agency (EPA) guidance, the following activities were performed during the September 2020 monitoring event:

- Measured groundwater levels in the monitoring wells.
- Collected groundwater samples from five monitoring wells.
- Analyzed the groundwater samples for the constituents listed in *Appendix I* of Code Rule 335-13-4-27 of the *ADEM Division 13 Regulations* (Table 2-2) by Methods SW8260B (VOCs), SW6020B (Inductively Coupled Plasma-Atomic Emission Spectrometry [ICP-MS metals], and SW7470A (mercury).
- Performed statistical analysis on the metals results (described in Section 5.0).

3.1 Groundwater Sampling

To address the issues with high turbidity concentrations in the groundwater at the Site, the groundwater samples are collected from each well using the sampling technique described below.

- The day before groundwater samples are to be collected, water levels are measured to the nearest hundredth of a foot using a Solinst™ water level indicator and recorded. Total well depths are also measured and recorded.
- After the water levels are taken, the wells are purged and allowed to recharge overnight, approximately 24 hours before sampling.
- The following day, groundwater levels, chemical and physical field screening parameters including pH, conductivity, dissolved oxygen (DO), oxidation-reduction potential (ORP), total dissolved solids (TDS), turbidity, and temperature are measured using a YSI 556 MPS Water Quality Meter. The field parameters are measured 24 hours after the wells are purged and before sampling.
- Using disposable bailers, groundwater samples are collected directly into laboratory-supplied sample bottles with the appropriate preservatives.

Groundwater samples were collected on September 15, 2020 from five residuum monitoring wells, LF4-MW1 through LF4-MW5. The sample containers were labeled, placed in a chilled cooler and shipped under chain-of-custody procedures to TestAmerica in Savannah, Georgia. The groundwater samples for monitoring wells LF4-MW1 through LF4-MW5 were analyzed for VOCs and metals. Figure 1-2 shows the groundwater sampling locations. The groundwater sample collection logs are provided in Appendix A and the chain-of-custody forms for the groundwater samples collected during the September 2020 monitoring event are provided in Appendix B.

3.2 Data Quality Review

MES reviewed the analytical data for the groundwater samples collected during the September 2020 monitoring event. The data quality review was performed in accordance with the *Quality Assurance Plan (QAP)* in *Appendix A* of the *Final Installation-Wide Sampling and Analysis Plan* (MES, 2013) to assess compliance with quality assurance objectives, and to assess hard copy and electronic deliverable consistency and integrity. Appendix C presents the analytical data collected during the September 2020 monitoring event. The Data Quality Summary (DQS) for the September 2020 groundwater samples is included in Appendix C. The laboratory data forms showing the validated results are also included in Appendix C.

4.0 RESULTS OF SEPTEMBER 2020 GROUNDWATER SAMPLING

This section discusses the results of the September 2020 groundwater monitoring event at the Site.

4.1 Groundwater Levels

Groundwater elevations measured during the September 2020 groundwater monitoring event are presented in Table 4-1. Groundwater elevations from previous monitoring events are also shown in Table 4-1. Figure 4-1 shows groundwater elevations and potentiometric surface contours for the residuum monitoring wells based on the September 2020 water level measurements. As indicated in Figure 4-1, groundwater flowed in a north and northwesterly direction.

To further aid in assessing groundwater flow at the Site, horizontal hydraulic gradients were calculated using the groundwater data collected during the September 2020 monitoring event, presented in Table 4-2. The horizontal hydraulic gradients were low over the Site, ranging from 0.008 feet per foot (ft/ft) to 0.018 ft/ft. Site-wide horizontal hydraulic gradients averaged 0.013 ft/ft. The highest horizontal hydraulic gradient occurred between wells LF4-MW4 and LF4-MW3 in the north-eastern portion of the Site.

Based on the groundwater flow direction (Figure 4-1) and horizontal hydraulic gradients (Table 4-2), the groundwater monitoring well network at the Site is functioning as intended and is sufficient for determining the facility's impact on the quality of groundwater in the first zone of saturation at the Site.

4.2 Analytical Data and Data Quality Review

The analytical data for the September 2020 samples is provided in Appendix C. Groundwater samples were analyzed for VOCs and metals. MES reviewed the analytical data in accordance with the *QAP* (MES, 2013). Based on the data quality review, the analytical data generated for these monitoring events are adequate to fulfill program objectives and are suitable for preparation of this report. A more detailed discussion of the analytical results can be found in the DQS provided in Appendix C.

4.3 Groundwater Field Parameter Results

Field screening parameters, including pH, conductivity, DO, ORP, TDS, turbidity, and temperature, and other sampling data (e.g., groundwater depths, well depths, sampling conditions, etc.) were recorded on the Groundwater Sampling Logs included in Appendix A. The field parameters for the groundwater samples are summarized in Table 4-3.

4.4 Summary of Groundwater Analytical Results

Groundwater samples were collected from five monitoring wells during the September 2020 monitoring event and analyzed for VOCs and metals. This section describes the analytical results for the groundwater samples.

4.4.1 Volatile Organic Compounds Analytical Results

Chlorobenzene, cis-1,2-dichloroethene, and trichloroethene were detected in well LF4-MW4 during the September 2020 sampling event. The analytical results for VOCs including historical data are presented in Table 4-4. Review of the current and historical analytical results indicate concentrations detected were all within the range of previous detections for LF4-MW4.

4.4.2 Metals Analytical Results

The analytical results for metals in the groundwater samples during the September 2020 monitoring event are presented in Table 4-5. Ten of the 16 target metals, arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, lead, nickel, and zinc were detected in groundwater samples from at least one of the monitoring wells during September 2020 monitoring event. Antimony, mercury, selenium, silver, thallium, and vanadium were not detected during the September 2020 monitoring event. Zinc was higher than historical data in LF-MW5, the sample was reanalyzed confirming the result. All reporting limits (RLs) and method detection limits (MDLs) were below the MCL. Table C6-1 compares RLs and MDLs to MCLs.

To simplify the presentation of historical analytical results and facilitate identification of downward or upward trends in metal concentrations, analytical results from previous sampling events are also presented in Table 4-5. Further details concerning trends in metal concentrations over time are described in Section 5.0.

5.0 EVALUATION OF GROUNDWATER ANALYTICAL DATA

The analytical results for groundwater collected during the September 2020 groundwater monitoring event were evaluated to determine whether there was an SSI over background groundwater quality at the Site.

5.1 Evaluation of Groundwater VOCs Quality Data

Detections of organic constituents are considered SSIs, as per the *Alabama Groundwater Monitoring Report Guidance for Solid Waste Facilities* (2011). During the September 2020 groundwater sampling event, chlorobenzene, cis-1,2-dichloroethene, and trichloroethene were detected. All VOCs detected are considered SSIs. Concentrations of chlorobenzene, cis-1,2-dichloroethene, and trichloroethene were below MCLs.

5.2 Evaluation of Groundwater Metals Quality Data

To evaluate whether there were any SSI occurrences for metal constituents in groundwater at the Site a statistical analysis was performed on the metals data using control charts in accordance with ADEM Admin. Code r 335-13-4-27, subparagraph (2) of the *ADEM Division 13 Regulations* and applicable United States Environmental Protection Agency (EPA) guidance.

Control charts are used to monitor the inherent statistical variation of the data collected within a single well. Because intrawell comparisons involve a single well, significant changes in the level of contamination in a well cannot be attributed to spatial and/or hydrogeological differences between wells. Intrawell control charts employ historical measurements from a compliance point well as background. Control charts are mostly appropriate for analytes with a reasonably high detection frequency in monitoring wells. Control charts allow data from a well to be viewed graphically over time (EPA, 2009).

The combined Shewhart Cumulative Sums (CUSUMs) control charts assesses two statistical quantities at every sampling event, both the new individual measurement and the CUSUM of past and current measurements. The Shewhart portion compares compliance measurements against a background limit. The CUSUM portion sequentially analyzes each new measurement with prior compliance data. Both portions are used to assess the similarity of compliance data to background. The baseline parameters for the chart, estimates of the mean and standard deviation, are obtained from historical background data collected from the specific compliance well. These baseline measurements characterize the expected background concentrations at compliance wells. As future compliance observations are collected, the baseline parameters are used to standardize the newly gathered data (EPA, 2009).

The combined CUSUM control chart is declared out-of-control in one of two ways. First, the standardized means (Z_i) computed at each sampling period may cross the Shewhart control limit (SCL). Such a change signifies a rapid increase in well concentration levels among the most recent sample data. Second, the CUSUM of the standardized means (Z_i) may become too large, crossing the "decision internal value" (h). Crossing the h threshold can mean either a sudden rise in concentration levels or a gradual increase over a longer span of time. A gradual increase or

trend is particularly indicated if the CUSUM crosses its threshold but the standardized mean Z_i does not. The reason for this is that several consecutive small increases in Z_i will not trigger the SCL threshold but may trigger the CUSUM threshold. As such, the control chart can indicate the onset of either sudden or gradual contamination at the compliance point. Three parameters are necessary to construct a CUSUM control chart, a reference value (k), h, and SCL. The combination of k = 1, h = 5 and SCL = 4.5 was determined to be the most appropriate for the application of CUSUM control charts for groundwater monitoring (EPA, 2009).

The CUSUM control charts are constructed with respect to a log scale. The lognormal distribution is a frequently-used model in groundwater statistics and is generally more appropriate as a default statistical model than the normal distribution (EPA, 2009). The log-mean and the log-standard deviation represent the sample mean and standard deviation computed using log-transformed values instead of the raw measurements.

5.2.1 Metals Background Groundwater Quality Data

For the statistical analyses performed on the March 2004 to March 2007 semi-annual groundwater sampling events, the results from the March 2000 to the September 2003 sampling events were used for the background data. However, several metals had only one or no background results out of the eight sampling events from March 2000 to September 2003. As of the September 2007 groundwater sampling event, four additional metals (cobalt, copper, nickel, and zinc) had 9 sampling events and at least one groundwater sample with nondetects less than 50%. However, these metals only had one background result out of the eight sampling events from March 2000 to September 2003. ADEM Admin. Code r 335-13-4-27, subparagraphs (3)(b) and (4)(b) of the *ADEM Division 13 Regulations* and the permit requires that a minimum of four independent samples from each well be used to establish background. In addition, the *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities: Unified Guidance* (EPA, 2009) recommends that if control charts remain "in control" for a long period of time the baseline parameters should be updated to include more recent background data.

A two-sample t-test was performed comparing the March 2004 through September 2005 data with the previous background data set from March 2000 through September 2003 data to ensure there were no significant differences at the 95 percent confidence level between the two data sets. Details of the t-test are presented in the *Statistical Analysis of Semi-Annual Groundwater Sampling Results September 2008 Groundwater Sampling Event, Fort McClellan Industrial Landfill (Permit No. 08-02), Ft. McClellan, Anniston, Calhoun County, Alabama* (MDA, 2008). The t-tests showed there were no significant differences at the 95 percent confidence level between the March 2004 to September 2005 data set and the March 2000 to September 2003 data set. Therefore, the data from the twelve sampling events from March 2000 to September 2005 were used for the background during the statistical analysis of metal constituents in wells that had 9 or more sampling events and percentages of nondetects less than 50%, starting with the September 2007 sampling event and continuing to the present.

5.2.2 September 2020 Metals Groundwater Quality Data

Statistical analysis was performed for the September 2020 groundwater metals data using

CUSUM control charts in accordance with ADEM Admin. Code r 335-13-4-27, subparagraph (2) of the *ADEM Division 13 Regulations* and applicable EPA guidance. Because control charts must be constructed from a data set large enough to characterize the behavior of a specific well and because control charts do not efficiently handle data sets with a significant fraction of nondetects (EPA, 2009), control charts were developed for those metal constituents in wells that had nine (9) or more sampling events and the percentage of nondetects was less than 50%. The results of the statistical analysis performed for the September 2020 groundwater metals data are provided in Appendix D. Attachment D1 summarizes the number of analyses and percentage of nondetects. Attachment D2 provides the calculations for the CUSUMs and Attachment D3 provides the CUSUM control charts for the statistical analyses.

The CUSUMs for cobalt (12.29) and nickel (25.66) in well LF4-MW1; and cobalt (37.37), nickel (28.83), and zinc (104.97) in well LF4-MW2 were above the threshold value of 5 and are therefore considered SSI occurrences.

5.3 SSI Occurrences in Groundwater for the September 2020 Sampling Event

Table 5-1 presents a summary of the SSI occurrences for the September 2020 groundwater sampling event. The concentrations of the SSI constituents were compared to the groundwater protection standards (Table 5-1). In accordance with Code Rule 335-13-4-27, subparagraph (4)(h), the maximum contaminant levels (MCLs) were used as the groundwater protection standards for the SSIs. For constituents for which MCLs have not been promulgated (cobalt), the background well concentrations were used as the groundwater protection standards, as per ADEM Admin. Code r 335-13-4-27, subparagraph (4)(h)2.

SSI occurrences of nickel, zinc, chlorobenzene, cis-1,2-dichloroethene, and trichloroethene were all below the groundwater protection standards or MCLs. The concentrations for metal SSI constituent cobalt (38 µg/L) in LF4-MW1 and (130 µg/L) in well LF4-MW2, were greater than the background concentration in LF4-MW5 (10.5 µg/L).

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6.0 SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

This section summarizes the activities performed and the results of the September 2020 monitoring event, and provides conclusions and recommendations based on the results of the groundwater monitoring activities.

6.1 Summary of Activities and Results

The September 2020 monitoring event was performed under the Assessment Monitoring program. Groundwater samples were collected from five residuum monitoring wells at the Site on September 15, 2020. The groundwater samples were analyzed for the constituents listed in *Appendix I* of ADEM Admin. Code r 335-13-4-27 of the *ADEM Division 13 Regulations* (Table 2-2).

Groundwater elevations showed groundwater at the Site flowed in a north and northwesterly direction. The horizontal hydraulic gradients were low over the Site, ranging from 0.008 ft/ft to 0.018 ft/ft.

During the September 2020 monitoring event, three VOCs in well LF4-MW4 were detected and considered SSIs. To evaluate whether there were any SSI occurrences for metal constituents in groundwater at the Site a statistical analysis was performed on the metals data using CUSUM control charts in accordance with ADEM Admin. Code r 335-13-4-27, subparagraph (2) of the *ADEM Division 13 Regulations* and applicable EPA guidance. The statistical analysis showed SSI occurrences for cobalt and nickel in well LF4-MW1; and cobalt, nickel and zinc in well LF4-MW2 during September 2020 groundwater monitoring event. Concentrations were consistent with historical data.

The concentrations of the SSI constituents were compared to the groundwater protection standards for the Site (Table 5-1). MCLs, as listed in the *ADEM Division 7 Regulations*, were used as the groundwater protection standards for the SSIs. Because there is no promulgated MCL for cobalt, the concentration for the cobalt SSI in wells were compared to the cobalt concentration for background well LF4-MW5.

6.2 Conclusions and Recommendations

The concentrations for metal SSI constituent cobalt (38 µg/L) in LF4-MW1 and (130 µg/L) in well LF4-MW2, were greater than the groundwater protection standard or background concentration (10.5 µg/L). All other SSI constituents were below groundwater protection standards. MDA recommends that natural attenuation and land use controls be allowed to continue, and the site continue to be monitored on a semi-annual basis under the assessment monitoring program.

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7.0 REFERENCES

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8.0 Professional Groundwater Scientist Certification

I certify that I currently hold an active license in the State of Alabama and the groundwater monitoring report activities undertaken by Matrix Environmental Services, LLC. as described in this report were performed in general accordance with the requirements of the Solid Waste Disposal Facility Permit No. 08-02 and Alabama Department of Environmental Management Land Division Solid Waste Program Division 13 Regulations (ADEM Division 13 Regulations).

Richard Lee Satkin
Alabama P.G. # 965

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TABLES

Table 2-1. Monitoring Well Construction Summary
Industrial Landfill, Parcel 175(5)
McClellan, Anniston, Alabama

Well ID	Permit Design	Northing	Easting	Ground Elevation (ft msl)	TOC Elevation (ft msl)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	Well Depth (ft bgs)	Well Material
LF4-MW1	CMP	1180041.4	669625.24	737.13	739.79	15	40	40	4" ID PVC
LF4-MW2	CMP	1180244.71	670492.08	738.5	738.5	6	36	36	4" ID PVC
LF4-MW3	CMP	1180197.72	671013.48	739.78	739.78	11	31	31	4" ID PVC
LF4-MW4	CMP	1179683.62	671522.79	743.35	743.35	5	25	25	4" ID PVC
LF4-MW5	BKG	1178445.5	669747.69	753.32	753.32	12	32	32	4" ID PVC

Notes:
bgs = below ground surface
BKG = Background well
CMP = Compliance/downgradient well
ft = feet
msl = Mean sea level
NM = Not Measured
TOC = Top of Casing
4" ID = 4-inch inside diameter
PVC = polyvinyl chloride

Table 2-2. Analyte List
Industrial Landfill, Parcel 175(5)
McClellan, Anniston, Alabama

Method	Parameters	CAS No.
Volatile Organic Compounds		
SW8260B	1,1,1,2-Tetrachloroethane	630-20-6
SW8260B	1,1,1-Trichloroethane	71-55-6
SW8260B	1,1,2,2-Tetrachloroethane	79-34-5
SW8260B	1,1,2-Trichloroethane	79-00-5
SW8260B	1,1-Dichloroethane	75-34-3
SW8260B	1,1-Dichloroethene	75-35-4
SW8260B	1,2,3-Trichloropropane	96-18-4
SW8260B	1,2-Dibromo-3-Chloropropane	96-12-8
SW8260B	1,2-Dibromoethane	106-93-4
SW8260B	1,2-Dichlorobenzene	95-50-1
SW8260B	1,2-Dichloroethane	107-06-2
SW8260B	1,2-Dichloropropane	78-87-5
SW8260B	1,4-Dichlorobenzene	106-46-7
SW8260B	2-Butanone (MEK)	78-93-3
SW8260B	2-Hexanone	591-78-6
SW8260B	4-Methyl-2-Pentanone (MIBK)	108-10-1
SW8260B	Acetone	67-64-1
SW8260B	Acrylonitrile	107-13-1
SW8260B	Benzene	71-43-2
SW8260B	Bromochloromethane	74-97-5
SW8260B	Bromodichloromethane	75-27-4
SW8260B	Bromoform	75-25-2
SW8260B	Bromomethane	74-83-9
SW8260B	Carbon Disulfide	75-15-0
SW8260B	Carbon Tetrachloride	56-23-5
SW8260B	Chlorobenzene	108-90-7
SW8260B	Chloroethane	75-00-3
SW8260B	Chloroform	67-66-3
SW8260B	Chloromethane	74-87-3
SW8260B	Cis-1,2-Dichloroethene	156-59-2
SW8260B	Cis-1,3-Dichloropropene	10061-01-5
SW8260B	Dibromochloromethane	124-48-1
SW8260B	Dibromomethane	74-95-3
SW8260B	Ethylbenzene	100-41-4
SW8260B	Iodomethane	74-88-4
SW8260B	Methylene Chloride	75-09-2
SW8260B	Styrene	100-42-5
SW8260B	Tetrachloroethene	127-18-4
SW8260B	Toluene	108-88-3
SW8260B	Trans-1,2-Dichloroethene	156-60-5
SW8260B	Trans-1,3-Dichloropropene	10061-02-6
SW8260B	Trans-1,4-Dichloro-2-Butene	110-57-6
SW8260B	Trichloroethene	79-01-6
SW8260B	Trichlorofluoromethane	75-69-4
SW8260B	Vinyl Acetate	108-05-4
SW8260B	Vinyl Chloride	75-01-4
SW8260B	Xylenes (Total)	1330-20-7

Method	Parameters	CAS No.
Metals		
SW6020A	Antimony	7440-36-0
SW6020A	Arsenic	7440-38-2
SW6020A	Barium	7440-39-3
SW6020A	Beryllium	7440-41-7
SW6020A	Cadmium	7440-43-9
SW6020A	Chromium	7440-47-3
SW6020A	Cobalt	7440-48-4
SW6020A	Copper	7440-50-8
SW6020A	Lead	7439-92-1
SW6020A	Nickel	7440-02-0
SW6020A	Selenium	7782-49-2
SW6020A	Silver	7440-22-4
SW6020A	Thallium	1314-32-5
SW6020A	Vanadium	7440-62-2
SW6020A	Zinc	7440-66-6
SW7470A	Mercury	7487-94-7

µg/L = micrograms per liter

mg/L = milligrams per liter

Analyte list from Appendix I of Code Rule 335-13-4-27 of the Alabama Department of Environmental Management Land Division Solid Waste Program Division 13 Regulations

Table 4-1: Groundwater Elevations
Industrial Landfill, Parcel 175(5)
McClellan, Anniston Alabama

Well ID	Permit Design	Measurement Date	Well Depth (ft BTOC)	Depth to Water (ft BTOC)	Groundwater Elevation (ft msl)
LF4-MW1	CMP	3/14/00	--	20.9	718.89
LF4-MW1		3/22/04	--	--	--
LF4-MW1		3/16/05	42.57	10.95	728.84
LF4-MW1		9/28/05	42.57	16.68	723.11
LF4-MW1		3/13/06	41.8	13.46	726.33
LF4-MW1		9/12/06	41.8	20.83	718.96
LF4-MW1		3/6/07	41.8	16.88	722.91
LF4-MW1		9/24/07	41.8	23.58	716.21
LF4-MW1		3/26/08	41.8	24.97	714.82
LF4-MW1		9/16/08	41.8	24.61	715.18
LF4-MW1		3/17/09	41.95	21.67	718.12
LF4-MW1		9/17/09	42.05	21.81	717.98
LF4-MW1		3/17/10	42	9.3	730.49
LF4-MW1		9/20/10	42.38	27.2	712.59
LF4-MW1		3/15/11	--	--	--
LF4-MW1		9/7/11	42.45	22.59	717.2
LF4-MW1		3/13/12	42.45	20.29	719.5
LF4-MW1		9/5/12	42.46	21.62	718.17
LF4-MW1		3/4/13	42.5	20.85	718.94
LF4-MW1		9/10/13	42.5	12.72	727.07
LF4-MW1		3/4/14	42.5	11.00	728.79
LF4-MW1		10/24/14	42.4	20.75	719.04
LF4-MW1		3/12/15	42.5	14.90	724.89
LF4-MW1		9/15/15	42.5	19.55	720.24
LF4-MW1		3/16/16	42.5	10.05	729.74
LF4-MW1		9/21/16	42.5	21.85	717.94
LF4-MW1		3/14/17	42.5	23.90	715.89
LF4-MW1		9/8/17	42.5	19.21	720.58
LF4-MW1		3/8/18	42.5	14.74	725.05
LF4-MW1		9/11/18	42.5	17.58	722.21
LF4-MW1		9/5/19	42.5	21.44	718.35
LF4-MW1		3/12/20	42.5	13.12	726.67
LF4-MW1		9/15/20	42.5	19.00	720.79
LF4-MW2	CMP	3/14/00	--	27.8	710.7
LF4-MW2		3/22/04	--	--	719
LF4-MW2		3/16/05	39.85	16.48	722.02
LF4-MW2		9/28/05	39.85	22.2	716.3
LF4-MW2		3/13/06	36	18.81	719.69
LF4-MW2		9/12/06	36	26.49	712.01
LF4-MW2		3/6/07	36	22.06	716.44
LF4-MW2		9/24/07	36	28.6	709.9
LF4-MW2		3/26/08	36	26.11	712.39
LF4-MW2		9/16/08	36	27.98	710.52
LF4-MW2		3/17/09	39	22.68	715.82
LF4-MW2		9/17/09	39.06	26.51	711.99
LF4-MW2		3/17/10	39.15	15.65	722.85
LF4-MW2		9/20/10	40.25	27.33	711.17
LF4-MW2		3/15/11	--	--	--
LF4-MW2		9/7/11	40.23	25.6	712.9

Table 4-1: Groundwater Elevations
Industrial Landfill, Parcel 175(5)
McClellan, Anniston Alabama

Well ID	Permit Design	Measurement Date	Well Depth (ft BTOC)	Depth to Water (ft BTOC)	Groundwater Elevation (ft msl)
LF4-MW2		3/13/12	40.23	23.19	715.31
LF4-MW2		9/5/12	40.25	24.83	713.67
LF4-MW2		3/4/13	40.25	23.66	714.84
LF4-MW2		9/10/13	40.25	20.35	718.15
LF4-MW2		3/4/14	40.25	18.90	719.60
LF4-MW2		10/24/14	40.2	26.01	712.49
LF4-MW2		3/12/15	40.25	19.14	719.36
LF4-MW2		9/15/15	40.28	24.95	713.55
LF4-MW2		3/16/16	40.25	17.11	721.39
LF4-MW2		9/21/16	40.25	27.28	711.22
LF4-MW2		3/14/17	40.25	23.30	715.20
LF4-MW2		9/8/17	40.25	24.24	716.14
LF4-MW2		3/8/18	40.25	17.26	721.24
LF4-MW2		9/11/18	40.25	23.65	714.85
LF4-MW2		9/5/19	40.25	26.74	711.76
LF4-MW2		3/12/20	40.25	16.05	722.45
LF4-MW2		9/15/20	40.25	24.90	713.60
LF4-MW3	CMP	3/14/00	--	21.6	718.18
LF4-MW3		3/22/04	--	--	727.18
LF4-MW3		3/16/05	34.41	11.69	728.09
LF4-MW3		9/29/05	34.41	17.33	722.45
LF4-MW3		3/13/06	31	11.21	728.57
LF4-MW3		9/14/06	31	17.9	721.88
LF4-MW3		3/6/07	31	12.33	727.45
LF4-MW3		9/25/07	31	21.63	718.16
LF4-MW3		3/26/08	31	12.63	727.15
LF4-MW3		9/16/08	31	16.27	723.51
LF4-MW3		3/17/09	34.13	12.05	727.73
LF4-MW3		9/17/09	34.12	17.2	722.58
LF4-MW3		3/17/10	34.05	11.8	727.98
LF4-MW3		9/20/10	34.1	26.8	712.98
LF4-MW3		3/15/11	--	--	--
LF4-MW3		9/7/11	34.15	16.4	723.38
LF4-MW3		3/13/12	34.15	12.51	727.27
LF4-MW3		9/5/12	34.2	13.7	726.08
LF4-MW3		3/4/13	34.2	17.3	722.48
LF4-MW3		9/10/13	34.2	13.15	726.63
LF4-MW3		3/4/14	34.2	12.45	727.33
LF4-MW3		10/24/14	34.2	19.90	719.88
LF4-MW3		3/12/15	34.2	11.71	728.07
LF4-MW3		9/15/15	34.19	16.85	722.93
LF4-MW3		3/16/16	34.2	12.13	727.65
LF4-MW3		9/21/16	34.2	20.17	719.61
LF4-MW3		3/14/17	34.2	13.15	726.63
LF4-MW3		9/8/17	34.2	15.41	724.37
LF4-MW3		3/8/18	34.2	11.91	728.27
LF4-MW3		9/11/18	34.2	21.74	718.04
LF4-MW3		9/5/19	34.2	23.94	715.84
LF4-MW3		3/12/20	34.2	11.48	728.30

Table 4-1: Groundwater Elevations
Industrial Landfill, Parcel 175(5)
McClellan, Anniston Alabama

Well ID	Permit Design	Measurement Date	Well Depth (ft BTOC)	Depth to Water (ft BTOC)	Groundwater Elevation (ft msl)
LF4-MW3		9/15/20	34.2	19.03	720.75
LF4-MW4	CMP	3/14/00	--	8.45	734.9
LF4-MW4		3/22/04	--	--	736.95
LF4-MW4		3/15/05	27.27	5.24	738.11
LF4-MW4		9/29/05	27.27	10.6	732.75
LF4-MW4		3/14/06	25	4.36	738.99
LF4-MW4		9/14/06	25	12.41	730.94
LF4-MW4		3/7/07	25	6.95	736.4
LF4-MW4		9/25/07	25	14.42	728.93
LF4-MW4		3/26/08	25	7.81	735.54
LF4-MW4		9/17/08	25	10.19	733.16
LF4-MW4		3/17/09	26.74	5.35	738
LF4-MW4		9/21/09	26.55	9.8	733.55
LF4-MW4		3/17/10	26.65	4.93	738.42
LF4-MW4		9/20/10	26.65	14.26	729.09
LF4-MW4		3/15/11	--	--	--
LF4-MW4		9/7/11	26.6	13.4	729.95
LF4-MW4		3/13/12	26.6	7.06	736.29
LF4-MW4		9/5/12	26.81	8.31	735.04
LF4-MW4		3/4/13	26.8	10.5	732.85
LF4-MW4		9/10/13	26.8	6.35	737.0
LF4-MW4		3/4/14	26.8	5.50	737.85
LF4-MW4		10/24/14	25	13.95	729.40
LF4-MW4		3/12/15	26.8	5.79	737.56
LF4-MW4		9/15/15	26.82	11.91	731.44
LF4-MW4		3/16/16	26.8	4.77	738.58
LF4-MW4		9/21/16	26.8	14.21	729.14
LF4-MW4		3/14/17	26.8	6.37	736.98
LF4-MW4		9/8/17	26.8	9.11	734.24
LF4-MW4		3/8/18	26.8	4.68	738.67
LF4-MW4		9/11/18	26.8	9.36	733.99
LF4-MW4		9/5/19	26.8	13.28	730.07
LF4-MW4		3/12/20	26.8	4.11	739.24
LF4-MW4		9/15/20	26.8	9.53	733.82
LF4-MW5	BKG	3/14/00	--	12.27	741.05
LF4-MW5		3/22/04	--	--	742.02
LF4-MW5		3/16/05	34.76	10.44	742.88
LF4-MW5		9/29/05	34.76	14.39	738.93
LF4-MW5		3/14/06	32	5.35	747.97
LF4-MW5		9/14/06	32	15.62	737.7
LF4-MW5		3/7/07	32	11.5	741.82
LF4-MW5		9/24/07	32	19.58	733.74
LF4-MW5		3/26/08	32	11.64	741.68
LF4-MW5		9/16/08	32	14.29	739.03
LF4-MW5		3/18/09	34.28	10.3	743.02
LF4-MW5		9/17/09	34.25	13.8	739.52
LF4-MW5		3/17/10	34.2	10.25	743.07
LF4-MW5		9/20/10	34.6	18.75	734.57

Table 4-1: Groundwater Elevations
Industrial Landfill, Parcel 175(5)
McClellan, Anniston Alabama

Well ID	Permit Design	Measurement Date	Well Depth (ft BTOC)	Depth to Water (ft BTOC)	Groundwater Elevation (ft msl)
LF4-MW5		3/15/11	--	--	--
LF4-MW5		9/7/11	34.6	17.54	735.78
LF4-MW5		3/13/12	34.6	11.95	741.37
LF4-MW5		9/5/12	34.6	12.1	741.22
LF4-MW5		3/4/13	34.6	16.1	737.22
LF4-MW5		9/10/13	34.6	11.58	741.74
LF4-MW5		3/4/14	34.6	10.65	742.67
LF4-MW5		10/24/14	34.6	17.32	736.00
LF4-MW5		3/12/15	34.6	9.97	743.35
LF4-MW5		9/15/15	34.55	15.57	737.75
LF4-MW5		3/16/16	34.6	10.11	743.21
LF4-MW5		9/21/16	34.6	19.77	733.55
LF4-MW5		3/14/17	34.6	12.44	740.88
LF4-MW5		9/8/17	34.6	13.59	739.73
LF4-MW5		3/8/18	34.6	9.69	743.63
LF4-MW5		9/11/18	34.6	13.27	740.05
LF4-MW5		9/5/19	34.6	18.67	734.65
LF4-MW5		3/12/20	34.6	10.29	743.03
LF4-MW5		9/15/20	34.6	14.51	738.81

Notes:

-- = Not available or not measured
bgs = below ground surface
BKG = Background well
BTOC = Below top of casing
CMP = Compliance/downgradient well
ft = feet
msl = Mean sea level

Table 4-2: Horizontal Hydraulic Gradients, September 2020
Industrial Landfill, Parcel 175(5)
McClellan, Anniston, Alabama

Upgradient Well	Groundwater Elevation	Downgradient Well	Groundwater Elevation	Estimated Groundwater Flow Direction	Horizontal Distance	Groundwater Elevation Difference (feet)	Horizontal Gradient (ft/ft)
LF4-MW5	738.81	LF4-MW1	720.79	north	1601	18.02	0.011
LF4-MW4	733.82	LF4-MW3	720.75	northwest	724	13.07	0.018
LF4-MW3	720.75	LF4-MW2	713.60	west	524	7.15	0.014
LF4-MW1	720.79	LF4-MW2	713.60	northeast	890	7.19	0.008
					Average Horizontal Gradient:		**0.013**

Notes:
Elevations in feet above mean sea level.
ft/ft = feet per foot

Table 4-3: Groundwater Field Parameters, September 2020
Industrial Landfill, Parcel 175(5)
McClellan, Anniston, Alabama

Sample Location	Sample Date	Temperature (^{o}C)	Conductivity (µs/cm)	Dissolved Oxygen (mg/L)	ORP (mV)	TDS (g/L)	Turbidity (NTU)	pH
LF4-MW1	9/15/20	18.80	161.2	1.23	100.3	0.1047	203.30	4.62
LF4-MW2	9/15/20	17.80	432	0.89	63.6	0.2808	207.10	5.17
LF4-MW3	9/15/20	19.30	82	3.30	154.6	0.06	49.54	4.87
LF4-MW4	9/15/20	21.10	877	1.52	100.9	0.572	15.66	5.66
LF4-MW5	9/15/20	22.20	48	2.70	195.8	0.0312	16.58	4.73

Notes:

^{o}C = Degrees Celsius
µs/cm = Microsiemens per centimeter
mg/L = Milligrams per liter
mV = Millivolts
NM = Not measured
NTU = Nephelometric turbidity units
ORP = Oxidation-reduction potential
TDS = Total Dissolved Solids

Table 4-4: Analytical Data for VOCs Detected in Groundwater
Industrial Landfill, Parcel 175(5)
McClellan, Anniston Alabama

Well ID	Sample Date	1,1-DCE	1,4-DCB	Acetone	Benzene	Carbon Disulfide	Chloro-benzene	Chloro-ethane	Chloro-form	c-1,2-DCE	Ethyl-benzene	Toluene	t-1,2-DCE	TCE	VC
LF4-MW1	3/29/00	< 0.5	< 0.5	< 5	< 0.5	< 5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
LF4-MW1	9/26/00	< 0.5	--	--	< 0.5	--	< 0.5	--	--	--	< 0.5	< 0.5	< 0.5	< 0.5	--
LF4-MW1	4/24/01	< 0.5	--	--	< 0.5	--	< 0.5	--	--	--	< 0.5	< 0.5	< 0.5	< 0.5	--
LF4-MW1	9/28/01	< 0.5	--	--	< 0.5	--	< 0.5	--	--	--	0.7	1.9	< 0.5	< 0.5	--
LF4-MW1	4/2/02	< 0.5	--	--	< 0.5	--	< 0.5	--	--	--	< 0.5	< 0.5	< 0.5	< 0.5	--
LF4-MW1	9/18/02	< 0.5	--	--	< 0.5	--	< 0.5	--	--	--	< 0.5	< 0.5	< 0.5	< 0.5	--
LF4-MW1	3/5/03	< 0.5	--	--	< 0.5	--	< 0.5	--	--	--	< 0.5	< 0.5	< 0.5	< 0.5	--
LF4-MW1	9/26/03	< 0.5	--	--	< 0.5	--	< 0.5	--	--	--	< 0.5	< 0.5	< 0.5	< 0.5	--
LF4-MW1	3/31/04	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	<1
LF4-MW1	9/29/04	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	<1
LF4-MW1	3/16/05	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	<1
LF4-MW1	9/28/05	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	<1
LF4-MW1	3/13/06	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	<1
LF4-MW1	9/13/06	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	<1
LF4-MW1	3/6/07	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	<1
LF4-MW1	9/24/07	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	<1
LF4-MW1	3/26/08	<1	<1	< 10 (UJC)	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	<1
LF4-MW1	9/16/08	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	< 0.8
LF4-MW1	3/17/09	<1	<1	8.4 J	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	< 0.8
LF4-MW1	9/17/09	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	< 0.8
LF4-MW1	3/17/10	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	< 0.8
LF4-MW1	9/21/10	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	< 0.8
LF4-MW1	9/8/11	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	< 0.8
LF4-MW1	3/14/12	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	< 0.8
LF4-MW1	9/6/12	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	< 0.8
LF4-MW1	3/5/13	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	< 0.8
LF4-MW1	9/11/13	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	< 0.8
LF4-MW1	3/5/14	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	< 0.8
LF4-MW1	9/4/14	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	< 0.8
LF4-MW1	3/13/15	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	< 0.8
LF4-MW1	9/16/15	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	< 0.8
LF4-MW1	3/16/16	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	< 0.8
LF4-MW1	9/21/16	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	< 0.8
LF4-MW1	3/15/17	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	< 0.8
LF4-MW1	9/8/17	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	< 0.8

Table 4-4: Analytical Data for VOCs Detected in Groundwater
Industrial Landfill, Parcel 175(5)
McClellan, Anniston Alabama

Well ID	Sample Date	1,1-DCE	1,4-DCB	Acetone	Benzene	Carbon Disulfide	Chloro-benzene	Chloro-ethane	Chloro-form	c-1,2-DCE	Ethyl-benzene	Toluene	t-1,2-DCE	TCE	VC
LF4-MW1	3/8/18	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	< 0.8
LF4-MW1	9/11/18	< 1	< 1	< 10	< 1	< 2	< 1	< 5	< 1	1.1	< 1	< 1	< 1	< 1	< 1
LF4-MW1	3/7/19	< 1	< 1	< 10	< 1	< 2	< 1	< 5	< 1	< 1	< 1	< 1	< 1	< 1	< 1
LF4-MW1	9/5/19	< 1	< 1	< 10	< 1	< 2	< 1	< 5	< 1	< 1	< 1	< 1	< 1	< 1	< 1
LF4-MW1	3/12/20	< 1	< 1	< 10	< 1	< 2	< 1	< 5	< 1	< 1	< 1	< 1	< 1	< 1	< 1
LF4-MW1	9/15/20	< 1	< 1	< 10	< 1	< 2	< 1	< 5	< 1	< 1	< 1	< 1	< 1	< 1	< 1
LF4-MW2	3/29/00	< 0.5	< 0.5	< 5	< 0.5	< 5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
LF4-MW2	9/26/00	< 0.5	--	--	< 0.5	--	< 0.5	--	--	--	< 0.5	< 0.5	< 0.5	< 0.5	--
LF4-MW2	4/24/01	< 0.5	--	--	< 0.5	--	< 0.5	--	--	--	< 0.5	< 0.5	< 0.5	< 0.5	--
LF4-MW2	9/28/01	< 0.5	--	--	< 0.5	--	< 0.5	--	--	--	0.6	2	< 0.5	< 0.5	--
LF4-MW2	4/2/02	< 0.5	--	--	< 0.5	--	< 0.5	--	--	--	< 0.5	< 0.5	< 0.5	< 0.5	--
LF4-MW2	9/18/02	< 0.5	--	--	< 0.5	--	< 0.5	--	--	--	< 0.5	< 0.5	< 0.5	< 0.5	--
LF4-MW2	3/5/03	< 0.5	--	--	< 0.5	--	< 0.5	--	--	--	< 0.5	< 0.5	< 0.5	< 0.5	--
LF4-MW2	9/26/03	< 0.5	--	--	< 0.5	--	< 0.5	--	--	--	< 0.5	< 0.5	< 0.5	< 0.5	--
LF4-MW2	3/31/04	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	<1
LF4-MW2	9/29/04	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	<1
LF4-MW2	3/16/05	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	<1
LF4-MW2	9/28/05	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	<1
LF4-MW2	3/13/06	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	<1
LF4-MW2	9/13/06	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	<1
LF4-MW2	3/6/07	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	<1
LF4-MW2	9/24/07	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	<1
LF4-MW2	3/26/08	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	<1
LF4-MW2	9/16/08	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	< 0.8
LF4-MW2	3/17/09	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	< 0.8
LF4-MW2	9/17/09	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	< 0.8
LF4-MW2	3/17/10	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	< 0.8
LF4-MW2	9/21/10	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	< 0.8
LF4-MW2	9/8/11	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	< 0.8
LF4-MW2	3/14/12	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	< 0.8
LF4-MW2	9/6/12	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	< 0.8
LF4-MW2	3/5/13	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	< 0.8
LF4-MW2	9/11/13	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	< 0.8
LF4-MW2	3/5/14	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	< 0.8
LF4-MW2	9/4/14	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	< 0.8

Table 4-4: Analytical Data for VOCs Detected in Groundwater
Industrial Landfill, Parcel 175(5)
McClellan, Anniston Alabama

Well ID	Sample Date	1,1-DCE	1,4-DCB	Acetone	Benzene	Carbon Disulfide	Chloro-benzene	Chloro-ethane	Chloro-form	c-1,2-DCE	Ethyl-benzene	Toluene	t-1,2-DCE	TCE	VC
LF4-MW2	3/13/15	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	< 0.8
LF4-MW2	9/16/15	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	< 0.8
LF4-MW2	3/16/16	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	< 0.8
LF4-MW2	9/21/16	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	< 0.8
LF4-MW2	3/15/17	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	< 0.8
LF4-MW2	9/8/17	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	< 0.8
LF4-MW2	3/8/18	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	< 0.8
LF4-MW2	9/11/18	< 1	< 1	< 10	< 1	< 2	< 1	< 5	< 1	< 1	< 1	< 1	< 1	< 1	< 1
LF4-MW2	3/7/19	< 1	< 1	< 10	< 1	< 2	< 1	< 5	< 1	< 1	< 1	< 1	< 1	< 1	< 1
LF4-MW2	9/5/19	< 1	< 1	< 10	< 1	< 2	< 1	< 5	< 1	< 1	< 1	< 1	< 1	< 1	< 1
LF4-MW2	3/12/20	< 1	< 1	< 10	< 1	< 2	< 1	< 5	< 1	< 1	< 1	< 1	< 1	< 1	< 1
LF4-MW2	9/15/20	< 1	< 1	< 10	< 1	< 2	< 1	< 5	< 1	< 1	< 1	< 1	< 1	< 1	< 1
LF4-MW3	3/29/00	< 0.5	< 0.5	< 5	< 0.5	< 5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
LF4-MW3	9/26/00	< 0.5	--	--	< 0.5	--	< 0.5	--	--	--	< 0.5	< 0.5	< 0.5	< 0.5	--
LF4-MW3	4/24/01	< 0.5	--	--	< 0.5	--	< 0.5	--	--	--	< 0.5	< 0.5	< 0.5	< 0.5	--
LF4-MW3	9/28/01	< 0.5	--	--	< 0.5	--	< 0.5	--	--	--	< 0.5	< 0.5	< 0.5	< 0.5	--
LF4-MW3	4/2/02	< 0.5	--	--	< 0.5	--	< 0.5	--	--	--	< 0.5	< 0.5	< 0.5	< 0.5	--
LF4-MW3	9/18/02	< 0.5	--	--	< 0.5	--	< 0.5	--	--	--	< 0.5	< 0.5	< 0.5	< 0.5	--
LF4-MW3	3/5/03	< 0.5	--	--	< 0.5	--	< 0.5	--	--	--	< 0.5	< 0.5	< 0.5	< 0.5	--
LF4-MW3	9/26/03	< 0.5	--	--	< 0.5	--	< 0.5	--	--	--	< 0.5	< 0.5	< 0.5	< 0.5	--
LF4-MW3	3/31/04	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	<1
LF4-MW3	9/29/04	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	<1
LF4-MW3	3/16/05	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	<1
LF4-MW3	9/29/05	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	<1
LF4-MW3	3/13/06	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	<1
LF4-MW3	9/14/06	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	<1
LF4-MW3	3/6/07	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	<1
LF4-MW3	9/25/07	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	<1
LF4-MW3	3/26/08	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	<1
LF4-MW3	9/16/08	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	< 0.8
LF4-MW3	3/17/09	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	< 0.8
LF4-MW3	9/17/09	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	< 0.8
LF4-MW3	3/17/10	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	< 0.8
LF4-MW3	9/21/10	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	< 0.8
LF4-MW3	9/8/11	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	< 0.8

Table 4-4: Analytical Data for VOCs Detected in Groundwater
Industrial Landfill, Parcel 175(5)
McClellan, Anniston Alabama

Well ID	Sample Date	1,1-DCE	1,4-DCB	Acetone	Benzene	Carbon Disulfide	Chloro-benzene	Chloro-ethane	Chloro-form	c-1,2-DCE	Ethyl-benzene	Toluene	t-1,2-DCE	TCE	VC
LF4-MW3	3/14/12	<1	<1	< 10	<1	<1	<1	<2	0.46 J	<1	<1	<1	<1	<1	< 0.8
LF4-MW3	9/6/12	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	< 0.8
LF4-MW3	3/5/13	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	< 0.8
LF4-MW3	9/11/13	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	< 0.8
LF4-MW3	3/5/14	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	< 0.8
LF4-MW3	9/4/14	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	< 0.8
LF4-MW3	3/13/15	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	< 0.8
LF4-MW3	9/16/15	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	< 0.8
LF4-MW3	3/16/16	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	< 0.8
LF4-MW3	9/21/16	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	< 0.8
LF4-MW3	3/15/17	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	< 0.8
LF4-MW3	9/8/17	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	< 0.8
LF4-MW3	3/8/18	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	< 0.8
LF4-MW3	9/11/18	< 1	< 1	< 10 (UJL)	< 1	< 2	< 1	< 5 (UJL)	< 1	< 1	< 1	< 1	< 1	< 1	< 1
LF4-MW3	3/7/19	< 1	< 1	< 10	< 1	< 2	< 1	< 5	< 1	< 1	< 1	< 1	< 1	< 1	< 1
LF4-MW3	9/5/19	< 1	< 1	< 10	< 1	< 2	< 1	< 5	< 1	< 1 (UJM)	< 1	< 1	< 1	< 1	< 1
LF4-MW3	3/12/20	< 1 H (UJH)	< 1 (JH)	< 10 (JH)	< 1 (JH)	< 2 (JH)	< 1 (JH)	< 5 (JH)	< 1 (JH)	< 1 (JH)	< 1 (JH)	< 1 (JH)	< 1 (JH)	< 1 (JH)	< 1
LF4-MW3	9/15/20	< 1	< 1	< 10	< 1	< 2	< 1	< 5	< 1	< 1	< 1	< 1	< 1	< 1	< 1
LF4-MW4	3/29/00	< 0.5	< 0.5	< 5	< 0.5	< 5	3.6	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
LF4-MW4	9/26/00	< 0.5	--	--	< 0.5	--	4.1	--	--	--	< 0.5	< 0.5	< 0.5	< 0.5	--
LF4-MW4	4/24/01	< 0.5	--	--	< 0.5	--	2.6	--	--	--	< 0.5	< 0.5	< 0.5	10.4	--
LF4-MW4	9/28/01	< 0.5	--	--	< 0.5	--	7.8	--	--	--	< 0.5	< 0.5	< 0.5	< 0.5	--
LF4-MW4	4/2/02	< 0.5	--	--	< 0.5	--	5.6	--	--	--	< 0.5	< 0.5	< 0.5	6	--
LF4-MW4	9/18/02	< 0.5	--	--	< 0.5	--	6.5	--	--	--	< 0.5	< 0.5	< 0.5	< 0.5	--
LF4-MW4	3/5/03	< 0.5	--	--	< 0.5	--	1.9	--	--	--	< 0.5	< 0.5	< 0.5	7.2	--
LF4-MW4	9/26/03	< 0.5	--	--	< 0.5	--	7.4	--	--	--	< 0.5	< 0.5	< 0.5	0.6	--
LF4-MW4	3/31/04	<1	<1	< 10	<1	<1	3.7	<2	<1	<1	<1	<1	<1	<1	<1
LF4-MW4	9/29/04	<1	0.99 J	< 10	0.5 J	<1	8.5	0.35 J	<1	<1	<1	<1	<1	<1	<1
LF4-MW4	3/15/05	<1	<1	2.9 J	<1	<1	1.4	<2	<1	<1	<1	<1	<1	<1	<1
LF4-MW4	9/29/05	<1	0.36 J	< 10	<1	<1	4.1	<2	<1	<1	<1	<1	<1	<1	<1
LF4-MW4	3/14/06	<1	<1	< 10	<1	<1	0.82 J	<2	<1	1.3	<1	<1	<1	7	<1
LF4-MW4	9/14/06	<1	<1	< 10	<1	<1	1.7	<2	<1	<1	<1	<1	<1	<1	<1
LF4-MW4	3/7/07	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	<1
LF4-MW4	9/25/07	<1	0.7 J	< 10	0.37 J	2.8	13	0.25 J	<1	<1	<1	<1	<1	<1	<1
LF4-MW4	3/26/08	<1	<1	< 10 (UJC)	<1	<1	1.9	<2	<1	<1	<1	<1	<1	<1	<1

Table 4-4: Analytical Data for VOCs Detected in Groundwater
Industrial Landfill, Parcel 175(5)
McClellan, Anniston Alabama

Well ID	Sample Date	1,1-DCE	1,4-DCB	Acetone	Benzene	Carbon Disulfide	Chloro-benzene	Chloro-ethane	Chloro-form	c-1,2-DCE	Ethyl-benzene	Toluene	t-1,2-DCE	TCE	VC
LF4-MW4	9/17/08	<1	0.93 J	< 10	0.42 J	< 1 (UJCL)	15	<2	<1	<1	<1	<1	<1	<1	< 0.8
LF4-MW4	3/17/09	<1	0.39 J	< 10	<1	<1	4.9	<2	<1	<1	<1	<1	<1	<1	< 0.8
LF4-MW4	9/21/09	<1	0.24 J	< 10	<1	<1	3.6	<2	<1	<1	<1	<1	<1	<1	< 0.8
LF4-MW4	3/17/10	0.22 J	<1	< 10	<1	<1	2.1	<2	<1	16	<1	<1	2.4	61	0.21 J
LF4-MW4	9/21/10	<1	0.53 J	< 10	<1	<1	7.6	<2	<1	<1	<1	<1	<1	0.22 J	< 0.8
LF4-MW4	9/8/11	<1	0.54 J	< 10	<1	<1	7.5	<2	<1	<1	<1	<1	<1	<1	< 0.8
LF4-MW4	3/14/12	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	< 0.8
LF4-MW4	9/6/12	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	< 0.8
LF4-MW4	3/5/13	<1	0.23 J	< 10	<1	<1	2.8	<2	<1	16	<1	<1	1.6	40	< 0.8
LF4-MW4	9/11/13	<1	0.5 J	< 10	<1	<1	7.7	<2	<1	2.9	<1	<1	<1	1.7	< 0.8
LF4-MW4	3/5/14	<1	0.28 J	< 10	<1	<1	3.7	<2	<1	19	<1	<1	1.3	17	0.25 J
LF4-MW4	9/4/14	<1	0.21 J	< 10	<1	<1	4.6	<2	<1	7.7	<1	<1	0.45 J	6.1	< 0.8
LF4-MW4	3/13/15	<1	<1	< 10	<1	<1	1.3	<2	<1	<1	<1	<1	<1	<1	< 0.8
LF4-MW4	9/16/15	<1	0.33 J	< 10	<1	<1	5.6	<2	<1	0.38 J	<1	<1	<1	0.33 J	< 0.8
LF4-MW4	3/16/16	<1	<1	< 10	<1	<1	1	<2	<1	30	<1	<1	2.3	32	< 0.8
LF4-MW4	9/21/16	<1	0.31 J	< 10	<1	<1	5	<2	<1	<1	<1	<1	<1	<1	< 0.8
LF4-MW4	3/15/17	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	< 0.8
LF4-MW4	9/8/17	<1	<1	< 10	<1	<1	2.6	<2	<1	2.1	<1	<1	<1	1	< 0.8
LF4-MW4	3/8/18	<1	<1	< 10	<1	<1	1.6	<2	<1	20	<1	<1	1.6	27	< 0.8
LF4-MW4	9/11/18	< 1	< 1	< 10	< 1	< 2	3.2	< 5	< 1	0.6 J	< 1	< 1	< 1	< 1	< 1
LF4-MW4	3/7/19	< 1	< 1	< 10	< 1	< 2	1.2	< 5	< 1	35	< 1	< 1	2.8	34	< 1
LF4-MW4	9/5/19	< 1	< 1	< 10	< 1	< 2	3.5	< 5	< 1	< 1	< 1	< 1	< 1	< 1	< 1
LF4-MW4	3/12/20	< 1	< 1	< 10	< 1	< 2	1.3	< 5	< 1	25	< 1	< 1	2.2	30	< 1
LF4-MW4	9/15/20	< 1	< 1	< 10	< 1	< 2	2.4	< 5	< 1	1.5	< 1	< 1	< 1	1.2	< 1.0
LF4-MW5	3/29/00	< 0.5	< 0.5	< 5	< 0.5	< 5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
LF4-MW5	9/26/00	< 0.5	--	--	< 0.5	--	< 0.5	--	--	--	< 0.5	< 0.5	< 0.5	< 0.5	--
LF4-MW5	4/24/01	< 0.5	--	--	< 0.5	--	< 0.5	--	--	--	< 0.5	< 0.5	< 0.5	< 0.5	--
LF4-MW5	9/28/01	< 0.5	--	--	< 0.5	--	< 0.5	--	--	--	< 0.5	< 0.5	< 0.5	< 0.5	--
LF4-MW5	4/2/02	< 0.5	--	--	< 0.5	--	< 0.5	--	--	--	< 0.5	< 0.5	< 0.5	< 0.5	--
LF4-MW5	9/18/02	< 0.5	--	--	< 0.5	--	< 0.5	--	--	--	< 0.5	< 0.5	< 0.5	< 0.5	--
LF4-MW5	3/5/03	< 0.5	--	--	< 0.5	--	< 0.5	--	--	--	< 0.5	< 0.5	< 0.5	< 0.5	--
LF4-MW5	9/26/03	< 0.5	--	--	< 0.5	--	< 0.5	--	--	--	< 0.5	< 0.5	< 0.5	< 0.5	--
LF4-MW5	3/31/04	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	<1
LF4-MW5	9/29/04	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	<1
LF4-MW5	3/16/05	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	<1

Table 4-4: Analytical Data for VOCs Detected in Groundwater
Industrial Landfill, Parcel 175(5)
McClellan, Anniston Alabama

Well ID	Sample Date	1,1-DCE	1,4-DCB	Acetone	Benzene	Carbon Disulfide	Chloro-benzene	Chloro-ethane	Chloro-form	c-1,2-DCE	Ethyl-benzene	Toluene	t-1,2-DCE	TCE	VC
LF4-MW5	9/29/05	<1	<1	< 10 (UJI)	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	<1
LF4-MW5	3/14/06	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	<1
LF4-MW5	9/14/06	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	<1
LF4-MW5	3/7/07	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	<1
LF4-MW5	9/24/07	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	<1
LF4-MW5	3/26/08	<1	<1	< 10 (UJC)	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	<1
LF4-MW5	9/16/08	<1	<1	< 10	<1	< 1 (UJC)	<1	<2	<1	<1	<1	<1	<1	<1	< 0.8
LF4-MW5	3/18/09	<1	<1	5.5 J	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	< 0.8
LF4-MW5	9/17/09	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	< 0.8
LF4-MW5	3/17/10	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	< 0.8
LF4-MW5	9/21/10	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	< 0.8
LF4-MW5	9/8/11	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	< 0.8
LF4-MW5	3/14/12	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	< 0.8
LF4-MW5	9/6/12	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	0.67 J	<1	<1	< 0.8
LF4-MW5	3/5/13	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	< 0.8
LF4-MW5	9/11/13	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	< 0.8
LF4-MW5	3/5/14	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	< 0.8
LF4-MW5	9/4/14	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	< 0.8
LF4-MW5	3/13/15	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	< 0.8
LF4-MW5	9/16/15	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	< 0.8
LF4-MW5	3/16/16	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	< 0.8
LF4-MW5	9/21/16	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	< 0.8
LF4-MW5	3/15/17	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	< 0.8
LF4-MW5	9/8/17	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	< 0.8
LF4-MW5	3/8/18	<1	<1	< 10	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	< 0.8
LF4-MW5	9/11/18	< 1	< 1	< 10	< 1	< 2	< 1	< 5	< 1	< 1	< 1	< 1	< 1	< 1	< 1
LF4-MW5	3/7/19	< 1	< 1	< 10	< 1	< 2	< 1	< 5	< 1	< 1	< 1	< 1	< 1	< 1	< 1
LF4-MW5	9/5/19	< 1	< 1	< 10	< 1	< 2	< 1	< 5	< 1	< 1	< 1	< 1	< 1	< 1	< 1
LF4-MW5	3/12/20	< 1	< 1	7.0 J	< 1	< 2	< 1	< 5	< 1	< 1	< 1	< 1	< 1	< 1	< 1
LF4-MW5	9/15/20	< 1	< 1	< 10	< 1	< 2	< 1	< 5	< 1	< 1	< 1	< 1	< 1	< 1	< 1

Table 4-4: Analytical Data for VOCs Detected in Groundwater
Industrial Landfill, Parcel 175(5)
McClellan, Anniston Alabama

Well ID	Sample Date	1,1-DCE	1,4-DCB	Acetone	Benzene	Carbon Disulfide	Chloro-benzene	Chloro-ethane	Chloro-form	c-1,2-DCE	Ethyl-benzene	Toluene	t-1,2-DCE	TCE	VC

Notes:

-- = Not analyzed
< = Indicates the analyte was not detected at the reported quantitation limit shown.
1,1-DCE = 1,1-Dichloroethene
1,4-DCB = 1,4-Dichlorobenzene
c-1,2-DCE = Cis-1,2-Dichloroethene
t-1,2-DCE = Trans-1,2-Dichloroethene
TCE = Trichloroethene
VC = Vinyl Chloride
VOC = Volatile organic compound

Data reported in micrograms per liter (µg/L)
Samples collected 2000 through 2003 by IT Corporation/Shaw Environmental.
Samples collected in 2004 to the present by Matrix Environmental Services, LLC (MES).

Lab Flag:

J = Estimated detection. Concentration is between the method detection limit and the practical quantitation limit.

Validation Flags:

(JH) = Data is estimated. Analytical method holding time exceeded.
(UJC) = Reported quantitation limit is estimated; continuing calibration was outside method-specific control limits.
(UJI) = Reported quantitation limit is estimated; initial calibration was outside method-specific control limits.
(UJL) = Reported quantitation limit is estimated; the LCS and LCSD recoveries were outside laboratory historical control limits.
(UJM) = Reported quantitation limit is estimated; the MS and MSD recoveries were outside laboratory historical control limits.

Table 4-5: Analytical Data for Metals in Groundwater
Industrial Landfill, Parcel 175(5)
McClellan, Anniston Alabama

Well ID	Sample Date	Antimony (µg/L)	Arsenic (µg/L)	Barium (µg/L)	Beryllium (µg/L)	Cadmium (µg/L)	Chromium (µg/L)	Cobalt (µg/L)	Copper (µg/L)	Lead (µg/L)	Mercury (µg/L)	Nickel (µg/L)	Selenium (µg/L)	Silver (µg/L)	Thallium (µg/L)	Vanadium (µg/L)	Zinc (µg/L)
LF4-MW1	3/29/00	< 5.0	< 5.0	< 50	< 1.0	< 1.0	< 5.0	< 500	< 5.0	< 3.0	< 1	18	< 5.0	--	< 2.0	< 100	71
LF4-MW1	9/26/00	--	< 5.0	60	--	< 1.0	12.4	--	--	28.4	< 1	--	< 5.0	--	--	--	--
LF4-MW1	4/24/01	--	< 5.0	< 50	--	< 1.0	17.8	--	--	21.1	< 1	--	< 5.0	--	--	--	--
LF4-MW1	9/28/01	--	< 5.0	< 50	--	< 1.0	< 5.0	--	--	< 3.0	< 1	--	< 5.0	--	--	--	--
LF4-MW1	4/2/02	--	< 5.0	60	--	< 1.0	< 5.0	--	--	< 3.0	< 1	--	< 5.0	--	--	--	--
LF4-MW1	9/18/02	--	< 5.0	60	--	< 1.0	< 5.0	--	--	3.0	< 1	--	< 5.0	--	--	--	--
LF4-MW1	3/5/03	--	< 5.0	< 50	--	< 1.0	< 5.0	--	--	< 3.0	< 1	--	< 5.0	--	--	--	--
LF4-MW1	9/26/03	--	< 5.0	< 50	--	1.0	< 5.0	--	--	13	< 1	--	< 5.0	--	--	--	--
LF4-MW1	3/31/04	< 100	< 10	40.8	< 10	< 10	< 20 (UJ-)	8.81 J (J-)	< 20	2.1 J (J-)	< 0.4	< 20	< 10	< 20 (UJ-)	< 10	< 10	21.6 J
LF4-MW1	9/29/04	< 100	< 10	41.2	< 10	2.31 J	< 20	30.5	< 20	2.25 J (J-)	< 0.4	13.1 J	< 10	5.11 J	< 10	< 10	51.9 J
LF4-MW1	3/16/05	< 100	< 10	29.1	< 10	< 10	< 20	8.6 J	< 20	< 10	< 0.4	< 20	< 10	< 20	< 10	< 10	14.4 J
LF4-MW1	9/28/05	< 100	< 10	43.2	< 10	< 10	< 20	14.6 J	< 20	< 10	< 0.4	< 20	< 10	< 20	< 10	< 10	100 U^ (UB)
LF4-MW1	3/13/06	< 100	< 10	71.5	1.62 J	< 10	7.94 J	17.8 J	15.1 J	< 10	< 0.4	20 U^ (UB)	< 10	20 U^ (UB)	< 10	14.3	83.1 J
LF4-MW1	9/13/06	< 100	5.07 J	41.6	1.13 J	< 10	< 20	8.79 J	10.1 J	2.86 J	< 0.4	12.9 J	< 10	38	< 10	< 10	30.4 J
LF4-MW1	3/6/07	< 100	< 10	40	< 10	< 10	< 20	8.36 J	9.69 J	4.77 J	< 0.4	< 20	< 10	< 20	< 10	< 10	39.5 J
LF4-MW1	9/24/07	< 100	< 10	32.1	< 10	< 10	< 20	9.65 J	6.72 J	3.48 J	< 0.4	10.2 J	< 10	< 20	< 10	< 10	100 U^ (UB)
LF4-MW1	3/26/08	< 100	< 10	50.3	< 10	< 10	< 20	28.6	9.1 J	7.19 J	< 0.4	16.3 J	< 10	< 20	< 10	< 10	41.7 J
LF4-MW1	9/16/08	< 100	< 10	31.3	< 10	< 10	< 20	10.6 J	6.42 J	< 10	< 0.4	10.1 J	< 10	< 20	< 10	< 10	23.9 J
LF4-MW1	3/17/09	< 100	< 10	28.7	< 10	< 10	< 20	19.9 J	4.64 J	< 10	< 0.8	12.3 J	< 10	< 20	6.41 J	< 10	34.9 J
LF4-MW1	9/17/09	< 100	< 10	33.1	< 10	< 10	< 20	14.7 J	4.63 J	3.4 J	< 0.4	11 J	< 10	< 20	< 10	< 10	31.3 J
LF4-MW1	3/17/10	< 100	< 10	32.5	< 10	< 10	< 20	12.6 J	4.74 J	5.31 J	< 0.4	6.78 J	< 10	< 20	< 10	< 10	13.1 J
LF4-MW1	9/21/10	100 U^ (UB)	< 10	29.9	< 10	< 10	< 20	21.7	2.12 J	< 10	< 0.4	13.8 J	< 10	< 20	< 10	< 10	41.2 J
LF4-MW1	3/15/11	< 100	< 10	40.9	< 10	< 10	< 20	26.7	17.8 J	< 10	< 0.4	19.1 J	< 10	< 20	< 10	< 10	65.9 J
LF4-MW1	9/8/11	< 100	< 10	39.1	< 10	< 10	< 20	31.9	< 20	3.17 J	< 2	19.1 J	< 10	< 20	< 10	< 10	52.1 J
LF4-MW1	3/14/12	< 100	< 10	47.2	< 10	< 10	< 20	32.8	< 20	3.18 J	< 0.4	20.5	< 10	< 20	< 10	< 10	52.8 J
LF4-MW1	9/6/12	< 100	< 10	46.6	< 10	< 10	< 20	36.8	< 20	< 10	< 0.4	25.4	< 10	< 20	< 10	< 10	55.9 J
LF4-MW1	3/5/13	< 100	< 10	47.7	< 10	< 10	< 20	33.0	< 20	3.26 J	< 0.4	23.1	< 10	< 20	< 10	< 10	62.9 J
LF4-MW1	9/11/13	< 100	< 10	36.1	< 10	< 10	< 20	22.1	3.11 J	7.36 J	< 0.4	15.4 J	< 10	< 20	< 10	< 10	39.1 J
LF4-MW1	3/5/14	< 1.0	0.258 J	37.1	0.284 J	< 1.0	< 1.0	26.4	2.74	0.223 J	< 0.4	17.7	< 1.0	< 1.0	< 1.0	< 1.0	43.3
LF4-MW1	9/4/14	< 1.0	0.263 J	36.0	0.391 J	< 1.0	0.296 J	24.3	2.71	0.378 J	< 0.4	14.7	< 1.0	< 1.0	< 1.0	< 1.0	39.3
LF4-MW1	3/13/15	< 1.0	0.227 J	43.5	0.289 J	< 1.0	< 1.0	33.6	1.45	0.282 J	< 0.4	19.4	< 1.0	< 1.0	< 1.0	< 1.0	59.5
LF4-MW1	9/16/15	< 1.0	0.513 J	42.3	0.497 J	< 1.0	1.89	25	4.87	3.77	< 0.4	16.4	< 1.0	< 1.0	< 1.0	1.77	40.5
LF4-MW1	3/16/16	< 1.0	< 1.0	42.7	0.275 J	0.201 J	< 1.0	39.5	1.78	0.374 J	< 0.4	22.1	< 1.0	< 1.0	< 1.0	< 1.0	60.5

Table 4-5: Analytical Data for Metals in Groundwater
Industrial Landfill, Parcel 175(5)
McClellan, Anniston Alabama

Well ID	Sample Date	Antimony (µg/L)	Arsenic (µg/L)	Barium (µg/L)	Beryllium (µg/L)	Cadmium (µg/L)	Chromium (µg/L)	Cobalt (µg/L)	Copper (µg/L)	Lead (µg/L)	Mercury (µg/L)	Nickel (µg/L)	Selenium (µg/L)	Silver (µg/L)	Thallium (µg/L)	Vanadium (µg/L)	Zinc (µg/L)
LF4-MW1	9/21/16	< 1.0	0.314 J	40.7	0.429 J	< 1.0	0.408 J	30.4	2.16	0.722 J	< 0.4	18.3	<1.0	<1.0	<1.0	<1.0	47
LF4-MW1	3/15/17	< 1.0	0.309 J	45.5	0.276 J	0.249 J	0.481 J	33.7	1.31	0.472 J	< 0.4	21.8	<1.0	<1.0	<1.0	<1.0	55.8
LF4-MW1	9/8/17	< 1	0.346 J	44	0.224 J	< 1	0.377 J	37.7	1.33	0.368 J	< 0.4	22.9	< 1	< 1	< 1	< 1	60.9
LF4-MW1	3/8/18	< 1	1.48	44.6	0.207 J	< 1	1.45	27.9	2.23	1.67	< 0.4	18.3	< 1	< 1	< 1	1.58	50.3
LF4-MW1	9/11/18	< 20	< 20	47	0.19 J	< 5	< 10	33	< 20	< 10	< 0.2	23 J	< 20	< 10	6.5 J	1.1 J	73
LF4-MW1	3/7/19	< 5	< 3	47	0.17 J	< 0.5	1.7 J	38	1.7 J	1.7 J	< 0.2	23	< 2.5	< 1	< 1	< 10	58
LF4-MW1	9/5/19	< 5	< 3	44	0.34 J	< 0.5	< 5	34	2.3 J	1.5 J	0.09 J B (UB)	21	< 2.5	< 1	< 1	< 10	150
LF4-MW1	3/12/20	< 5	< 3	46	0.27 J	< 0.5	< 5	35 ^	2.6 J	1.6 J	< 0.20	22	< 2.5	< 1	< 1	< 10	57
LF4-MW1	9/15/20	< 5	< 3	46 B	0.3 J	0.2 J	< 5	38	< 5	< 2.5	< 0.2	23	< 2.5	< 1	< 1	< 10	82
LF4-MW2	3/29/00	< 5.0	< 5.0	96.5	< 1.0	< 1.0	< 5.0	< 500	< 5.0	< 3.0	< 1.0	15	< 5.0	--	< 2.0	< 100	39.5
LF4-MW2	9/26/00	--	< 5.0	120	--	< 1.0	7.4	--	--	23.9	< 1.0	--	< 5.0	--	--	--	--
LF4-MW2	4/24/01	--	< 5.0	100	--	< 1.0	< 5.0	--	--	< 3.0	< 1.0	--	< 5.0	--	--	--	--
LF4-MW2	9/28/01	--	< 5.0	70	--	< 1.0	5.77	--	--	8.14	< 1.0	--	< 5.0	--	--	--	--
LF4-MW2	4/2/02	--	< 5.0	120	--	< 1.0	< 5.0	--	--	5.69	< 1.0	--	< 5.0	--	--	--	--
LF4-MW2	9/18/02	--	< 5.0	110	--	< 1.0	< 5.0	--	--	3.0	< 1.0	--	< 5.0	--	--	--	--
LF4-MW2	3/5/03	--	< 5.0	60	--	< 1.0	9.0	--	--	10	< 1.0	--	< 5.0	--	--	--	--
LF4-MW2	9/26/03	--	< 5.0	90	--	1.0	< 5.0	--	--	15	< 1.0	--	< 5.0	--	--	--	--
LF4-MW2	3/31/04	< 100	< 10	87.2	< 10	< 10	< 20 (UJ-)	7.27 J (J-)	< 20	4.27 J (J-)	< 0.4	< 20	< 10	< 20 (UJ-)	< 10	< 10	50.4 J
LF4-MW2	9/29/04	< 100	15.2	227	4.41 J	< 10	30.1	27.2	55.6	78.8	0.188 J	33.2	< 10	< 20	< 10	101	92.9 J
LF4-MW2	3/16/05	< 100	< 10	60.3	< 10	< 10	< 20	8.53 J	< 20	2.71 J	< 0.4	< 20	< 10	< 20	< 10	< 10	65.6 J
LF4-MW2	9/28/05	< 100	< 10	87.7	1.32 J	< 10	< 20	22.0	< 20	< 10	< 0.4	14.8 J	< 10	< 20	< 10	< 10	100 U^ (UB)
LF4-MW2	3/13/06	< 100	< 10	25.4	< 10	< 10	< 20	6.39 J	10.7 J	10.1	< 0.4	< 20	< 10	20 U^ (UB)	< 10	< 10	54.2 J
LF4-MW2	9/13/06	46.2 J	6.34 J	111	2.38 J	< 10	5.68 J	15 J	16.1 J	12.1	< 0.4	18.7 J	< 10	20 U^ (UB)	10 U^ (UB)	18.7	96 J
LF4-MW2	3/6/07	< 100	< 10	94.7	< 10	< 10	< 20	14.6 J	9.44 J	7.79 J	< 0.4	10.8 J	< 10	< 20	< 10	6.95 J	35.5 J
LF4-MW2	9/24/07	< 100	< 10	82	< 10	< 10	< 20	12.7 J	2.59 J	4.45 J	< 0.4	10.8 J	< 10	< 20	< 10	< 10	100 U^ (UB)
LF4-MW2	3/26/08	< 100	< 10	133	< 10	< 10	< 20	9.79 J	4.98 J	7.24 J	< 0.4	9.77 J	< 10	< 20	< 10	< 10	17.1 J
LF4-MW2	9/16/08	< 100	< 10	97.6	< 10	< 10	< 20	19.4 J	4.2 J	5.01 J	< 0.4	14.8 J	< 10	< 20	< 10	< 10	30.6 J
LF4-MW2	3/17/09	< 100	< 10	125	1.06 J	< 10	< 20	96.4	3.4 J	< 10	< 0.8	68.3	< 10	< 20	5.84 J	< 10	501
LF4-MW2	9/17/09	< 100	< 10	93.4	< 10	< 10	< 20	113	3.54 J	< 10	< 0.4	70.1	< 10	< 20	6.54 J	< 10	608
LF4-MW2	3/17/10	< 100	< 10	89.8	2.02 J	1.01 J	3.36 J	87	24.3	9.3 J	< 0.4	64.8	< 10	< 20	< 10	< 10	887
LF4-MW2	9/21/10	< 100	8.3 J	99.7	< 10	< 10	< 20	31.3	< 20	< 10	< 0.4	20.5	< 10	< 20	< 10	< 10	105
LF4-MW2	3/15/11	< 100	< 10	102	< 10	< 10	< 20	23.5	< 20	< 10	< 0.4	14.6 J	< 10	< 20	< 10	< 10	703 J
LF4-MW2	9/8/11	< 100	5.4 J	107	< 10	< 10	< 20	24.6	< 20	< 10	< 2.0	15 J	< 10	< 20	< 10	< 10	73.7 J

Table 4-5: Analytical Data for Metals in Groundwater
Industrial Landfill, Parcel 175(5)
McClellan, Anniston Alabama

Well ID	Sample Date	Antimony (µg/L)	Arsenic (µg/L)	Barium (µg/L)	Beryllium (µg/L)	Cadmium (µg/L)	Chromium (µg/L)	Cobalt (µg/L)	Copper (µg/L)	Lead (µg/L)	Mercury (µg/L)	Nickel (µg/L)	Selenium (µg/L)	Silver (µg/L)	Thallium (µg/L)	Vanadium (µg/L)	Zinc (µg/L)
LF4-MW2	3/14/12	< 100	< 10	107	< 10	< 10	< 20	19.9 J	< 20	< 10	< 0.4	11.6 J	< 10	< 20	< 10	< 10	54.9 J
LF4-MW2	9/6/12	< 100	< 10	109	< 10	< 10	< 20	18.7 J	4.79 J	< 10	< 0.4	15.4 J	< 10	< 20	< 10	< 10	62.4 J
LF4-MW2	3/5/13	< 100	< 10	128	< 10	< 10	< 20	142	11.8 J	3.74 J	< 0.4	83.4	< 10	< 20	< 10	< 10	733
LF4-MW2	9/11/13	< 100	< 10	75.4	< 10	< 10	< 20	109	< 20	4.31 J	< 0.4	61.6	< 10	< 20	< 10	< 10	410
LF4-MW2	3/5/14	< 1.0	1.38	63	0.8 J	1.08	2.4	175	23.5	2.2	< 0.4	99	0.771 J	< 1.0	< 1.0	< 1.0	1020
LF4-MW2	9/4/14	< 1.0	1.96	57.6	0.11 J	0.303 J	0.667 J	90.6	1.86	0.987 J	< 0.4	44.2	< 1.0	< 1.0	< 1.0	0.639 J	311
LF4-MW2	3/13/15	< 1.0	2.36	73.6	0.709 J	0.715 J	2.04	139	15.1	2.08	< 0.4	75.4	1.04	< 1.0	< 1.0	< 1.0	826
LF4-MW2	9/16/15	< 1.0	4.05	79.1	0.148 J	0.232 J	0.972 J	75.5	2.42	1.9	< 0.4	41.1	< 1.0	< 1.0	< 1.0	0.8 J	281
LF4-MW2	3/16/16	< 1.0	2.46	58.8	0.345 J	0.5 J	1.83	92.8	10.4	4.16	< 0.4	53.8	< 1.0	< 1.0	< 1.0	1.4	434
LF4-MW2	9/21/16	<1.0	3.33	69.7	0.14 J	0.282 J	1	91.7	2.54	1.8	< 0.4	49.1	<1.0	<1.0	<1.0	0.895 J	389
LF4-MW2	3/15/17	<1.0	2.85	66.5	0.119 J	<1.0	0.854 J	55.7	2.31	2.24	< 0.4	27.5	<1.0	<1.0	<1.0	1.4	175
LF4-MW2	9/8/17	< 1	5.43	87.3	0.115 J	< 1	1.22	51.3	2.11	1.93	< 0.4	25.3	< 1	< 1	< 1	1.96	180
LF4-MW2	3/8/18	< 1	2.74	77	0.542 J	0.915 J	2.97	125	10.9	3.91	< 0.4	64.8	0.608 J	< 1	< 1	2.52	732
LF4-MW2	9/11/18	< 20	9.9 J	74	0.15 J	< 5	< 10	100	2.3 J	< 10	< 0.2	53	< 20	< 10	< 25	< 10	390
LF4-MW2	3/7/19	< 5	< 3	59	1.3	1.3	4.7 J	160	27	4.7	< 0.2	96	1.3 J	< 1	< 1	< 10	1200
LF4-MW2	9/5/19	0.65 J	2.4 J	68	0.24 J	0.37 J	3.2 J	120	4.4 J	2.2 J	0.095 J B (UB)	63	< 2.5	< 1	< 1	< 10	520
LF4-MW2	3/12/20	< 5	3.1	63	0.8	0.74	3.9 J	100 ^	19	16	< 0.20	59	< 2.5	< 1	< 1	< 10	540
LF4-MW2	9/15/20	< 5	3.3	69 B	0.42 J	0.21 J	4.5 J	130	5.1	6.2	< 0.2	65	< 2.5	< 1	< 1	< 10	460
LF4-MW3	3/29/00	< 5.0	< 5.0	< 50	< 1.0	< 1.0	< 5.0	< 500	< 5.0	4.0	< 1.0	< 5.0	< 5.0	--	< 2.0	< 100	< 30
LF4-MW3	9/26/00	--	< 5.0	60	--	< 1.0	6.23	--	--	11.4	< 1.0	--	< 5.0	--	--	--	--
LF4-MW3	4/24/01	--	< 5.0	60	--	< 1.0	< 5.0	--	--	5.0	< 1.0	--	< 5.0	--	--	--	--
LF4-MW3	9/28/01	--	6.0	< 50	--	< 1.0	< 5.0	--	--	< 3.0	< 1.0	--	< 5.0	--	--	--	--
LF4-MW3	4/2/02	--	< 5.0	60	--	< 1.0	< 5.0	--	--	< 3.0	< 1.0	--	< 5.0	--	--	--	--
LF4-MW3	9/18/02	--	< 5.0	70	--	< 1.0	< 5.0	--	--	< 3.0	< 1.0	--	< 5.0	--	--	--	--
LF4-MW3	3/5/03	--	< 5.0	50	--	< 1.0	7.0	--	--	< 3.0	< 1.0	--	< 5.0	--	--	--	--
LF4-MW3	9/26/03	--	< 5.0	70	--	< 1.0	< 5.0	--	--	17	< 1.0	--	< 5.0	--	--	--	--
LF4-MW3	3/31/04	< 100	< 10	53.7	< 10	< 10	< 20 (UJ-)	< 20 (UJ-)	27.4	5.34 J (J-)	< 0.4	< 20	< 10	< 20 (UJ-)	< 10 (UJ-)	< 10	69.4 J
LF4-MW3	9/29/04	< 100	< 10	66.8	< 10	< 10	< 20	12.3 J	< 20	< 10 (UJ-)	< 0.4	< 20	< 10	< 20	< 10	< 10	100 U^ (UB)
LF4-MW3	3/16/05	< 100	< 10	36.3	< 10	< 10	< 20	< 20	< 20	< 10	< 0.4	< 20	< 10	< 20	< 10	< 10	5.05 J
LF4-MW3	9/29/05	< 100	< 10	54.1	< 10	< 10	< 20	< 20	< 20	< 10	< 0.4	< 20	< 10	< 20	< 10	< 10	100 U^ (UB)
LF4-MW3	3/13/06	< 100	< 10	57	< 10	< 10	< 20	< 20	6.48 J	5.43 J	< 0.4	< 20	< 10	20 U^ (UB)	< 10	7.06 J	21.1 J
LF4-MW3	9/14/06	< 100	5.12 J	65.4	< 10	< 10	20 U^ (UB)	14 J	7.02 J	3.01 J	< 0.4	15.4 J	< 10	< 20 (UJ-)	5.41 J	5.79 J	25.1 J
LF4-MW3	3/6/07	< 100	< 10	48.3	< 10	< 10	< 20	< 20	< 20	2.38 J	< 0.4	< 20	< 10	< 20 (UJM)	< 10	< 10	26.2 J

Table 4-5: Analytical Data for Metals in Groundwater
Industrial Landfill, Parcel 175(5)
McClellan, Anniston Alabama

Well ID	Sample Date	Antimony (µg/L)	Arsenic (µg/L)	Barium (µg/L)	Beryllium (µg/L)	Cadmium (µg/L)	Chromium (µg/L)	Cobalt (µg/L)	Copper (µg/L)	Lead (µg/L)	Mercury (µg/L)	Nickel (µg/L)	Selenium (µg/L)	Silver (µg/L)	Thallium (µg/L)	Vanadium (µg/L)	Zinc (µg/L)
LF4-MW3	9/25/07	< 100	< 10	59.7	< 10	< 10	< 20	7.41 J	< 20	< 10	< 0.4	6.81 J	< 10	< 20	< 10	< 10	15.6 J
LF4-MW3	3/26/08	< 100	< 10	69.8	< 10	< 10	< 20	< 20	2.46 J	4.79 J	< 0.4	6.14 J	< 10	< 20	< 10	< 10	15.9 J
LF4-MW3	9/16/08	< 100	< 10	51.9	< 10	< 10	< 20	< 20	3.72 J	< 10	< 0.4	3.94 J	< 10	< 20	< 10	< 10	8.07 J
LF4-MW3	3/17/09	< 100	< 10	53.5	< 10	< 10	< 20	< 20	2.2 J	< 10	< 0.8	3.49 J	< 10	< 20	< 10	< 10	15 J
LF4-MW3	9/17/09	< 100	22.4	76.3	< 10	< 10	< 20	< 20	< 20	29.1	< 0.4	6.87 J	< 10	< 20	< 10	< 10	26.6 J
LF4-MW3	3/17/10	< 100	< 10	58.5	< 10	< 10	< 20	< 20	2.03 J	< 10	< 0.4	< 20	< 10	< 20	< 10	< 10	7.51 J
LF4-MW3	9/21/10	< 100	< 10	39.2	< 10	< 10	< 20	3.39 J	< 20	< 10	< 0.4	2.66 J	< 10	< 20	< 10	< 10	5.95 J
LF4-MW3	3/15/11	< 100	< 10	69.2	< 10	< 10	< 20	2.92 J	6.07 J	5.0 J	< 0.4	3.87 J	< 10	< 20	< 10	< 10	20.6 J
LF4-MW3	9/8/11	< 100	< 10	57.1	< 10	< 10	< 20	2.74 J	< 20	< 10	< 2.0	3.49 J	< 10	< 20	< 10	< 10	10.1 J
LF4-MW3	3/14/12	< 100	< 10	60.8	< 10	< 10	< 20	< 20	3.23 J	< 10	< 0.4	3.43 J	< 10	< 20	< 10	< 10	14.7 J
LF4-MW3	9/6/12	< 100	< 10	59	< 10	< 10	< 20	< 20	3.05 J	< 10	< 0.4	3.62 J	< 10	< 20	< 10	< 10	17.1 J
LF4-MW3	3/5/13	< 100	< 10	75.7	< 10	< 10	< 20	< 20	3.46 J	4.5 J	< 0.4	4.38 J	< 10	< 20	< 10	< 10	16.6 J
LF4-MW3	9/11/13	< 100	< 10	52.2	< 10	< 10	< 20	9.77 J	< 20	3.13 J	< 0.4	< 20	< 10	< 20	< 10	< 10	< 100
LF4-MW3	3/5/14	< 1.0	0.272 J	54.7	0.27 J	< 1.0	0.256 J	1.76	1.74	2.01	< 0.4	2.85	< 1.0	< 1.0	< 1.0	< 1.0	< 20
LF4-MW3	9/4/14	< 1.0	679 J	67200	0.35 J	0.243 J	0.654 J	4.03	1.67	2.01	< 0.4	3.4	< 1.0	< 1.0	< 1.0	1.28	< 20
LF4-MW3	3/13/15	< 1.0	0.648 J	84.5	0.597 J	< 1.0	0.356 J	1.61	1.93	4.32	< 0.4	3.37	< 1.0	< 1.0	< 1.0	< 1.0	14.9 J
LF4-MW3	9/16/15	< 1.0	0.432 J	97.8	0.308 J	0.248 J	0.406 J	17.7	1.1	1.53	< 0.4	6.0	< 1.0	< 1.0	< 1.0	< 1.0	< 20
LF4-MW3	3/16/16	< 1.0	0.352 J	56.7	0.31 J	< 1.0	0.34 J	1.49	1.91	2.41	< 0.4	2.9	< 1.0	< 1.0	< 1.0	< 1.0	< 20
LF4-MW3	9/21/16	<1.0	0.992 J	86.8	0.508 J	0.262 J	1.19	1.02	2.26	3.16	< 0.4	3.93	<1.0	<1.0	<1.0	1.83	11.2 J
LF4-MW3	3/15/17	<1.0	0.782 J	60.3	0.373 J	< 1.0	0.786 J	1.5	1.3	3.05	< 0.4	3.0	<1.0	<1.0	<1.0	0.949 J	10.4 J
LF4-MW3	9/8/17	< 1	0.207 J	59.3	0.224 J	< 1	0.591 J	1.86	3.36	0.935 J	< 0.4	3.4	< 1	< 1	< 1	< 1	18 J
LF4-MW3	3/8/18	< 1 (UJM)	0.715 J	58.1	0.329 J	< 1	0.841	1.38	1.58	2.91	< 0.4	2.8	< 1	< 1	< 1	0.898 J	14.2 J
LF4-MW3	9/11/18	< 20	< 20	57	0.28 J	< 5	< 10	6.4 J	< 20	< 10	< 0.2	4.7 J	< 20	< 10	< 25	1.2 J	15J F1 F2
LF4-MW3	3/7/19	< 5	< 3	68	0.44 J	< 0.5	2.4 J	1.3	2.5 J	4.1	< 0.2	3.3 J	< 2.5	< 1	< 1	< 10	16 J
LF4-MW3	9/5/19	< 5	< 3	73	0.32 J	< 0.5	1.6 J	0.59	< 5	1.5 J	0.054 J B (UB)	3.5 J	< 2.5	< 1	< 1	< 10	41
LF4-MW3	3/12/20	< 5	3.5	85	0.69	< 0.5	4.2 J	1.5 ^	4.1 J	8.9	< 0.20	4.5 J	2.2 J	< 1	< 1	< 10	19 J
LF4-MW3	9/15/20	< 5	< 3	42 (JM)	0.41 J	0.17 J	2.4 J	1.1 (B)	1.7 J	2 J	< 0.2	2.7 J	< 2.5	< 1	< 1	< 10	53 F2
LF4-MW4	3/29/00	< 5.0	< 5.0	245	< 1	< 1.0	< 5.0	< 500	< 5.0	6.0	< 1.0	< 5.0	< 5.0	--	< 2.0	< 100	< 30
LF4-MW4	9/26/00	--	< 5.0	200	--	< 1.0	5.55	--	--	22.3	< 1.0	--	< 5.0	--	--	--	--
LF4-MW4	4/24/01	--	< 5.0	140	--	< 1.0	< 5.0	--	--	< 3.0	< 1.0	--	< 5.0	--	--	--	--
LF4-MW4	9/28/01	--	6.0	250	--	< 1.0	< 5.0	--	--	< 3.0	< 1.0	--	< 5.0	--	--	--	--
LF4-MW4	4/2/02	--	< 5.0	250	--	< 1.0	< 5.0	--	--	< 3.0	< 1.0	--	< 5.0	--	--	--	--
LF4-MW4	9/18/02	--	< 5.0	240	--	< 1.0	< 5.0	--	--	5.0	< 1.0	--	< 5.0	--	--	--	--

Table 4-5: Analytical Data for Metals in Groundwater
Industrial Landfill, Parcel 175(5)
McClellan, Anniston Alabama

Well ID	Sample Date	Antimony (µg/L)	Arsenic (µg/L)	Barium (µg/L)	Beryllium (µg/L)	Cadmium (µg/L)	Chromium (µg/L)	Cobalt (µg/L)	Copper (µg/L)	Lead (µg/L)	Mercury (µg/L)	Nickel (µg/L)	Selenium (µg/L)	Silver (µg/L)	Thallium (µg/L)	Vanadium (µg/L)	Zinc (µg/L)
LF4-MW4	3/5/03	--	< 5.0	170	--	< 1.0	< 5.0	--	--	5.0	< 1.0	--	< 5.0	--	--	--	--
LF4-MW4	9/26/03	--	< 5.0	230	--	2.0	< 5.0	--	--	15	< 1.0	--	< 5.0	--	--	--	--
LF4-MW4	3/31/04	< 100	< 10	197	< 10	< 10	< 20 (UJ-)	6.45 J (J-)	< 20	< 10 (UJ-)	< 0.4	< 20	< 10	< 20 (UJ-)	< 10 (UJ-)	< 10	17.5 J
LF4-MW4	9/29/04	< 100	< 10	181	< 10	< 10	< 20	< 20	< 20	6.94 J (J-)	< 2.0	< 20	< 10	< 20	< 10	< 10	100 U^ (UB)
LF4-MW4	3/15/05	< 100	< 10	152	< 10	< 10	< 20	< 20 (UJ-)	< 20	< 10	< 0.4	< 20	< 10	< 20	< 10	< 10	10.4 J
LF4-MW4	9/29/05	< 100	< 10	186	< 10	< 10	< 20	< 20	< 20	2.7 J	< 0.4	< 20	< 10	< 20	< 10	< 10	100 U^ (UB)
LF4-MW4	3/14/06	< 100	< 10	145	< 10	< 10	< 20	< 20	< 20	11.6	< 0.4	< 20	< 10	< 20	< 10	6.87 J	25.5 J
LF4-MW4	9/14/06	< 100	5.18 J	180	< 10	< 10	20 U^ (UB)	< 20	8.16 J	28.5	< 0.4	< 20	< 10	< 20 (UJ-)	< 10	12.5	45 J
LF4-MW4	3/7/07	< 100	5.59 J	119	< 10	< 10	< 20	< 20	< 20	5.62 J	< 0.4	< 20	< 10	< 20	< 10	< 10	9.82 J
LF4-MW4	9/25/07	< 100	< 10	209	< 10	< 10	< 20	4.34 J	< 20	5 J	< 0.4	5.16 J	< 10	< 20	< 10	< 10	14 J
LF4-MW4	3/26/08	< 100	< 10	143	< 10	< 10	< 20	6.95 J	< 20	< 10	< 0.4	4.22 J	< 10	< 20	8.84 J	< 10	7.11 J
LF4-MW4	9/17/08	68.6 J	< 10	193	< 10	< 10	< 20	4.32 J	2.4 J	5.62 J	< 0.4	4.99 J	< 10	3.37 J (JM)	10.7	< 10	17.8 J
LF4-MW4	3/17/09	< 100	< 10	139	< 10	< 10	< 20	5.29 J	< 20	4.94 J	< 0.8	4.39 J	< 10	< 20	11.8	< 10	19.3 J
LF4-MW4	9/21/09	< 100	< 10	115	< 10	< 10	< 20	< 20	2.06 J	5.62 J	< 0.4	2.83 J	< 10	< 20	< 10	< 10	7.15 J
LF4-MW4	3/17/10	36.7 J	< 10	129	< 10	< 10	< 20	2.63 J	2 U^ (UB)	3.32 J	< 0.4 (UJM)	4.59 J	< 10	< 20	< 10	< 10	6.8 J
LF4-MW4	9/21/10	< 100	< 10	177	< 10	1.62 J	< 20	4.49 J	< 20	3.58 J	< 0.4	3.93 J	< 10	< 20	< 10	< 10	12.9 J
LF4-MW4	3/15/11	< 100	< 10	89.8	< 10	< 10	< 20	3.02 J	3.05 J	3.56 J	< 0.4	< 20	< 10	< 20	< 10	< 10	12.7 J
LF4-MW4	9/8/11	< 100	< 10	169	< 10	< 10	< 20	4.25 J	< 20	3.69 J	< 2.0	3.72 J	< 10	< 20	< 10	2.75 J	10.2 J
LF4-MW4	3/14/12	< 100	< 10	136	< 10	< 10	< 20	3.92 J	3.03 J	< 10	< 0.4	< 20	< 10	< 20	< 10	< 10	< 100
LF4-MW4	9/6/12	< 100	< 10	115	< 10	< 10	< 20	< 20	4.83 J	< 10	< 0.4	< 20	< 10	< 20	< 10	< 10	< 100
LF4-MW4	3/5/13	< 100	< 10	162	< 10	< 10	< 20	2.86 J	< 20	< 10	< 0.4	< 20	< 10	< 20	< 10	< 10	12.7 J
LF4-MW4	9/11/13	< 100	< 10	201	< 10	< 10	< 20	6.32 J	< 20	4.8 J	< 0.4	8.64 J	< 10	< 20	< 10	< 10	11.8 J
LF4-MW4	3/5/14	< 1.0	2.03	174	< 1.0	< 1.0	< 1.0	3.05	1.37	1.01	< 0.4 (UJM)	2.57	< 1.0	< 1.0	< 1.0	< 1.0	< 20
LF4-MW4	9/4/14	< 1.0	2720	188000	0.114 J	0.926 J	< 1.0	3.31	0.889 J	4.09	< 0.4	3.73	< 1.0	< 1.0	< 1.0	2.33	< 20
LF4-MW4	3/13/15	< 1.0	2.29	112	< 1.0	< 1.0	0.22 J	5.34	< 1.0	0.601 J	< 0.4	2.11	< 1.0	< 1.0	< 1.0	1.28	< 20
LF4-MW4	9/16/15	< 1.0	1.3	174	0.196 J	1.5	1.95	4.47	2.53	10.9	< 0.4	4.35	0.308 J	< 1.0	< 1.0	7.32	17.3 J
LF4-MW4	3/16/16	< 1.0	5.22	186	< 1.0	< 1.0	< 1.0	2.11	< 1.0	0.407 J	< 0.4	2.2	< 1.0	< 1.0	< 1.0	< 1.0	< 20
LF4-MW4	9/21/16	<1.0	1.02	160	<1.0	0.508 J	<1.0	4.22	1.17	3.2	< 0.4	3.16	<1.0	<1.0	<1.0	2.91	17.1 J
LF4-MW4	3/15/17	<1.0	3.28	127	<1.0	< 1.0	0.289 J	7.09	0.501 J	0.711 J	< 0.4	2.29	<1.0	<1.0	<1.0	2.09	< 20
LF4-MW4	9/8/17	< 1	6.17	225	0.103 J	0.892 J	0.709 J	8.34	1.28	8.82	< 0.4	3.63	0.463 J	< 1	< 1	3.91	23.5
LF4-MW4	3/8/18	< 1	2.47	197	< 1	< 1	0.253 J	2.71	< 1	0.547 J	< 0.4	1.47	< 1	< 1	< 1	0.799 J	< 20
LF4-MW4	9/11/18	< 20	7.0 J	160	< 4	< 5	< 10	4.3 J	< 20	7.2 J	< 0.2	4.8 J	< 20	< 10	< 25	< 10	46
LF4-MW4	3/7/19	< 5	5	180	< 0.5	< 0.5	< 5	1.9	< 5	1.2 J	< 0.2	< 5	< 2.5	< 1	< 1	< 10	56

Table 4-5: Analytical Data for Metals in Groundwater
Industrial Landfill, Parcel 175(5)
McClellan, Anniston Alabama

Well ID	Sample Date	Antimony (µg/L)	Arsenic (µg/L)	Barium (µg/L)	Beryllium (µg/L)	Cadmium (µg/L)	Chromium (µg/L)	Cobalt (µg/L)	Copper (µg/L)	Lead (µg/L)	Mercury (µg/L)	Nickel (µg/L)	Selenium (µg/L)	Silver (µg/L)	Thallium (µg/L)	Vanadium (µg/L)	Zinc (µg/L)
LF4-MW4	9/5/19	1.2 J	1.6 J	160	< 0.5	1	< 5	4	< 5	5.2	< 0.2	3.4 J	< 2.5	< 1	< 1	< 10	92
LF4-MW4	3/12/20	< 5	5.9	170	< 0.5	0.21 J	< 5	2.2 ^	< 5	3.3	< 0.20	2.2 J	< 2.5	< 1	< 1	< 10	12 J
LF4-MW4	9/15/20	< 5	< 3	160 B	< 0.5	0.7	< 5	3.4	< 5	5.2	< 0.2	2.6 J	< 2.5	< 1	< 1	< 10	27
LF4-MW5	3/29/00	< 5.0	< 5.0	< 50	< 1	< 1.0	< 5.0	< 500	< 5.0	3.0	< 1.0	< 5.0	< 5.0	--	< 2.0	< 100	< 30
LF4-MW5	9/26/00	--	< 5.0	< 20	--	< 1.0	< 5.0	--	--	11.2	< 1.0	--	< 5.0	--	--	--	--
LF4-MW5	4/24/01	--	< 5.0	< 50	--	< 1.0	< 5.0	--	--	< 3.0	< 1.0	--	< 5.0	--	--	--	--
LF4-MW5	9/28/01	--	< 5.0	< 50	--	< 1.0	< 5.0	--	--	< 3.0	< 1.0	--	< 5.0	--	--	--	--
LF4-MW5	4/2/02	--	< 5.0	< 50	--	< 1.0	< 5.0	--	--	< 3.0	< 1.0	--	< 5.0	--	--	--	--
LF4-MW5	9/18/02	--	< 5.0	< 50	--	< 1.0	< 5.0	--	--	3.0	< 1.0	--	< 5.0	--	--	--	--
LF4-MW5	3/5/03	--	< 5.0	< 50	--	< 1.0	< 5.0	--	--	< 3.0	< 1.0	--	< 5.0	--	--	--	--
LF4-MW5	9/26/03	--	< 5.0	< 50	--	< 1.0	< 5.0	--	--	17	< 1.0	--	< 5.0	--	--	--	--
LF4-MW5	3/31/04	< 100	< 10	14.4	< 10	< 10	< 20 (UJ-)	< 20 (UJ-)	29.2	4.98 J (J-)	< 0.4	< 20	< 10	< 20 (UJ-)	< 10 (UJ-)	< 10	67.5 J
LF4-MW5	9/29/04	< 100	< 10	12.7	< 10	< 10	< 20	7.63 J	< 20	< 10 (UJ-)	< 0.4	< 20	< 10	< 20	< 10	< 10	100 U^ (UB)
LF4-MW5	3/16/05	< 100	< 10	15.8	< 10	< 10	< 20	< 20	< 20	3.87 J	< 0.4	< 20	< 10	< 20	< 10	< 10	7.98 J
LF4-MW5	9/29/05	< 100	< 10	11.6	< 10	< 10	< 20	< 20	< 20	< 10	< 0.4	< 20	< 10	< 20	< 10	< 10	< 100
LF4-MW5	3/14/06	< 100	< 10	20.4	< 10	< 10	< 20	7.09 J	< 20	4.51 J	< 0.4	< 20	< 10	20 U^ (UB)	6.92 J	9.47 J	12.8 J
LF4-MW5	9/14/06	< 100	< 10	20.8	< 10	< 10	< 20	6.42 J	< 20	10.7	< 0.4	< 20	< 10	< 20 (UJ-)	8.76 J	7.5 J	20.9 J
LF4-MW5	3/7/07	< 100	< 10	14.5	< 10	< 10	< 20	< 20	< 20	3.2 J	< 0.4	< 20	< 10	< 20	< 10	< 10	18.8 J
LF4-MW5	9/24/07	< 100	< 10	20.5	< 10	< 10	< 20	4.25 J	2.14 J	5 J	< 0.4	3.21 J	< 10	< 20	< 10	< 10	100 U^ (UB)
LF4-MW5	3/26/08	< 100	< 10	12.2	< 10	< 10	< 20	2.59 J	< 20	< 10	< 0.4	2.75 J	< 10	< 20	< 10	< 10	6.55 J
LF4-MW5	9/16/08	< 100	< 10	10.7	< 10	< 10	< 20	3.33 J	< 20	< 10	< 0.4	2.58 J	< 10	< 20	< 10	< 10	6.3 J
LF4-MW5	3/18/09	< 100	< 10	13.1	< 10	< 10	< 20	2.91 J	< 20	< 10	< 0.4	< 20	< 10	< 20	< 10	< 10	8.63 J
LF4-MW5	9/17/09	< 100	< 10	9.23 J	< 10	< 10	< 20	4.33 J	< 20	< 10	< 0.4	< 20	< 10	< 20	< 10	< 10	5.65 J
LF4-MW5	3/17/10	< 100	< 10	13.6	< 10	< 10	< 20	6.24 J	< 20	< 10	< 0.4	3.17 J	< 10	< 20	< 10	< 10	< 100
LF4-MW5	9/21/10	100 U^ (UB)	< 10	12.5	< 10	< 10	< 20	10.5 J	< 20	< 10	< 0.4	3.69 J	< 10	< 20	< 10	< 10	8.21 J
LF4-MW5	3/15/11	< 100	< 10	28.9	< 10	< 10	4.91 J	2.95 J	4.69 J	9.14 J	< 0.4	5.17 J	< 10	< 20	< 10	12.5	15 J
LF4-MW5	9/8/11	< 100	< 10	17.2	< 10	< 10	< 20	7.26 J	< 20	< 10	< 2.0	3.14 J	< 10	< 20	< 10	< 10	< 100
LF4-MW5	3/14/12	< 100	< 10	12.5	< 10	< 10	< 20	3.17 J	< 20	< 10	< 0.4	< 20	< 10	< 20	< 10	< 10	11.5 J
LF4-MW5	9/6/12	< 100	< 10	11.1	< 10	< 10	< 20	2.34 J	< 20	< 10	< 0.4	< 20	< 10	< 20	< 10	< 10	< 100
LF4-MW5	3/5/13	< 100	< 10	12	< 10	< 10	< 20	2.76 J	< 20	< 10	< 0.4	< 20	< 10	< 20	< 10	< 10	11 J
LF4-MW5	9/11/13	< 100	< 10	< 10	< 10	< 10	< 20	< 20	< 20	< 10	< 0.4	< 20	< 10	< 20	< 10	< 10	< 100
LF4-MW5	3/5/14	< 1.0	0.21 J	11.6	< 1.0	< 1.0	< 1.0	4.02	1.1	0.943 J	< 0.4	2.36	< 1.0	< 1.0	< 1.0	< 1.0	< 20
LF4-MW5	9/4/14	< 1.0	226 J	10100	0.101 J	< 1.0	< 1.0	3.24	0.788 J	0.638 J	< 0.4	1.61	< 1.0	< 1.0	< 1.0	< 1.0	< 20

Table 4-5: Analytical Data for Metals in Groundwater
Industrial Landfill, Parcel 175(5)
McClellan, Anniston Alabama

Well ID	Sample Date	Antimony (µg/L)	Arsenic (µg/L)	Barium (µg/L)	Beryllium (µg/L)	Cadmium (µg/L)	Chromium (µg/L)	Cobalt (µg/L)	Copper (µg/L)	Lead (µg/L)	Mercury (µg/L)	Nickel (µg/L)	Selenium (µg/L)	Silver (µg/L)	Thallium (µg/L)	Vanadium (µg/L)	Zinc (µg/L)
LF4-MW5	3/13/15	< 1.0	< 1.0	13.5	0.102 J	< 1.0	< 1.0	3.15	0.624 J	0.923 J	< 0.4	1.89	< 1.0	< 1.0	< 1.0	< 1.0	< 20
LF4-MW5	9/16/15	< 1.0	< 1.0	10.8	< 1.0	< 1.0	0.206 J	2.31	< 1.0	0.6 J	< 0.4	1.46	< 1.0	< 1.0	< 1.0	< 1.0	< 20
LF4-MW5	3/16/16	< 1.0	0.284 J	16.2	0.101 J	< 1.0	0.402 J	4.38	1.13	2.28	< 0.4	2.63	< 1.0	< 1.0	< 1.0	1.0 J	11.6 J
LF4-MW5	9/21/16	<1.0	<1.0	14.7	0.163 J	<1.0	<1.0	6.56	0.616 J	0.647 J	< 0.4	3.3	<1.0	<1.0	<1.0	<1.0	< 20
LF4-MW5	3/15/17	<1.0	<1.0	14.8	0.125 J	<1.0	0.477 J	2.67	1.22	1.24	< 0.4	2.07	<1.0	<1.0	<1.0	0.903 J	< 20
LF4-MW5	9/8/17	< 1	0.232 J	11.8	0.124 J	< 1	0.388 J	3.05	1.15	0.715 J	< 0.4	1.46	< 1	< 1	< 1	< 1	< 20
LF4-MW5	3/8/18	< 1	0.658 J	17.4	0.123 J	< 1	0.796	4.09	1.7	3.18	< 0.4	2.77	< 1	< 1	< 1	2.46	59.7
LF4-MW5	9/11/18	<20	< 20	11	< 4	< 5	< 10	2.7 J	< 20	< 10	< 0.2	3.9 J	< 20	< 10	< 25	<10	120
LF4-MW5	3/7/19	< 5	< 3	23	< 0.5	< 0.5	2.6 J	4.3	2 J	2.3 J	< 0.2	3.9 J	< 2.5	< 1	< 1	5.4 J	21
LF4-MW5	9/5/19	< 5	< 3	13	< 0.5	< 0.5	< 5	6.7	< 5	< 2.5	0.050 J B (UB)	3.1 J	< 2.5	< 1	< 1	< 10	11 J
LF4-MW5	3/12/20	< 5	< 3	18	< 0.5	< 0.5	< 5	3.6 ^	< 5	1.5 J	< 0.20	2.4 J	< 2.5	< 1	< 1	< 10	13 J
LF4-MW5	9/15/20	< 5	< 3	16 B	0.21 J	< 0.5	2.3 J	3.5	2.1 J	3	< 0.2	2.6 J	< 2.5	< 1	< 1	< 10	1000

Notes:
-- = Not analyzed
< = Indicates the analyte was not detected at the reported quantitation limit shown.
µg/L = micrograms per liter
mg/L = milligrams per liter

Samples collected 2000 through 2003 by IT Corporation/Shaw Environmental.
Samples collected in 2004 to the present by Matrix Environmental Services, LLC.

Lab Flags:
J = Estimated detection. Concentration is between the method detection limit and the practical quantitation limit.
U^ = Analyte is not detected above the reporting limit. Lab flag updated by MES data reviewer.
^ = ICV, CCV, ICB, CCB, ISA, CRL, CRA, DLCK or MRL standard, instrument related QC is outside acceptance limits.
Validation Flags:
(B) = Analyte was detected in an associated blank.
(UB) = Value is considered a non-detection due to a detection of the analyte in an associated blank.
(JM) = Estimated detection; the MS and MSD recoveries were outside laboratory historical control limits.
(UJM) = Reported quantitation limit is estimated; the MS and MSD recoveries were outside laboratory historical control limits.
(J-) = Analyte was reported as a negative concentration in the method or continuing calibration blank; affected sample detects may be biased low.
(UJ-) = Analyte was reported as a negative concentration in the method or continuing calibration blank; affected sample non-detects may be potential false negatives.

Table 5-1 - Summary of Statistically Significant Increases, September 2020 Sampling Event
Industrial Landfill, Parcel 175(5)
McClellan, Anniston, Alabama

Well Location	SSI Analyte	CUSUM	Sample Concentration	MCL	BKG Concentration	Units
LF4-MW1	cobalt	12.29	38	NA	10.5	µg/L
	nickel	25.66	23	100	--	µg/L
LF4-MW2	cobalt	37.37	130	NA	10.5	µg/L
	nickel	28.83	65	100	--	µg/L
	zinc	104.97	460	5000*	--	µg/L
LF4-MW4	chlorobenzene	NA	2.4	100	--	µg/L
	cis-1,2-dichloroethene	NA	1.5	70	--	µg/L
	trichloroethene	NA	1.2	5	--	µg/L

Notes:

-- = Not applicable or not established

µg/L = micrograms per liter

BKG = Background well LF4-MW5

CUSUM = Shewhart Cumulative Sum

MCL = Maximum contaminant level (Codes 335-7-2-.03, 335-7-2-.05, and 335-7-3-.02 of the *ADEM Division 7 Regulations* [ADEM, 2014])

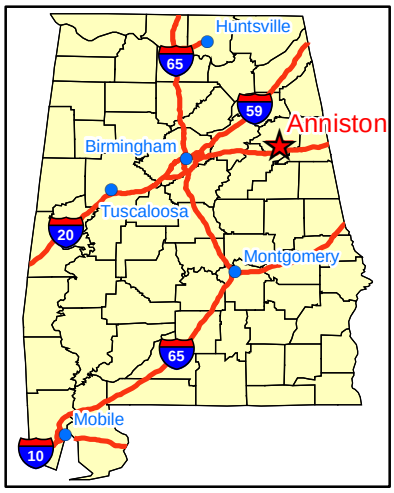
NA = Promulgated MCL not available

SSI = Statistically Significant Increase

* Secondary MCL (Code 335-7-3-.02 of the *ADEM Division 7 Regulations* [ADEM, 2014])

Sample concentration > MCL or BKG Concentration

Figures



PELHAM RANGE

CHOCCOLOCCO CORRIDOR

McCLELLAN

21

431

78

20

20

431

CALHOUN COUNTY

CLEBURNE COUNTY

CALHOUN COUNTY

CLEBURNE COUNTY

TALLADEGA COUNTY

0 1 2 4

Miles

Figure 1-1
Location Map
McClellan, Anniston, Alabama

Matrix ENVIRONMENTAL

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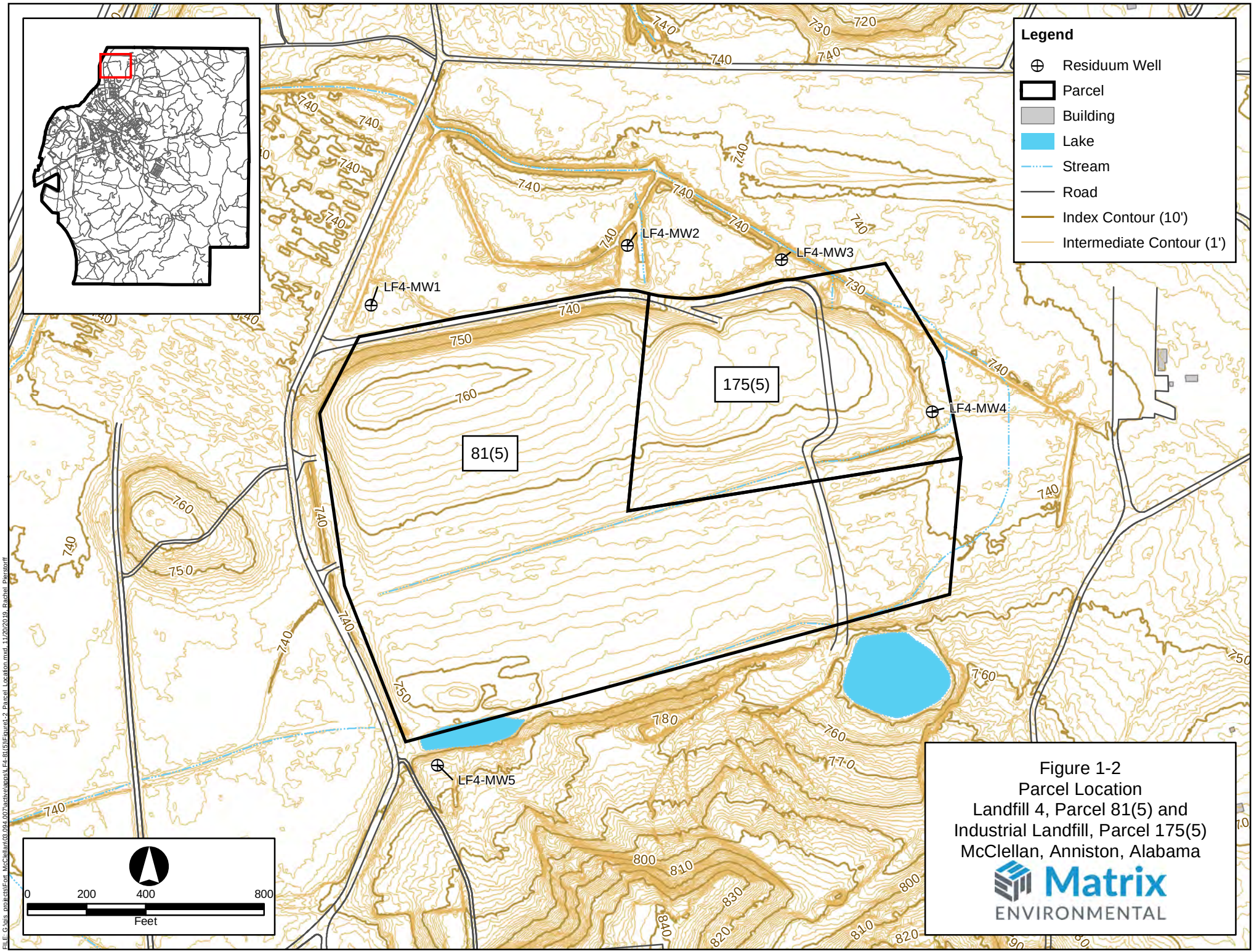
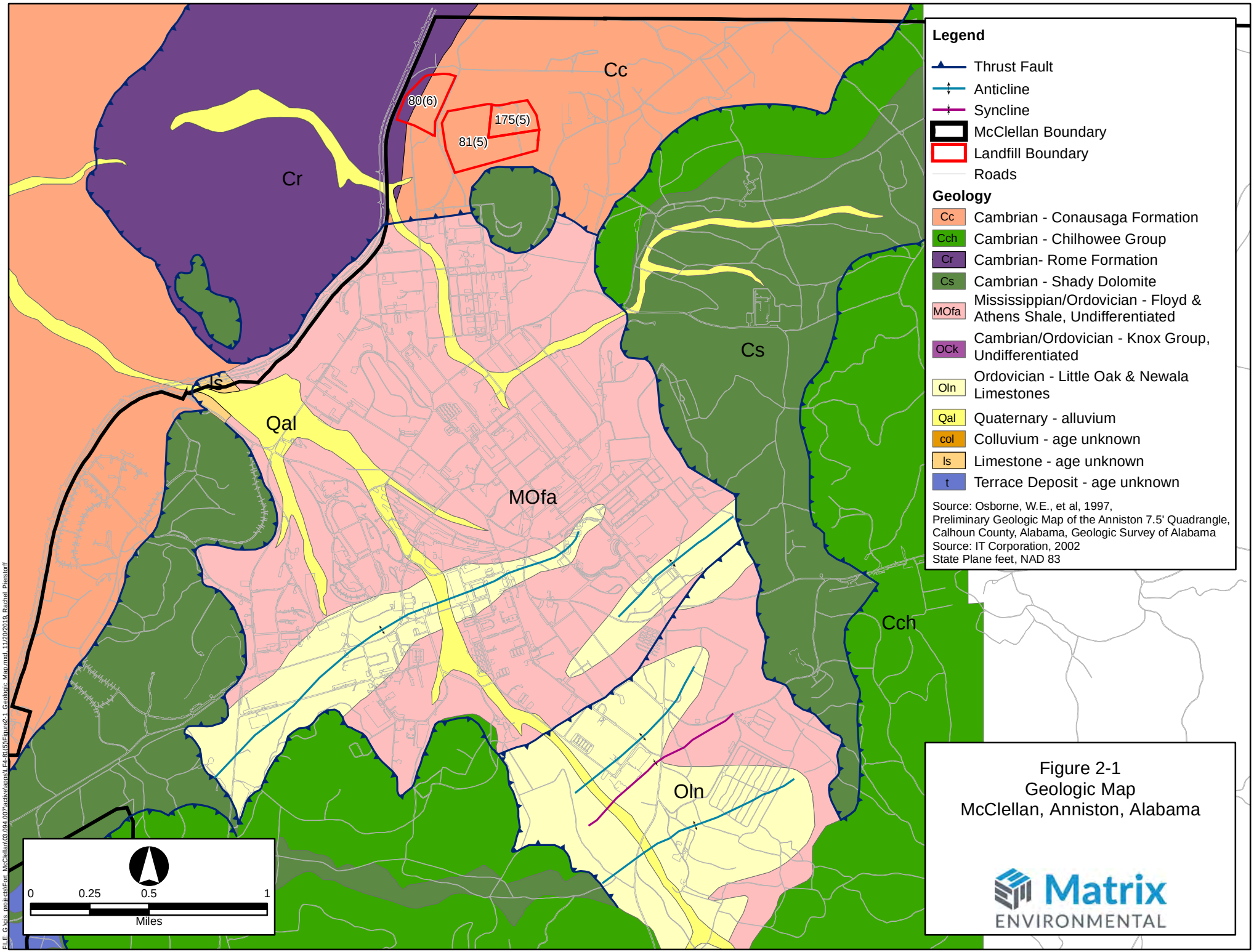
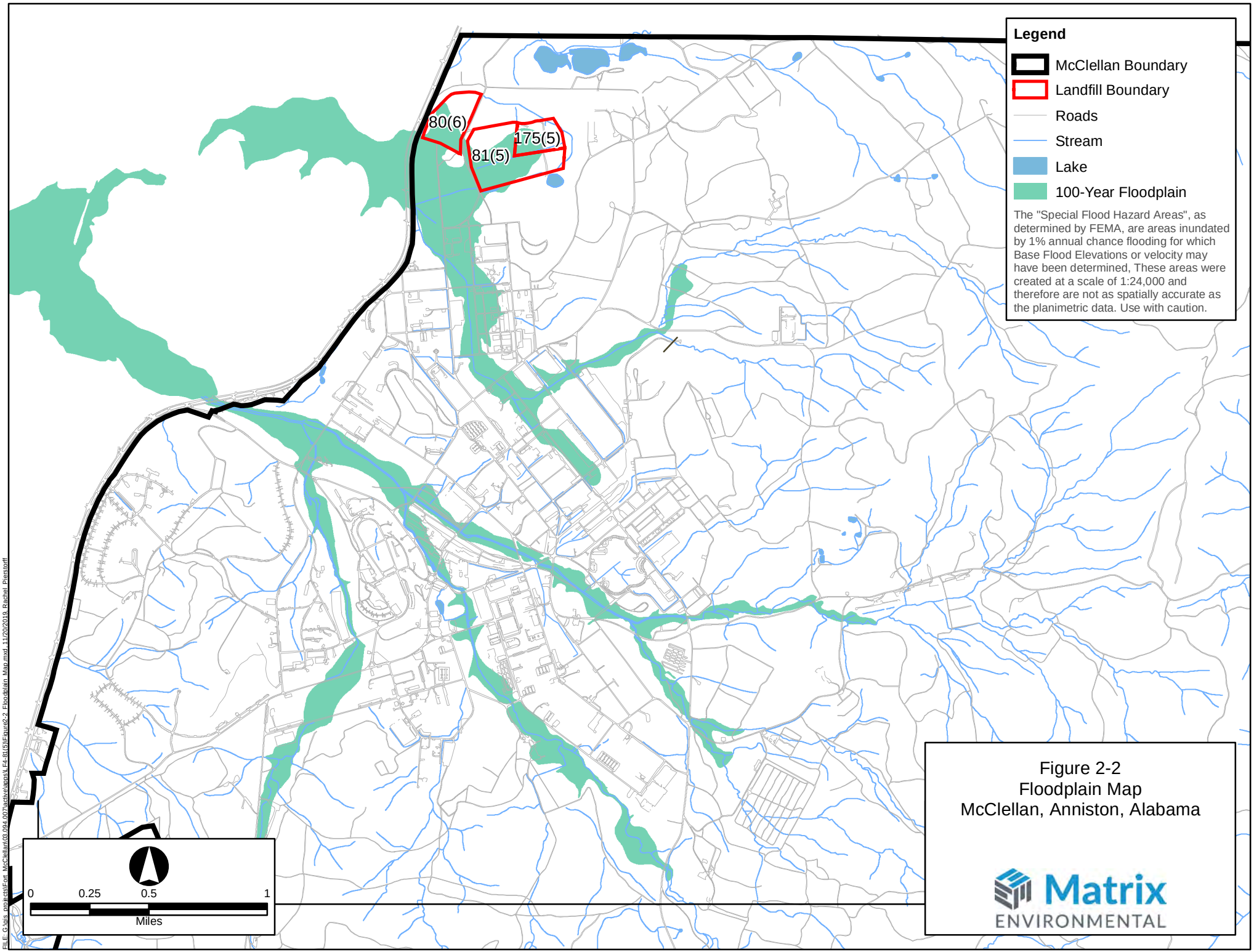


Figure 1-2
Parcel Location
Landfill 4, Parcel 81(5) and
Industrial Landfill, Parcel 175(5)
McClellan, Anniston, Alabama

Matrix ENVIRONMENTAL

FILE: G:\gis projects\Fort McClellan\03.094.007\active\apps\LF4-81(5)\Figure1-2 Parcel Location.mxd 11/20/2019, Rachel Perstorff


Cc
80(6)
175(5)
81(5)
Cr
Cs
ls
Qal
MOfa
Cch
Oln
Legend
Thrust Fault
Anticline
Syncline
McClellan Boundary
Landfill Boundary
Roads
Geology
Cc Cambrian - Conausaga Formation
Cch Cambrian - Chilhowee Group
Cr Cambrian- Rome Formation
Cs Cambrian - Shady Dolomite
MOfa Mississippian/Ordovician - Floyd & Athens Shale, Undifferentiated
OCk Cambrian/Ordovician - Knox Group, Undifferentiated
Oln Ordovician - Little Oak & Newala Limestones
Qal Quaternary - alluvium
col Colluvium - age unknown
ls Limestone - age unknown
t Terrace Deposit - age unknown
Source: Osborne, W.E., et al, 1997, Preliminary Geologic Map of the Anniston 7.5' Quadrangle, Calhoun County, Alabama, Geologic Survey of Alabama
Source: IT Corporation, 2002
State Plane feet, NAD 83
0 0.25 0.5 1
Miles
Figure 2-1
Geologic Map
McClellan, Anniston, Alabama
Matrix ENVIRONMENTAL
FILE: G:\gis_proj\FortsFort_McClellan\03.094.007\activeloppe\LF4-81(5)\Figure2-1_Geologic_Map.mxd, 11/20/2019, Rachel_Pierstorff


Legend
McClellan Boundary
Landfill Boundary
Roads
Stream
Lake
100-Year Floodplain
The "Special Flood Hazard Areas", as determined by FEMA, are areas inundated by 1% annual chance flooding for which Base Flood Elevations or velocity may have been determined, These areas were created at a scale of 1:24,000 and therefore are not as spatially accurate as the planimetric data. Use with caution.
80(6)
81(5)
175(5)
0
0.25
0.5
1
Miles
Figure 2-2
Floodplain Map
McClellan, Anniston, Alabama
Matrix
ENVIRONMENTAL
FILE: G:\gis_projects\Fort_McClellan\03.004.007\active\mxd\F4-81(5)\Figure2-2_Floodplain_Map.mxd 11/20/2019, Rachel Pierstorff

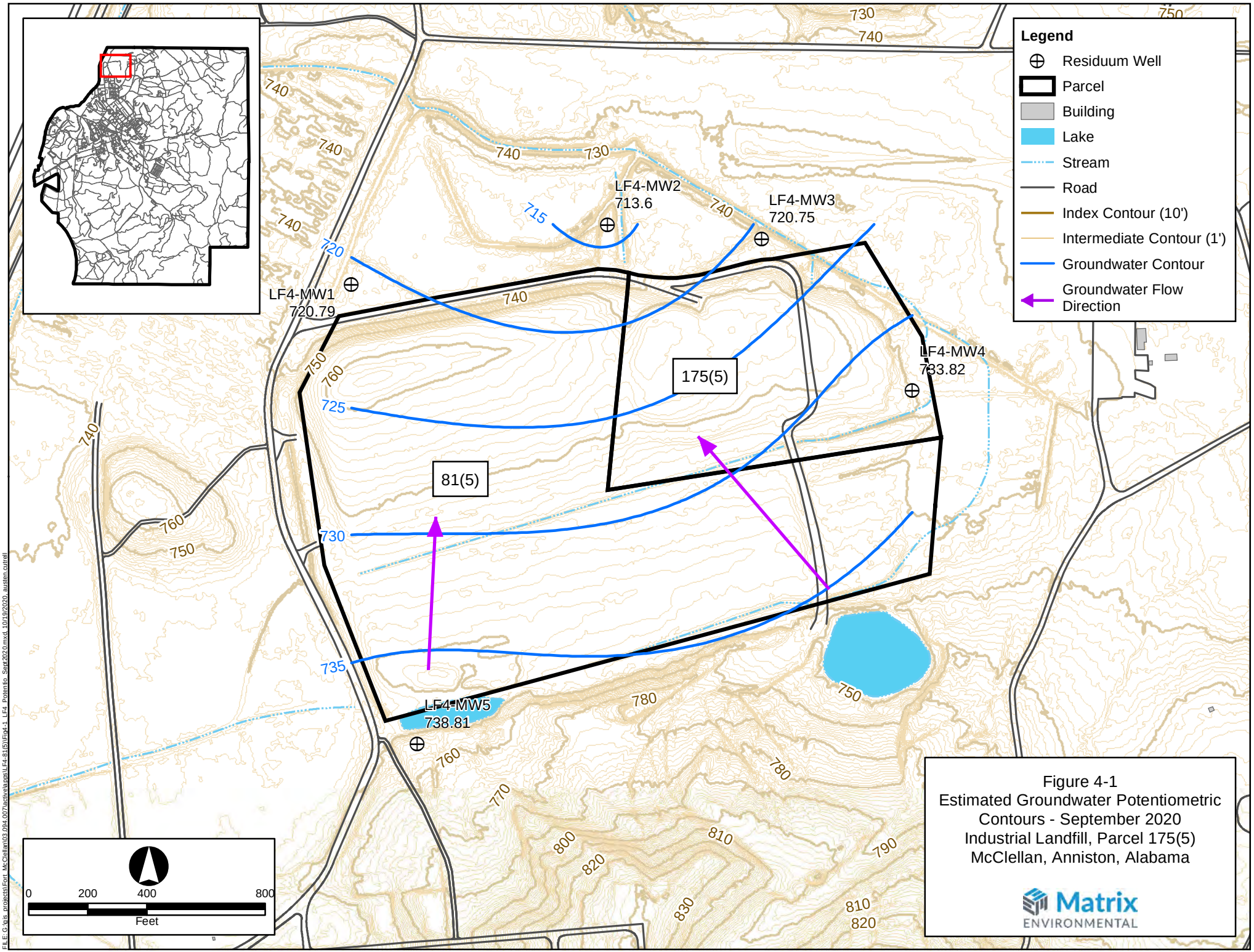


Figure 4-1
Estimated Groundwater Potentiometric Contours - September 2020
Industrial Landfill, Parcel 175(5)
McClellan, Anniston, Alabama

Matrix ENVIRONMENTAL

FILE: G:\gis projects\Fort McClellan\03.094.007\active\apps\LF4-81(5)\Fig4-1 LF4 Potentio Sept2020.mxd, 10/19/2020, austen.cutrell

APPENDICES

Groundwater Monitoring Report, September 2020
Butler Green Industrial Landfill, Parcel 175(5)
(Permit No. 08-02)
McClellan, Anniston, Alabama

APPENDIX A

Groundwater Sample Logs

Matrix ENVIRONMENTAL

Matrix Environmental Services
283 Rucker Street
Anniston, Alabama 36205
(256) 847-0780

Station Name/Sample ID	
LF4-MW01	
Project	**Project Number**
McClellan	19.094.20-07.1

GROUNDWATER SAMPLING LOG

Groundwater Depth (TOC) 19 feet	**Equipment**	**Sampler** Tulley	**Date** 9/15/2020
Well Depth (TOC) 42.5 feet	_X_ Bailer	**Location (Site)** Landfill 4	**Begin Time** 9:15
Water Column Thickness 23.5 feet	____ Check Valve	**Laboratory** TestAmerica	**Sample Depth** Bailer
Casing Diameter 4 inches	____ Grundfos	**Sample Suite** See COCs	
Casing Volume 15.28 gallons	____ Peristaltic	**Meters** YSI 556 MPS Solinst Water Level	**Serial numbers**
1"=x0.04 2"=x0.16 4"=x0.65 6"=x1.47 8"=x10.4	____ Bladder Pump		
Well Elevation (TOC) 739.79 feet	____ PID/FID	**Calibration** 9/15/2020	**Ferrous Iron (Fe II) (mg/L) (for MNA sampling)** Not Applicable
Groundwater Elevation 720.79 feet	____ Other (describe)	**Product Observed (yes/no)** No	**Depth to product** Not Applicable
	Conditions (temp, weather, precip) Overcast, 82°F		
	Parameter Stabilization temp +/- 1° DO +/- 10% Turbidity +/- 10% cond +/- 3% ORP +/- 10mV pH +/- 0.1 unit		

Time	Volume removed (gallon)	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	TDS (g/L)	Turbidity (NTU)	pH	Description (e.g. odor, clarity, color)
9:15	0.25	18.80	161.2	1.23	100.3	0.1047	203.30	4.62	cloudy, slightly yellow, no odor

Total Time (min.)	Total Volume Removed	Well pumped dry (yes/no)	Notes
Not Applicable	0.25 gallons	No	N/A

QA/QC Samples	Signature
DUP356	

Matrix Environmental Services
283 Rucker Street
Anniston, Alabama 36205
(256) 847-0780

Station Name/Sample ID	
LF4-MW02	
Project	**Project Number**
McClellan	19.094.20-07.1

GROUNDWATER SAMPLING LOG

Groundwater Depth (TOC) 24.9 feet	**Equipment**	**Sampler** Tulley	**Date** 9/15/2020
Well Depth (TOC) 40.25 feet	_X_ Bailer	**Location (Site)** Landfill 4	**Begin Time** 9:45
Water Column Thickness 15.35 feet	____ Check Valve	**Laboratory** Test America	**Sample Depth** Bailer
Casing Diameter 4 inches	____ Grundfos	**Sample Suite** See COCs	
Casing Volume 9.98 gallons	____ Peristaltic	**Meters** YSI 556 MPS; Solinst Water Level	**Serial numbers**
1"=x0.04 2"=x0.16 4"=x0.65 6"=x1.47 8"=x10.4	____ Bladder Pump		
Well Elevation (TOC) 738.5 feet	____ PID/FID	**Calibration** 9/15/2020	**Ferrous Iron (Fe II) (mg/L) (for MNA sampling)** Not Applicable
Groundwater Elevation 713.6 feet	____ Other (describe)	**Product Observed (yes/no)** No	**Depth to product** Not Applicable
	Conditions (temp, weather, precip) Overcast, 82°F		
	Parameter Stabilization temp +/- 1° DO +/- 10% Turbidity +/- 10% cond +/- 3% ORP +/- 10mV pH +/- 0.1 unit		

Time	Volume removed (gallon)	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	TDS (g/L)	Turbidity (NTU)	pH	Description (e.g. odor, clarity, color)
9:45	0.25	17.80	432	0.89	63.6	0.281	207.10	5.17	clear, colorless, no odor

Total Time (min.)	Total Volume Removed	Well pumped dry (yes/no)	Notes
Not Applicable	0.25 gallons	No	N/A

QA/QC Samples	Signature
N/A	

Matrix ENVIRONMENTAL

Matrix Environmental Services
283 Rucker Street
Anniston, Alabama 36205
(256) 847-0780

Station Name/Sample ID	
LF4-MW03	
Project	**Project Number**
McClellan	19.094.20-07.1

GROUNDWATER SAMPLING LOG

Groundwater Depth (TOC) 19.03 feet	**Equipment**	**Sampler** Tulley	**Date** 9/15/2020
Well Depth (TOC) 34.2 feet	_X_ Bailer	**Location (Site)** Landfill 4	**Begin Time** 10:20
Water Column Thickness 15.17 feet	____ Check Valve	**Laboratory** Test America	**Sample Depth** Bailer
Casing Diameter 4 inches	____ Grundfos	**Sample Suite** See COCs	
Casing Volume 9.86 gallons	____ Peristaltic	**Meters** YSI 556 MPS Solinst Water Level	**Serial numbers**
1"=x0.04 2"=x0.16 4"=x0.65 6"=x1.47 8"=x10.4	____ Bladder Pump		
Well Elevation (TOC) 739.78 feet	____ PID/FID	**Calibration** 9/15/2020	**Ferrous Iron (Fe II) (mg/L) (for MNA sampling)** Not Applicable
Groundwater Elevation 720.75 feet	____ Other (describe)	**Product Observed (yes/no)** No	**Depth to product** Not Applicable
Parameter Stabilization temp +/- 1° DO +/- 10% Turbidity +/- 10% cond +/- 3% ORP +/- 10mV pH +/- 0.1 unit	**Conditions (temp, weather, precip)** Overcast, 82°F		

Time	Volume removed (gallon)	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	TDS (g/L)	Turbidity (NTU)	pH	Description (e.g. odor, clarity, color)
10:20	0.25	19.30	86	3.30	154.6	0.056	49.54	4.87	clear, colorless, no odor

Total Time (min.)	Total Volume Removed	Well pumped dry (yes/no)	Notes
Not Applicable	0.25 gallons	No	

QA/QC Samples	Signature
MS/MSD	

Matrix ENVIRONMENTAL

Matrix Environmental Services
283 Rucker Street
Anniston, Alabama 36205
(256) 847-0780

Station Name/Sample ID	
LF4-MW04	
Project	**Project Number**
McClellan	19.094.20-07.1

GROUNDWATER SAMPLING LOG

Groundwater Depth (TOC) 9.53 feet	**Equipment**	**Sampler** Tulley	**Date** 9/15/2020
Well Depth (TOC) 26.8 feet	_X_ Bailer	**Location (Site)** Landfill 4	**Begin Time** 11:10
Water Column Thickness 17.27 feet	____ Check Valve	**Laboratory** TestAmerica	**Sample Depth** Bailer
Casing Diameter 4 inches	____ Grundfos	**Sample Suite** See COCs	
Casing Volume 11.23 gallons	____ Peristaltic	**Meters** YSI 556 MPS; Solinst Water Level	**Serial numbers**
1"=x0.04 2"=x0.16 4"=x0.65 6"=x1.47 8"=x10.4	____ Bladder Pump		
Well Elevation (TOC) 743.35 feet	____ PID/FID	**Calibration** 9/15/2020	**Ferrous Iron (Fe II) (mg/L) (for MNA sampling)** Not Applicable
Groundwater Elevation 733.82 feet	____ Other (describe)	**Product Observed (yes/no)** No	**Depth to product** Not Applicable
Parameter Stabilization temp +/- 1° DO +/- 10% Turbidity +/- 10% cond +/- 3% ORP +/- 10mV pH +/- 0.1 unit	**Conditions (temp, weather, precip)** Overcast, 82°F		

Time	Volume removed (gallon)	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	TDS (g/L)	Turbidity (NTU)	pH	Description (e.g. odor, clarity, color)
11:10	0.25	21.10	877	1.52	100.9	0.572	15.66	5.66	clear, colorless, no odor

Total Time (min.)	Total Volume Removed	Well pumped dry (yes/no)	Notes
Not Applicable	0.25 gallons	No	N/A

QA/QC Samples	Signature
N/A	

Matrix ENVIRONMENTAL

Matrix Environmental Services
283 Rucker Street
Anniston, Alabama 36205
(256) 847-0780

Station Name/Sample ID	
LF4-MW05	
Project	**Project Number**
McClellan	19.094.20-07.1

GROUNDWATER SAMPLING LOG

Groundwater Depth (TOC) 14.51 feet	**Equipment**	**Sampler** Tulley	**Date** 9/15/2020
Well Depth (TOC) 34.6 feet	_X_ Bailer	**Location (Site)** Landfill 4	**Begin Time** 11:50
Water Column Thickness 20.09 feet	____ Check Valve	**Laboratory** TestAmerica	**Sample Depth** Bailer
Casing Diameter 4 inches	____ Grundfos	**Sample Suite** See COCs	
Casing Volume 13.06 gallons	____ Peristaltic	**Meters** YSI 556 MPS; Solinst Water Level	**Serial numbers**
1"=x0.04 2"=x0.16 4"=x0.65 6"=x1.47 8"=x10.4	____ Bladder Pump		
Well Elevation (TOC) 753.32 feet	____ PID/FID	**Calibration** 9/15/2020	**Ferrous Iron (Fe II) (mg/L) (for MNA sampling)** Not Applicable
Groundwater Elevation 738.81 feet	____ Other (describe)	**Product Observed (yes/no)** No	**Depth to product** Not Applicable
Parameter Stabilization temp +/- 1° DO +/- 10% Turbidity +/- 10% cond +/- 3% ORP +/- 10mV pH +/- 0.1 unit	**Conditions (temp, weather, precip)** Overcast, 82°F		

Time	Volume removed (gallon)	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	TDS (g/L)	Turbidity (NTU)	pH	Description (e.g. odor, clarity, color)
11:50	0.25	22.20	48	2.70	195.8	0.031	16.58	4.73	clear, colorless, no odor

Total Time (min.)	Total Volume Removed	Well pumped dry (yes/no)	Notes
Not Applicable	0.25 gallons	No	N/A

QA/QC Samples	Signature
N/A	

APPENDIX B

Chains-of-Custody, September 2020

MATRIX ENVIRONMENTAL SERVICES CHAIN OF CUSTODY RECORD

COC Number 6159
Cooler ID 1 of 1
Page 1 of 1

Laboratory TestAmerica
Lab Contact Jon Lawhon, Amy Ragnaldsen
MES Contact Betty Van Pelt
MES Phone 801-699-1246
Project Parcel 81(5), Landfill 4
Task # 19.094.20-07.1
Lab contract: ~~19.094.20-07.1 500~~

Samplers Signature

SWMU	Station ID	QC Code	Station Code	Matrix	Sample Method	Date Collected	Sample Time	Analysis: SW8260 - VOC 3 - 40 ml vials, HCl	Analysis: 6020A/7470A Metals (Total) 1 - 250 ml poly HNO3	Analysis: SW8260 - VOC 2 - 40 ml vials, HCl		
Parcel 81(5), Landfill 4	LF4-MW1	NS	MW	WQ	Grab	9-15-20	915	X	X			
Parcel 81(5), Landfill 4	LF4-MW2	NS	MW	WQ	Grab		945	X	X			
Parcel 81(5), Landfill 4	LF4-MW3	NS	MW	WQ	Grab		1020	X	X			
Parcel 81(5), Landfill 4	LF4-MW3	MS/MSD	MW	WQ	Grab		1020	X	X			
Parcel 81(5), Landfill 4	LF4-MW4	NS	MW	WQ	Grab		1110	X	X			
Parcel 81(5), Landfill 4	LF4-MW5	NS	MW	WQ	Grab		1150	X	X			
Parcel 81(5), Landfill 4	DUP343	FD	MW	WQ	Grab		N/A	X	X			
Parcel 81(5), Landfill 4	TB551	TB	WQ	W	Grab		1300			X		

NOTES:

QC Code: NS = Investigative Sample, FD = Field Duplicate, MS/MSD = Matrix Spike/Matrix Spike Duplicate, EB = Equipment Blank, TB = Trip Blank, WQ = Water Quality, WS = Source Water

Station Type = MW = Monitoring Well, BH = Bore Hole, SD = Sediment, SW = Surface Water, SS = Surface Soil, SU = Sump, WS = Waste Solid/Soil, WW = Waste Water

White Copy = Lab COC, Yellow COC = Field Copy, Pink COC = Data Mgmt

Double the number of bottles for MS/MSD

COMMENTS: See Task Order ~~19.094.20-07.1 500~~ for required list of VOCs and metals

Relinquished by (Signature): Date/Time: 9-15-20 1600 Received by (Signature): FedEx

Relinquished by (Signature): Date/Time: Received by (Signature):

Dup # 356
on LF4-MW1

APPENDIX C

Data Quality Summary, September 2020

Appendix C

Data Quality Summary:

Butler Green Industrial Landfill, Parcel 175(5)
McClellan, Anniston, Alabama

September 2020 Monitoring Event

Prepared for:

MCCLELLAN
DEVELOPMENT AUTHORITY

Prepared by:

Matrix ENVIRONMENTAL
283 Rucker Street, Bldg. 3165
Anniston, Alabama 36205
(256) 847-0780
Fax (256) 847-0905

October 2020

TABLE OF CONTENTS

LIST OF TABLES

ATTACHMENTS

LIST OF ABBREVIATIONS AND ACRONYMS

ADEM	Alabama Department of Environmental Management
ADEM Division 13 Regulations	*Alabama Department of Environmental Management (ADEM) Land Division Solid Waste Program Division 13 Regulations*
ARBCA	*Alabama Risk-Based Corrective Action Guidance Manual*
CCAL	Continuing calibration
CCB	Continuing calibration blank
COC	Chain-of-custody
DQO	Data Quality Objective
DQS	Data Quality Summary
EPA	United States Environmental Protection Agency
FD	Field duplicate
GC/MS	Gas chromatography/mass spectrometry
ICAL	Initial calibration
ID	Identification
IDL	Instrument detection limit
IS	Internal standard
LCS	Laboratory control sample
LCSD	Laboratory control sample duplicate
MCL	Maximum contaminant level
MDA	McClellan Development Authority
MDL	Method detection limit
MES	Matrix Environmental Services, LLC
MS	Matrix spike
MSD	Matrix spike duplicate
PARCCS	Precision, accuracy, representativeness, completeness, comparability, and sensitivity
Permit	Solid Waste Disposal Facility Permit No. 08-02
QA	Quality assurance
QAP	*Quality Assurance Plan*
QC	Quality control
%R	Percent recovery
RL	Reporting limit
RPD	Relative percent difference
RSD	Relative standard deviation
Site	Butler Green Industrial Landfill, Parcel 175(5)
SOP	Standard Operating Procedure
TB	Trip blank
VOC	Volatile Organic Compound

1.0 INTRODUCTION

Matrix Environmental Services, LLC (MES) has prepared this Data Quality Summary (DQS) on behalf of the McClellan Development Authority (MDA) in support of the groundwater monitoring at Butler Green Industrial Landfill, Parcel 175(5) (Site) within McClellan, Anniston, Alabama, formerly known as Fort McClellan. The purpose of this monitoring event was to collect data to support the implementation of groundwater monitoring under the requirements of the Solid Waste Disposal Facility Permit No. 08-02 (permit) and the *Alabama Department of Environmental Management (ADEM) Land Division Solid Waste Program Division 13 Regulations* (*ADEM Division 13 Regulations*) for solid waste facilities (ADEM, 2016).

This DQS addresses the data quality review for groundwater samples collected during the March 2020 monitoring event. The approved methods used to conduct the investigations are discussed in the *Quality Assurance Plan* (*QAP*) in *Appendix A* of the *Final Installation-Wide Sampling and Analysis Plan* (MES, 2013) which details the specifics of quality assurance (QA) and quality control (QC) with respect to sampling and data evaluation.

2.0 PROJECT DESCRIPTION

Project objectives and QA objectives in terms of precision, accuracy, representativeness, completeness, comparability, and sensitivity (PARCCS) are described in this section.

2.1 PROJECT OBJECTIVES

The objective of the environmental sampling at the Site is to evaluate the groundwater analytical data and demonstrate compliance with the permit and the *ADEM Division 13 Regulations*. To support this objective, groundwater samples were collected from five residuum monitoring wells using quiescent sampling techniques and analyzed for volatile organic compounds (VOCs) and metals.

2.2 DATA QUALITY LEVELS

During the field program, groundwater samples were collected and analyzed with screening level methods for field parameters and definitive level methods for specific chemical analytes. Screening and definitive level data are defined as follows (United States Environmental Protection Agency [EPA], 1994):

- Screening Level Data – Screening level data are subject to minimal QC requirements. Results are often not compound-specific and not quantitative, but results are available in real time. Obtaining screening level data is less costly than obtaining definitive level data, but the results are less defensible because of the greater potential for error and the inherent precision and accuracy limitations. This level is normally used for field investigation health and safety screening but can also be used to identify media or samples for consideration for further analyses. Field pH, conductivity, temperature, turbidity, total dissolved solids, dissolved oxygen, and oxidation/reduction potential measurements collected during this investigation are considered screening level data.

- Definitive Level Data - Analyses performed using established analytical procedures and strict QC procedures produce definitive level data. Applicable EPA test methods (EPA, 1986) were used to collect definitive level data for the Site. Analytical results produced were analyte-specific with confirmation of analyte identity and concentration. Definitive level data meeting quality criteria are suitable for site assessments, risk assessments, remedial design, and remediation efforts.

2.3 DATA QUALITY OBJECTIVES

QA objectives in terms of PARCCS are outlined below.

Precision is a measure of the reproducibility of a set of duplicate analytical results, usually under prescribed similar conditions. Precision, as discussed in Section A3.3.1 in the *QAP*, is expressed in terms of the relative percent difference (RPD) between duplicate determinations, or in terms of the relative standard deviation (RSD) when three or more determinations are made. Various measures of precision exist depending on the prescribed similar conditions.

Overall sampling and analysis precision was assessed using RPDs for duplicate environmental samples and matrix spike/matrix spike duplicates (MS/MSDs). The RPDs for laboratory control sample/laboratory control sample duplicate (LCS/LCSD) results were used to assess laboratory precision. RPD is defined as the difference between two measurements divided by their mean and expressed as a percent as shown in the following equation:

$$RPD = \frac{|X - Y|}{(X + Y) / 2} \times 100\%$$

where:

X = Primary sample concentration (primary field investigative sample, MS, or LCS)

Y = Duplicate sample concentration (laboratory duplicate, field duplicate [FD], MSD, or LCSD)

To evaluate precision, the RPDs for MS/MSDs, laboratory duplicates, and LCS/LCSDs were compared to laboratory historical limits. The RPDs for FDs were compared to the project precision goal of 50 percent for aqueous samples.

The RSD is the standard deviation of a set of values divided by the average value expressed as a percent as shown in the following equation:

$$RSD = S/\overline{X} \times 100$$

where:

S = The standard deviation of the sample data

$\overline{X}$ = The arithmetic mean of the sample data

RSDs can be used to evaluate the linearity of the initial calibration (EPA, 1986).

Accuracy is a measure of the agreement of an analytical result with the true value. Accuracy, as discussed in Section A3.3.2 in the *QAP*, is typically expressed as a percent recovery (%R) calculated by the ratio of the measurement and accepted true value as shown in the following equation:

$$\%R = ((Xs - Xu) / K) \times 100\%$$

where:

Xs = Measured value of the spiked sample

Xu = Measured value of the unspiked sample

K = Known amount of the spike in the sample

Analytical accuracy is assessed through the analysis of spikes such as surrogates, MS/MSDs and LCS/LCSDs, performance evaluation samples, standard reference materials and calibration check samples. Surrogates and MS/MSDs are spiked into the actual sample matrix and are accuracy indicators that take into account the nature of the matrix in question and the native concentration of the analyte spiked. Matrix variability or interferences from high concentrations of native compounds may adversely affect spike recovery and yield less than conclusive data. Accuracy checks that focus on analytical method and consist of compounds

spiked in a blank or non-interfering matrix (e.g., LCSs or calibration check samples) address the accuracy of the method or instrumentation at detecting the target analyte(s) at a certain quantification level and are not considered to be subject to matrix effects. The accuracy of sample results can also be affected by holding time violations.

Representativeness, as described in Section A3.3.3 in the *QAP*, is a qualitative parameter that expresses the degree to which sample data actually represent the matrix conditions. For example, in conducting groundwater monitoring, representativeness requires proper location of wells and the collection of samples under consistent, documented procedures. Wells are located based upon the results of the hydrogeologic study in progress and are designed to provide maximum coverage of the flow conditions. Requirements and procedures for sample collection and handling are designed to maximize sample representativeness. Representativeness can also be monitored by reviewing field documentation and by performing field QA audits.

Completeness, as discussed in Section A3.3.4 in the *QAP*, represents the percentage of valid data collected from a sampling/analytical program or measurement system compared to the amount achieved under optimal conditions. The completeness goal for investigative samples is 95 percent. Completeness is calculated using the following formula:

$$\text{Percent Complete} = \frac{\text{Valid Data}}{\text{Total Data}} \times 100\%$$

Valid data are identified during the data review process as being acceptable for use or usable as qualified. Invalid data are identified as rejected.

Comparability, as discussed in Section A3.3.5 of the *QAP*, is a qualitative parameter expressing the confidence with which one data set can be compared with another. Comparability for sampling and analysis tasks is achieved by:

- Specifying well-recognized techniques and accepted standard methods for sampling and analysis, and using well-trained sampling and analysis technicians to execute the prescribed methods consistently.
- Requiring that sampling and analysis personnel produce adequate documentation to record how the prescribed methods were actually executed.
- Noting non-conformances and corrective measures taken.

Specifying standardized laboratory methods helps to ensure that the data generated for a sampling event are comparable to past and future sampling events.

Sensitivity is used broadly here to describe the method detection limits (MDLs) or reporting limits (RLs) established to meet project-specific data quality objectives (DQOs). In addition, sensitivity can be used to describe the capability of a method for instrument to discriminate between measurement responses. Several limits have been established to describe sensitivity requirements as specified in Section A3.3.6 of the *QAP*. Reported instrument detection limits (IDLs) and MDLs are typically based upon a reagent water matrix or purified solid, and ignore sample matrix interferences and the resulting effects on the limits. For this reason, published

MDLs or IDLs may not be achievable for environmental samples. The *QAP* RLs were generated by the laboratory and may exceed Maximum Contaminant Levels (MCLs) due to instrument limitations. Section 6.2 discusses the comparisons between the MCLs and the laboratory RLs and MDLs for this sampling event.

2.4 ANALYTICAL SERVICES

TestAmerica Laboratories, Inc, Savannah, Georgia, provided analytical services for the sampling conducted by MES.

2.4.1 Analytical Program

The *QAP* lists the EPA analytical methods used to meet definitive data requirements. Based on activities conducted at the Site during the March 2020 monitoring event, the methods used to analyze constituents of concern in samples during this sampling event were:

- Method SW8260B - VOCs by Gas Chromatography/Mass Spectrometry (GC/MS)
- Method SW6020B – Inductively Coupled Plasma-Atomic Emission Spectrometry (ICP/AES)
- Method SW7470A - Mercury by Cold Vapor Atomic Absorption

2.4.2 Quality Control

The *QAP* describes the analytical QC requirements. The results of the analytical QC data review for this sampling event are presented in Section 5.0.

3.0 DEVIATIONS FROM PLANNED FIELD ACTIVITIES

No deviations from the planned field activities were noted during the preparation of this DQS. Metals were analyzed by SW6020B for this sampling round, reporting limits which are listed on Table C6-1.

4.0 ASSESSMENT OF DATA QUALITY

Data quality is assessed through two review processes. The contracted analytical laboratory performs the first data review to assess compliance with *QAP*-approved analytical methods (MES, 2013) and with laboratory standard operating procedures. MES performs the second data review to assess compliance with the QA objectives, and to assess hard copy and electronic deliverable consistency and integrity.

4.1 LABORATORY DATA QUALITY ASSESSMENT

The laboratory data quality assessment includes an analytical data review to ensure accurate and complete data reporting and compliance with the analytical method specifications.

4.1.1 Laboratory Qualification of Data

The laboratory will flag analytical results, when necessary, to indicate potential impacts to data usability and to alert the user to special analytical conditions. More than one qualifier may be used to indicate multiple conditions or situations that apply to an individual result. The following laboratory qualifiers were used during this investigation:

FLAG	DESCRIPTION
B	Analyte detected in an associated blank.
F1	MS and/or MSD recoveries outside criteria.
F2	MS/MSD RPD outside criteria.
J	Estimated value. The analyte is positively identified and the concentration is less than the RL but greater than the MDL.
U	Analyte is not detected above the RL.

4.2 MES DATA QUALITY AND USABILITY ASSESSMENT

The following sections describe the procedures that MES followed to assess the quality and usability of both field measurement and definitive data. Data assessment is complete when 100 percent of the information have been collected and reviewed. Based on the results of the review process, data are categorized as fully usable, usable as qualified, or rejected.

4.2.1 Data Review and Validation

MES reviewed the analytical data in accordance with the *QAP* (MES, 2013), analytical methods (EPA, 1986), and *USEPA Contract Laboratory Program National Functional Guidelines for Organic and Inorganic Data Review* (EPA, 2014a and 2014b). The data review process included reviewing and evaluating 100 percent of the hard copy data for (1) extraction and analysis holding times, (2) surrogate recoveries, (3) blank detections, (4) LCS/LCSD recoveries and RPDs, (5) MS/MSD recoveries and RPDs, (6) FD RPDs, (7) laboratory duplicate RPDs, if applicable, (8) initial and continuing calibrations (ICALs and CCALs), (9) instrument tuning and performance, (10) reporting limits, and (11) completeness of the chain-of-custody (COC) forms.

Hard copy data packages were checked to verify that the following items were included:

- Case narrative
- Data summary sheets
- ICALs and CCALs
- Method or preparation blanks (at least one per QC batch)
- MS/MSD (5 percent of client samples)
- LCS/LCSD (one per QC batch)
- Duplicate analyses (laboratory duplicate sample, LCS/LCSD, MS/MSD, as applicable)
- Holding times
- Retention time window calculation (if applicable)
- Standard preparation sheets
- Linear range calculations (correlation coefficients)

The results of the review of the chemical data obtained during this investigation are included in Section 5.0. The laboratory data forms showing the validated results are included in Attachment D1.

4.2.2 MES Qualification of Data

Based on the data review, MES may assign final qualifiers to analytical results on both the hard copy results and in the database. The following final qualifiers may be assigned to the results to describe data quality and usability:

FLAG	DESCRIPTION
J	Estimated detection. The associated numerical value is the approximate concentration of the analyte in the sample.
UJ	Analyte was analyzed for, but was not detected. The reported quantitation limit is estimated.
U	Result was qualified as not detected above the RL or reported sample quantitation limit.

In addition to the qualifier, a sub-qualifier is applied to describe the specific multiple conditions or situations that apply to an individual result. These qualifiers and sub-qualifiers are collectively referred to as validation codes.

FLAG	DESCRIPTION
A	Internal standard area was outside method-specific control limits.
B	Result was qualified based on method blank, continuing calibration blank, or trip blank contamination.
C	Continuing calibration was outside method-specific control limits.
H	Holding time exceeded method criteria.
I	Initial calibration was outside method-specific control limits.
L	The LCS and LCSD recoveries were outside laboratory historical control limits.
M	The MS and MSD recoveries were outside laboratory historical control limits.

FLAG	DESCRIPTION
S	Surrogate recovery was outside laboratory historical control limits.
X	Result exceeded the calibration range of the instrument.
Q	Result was qualified based on reviewer judgment.

Whenever duplicate sets of results were reported by the laboratory due to dilutions, re-analyses, re-extractions, or dual column analytical methods, the MES reviewer chose the "most-preferred" results based on the data review. In the "Reportable Result" column shown on the hard copy sample data reports and the database, MES assigned a "Y" flag for the "most-preferred" results, and an "N" flag for the "least-preferred" results. When there was only one set of laboratory reported results, MES assigned a "Y" flag in the "Reportable Data" column. In Section 5.0, only the reportable data (flagged "Y") are shown in Tables C5-2 to C5-6.

5.0 RESULTS OF QUALITY CONTROL ANALYSES

Table C5-1 lists samples and analytical methods included in the sampling event for the Site. To evaluate the data quality, the results were compared to method requirements and laboratory historical control limits. Qualified data are presented in Table C5-2.

Based on the data review process, six analytes were qualified. None of the data were rejected. The results of the data review process are discussed further in the following sections. Due to analysis issues at the laboratory the trip blank was not reported.

5.1 QUALITY CONTROL PROCEDURES AND RESULTS OF QUALITY CONTROL ANALYSES

Two types of QC results were used to evaluate data quality: field QC samples were collected and analyzed to evaluate field sampling activities, and laboratory QC samples were analyzed to evaluate laboratory analytical procedures and maintain control of the analytical methods.

5.1.1 Field Quality Control Procedures and Analyses

Field QC samples included MS/MSD samples, FDs, material blanks, and trip blanks (TBs). The *QAP* was used as the guidance document to identify the appropriate number of field QC samples, procedures for their collection and analysis, and evaluation of results required for this sampling event. The evaluation procedures for the field QC sample analyses are summarized below.

5.1.1.1 Matrix Spike/Matrix Spike Duplicate Samples

MS and MSD samples are investigative samples spiked by the laboratory with known concentrations of target analytes. MS and MSD sample results are used to evaluate possible matrix interferences. The formulas used to calculate the percent recoveries and RPDs are presented in Section 2.3.

Accuracy was assessed by calculating the MS and MSD %Rs of the concentrations of the target analytes added to the investigative sample. The %Rs were then compared to laboratory historical control limits. When both the MS and MSD %Rs were outside laboratory historical control limits, MS/MSD qualifiers were applied only to the results for the investigative sample used for the MS/MSD. When only an MS was analyzed, qualifiers were applied when the MS %R was outside laboratory historical control limits. Low recoveries in an MS/MSD may indicate the matrix has negatively influenced the results. Constituent concentrations could be potentially higher in samples with low MS/MSD recoveries. High MS/MSD recoveries may indicate the matrix has positively influenced the results. Constituent concentrations may be potentially lower in samples with high MS/MSD recoveries.

Precision was assessed by calculating the RPDs for the MS/MSD sample pairs and laboratory duplicate samples. The MS/MSD and laboratory duplicate RPD values were reviewed to assess the precision of the analytical results based on the magnitude of the RPD values. In cases

where a target analyte was not detected in at least one of the MS/MSD sample pair or laboratory duplicate sample pair, an RPD would not be valid, and therefore, was not calculated. Qualifiers were not applied based on the MS/MSD or laboratory duplicate RPD values, however, the MS/MSD and laboratory duplicate RPD values were compared to laboratory historical control limits to assess if further evaluation of the data was warranted.

For this investigation, sample LF4-MW3 was collected and analyzed for the MS and MSD for Methods SW8260B, SW6020B, and SW7470A. A summary of the MS/MSD %R and RPD data is shown in Table C5-3. All recoveries met criteria with the following exceptions. Barium and chloroethane had MS and MSD recoveries above criteria. Barium is qualified in LF4-MW3. Chloroethane was not detected; therefore, chloroethane is not qualified. The RPD for zinc was outside criteria. Both MS and MSD recoveries for zinc where met; data were not qualified. The overall accuracy of the analytical results and variability of the precision measurements are considered to be acceptable.

5.1.1.2 Field Duplicate Samples

FD samples were collected and analyzed as specified in the *QAP* (Section A6.3.5). FD samples are independent samples collected simultaneously or in immediate succession with the original investigative samples such that they are expected to be equally representative of the medium at the time of sampling. These samples provide precision information for the entire measurement system, including sample collection, handling, shipping, storage, preparation, and analysis. The precision of FD pairs was assessed by calculating the RPDs using the equation in Section 2.3. In cases where a target analyte was not detected in either sample or was detected in only one of the samples, an RPD would not be valid, and therefore, was not calculated.

One groundwater FD sample was collected for this sampling event. The original station name from the COC forms (i.e. COC identifications (IDs) used to disguise the sample's identity when the sample was sent to the laboratory), the parent station name, and the methods analyzed are shown below.

Matrix	COC ID	Parent Station Name	Sample Date	Delivery Group	Method
WG	DUP343	LF4-MW1	9/15/20	680-188774-6	SW6020B
WG	DUP343	LF4-MW1	9/15/20	680-188774-6	SW7470A
WG	DUP343	LF4-MW1	9/15/20	680-188774-6	SW8260B

The results for the FD and associated investigative sample analyses were reviewed to assess the precision of the analytical results based on the magnitude of the RPD values. Table C5-4 shows the RPDs calculated for the investigative and FD sample pair. The criterion of 50 percent for aqueous samples was used to assess if further evaluation of the data was warranted. Three of the RPD values exceeded 50 percent (cadmium, lead, and zinc): all less than five times the reporting limit. No data were qualified based on field duplicate results. Therefore, the overall variability of the precision measurements is considered acceptable.

5.1.1.3 Trip Blanks Analyses

TBs are used to assess the potential introduction of contaminants from sample containers or during the sampling, transportation, and storage procedures (MES, 2013). A TB sample consists of VOC sample vials filled in the laboratory with American Society of Testing and Materials Type II reagent grade water, transported to the sampling site, handled like an environmental sample and returned to the laboratory for analysis. TBs are not opened in the field and are only prepared when aqueous VOC samples are scheduled to be collected and analyzed by the laboratory. Sample results are considered affected by TB contamination when the sample concentration is less than five times the blank concentration (ten times for common laboratory contaminants acetone, methylene chloride, and 2-butanone). Affected sample results less than the reporting limit and less than five times the associated blank concentration are considered non-detects at the reporting limit. Affected sample results greater than the reporting limit and less than five times the blank concentration are considered non-detects at the concentration observed in the sample. One TB was collected for this sampling event. No analytes were detected. Based on review of the samples there is no apparent contamination in associated samples.

5.1.2 Laboratory Quality Control Procedures and Analyses

Laboratory QC checks include internal system checks and QC samples used to monitor the possible effect of laboratory activities on sample results. The analytical method and method-specific standard operating procedures (SOPs) developed by the laboratory define the types of laboratory QC checks required. QC procedures followed by the laboratory include sample container inspection, COC documentation review, sample holding time review, LCS/LCSD analyses, method blank analyses, and surrogate spike percent recovery evaluation. The laboratories are also responsible for analytical instrument calibration, which includes method-specific criteria for initial and continuing calibrations for external and internal standard calibration procedures.

5.1.2.1 Initial Sample Inspection and Chain-of-Custody Documentation

The laboratory inspected the shipping containers upon receipt and compared the contents with the COC forms associated with each cooler. Information from the sample check-in procedure was recorded on the Sample Receipt Form, including sample receipt anomalies. These forms were used by the laboratory to document that sample identifications listed on the COC forms agreed with the samples contained in the coolers. The laboratory verified that COC forms were filled out properly, sample containers were not broken, custody seals were intact, the pH met method-specific criteria for water samples (if applicable), and cooler temperatures were maintained 0 - 6 degrees Celsius. The completed forms are included in the laboratory analytical packages and were reviewed during the data review process. The samples arrived at the laboratory at the proper temperature, and no sample containers were damaged during transit.

MES compared the data on the COC forms with the laboratory reports and documented any differences. If minor discrepancies were found and verified by the laboratory, the laboratory reports and MES electronic databases were corrected. In addition to the COC checks, MES reviewers verified approximately 10 percent of the laboratory hard copy reports against the laboratory electronic data deliverables.

5.1.2.2 Holding Times

Samples were shipped regularly in coordination with the analytical laboratory to ensure analyses were conducted within the required holding times. The time elapsed between sample collection and sample extraction/analysis was calculated as part of the review process to evaluate if holding times were met. Holding time criteria were met for this sampling event. Data are consistent with historical data. Accuracy of the analytical results is acceptable with regards to holding time.

5.1.2.3 Laboratory Control Sample/Laboratory Control Sample Duplicate

The laboratory analyzed LCS/LCSD pairs with each analytical batch of field samples to assess internal precision and accuracy. LCS/LCSD pairs consisted of analyte-free water spiked with selected target constituents of known concentration. The LCS/LCSD %Rs and RPDs are used to determine laboratory accuracy and precision, respectively. The formulas used to calculate the %Rs and RPDs are presented in Section 2.3. The %Rs and RPDs were then compared to laboratory historical control limits. When the LCS and LCSD %Rs were outside laboratory historical control limits, the LCS/LCSD qualifications were applied to investigative samples within the same analytical batch. Qualifiers were applied only when both the LCS and LCSD %Rs were outside laboratory historical control limits. In cases where only an LCS was analyzed, qualifiers were applied when the LCS %R was outside laboratory historical control limits. Qualifiers were not applied based on LCS/LCSD RPD values, however, the LCS/LCSD RPD values were compared to laboratory historical control limits to assess if further evaluation of the data was warranted. For this sampling event, MES reviewed the LCS/LCSD %Rs and RPDs for Methods SW8260B, SW6010C, and SW7470A.

Table C5-5 shows the LCS/LCSD percent recovery and RPD data. The LCS and LCSD percent recoveries met criteria with the below exceptions.

A few LCS or LCSD recoveries were outside criteria high. None of the samples had both LCA and LCSD out. One RPD was outside criteria. Results are presented in Table C5-5. No data were qualified. Greater than 99 percent of the LCS/LCSD percent recoveries and greater than 99 percent of the RPD results were within the laboratory control limits, therefore, the overall accuracy and precision measurements are considered to be acceptable.

5.1.2.4 Method Blank and Continuing Calibration Blank Samples

Method blanks are prepared and analyzed by the laboratory to assess the level of background interferences and possible contamination in the analytical system. The method blank must be carried through the complete procedure and contain analyte-free reagents in the same volumes

as used in processing the samples. The goal is to conduct investigative sample analysis in such a manner that sample contamination is not introduced by the analytical methods, equipment, or reagents. If such contamination occurs, it is usually identified by the detection of target analytes at trace or low concentrations in the method blanks. When these detections are found, the laboratory investigates the source, qualifies the affected data as appropriate according to the magnitude of the detections, and implements corrective measures as appropriate. For this investigation, method blanks were prepared and analyzed with each analytical batch for Methods SW6020B, SW8260B, and SW7470A.

Continuing calibration blanks (CCBs) are used to check the instrument calibration and level of background interferences. CCBs are prepared by acidifying reagent water to the same concentrations of the acids used in the calibration standards and investigative samples. For this investigation, CCBs were analyzed for Methods SW6010C and SW7470A to evaluate if any analytes detected in the CCBs impacted the concentrations of the associated samples.

The following are descriptions of the qualifiers that may be used based on blank contamination:

- When a VOC target analyte was detected in the sample and associated method blank, affected sample results with concentrations less than five times the blank concentration (ten times for common laboratory contaminants acetone, methylene chloride, and 2-butanone) were qualified as non-detect (UB) at the reporting limit (when the sample concentration was less than the reporting limit) or qualified as non-detect (UB) at the concentration observed in the sample (when the sample concentration was greater than the reporting limit).
- When an inorganic target analyte was detected in the sample and associated method blank or CCB, affected sample results with concentrations > MDL but ≤ RL were qualified as non-detect (UB) at the RL; associated sample results with concentrations > RL but < 5x the blank concentration were qualified as non-detect (UB) at the sample concentration; for sample results with concentrations > RL and > 5x the blank concentration, no qualifiers were required.

No analytes were detected in the method blank. Cobalt was detected about the RL in the interference check standard but since not in the method blank no data were qualified.

5.1.2.5 Surrogate Recovery

Surrogate spike compounds were added to investigative samples during organic analyses to assess the individual matrix effect of investigative samples and to monitor overall analytical system performance. Surrogate recoveries that are outside the laboratory historical control limits may indicate performance problems with the analytical system and extraction procedures, or significant matrix effects when evaluated in conjunction with the MS/MSD results. MES reviewers used laboratory historical control limits to assess percent recoveries for surrogate spike constituents. For sample results affected by surrogate percent recoveries less than the lower control limit, detects were qualified as estimated (JS) and may be biased low, and non-detects were qualified as estimated (UJS) and may be potential false negatives. For

sample results affected by surrogate percent recoveries greater than the upper control. No qualifiers are required; all surrogates were within acceptance criteria.

A summary of the surrogate percent recovery data is provided in Table C5-6.

5.1.2.6 Internal Standards

Adherence to method-specific internal standards (ISs) criteria ensures that GC/MS sensitivity and response are stable during each analysis. *SW-846* (EPA, 1986) recommended ISs are often brominated, fluorinated, or stable isotopically labeled analogs of specific target compounds, or are closely related compounds whose presence in environmental samples is unlikely. The IS spike solution is added after the preparation or extraction of a sample. ISs are used in internal calibration methods to correct sample results affected by column injection loss, purging loss, or viscosity effects. ISs are added to environmental samples, control standards, and blanks, in accordance with method requirements and laboratory SOPs (MES, 2013). No qualifiers were required for samples based on the IS data.

5.1.2.7 Initial and Continuing Calibration

The calibration of an analytical instrument involves the delineation of the relationship between the response of the instrument and the concentration of an analyte introduced into the instrument. An ICAL is performed on an analytical instrument prior to the analysis of samples to ensure that the equipment is capable of producing acceptable qualitative and quantitative data. The CCAL is the verification of the ICAL at periodic intervals. The CCAL demonstrates that the instrument is capable of acceptable performance during the course of the analytical analysis. Review of the ICAL data included the evaluation of the correlation coefficients and relative standard deviations. Review of the CCAL data included the evaluation of the percent difference between the concentration of the CCAL standard and the expected concentration. All calibration data meet acceptance criteria.

5.2 SUMMARY OF DATA QUALITY INDICATORS

A summary of the data quality indicators in terms of the PARCCS are described in this section.

5.2.1 Precision

As discussed in Section 2.3, the precision evaluation included field precision (FDs), laboratory precision (LCS/LCSDs), and combined field/laboratory precision (MS/MSDs). The MS/MSD, FD, and LCS/LCSD RPDs are discussed in Sections 5.1.1.1, 5.1.1.2, and 5.1.2.3 of this report, respectively. Based on this evaluation, the precision of the data is acceptable for its intended use.

5.2.2 Accuracy

As discussed in Section 2.3, the accuracy evaluation included a comparison of spike recoveries from field samples (surrogate and MS/MSD spikes) and laboratory QC samples (LCS and

LCSD) and assessing holding time. The MS/MSD, LCS/LCSD, and surrogate spike recoveries are discussed in Sections 5.1.1.1, 5.1.2.3, and 5.1.2.5, respectively, and holding time is discussed in Section 5.1.2.2. Recoveries from MS/MSDs, LCS/LCSD and surrogate percent recoveries were compared to laboratory historical control limits to determine a laboratory's ability to accurately determine both qualitative and quantitative results. The investigative sample results were within the required percent recovery limits. The investigative sample results were within the required holding time limits. Based on this evaluation, the accuracy of the data is acceptable for its intended use.

5.2.3 Representativeness

Representativeness is the degree to which the data accurately and precisely portray the environmental conditions being studied. For this investigation, sampling procedures and locations were selected to accurately represent overall Site conditions and were biased toward areas that were likely to exhibit evidence of past releases. Sampling was conducted using known, approved field procedures to minimize variability introduced during field sampling. The investigative and FD analyses indicate that the overall combined variability introduced by the sampling procedures, sample matrix, and laboratory analysis is acceptable, and the FD samples are representative of the data associated with the investigative sample.

5.2.4 Completeness

Completeness refers to the amount of valid data obtainable from a measurement system compared to the expected amount of data. Data that have not been qualified as rejected during the data validation process are considered to be valid. As presented in the *QAP* (MES, 2013), a completeness goal of 95 percent was established for investigations. Of the 180 investigative and field duplicate sample records from the sampling event, no records were qualified as rejected based on MES' review of the data. Therefore, a completeness of 100 percent was calculated for the sampling event, which exceeds project goals. One hundred percent of the results are usable and are acceptable for their intended use.

5.2.5 Comparability

Comparability expresses the confidence with which one data set can be compared to another. Comparability objectives were met by minimizing the number of contract laboratories used, using EPA methods for analyses, and reporting results in standardized units. The comparability objective for the project was fulfilled. Zinc in LF4-MW5 is higher than historical data. Sample reanalyzed and result confirmed.

6.0 REPORTING LIMITS AND DATA USES

This section discusses the laboratory reporting limits and how they compare to MCLs.

6.1 LABORATORY REPORTING LIMITS

TestAmerica Laboratories, Inc. confirms reporting limits on an annual or quarterly basis by performing MDL studies. The MDL is defined as the minimum concentration of a substance that can be measured and reported with 99 percent confidence that the analyte concentration is greater than zero and is generated from the analysis of a sample in a given matrix containing the analyte (40 Code of Federal Regulations, Chapter 1, Part 136, Appendix B). The reporting limit is defined as the lowest concentration of the target analyte required to be reported. This value is based on project-specific criteria.

The laboratory reports detections that are below the reporting limit as estimated values by assigning a flag to the analytical result. This flag is assigned because the laboratory cannot accurately quantify analyte concentrations at levels below the reporting limit. For detections in the concentration range between the MDL and the reporting limit, the laboratory is confident of the analyte identification and detection but can only estimate the analyte concentration.

6.2 COMPARISON OF LABORATORY REPORTING LIMITS TO MCLs

For this assessment, the laboratory RLs and MDLs were compared to MCLs, shown in Table C6-1. The laboratory RLs and MDLs for the investigative samples were equal to or lower than the MCLs. If a MCL was not available for comparison, the target analyte was not shown in Table C6-1.

7.0 CONCLUSIONS

This DQS presents in specific terms the QA and QC practices used to achieve the project objectives for the Site during the September 2020 sampling event. Samples were collected and analyzed in accordance with EPA methods and using laboratory-specific QA/QC procedures. These procedures were followed to generate legally and technically defensible data.

Some of the quality issues addressed in Section 5.0 of this report resulted in qualification of investigative sample results. Six analytes were qualified, no data were rejected. Based on this review, the analytical data generated for this sampling event are acceptable and adequate to fulfill program objectives.

8.0 REFERENCES

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TABLES

Table C5-1: Sample Index
Industrial Landfill, Parcel 175(5)
McClellan, Anniston, Alabama

Site Name	Station Name	QC Code	Matrix	Sample Date	Lab	Delivery Group	Laboratory Sample ID	Method
PARCEL 81(5), LANDFILL 4	LF4-MW1	NS	WG	9/15/2020	TALSAV	680-188774-1	680-188774-1	SW6020B
PARCEL 81(5), LANDFILL 4	LF4-MW1	NS	WG	9/15/2020	TALSAV	680-188774-1	680-188774-1	SW7470A
PARCEL 81(5), LANDFILL 4	LF4-MW1	NS	WG	9/15/2020	TALSAV	680-188774-1	680-188774-1	SW8260B
PARCEL 81(5), LANDFILL 4	LF4-MW1	FD	WG	9/15/2020	TALSAV	680-188774-1	680-188774-6	SW6020B
PARCEL 81(5), LANDFILL 4	LF4-MW1	FD	WG	9/15/2020	TALSAV	680-188774-1	680-188774-6	SW7470A
PARCEL 81(5), LANDFILL 4	LF4-MW1	FD	WG	9/15/2020	TALSAV	680-188774-1	680-188774-6	SW8260B
PARCEL 81(5), LANDFILL 4	LF4-MW2	NS	WG	9/15/2020	TALSAV	680-188774-1	680-188774-2	SW6020B
PARCEL 81(5), LANDFILL 4	LF4-MW2	NS	WG	9/15/2020	TALSAV	680-188774-1	680-188774-2	SW7470A
PARCEL 81(5), LANDFILL 4	LF4-MW2	NS	WG	9/15/2020	TALSAV	680-188774-1	680-188774-2	SW8260B
PARCEL 81(5), LANDFILL 4	LF4-MW3	NS	WG	9/15/2020	TALSAV	680-188774-1	680-188774-3	SW6020B
PARCEL 81(5), LANDFILL 4	LF4-MW3	NS	WG	9/15/2020	TALSAV	680-188774-1	680-188774-3	SW7470A
PARCEL 81(5), LANDFILL 4	LF4-MW3	NS	WG	9/15/2020	TALSAV	680-188774-1	680-188774-3	SW8260B
PARCEL 81(5), LANDFILL 4	LF4-MW3	MSD	WG	9/15/2020	TALSAV	680-188774-1	680-188774-3 MSD	SW6020B
PARCEL 81(5), LANDFILL 4	LF4-MW3	MSD	WG	9/15/2020	TALSAV	680-188774-1	680-188774-3 MSD	SW7470A
PARCEL 81(5), LANDFILL 4	LF4-MW3	MSD	WG	9/15/2020	TALSAV	680-188774-1	680-188774-3 MSD	SW8260B
PARCEL 81(5), LANDFILL 4	LF4-MW3	MS	WG	9/15/2020	TALSAV	680-188774-1	680-188774-3 MS	SW6020B
PARCEL 81(5), LANDFILL 4	LF4-MW3	MS	WG	9/15/2020	TALSAV	680-188774-1	680-188774-3 MS	SW7470A
PARCEL 81(5), LANDFILL 4	LF4-MW3	MS	WG	9/15/2020	TALSAV	680-188774-1	680-188774-3 MS	SW8260B
PARCEL 81(5), LANDFILL 4	LF4-MW4	NS	WG	9/15/2020	TALSAV	680-188774-1	680-188774-4	SW6020B
PARCEL 81(5), LANDFILL 4	LF4-MW4	NS	WG	9/15/2020	TALSAV	680-188774-1	680-188774-4	SW7470A
PARCEL 81(5), LANDFILL 4	LF4-MW4	NS	WG	9/15/2020	TALSAV	680-188774-1	680-188774-4	SW8260B
PARCEL 81(5), LANDFILL 4	LF4-MW5	NS	WG	9/15/2020	TALSAV	680-188774-1	680-188774-5	SW6020B
PARCEL 81(5), LANDFILL 4	LF4-MW5	NS	WG	9/15/2020	TALSAV	680-188774-1	680-188774-5	SW7470A
PARCEL 81(5), LANDFILL 4	LF4-MW5	NS	WG	9/15/2020	TALSAV	680-188774-1	680-188774-5	SW8260B
MCCLELLAN FIELD QC	TRIP BLANK	TB	W	9/15/2020	TALSAV	680-188774-1	680-188774-7	SW8260B

Notes:
TALSAV = TestAmerica, Savannah, GA
ID = Identification
MS = Matrix spike
MSD = Matrix spike duplicate
NS = Normal sample
QC = Quality Control
TB = Trip blank
W = Water
WG = Groundwater
WS = Material Blank

Table C5-2: Summary of Qualified Data
Industrial Landfill, Parcel 175(5)
McClellan, Anniston, Alabama

Station Name	QC Code	Matrix	Sample Date	Delivery Group	Laboratory Sample ID	Method	LongName	Value	Flag	Validation Flag	Reporting Units
LF4-MW3	NS	WG	9/15/20	680-188774-1	680-181564-3	SW6020B	Barium	42	F1	JM	µg/L
LF4-MW3	NS	WG	9/15/20	680-188774-1	680-181564-3	SW6020B	Cobalt	1.1	B	B	µg/L

Notes:
µg/L = micrograms per liter
FD = Field duplicate
ID = Identification
MS = Matrix spike
MSD = Matrix spike duplicate
NS = Normal sample
QC = Quality control
Lab Flag:
B = Analyte detected in an associated sample.
F1 = MS and MSD outside acceptance criteria.
Validation Flag:
B = Analyte detected in an associated blank.
JM = Result is estimated due to MS and MSD recoveries outside acceptance criteria.

Table C5-3: Summary of MS/MSD Recoveries and RPDs
Industrial Landfill, Parcel 175(5)
McClellan, Anniston, Alabama

Station Name	Matrix	Sample Date	Delivery Group	Method	Parameter Name	MS %R	MSD %R	%R LCL	%R UCL	RPD	RPD Limit
LF4-MW3	WG	9/15/20	680-188774-1	SW6020B	Antimony	101	101	75	125	0	20
LF4-MW3	WG	9/15/20	680-188774-1	SW6020B	Arsenic	117	114	75	125	2.6	20
LF4-MW3	WG	9/15/20	680-188774-1	SW6020B	Barium	141	140	75	125	0.7	20
LF4-MW3	WG	9/15/20	680-188774-1	SW6020B	Beryllium	104	105	75	125	1.0	20
LF4-MW3	WG	9/15/20	680-188774-1	SW6020B	Cadmium	117	114	75	125	2.6	20
LF4-MW3	WG	9/15/20	680-188774-1	SW6020B	Chromium	117	113	75	125	3.5	20
LF4-MW3	WG	9/15/20	680-188774-1	SW6020B	Cobalt	120	117	75	125	2.5	20
LF4-MW3	WG	9/15/20	680-188774-1	SW6020B	Copper	122	118	75	125	3.3	20
LF4-MW3	WG	9/15/20	680-188774-1	SW6020B	Lead	117	116	75	125	0.9	20
LF4-MW3	WG	9/15/20	680-188774-1	SW6020B	Nickel	120	118	75	125	1.7	20
LF4-MW3	WG	9/15/20	680-188774-1	SW6020B	Selenium	108	108	75	125	0	20
LF4-MW3	WG	9/15/20	680-188774-1	SW6020B	Silver	117	109	75	125	7.1	20
LF4-MW3	WG	9/15/20	680-188774-1	SW6020B	Thallium	116	114	75	125	1.7	20
LF4-MW3	WG	9/15/20	680-188774-1	SW6020B	Vanadium	117	114	75	125	2.6	20
LF4-MW3	WG	9/15/20	680-188774-1	SW6020B	Zinc	82	116	75	125	34	20
LF4-MW3	WG	9/15/20	680-188774-1	SW7470A	Mercury	97	96	80	120	1.0	20
LF4-MW3	WG	9/15/20	680-188774-1	SW8260B	1,1-Dichloroethene	106	108	74	125	1.9	30
LF4-MW3	WG	9/15/20	680-188774-1	SW8260B	1,4-Dichlorobenzene	101	101	80	120	0	20
LF4-MW3	WG	9/15/20	680-188774-1	SW8260B	Acetone	113	117	60	154	3.5	20
LF4-MW3	WG	9/15/20	680-188774-1	SW8260B	Benzene	104	105	73	131	1.0	20
LF4-MW3	WG	9/15/20	680-188774-1	SW8260B	Carbon Disulfide	96	99	73	127	3.1	20
LF4-MW3	WG	9/15/20	680-188774-1	SW8260B	Chlorobenzene	102	104	80	120	1.9	20
LF4-MW3	WG	9/15/20	680-188774-1	SW8260B	Chloroethane	140	147	50	151	4.9	20
LF4-MW3	WG	9/15/20	680-188774-1	SW8260B	Chloroform	103	104	79	122	1.0	20
LF4-MW3	WG	9/15/20	680-188774-1	SW8260B	Cis-1,2-Dichloroethene	97	96	80	122	1.0	20
LF4-MW3	WG	9/15/20	680-188774-1	SW8260B	Ethylbenzene	107	108	80	120	0.9	20
LF4-MW3	WG	9/15/20	680-188774-1	SW8260B	Toluene	105	106	80	122	0.9	20
LF4-MW3	WG	9/15/20	680-188774-1	SW8260B	Trans-1,2-Dichloroethene	103	105	78	123	1.9	20
LF4-MW3	WG	9/15/20	680-188774-1	SW8260B	Trichloroethene	106	107	80	123	0.9	20
LF4-MW3	WG	9/15/20	680-188774-1	SW8260B	Vinyl Chloride	97	101	68	132	4.0	20

Notes:
%R = Percent recovery
LCL = Lower control limit
UCL = Upper control limit
MS = Matrix spike
MSD = Matrix spike duplicate
RPD = Relative percent difference
WG = Groundwater

Blue text and outlined indicates value above acceptance critieria.
Shade indicates value below acceptance criteria.

Table C5-4: Comparison of Investifative and Field Duplicate Sample Detections
Industrial Landfill, Parcel 175(5)
McClellan, Anniston, Alabama

Station Name	Matrix	Sample Date	Delivery Group	Method	Parameter Name	FD Value	FD Lab Flag	NS Value	NS Lab Flag	Units	RPD	MDL	RL
LF4-MW1	WG	9/15/20	680-188774-1	SW6020B	Barium	46	B	46	B	µg/L	0	1.5	3
LF4-MW1	WG	9/15/20	680-188774-1	SW6020B	Beryllium	0.33	J	0.3	J	µg/L	9.5	0.61	5
LF4-MW1	WG	9/15/20	680-188774-1	SW6020B	Cadmium	0.22	J	0.2	J	µg/L	9.5	0.2	0.5
LF4-MW1	WG	9/15/20	680-188774-1	SW6020B	Cobalt	37		38		µg/L	2.7	0.12	0.5
LF4-MW1	WG	9/15/20	680-188774-1	SW6020B	Nickel	23		23		µg/L	0	0.98	2.5
LF4-MW1	WG	9/15/20	680-188774-1	SW6020B	Zinc	89		82		µg/L	8.2	1.9	5

Notes:
FD = Field duplicate
MDL = Method detection limit
µg/L = micrograms per liter
NS = Normal sample
RL = Reporting limit
RPD = Relative percent difference
WG = Groundwater

Blue text and outlined indicates RPD outside acceptance critieria of 50%.

Lab Flag:
B = Analyte detected in an associated blank.
J = Estimated value. The analyte is positively identified and the concentration is less than the reporting limit, but greater than the method detection limit.

Table C5-5: Summary of LCS/LCSD Recoveries and RPDs
Industrial Landfill, Parcel 175(5)
McClellan, Anniston, Alabama

Method	Delivery Group	Analysis Date	Analytical Batch	Matrix	Parameter Name	LCS %R	LCSD %R	LCL	UCL	RPD	RPD Limit
SW6020B	680-181564-1	9/21/20	680-634922	W	Antimony	87	NA	80	120	NA	20
SW6020B	680-181564-1	9/21/20	680-634922	W	Arsenic	106	NA	80	120	NA	20
SW6020B	680-181564-1	9/21/20	680-634922	W	Barium	94	NA	80	120	NA	20
SW6020B	680-181564-1	9/21/20	680-634922	W	Beryllium	107	NA	80	120	NA	20
SW6020B	680-181564-1	9/21/20	680-634922	W	Cadmium	94	NA	80	120	NA	20
SW6020B	680-181564-1	9/21/20	680-634922	W	Chromium	105	NA	80	120	NA	20
SW6020B	680-181564-1	9/21/20	680-634922	W	Cobalt	106	NA	80	120	NA	20
SW6020B	680-181564-1	9/21/20	680-634922	W	Copper	105	NA	80	120	NA	20
SW6020B	680-181564-1	9/21/20	680-634922	W	Lead	100	NA	80	120	NA	20
SW6020B	680-181564-1	9/21/20	680-634922	W	Nickel	110	NA	80	120	NA	20
SW6020B	680-181564-1	9/21/20	680-634922	W	Selenium	94	NA	80	120	NA	20
SW6020B	680-181564-1	9/21/20	680-634922	W	Silver	94	NA	80	120	NA	20
SW6020B	680-181564-1	9/21/20	680-634922	W	Thallium	90	NA	80	120	NA	20
SW6020B	680-181564-1	9/21/20	680-634922	W	Vanadium	105	NA	80	120	NA	20
SW6020B	680-181564-1	9/21/20	680-634922	W	Zinc	108	NA	80	120	NA	20
SW6020B	680-181564-1	9/26/20	680-636021	W	Antimony	95	NA	80	120	NA	20
SW6020B	680-181564-1	9/26/20	680-636021	W	Arsenic	102	NA	80	120	NA	20
SW6020B	680-181564-1	9/26/20	680-636021	W	Barium	101	NA	80	120	NA	20
SW6020B	680-181564-1	9/26/20	680-636021	W	Beryllium	97	NA	80	120	NA	20
SW6020B	680-181564-1	9/26/20	680-636021	W	Cadmium	105	NA	80	120	NA	20
SW6020B	680-181564-1	9/26/20	680-636021	W	Chromium	106	NA	80	120	NA	20
SW6020B	680-181564-1	9/26/20	680-636021	W	Cobalt	107	NA	80	120	NA	20
SW6020B	680-181564-1	9/26/20	680-636021	W	Copper	106	NA	80	120	NA	20
SW6020B	680-181564-1	9/26/20	680-636021	W	Lead	104	NA	80	120	NA	20
SW6020B	680-181564-1	9/26/20	680-636021	W	Nickel	106	NA	80	120	NA	20
SW6020B	680-181564-1	9/26/20	680-636021	W	Selenium	100	NA	80	120	NA	20
SW6020B	680-181564-1	9/26/20	680-636021	W	Silver	106	NA	80	120	NA	20
SW6020B	680-181564-1	9/26/20	680-636021	W	Thallium	104	NA	80	120	NA	20
SW6020B	680-181564-1	9/26/20	680-636021	W	Vanadium	103	NA	80	120	NA	20
SW6020B	680-181564-1	9/26/20	680-636021	W	Zinc	104	NA	80	120	NA	20
SW7470A	680-181564-1	9/21/20	680-634710	W	Mercury	90	NA	80	120	NA	20
SW8260B	680-188774-1	9/26/20	680-636151	W	1,1-Dichloroethene	98	94	76	120	4	30
SW8260B	680-188774-1	9/26/20	680-636151	W	1,4-Dichlorobenzene	100	91	80	120	9	20
SW8260B	680-188774-1	9/26/20	680-636151	W	Acetone	92	85	70	135	8	20
SW8260B	680-188774-1	9/26/20	680-636151	W	Benzene	99	94	80	120	5	20
SW8260B	680-188774-1	9/26/20	680-636151	W	Carbon Disulfide	103	97	80	120	6	20
SW8260B	680-188774-1	9/26/20	680-636151	W	Chlorobenzene	101	101	80	120	0	20
SW8260B	680-188774-1	9/26/20	680-636151	W	Chloroethane	143	109	66	135	27	20
SW8260B	680-188774-1	9/26/20	680-636151	W	Chloroform	94	96	80	120	2	20
SW8260B	680-188774-1	9/26/20	680-636151	W	Cis-1,2-Dichloroethene	95	96	80	120	1	20
SW8260B	680-188774-1	9/26/20	680-636151	W	Ethylbenzene	105	101	80	120	4	20
SW8260B	680-188774-1	9/26/20	680-636151	W	Toluene	96	114	80	113	17	20
SW8260B	680-188774-1	9/26/20	680-636151	W	Trans-1,2-Dichloroethene	96	91	80	120	5	20
SW8260B	680-188774-1	9/26/20	680-636151	W	Trichloroethene	92	98	80	120	6	20
SW8260B	680-188774-1	9/26/20	680-636151	W	Vinyl Chloride	80	78	71	128	3	20
SW8260B	680-188774-1	9/28/20	680-636294	W	1,1-Dichloroethene	108	110	76	120	2	30
SW8260B	680-188774-1	9/28/20	680-636294	W	1,4-Dichlorobenzene	106	104	80	120	2	20
SW8260B	680-188774-1	9/28/20	680-636294	W	Acetone	115	109	70	135	5	20
SW8260B	680-188774-1	9/28/20	680-636294	W	Benzene	105	104	80	120	1	20
SW8260B	680-188774-1	9/28/20	680-636294	W	Carbon Disulfide	104	104	80	120	0	20
SW8260B	680-188774-1	9/28/20	680-636294	W	Chlorobenzene	105	102	80	120	3	20
SW8260B	680-188774-1	9/28/20	680-636294	W	Chloroethane	86	84	66	135	2	20
SW8260B	680-188774-1	9/28/20	680-636294	W	Chloroform	106	103	80	120	3	20
SW8260B	680-188774-1	9/28/20	680-636294	W	Cis-1,2-Dichloroethene	111	108	80	120	3	20
SW8260B	680-188774-1	9/28/20	680-636294	W	Ethylbenzene	108	105	80	120	3	20
SW8260B	680-188774-1	9/28/20	680-636294	W	Toluene	107	105	80	113	2	20

Table C5-5: Summary of LCS/LCSD Recoveries and RPDs
Industrial Landfill, Parcel 175(5)
McClellan, Anniston, Alabama

Method	Delivery Group	Analysis Date	Analytical Batch	Matrix	Parameter Name	LCS %R	LCSD %R	LCL	UCL	RPD	RPD Limit
SW8260B	680-188774-1	9/28/20	680-636294	W	Trans-1,2-Dichloroethene	106	105	80	120	1	20
SW8260B	680-188774-1	9/28/20	680-636294	W	Trichloroethene	108	107	80	120	1	20
SW8260B	680-188774-1	9/28/20	680-636294	W	Vinyl Chloride	104	103	71	128	1	20
SW8260B	680-188774-1	9/29/20	680-636511	W	1,1-Dichloroethene	122	119	76	120	2	30
SW8260B	680-188774-1	9/29/20	680-636511	W	1,4-Dichlorobenzene	107	104	80	120	3	20
SW8260B	680-188774-1	9/29/20	680-636511	W	Acetone	120	121	70	135	1	20
SW8260B	680-188774-1	9/29/20	680-636511	W	Benzene	112	111	80	120	1	20
SW8260B	680-188774-1	9/29/20	680-636511	W	Carbon Disulfide	114	113	80	120	1	20
SW8260B	680-188774-1	9/29/20	680-636511	W	Chlorobenzene	101	101	80	120	0	20
SW8260B	680-188774-1	9/29/20	680-636511	W	Chloroethane	83	79	66	135	5	20
SW8260B	680-188774-1	9/29/20	680-636511	W	Chloroform	110	111	80	120	1	20
SW8260B	680-188774-1	9/29/20	680-636511	W	Cis-1,2-Dichloroethene	120	119	80	120	1	20
SW8260B	680-188774-1	9/29/20	680-636511	W	Ethylbenzene	105	102	80	120	3	20
SW8260B	680-188774-1	9/29/20	680-636511	W	Toluene	111	113	80	113	2	20
SW8260B	680-188774-1	9/29/20	680-636511	W	Trans-1,2-Dichloroethene	117	118	80	120	1	20
SW8260B	680-188774-1	9/29/20	680-636511	W	Trichloroethene	114	115	80	120	1	20
SW8260B	680-188774-1	9/29/20	680-636511	W	Vinyl Chloride	112	111	71	128	1	20

Notes:

LCL = Lower control limit

LCS = Laboratory control sample

LCSD = Laboratory control sample duplicate

NA = not applicable

W = Water

%R = Percent recovery

Blue text and outlined indicates value above acceptance critieria.

Shade indicates value below acceptance criteria.

RPD = Relative percent difference

UCL = Upper control limit

Table C5-6: Summary of Surrogate Recoveries
Industrial Landfill, Parcel 175(5)
McClellan, Anniston, Alabama

Station Name	Sample Date	Matrix	QC Code	Delivery Group	Method	Parameter Name	%R	LCL	UCL
LF4-MW1	9/15/20	WG	NS	680-188774-1	SW8260B	1,2-Dichloroethane-D4	84	73	131
LF4-MW1	9/15/20	WG	NS	680-188774-1	SW8260B	4-Bromofluorobenzene	89	80	120
LF4-MW1	9/15/20	WG	NS	680-188774-1	SW8260B	Dibromofluoromethane	98	80	122
LF4-MW1	9/15/20	WG	NS	680-188774-1	SW8260B	Toluene-D8	105	80	120
LF4-MW1	9/15/20	WG	FD	680-188774-1	SW8260B	1,2-Dichloroethane-D4	89	73	131
LF4-MW1	9/15/20	WG	FD	680-188774-1	SW8260B	4-Bromofluorobenzene	95	80	120
LF4-MW1	9/15/20	WG	FD	680-188774-1	SW8260B	Dibromofluoromethane	101	80	122
LF4-MW1	9/15/20	WG	FD	680-188774-1	SW8260B	Toluene-D8	90	80	120
LF4-MW2	9/15/20	WG	NS	680-188774-1	SW8260B	1,2-Dichloroethane-D4	82	73	131
LF4-MW2	9/15/20	WG	NS	680-188774-1	SW8260B	4-Bromofluorobenzene	82	80	120
LF4-MW2	9/15/20	WG	NS	680-188774-1	SW8260B	Dibromofluoromethane	84	80	122
LF4-MW2	9/15/20	WG	NS	680-188774-1	SW8260B	Toluene-D8	100	80	120
LF4-MW3	9/15/20	WG	NS	680-188774-1	SW8260B	1,2-Dichloroethane-D4	100	73	131
LF4-MW3	9/15/20	WG	NS	680-188774-1	SW8260B	4-Bromofluorobenzene	110	80	120
LF4-MW3	9/15/20	WG	NS	680-188774-1	SW8260B	Dibromofluoromethane	101	80	122
LF4-MW3	9/15/20	WG	NS	680-188774-1	SW8260B	Toluene-D8	106	80	120
LF4-MW4	9/15/20	WG	NS	680-188774-1	SW8260B	1,2-Dichloroethane-D4	87	73	131
LF4-MW4	9/15/20	WG	NS	680-188774-1	SW8260B	4-Bromofluorobenzene	68	80	120
LF4-MW4	9/15/20	WG	NS	680-188774-1	SW8260B	Dibromofluoromethane	96	80	122
LF4-MW4	9/15/20	WG	NS	680-188774-1	SW8260B	Toluene-D8	88	80	120
LF4-MW5	9/15/20	WG	NS	680-188774-1	SW8260B	1,2-Dichloroethane-D4	89	73	131
LF4-MW5	9/15/20	WG	NS	680-188774-1	SW8260B	4-Bromofluorobenzene	89	80	120
LF4-MW5	9/15/20	WG	NS	680-188774-1	SW8260B	Dibromofluoromethane	99	80	122
LF4-MW5	9/15/20	WG	NS	680-188774-1	SW8260B	Toluene-D8	91	80	120

Notes:

FD = Field duplicate
LCL = Lower control limit
NS = Normal sample
QC = Quality control
%R = Percent recovery
UCL = Upper control limit
WG = Groundwater

Table C6-1: Reporting Limits and Method Detection Limits Compared to MCLs
Industrial Landfill, Parcel 175(5)
McClellan, Anniston, Alabama

Matrix	Method	Parameter Name	MDL	RL	Units	MCL
WG	SW6020B	Antimony	0.5	5	µg/L	6.0
WG	SW6020B	Arsenic	1.5	3	µg/L	10
WG	SW6020B	Barium	0.61	5	µg/L	2000
WG	SW6020B	Beryllium	0.17	0.5	µg/L	4.0
WG	SW6020B	Cadmium	0.15	0.5	µg/L	5.0
WG	SW6020B	Chromium	1.6	5	µg/L	100
WG	SW6020B	Copper	1.7	5	µg/L	1300
WG	SW6020B	Lead	0.98	2.5	µg/L	15
WG	SW6020B	Nickel	1.9	5	µg/L	100
WG	SW6020B	Selenium	1	2.5	µg/L	50
WG	SW6020B	Silver	0.1	1	µg/L	100
WG	SW6020B	Thallium	0.49	1	µg/L	2.0
WG	SW6020B	Zinc	9.6	20	µg/L	5000
WG	SW7470A	Mercury	0.08	0.2	µg/L	2.0
WG	SW8260B	1,1-Dichloroethene	0.36	1	µg/L	7.0
WG	SW8260B	1,4-Dichlorobenzene	0.46	1	µg/L	75
WG	SW8260B	Benzene	0.43	1	µg/L	5.0
WG	SW8260B	Chlorobenzene	0.26	1	µg/L	100
WG	SW8260B	Cis-1,2-Dichloroethene	0.41	1	µg/L	70
WG	SW8260B	Ethylbenzene	0.33	1	µg/L	700
WG	SW8260B	Toluene	0.48	1	µg/L	1000
WG	SW8260B	Trans-1,2-Dichloroethene	0.37	1	µg/L	100
WG	SW8260B	Trichloroethene	0.48	1	µg/L	5.0
WG	SW8260B	Vinyl Chloride	0.5	1	µg/L	2.0

Notes:
MDL = Method detection limit
µg/L = micrograms per liter
mg/L = milligrams per liter
MCL = Maximum contaminant level (Codes 335-7-2-.03, 335-7-2-.05, and 335-7-3-.02 of the *ADEM Division 7 Regulations* [ADEM, 2014])
RL = Reporting limit
WG = Groundwater

Indicates the limit is greater than the MCL.

ATTACHMENT C1

Laboratory Data, September 2020

eurofins | Environment Testing America

ANALYTICAL REPORT

Eurofins TestAmerica, Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Tel: (912)354-7858

Laboratory Job ID: 680-188774-1
Client Project/Site: Parcel 81(5), Landfill 4

For:
Matrix Environmental Services, LLC
1601 Blake Street
Suite 200
Denver, Colorado 80202

Attn: Ms. Betty Van Pelt

Authorized for release by:
9/30/2020 5:02:11 PM

Ken Hayes, Project Manager II
(615)301-5035
Ken.Hayes@Eurofinset.com

Definitions/Glossary

Client: Matrix Environmental Services, LLC
Project/Site: Parcel 81(5), Landfill 4

Job ID: 680-188774-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
*	LCS or LCSD is outside acceptance limits.
*1	LCS/LCSD RPD exceeds control limits.
U	Indicates the analyte was analyzed for but not detected.
X	Surrogate recovery exceeds control limits

Metals

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
F1	MS and/or MSD recovery exceeds control limits.
F2	MS/MSD RPD exceeds control limits
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
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)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
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)
TNTC	Too Numerous To Count

Sample Summary

Client: Matrix Environmental Services, LLC
Project/Site: Parcel 81(5), Landfill 4

Job ID: 680-188774-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
680-188774-1	LF4-MW1	Water	09/15/20 09:15	09/16/20 10:25	
680-188774-2	LF4-MW2	Water	09/15/20 09:45	09/16/20 10:25	
680-188774-3	LF4-MW3	Water	09/15/20 10:20	09/16/20 10:25	
680-188774-4	LF4-MW4	Water	09/15/20 11:10	09/16/20 10:25	
680-188774-5	LF4-MW5	Water	09/15/20 11:50	09/16/20 10:25	
680-188774-6	DUP343	Water	09/15/20 00:00	09/16/20 10:25	
680-188774-7	TB551	Water	09/15/20 13:00	09/16/20 10:25	

Job ID: 680-188774-1

Laboratory: Eurofins TestAmerica, Savannah

Narrative

Job Narrative
680-188774-1

Comments
No additional comments.

Receipt
The samples were received on 9/16/2020 10:25 AM; the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 3.0º C.

Receipt Exceptions
The container label for the following sample did not match the information listed on the Chain-of-Custody (COC): DUP343 (680-188774-6). The container labels list DUP356, while the COC lists DUP343.

GC/MS VOA
Method 8260B: The Laboratory Control Sample Duplicate (LCSD) recovered 3% above the recovery limit for 4-Bromofluorobenzene (Surr). The other surrogates were within limits, and both the CCVIS and LCS surrogate recoveries were within recovery limits. 4-Bromofluorobenzene(surr) is not associated with the target analytes, data has been reported. (LCSD 680-636151/5)

Method 8260B: Surrogate recovery for the following sample was outside control limits: LF4-MW4 (680-188774-4). Evidence of matrix interferences is not obvious.

Method 8260B: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD/DUP) associated with analytical batch 680-636151.

Method 8260B: The laboratory control sample (LCS) for analytical batch 680-636511 recovered outside control limits for the following analytes: 1,1-Dichloroethene. This analyte was biased high in the LCS and was not detected in the associated samples; therefore, the data have been reported.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Metals
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Client Sample ID: LF4-MW1
Lab Sample ID: 680-188774-1
Date Collected: 09/15/20 09:15
Matrix: Water
Date Received: 09/16/20 10:25

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	7.0	U	10	7.0	ug/L			09/26/20 20:49	1
Benzene	0.43	U	1.0	0.43	ug/L			09/26/20 20:49	1
Carbon disulfide	1.0	U	2.0	1.0	ug/L			09/26/20 20:49	1
Chlorobenzene	0.26	U	1.0	0.26	ug/L			09/26/20 20:49	1
Chloroethane	2.5	U * *1	5.0	2.5	ug/L			09/26/20 20:49	1
Chloroform	0.50	U	1.0	0.50	ug/L			09/26/20 20:49	1
cis-1,2-Dichloroethene	0.41	U	1.0	0.41	ug/L			09/26/20 20:49	1
1,4-Dichlorobenzene	0.46	U	1.0	0.46	ug/L			09/26/20 20:49	1
1,1-Dichloroethene	0.36	U	1.0	0.36	ug/L			09/26/20 20:49	1
Ethylbenzene	0.33	U	1.0	0.33	ug/L			09/26/20 20:49	1
Toluene	0.48	U *	1.0	0.48	ug/L			09/26/20 20:49	1
trans-1,2-Dichloroethene	0.37	U	1.0	0.37	ug/L			09/26/20 20:49	1
Trichloroethene	0.48	U	1.0	0.48	ug/L			09/26/20 20:49	1
Vinyl chloride	0.50	U	1.0	0.50	ug/L			09/26/20 20:49	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*89*		*80 - 120*		*09/26/20 20:49*	*1*
Dibromofluoromethane (Surr)	*98*		*80 - 122*		*09/26/20 20:49*	*1*
1,2-Dichloroethane-d4 (Surr)	*84*		*73 - 131*		*09/26/20 20:49*	*1*
Toluene-d8 (Surr)	*105*		*80 - 120*		*09/26/20 20:49*	*1*

Method: 6020B - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.50	U	5.0	0.50	ug/L		09/18/20 13:11	09/21/20 15:06	1
Arsenic	1.5	U	3.0	1.5	ug/L		09/18/20 13:11	09/21/20 15:06	1
Barium	**46**	**B**	5.0	0.61	ug/L		09/18/20 13:11	09/21/20 15:06	1
Beryllium	**0.30**	**J**	0.50	0.17	ug/L		09/18/20 13:11	09/21/20 15:06	1
Cadmium	**0.20**	**J**	0.50	0.15	ug/L		09/18/20 13:11	09/21/20 15:06	1
Chromium	1.6	U	5.0	1.6	ug/L		09/18/20 13:11	09/21/20 15:06	1
Cobalt	**38**		0.50	0.12	ug/L		09/18/20 13:11	09/21/20 15:06	1
Copper	1.7	U	5.0	1.7	ug/L		09/18/20 13:11	09/21/20 15:06	1
Lead	0.98	U	2.5	0.98	ug/L		09/18/20 13:11	09/21/20 15:06	1
Nickel	**23**		5.0	1.9	ug/L		09/18/20 13:11	09/21/20 15:06	1
Selenium	1.0	U	2.5	1.0	ug/L		09/18/20 13:11	09/21/20 15:06	1
Silver	0.10	U	1.0	0.10	ug/L		09/18/20 13:11	09/21/20 15:06	1
Thallium	0.49	U	1.0	0.49	ug/L		09/18/20 13:11	09/21/20 15:06	1
Vanadium	5.3	U	10	5.3	ug/L		09/18/20 13:11	09/21/20 15:06	1
Zinc	**82**		20	9.6	ug/L		09/18/20 13:11	09/21/20 15:06	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.080	U	0.20	0.080	ug/L		09/17/20 12:18	09/21/20 00:33	1

Client Sample ID: LF4-MW2
Lab Sample ID: 680-188774-2
Date Collected: 09/15/20 09:45
Matrix: Water
Date Received: 09/16/20 10:25

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	7.0	U	10	7.0	ug/L			09/26/20 21:13	1
Benzene	0.43	U	1.0	0.43	ug/L			09/26/20 21:13	1

Client Sample ID: LF4-MW2
Lab Sample ID: 680-188774-2
Date Collected: 09/15/20 09:45
Matrix: Water
Date Received: 09/16/20 10:25

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Carbon disulfide	1.0	U	2.0	1.0	ug/L			09/26/20 21:13	1
Chlorobenzene	0.26	U	1.0	0.26	ug/L			09/26/20 21:13	1
Chloroethane	2.5	U * *1	5.0	2.5	ug/L			09/26/20 21:13	1
Chloroform	0.50	U	1.0	0.50	ug/L			09/26/20 21:13	1
cis-1,2-Dichloroethene	0.41	U	1.0	0.41	ug/L			09/26/20 21:13	1
1,4-Dichlorobenzene	0.46	U	1.0	0.46	ug/L			09/26/20 21:13	1
1,1-Dichloroethene	0.36	U	1.0	0.36	ug/L			09/26/20 21:13	1
Ethylbenzene	0.33	U	1.0	0.33	ug/L			09/26/20 21:13	1
Toluene	0.48	U *	1.0	0.48	ug/L			09/26/20 21:13	1
trans-1,2-Dichloroethene	0.37	U	1.0	0.37	ug/L			09/26/20 21:13	1
Trichloroethene	0.48	U	1.0	0.48	ug/L			09/26/20 21:13	1
Vinyl chloride	0.50	U	1.0	0.50	ug/L			09/26/20 21:13	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*82*		*80 - 120*		*09/26/20 21:13*	*1*
Dibromofluoromethane (Surr)	*84*		*80 - 122*		*09/26/20 21:13*	*1*
1,2-Dichloroethane-d4 (Surr)	*82*		*73 - 131*		*09/26/20 21:13*	*1*
Toluene-d8 (Surr)	*100*		*80 - 120*		*09/26/20 21:13*	*1*

Method: 6020B - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.50	U	5.0	0.50	ug/L		09/18/20 13:11	09/21/20 15:03	1
Arsenic	**3.3**		3.0	1.5	ug/L		09/18/20 13:11	09/21/20 15:03	1
Barium	**69**	**B**	5.0	0.61	ug/L		09/18/20 13:11	09/21/20 15:03	1
Beryllium	**0.42**	**J**	0.50	0.17	ug/L		09/18/20 13:11	09/21/20 15:03	1
Cadmium	**0.21**	**J**	0.50	0.15	ug/L		09/18/20 13:11	09/21/20 15:03	1
Chromium	**4.5**	**J**	5.0	1.6	ug/L		09/18/20 13:11	09/21/20 15:03	1
Cobalt	**130**		0.50	0.12	ug/L		09/18/20 13:11	09/21/20 15:03	1
Copper	**5.1**		5.0	1.7	ug/L		09/18/20 13:11	09/21/20 15:03	1
Lead	**6.2**		2.5	0.98	ug/L		09/18/20 13:11	09/21/20 15:03	1
Nickel	**65**		5.0	1.9	ug/L		09/18/20 13:11	09/21/20 15:03	1
Selenium	1.0	U	2.5	1.0	ug/L		09/18/20 13:11	09/21/20 15:03	1
Silver	0.10	U	1.0	0.10	ug/L		09/18/20 13:11	09/21/20 15:03	1
Thallium	0.49	U	1.0	0.49	ug/L		09/18/20 13:11	09/21/20 15:03	1
Vanadium	5.3	U	10	5.3	ug/L		09/18/20 13:11	09/21/20 15:03	1
Zinc	**460**		20	9.6	ug/L		09/18/20 13:11	09/21/20 15:03	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.080	U	0.20	0.080	ug/L		09/17/20 12:18	09/21/20 00:37	1

Client Sample ID: LF4-MW3
Lab Sample ID: 680-188774-3
Date Collected: 09/15/20 10:20
Matrix: Water
Date Received: 09/16/20 10:25

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	7.0	U	10	7.0	ug/L			09/28/20 17:54	1
Benzene	0.43	U	1.0	0.43	ug/L			09/28/20 17:54	1
Carbon disulfide	1.0	U	2.0	1.0	ug/L			09/28/20 17:54	1
Chlorobenzene	0.26	U	1.0	0.26	ug/L			09/28/20 17:54	1

Client Sample ID: LF4-MW3

Date Collected: 09/15/20 10:20
Date Received: 09/16/20 10:25

Lab Sample ID: 680-188774-3

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloroethane	2.5	U	5.0	2.5	ug/L			09/28/20 17:54	1
Chloroform	0.50	U	1.0	0.50	ug/L			09/28/20 17:54	1
cis-1,2-Dichloroethene	0.41	U	1.0	0.41	ug/L			09/28/20 17:54	1
1,4-Dichlorobenzene	0.46	U	1.0	0.46	ug/L			09/28/20 17:54	1
1,1-Dichloroethene	0.36	U	1.0	0.36	ug/L			09/28/20 17:54	1
Ethylbenzene	0.33	U	1.0	0.33	ug/L			09/28/20 17:54	1
Toluene	0.48	U	1.0	0.48	ug/L			09/28/20 17:54	1
trans-1,2-Dichloroethene	0.37	U	1.0	0.37	ug/L			09/28/20 17:54	1
Trichloroethene	0.48	U	1.0	0.48	ug/L			09/28/20 17:54	1
Vinyl chloride	0.50	U	1.0	0.50	ug/L			09/28/20 17:54	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*110*		*80 - 120*		*09/28/20 17:54*	*1*
Dibromofluoromethane (Surr)	*101*		*80 - 122*		*09/28/20 17:54*	*1*
1,2-Dichloroethane-d4 (Surr)	*100*		*73 - 131*		*09/28/20 17:54*	*1*
Toluene-d8 (Surr)	*106*		*80 - 120*		*09/28/20 17:54*	*1*

Method: 6020B - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.50	U	5.0	0.50	ug/L		09/25/20 13:07	09/26/20 14:03	1
Arsenic	1.5	U	3.0	1.5	ug/L		09/25/20 13:07	09/26/20 14:03	1
Barium	**42**	**F1**	5.0	0.61	ug/L		09/25/20 13:07	09/26/20 14:03	1
Beryllium	**0.41**	**J**	0.50	0.17	ug/L		09/25/20 13:07	09/26/20 14:03	1
Cadmium	**0.17**	**J**	0.50	0.15	ug/L		09/25/20 13:07	09/26/20 14:03	1
Chromium	**2.4**	**J**	5.0	1.6	ug/L		09/25/20 13:07	09/26/20 14:03	1
Cobalt	**1.1**	**B**	0.50	0.12	ug/L		09/25/20 13:07	09/26/20 14:03	1
Copper	**1.7**	**J**	5.0	1.7	ug/L		09/25/20 13:07	09/26/20 14:03	1
Lead	**2.0**	**J**	2.5	0.98	ug/L		09/25/20 13:07	09/26/20 14:03	1
Nickel	**2.7**	**J**	5.0	1.9	ug/L		09/25/20 13:07	09/26/20 14:03	1
Selenium	1.0	U	2.5	1.0	ug/L		09/25/20 13:07	09/26/20 14:03	1
Silver	0.10	U	1.0	0.10	ug/L		09/25/20 13:07	09/26/20 14:03	1
Thallium	0.49	U	1.0	0.49	ug/L		09/25/20 13:07	09/26/20 14:03	1
Vanadium	5.3	U	10	5.3	ug/L		09/25/20 13:07	09/26/20 14:03	1
Zinc	**53**	**F2**	20	9.6	ug/L		09/25/20 13:07	09/26/20 14:03	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.080	U	0.20	0.080	ug/L		09/17/20 12:18	09/21/20 00:19	1

Client Sample ID: LF4-MW4

Date Collected: 09/15/20 11:10
Date Received: 09/16/20 10:25

Lab Sample ID: 680-188774-4

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	7.0	U	10	7.0	ug/L			09/26/20 21:38	1
Benzene	0.43	U	1.0	0.43	ug/L			09/26/20 21:38	1
Carbon disulfide	1.0	U	2.0	1.0	ug/L			09/26/20 21:38	1
Chlorobenzene	**2.4**		1.0	0.26	ug/L			09/26/20 21:38	1
Chloroethane	2.5	U * *1	5.0	2.5	ug/L			09/26/20 21:38	1
Chloroform	0.50	U	1.0	0.50	ug/L			09/26/20 21:38	1

Client Sample ID: LF4-MW4

Date Collected: 09/15/20 11:10
Date Received: 09/16/20 10:25

Lab Sample ID: 680-188774-4

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	**1.5**		1.0	0.41	ug/L			09/26/20 21:38	1
1,4-Dichlorobenzene	0.46	U	1.0	0.46	ug/L			09/26/20 21:38	1
1,1-Dichloroethene	0.36	U	1.0	0.36	ug/L			09/26/20 21:38	1
Ethylbenzene	0.33	U	1.0	0.33	ug/L			09/26/20 21:38	1
Toluene	0.48	U *	1.0	0.48	ug/L			09/26/20 21:38	1
trans-1,2-Dichloroethene	0.37	U	1.0	0.37	ug/L			09/26/20 21:38	1
Trichloroethene	**1.2**		1.0	0.48	ug/L			09/26/20 21:38	1
Vinyl chloride	0.50	U	1.0	0.50	ug/L			09/26/20 21:38	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*68*	*X*	*80 - 120*		*09/26/20 21:38*	*1*
Dibromofluoromethane (Surr)	*96*		*80 - 122*		*09/26/20 21:38*	*1*
1,2-Dichloroethane-d4 (Surr)	*87*		*73 - 131*		*09/26/20 21:38*	*1*
Toluene-d8 (Surr)	*88*		*80 - 120*		*09/26/20 21:38*	*1*

Method: 6020B - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.50	U	5.0	0.50	ug/L		09/18/20 13:11	09/21/20 15:00	1
Arsenic	1.5	U	3.0	1.5	ug/L		09/18/20 13:11	09/21/20 15:00	1
Barium	**160**	**B**	5.0	0.61	ug/L		09/18/20 13:11	09/21/20 15:00	1
Beryllium	0.17	U	0.50	0.17	ug/L		09/18/20 13:11	09/21/20 15:00	1
Cadmium	**0.70**		0.50	0.15	ug/L		09/18/20 13:11	09/21/20 15:00	1
Chromium	1.6	U	5.0	1.6	ug/L		09/18/20 13:11	09/21/20 15:00	1
Cobalt	**3.4**		0.50	0.12	ug/L		09/18/20 13:11	09/21/20 15:00	1
Copper	1.7	U	5.0	1.7	ug/L		09/18/20 13:11	09/21/20 15:00	1
Lead	**5.2**		2.5	0.98	ug/L		09/18/20 13:11	09/21/20 15:00	1
Nickel	**2.6**	**J**	5.0	1.9	ug/L		09/18/20 13:11	09/21/20 15:00	1
Selenium	1.0	U	2.5	1.0	ug/L		09/18/20 13:11	09/21/20 15:00	1
Silver	0.10	U	1.0	0.10	ug/L		09/18/20 13:11	09/21/20 15:00	1
Thallium	0.49	U	1.0	0.49	ug/L		09/18/20 13:11	09/21/20 15:00	1
Vanadium	5.3	U	10	5.3	ug/L		09/18/20 13:11	09/21/20 15:00	1
Zinc	**27**		20	9.6	ug/L		09/18/20 13:11	09/21/20 15:00	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.080	U	0.20	0.080	ug/L		09/17/20 12:18	09/21/20 00:42	1

Client Sample ID: LF4-MW5

Date Collected: 09/15/20 11:50
Date Received: 09/16/20 10:25

Lab Sample ID: 680-188774-5

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	7.0	U	10	7.0	ug/L			09/26/20 22:02	1
Benzene	0.43	U	1.0	0.43	ug/L			09/26/20 22:02	1
Carbon disulfide	1.0	U	2.0	1.0	ug/L			09/26/20 22:02	1
Chlorobenzene	0.26	U	1.0	0.26	ug/L			09/26/20 22:02	1
Chloroethane	2.5	U * *1	5.0	2.5	ug/L			09/26/20 22:02	1
Chloroform	0.50	U	1.0	0.50	ug/L			09/26/20 22:02	1
cis-1,2-Dichloroethene	0.41	U	1.0	0.41	ug/L			09/26/20 22:02	1
1,4-Dichlorobenzene	0.46	U	1.0	0.46	ug/L			09/26/20 22:02	1

Client Sample ID: LF4-MW5
Lab Sample ID: 680-188774-5
Date Collected: 09/15/20 11:50
Matrix: Water
Date Received: 09/16/20 10:25

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	0.36	U	1.0	0.36	ug/L			09/26/20 22:02	1
Ethylbenzene	0.33	U	1.0	0.33	ug/L			09/26/20 22:02	1
Toluene	0.48	U *	1.0	0.48	ug/L			09/26/20 22:02	1
trans-1,2-Dichloroethene	0.37	U	1.0	0.37	ug/L			09/26/20 22:02	1
Trichloroethene	0.48	U	1.0	0.48	ug/L			09/26/20 22:02	1
Vinyl chloride	0.50	U	1.0	0.50	ug/L			09/26/20 22:02	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*89*		*80 - 120*		*09/26/20 22:02*	*1*
Dibromofluoromethane (Surr)	*99*		*80 - 122*		*09/26/20 22:02*	*1*
1,2-Dichloroethane-d4 (Surr)	*89*		*73 - 131*		*09/26/20 22:02*	*1*
Toluene-d8 (Surr)	*91*		*80 - 120*		*09/26/20 22:02*	*1*

Method: 6020B - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.50	U	5.0	0.50	ug/L		09/18/20 13:11	09/21/20 15:10	1
Arsenic	1.5	U	3.0	1.5	ug/L		09/18/20 13:11	09/21/20 15:10	1
Barium	**16**	**B**	5.0	0.61	ug/L		09/18/20 13:11	09/21/20 15:10	1
Beryllium	**0.21**	**J**	0.50	0.17	ug/L		09/18/20 13:11	09/21/20 15:10	1
Cadmium	0.15	U	0.50	0.15	ug/L		09/18/20 13:11	09/21/20 15:10	1
Chromium	**2.3**	**J**	5.0	1.6	ug/L		09/18/20 13:11	09/21/20 15:10	1
Cobalt	**3.5**		0.50	0.12	ug/L		09/18/20 13:11	09/21/20 15:10	1
Copper	**2.1**	**J**	5.0	1.7	ug/L		09/18/20 13:11	09/21/20 15:10	1
Lead	**3.0**		2.5	0.98	ug/L		09/18/20 13:11	09/21/20 15:10	1
Nickel	**2.6**	**J**	5.0	1.9	ug/L		09/18/20 13:11	09/21/20 15:10	1
Selenium	1.0	U	2.5	1.0	ug/L		09/18/20 13:11	09/21/20 15:10	1
Silver	0.10	U	1.0	0.10	ug/L		09/18/20 13:11	09/21/20 15:10	1
Thallium	0.49	U	1.0	0.49	ug/L		09/18/20 13:11	09/21/20 15:10	1
Vanadium	5.3	U	10	5.3	ug/L		09/18/20 13:11	09/21/20 15:10	1
Zinc	**1000**		20	9.6	ug/L		09/18/20 13:11	09/21/20 15:10	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.080	U	0.20	0.080	ug/L		09/17/20 12:18	09/21/20 00:46	1

Client Sample ID: DUP343
Lab Sample ID: 680-188774-6
Date Collected: 09/15/20 00:00
Matrix: Water
Date Received: 09/16/20 10:25

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	7.0	U	10	7.0	ug/L			09/26/20 22:26	1
Benzene	0.43	U	1.0	0.43	ug/L			09/26/20 22:26	1
Carbon disulfide	1.0	U	2.0	1.0	ug/L			09/26/20 22:26	1
Chlorobenzene	0.26	U	1.0	0.26	ug/L			09/26/20 22:26	1
Chloroethane	2.5	U * *1	5.0	2.5	ug/L			09/26/20 22:26	1
Chloroform	0.50	U	1.0	0.50	ug/L			09/26/20 22:26	1
cis-1,2-Dichloroethene	0.41	U	1.0	0.41	ug/L			09/26/20 22:26	1
1,4-Dichlorobenzene	0.46	U	1.0	0.46	ug/L			09/26/20 22:26	1
1,1-Dichloroethene	0.36	U	1.0	0.36	ug/L			09/26/20 22:26	1
Ethylbenzene	0.33	U	1.0	0.33	ug/L			09/26/20 22:26	1

Client Sample ID: DUP343

Lab Sample ID: 680-188774-6

Date Collected: 09/15/20 00:00

Matrix: Water

Date Received: 09/16/20 10:25

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Toluene	0.48	U *	1.0	0.48	ug/L			09/26/20 22:26	1
trans-1,2-Dichloroethene	0.37	U	1.0	0.37	ug/L			09/26/20 22:26	1
Trichloroethene	0.48	U	1.0	0.48	ug/L			09/26/20 22:26	1
Vinyl chloride	0.50	U	1.0	0.50	ug/L			09/26/20 22:26	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*95*		*80 - 120*		*09/26/20 22:26*	*1*
Dibromofluoromethane (Surr)	*101*		*80 - 122*		*09/26/20 22:26*	*1*
1,2-Dichloroethane-d4 (Surr)	*89*		*73 - 131*		*09/26/20 22:26*	*1*
Toluene-d8 (Surr)	*90*		*80 - 120*		*09/26/20 22:26*	*1*

Method: 6020B - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.50	U	5.0	0.50	ug/L		09/18/20 13:11	09/21/20 15:13	1
Arsenic	1.5	U	3.0	1.5	ug/L		09/18/20 13:11	09/21/20 15:13	1
Barium	**46**	**B**	5.0	0.61	ug/L		09/18/20 13:11	09/21/20 15:13	1
Beryllium	**0.33**	**J**	0.50	0.17	ug/L		09/18/20 13:11	09/21/20 15:13	1
Cadmium	**0.22**	**J**	0.50	0.15	ug/L		09/18/20 13:11	09/21/20 15:13	1
Chromium	**2.1**	**J**	5.0	1.6	ug/L		09/18/20 13:11	09/21/20 15:13	1
Cobalt	**37**		0.50	0.12	ug/L		09/18/20 13:11	09/21/20 15:13	1
Copper	**2.4**	**J**	5.0	1.7	ug/L		09/18/20 13:11	09/21/20 15:13	1
Lead	**1.1**	**J**	2.5	0.98	ug/L		09/18/20 13:11	09/21/20 15:13	1
Nickel	**23**		5.0	1.9	ug/L		09/18/20 13:11	09/21/20 15:13	1
Selenium	1.0	U	2.5	1.0	ug/L		09/18/20 13:11	09/21/20 15:13	1
Silver	0.10	U	1.0	0.10	ug/L		09/18/20 13:11	09/21/20 15:13	1
Thallium	0.49	U	1.0	0.49	ug/L		09/18/20 13:11	09/21/20 15:13	1
Vanadium	5.3	U	10	5.3	ug/L		09/18/20 13:11	09/21/20 15:13	1
Zinc	**89**		20	9.6	ug/L		09/18/20 13:11	09/21/20 15:13	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.080	U	0.20	0.080	ug/L		09/17/20 12:18	09/21/20 00:51	1

Client Sample ID: TB551

Lab Sample ID: 680-188774-7

Date Collected: 09/15/20 13:00

Matrix: Water

Date Received: 09/16/20 10:25

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	7.0	U	10	7.0	ug/L			09/29/20 13:41	1
Benzene	0.43	U	1.0	0.43	ug/L			09/29/20 13:41	1
Carbon disulfide	1.0	U	2.0	1.0	ug/L			09/29/20 13:41	1
Chlorobenzene	0.26	U	1.0	0.26	ug/L			09/29/20 13:41	1
Chloroethane	2.5	U	5.0	2.5	ug/L			09/29/20 13:41	1
Chloroform	0.50	U	1.0	0.50	ug/L			09/29/20 13:41	1
cis-1,2-Dichloroethene	0.41	U	1.0	0.41	ug/L			09/29/20 13:41	1
1,4-Dichlorobenzene	0.46	U	1.0	0.46	ug/L			09/29/20 13:41	1
1,1-Dichloroethene	0.36	U *	1.0	0.36	ug/L			09/29/20 13:41	1
Ethylbenzene	0.33	U	1.0	0.33	ug/L			09/29/20 13:41	1
Toluene	0.48	U	1.0	0.48	ug/L			09/29/20 13:41	1
trans-1,2-Dichloroethene	0.37	U	1.0	0.37	ug/L			09/29/20 13:41	1

Client: Matrix Environmental Services, LLC
Project/Site: Parcel 81(5), Landfill 4

Job ID: 680-188774-1

Client Sample ID: TB551
Date Collected: 09/15/20 13:00
Date Received: 09/16/20 10:25

Lab Sample ID: 680-188774-7
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Trichloroethene	0.48	U	1.0	0.48	ug/L			09/29/20 13:41	1
Vinyl chloride	0.50	U	1.0	0.50	ug/L			09/29/20 13:41	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*107*		*80 - 120*		*09/29/20 13:41*	*1*
Dibromofluoromethane (Surr)	*100*		*80 - 122*		*09/29/20 13:41*	*1*
1,2-Dichloroethane-d4 (Surr)	*98*		*73 - 131*		*09/29/20 13:41*	*1*
Toluene-d8 (Surr)	*107*		*80 - 120*		*09/29/20 13:41*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 680-636151/10
Matrix: Water
Analysis Batch: 636151

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	7.0	U	10	7.0	ug/L			09/26/20 15:36	1
Benzene	0.43	U	1.0	0.43	ug/L			09/26/20 15:36	1
Carbon disulfide	1.0	U	2.0	1.0	ug/L			09/26/20 15:36	1
Chlorobenzene	0.26	U	1.0	0.26	ug/L			09/26/20 15:36	1
Chloroethane	2.5	U	5.0	2.5	ug/L			09/26/20 15:36	1
Chloroform	0.50	U	1.0	0.50	ug/L			09/26/20 15:36	1
cis-1,2-Dichloroethene	0.41	U	1.0	0.41	ug/L			09/26/20 15:36	1
1,4-Dichlorobenzene	0.46	U	1.0	0.46	ug/L			09/26/20 15:36	1
1,1-Dichloroethene	0.36	U	1.0	0.36	ug/L			09/26/20 15:36	1
Ethylbenzene	0.33	U	1.0	0.33	ug/L			09/26/20 15:36	1
Toluene	0.48	U	1.0	0.48	ug/L			09/26/20 15:36	1
trans-1,2-Dichloroethene	0.37	U	1.0	0.37	ug/L			09/26/20 15:36	1
Trichloroethene	0.48	U	1.0	0.48	ug/L			09/26/20 15:36	1
Vinyl chloride	0.50	U	1.0	0.50	ug/L			09/26/20 15:36	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*96*		*80 - 120*		*09/26/20 15:36*	*1*
Dibromofluoromethane (Surr)	*95*		*80 - 122*		*09/26/20 15:36*	*1*
1,2-Dichloroethane-d4 (Surr)	*80*		*73 - 131*		*09/26/20 15:36*	*1*
Toluene-d8 (Surr)	*96*		*80 - 120*		*09/26/20 15:36*	*1*

Lab Sample ID: LCS 680-636151/4
Matrix: Water
Analysis Batch: 636151

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acetone	250	230		ug/L		92	70 - 135
Benzene	50.0	49.5		ug/L		99	80 - 120
Carbon disulfide	50.0	51.7		ug/L		103	80 - 120
Chlorobenzene	50.0	50.5		ug/L		101	80 - 120
Chloroethane	50.0	71.5	*	ug/L		143	66 - 135
Chloroform	50.0	47.2		ug/L		94	80 - 120
cis-1,2-Dichloroethene	50.0	47.5		ug/L		95	80 - 120
1,4-Dichlorobenzene	50.0	49.8		ug/L		100	80 - 120
1,1-Dichloroethene	50.0	49.0		ug/L		98	76 - 120
Ethylbenzene	50.0	52.6		ug/L		105	80 - 120
Toluene	50.0	48.1		ug/L		96	80 - 113
trans-1,2-Dichloroethene	50.0	48.1		ug/L		96	80 - 120
Trichloroethene	50.0	45.9		ug/L		92	80 - 120
Vinyl chloride	50.0	40.1		ug/L		80	71 - 128

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*92*		*80 - 120*
Dibromofluoromethane (Surr)	*94*		*80 - 122*
1,2-Dichloroethane-d4 (Surr)	*81*		*73 - 131*
Toluene-d8 (Surr)	*97*		*80 - 120*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 680-636151/5
Matrix: Water
Analysis Batch: 636151

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Acetone			250	212		ug/L		85	70 - 135	8	30
Benzene			50.0	47.1		ug/L		94	80 - 120	5	20
Carbon disulfide			50.0	48.6		ug/L		97	80 - 120	6	20
Chlorobenzene			50.0	50.7		ug/L		101	80 - 120	0	20
Chloroethane			50.0	54.4	*1	ug/L		109	66 - 135	27	20
Chloroform			50.0	48.0		ug/L		96	80 - 120	2	20
cis-1,2-Dichloroethene			50.0	48.1		ug/L		96	80 - 120	1	20
1,4-Dichlorobenzene			50.0	45.7		ug/L		91	80 - 120	9	20
1,1-Dichloroethene			50.0	47.2		ug/L		94	76 - 120	4	20
Ethylbenzene			50.0	50.6		ug/L		101	80 - 120	4	20
Toluene			50.0	57.0	*	ug/L		114	80 - 113	17	20
trans-1,2-Dichloroethene			50.0	45.5		ug/L		91	80 - 120	5	20
Trichloroethene			50.0	48.9		ug/L		98	80 - 120	6	20
Vinyl chloride			50.0	38.9		ug/L		78	71 - 128	3	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*124*	*X*	*80 - 120*
Dibromofluoromethane (Surr)	*96*		*80 - 122*
1,2-Dichloroethane-d4 (Surr)	*90*		*73 - 131*
Toluene-d8 (Surr)	*105*		*80 - 120*

Lab Sample ID: MB 680-636294/8
Matrix: Water
Analysis Batch: 636294

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	7.0	U	10	7.0	ug/L			09/28/20 10:28	1
Benzene	0.43	U	1.0	0.43	ug/L			09/28/20 10:28	1
Carbon disulfide	1.0	U	2.0	1.0	ug/L			09/28/20 10:28	1
Chlorobenzene	0.26	U	1.0	0.26	ug/L			09/28/20 10:28	1
Chloroethane	2.5	U	5.0	2.5	ug/L			09/28/20 10:28	1
Chloroform	0.50	U	1.0	0.50	ug/L			09/28/20 10:28	1
cis-1,2-Dichloroethene	0.41	U	1.0	0.41	ug/L			09/28/20 10:28	1
1,4-Dichlorobenzene	0.46	U	1.0	0.46	ug/L			09/28/20 10:28	1
1,1-Dichloroethene	0.36	U	1.0	0.36	ug/L			09/28/20 10:28	1
Ethylbenzene	0.33	U	1.0	0.33	ug/L			09/28/20 10:28	1
Toluene	0.48	U	1.0	0.48	ug/L			09/28/20 10:28	1
trans-1,2-Dichloroethene	0.37	U	1.0	0.37	ug/L			09/28/20 10:28	1
Trichloroethene	0.48	U	1.0	0.48	ug/L			09/28/20 10:28	1
Vinyl chloride	0.50	U	1.0	0.50	ug/L			09/28/20 10:28	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*108*		*80 - 120*		*09/28/20 10:28*	*1*
Dibromofluoromethane (Surr)	*101*		*80 - 122*		*09/28/20 10:28*	*1*
1,2-Dichloroethane-d4 (Surr)	*98*		*73 - 131*		*09/28/20 10:28*	*1*
Toluene-d8 (Surr)	*105*		*80 - 120*		*09/28/20 10:28*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 680-636294/3
Matrix: Water
Analysis Batch: 636294

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Acetone			250	288		ug/L		115	70 - 135		
Benzene			50.0	52.7		ug/L		105	80 - 120		
Carbon disulfide			50.0	52.0		ug/L		104	80 - 120		
Chlorobenzene			50.0	52.4		ug/L		105	80 - 120		
Chloroethane			50.0	43.2		ug/L		86	66 - 135		
Chloroform			50.0	53.0		ug/L		106	80 - 120		
cis-1,2-Dichloroethene			50.0	55.4		ug/L		111	80 - 120		
1,4-Dichlorobenzene			50.0	53.1		ug/L		106	80 - 120		
1,1-Dichloroethene			50.0	53.8		ug/L		108	76 - 120		
Ethylbenzene			50.0	54.0		ug/L		108	80 - 120		
Toluene			50.0	53.7		ug/L		107	80 - 113		
trans-1,2-Dichloroethene			50.0	53.0		ug/L		106	80 - 120		
Trichloroethene			50.0	53.9		ug/L		108	80 - 120		
Vinyl chloride			50.0	51.8		ug/L		104	71 - 128		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*108*		*80 - 120*
Dibromofluoromethane (Surr)	*106*		*80 - 122*
1,2-Dichloroethane-d4 (Surr)	*108*		*73 - 131*
Toluene-d8 (Surr)	*106*		*80 - 120*

Lab Sample ID: LCSD 680-636294/4
Matrix: Water
Analysis Batch: 636294

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Acetone			250	273		ug/L		109	70 - 135	5	30
Benzene			50.0	52.0		ug/L		104	80 - 120	1	20
Carbon disulfide			50.0	51.9		ug/L		104	80 - 120	0	20
Chlorobenzene			50.0	51.1		ug/L		102	80 - 120	3	20
Chloroethane			50.0	42.1		ug/L		84	66 - 135	3	20
Chloroform			50.0	51.6		ug/L		103	80 - 120	3	20
cis-1,2-Dichloroethene			50.0	54.1		ug/L		108	80 - 120	2	20
1,4-Dichlorobenzene			50.0	52.0		ug/L		104	80 - 120	2	20
1,1-Dichloroethene			50.0	54.9		ug/L		110	76 - 120	2	20
Ethylbenzene			50.0	52.5		ug/L		105	80 - 120	3	20
Toluene			50.0	52.6		ug/L		105	80 - 113	2	20
trans-1,2-Dichloroethene			50.0	52.5		ug/L		105	80 - 120	1	20
Trichloroethene			50.0	53.7		ug/L		107	80 - 120	0	20
Vinyl chloride			50.0	51.5		ug/L		103	71 - 128	1	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*109*		*80 - 120*
Dibromofluoromethane (Surr)	*104*		*80 - 122*
1,2-Dichloroethane-d4 (Surr)	*103*		*73 - 131*
Toluene-d8 (Surr)	*103*		*80 - 120*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 680-188774-3 MS
Matrix: Water
Analysis Batch: 636294

Client Sample ID: LF4-MW3
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Acetone	7.0	U	250	282		ug/L		113	60 - 154
Benzene	0.43	U	50.0	52.0		ug/L		104	73 - 131
Carbon disulfide	1.0	U	50.0	48.2		ug/L		96	73 - 127
Chlorobenzene	0.26	U	50.0	51.2		ug/L		102	80 - 120
Chloroethane	2.5	U	50.0	70.0		ug/L		140	50 - 151
Chloroform	0.50	U	50.0	51.3		ug/L		103	79 - 122
cis-1,2-Dichloroethene	0.41	U	50.0	48.3		ug/L		97	80 - 122
1,4-Dichlorobenzene	0.46	U	50.0	50.7		ug/L		101	80 - 120
1,1-Dichloroethene	0.36	U	50.0	53.1		ug/L		106	74 - 125
Ethylbenzene	0.33	U	50.0	53.5		ug/L		107	80 - 120
Toluene	0.48	U	50.0	52.5		ug/L		105	80 - 122
trans-1,2-Dichloroethene	0.37	U	50.0	51.5		ug/L		103	78 - 123
Trichloroethene	0.48	U	50.0	53.1		ug/L		106	80 - 123
Vinyl chloride	0.50	U	50.0	48.5		ug/L		97	68 - 132

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*106*		*80 - 120*
Dibromofluoromethane (Surr)	*104*		*80 - 122*
1,2-Dichloroethane-d4 (Surr)	*102*		*73 - 131*
Toluene-d8 (Surr)	*106*		*80 - 120*

Lab Sample ID: 680-188774-3 MSD
Matrix: Water
Analysis Batch: 636294

Client Sample ID: LF4-MW3
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Acetone	7.0	U	250	293		ug/L		117	60 - 154	4	30
Benzene	0.43	U	50.0	52.6		ug/L		105	73 - 131	1	20
Carbon disulfide	1.0	U	50.0	49.6		ug/L		99	73 - 127	3	20
Chlorobenzene	0.26	U	50.0	51.9		ug/L		104	80 - 120	1	20
Chloroethane	2.5	U	50.0	73.7		ug/L		147	50 - 151	5	20
Chloroform	0.50	U	50.0	51.8		ug/L		104	79 - 122	1	20
cis-1,2-Dichloroethene	0.41	U	50.0	48.2		ug/L		96	80 - 122	0	20
1,4-Dichlorobenzene	0.46	U	50.0	50.4		ug/L		101	80 - 120	1	20
1,1-Dichloroethene	0.36	U	50.0	53.8		ug/L		108	74 - 125	1	20
Ethylbenzene	0.33	U	50.0	53.9		ug/L		108	80 - 120	1	20
Toluene	0.48	U	50.0	53.1		ug/L		106	80 - 122	1	20
trans-1,2-Dichloroethene	0.37	U	50.0	52.4		ug/L		105	78 - 123	2	20
Trichloroethene	0.48	U	50.0	53.6		ug/L		107	80 - 123	1	20
Vinyl chloride	0.50	U	50.0	50.3		ug/L		101	68 - 132	4	20

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*102*		*80 - 120*
Dibromofluoromethane (Surr)	*104*		*80 - 122*
1,2-Dichloroethane-d4 (Surr)	*99*		*73 - 131*
Toluene-d8 (Surr)	*105*		*80 - 120*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 680-636511/8
Matrix: Water
Analysis Batch: 636511

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	7.0	U	10	7.0	ug/L			09/29/20 13:08	1
Benzene	0.43	U	1.0	0.43	ug/L			09/29/20 13:08	1
Carbon disulfide	1.0	U	2.0	1.0	ug/L			09/29/20 13:08	1
Chlorobenzene	0.26	U	1.0	0.26	ug/L			09/29/20 13:08	1
Chloroethane	2.5	U	5.0	2.5	ug/L			09/29/20 13:08	1
Chloroform	0.50	U	1.0	0.50	ug/L			09/29/20 13:08	1
cis-1,2-Dichloroethene	0.41	U	1.0	0.41	ug/L			09/29/20 13:08	1
1,4-Dichlorobenzene	0.46	U	1.0	0.46	ug/L			09/29/20 13:08	1
1,1-Dichloroethene	0.36	U	1.0	0.36	ug/L			09/29/20 13:08	1
Ethylbenzene	0.33	U	1.0	0.33	ug/L			09/29/20 13:08	1
Toluene	0.48	U	1.0	0.48	ug/L			09/29/20 13:08	1
trans-1,2-Dichloroethene	0.37	U	1.0	0.37	ug/L			09/29/20 13:08	1
Trichloroethene	0.48	U	1.0	0.48	ug/L			09/29/20 13:08	1
Vinyl chloride	0.50	U	1.0	0.50	ug/L			09/29/20 13:08	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*105*		*80 - 120*		*09/29/20 13:08*	*1*
Dibromofluoromethane (Surr)	*100*		*80 - 122*		*09/29/20 13:08*	*1*
1,2-Dichloroethane-d4 (Surr)	*99*		*73 - 131*		*09/29/20 13:08*	*1*
Toluene-d8 (Surr)	*106*		*80 - 120*		*09/29/20 13:08*	*1*

Lab Sample ID: LCS 680-636511/3
Matrix: Water
Analysis Batch: 636511

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acetone	250	299		ug/L		120	70 - 135
Benzene	50.0	55.9		ug/L		112	80 - 120
Carbon disulfide	50.0	57.1		ug/L		114	80 - 120
Chlorobenzene	50.0	50.7		ug/L		101	80 - 120
Chloroethane	50.0	41.3		ug/L		83	66 - 135
Chloroform	50.0	55.1		ug/L		110	80 - 120
cis-1,2-Dichloroethene	50.0	59.9		ug/L		120	80 - 120
1,4-Dichlorobenzene	50.0	53.5		ug/L		107	80 - 120
1,1-Dichloroethene	50.0	60.8	*	ug/L		122	76 - 120
Ethylbenzene	50.0	52.4		ug/L		105	80 - 120
Toluene	50.0	55.7		ug/L		111	80 - 113
trans-1,2-Dichloroethene	50.0	58.6		ug/L		117	80 - 120
Trichloroethene	50.0	57.2		ug/L		114	80 - 120
Vinyl chloride	50.0	56.1		ug/L		112	71 - 128

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*111*		*80 - 120*
Dibromofluoromethane (Surr)	*113*		*80 - 122*
1,2-Dichloroethane-d4 (Surr)	*113*		*73 - 131*
Toluene-d8 (Surr)	*105*		*80 - 120*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 680-636511/4
Matrix: Water
Analysis Batch: 636511

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Acetone			250	301		ug/L		121	70 - 135	1	30
Benzene			50.0	55.6		ug/L		111	80 - 120	0	20
Carbon disulfide			50.0	56.6		ug/L		113	80 - 120	1	20
Chlorobenzene			50.0	50.5		ug/L		101	80 - 120	0	20
Chloroethane			50.0	39.6		ug/L		79	66 - 135	4	20
Chloroform			50.0	55.3		ug/L		111	80 - 120	0	20
cis-1,2-Dichloroethene			50.0	59.5		ug/L		119	80 - 120	1	20
1,4-Dichlorobenzene			50.0	52.1		ug/L		104	80 - 120	3	20
1,1-Dichloroethene			50.0	59.6		ug/L		119	76 - 120	2	20
Ethylbenzene			50.0	51.2		ug/L		102	80 - 120	2	20
Toluene			50.0	56.3		ug/L		113	80 - 113	1	20
trans-1,2-Dichloroethene			50.0	58.8		ug/L		118	80 - 120	0	20
Trichloroethene			50.0	57.7		ug/L		115	80 - 120	1	20
Vinyl chloride			50.0	55.5		ug/L		111	71 - 128	1	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*109*		*80 - 120*
Dibromofluoromethane (Surr)	*114*		*80 - 122*
1,2-Dichloroethane-d4 (Surr)	*115*		*73 - 131*
Toluene-d8 (Surr)	*104*		*80 - 120*

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: MB 680-634922/1-A
Matrix: Water
Analysis Batch: 635295

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 634922

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.50	U	5.0	0.50	ug/L		09/18/20 13:11	09/21/20 12:40	1
Arsenic	1.5	U	3.0	1.5	ug/L		09/18/20 13:11	09/21/20 12:40	1
Barium	0.940	J	5.0	0.61	ug/L		09/18/20 13:11	09/21/20 12:40	1
Beryllium	0.17	U	0.50	0.17	ug/L		09/18/20 13:11	09/21/20 12:40	1
Cadmium	0.15	U	0.50	0.15	ug/L		09/18/20 13:11	09/21/20 12:40	1
Chromium	1.6	U	5.0	1.6	ug/L		09/18/20 13:11	09/21/20 12:40	1
Cobalt	0.12	U	0.50	0.12	ug/L		09/18/20 13:11	09/21/20 12:40	1
Copper	1.7	U	5.0	1.7	ug/L		09/18/20 13:11	09/21/20 12:40	1
Lead	0.98	U	2.5	0.98	ug/L		09/18/20 13:11	09/21/20 12:40	1
Nickel	1.9	U	5.0	1.9	ug/L		09/18/20 13:11	09/21/20 12:40	1
Selenium	1.0	U	2.5	1.0	ug/L		09/18/20 13:11	09/21/20 12:40	1
Silver	0.10	U	1.0	0.10	ug/L		09/18/20 13:11	09/21/20 12:40	1
Thallium	0.49	U	1.0	0.49	ug/L		09/18/20 13:11	09/21/20 12:40	1
Vanadium	5.3	U	10	5.3	ug/L		09/18/20 13:11	09/21/20 12:40	1
Zinc	9.6	U	20	9.6	ug/L		09/18/20 13:11	09/21/20 12:40	1

Method: 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: LCS 680-634922/2-A
Matrix: Water
Analysis Batch: 635295

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 634922

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	50.0	43.4		ug/L		87	80 - 120
Arsenic	100	106		ug/L		106	80 - 120
Barium	100	94.4		ug/L		94	80 - 120
Beryllium	50.0	53.5		ug/L		107	80 - 120
Cadmium	50.0	46.9		ug/L		94	80 - 120
Chromium	100	105		ug/L		105	80 - 120
Cobalt	50.1	52.9		ug/L		106	80 - 120
Copper	100	105		ug/L		105	80 - 120
Lead	454	454		ug/L		100	80 - 120
Nickel	99.5	109		ug/L		110	80 - 120
Selenium	100	94.5		ug/L		94	80 - 120
Silver	50.0	46.9		ug/L		94	80 - 120
Thallium	40.0	36.0		ug/L		90	80 - 120
Vanadium	99.8	105		ug/L		105	80 - 120
Zinc	101	108		ug/L		108	80 - 120

Lab Sample ID: MB 680-636021/1-A
Matrix: Water
Analysis Batch: 636319

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 636021

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.50	U	5.0	0.50	ug/L		09/25/20 13:07	09/26/20 13:57	1
Arsenic	1.5	U	3.0	1.5	ug/L		09/25/20 13:07	09/26/20 13:57	1
Barium	0.61	U	5.0	0.61	ug/L		09/25/20 13:07	09/26/20 13:57	1
Beryllium	0.17	U	0.50	0.17	ug/L		09/25/20 13:07	09/26/20 13:57	1
Cadmium	0.15	U	0.50	0.15	ug/L		09/25/20 13:07	09/26/20 13:57	1
Chromium	1.6	U	5.0	1.6	ug/L		09/25/20 13:07	09/26/20 13:57	1
Cobalt	0.135	J	0.50	0.12	ug/L		09/25/20 13:07	09/26/20 13:57	1
Copper	1.7	U	5.0	1.7	ug/L		09/25/20 13:07	09/26/20 13:57	1
Lead	0.98	U	2.5	0.98	ug/L		09/25/20 13:07	09/26/20 13:57	1
Nickel	1.9	U	5.0	1.9	ug/L		09/25/20 13:07	09/26/20 13:57	1
Selenium	1.0	U	2.5	1.0	ug/L		09/25/20 13:07	09/26/20 13:57	1
Silver	0.10	U	1.0	0.10	ug/L		09/25/20 13:07	09/26/20 13:57	1
Thallium	0.49	U	1.0	0.49	ug/L		09/25/20 13:07	09/26/20 13:57	1
Vanadium	5.3	U	10	5.3	ug/L		09/25/20 13:07	09/26/20 13:57	1
Zinc	9.6	U	20	9.6	ug/L		09/25/20 13:07	09/26/20 13:57	1

Lab Sample ID: LCS 680-636021/2-A
Matrix: Water
Analysis Batch: 636319

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 636021

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	50.0	47.6		ug/L		95	80 - 120
Arsenic	100	102		ug/L		102	80 - 120
Barium	100	101		ug/L		101	80 - 120
Beryllium	50.0	48.4		ug/L		97	80 - 120
Cadmium	50.0	52.5		ug/L		105	80 - 120
Chromium	100	106		ug/L		106	80 - 120
Cobalt	50.0	53.2		ug/L		107	80 - 120

Method: 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: LCS 680-636021/2-A
Matrix: Water
Analysis Batch: 636319

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 636021

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Copper			100	106		ug/L		106	80 - 120		
Lead			454	474		ug/L		104	80 - 120		
Nickel			99.0	105		ug/L		106	80 - 120		
Selenium			100	100		ug/L		100	80 - 120		
Silver			50.0	52.8		ug/L		106	80 - 120		
Thallium			40.0	41.5		ug/L		104	80 - 120		
Vanadium			99.8	103		ug/L		103	80 - 120		
Zinc			100	104		ug/L		104	80 - 120		

Lab Sample ID: 680-188774-3 MS
Matrix: Water
Analysis Batch: 636319

Client Sample ID: LF4-MW3
Prep Type: Total Recoverable
Prep Batch: 636021

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Antimony	0.50	U	50.0	50.6		ug/L		101	75 - 125		
Arsenic	1.5	U	100	117		ug/L		117	75 - 125		
Barium	42	F1	100	183	F1	ug/L		141	75 - 125		
Beryllium	0.41	J	50.0	52.2		ug/L		104	75 - 125		
Cadmium	0.17	J	50.0	58.5		ug/L		117	75 - 125		
Chromium	2.4	J	100	119		ug/L		117	75 - 125		
Cobalt	1.1	B	50.0	61.0		ug/L		120	75 - 125		
Copper	1.7	J	100	122		ug/L		122	75 - 125		
Lead	2.0	J	454	533		ug/L		117	75 - 125		
Nickel	2.7	J	99.0	122		ug/L		120	75 - 125		
Selenium	1.0	U	100	108		ug/L		108	75 - 125		
Silver	0.10	U	50.0	58.4		ug/L		117	75 - 125		
Thallium	0.49	U	40.0	46.5		ug/L		116	75 - 125		
Vanadium	5.3	U	99.8	117		ug/L		117	75 - 125		
Zinc	53	F2	100	135		ug/L		82	75 - 125		

Lab Sample ID: 680-188774-3 MSD
Matrix: Water
Analysis Batch: 636319

Client Sample ID: LF4-MW3
Prep Type: Total Recoverable
Prep Batch: 636021

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Antimony	0.50	U	50.0	50.6		ug/L		101	75 - 125	0	20
Arsenic	1.5	U	100	114		ug/L		114	75 - 125	3	20
Barium	42	F1	100	182	F1	ug/L		140	75 - 125	1	20
Beryllium	0.41	J	50.0	52.7		ug/L		105	75 - 125	1	20
Cadmium	0.17	J	50.0	56.9		ug/L		114	75 - 125	3	20
Chromium	2.4	J	100	116		ug/L		113	75 - 125	3	20
Cobalt	1.1	B	50.0	59.6		ug/L		117	75 - 125	2	20
Copper	1.7	J	100	118		ug/L		118	75 - 125	3	20
Lead	2.0	J	454	528		ug/L		116	75 - 125	1	20
Nickel	2.7	J	99.0	119		ug/L		118	75 - 125	2	20
Selenium	1.0	U	100	108		ug/L		108	75 - 125	0	20
Silver	0.10	U	50.0	54.5		ug/L		109	75 - 125	7	20
Thallium	0.49	U	40.0	45.5		ug/L		114	75 - 125	2	20
Vanadium	5.3	U	99.8	113		ug/L		114	75 - 125	3	20

Method: 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: 680-188774-3 MSD
Matrix: Water
Analysis Batch: 636319

Client Sample ID: LF4-MW3
Prep Type: Total Recoverable
Prep Batch: 636021

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Zinc	53	F2	100	169	F2	ug/L		116	75 - 125	23	20

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 680-634710/1-A
Matrix: Water
Analysis Batch: 635155

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 634710

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.080	U	0.20	0.080	ug/L		09/17/20 12:18	09/21/20 00:02	1

Lab Sample ID: LCS 680-634710/2-A
Matrix: Water
Analysis Batch: 635155

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 634710

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	2.50	2.24		ug/L		90	80 - 120

Lab Sample ID: 680-188774-3 MS
Matrix: Water
Analysis Batch: 635155

Client Sample ID: LF4-MW3
Prep Type: Total/NA
Prep Batch: 634710

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	0.080	U	1.00	0.969		ug/L		97	80 - 120

Lab Sample ID: 680-188774-3 MSD
Matrix: Water
Analysis Batch: 635155

Client Sample ID: LF4-MW3
Prep Type: Total/NA
Prep Batch: 634710

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	0.080	U	1.00	0.959		ug/L		96	80 - 120	1	20

GC/MS VOA

Analysis Batch: 636151

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-188774-1	LF4-MW1	Total/NA	Water	8260B	
680-188774-2	LF4-MW2	Total/NA	Water	8260B	
680-188774-4	LF4-MW4	Total/NA	Water	8260B	
680-188774-5	LF4-MW5	Total/NA	Water	8260B	
680-188774-6	DUP343	Total/NA	Water	8260B	
MB 680-636151/10	Method Blank	Total/NA	Water	8260B	
LCS 680-636151/4	Lab Control Sample	Total/NA	Water	8260B	
LCSD 680-636151/5	Lab Control Sample Dup	Total/NA	Water	8260B	

Analysis Batch: 636294

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-188774-3	LF4-MW3	Total/NA	Water	8260B	
MB 680-636294/8	Method Blank	Total/NA	Water	8260B	
LCS 680-636294/3	Lab Control Sample	Total/NA	Water	8260B	
LCSD 680-636294/4	Lab Control Sample Dup	Total/NA	Water	8260B	
680-188774-3 MS	LF4-MW3	Total/NA	Water	8260B	
680-188774-3 MSD	LF4-MW3	Total/NA	Water	8260B	

Analysis Batch: 636511

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-188774-7	TB551	Total/NA	Water	8260B	
MB 680-636511/8	Method Blank	Total/NA	Water	8260B	
LCS 680-636511/3	Lab Control Sample	Total/NA	Water	8260B	
LCSD 680-636511/4	Lab Control Sample Dup	Total/NA	Water	8260B	

Metals

Prep Batch: 634710

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-188774-1	LF4-MW1	Total/NA	Water	7470A	
680-188774-2	LF4-MW2	Total/NA	Water	7470A	
680-188774-3	LF4-MW3	Total/NA	Water	7470A	
680-188774-4	LF4-MW4	Total/NA	Water	7470A	
680-188774-5	LF4-MW5	Total/NA	Water	7470A	
680-188774-6	DUP343	Total/NA	Water	7470A	
MB 680-634710/1-A	Method Blank	Total/NA	Water	7470A	
LCS 680-634710/2-A	Lab Control Sample	Total/NA	Water	7470A	
680-188774-3 MS	LF4-MW3	Total/NA	Water	7470A	
680-188774-3 MSD	LF4-MW3	Total/NA	Water	7470A	

Prep Batch: 634922

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-188774-1	LF4-MW1	Total Recoverable	Water	3005A	
680-188774-2	LF4-MW2	Total Recoverable	Water	3005A	
680-188774-4	LF4-MW4	Total Recoverable	Water	3005A	
680-188774-5	LF4-MW5	Total Recoverable	Water	3005A	
680-188774-6	DUP343	Total Recoverable	Water	3005A	
MB 680-634922/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 680-634922/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Client: Matrix Environmental Services, LLC
Project/Site: Parcel 81(5), Landfill 4

Job ID: 680-188774-1

Metals

Analysis Batch: 635155

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-188774-1	LF4-MW1	Total/NA	Water	7470A	634710
680-188774-2	LF4-MW2	Total/NA	Water	7470A	634710
680-188774-3	LF4-MW3	Total/NA	Water	7470A	634710
680-188774-4	LF4-MW4	Total/NA	Water	7470A	634710
680-188774-5	LF4-MW5	Total/NA	Water	7470A	634710
680-188774-6	DUP343	Total/NA	Water	7470A	634710
MB 680-634710/1-A	Method Blank	Total/NA	Water	7470A	634710
LCS 680-634710/2-A	Lab Control Sample	Total/NA	Water	7470A	634710
680-188774-3 MS	LF4-MW3	Total/NA	Water	7470A	634710
680-188774-3 MSD	LF4-MW3	Total/NA	Water	7470A	634710

Analysis Batch: 635295

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-188774-1	LF4-MW1	Total Recoverable	Water	6020B	634922
680-188774-2	LF4-MW2	Total Recoverable	Water	6020B	634922
680-188774-4	LF4-MW4	Total Recoverable	Water	6020B	634922
680-188774-5	LF4-MW5	Total Recoverable	Water	6020B	634922
680-188774-6	DUP343	Total Recoverable	Water	6020B	634922
MB 680-634922/1-A	Method Blank	Total Recoverable	Water	6020B	634922
LCS 680-634922/2-A	Lab Control Sample	Total Recoverable	Water	6020B	634922

Prep Batch: 636021

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-188774-3	LF4-MW3	Total Recoverable	Water	3005A	
MB 680-636021/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 680-636021/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
680-188774-3 MS	LF4-MW3	Total Recoverable	Water	3005A	
680-188774-3 MSD	LF4-MW3	Total Recoverable	Water	3005A	

Analysis Batch: 636319

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-188774-3	LF4-MW3	Total Recoverable	Water	6020B	636021
MB 680-636021/1-A	Method Blank	Total Recoverable	Water	6020B	636021
LCS 680-636021/2-A	Lab Control Sample	Total Recoverable	Water	6020B	636021
680-188774-3 MS	LF4-MW3	Total Recoverable	Water	6020B	636021
680-188774-3 MSD	LF4-MW3	Total Recoverable	Water	6020B	636021

Lab Chronicle

Client: Matrix Environmental Services, LLC
Project/Site: Parcel 81(5), Landfill 4

Job ID: 680-188774-1

Client Sample ID: LF4-MW1

Date Collected: 09/15/20 09:15
Date Received: 09/16/20 10:25

Lab Sample ID: 680-188774-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 mL	5 mL	636151	09/26/20 20:49	EMA	TAL SAV
	Instrument ID: CMSO2									
Total Recoverable	Prep	3005A			50 mL	250 mL	634922	09/18/20 13:11	AJR	TAL SAV
Total Recoverable	Analysis	6020B		1			635295	09/21/20 15:06	BJB	TAL SAV
	Instrument ID: ICPMSD									
Total/NA	Prep	7470A			50 mL	50 mL	634710	09/17/20 12:18	BCB	TAL SAV
Total/NA	Analysis	7470A		1			635155	09/21/20 00:33	BCB	TAL SAV
	Instrument ID: LEEMAN2									

Client Sample ID: LF4-MW2

Date Collected: 09/15/20 09:45
Date Received: 09/16/20 10:25

Lab Sample ID: 680-188774-2

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 mL	5 mL	636151	09/26/20 21:13	EMA	TAL SAV
	Instrument ID: CMSO2									
Total Recoverable	Prep	3005A			50 mL	250 mL	634922	09/18/20 13:11	AJR	TAL SAV
Total Recoverable	Analysis	6020B		1			635295	09/21/20 15:03	BJB	TAL SAV
	Instrument ID: ICPMSD									
Total/NA	Prep	7470A			50 mL	50 mL	634710	09/17/20 12:18	BCB	TAL SAV
Total/NA	Analysis	7470A		1			635155	09/21/20 00:37	BCB	TAL SAV
	Instrument ID: LEEMAN2									

Client Sample ID: LF4-MW3

Date Collected: 09/15/20 10:20
Date Received: 09/16/20 10:25

Lab Sample ID: 680-188774-3

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 mL	5 mL	636294	09/28/20 17:54	P1C	TAL SAV
	Instrument ID: CMSB									
Total Recoverable	Prep	3005A			50 mL	250 mL	636021	09/25/20 13:07	AJR	TAL SAV
Total Recoverable	Analysis	6020B		1			636319	09/26/20 14:03	BJB	TAL SAV
	Instrument ID: ICPMSD									
Total/NA	Prep	7470A			50 mL	50 mL	634710	09/17/20 12:18	BCB	TAL SAV
Total/NA	Analysis	7470A		1			635155	09/21/20 00:19	BCB	TAL SAV
	Instrument ID: LEEMAN2									

Client Sample ID: LF4-MW4

Date Collected: 09/15/20 11:10
Date Received: 09/16/20 10:25

Lab Sample ID: 680-188774-4

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 mL	5 mL	636151	09/26/20 21:38	EMA	TAL SAV
	Instrument ID: CMSO2									

Lab Chronicle

Client: Matrix Environmental Services, LLC
Project/Site: Parcel 81(5), Landfill 4

Job ID: 680-188774-1

Client Sample ID: LF4-MW4

Date Collected: 09/15/20 11:10
Date Received: 09/16/20 10:25

Lab Sample ID: 680-188774-4

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	250 mL	634922	09/18/20 13:11	AJR	TAL SAV
Total Recoverable	Analysis	6020B		1			635295	09/21/20 15:00	BJB	TAL SAV
	Instrument ID: ICPMSD									
Total/NA	Prep	7470A			50 mL	50 mL	634710	09/17/20 12:18	BCB	TAL SAV
Total/NA	Analysis	7470A		1			635155	09/21/20 00:42	BCB	TAL SAV
	Instrument ID: LEEMAN2									

Client Sample ID: LF4-MW5

Date Collected: 09/15/20 11:50
Date Received: 09/16/20 10:25

Lab Sample ID: 680-188774-5

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 mL	5 mL	636151	09/26/20 22:02	EMA	TAL SAV
	Instrument ID: CMSO2									
Total Recoverable	Prep	3005A			50 mL	250 mL	634922	09/18/20 13:11	AJR	TAL SAV
Total Recoverable	Analysis	6020B		1			635295	09/21/20 15:10	BJB	TAL SAV
	Instrument ID: ICPMSD									
Total/NA	Prep	7470A			50 mL	50 mL	634710	09/17/20 12:18	BCB	TAL SAV
Total/NA	Analysis	7470A		1			635155	09/21/20 00:46	BCB	TAL SAV
	Instrument ID: LEEMAN2									

Client Sample ID: DUP343

Date Collected: 09/15/20 00:00
Date Received: 09/16/20 10:25

Lab Sample ID: 680-188774-6

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 mL	5 mL	636151	09/26/20 22:26	EMA	TAL SAV
	Instrument ID: CMSO2									
Total Recoverable	Prep	3005A			50 mL	250 mL	634922	09/18/20 13:11	AJR	TAL SAV
Total Recoverable	Analysis	6020B		1			635295	09/21/20 15:13	BJB	TAL SAV
	Instrument ID: ICPMSD									
Total/NA	Prep	7470A			50 mL	50 mL	634710	09/17/20 12:18	BCB	TAL SAV
Total/NA	Analysis	7470A		1			635155	09/21/20 00:51	BCB	TAL SAV
	Instrument ID: LEEMAN2									

Client Sample ID: TB551

Date Collected: 09/15/20 13:00
Date Received: 09/16/20 10:25

Lab Sample ID: 680-188774-7

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 mL	5 mL	636511	09/29/20 13:41	P1C	TAL SAV
	Instrument ID: CMSB									

Laboratory References:

TAL SAV = Eurofins TestAmerica, Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

Accreditation/Certification Summary

Client: Matrix Environmental Services, LLC
Job ID: 680-188774-1
Project/Site: Parcel 81(5), Landfill 4

Laboratory: Eurofins TestAmerica, Savannah

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Florida	NELAP	E87052	06-30-21

Method Summary

Client: Matrix Environmental Services, LLC
Project/Site: Parcel 81(5), Landfill 4

Job ID: 680-188774-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL SAV
6020B	Metals (ICP/MS)	SW846	TAL SAV
7470A	Mercury (CVAA)	SW846	TAL SAV
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	TAL SAV
5030B	Purge and Trap	SW846	TAL SAV
7470A	Preparation, Mercury	SW846	TAL SAV

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL SAV = Eurofins TestAmerica, Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

MATRIX ENVIRONMENTAL SERVICES CHAIN OF CUSTODY RECORD

COC Number 6159
Cooler ID 1 of 1
Page 1 of 1

Laboratory TestAmerica
Lab Contact Jon Lawhon, Amy Ragnaldsen
MES Contact Betty Van Pelt
MES Phone 801-699-1246
Project Parcel 81(5), Landfill 4
Task # 19.094.20-07.1
Lab contract: ~~19.094.20-07.1 500~~

Samplers Signature

SWMU	Station ID	QC Code	Station Code	Matrix	Sample Method	Date Collected	Sample Time	Analysis: SW8260 - VOC 3 - 40 ml vials, HCl	Analysis: 6020A/7470A Metals (Total) 1 - 250 ml poly HNO3	Analysis: SW8260 - VOC 2 - 40 ml vials, HCl		
Parcel 81(5), Landfill 4	LF4-MW1	NS	MW	WQ	Grab	9-15-20	915	X	X			
Parcel 81(5), Landfill 4	LF4-MW2	NS	MW	WQ	Grab		945	X	X			
Parcel 81(5), Landfill 4	LF4-MW3	NS	MW	WQ	Grab		1020	X	X			
Parcel 81(5), Landfill 4	LF4-MW3	MS/MSD	MW	WQ	Grab		1020	X	X			
Parcel 81(5), Landfill 4	LF4-MW4	NS	MW	WQ	Grab		1110	X	X			
Parcel 81(5), Landfill 4	LF4-MW5	NS	MW	WQ	Grab		1150	X	X			
Parcel 81(5), Landfill 4	DUP343	FD	MW	WQ	Grab		N/A	X	X			
Parcel 81(5), Landfill 4	TB551	TB	WQ	W	Grab		1300			X		

NOTES:

QC Code: NS = Investigative Sample, FD = Field Duplicate, MS/MSD = Matrix Spike/Matrix Spike Duplicate, EB = Equipment Blank, TB = Trip Blank, WQ = Water Quality, WS = Source Water

Station Type = MW = Monitoring Well, BH = Bore Hole, SD = Sediment, SW = Surface Water, SS = Surface Soil, SU = Sump, WS = Waste Solid/Soil, WW = Waste Water

White Copy = Lab COC, Yellow COC = Field Copy, Pink COC = Data Mgmt

Double the number of bottles for MS/MSD

COMMENTS: See Task Order 19.094.20-07.1 500 for required list of VOCs and metals

Relinquished by (Signature): Date/Time: 9-15-20 1600 Received by (Signature): FedEx

Relinquished by (Signature): Date/Time: Received by (Signature): CSBander 09-16-20 1025

2.6 (CF) 3.0°C

680-188774 Chain of Custody

Login Sample Receipt Checklist

Client: Matrix Environmental Services, LLC

Job Number: 680-188774-1

Login Number: 188774
List Number: 1
Creator: Banda, Christy S

List Source: Eurofins TestAmerica, Savannah

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	False	IDs on containers do not match the COC. Logged in per COC.
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

APPENDIX D

Statistical Evaluation of Metals Data September 2020

Attachment D1. Analyses and Percent Non-Detects
McClellan Industrial Landfill, Parcel 175(5)
McClellan, Anniston, Alabama

	Antimony			Arsenic			Barium		
Well ID	**Sample #**	**# of NDs**	**%NDs**	**Sample #**	**# of NDs**	**%NDs**	**Sample #**	**# of NDs**	**%NDs**
LF4-MW1	35	35	100%	42	33	79%	43	5	12%
LF4-MW2	35	33	94%	42	25	60%	42	0	0%
LF4-MW3	35	35	100%	42	29	69%	42	2	5%
LF4-MW4	35	31	89%	42	26	62%	42	0	0%
LF4-MW5	35	35	100%	42	37	88%	42	9	21%

	Beryllium			Cadmium			Chromium		
Well ID	**Sample #**	**# of NDs**	**%NDs**	**Sample #**	**# of NDs**	**%NDs**	**Sample #**	**# of NDs**	**%NDs**
LF4-MW1	34	19	56%	41	35	85%	41	32	78%
LF4-MW2	34	16	47%	41	30	73%	41	23	56%
LF4-MW3	34	21	62%	41	35	85%	41	27	66%
LF4-MW4	34	31	91%	41	32	78%	41	36	88%
LF4-MW5	34	27	79%	41	40	98%	41	34	83%

	Cobalt			Copper			Lead		
Well ID	**Sample #**	**# of NDs**	**%NDs**	**Sample #**	**# of NDs**	**%NDs**	**Sample #**	**# of NDs**	**%NDs**
LF4-MW1	34	0	0%	35	12	34%	42	14	33%
LF4-MW2	34	0	0%	35	10	29%	42	11	26%
LF4-MW3	34	13	38%	35	13	37%	42	16	38%
LF4-MW4	34	8	24%	35	21	60%	42	10	24%
LF4-MW5	34	5	15%	35	23	66%	42	19	45%

	Mercury			Nickel			Selenium		
Well ID	**Sample #**	**# of NDs**	**%NDs**	**Sample #**	**# of NDs**	**%NDs**	**Sample #**	**# of NDs**	**%NDs**
LF4-MW1	42	42	100%	35	5	14%	42	42	100%
LF4-MW2	42	41	98%	35	3	9%	42	38	90%
LF4-MW3	42	42	100%	35	9	26%	42	41	98%
LF4-MW4	42	42	100%	35	13	37%	42	40	95%
LF4-MW5	42	42	100%	35	14	40%	42	42	100%

	Silver			Thallium			Vanadium		
Well ID	**Sample #**	**# of NDs**	**%NDs**	**Sample #**	**# of NDs**	**%NDs**	**Sample #**	**# of NDs**	**%NDs**
LF4-MW1	34	32	94%	35	33	94%	35	31	89%
LF4-MW2	34	34	100%	35	33	94%	35	26	74%
LF4-MW3	34	34	100%	35	34	97%	35	29	83%
LF4-MW4	34	33	97%	35	32	91%	35	26	74%
LF4-MW5	34	34	100%	35	33	94%	35	29	83%

	Zinc		
Well ID	**Sample #**	**# of NDs**	**%NDs**
LF4-MW1	35	2	6%
LF4-MW2	35	2	6%
LF4-MW3	35	8	23%
LF4-MW4	35	11	31%
LF4-MW5	35	15	43%

Attachment D2. Calculations for CUSUM Control Charts
Butler Green Industrial Landfill, Parcel 175(5)
McClellan, Anniston, Alabama

Barium

Well ID	Date	Ln Conc	Zi	Zi - k	Cusum
LF4-MW1	3/13/06	-2.638	1.86	0.86	0.86
LF4-MW1	9/13/06	-3.180	0.37	-0.63	0.23
LF4-MW1	3/6/07	-3.219	0.26	-0.74	0.00
LF4-MW1	9/24/07	-3.439	-0.34	-1.34	0.00
LF4-MW1	3/26/08	-2.990	0.89	-0.11	0.00
LF4-MW1	9/16/08	-3.464	-0.41	-1.41	0.00
LF4-MW1	3/17/09	-3.551	-0.65	-1.65	0.00
LF4-MW1	9/17/09	-3.408	-0.26	-1.26	0.00
LF4-MW1	3/17/10	-3.427	-0.31	-1.31	0.00
LF4-MW1	9/21/10	-3.510	-0.54	-1.54	0.00
LF4-MW1	3/15/11	-3.197	0.32	-0.68	0.00
LF4-MW1	9/8/11	-3.242	0.20	-0.80	0.00
LF4-MW1	3/14/12	-3.053	0.72	-0.28	0.00
LF4-MW1	9/6/12	-3.066	0.68	-0.32	0.00
LF4-MW1	3/5/13	-3.043	0.75	-0.25	0.00
LF4-MW1	9/11/13	-3.321	-0.02	-1.02	0.00
LF4-MW1	3/5/14	-3.294	0.06	-0.94	0.00
LF4-MW1	9/4/14	-3.324	-0.03	-1.03	0.00
LF4-MW1	3/13/15	-3.135	0.49	-0.51	0.00
LF4-MW1	9/16/15	-3.163	0.42	-0.58	0.00
LF4-MW1	3/16/16	-3.154	0.44	-0.56	0.00
LF4-MW1	9/21/16	-3.202	0.31	-0.69	0.00
LF4-MW1	3/15/17	-3.090	0.62	-0.38	0.00
LF4-MW1	9/8/17	-3.124	0.52	-0.48	0.00
LF4-MW1	3/8/18	-3.110	0.56	-0.44	0.00
LF4-MW1	9/11/18	-3.058	0.71	-0.29	0.00
LF4-MW1	3/7/19	-3.058	0.71	-0.29	0.00
LF4-MW1	9/5/19	-3.124	0.53	-0.47	0.00
LF4-MW1	3/12/20	-3.079	0.65	-0.35	0.00
LF4-MW1	9/15/20	-3.079	0.65	-0.35	0.00
Background					
LF4-MW1	MEAN	-3.315			
LF4-MW1	STDEV	0.364			

Barium

Well ID	Date	Ln Conc	Zi	Zi - k	Cusum
LF4-MW2	3/13/06	-3.673	-3.70	-4.70	0.00
LF4-MW2	9/13/06	-2.198	0.41	-0.59	0.00
LF4-MW2	3/6/07	-2.357	-0.03	-1.03	0.00
LF4-MW2	9/24/07	-2.501	-0.44	-1.44	0.00
LF4-MW2	3/26/08	-2.017	0.91	-0.09	0.00
LF4-MW2	9/16/08	-2.327	0.05	-0.95	0.00
LF4-MW2	3/17/09	-2.079	0.74	-0.26	0.00
LF4-MW2	9/17/09	-2.371	-0.07	-1.07	0.00
LF4-MW2	3/17/10	-2.410	-0.18	-1.18	0.00
LF4-MW2	9/21/10	-2.306	0.11	-0.89	0.00
LF4-MW2	3/15/11	-2.283	0.17	-0.83	0.00
LF4-MW2	9/8/11	-2.235	0.31	-0.69	0.00
LF4-MW2	3/14/12	-2.235	0.31	-0.69	0.00
LF4-MW2	9/6/12	-2.216	0.36	-0.64	0.00
LF4-MW2	3/5/13	-2.056	0.80	-0.20	0.00
LF4-MW2	9/11/13	-2.585	-0.67	-1.67	0.00
LF4-MW2	3/5/14	-2.765	-1.17	-2.17	0.00
LF4-MW2	9/4/14	-2.854	-1.42	-2.42	0.00
LF4-MW2	3/13/15	-2.609	-0.74	-1.74	0.00
LF4-MW2	9/16/15	-2.537	-0.54	-1.54	0.00
LF4-MW2	3/16/16	-2.834	-1.36	-2.36	0.00
LF4-MW2	9/21/16	-2.664	-0.89	-1.89	0.00
LF4-MW2	3/15/17	-2.711	-1.02	-2.02	0.00
LF4-MW2	9/8/17	-2.438	-0.26	-1.26	0.00
LF4-MW2	3/8/18	-2.564	-0.61	-1.61	0.00
LF4-MW2	9/11/18	-2.604	-0.72	-1.72	0.00
LF4-MW2	3/7/19	-2.830	-1.35	-2.35	0.00
LF4-MW2	9/5/19	-2.688	-0.96	-1.96	0.00
LF4-MW2	3/12/20	-2.765	-1.17	-2.17	0.00
LF4-MW2	9/15/20	-2.674	-0.92	-1.92	0.00
Background					
LF4-MW2	MEAN	-2.344			
LF4-MW2	STDEV	0.359			

Barium

Well ID	Date	Ln Conc	Zi	Zi - k	Cusum
LF4-MW3	3/13/06	-2.865	0.37	-0.63	0.00
LF4-MW3	9/14/06	-2.727	0.74	-0.26	0.00
LF4-MW3	3/6/07	-3.030	-0.08	-1.08	0.00
LF4-MW3	9/25/07	-2.818	0.49	-0.51	0.00
LF4-MW3	3/26/08	-2.662	0.92	-0.08	0.00
LF4-MW3	9/16/08	-2.958	0.11	-0.89	0.00
LF4-MW3	3/17/09	-2.928	0.19	-0.81	0.00
LF4-MW3	9/17/09	-2.573	1.16	0.16	0.16
LF4-MW3	3/17/10	-2.839	0.44	-0.56	0.00
LF4-MW3	9/21/10	-3.239	-0.65	-1.65	0.00
LF4-MW3	3/15/11	-2.671	0.90	-0.10	0.00
LF4-MW3	9/8/11	-2.863	0.37	-0.63	0.00
LF4-MW3	3/14/12	-2.800	0.54	-0.46	0.00
LF4-MW3	9/6/12	-2.830	0.46	-0.54	0.00
LF4-MW3	3/5/13	-2.581	1.14	0.14	0.14
LF4-MW3	9/11/13	-2.953	0.13	-0.87	0.00
LF4-MW3	3/5/14	-2.906	0.26	-0.74	0.00
LF4-MW3	9/4/14	-2.700	0.82	-0.18	0.00
LF4-MW3	3/13/15	-2.471	1.44	0.44	0.44
LF4-MW3	9/16/15	-2.325	1.84	0.84	1.28
LF4-MW3	3/16/16	-2.870	0.35	-0.65	0.63
LF4-MW3	9/21/16	-2.444	1.51	0.51	1.14
LF4-MW3	3/15/17	-2.808	0.52	-0.48	0.66
LF4-MW3	9/8/17	-2.825	0.47	-0.53	0.14
LF4-MW3	3/8/18	-2.846	0.42	-0.58	0.00
LF4-MW3	9/11/18	-2.865	0.37	-0.63	0.00
LF4-MW3	3/7/19	-2.688	0.85	-0.15	0.00
LF4-MW3	9/5/19	-2.617	1.04	0.04	0.04
LF4-MW3	3/12/20	-2.465	1.46	0.46	0.50
LF4-MW3	9/15/20	-3.170	-0.46	-1.46	0.00
Background					
LF4-MW3	MEAN	-3.000			
LF4-MW3	STDEV	0.367			

Barium

Well ID	Date	Ln Conc	Zi	Zi - k	Cusum
LF4-MW4	3/14/06	-1.931	-1.61	-2.61	0.00
LF4-MW4	9/14/06	-1.715	-0.52	-1.52	0.00
LF4-MW4	3/7/07	-2.129	-2.60	-3.60	0.00
LF4-MW4	9/25/07	-1.565	0.22	-0.78	0.00
LF4-MW4	3/26/08	-1.945	-1.68	-2.68	0.00
LF4-MW4	9/17/08	-1.645	-0.17	-1.17	0.00
LF4-MW4	3/17/09	-1.973	-1.82	-2.82	0.00
LF4-MW4	9/21/09	-2.163	-2.77	-3.77	0.00
LF4-MW4	3/17/10	-2.048	-2.19	-3.19	0.00
LF4-MW4	9/21/10	-1.732	-0.61	-1.61	0.00
LF4-MW4	3/15/11	-2.410	-4.01	-5.01	0.00
LF4-MW4	9/8/11	-1.778	-0.84	-1.84	0.00
LF4-MW4	3/14/12	-1.995	-1.93	-2.93	0.00
LF4-MW4	9/6/12	-2.163	-2.77	-3.77	0.00
LF4-MW4	3/5/13	-1.820	-1.05	-2.05	0.00
LF4-MW4	9/11/13	-1.604	0.03	-0.97	0.00
LF4-MW4	3/5/14	-1.749	-0.69	-1.69	0.00
LF4-MW4	9/4/14	-1.671	-0.31	-1.31	0.00
LF4-MW4	3/13/15	-2.189	-2.90	-3.90	0.00
LF4-MW4	9/16/15	-1.749	-0.69	-1.69	0.00
LF4-MW4	3/16/16	-1.682	-0.36	-1.36	0.00
LF4-MW4	9/21/16	-1.833	-1.12	-2.12	0.00
LF4-MW4	3/15/17	-2.064	-2.27	-3.27	0.00
LF4-MW4	9/8/17	-1.492	0.59	-0.41	0.00
LF4-MW4	3/8/18	-1.625	-0.07	-1.07	0.00
LF4-MW4	9/11/18	-1.833	-1.11	-2.11	0.00
LF4-MW4	3/7/19	-1.715	-0.52	-1.52	0.00
LF4-MW4	9/5/19	-1.833	-1.11	-2.11	0.00
LF4-MW4	3/12/20	-1.772	-0.81	-1.81	0.00
LF4-MW4	9/15/20	-2.303	-3.47	-4.47	0.00
Background					
LF4-MW4	MEAN	-1.610			
LF4-MW4	STDEV	0.200			

Attachment D2. Calculations for CUSUM Control Charts
Butler Green Industrial Landfill, Parcel 175(5)
McClellan, Anniston, Alabama

Barium

Well ID	Date	Ln Conc	Zi	Zi - k	Cusum
LF4-MW5	3/14/06	-3.892	0.21	-0.79	0.00
LF4-MW5	9/14/06	-3.873	0.27	-0.73	0.00
LF4-MW5	3/7/07	-4.234	-0.73	-1.73	0.00
LF4-MW5	9/24/07	-3.887	0.23	-0.77	0.00
LF4-MW5	3/26/08	-4.406	-1.20	-2.20	0.00
LF4-MW5	9/16/08	-4.538	-1.56	-2.56	0.00
LF4-MW5	3/18/09	-4.335	-1.00	-2.00	0.00
LF4-MW5	9/17/09	-4.685	-1.97	-2.97	0.00
LF4-MW5	3/17/10	-4.298	-0.90	-1.90	0.00
LF4-MW5	9/21/10	-4.382	-1.13	-2.13	0.00
LF4-MW5	3/15/11	-3.544	1.17	0.17	0.17
LF4-MW5	9/8/11	-4.063	-0.26	-1.26	0.00
LF4-MW5	3/14/12	-4.382	-1.13	-2.13	0.00
LF4-MW5	9/6/12	-4.501	-1.46	-2.46	0.00
LF4-MW5	3/5/13	-4.423	-1.25	-2.25	0.00
LF4-MW5	9/11/13	-5.298	-3.65	-4.65	0.00
LF4-MW5	3/5/14	-4.457	-1.34	-2.34	0.00
LF4-MW5	9/4/14	-4.595	-1.72	-2.72	0.00
LF4-MW5	3/13/15	-4.305	-0.92	-1.92	0.00
LF4-MW5	9/16/15	-4.528	-1.54	-2.54	0.00
LF4-MW5	3/16/16	-4.123	-0.42	-1.42	0.00
LF4-MW5	9/21/16	-4.220	-0.69	-1.69	0.00
LF4-MW5	3/15/17	-4.213	-0.67	-1.67	0.00
LF4-MW5	9/8/17	-4.440	-1.29	-2.29	0.00
LF4-MW5	3/8/18	-4.051	-0.22	-1.22	0.00
LF4-MW5	9/11/18	-4.510	-1.48	-2.48	0.00
LF4-MW5	3/7/19	-3.772	0.54	-0.46	0.00
LF4-MW5	9/5/19	-4.343	-1.03	-2.03	0.00
LF4-MW5	3/12/20	-4.017	-0.13	-1.13	0.00
LF4-MW5	9/15/20	-4.135	-0.45	-1.45	0.00
Background					
LF4-MW5	MEAN	-3.970			
LF4-MW5	STDEV	0.364			

Beryllium

Well ID	Date	Ln Conc	Zi	Zi - k	Cusum
LF4-MW2	3/13/06	-6.041	-0.58	-1.58	0.00
LF4-MW2	9/13/06	-5.298	0.56	-0.44	0.00
LF4-MW2	3/6/07	-5.298	0.56	-0.44	0.00
LF4-MW2	9/24/07	-5.298	0.56	-0.44	0.00
LF4-MW2	3/26/08	-5.298	0.56	-0.44	0.00
LF4-MW2	9/16/08	-5.298	0.56	-0.44	0.00
LF4-MW2	3/17/09	-6.849	-1.83	-2.83	0.00
LF4-MW2	9/17/09	-5.298	0.56	-0.44	0.00
LF4-MW2	3/17/10	-6.205	-0.84	-1.84	0.00
LF4-MW2	9/21/10	-5.298	0.56	-0.44	0.00
LF4-MW2	3/15/11	-5.298	0.56	-0.44	0.00
LF4-MW2	9/8/11	-5.298	0.56	-0.44	0.00
LF4-MW2	3/14/12	-5.298	0.56	-0.44	0.00
LF4-MW2	9/6/12	-5.298	0.56	-0.44	0.00
LF4-MW2	3/5/13	-5.298	0.56	-0.44	0.00
LF4-MW2	9/11/13	-5.298	0.56	-0.44	0.00
LF4-MW2	3/5/14	-7.131	-2.27	-3.27	0.00
LF4-MW2	9/4/14	-9.115	-5.33	-6.33	0.00
LF4-MW2	3/13/15	-7.252	-2.45	-3.45	0.00
LF4-MW2	9/16/15	-8.818	-4.87	-5.87	0.00
LF4-MW2	3/16/16	-7.972	-3.57	-4.57	0.00
LF4-MW2	9/21/16	-8.874	-4.96	-5.96	0.00
LF4-MW2	3/15/17	-9.036	-5.21	-6.21	0.00
LF4-MW2	9/8/17	-9.071	-5.26	-6.26	0.00
LF4-MW2	3/8/18	-7.520	-2.87	-3.87	0.00
LF4-MW2	9/11/18	-8.805	-4.85	-5.85	0.00
LF4-MW2	3/7/19	-6.645	-1.52	-2.52	0.00
LF4-MW2	9/5/19	-8.335	-4.13	-5.13	0.00
LF4-MW2	3/12/20	-7.131	-2.27	-3.27	0.00
LF4-MW2	9/15/20	-7.775	-3.26	-4.26	0.00
Background					
LF4-MW1	MEAN	-5.663			
LF4-MW1	STDEV	0.648			

Cobalt

Well ID	Date	Ln Conc	Zi	Zi - k	Cusum
LF4-MW1	3/13/06	-4.029	0.50	-0.50	0.00
LF4-MW1	9/13/06	-4.734	-0.87	-1.87	0.00
LF4-MW1	3/6/07	-4.784	-0.97	-1.97	0.00
LF4-MW1	9/24/07	-4.641	-0.69	-1.69	0.00
LF4-MW1	3/26/08	-3.554	1.42	0.42	0.42
LF4-MW1	9/16/08	-4.547	-0.51	-1.51	0.00
LF4-MW1	3/17/09	-3.917	0.72	-0.28	0.00
LF4-MW1	9/17/09	-4.220	0.13	-0.87	0.00
LF4-MW1	3/17/10	-4.374	-0.17	-1.17	0.00
LF4-MW1	9/21/10	-3.830	0.89	-0.11	0.00
LF4-MW1	3/15/11	-3.623	1.29	0.29	0.29
LF4-MW1	9/8/11	-3.445	1.63	0.63	0.92
LF4-MW1	3/14/12	-3.417	1.69	0.69	1.61
LF4-MW1	9/6/12	-3.302	1.91	0.91	2.52
LF4-MW1	3/5/13	-3.411	1.70	0.70	3.22
LF4-MW1	9/11/13	-3.812	0.92	-0.08	3.14
LF4-MW1	3/5/14	-3.634	1.27	0.27	3.41
LF4-MW1	9/4/14	-3.717	1.11	0.11	3.51
LF4-MW1	3/13/15	-3.393	1.73	0.73	4.25
LF4-MW1	9/16/15	-3.689	1.16	0.16	4.41
LF4-MW1	3/16/16	-3.231	2.05	1.05	5.46
LF4-MW1	9/21/16	-3.493	1.54	0.54	6.00
LF4-MW1	3/15/17	-3.390	1.74	0.74	6.74
LF4-MW1	9/8/17	-3.278	1.96	0.96	7.70
LF4-MW1	3/8/18	-3.579	1.37	0.37	8.07
LF4-MW1	9/11/18	-3.411	1.70	0.70	8.77
LF4-MW1	3/7/19	-3.270	1.97	0.97	9.74
LF4-MW1	9/5/19	-3.381	1.76	0.76	10.50
LF4-MW1	3/12/20	-3.352	1.81	0.81	11.31
LF4-MW1	9/15/20	-3.270	1.97	0.97	12.29
Background					
LF4-MW1	MEAN	-4.286			
LF4-MW1	STDEV	0.515			

Cobalt

Well ID	Date	Ln Conc	Zi	Zi - k	Cusum
LF4-MW2	3/13/06	-5.053	-1.17	-2.17	0.00
LF4-MW2	9/13/06	-4.200	0.12	-0.88	0.00
LF4-MW2	3/6/07	-4.227	0.08	-0.92	0.00
LF4-MW2	9/24/07	-4.366	-0.13	-1.13	0.00
LF4-MW2	3/26/08	-4.626	-0.53	-1.53	0.00
LF4-MW2	9/16/08	-3.942	0.50	-0.50	0.00
LF4-MW2	3/17/09	-2.339	2.92	1.92	1.92
LF4-MW2	9/17/09	-2.180	3.16	2.16	4.08
LF4-MW2	3/17/10	-2.442	2.77	1.77	5.85
LF4-MW2	9/21/10	-3.464	1.23	0.23	6.08
LF4-MW2	3/15/11	-3.751	0.79	-0.21	5.87
LF4-MW2	9/8/11	-3.705	0.86	-0.14	5.73
LF4-MW2	3/14/12	-3.917	0.54	-0.46	5.28
LF4-MW2	9/6/12	-3.979	0.45	-0.55	4.73
LF4-MW2	3/5/13	-1.952	3.51	2.51	7.23
LF4-MW2	9/11/13	-2.216	3.11	2.11	9.34
LF4-MW2	3/5/14	-1.743	3.82	2.82	12.16
LF4-MW2	9/4/14	-2.401	2.83	1.83	13.99
LF4-MW2	3/13/15	-1.973	3.47	2.47	16.46
LF4-MW2	9/16/15	-2.584	2.55	1.55	18.01
LF4-MW2	3/16/16	-2.377	2.86	1.86	19.88
LF4-MW2	9/21/16	-2.389	2.85	1.85	21.73
LF4-MW2	3/15/17	-2.888	2.09	1.09	22.82
LF4-MW2	9/8/17	-2.970	1.97	0.97	23.79
LF4-MW2	3/8/18	-2.079	3.31	2.31	26.10
LF4-MW2	9/11/18	-2.303	2.98	1.98	28.08
LF4-MW2	3/7/19	-1.833	3.68	2.68	30.77
LF4-MW2	9/5/19	-2.120	3.25	2.25	33.02
LF4-MW2	3/12/20	-2.303	2.98	1.98	34.99
LF4-MW2	9/15/20	-2.040	3.37	2.37	37.37
Background					
LF4-MW2	MEAN	-4.277			
LF4-MW2	STDEV	0.663			

Attachment D2. Calculations for CUSUM Control Charts
Butler Green Industrial Landfill, Parcel 175(5)
McClellan, Anniston, Alabama

Cobalt

Well ID	Date	Ln Conc	Zi	Zi - k	Cusum
LF4-MW3	3/13/06	-4.605	-0.50	-1.50	0.00
LF4-MW3	9/14/06	-4.269	2.75	1.75	1.75
LF4-MW3	3/6/07	-4.605	-0.50	-1.50	0.25
LF4-MW3	9/25/07	-4.905	-3.40	-4.40	0.00
LF4-MW3	3/26/08	-4.605	-0.50	-1.50	0.00
LF4-MW3	9/16/08	-4.605	-0.50	-1.50	0.00
LF4-MW3	3/17/09	-4.605	-0.50	-1.50	0.00
LF4-MW3	9/17/09	-4.605	-0.50	-1.50	0.00
LF4-MW3	3/17/10	-4.605	-0.50	-1.50	0.00
LF4-MW3	9/21/10	-5.687	-10.95	-11.95	0.00
LF4-MW3	3/15/11	-5.836	-12.39	-13.39	0.00
LF4-MW3	9/8/11	-5.900	-13.01	-14.01	0.00
LF4-MW3	3/14/12	-4.605	-0.50	-1.50	0.00
LF4-MW3	9/6/12	-4.605	-0.50	-1.50	0.00
LF4-MW3	3/5/13	-4.605	-0.50	-1.50	0.00
LF4-MW3	9/11/13	-4.628	-0.72	-1.72	0.00
LF4-MW3	3/5/14	-6.342	-17.28	-18.28	0.00
LF4-MW3	9/4/14	-5.514	-9.28	-10.28	0.00
LF4-MW3	3/13/15	-6.432	-18.14	-19.14	0.00
LF4-MW3	9/16/15	-4.034	5.02	4.02	4.02
LF4-MW3	3/16/16	-6.509	-18.89	-19.89	0.00
LF4-MW3	9/21/16	-6.888	-22.55	-23.55	0.00
LF4-MW3	3/15/17	-6.502	-18.83	-19.83	0.00
LF4-MW3	9/8/17	-6.287	-16.75	-17.75	0.00
LF4-MW3	3/8/18	-6.586	-19.63	-20.63	0.00
LF4-MW3	9/11/18	-5.051	-4.81	-5.81	0.00
LF4-MW3	3/7/19	-6.645	-20.21	-21.21	0.00
LF4-MW3	9/5/19	-7.435	-27.84	-28.84	0.00
LF4-MW3	3/12/20	-6.502	-18.83	-19.83	0.00
LF4-MW3	9/15/20	-6.812	-21.82	-22.82	0.00
Background					
LF4-MW3	MEAN	-4.553			
LF4-MW3	STDEV	0.104			

Cobalt

Well ID	Date	Ln Conc	Zi	Zi - k	Cusum
LF4-MW4	3/14/06	-4.605	0.50	-0.50	0.00
LF4-MW4	9/14/06	-4.605	0.50	-0.50	0.00
LF4-MW4	3/7/07	-4.605	0.50	-0.50	0.00
LF4-MW4	9/25/07	-5.440	-3.31	-4.31	0.00
LF4-MW4	3/26/08	-4.969	-1.16	-2.16	0.00
LF4-MW4	9/17/08	-5.444	-3.33	-4.33	0.00
LF4-MW4	3/17/09	-5.242	-2.40	-3.40	0.00
LF4-MW4	9/21/09	-4.605	0.50	-0.50	0.00
LF4-MW4	3/17/10	-5.941	-5.59	-6.59	0.00
LF4-MW4	9/21/10	-5.406	-3.15	-4.15	0.00
LF4-MW4	3/15/11	-5.802	-4.96	-5.96	0.00
LF4-MW4	9/8/11	-5.461	-3.40	-4.40	0.00
LF4-MW4	3/14/12	-5.542	-3.77	-4.77	0.00
LF4-MW4	9/6/12	-4.605	0.50	-0.50	0.00
LF4-MW4	3/5/13	-5.857	-5.21	-6.21	0.00
LF4-MW4	9/11/13	-5.064	-1.59	-2.59	0.00
LF4-MW4	3/5/14	-5.793	-4.92	-5.92	0.00
LF4-MW4	9/4/14	-5.711	-4.54	-5.54	0.00
LF4-MW4	3/13/15	-5.233	-2.36	-3.36	0.00
LF4-MW4	9/16/15	-5.410	-3.17	-4.17	0.00
LF4-MW4	3/16/16	-6.161	-6.60	-7.60	0.00
LF4-MW4	9/21/16	-5.468	-3.44	-4.44	0.00
LF4-MW4	3/15/17	-4.949	-1.07	-2.07	0.00
LF4-MW4	9/8/17	-4.787	-0.33	-1.33	0.00
LF4-MW4	3/8/18	-5.911	-5.45	-6.45	0.00
LF4-MW4	9/11/18	-5.449	-3.35	-4.35	0.00
LF4-MW4	3/7/19	-6.266	-7.07	-8.07	0.00
LF4-MW4	9/5/19	-5.521	-3.68	-4.68	0.00
LF4-MW4	3/12/20	-6.119	-6.40	-7.40	0.00
LF4-MW4	9/15/20	-5.684	-4.42	-5.42	0.00
Background					
LF4-MW4	MEAN	-4.715			
LF4-MW4	STDEV	0.219			

Cobalt

Well ID	Date	Ln Conc	Zi	Zi - k	Cusum
LF4-MW5	3/14/06	-4.949	-2.04	-3.04	0.00
LF4-MW5	9/14/06	-5.048	-2.78	-3.78	0.00
LF4-MW5	3/7/07	-4.605	0.50	-0.50	0.00
LF4-MW5	9/24/07	-5.461	-5.83	-6.83	0.00
LF4-MW5	3/26/08	-5.956	-9.49	-10.49	0.00
LF4-MW5	9/16/08	-5.705	-7.63	-8.63	0.00
LF4-MW5	3/18/09	-5.840	-8.63	-9.63	0.00
LF4-MW5	9/17/09	-5.442	-5.69	-6.69	0.00
LF4-MW5	3/17/10	-5.077	-2.99	-3.99	0.00
LF4-MW5	9/21/10	-4.556	0.86	-0.14	0.00
LF4-MW5	3/15/11	-5.826	-8.53	-9.53	0.00
LF4-MW5	9/8/11	-4.925	-1.87	-2.87	0.00
LF4-MW5	3/14/12	-5.754	-7.99	-8.99	0.00
LF4-MW5	9/6/12	-6.058	-10.24	-11.24	0.00
LF4-MW5	3/5/13	-5.893	-9.02	-10.02	0.00
LF4-MW5	9/11/13	-4.605	0.50	-0.50	0.00
LF4-MW5	3/5/14	-5.516	-6.24	-7.24	0.00
LF4-MW5	9/4/14	-5.732	-7.83	-8.83	0.00
LF4-MW5	3/13/15	-5.760	-8.04	-9.04	0.00
LF4-MW5	9/16/15	-6.071	-10.33	-11.33	0.00
LF4-MW5	3/16/16	-5.431	-5.60	-6.60	0.00
LF4-MW5	9/21/16	-5.027	-2.62	-3.62	0.00
LF4-MW5	3/15/17	-5.926	-9.26	-10.26	0.00
LF4-MW5	9/8/17	-5.793	-8.28	-9.28	0.00
LF4-MW5	3/8/18	-5.499	-6.11	-7.11	0.00
LF4-MW5	9/11/18	-5.915	-9.18	-10.18	0.00
LF4-MW5	3/7/19	-5.499	-6.11	-7.11	0.00
LF4-MW5	9/5/19	-5.006	-2.46	-3.46	0.00
LF4-MW5	3/12/20	-5.627	-7.06	-8.06	0.00
LF4-MW5	9/15/20	-5.655	-7.26	-8.26	0.00
Background					
LF4-MW5	MEAN	-4.673			
LF4-MW5	STDEV	0.135			

Copper

Well ID	Date	Ln Conc	Zi	Zi - k	Cusum
LF4-MW1	3/13/06	-4.193	1.14	0.14	0.14
LF4-MW1	9/13/06	-4.595	0.43	-0.57	0.00
LF4-MW1	3/6/07	-4.637	0.35	-0.65	0.00
LF4-MW1	9/24/07	-5.003	-0.29	-1.29	0.00
LF4-MW1	3/26/08	-4.699	0.24	-0.76	0.00
LF4-MW1	9/16/08	-5.048	-0.37	-1.37	0.00
LF4-MW1	3/17/09	-5.373	-0.95	-1.95	0.00
LF4-MW1	9/17/09	-5.375	-0.95	-1.95	0.00
LF4-MW1	3/17/10	-5.352	-0.91	-1.91	0.00
LF4-MW1	9/21/10	-6.156	-2.33	-3.33	0.00
LF4-MW1	3/15/11	-4.029	1.43	0.43	0.43
LF4-MW1	9/8/11	-4.605	0.41	-0.59	0.00
LF4-MW1	3/14/12	-4.605	0.41	-0.59	0.00
LF4-MW1	9/6/12	-4.605	0.41	-0.59	0.00
LF4-MW1	3/5/13	-4.605	0.41	-0.59	0.00
LF4-MW1	9/11/13	-5.773	-1.66	-2.66	0.00
LF4-MW1	3/5/14	-5.900	-1.88	-2.88	0.00
LF4-MW1	9/4/14	-5.911	-1.90	-2.90	0.00
LF4-MW1	3/13/15	-6.536	-3.00	-4.00	0.00
LF4-MW1	9/16/15	-5.325	-0.86	-1.86	0.00
LF4-MW1	3/16/16	-6.331	-2.64	-3.64	0.00
LF4-MW1	9/21/16	-6.138	-2.30	-3.30	0.00
LF4-MW1	3/15/17	-6.638	-3.18	-4.18	0.00
LF4-MW1	9/8/17	-6.623	-3.16	-4.16	0.00
LF4-MW1	3/8/18	-6.106	-2.24	-3.24	0.00
LF4-MW1	9/11/18	-4.605	0.41	-0.59	0.00
LF4-MW1	3/7/19	-6.377	-2.72	-3.72	0.00
LF4-MW1	9/5/19	-6.075	-2.19	-3.19	0.00
LF4-MW1	3/12/20	-5.952	-1.97	-2.97	0.00
LF4-MW1	9/15/20	-5.991	-2.04	-3.04	0.00
Background					
LF4-MW1	MEAN	-4.836			
LF4-MW1	STDEV	0.566			

Attachment D2. Calculations for CUSUM Control Charts
Butler Green Industrial Landfill, Parcel 175(5)
McClellan, Anniston, Alabama

Copper

Well ID	Date	Ln Conc	Zi	Zi - k	Cusum
LF4-MW2	3/13/06	-4.538	0.00	-1.00	0.00
LF4-MW2	9/13/06	-4.129	0.37	-0.63	0.00
LF4-MW2	3/6/07	-4.663	-0.11	-1.11	0.00
LF4-MW2	9/24/07	-5.956	-1.29	-2.29	0.00
LF4-MW2	3/26/08	-5.302	-0.69	-1.69	0.00
LF4-MW2	9/16/08	-5.473	-0.85	-1.85	0.00
LF4-MW2	3/17/09	-5.684	-1.04	-2.04	0.00
LF4-MW2	9/17/09	-5.644	-1.00	-2.00	0.00
LF4-MW2	3/17/10	-3.717	0.75	-0.25	0.00
LF4-MW2	9/21/10	-6.215	-1.52	-2.52	0.00
LF4-MW2	3/15/11	-4.605	-0.06	-1.06	0.00
LF4-MW2	9/8/11	-4.605	-0.06	-1.06	0.00
LF4-MW2	3/14/12	-4.605	-0.06	-1.06	0.00
LF4-MW2	9/6/12	-5.341	-0.73	-1.73	0.00
LF4-MW2	3/5/13	-4.440	0.09	-0.91	0.00
LF4-MW2	9/11/13	-4.605	-0.06	-1.06	0.00
LF4-MW2	3/5/14	-3.751	0.72	-0.28	0.00
LF4-MW2	9/4/14	-6.287	-1.59	-2.59	0.00
LF4-MW2	3/13/15	-4.193	0.31	-0.69	0.00
LF4-MW2	9/16/15	-6.024	-1.35	-2.35	0.00
LF4-MW2	3/16/16	-4.566	-0.02	-1.02	0.00
LF4-MW2	9/21/16	-5.976	-1.31	-2.31	0.00
LF4-MW2	3/15/17	-6.071	-1.39	-2.39	0.00
LF4-MW2	9/8/17	-6.161	-1.47	-2.47	0.00
LF4-MW2	3/8/18	-4.519	0.02	-0.98	0.00
LF4-MW2	9/11/18	-6.075	-1.40	-2.40	0.00
LF4-MW2	3/7/19	-3.612	0.84	-0.16	0.00
LF4-MW2	9/5/19	-5.426	-0.81	-1.81	0.00
LF4-MW2	3/12/20	-3.963	0.52	-0.48	0.00
LF4-MW2	9/15/20	-5.279	-0.67	-1.67	0.00
Background					
LF4-MW2	MEAN	-4.539			
LF4-MW2	STDEV	1.100			

Copper

Well ID	Date	Ln Conc	Zi	Zi - k	Cusum
LF4-MW3	3/13/06	-5.039	0.53	-0.47	0.00
LF4-MW3	9/14/06	-4.959	0.60	-0.40	0.00
LF4-MW3	3/6/07	-6.215	-0.49	-1.49	0.00
LF4-MW3	9/25/07	-6.215	-0.49	-1.49	0.00
LF4-MW3	3/26/08	-6.008	-0.31	-1.31	0.00
LF4-MW3	9/16/08	-5.594	0.05	-0.95	0.00
LF4-MW3	3/17/09	-6.119	-0.41	-1.41	0.00
LF4-MW3	9/17/09	-6.215	-0.49	-1.49	0.00
LF4-MW3	3/17/10	-6.200	-0.48	-1.48	0.00
LF4-MW3	9/21/10	-6.215	-0.49	-1.49	0.00
LF4-MW3	3/15/11	-5.104	0.47	-0.53	0.00
LF4-MW3	9/8/11	-4.605	0.91	-0.09	0.00
LF4-MW3	3/14/12	-5.735	-0.08	-1.08	0.00
LF4-MW3	9/6/12	-5.793	-0.13	-1.13	0.00
LF4-MW3	3/5/13	-5.666	-0.02	-1.02	0.00
LF4-MW3	9/11/13	-4.605	0.91	-0.09	0.00
LF4-MW3	3/5/14	-6.354	-0.62	-1.62	0.00
LF4-MW3	9/4/14	-6.395	-0.65	-1.65	0.00
LF4-MW3	3/13/15	-6.250	-0.53	-1.53	0.00
LF4-MW3	9/16/15	-6.812	-1.01	-2.01	0.00
LF4-MW3	3/16/16	-6.261	-0.53	-1.53	0.00
LF4-MW3	9/21/16	-6.092	-0.39	-1.39	0.00
LF4-MW3	3/15/17	-6.645	-0.87	-1.87	0.00
LF4-MW3	9/8/17	-5.696	-0.04	-1.04	0.00
LF4-MW3	3/8/18	-6.450	-0.70	-1.70	0.00
LF4-MW3	9/11/18	-4.605	0.91	-0.09	0.00
LF4-MW3	3/7/19	-5.991	-0.30	-1.30	0.00
LF4-MW3	9/5/19	-5.991	-0.30	-1.30	0.00
LF4-MW3	3/12/20	-5.497	0.13	-0.87	0.00
LF4-MW3	9/15/20	-6.377	-0.64	-1.64	0.00
Background					
LF4-MW3	MEAN	-5.647			
LF4-MW3	STDEV	1.150			

Lead

Well ID	Date	Ln Conc	Zi	Zi - k	Cusum
LF4-MW1	3/13/06	-5.298	0.21	-0.79	0.00
LF4-MW1	9/13/06	-5.857	-0.33	-1.33	0.00
LF4-MW1	3/6/07	-5.345	0.17	-0.83	0.00
LF4-MW1	9/24/07	-5.661	-0.14	-1.14	0.00
LF4-MW1	3/26/08	-4.935	0.56	-0.44	0.00
LF4-MW1	9/16/08	-5.298	0.21	-0.79	0.00
LF4-MW1	3/17/09	-5.298	0.21	-0.79	0.00
LF4-MW1	9/17/09	-5.684	-0.16	-1.16	0.00
LF4-MW1	3/17/10	-5.238	0.27	-0.73	0.00
LF4-MW1	9/21/10	-5.809	-0.28	-1.28	0.00
LF4-MW1	3/15/11	-5.298	0.21	-0.79	0.00
LF4-MW1	9/8/11	-5.754	-0.23	-1.23	0.00
LF4-MW1	3/14/12	-5.751	-0.22	-1.22	0.00
LF4-MW1	9/6/12	-5.298	0.21	-0.79	0.00
LF4-MW1	3/5/13	-5.726	-0.20	-1.20	0.00
LF4-MW1	9/11/13	-4.912	0.59	-0.41	0.00
LF4-MW1	3/5/14	-8.408	-2.80	-3.80	0.00
LF4-MW1	9/4/14	-7.881	-2.29	-3.29	0.00
LF4-MW1	3/13/15	-8.174	-2.57	-3.57	0.00
LF4-MW1	9/16/15	-5.581	-0.06	-1.06	0.00
LF4-MW1	3/16/16	-7.891	-2.30	-3.30	0.00
LF4-MW1	9/21/16	-7.233	-1.66	-2.66	0.00
LF4-MW1	3/15/17	-7.659	-2.07	-3.07	0.00
LF4-MW1	9/8/17	-7.907	-2.31	-3.31	0.00
LF4-MW1	3/8/18	-6.395	-0.85	-1.85	0.00
LF4-MW1	9/11/18	-5.298	0.21	-0.79	0.00
LF4-MW1	3/7/19	-6.377	-0.83	-1.83	0.00
LF4-MW1	9/5/19	-6.502	-0.95	-1.95	0.00
LF4-MW1	3/12/20	-6.438	-0.89	-1.89	0.00
LF4-MW1	9/15/20	-6.348	-0.80	-1.80	0.00
Background					
LF4-MW1	MEAN	-5.518			
LF4-MW1	STDEV	1.034			

Lead

Well ID	Date	Ln Conc	Zi	Zi - k	Cusum
LF4-MW2	3/13/06	-4.595	0.39	-0.61	0.00
LF4-MW2	9/13/06	-4.415	0.54	-0.46	0.00
LF4-MW2	3/6/07	-4.855	0.16	-0.84	0.00
LF4-MW2	9/24/07	-5.415	-0.32	-1.32	0.00
LF4-MW2	3/26/08	-4.928	0.10	-0.90	0.00
LF4-MW2	9/16/08	-5.296	-0.22	-1.22	0.00
LF4-MW2	3/17/09	-5.298	-0.22	-1.22	0.00
LF4-MW2	9/17/09	-5.298	-0.22	-1.22	0.00
LF4-MW2	3/17/10	-4.678	0.32	-0.68	0.00
LF4-MW2	9/21/10	-5.809	-0.66	-1.66	0.00
LF4-MW2	3/15/11	-5.298	-0.22	-1.22	0.00
LF4-MW2	9/8/11	-5.298	-0.22	-1.22	0.00
LF4-MW2	3/14/12	-5.298	-0.22	-1.22	0.00
LF4-MW2	9/6/12	-5.298	-0.22	-1.22	0.00
LF4-MW2	3/5/13	-5.589	-0.47	-1.47	0.00
LF4-MW2	9/11/13	-5.447	-0.35	-1.35	0.00
LF4-MW2	3/5/14	-6.119	-0.93	-1.93	0.00
LF4-MW2	9/4/14	-6.921	-1.62	-2.62	0.00
LF4-MW2	3/13/15	-6.175	-0.98	-1.98	0.00
LF4-MW2	9/16/15	-6.266	-1.05	-2.05	0.00
LF4-MW2	3/16/16	-5.482	-0.38	-1.38	0.00
LF4-MW2	9/21/16	-6.320	-1.10	-2.10	0.00
LF4-MW2	3/15/17	-6.101	-0.91	-1.91	0.00
LF4-MW2	9/8/17	-6.250	-1.04	-2.04	0.00
LF4-MW2	3/8/18	-5.544	-0.43	-1.43	0.00
LF4-MW2	9/11/18	-5.298	-0.22	-1.22	0.00
LF4-MW2	3/7/19	-5.360	-0.27	-1.27	0.00
LF4-MW2	9/5/19	-6.119	-0.93	-1.93	0.00
LF4-MW2	3/12/20	-4.135	0.78	-0.22	0.00
LF4-MW2	9/15/20	-5.083	-0.03	-1.03	0.00
Background					
LF4-MW2	MEAN	-5.045			
LF4-MW2	STDEV	1.159			

Attachment D2. Calculations for CUSUM Control Charts
Butler Green Industrial Landfill, Parcel 175(5)
McClellan, Anniston, Alabama

Lead

Well ID	Date	Ln Conc	Zi	Zi - k	Cusum
LF4-MW3	3/13/06	-5.216	0.40	-0.60	0.00
LF4-MW3	9/14/06	-5.806	-0.32	-1.32	0.00
LF4-MW3	3/6/07	-6.041	-0.61	-1.61	0.00
LF4-MW3	9/25/07	-5.298	0.30	-0.70	0.00
LF4-MW3	3/26/08	-5.341	0.25	-0.75	0.00
LF4-MW3	9/16/08	-5.298	0.30	-0.70	0.00
LF4-MW3	3/17/09	-5.298	0.30	-0.70	0.00
LF4-MW3	9/17/09	-3.537	2.46	1.46	1.46
LF4-MW3	3/17/10	-5.298	0.30	-0.70	0.76
LF4-MW3	9/21/10	-5.298	0.30	-0.70	0.06
LF4-MW3	3/15/11	-5.298	0.30	-0.70	0.00
LF4-MW3	9/8/11	-5.298	0.30	-0.70	0.00
LF4-MW3	3/14/12	-5.298	0.30	-0.70	0.00
LF4-MW3	9/6/12	-5.298	0.30	-0.70	0.00
LF4-MW3	3/5/13	-5.404	0.17	-0.83	0.00
LF4-MW3	9/11/13	-5.767	-0.28	-1.28	0.00
LF4-MW3	3/5/14	-6.210	-0.82	-1.82	0.00
LF4-MW3	9/4/14	-6.210	-0.82	-1.82	0.00
LF4-MW3	3/13/15	-5.444	0.12	-0.88	0.00
LF4-MW3	9/16/15	-6.482	-1.15	-2.15	0.00
LF4-MW3	3/16/16	-6.028	-0.60	-1.60	0.00
LF4-MW3	9/21/16	-5.757	-0.26	-1.26	0.00
LF4-MW3	3/15/17	-5.793	-0.31	-1.31	0.00
LF4-MW3	9/8/17	-6.975	-1.76	-2.76	0.00
LF4-MW3	3/8/18	-5.840	-0.36	-1.36	0.00
LF4-MW3	9/11/18	-5.298	0.30	-0.70	0.00
LF4-MW3	3/7/19	-5.497	0.06	-0.94	0.00
LF4-MW3	9/5/19	-6.502	-1.18	-2.18	0.00
LF4-MW3	3/12/20	-4.722	1.01	0.01	0.01
LF4-MW3	9/15/20	-6.215	-0.83	-1.83	0.00
Background					
LF4-MW3	MEAN	-5.542			
LF4-MW3	STDEV	0.816			

Lead

Well ID	Date	Ln Conc	Zi	Zi - k	Cusum
LF4-MW4	3/14/06	-4.457	1.08	0.08	0.08
LF4-MW4	9/14/06	-3.558	2.12	1.12	1.21
LF4-MW4	3/7/07	-5.298	0.11	-0.89	0.31
LF4-MW4	9/25/07	-5.298	0.11	-0.89	0.00
LF4-MW4	3/26/08	-5.298	0.11	-0.89	0.00
LF4-MW4	9/17/08	-5.181	0.24	-0.76	0.00
LF4-MW4	3/17/09	-5.310	0.09	-0.91	0.00
LF4-MW4	9/21/09	-5.298	0.11	-0.89	0.00
LF4-MW4	3/17/10	-5.708	-0.37	-1.37	0.00
LF4-MW4	9/21/10	-5.632	-0.28	-1.28	0.00
LF4-MW4	3/15/11	-5.638	-0.28	-1.28	0.00
LF4-MW4	9/8/11	-5.602	-0.24	-1.24	0.00
LF4-MW4	3/14/12	-5.298	0.11	-0.89	0.00
LF4-MW4	9/6/12	-5.298	0.11	-0.89	0.00
LF4-MW4	3/5/13	-5.298	0.11	-0.89	0.00
LF4-MW4	9/11/13	-5.339	0.06	-0.94	0.00
LF4-MW4	3/5/14	-6.898	-1.74	-2.74	0.00
LF4-MW4	9/4/14	-5.499	-0.12	-1.12	0.00
LF4-MW4	3/13/15	-7.417	-2.34	-3.34	0.00
LF4-MW4	9/16/15	-4.519	1.01	0.01	0.01
LF4-MW4	3/16/16	-7.807	-2.80	-3.80	0.00
LF4-MW4	9/21/16	-5.745	-0.41	-1.41	0.00
LF4-MW4	3/15/17	-7.249	-2.15	-3.15	0.00
LF4-MW4	9/8/17	-4.731	0.77	-0.23	0.00
LF4-MW4	3/8/18	-7.511	-2.45	-3.45	0.00
LF4-MW4	9/11/18	-4.934	0.53	-0.47	0.00
LF4-MW4	3/7/19	-6.725	-1.54	-2.54	0.00
LF4-MW4	9/5/19	-5.259	0.15	-0.85	0.00
LF4-MW4	3/12/20	-5.714	-0.37	-1.37	0.00
LF4-MW4	9/15/20	-5.259	0.15	-0.85	0.00
Background					
LF4-MW4	MEAN	-5.392			
LF4-MW4	STDEV	0.864			

Lead

Well ID	Date	Ln Conc	Zi	Zi - k	Cusum
LF4-MW5	3/14/06	-5.401	0.29	-0.71	0.00
LF4-MW5	9/14/06	-4.538	1.36	0.36	0.36
LF4-MW5	3/7/07	-5.745	-0.13	-1.13	0.00
LF4-MW5	9/24/07	-5.298	0.42	-0.58	0.00
LF4-MW5	3/26/08	-5.298	0.42	-0.58	0.00
LF4-MW5	9/16/08	-5.298	0.42	-0.58	0.00
LF4-MW5	3/18/09	-5.298	0.42	-0.58	0.00
LF4-MW5	9/17/09	-5.298	0.42	-0.58	0.00
LF4-MW5	3/17/10	-5.298	0.42	-0.58	0.00
LF4-MW5	9/16/10	-5.440	0.24	-0.76	0.00
LF4-MW5	3/15/11	-4.695	1.17	0.17	0.17
LF4-MW5	9/8/11	-5.298	0.42	-0.58	0.00
LF4-MW5	3/14/12	-5.298	0.42	-0.58	0.00
LF4-MW5	9/6/12	-5.298	0.42	-0.58	0.00
LF4-MW5	3/5/13	-5.298	0.42	-0.58	0.00
LF4-MW5	9/11/13	-5.298	0.42	-0.58	0.00
LF4-MW5	3/5/14	-6.966	-1.65	-2.65	0.00
LF4-MW5	9/4/14	-7.357	-2.13	-3.13	0.00
LF4-MW5	3/13/15	-6.988	-1.67	-2.67	0.00
LF4-MW5	9/16/15	-7.419	-2.21	-3.21	0.00
LF4-MW5	3/16/16	-6.084	-0.55	-1.55	0.00
LF4-MW5	9/21/16	-7.343	-2.11	-3.11	0.00
LF4-MW5	3/15/17	-6.693	-1.31	-2.31	0.00
LF4-MW5	9/8/17	-7.243	-1.99	-2.99	0.00
LF4-MW5	3/8/18	-5.751	-0.14	-1.14	0.00
LF4-MW5	9/11/18	-5.298	0.42	-0.58	0.00
LF4-MW5	3/7/19	-6.075	-0.54	-1.54	0.00
LF4-MW5	9/5/19	-6.685	-1.30	-2.30	0.00
LF4-MW5	3/12/20	-6.502	-1.07	-2.07	0.00
LF4-MW5	9/15/20	-5.809	-0.21	-1.21	0.00
Background					
LF4-MW2	MEAN	-5.637			
LF4-MW2	STDEV	0.807			

Nickel

Well ID	Date	Ln Conc	Zi	Zi - k	Cusum
LF4-MW1	3/13/06	-4.605	-0.59	-1.59	0.00
LF4-MW1	9/13/06	-4.351	0.46	-0.54	0.00
LF4-MW1	3/6/07	-4.605	-0.59	-1.59	0.00
LF4-MW1	9/24/07	-4.585	-0.51	-1.51	0.00
LF4-MW1	3/26/08	-4.117	1.42	0.42	0.42
LF4-MW1	9/16/08	-4.595	-0.55	-1.55	0.00
LF4-MW1	3/17/09	-4.398	0.26	-0.74	0.00
LF4-MW1	9/17/09	-4.510	-0.20	-1.20	0.00
LF4-MW1	3/17/10	-4.994	-2.19	-3.19	0.00
LF4-MW1	9/21/10	-4.283	0.74	-0.26	0.00
LF4-MW1	3/15/11	-3.958	2.07	1.07	1.07
LF4-MW1	9/8/11	-3.958	2.07	1.07	2.15
LF4-MW1	3/14/12	-3.887	2.36	1.36	3.51
LF4-MW1	9/6/12	-3.673	3.24	2.24	5.75
LF4-MW1	3/5/13	-3.768	2.85	1.85	7.61
LF4-MW1	9/11/13	-4.173	1.19	0.19	7.80
LF4-MW1	3/5/14	-4.034	1.76	0.76	8.56
LF4-MW1	9/4/14	-4.220	1.00	0.00	8.55
LF4-MW1	3/13/15	-3.942	2.14	1.14	9.69
LF4-MW1	9/16/15	-4.110	1.45	0.45	10.14
LF4-MW1	3/16/16	-3.812	2.67	1.67	11.81
LF4-MW1	9/21/16	-4.001	1.90	0.90	12.70
LF4-MW1	3/15/17	-3.826	2.62	1.62	14.32
LF4-MW1	9/8/17	-3.777	2.82	1.82	16.14
LF4-MW1	3/8/18	-4.001	1.90	0.90	17.04
LF4-MW1	9/11/18	-3.772	2.84	1.84	18.87
LF4-MW1	3/7/19	-3.772	2.84	1.84	20.71
LF4-MW1	9/5/19	-3.863	2.46	1.46	22.17
LF4-MW1	3/12/20	-3.817	2.65	1.65	23.83
LF4-MW1	9/15/20	-3.772	2.84	1.84	25.66
Background					
LF4-MW1	MEAN	-4.462			
LF4-MW1	STDEV	0.243			

Attachment D2. Calculations for CUSUM Control Charts
Butler Green Industrial Landfill, Parcel 175(5)
McClellan, Anniston, Alabama

Nickel

Well ID	Date	Ln Conc	Zi	Zi - k	Cusum
LF4-MW2	3/13/06	-4.605	-0.82	-1.82	0.00
LF4-MW2	9/13/06	-3.979	0.46	-0.54	0.00
LF4-MW2	3/6/07	-4.528	-0.66	-1.66	0.00
LF4-MW2	9/24/07	-4.528	-0.66	-1.66	0.00
LF4-MW2	3/26/08	-4.628	-0.86	-1.86	0.00
LF4-MW2	9/16/08	-4.213	-0.02	-1.02	0.00
LF4-MW2	3/17/09	-2.684	3.11	2.11	2.11
LF4-MW2	9/17/09	-2.658	3.16	2.16	4.27
LF4-MW2	3/17/10	-2.736	3.00	2.00	6.26
LF4-MW2	9/21/10	-3.887	0.65	-0.35	5.91
LF4-MW2	3/15/11	-4.227	-0.04	-1.04	4.87
LF4-MW2	9/8/11	-4.200	0.01	-0.99	3.88
LF4-MW2	3/14/12	-4.457	-0.51	-1.51	2.37
LF4-MW2	9/6/12	-4.173	0.07	-0.93	1.44
LF4-MW2	3/5/13	-2.484	3.51	2.51	3.95
LF4-MW2	9/11/13	-2.787	2.90	1.90	5.85
LF4-MW2	3/5/14	-2.313	3.86	2.86	8.71
LF4-MW2	9/4/14	-3.119	2.22	1.22	9.93
LF4-MW2	3/13/15	-2.585	3.31	2.31	12.24
LF4-MW2	9/16/15	-3.192	2.07	1.07	13.31
LF4-MW2	3/16/16	-2.922	2.62	1.62	14.93
LF4-MW2	9/21/16	-3.014	2.43	1.43	16.36
LF4-MW2	3/15/17	-3.594	1.25	0.25	16.61
LF4-MW2	9/8/17	-3.677	1.08	0.08	16.69
LF4-MW2	3/8/18	-2.736	3.00	2.00	18.69
LF4-MW2	9/11/18	-2.937	2.59	1.59	20.27
LF4-MW2	3/7/19	-2.343	3.80	2.80	23.08
LF4-MW2	9/5/19	-2.765	2.94	1.94	25.02
LF4-MW2	3/12/20	-2.830	2.81	1.81	26.83
LF4-MW2	9/15/20	-2.733	3.01	2.01	28.83
Background					
LF4-MW2	MEAN	-4.206			
LF4-MW2	STDEV	0.490			

Nickel

Well ID	Date	Ln Conc	Zi	Zi - k	Cusum
LF4-MW3	3/13/06	-4.605	0.45	-0.55	0.00
LF4-MW3	9/14/06	-4.173	1.14	0.14	0.14
LF4-MW3	3/6/07	-4.605	0.45	-0.55	0.00
LF4-MW3	9/25/07	-4.989	-0.17	-1.17	0.00
LF4-MW3	3/26/08	-5.093	-0.34	-1.34	0.00
LF4-MW3	9/16/08	-5.537	-1.06	-2.06	0.00
LF4-MW3	3/17/09	-5.658	-1.25	-2.25	0.00
LF4-MW3	9/17/09	-4.981	-0.16	-1.16	0.00
LF4-MW3	3/17/10	-4.605	0.45	-0.55	0.00
LF4-MW3	9/21/10	-5.929	-1.69	-2.69	0.00
LF4-MW3	3/15/11	-5.555	-1.08	-2.08	0.00
LF4-MW3	9/8/11	-5.658	-1.25	-2.25	0.00
LF4-MW3	3/14/12	-5.675	-1.28	-2.28	0.00
LF4-MW3	9/6/12	-5.621	-1.19	-2.19	0.00
LF4-MW3	3/5/13	-5.431	-0.88	-1.88	0.00
LF4-MW3	9/11/13	-4.605	0.45	-0.55	0.00
LF4-MW3	3/5/14	-5.860	-1.58	-2.58	0.00
LF4-MW3	9/4/14	-5.684	-1.29	-2.29	0.00
LF4-MW3	3/13/15	-5.693	-1.31	-2.31	0.00
LF4-MW3	9/16/15	-5.116	-0.38	-1.38	0.00
LF4-MW3	3/16/16	-5.836	-1.54	-2.54	0.00
LF4-MW3	9/21/16	-5.539	-1.06	-2.06	0.00
LF4-MW3	3/15/17	-5.802	-1.48	-2.48	0.00
LF4-MW3	9/8/17	-5.675	-1.28	-2.28	0.00
LF4-MW3	3/8/18	-5.864	-1.58	-2.58	0.00
LF4-MW3	9/11/18	-5.360	-0.77	-1.77	0.00
LF4-MW3	3/7/19	-5.714	-1.34	-2.34	0.00
LF4-MW3	9/5/19	-5.655	-1.25	-2.25	0.00
LF4-MW3	3/12/20	-5.404	-0.84	-1.84	0.00
LF4-MW3	9/15/20	-5.915	-1.67	-2.67	0.00
Background					
LF4-MW3	MEAN	-4.882			
LF4-MW3	STDEV	0.620			

Nickel

Well ID	Date	Ln Conc	Zi	Zi - k	Cusum
LF4-MW4	3/14/06	-4.605	0.45	-0.55	0.00
LF4-MW4	9/14/06	-4.605	0.45	-0.55	0.00
LF4-MW4	3/7/07	-5.267	-0.62	-1.62	0.00
LF4-MW4	9/25/07	-5.468	-0.94	-1.94	0.00
LF4-MW4	3/26/08	-5.300	-0.67	-1.67	0.00
LF4-MW4	9/17/08	-5.428	-0.88	-1.88	0.00
LF4-MW4	3/17/09	-5.428	-0.88	-1.88	0.00
LF4-MW4	9/21/09	-5.867	-1.59	-2.59	0.00
LF4-MW4	3/17/10	-5.384	-0.81	-1.81	0.00
LF4-MW4	9/21/10	-5.539	-1.06	-2.06	0.00
LF4-MW4	3/15/11	-4.605	0.45	-0.55	0.00
LF4-MW4	9/8/11	-5.594	-1.15	-2.15	0.00
LF4-MW4	3/14/12	-4.605	0.45	-0.55	0.00
LF4-MW4	9/6/12	-4.605	0.45	-0.55	0.00
LF4-MW4	3/5/13	-4.605	0.45	-0.55	0.00
LF4-MW4	9/11/13	-4.751	0.21	-0.79	0.00
LF4-MW4	3/5/14	-5.964	-1.74	-2.74	0.00
LF4-MW4	9/4/14	-5.591	-1.14	-2.14	0.00
LF4-MW4	3/13/15	-6.161	-2.06	-3.06	0.00
LF4-MW4	9/16/15	-5.438	-0.90	-1.90	0.00
LF4-MW4	3/16/16	-6.119	-2.00	-3.00	0.00
LF4-MW4	9/21/16	-5.757	-1.41	-2.41	0.00
LF4-MW4	3/15/17	-6.079	-1.93	-2.93	0.00
LF4-MW4	9/8/17	-5.619	-1.19	-2.19	0.00
LF4-MW4	3/8/18	-6.522	-2.65	-3.65	0.00
LF4-MW4	9/11/18	-5.339	-0.74	-1.74	0.00
LF4-MW4	3/7/19	-5.991	-1.79	-2.79	0.00
LF4-MW4	9/5/19	-5.684	-1.29	-2.29	0.00
LF4-MW4	3/12/20	-6.119	-1.99	-2.99	0.00
LF4-MW4	9/15/20	-5.952	-1.73	-2.73	0.00
Background					
LF4-MW4	MEAN	-4.882			
LF4-MW4	STDEV	0.620			

Nickel

Well ID	Date	Ln Conc	Zi	Zi - k	Cusum
LF4-MW5	3/14/06	-4.605	0.45	-0.55	0.00
LF4-MW5	9/14/06	-4.605	0.45	-0.55	0.00
LF4-MW5	3/7/07	-4.605	0.45	-0.55	0.00
LF4-MW5	9/24/07	-5.741	-1.39	-2.39	0.00
LF4-MW5	3/26/08	-5.896	-1.64	-2.64	0.00
LF4-MW5	9/16/08	-5.960	-1.74	-2.74	0.00
LF4-MW5	3/18/09	-4.605	0.45	-0.55	0.00
LF4-MW5	9/17/09	-4.605	0.45	-0.55	0.00
LF4-MW5	3/17/10	-5.754	-1.41	-2.41	0.00
LF4-MW5	9/16/10	-5.526	-1.04	-2.04	0.00
LF4-MW5	3/15/11	-5.265	-0.62	-1.62	0.00
LF4-MW5	9/8/11	-5.764	-1.42	-2.42	0.00
LF4-MW5	3/14/12	-4.605	0.45	-0.55	0.00
LF4-MW5	9/6/12	-4.605	0.45	-0.55	0.00
LF4-MW5	3/5/13	-4.605	0.45	-0.55	0.00
LF4-MW5	9/11/13	-4.605	0.45	-0.55	0.00
LF4-MW5	3/5/14	-6.049	-1.88	-2.88	0.00
LF4-MW5	9/4/14	-6.432	-2.50	-3.50	0.00
LF4-MW5	3/13/15	-6.271	-2.24	-3.24	0.00
LF4-MW5	9/16/15	-6.529	-2.66	-3.66	0.00
LF4-MW5	3/16/16	-5.941	-1.71	-2.71	0.00
LF4-MW5	9/21/16	-5.714	-1.34	-2.34	0.00
LF4-MW5	3/15/17	-6.180	-2.09	-3.09	0.00
LF4-MW5	9/8/17	-6.529	-2.66	-3.66	0.00
LF4-MW5	3/8/18	-5.889	-1.62	-2.62	0.00
LF4-MW5	9/11/18	-5.547	-1.07	-2.07	0.00
LF4-MW5	3/7/19	-5.547	-1.07	-2.07	0.00
LF4-MW5	9/5/19	-5.776	-1.44	-2.44	0.00
LF4-MW5	3/12/20	-6.032	-1.85	-2.85	0.00
LF4-MW5	9/15/20	-5.952	-1.73	-2.73	0.00
Background					
LF4-MW5	MEAN	-4.882			
LF4-MW5	STDEV	0.620			

Attachment D2. Calculations for CUSUM Control Charts
Butler Green Industrial Landfill, Parcel 175(5)
McClellan, Anniston, Alabama

Zinc

Well ID	Date	Ln Conc	Zi	Zi - k	Cusum
LF4-MW1	3/13/06	-2.488	1.28	0.28	0.28
LF4-MW1	9/13/06	-3.493	-0.35	-1.35	0.00
LF4-MW1	3/6/07	-3.231	0.08	-0.92	0.00
LF4-MW1	9/24/07	-2.996	0.46	-0.54	0.00
LF4-MW1	3/26/08	-3.177	0.16	-0.84	0.00
LF4-MW1	9/16/08	-3.734	-0.74	-1.74	0.00
LF4-MW1	3/17/09	-3.355	-0.12	-1.12	0.00
LF4-MW1	9/17/09	-3.464	-0.30	-1.30	0.00
LF4-MW1	3/17/10	-4.335	-1.71	-2.71	0.00
LF4-MW1	9/21/10	-3.189	0.14	-0.86	0.00
LF4-MW1	3/15/11	-2.720	0.91	-0.09	0.00
LF4-MW1	9/8/11	-2.955	0.53	-0.47	0.00
LF4-MW1	3/14/12	-2.941	0.55	-0.45	0.00
LF4-MW1	9/6/12	-2.884	0.64	-0.36	0.00
LF4-MW1	3/5/13	-2.766	0.83	-0.17	0.00
LF4-MW1	9/11/13	-3.242	0.06	-0.94	0.00
LF4-MW1	3/5/14	-3.140	0.23	-0.77	0.00
LF4-MW1	9/4/14	-3.237	0.07	-0.93	0.00
LF4-MW1	3/13/15	-2.822	0.74	-0.26	0.00
LF4-MW1	9/16/15	-3.206	0.12	-0.88	0.00
LF4-MW1	3/16/16	-2.805	0.77	-0.23	0.00
LF4-MW1	9/21/16	-3.058	0.36	-0.64	0.00
LF4-MW1	3/15/17	-2.886	0.64	-0.36	0.00
LF4-MW1	9/8/17	-2.799	0.78	-0.22	0.00
LF4-MW1	3/8/18	-2.990	0.47	-0.53	0.00
LF4-MW1	9/11/18	-2.617	1.07	0.07	0.07
LF4-MW1	3/7/19	-2.847	0.70	-0.30	0.00
LF4-MW1	9/5/19	-1.897	2.24	1.24	1.24
LF4-MW1	3/12/20	-2.865	0.67	-0.33	0.91
LF4-MW1	9/15/20	-2.501	1.26	0.26	1.17
Background					
LF4-MW1	MEAN	-3.278			
LF4-MW1	STDEV	0.616			

Zinc

Well ID	Date	Ln Conc	Zi	Zi - k	Cusum
LF4-MW2	3/13/06	-2.915	-0.16	-1.16	0.00
LF4-MW2	9/13/06	-2.343	1.59	0.59	0.59
LF4-MW2	3/6/07	-3.338	-1.46	-2.46	0.00
LF4-MW2	9/24/07	-2.996	-0.41	-1.41	0.00
LF4-MW2	3/26/08	-4.069	-3.70	-4.70	0.00
LF4-MW2	9/16/08	-3.487	-1.91	-2.91	0.00
LF4-MW2	3/17/09	-0.691	6.66	5.66	5.66
LF4-MW2	9/17/09	-0.498	7.26	6.26	11.92
LF4-MW2	3/17/10	-0.120	8.41	7.41	19.33
LF4-MW2	9/21/10	-2.254	1.87	0.87	20.20
LF4-MW2	3/15/11	-2.655	0.64	-0.36	19.84
LF4-MW2	9/8/11	-2.608	0.78	-0.22	19.62
LF4-MW2	3/14/12	-2.902	-0.12	-1.12	18.50
LF4-MW2	9/6/12	-2.774	0.27	-0.73	17.77
LF4-MW2	3/5/13	-0.311	7.83	6.83	24.60
LF4-MW2	9/11/13	-0.892	6.05	5.05	29.65
LF4-MW2	3/5/14	0.020	8.84	7.84	37.49
LF4-MW2	9/4/14	-1.168	5.20	4.20	41.69
LF4-MW2	3/13/15	-0.191	8.20	7.20	48.89
LF4-MW2	9/16/15	-1.269	4.89	3.89	52.78
LF4-MW2	3/16/16	-0.835	6.22	5.22	58.00
LF4-MW2	9/21/16	-0.944	5.89	4.89	62.88
LF4-MW2	3/15/17	-1.743	3.44	2.44	65.32
LF4-MW2	9/8/17	-1.715	3.52	2.52	67.84
LF4-MW2	3/8/18	-0.312	7.82	6.82	74.67
LF4-MW2	9/11/18	-0.942	5.89	4.89	79.56
LF4-MW2	3/7/19	0.182	9.34	8.34	87.90
LF4-MW2	9/5/19	-0.654	6.78	5.78	93.68
LF4-MW2	3/12/20	-0.616	6.89	5.89	99.57
LF4-MW2	9/15/20	-0.777	6.40	5.40	104.97
Background					
LF4-MW2	MEAN	-2.863			
LF4-MW2	STDEV	0.326			

Zinc

Well ID	Date	Ln Conc	Zi	Zi - k	Cusum
LF4-MW3	3/13/06	-3.858	-0.21	-1.21	0.00
LF4-MW3	9/14/06	-3.685	-0.05	-1.05	0.00
LF4-MW3	3/6/07	-3.642	-0.01	-1.01	0.00
LF4-MW3	9/25/07	-4.160	-0.48	-1.48	0.00
LF4-MW3	3/26/08	-4.141	-0.47	-1.47	0.00
LF4-MW3	9/16/08	-4.820	-1.09	-2.09	0.00
LF4-MW3	3/17/09	-4.200	-0.52	-1.52	0.00
LF4-MW3	9/17/09	-3.627	0.00	-1.00	0.00
LF4-MW3	3/17/10	-4.892	-1.15	-2.15	0.00
LF4-MW3	9/21/10	-5.124	-1.36	-2.36	0.00
LF4-MW3	3/15/11	-3.882	-0.23	-1.23	0.00
LF4-MW3	9/8/11	-4.595	-0.88	-1.88	0.00
LF4-MW3	3/14/12	-4.220	-0.54	-1.54	0.00
LF4-MW3	9/6/12	-4.069	-0.40	-1.40	0.00
LF4-MW3	3/5/13	-4.098	-0.43	-1.43	0.00
LF4-MW3	9/11/13	-2.996	0.58	-0.42	0.00
LF4-MW3	3/5/14	-4.605	-0.89	-1.89	0.00
LF4-MW3	9/4/14	-4.605	-0.89	-1.89	0.00
LF4-MW3	3/13/15	-4.206	-0.53	-1.53	0.00
LF4-MW3	9/16/15	-4.605	-0.89	-1.89	0.00
LF4-MW3	3/16/16	-4.605	-0.89	-1.89	0.00
LF4-MW3	9/21/16	-4.492	-0.79	-1.79	0.00
LF4-MW3	3/15/17	-4.566	-0.85	-1.85	0.00
LF4-MW3	9/8/17	-4.017	-0.35	-1.35	0.00
LF4-MW3	3/8/18	-4.255	-0.57	-1.57	0.00
LF4-MW3	9/11/18	-4.200	-0.52	-1.52	0.00
LF4-MW3	3/7/19	-4.135	-0.46	-1.46	0.00
LF4-MW3	9/5/19	-3.194	0.40	-0.60	0.00
LF4-MW3	3/12/20	-3.963	-0.30	-1.30	0.00
LF4-MW3	9/15/20	-2.937	0.63	-0.37	0.00
Background					
LF4-MW3	MEAN	-3.629			
LF4-MW3	STDEV	1.096			

Zinc

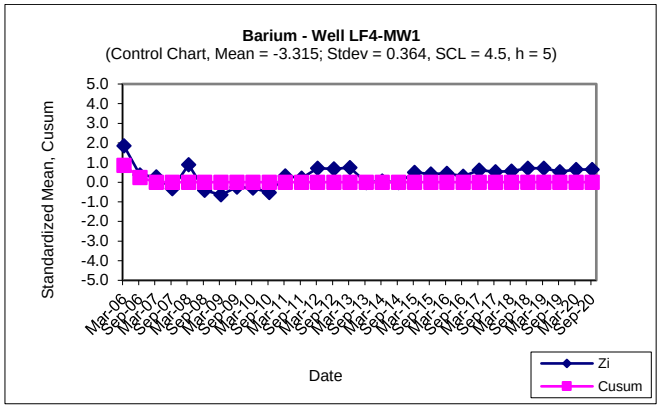
Well ID	Date	Ln Conc	Zi	Zi - k	Cusum
LF4-MW4	3/14/06	-3.669	0.13	-0.87	0.00
LF4-MW4	9/14/06	-3.101	0.48	-0.52	0.00
LF4-MW4	3/7/07	-4.623	-1.17	-2.17	0.00
LF4-MW4	9/25/07	-4.269	-0.79	-1.79	0.00
LF4-MW4	3/26/08	-4.946	-1.52	-2.52	0.00
LF4-MW4	9/17/08	-4.029	-0.52	-1.52	0.00
LF4-MW4	3/17/09	-3.948	-0.44	-1.44	0.00
LF4-MW4	9/21/09	-4.941	-1.51	-2.51	0.00
LF4-MW4	3/17/10	-4.991	-1.57	-2.57	0.00
LF4-MW4	9/21/10	-4.351	-0.87	-1.87	0.00
LF4-MW4	3/15/11	-4.366	-0.89	-1.89	0.00
LF4-MW4	9/8/11	-4.585	-1.13	-2.13	0.00
LF4-MW4	3/14/12	-2.996	0.59	-0.41	0.00
LF4-MW4	9/6/12	-2.996	0.59	-0.41	0.00
LF4-MW4	3/5/13	-4.366	-0.89	-1.89	0.00
LF4-MW4	9/11/13	-4.440	-0.97	-1.97	0.00
LF4-MW4	3/5/14	-4.605	-1.15	-2.15	0.00
LF4-MW4	9/4/14	-4.605	-1.15	-2.15	0.00
LF4-MW4	3/13/15	-4.605	-1.15	-2.15	0.00
LF4-MW4	9/16/15	-4.057	-0.56	-1.56	0.00
LF4-MW4	3/16/16	-4.605	-1.15	-2.15	0.00
LF4-MW4	9/21/16	-4.069	-0.57	-1.57	0.00
LF4-MW4	3/15/17	-4.605	-1.15	-2.15	0.00
LF4-MW4	9/8/17	-3.423	0.13	-0.87	0.00
LF4-MW4	3/8/18	-4.605	-1.15	-2.15	0.00
LF4-MW4	9/11/18	-3.079	0.50	-0.50	0.00
LF4-MW4	3/7/19	-2.880	0.72	-0.28	0.00
LF4-MW4	9/5/19	-2.386	1.25	0.25	0.25
LF4-MW4	3/12/20	-4.422	-0.95	-1.95	0.00
LF4-MW4	9/15/20	-3.612	-0.07	-1.07	0.00
Background					
LF4-MW4	MEAN	-3.761			
LF4-MW4	STDEV	0.723			

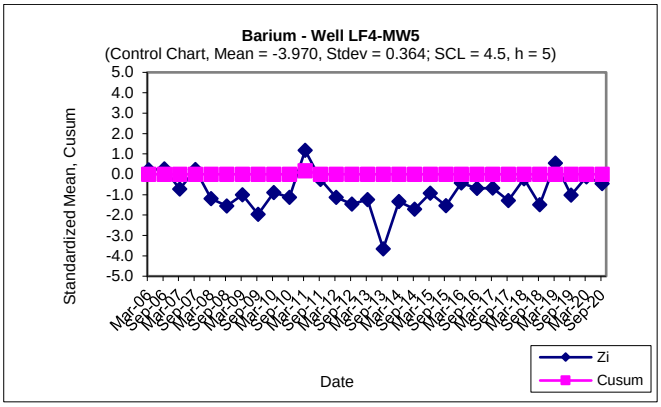
Attachment D2. Calculations for CUSUM Control Charts
Butler Green Industrial Landfill, Parcel 175(5)
McClellan, Anniston, Alabama

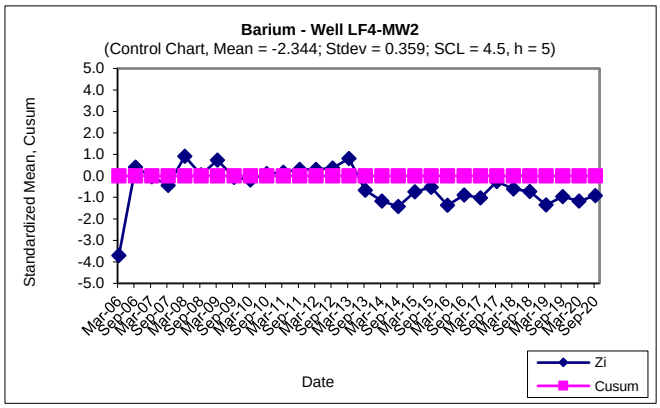
Zinc

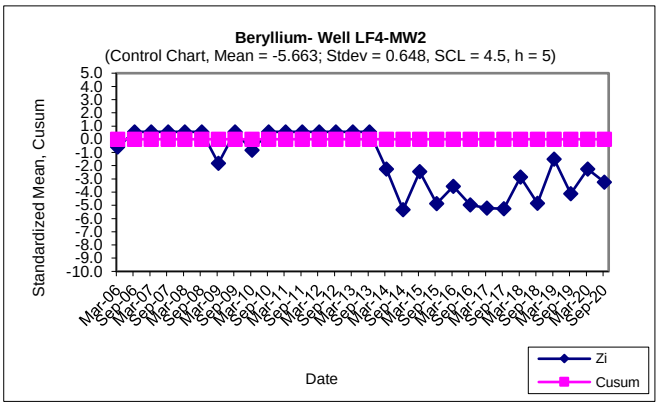
Well ID	Date	Ln Conc	Zi	Zi - k	Cusum
LF4-MW5	3/14/06	-4.358	-0.88	-1.88	0.00
LF4-MW5	9/14/06	-3.868	-0.35	-1.35	0.00
LF4-MW5	3/7/07	-3.974	-0.47	-1.47	0.00
LF4-MW5	9/24/07	-2.996	0.59	-0.41	0.00
LF4-MW5	3/26/08	-5.028	-1.61	-2.61	0.00
LF4-MW5	9/16/08	-5.067	-1.65	-2.65	0.00
LF4-MW5	3/18/09	-4.753	-1.31	-2.31	0.00
LF4-MW5	9/17/09	-5.176	-1.77	-2.77	0.00
LF4-MW5	3/17/10	-2.996	0.59	-0.41	0.00
LF4-MW5	9/16/10	-4.683	-1.23	-2.23	0.00
LF4-MW5	3/15/11	-4.200	-0.71	-1.71	0.00
LF4-MW5	9/8/11	-2.996	0.59	-0.41	0.00
LF4-MW5	3/14/12	-4.465	-1.00	-2.00	0.00
LF4-MW5	9/6/12	-2.996	0.59	-0.41	0.00
LF4-MW5	3/5/13	-4.510	-1.05	-2.05	0.00
LF4-MW5	9/11/13	-2.996	0.59	-0.41	0.00
LF4-MW5	3/5/14	-4.605	-1.15	-2.15	0.00
LF4-MW5	9/4/14	-4.605	-1.15	-2.15	0.00
LF4-MW5	3/13/15	-4.605	-1.15	-2.15	0.00
LF4-MW5	9/16/15	-4.605	-1.15	-2.15	0.00
LF4-MW5	3/16/16	-4.457	-0.99	-1.99	0.00
LF4-MW5	9/21/16	-4.605	-1.15	-2.15	0.00
LF4-MW5	3/15/17	-4.605	-1.15	-2.15	0.00
LF4-MW5	9/8/17	-4.605	-1.15	-2.15	0.00
LF4-MW5	3/8/18	-2.818	0.79	-0.21	0.00
LF4-MW5	9/11/18	-2.120	1.54	0.54	0.54
LF4-MW5	3/7/19	-3.863	-0.35	-1.35	0.00
LF4-MW5	9/5/19	-4.510	-1.05	-2.05	0.00
LF4-MW5	3/12/20	-4.343	-0.87	-1.87	0.00
LF4-MW5	9/15/20	0.000	3.84	2.84	2.84
Background					
LF4-MW2	MEAN	-3.544			
LF4-MW2	STDEV	0.923			

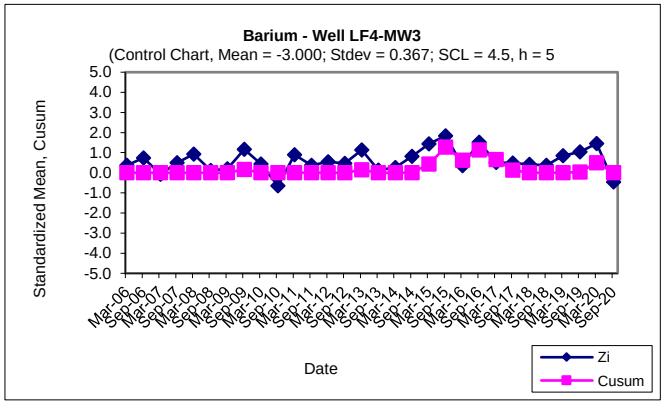
Attachment D3. Control Charts
Butler Green Industrial Landfill, Parcel 175(5), McClellan, Anniston, Alabama

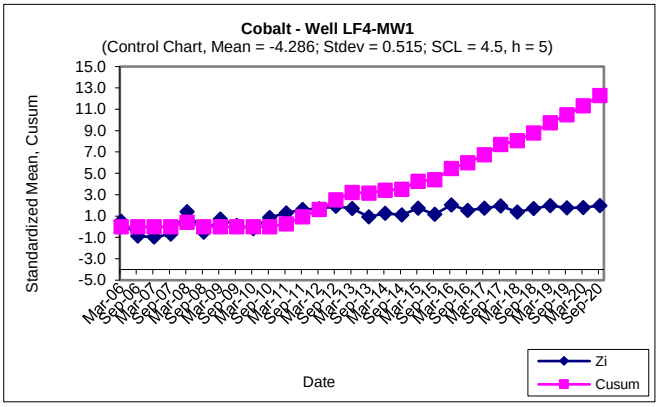


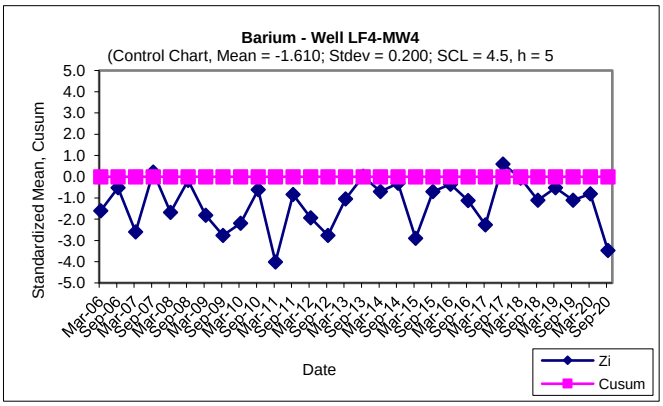


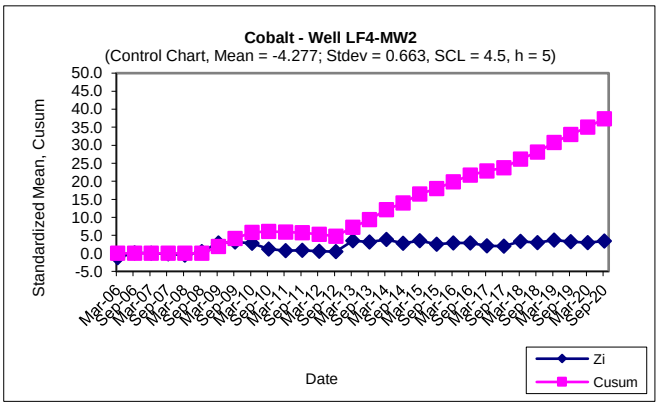




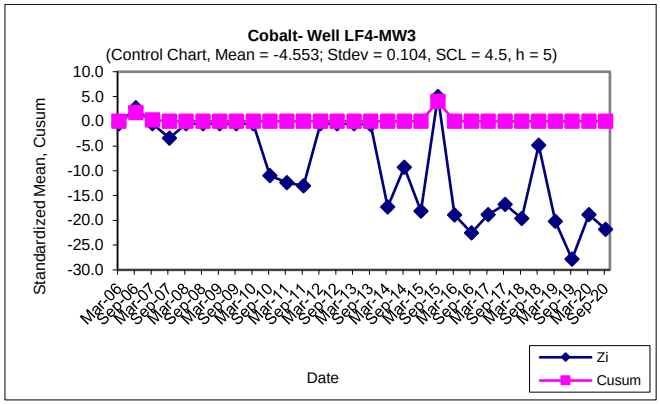


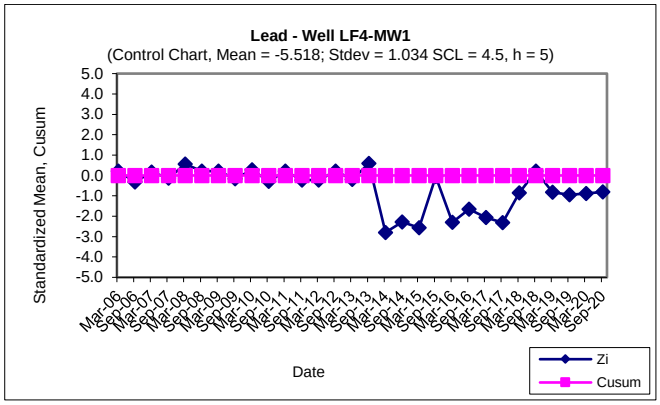


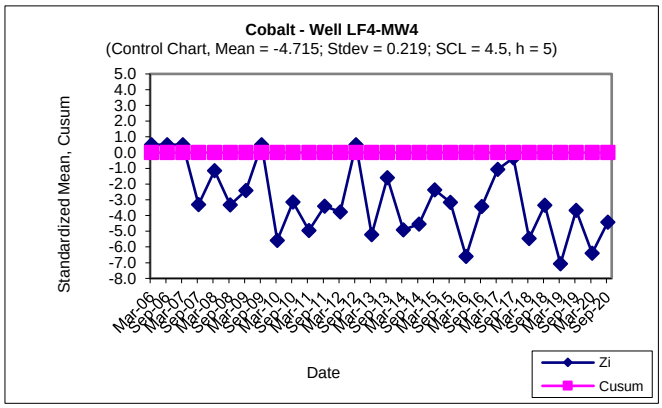


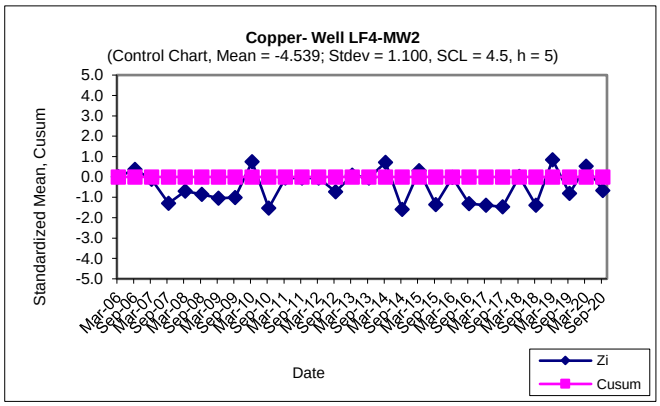


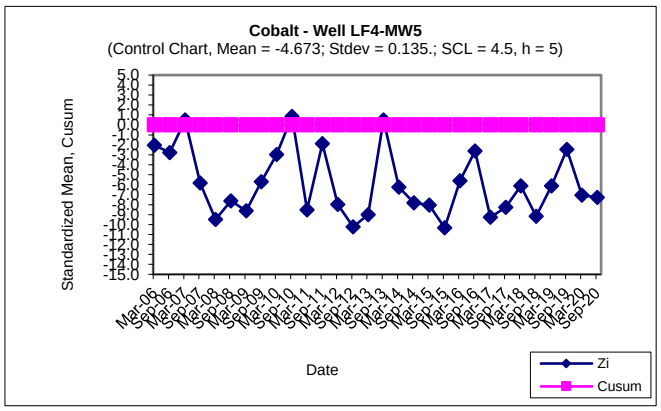
Attachment D3. Control Charts
Butler Green Industrial Landfill, Parcel 175(5), McClellan, Anniston, Alabama

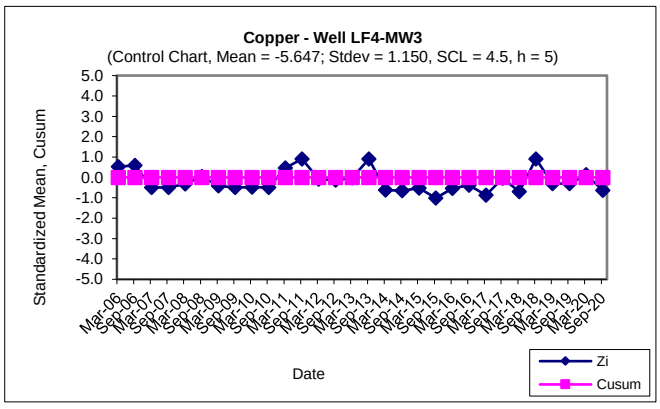


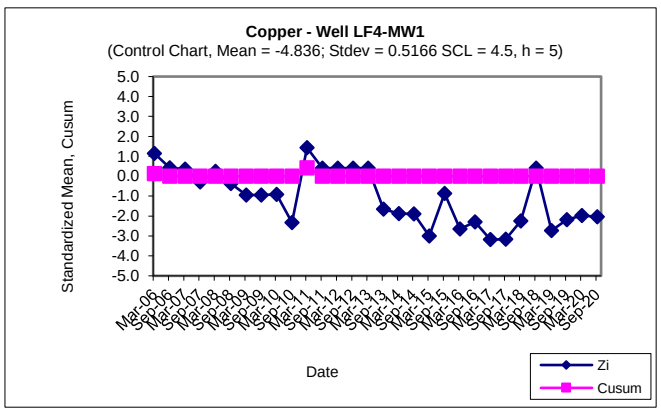


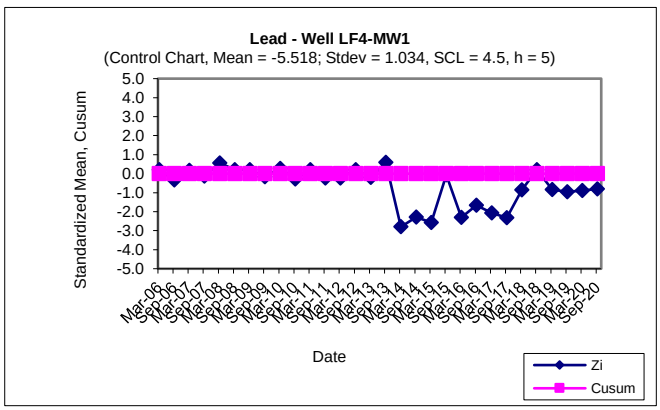




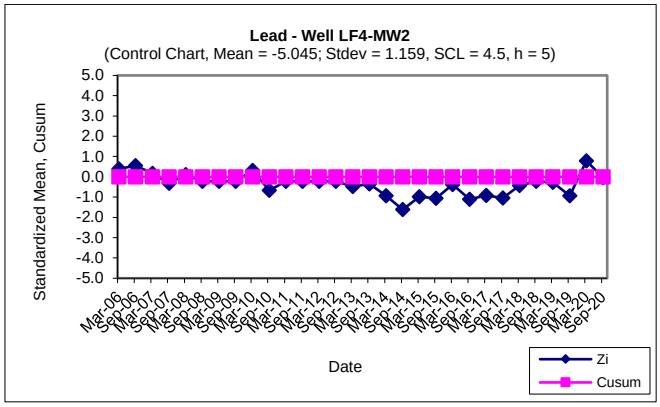


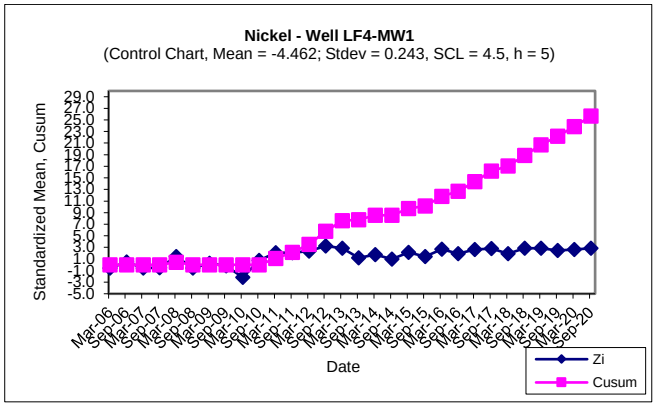


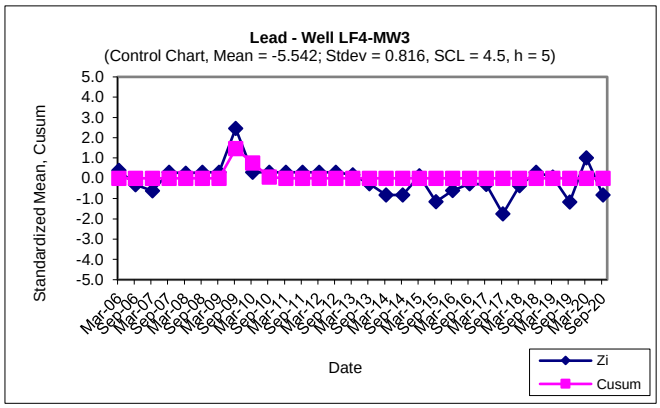


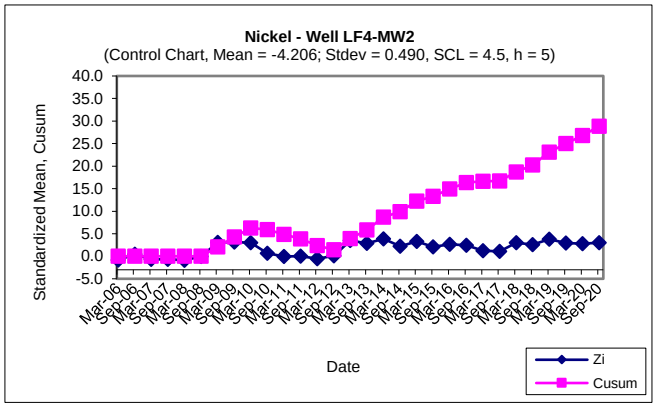


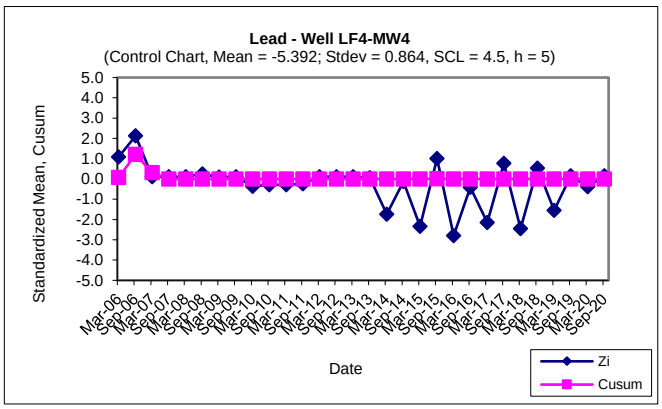
Attachment D3. Control Charts
Butler Green Industrial Landfill, Parcel 175(5), McClellan, Anniston, Alabama

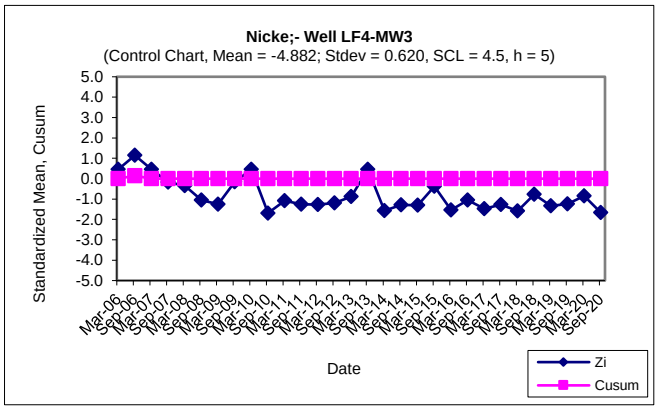


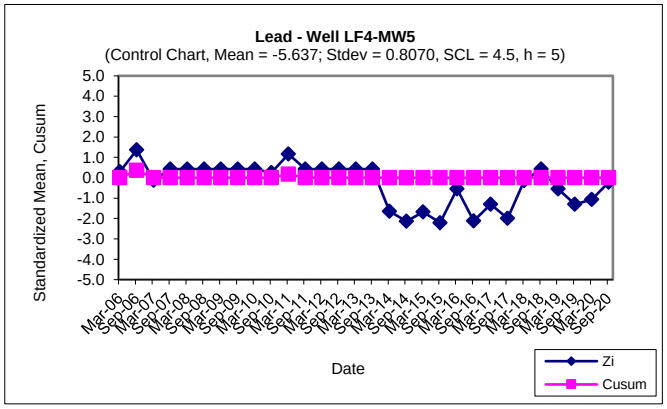


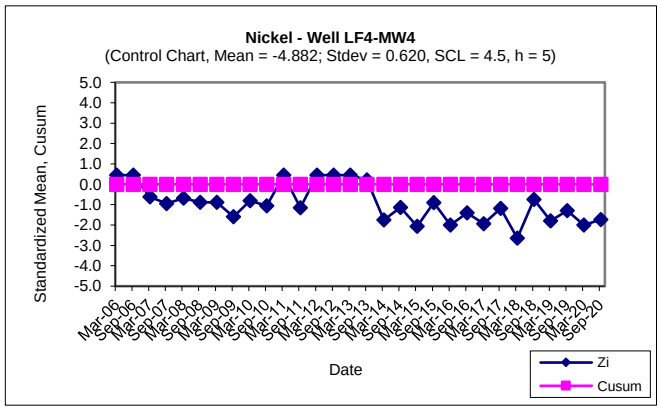












Attachment D3. Control Charts
Butler Green Industrial Landfill, Parcel 175(5), McClellan, Anniston, Alabama