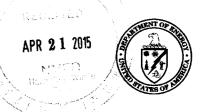




Department of Energy National Nuclear Security Administration Sandia Field Office

P. O. Box 5400 Albuquerque, **NM** 87185



CERTIFIED MAIL-RETURN RECEIPT REQUESTED

APR 1 3 2015

Mr. John E. Kieling Chief Hazardous Waste Bureau New Mexico Environment Department 2905 Rodeo Park Drive East, Bldg. 1 Santa Fe, NM 87505

Subject: Department of Energy/National Nuclear Security Administration Sandia National

Laboratories Environmental Restoration Operations Consolidated Quarterly Report,

April 2015.

Dear Mr. Kieling:

Enclosed is the Environmental Restoration Operations Consolidated Quarterly Report, April 2015 for the Department of Energy, National Nuclear Security Administration, Sandia National Laboratories that addresses all quarterly reporting (October through December 2014) required under the Hazardous and Solid Waste Amendments Module of the Resource Conservation and Recovery Act Permit, the Compliance Order on Consent and the Chemical Waste Landfill Post-Closure Care Permit for Sandia National Laboratories/New Mexico, Environmental Protection Agency Identification Number NM5890110518.

If you have questions, please contact me at (505) 845-5201 or David Rast of my staff at (505) 845-5349.

Sincerely,

William P. Ortiz Acting Assistant Manager

for Engineering

Enclosure

cc: See Page 2

CERTIFICATION STATEMENT FOR APPROVAL AND FINAL RELEASE OF DOCUMENTS

Document title: **Environmental Restoration Operations Consolidated** Quarterly Report, December, 2014 Document author: John Cochran, Department 06234 I certify under penalty of law that this document and all attachments were prepared under my direction or supervision according to a system designed to ensure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine or imprisonment for knowing violations. Signature: Peter Davies, Director Nuclear Energy & Fuel Cycle Programs Center 6200 Sandia National Laboratories/New Mexico Albuquerque, New Mexico 87185 Operator and Signature: James W. Todd U.S. Department of Energy National Nuclear Security Administration

Sandia Site Office Owner and Co-Operator



Sandia National Laboratories, New Mexico

Environmental Restoration Operations

A U.S. Department of Energy Environmental Cleanup Program

Consolidated Quarterly Report

October – December 2014



April 2015



United States Department of Energy Sandia Field Office

CONSOLIDATED QUARTERLY REPORT

April 2015

SANDIA NATIONAL LABORATORIES, NEW MEXICO

ENVIRONMENTAL RESTORATION OPERATIONS

U.S. DEPARTMENT OF ENERGY:

CONTRACTOR:

SANDIA FIELD OFFICE

SANDIA CORPORATION

PROJECT MANAGER:

John Cochran

NUMBER OF POTENTIAL RELEASE SITES SUBJECT TO THIS PERMIT: 33

SUSPECT WASTE: Radionuclides, metals, organic compounds, and explosives

REPORTING PERIOD: October – December 2014

OVERVIEW

This Sandia National Laboratories, New Mexico Environmental Restoration Operations (ER) Consolidated Quarterly Report (ER Quarterly Report) fulfills all quarterly reporting requirements set forth in the Hazardous and Solid Waste Amendments (HSWA) Module of the Resource Conservation and Recovery Act Permit, and the Compliance Order on Consent. The 33 sites in the Corrective Action regulatory process are listed in Table I-1. The 33 sites consist of 25 Solid Waste Management Units and 8 Areas of Concern (AOCs). A summary of post-closure care activities performed in accordance with the Chemical Waste Landfill Post-Closure Care Permit is also included in this document. The Burn Site Groundwater and Technical Area V Groundwater AOCs are not included on the current HSWA Permit, but have been added as AOCs to the revised Hazardous Waste Facility Permit, which is pending approval by the New Mexico Environment Department at this time, and are included within this Consolidated Quarterly Report for completeness. This ER Quarterly Report presents activities and data in sections as follows:

SECTION I: Environmental Restoration Operations Consolidated Quarterly Report,

October – December 2014

SECTION II: Perchlorate Screening Quarterly Groundwater Monitoring Report,

October – December 2014

SECTION III: Solid Waste Management Units 8/58 and 68 Quarterly Groundwater

Monitoring Report, October – December 2014

ABBREVIATIONS AND ACRONYMS

°C degrees Celsius

 $\mu g/L$ microgram(s) per liter

μmhos/cm micromhos per centimeter

% Sat percent saturation

AGMR Annual Groundwater Monitoring Report

ALTMM Annual Long-Term Monitoring and Maintenance

AOC Area of Concern

AOP Administrative Operating Procedure

AR Analysis Request

BSG Burn Site Groundwater

BW background well

CAC Corrective Action Complete

CAMU Corrective Action Management Unit

CCBA Coyote Canyon Blast Area
CFR Code of Federal Regulations
CME Corrective Measures Evaluation

COA certificates of analyses

COC Chain-of-Custody
CTF Coyote Test Field

CWL Chemical Waste Landfill

CY Calendar Year

CYN Canyons (Burn Site Groundwater Area of Concern)

DO dissolved oxygen

DOE U.S. Department of Energy

EB equipment blank

EPA U.S. Environmental Protection Agency
ER Environmental Restoration Operations

ER Quarterly Report Environmental Restoration Operations (ER) Consolidated Quarterly Report

ET Cover evapotranspirative cover

FB field blank

FOP Field Operating Procedure
GEL GEL Laboratories LLC

H₂SO₄ sulfuric acid

HASL Health and Safety Laboratory

HE high explosive(s)

HMX tetrahexamine tetranitramine

HNO₃ nitric acid

HQ hazard quotient

HSWA Hazardous and Solid Waste Amendments

L liter

LCRS leachate collection and removal system

LTMMP Long-Term Monitoring and Maintenance Plan

LTS Long-Term Stewardship
LWDS liquid waste disposal system
MCL maximum contaminant level
MDA minimum detectable activity

MDL method detection limit mg/L milligram(s) per liter

mL milliliter(s)
mrem/yr millirem per year
MRN Magazine Road North

mV millivolt

MW monitoring well

MWL Mixed Waste Landfill
NaOH sodium hydroxide
NA not applicable
ND nondetect
NE not established

NMED New Mexico Environment Department NNSA National Nuclear Security Administration

NPN nitrate plus nitrite

NTU nephelometric turbidity unit NWTA Northwest Technical Area

OBS Old Burn Site

ORP oxidation-reduction potential PCCP Post-Closure Care Permit

pCi/L picocuries per liter

Permit Hazardous Waste Facility Operating Permit

pH potential of hydrogen PQL practical quantitation limit

QC quality control

RCRA Resource Conservation and Recovery Act
RDX hexahydro-1,3,5-trinitro-1,3,5-triazine

RPD relative percent difference

Sandia Corporation

SAP Sampling and Analysis Plan

SC specific conductance SM standard method

SNL/NM Sandia National Laboratories, New Mexico

SVOC semivolatile organic compound
SWMU Solid Waste Management Unit
SWTA Southwest Technical Area

TA Technical Area

TAVG Technical Area V Groundwater
TAG Tijeras Arroyo Groundwater

TAL Target Analyte List

TB trip blank

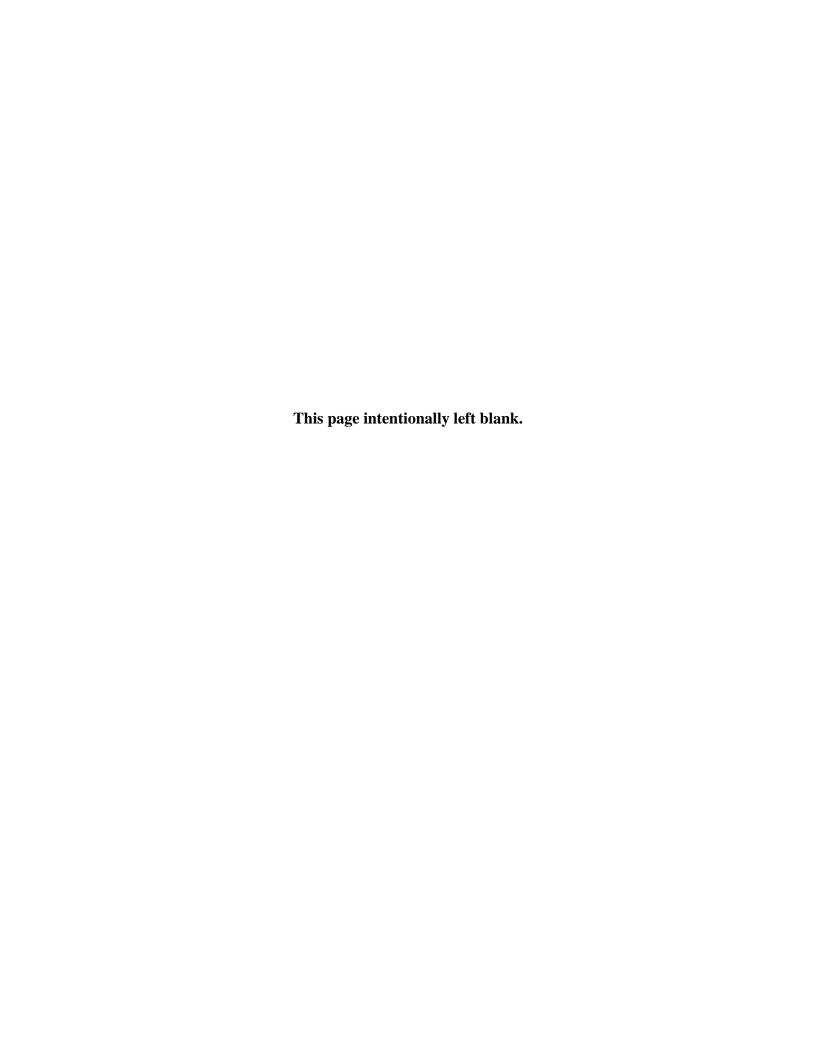
TBD to be determined

Tetryl 2,4,6-trinitrophenylmethylnitramine
The Consent Order the Compliance Order on Consent

TO Technical Order

VOC volatile organic compound

W Well



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SECTION I ENVIRONMENTAL RESTORATION OPERATIONS CONSOLIDATED QUARTERLY REPORT, October – December 2014

1.0 Introduction

This Environmental Restoration Operations (ER) Consolidated Quarterly Report (ER Quarterly Report) provides the status of ongoing corrective actions and related Long-Term Stewardship (LTS) activities being implemented by Sandia National Laboratories, New Mexico (SNL/NM) ER for the October, November, and December 2014 quarterly reporting period. Section 2.0 provides the status of ER Operations activities including closure activities for the Mixed Waste Landfill (MWL), project management and site closure, and groundwater sampling and analysis. Section 3.0 provides the status of LTS activities that relate to the MWL, Chemical Waste Landfill (CWL), and Corrective Action Management Unit (CAMU). Section 4.0 provides the references noted in Section I of this report.

2.0 Environmental Restoration Operations Work Completed

2.1 Mixed Waste Landfill

The Long-Term Monitoring and Maintenance Plan (LTMMP) was submitted to the New Mexico Environment Department (NMED) in March 2012 (SNL/NM March 2012). NMED approved the LTMMP on January 8, 2014 (Blaine January 2014). Monitoring, inspections, maintenance/repair, and reporting activities required by the LTMMP are now presented in Section I.3.1, including MWL evapotranspirative cover (ET Cover) supplemental watering and maintenance (LTS Activities). Remaining ER Operations activities at the MWL are presented below.

The U.S. Department of Energy/National Nuclear Security Administration (DOE/NNSA) and Sandia Corporation (Sandia) requested a Certificate of Completion for the MWL on September 25, 2014 (Beausoleil September 2014). NMED provided the Certification of Completion for the MWL on October 8, 2014 (Cobrain October 2014) and DOE/NNSA and Sandia subsequently submitted a request to NMED for a Class 3 Permit Modification to the Resource Conservation and Recovery Act (RCRA) Hazardous Waste Permit (Permit). The Final Order becomes effective on February 26, 2015. The Class 3 Permit Modification Request was dated October 17, 2014 and petitioned the NMED to change the MWL status to Corrective Action Complete (CAC) with Controls (Beausoleil October 2014). The request and associated legal notice initiated the DOE/NNSA and Sandia 60-day public comment

period that will be completed on January 5, 2015, and included a public meeting that was held on November 18, 2014. Compilation of the MWL Justification Binder that includes all major MWL documents and related correspondence from May 2005 to October 2014 was completed and distributed to NMED and the Federal Repository located at the University of New Mexico Zimmerman Library on October 14, 2014. The Class 3 Permit Modification Request, Justification Binders, and supporting information for the November 18, 2014 public meeting (posters, fact sheets, and supplemental information) were also uploaded to the Zimmerman Library website (i.e., LoboVault). Approximately 60 members of the public attended the public meeting (poster session format held from 4 to 8 p.m. at the Manzano Mesa Multigenerational Center) and 12 public comments were received during the meeting.

Installation and reporting associated with the soil-vapor monitoring well network was completed during the last reporting period. The first semiannual soil-vapor sampling event under the LTMMP occurred on September 11, 2014, approximately 2 months after completion of drilling and installation activities to allow for vadose zone equilibration as specified in the Installation Plan (SNL/NM January 2014). Final results were made available to the public at the November 18, 2014 public meeting and on the Zimmerman Library website. Soil-vapor monitoring under the LTMMP is addressed in Section I.3.1.

A groundwater monitoring report focusing on filtered and unfiltered metals in groundwater from monitoring well MWL-MW4 during the annual sampling event conducted in January and February 2013 was prepared and submitted to NMED on May 20, 2014 (SNL/NM May 2014). This report addressed results from analysis of groundwater for unfiltered metals (chromium, cobalt, copper, iron, and nickel) that showed a significant increase in the 2013 samples. NMED provided recommendations on July 24, 2014 that included repeated pumping of the well with the goal of removing as much sediment and stainless steel corrosion particles as possible prior to removing the packer and dedicated sampling pump from the monitoring well for inspection, replacement, and/or cleaning (Kieling July 2014). NMED also recommended sampling for filtered and unfiltered metals during the pumping effort to determine if unfiltered metals concentrations returned to background levels.

- From September 8 through September 29, 2014, pumping and sampling of MWL-MW4 was conducted to remove sediment and corrosion particles from the well in accordance with the NMED July 24, 2014 recommendations.
- In October 2014, preliminary results were provided to NMED and report preparation began for submittal to NMED in early 2015.

- On December 16, 2014, the dedicated Bennett[™] sampling pump, Baski[™] packer, supporting metal rods, and associated tubing were removed from MWL-MW4. The Bennett[™] pump was inspected and photographed to document corrosion, which was severe. The pumping and sampling data, along with the visual inspections, confirms the source of the anomalous unfiltered metals results from the 2013 groundwater samples was corrosion of the dedicated pump.
- A video log of MWL-MW4 performed on December 16 confirmed the monitoring well
 is in reasonable condition. Only the inflatable packer was reinstalled after it was cleaned
 and inspected. MWL-MW4 will be used to measure and monitor the elevation of the
 regional aquifer water table in accordance with the LTMMP; future sampling is not
 required.

2.2 **Project Management and Site Closure**

ER sites in the CAC regulatory process are addressed in this section. Two Permit modification requests that are in process with the NMED at this time are summarized in Sections I.2.2.1 through I.2.2.3.

2.2.1 Permit Modification Request Submitted in March 2006

This Quarterly Report addresses 33 sites undergoing corrective action under the Permit and the Consent Order (Table I-1); of these 33 sites, 26 sites were the subject of a request submitted to the NMED in March 2006 (Wagner March 2006) for final determination of CAC. The sites include 19 Solid Waste Management Units (SWMUs) and 7 Areas of Concern (AOCs). The NMED issued the "Notice of Public Comment Period and Intent to Approve a Class 3 Permit Modification of the RCRA Permit for Sandia National Laboratories" for these 26 sites in December 2007 (NMED December 2007). The NMED public review and comment period ended in February 2008.

The following SWMUs and AOCs were included in this Permit modification request:

- SWMUs 4, 5, 46, 49, 52, 68, 91, 101, 116, 138, 140, 147, 149, 150, 154, 161, 196, 223, and 224.
- AOCs 1090, 1094, 1095, 1114, 1115, 1116, and 1117

2.2.2 Permit Modification Request Submitted in January 2008

Five additional sites were submitted for the NMED determination of CAC in a Permit modification request submitted in January 2008 (Wagner January 2008). The four SWMUs and one AOC included in the January 2008 Permit modification request are:

- SWMUs 8, 28-2, 58, and 105
- AOC 1101

This Permit modification request included all remaining SNL/NM ER sites with the exception of three active mission sites (SWMUs 83, 84, and 240), the MWL (SWMU 76), and three groundwater AOCs (Technical Area V Groundwater [TAVG], Burn Site Groundwater [BSG], and Tijeras Arroyo Groundwater [TAG]).

2.2.3 Status of Permit Modification Requests Submitted in March 2006 and January 2008

In April 2010, DOE/Sandia received a letter from the NMED entitled, "Class 3 Permit Modification Requests for Granting Corrective Action Complete Status for 26 SWMUs/AOCs (Request of March 1, 2006) and 5 Other SWMUs/AOCs (Request of January 7, 2008), Sandia National Laboratories, EPA ID #NM5890110518, HWB-SNL-06-007 and HWB-SNL-08-001" (NMED April 2010).

This letter included four main sections:

- 1. "SWMUs Requiring Additional Corrective Action"
- 2. "SWMUs/AOCs to be Subject to Groundwater Monitoring Controls"
- 3. "SWMUs/AOCs to be Restricted to Industrial Land Use"
- 4. "SWMUs/AOCs that do not Require Corrective Action"

The NMED specifies additional groundwater characterization requirements for five SWMUs in the section titled, "SWMUs Requiring Additional Corrective Action." The SWMUs include the following:

- 1. SWMUs 8/58 Open Dump/Coyote Canyon Blast Area
- 2. SWMU 68 Old Burn Site
- 3. SWMU 149 Building 9930 Septic System (Coyote Test Field [CTF])
- 4. SWMU 154 Building 9960 Septic System and Seepage Pits

Activities associated with these requirements are summarized in Section I.2.3 of this ER Quarterly Report. Analytical results for groundwater sampling at these SWMUs 8/58 and 68 are presented in Section III of this ER Quarterly Report.

Subsequent correspondence, in 2012 and 2014, from the NMED granted CAC status to the remaining SWMUs and AOCs that were listed in the April 2010 letter from the NMED (NMED April 2010). These letters are described below.

In a letter dated July 27, 2012, the NMED granted CAC status to three SWMUs/AOCs that were not opposed by the public in the public comment period ending in February 2008 (NMED July 2012). The two SWMUs and one AOC granted CAC status are as follows:

- SWMUs 233 and 234
- AOC 1115

Via Public Notice and letter (both dated September 17, 2012), the NMED solicited public comments and initiated the public comment period on 24 SWMUs/AOCs that the NMED intends, pending public input, to approve as CAC (NMED September 2012). The 24 SWMUs/AOCs included SWMU 52. Twenty-three of these 24 SWMUs/AOCs were from the March 2006 and January 2008 requests.

In response to the NMED's September 17, 2012 Public Notice, the submitted written public comments included requests for a public hearing on the granting of CAC status to the 24 SWMUs/AOCs. The NMED held the Public Hearing on the "Renewal of Hazardous Waste Permit EPA ID Number NM890110518 and Granting of Corrective Action Complete Status For Certain Solid Waste Management Units and Areas Of Concern at Sandia National Laboratories" from May 5 through 8, 2014, in Albuquerque, New Mexico. Sandia provided testimony at the Hearing in support of granting CAC status to the 24 SWMUs/AOCs.

In December 2014, the NMED Secretary signed the Final Order supporting the grant of CAC status to the 24 SWMUs/AOCs in conjunction with the Hazardous Waste Facility Operating Permit (NMED December 2014). This Permit for treatment and storage of hazardous and mixed waste at the SNL Facility and the granting of CAC for the 24 SWMUs/AOCs will become effective on February 26, 2015.

In summary, of the original 31 SWMUs/AOCs submitted for CAC status (26 in 2006 and 5 in 2008), 5 are undergoing additional groundwater investigations, 3 were granted CAC status in 2012, and after a Public Hearing in 2014, the NMED Secretary signed a Final Order supporting the grant of CAC status to the remaining 24 SWMU/AOC sites, which will become effective on February 26, 2015.

2.3 Groundwater Sampling and Analysis

The following sections present groundwater monitoring activities conducted at three groundwater AOCs (TAVG, BSG, and TAG), the MWL, the CWL, and seven SWMUs subject to additional corrective action and groundwater monitoring controls as discussed in Section I.2.2.3 of this ER Quarterly Report. Table I-2 summarizes the groundwater monitoring for these sites.

Analytical results for groundwater monitoring at TAVG AOC; BSG AOC; TAG AOC; the MWL; the CWL; and SWMUs 68, 149, 154, 8/58, 49, and 116 will be presented in the SNL/NM Calendar Year (CY) 2014 Annual Groundwater Monitoring Report, which is anticipated to be submitted to the NMED in the summer 2015.

Analytical results for the CWL groundwater monitoring will be presented and discussed in the CWL Annual Post-Closure Care Report for CY 2014. Also, the analytical results for the MWL groundwater monitoring will be presented and discussed in the MWL Long-Term Monitoring and Maintenance Report for the reporting period of April 1, 2014 to March 31, 2015, which will be submitted to NMED in June 2015.

Perchlorate analysis of groundwater samples for SWMUs 8/58, 68, and BSG AOC is discussed in Section II of this ER Quarterly Report.

Analytical results for the October 2014 groundwater sampling of monitoring wells at SWMUs 8/58 (CCBA-MW-1 and CCBA-MW-2) and SWMU 68 (OBS-MW1, OBS-MW2, and OBS-MW3) are presented in Section III of this ER Quarterly Report.

2.3.1 Technical Area V Groundwater Area of Concern

Groundwater sampling at TAVG AOC was conducted in October and November 2014.

2.3.2 Burn Site Groundwater Area of Concern

Groundwater sampling at BSG AOC was conducted in December 2014. SNL/NM personnel installed two groundwater monitoring wells (CYN-MW14A and CYN-MW15) based on the NMED-approved Monitoring Well Plug and Abandonment Plan and Well Construction Plan (SNL/NM September 2013; NMED June 2014).

2.3.3 Tijeras Arroyo Groundwater Area of Concern

Groundwater sampling at TAG AOC was conducted in November and December 2014. SNL/NM personnel installed one groundwater monitoring well (TA2-W-28) and

decommissioned one groundwater monitoring well (TA2-SW1-320) based on the NMED-approved Monitoring Well Plug and Abandonment Plan and Well Construction Plan (SNL/NM September 2013; NMED June 2014).

2.3.4 Mixed Waste Landfill Groundwater

Groundwater sampling at MWL was conducted in October 2014. Groundwater monitoring results will be presented in the MWL Long-Term Monitoring and Maintenance Report for the reporting period April 1, 2014 to March 31, 2015, which will be submitted to NMED in June 2015.

2.3.5 Chemical Waste Landfill Groundwater

No CWL groundwater monitoring activities were performed during this reporting period. Groundwater monitoring results will be presented in the CWL Annual Post-Closure Care Report for CY 2014, which will be submitted to NMED in March 2015.

2.3.6 SWMUs 8/58 Groundwater

SWMUs 8/58 groundwater sampling was conducted in October 2014. In October 2014, DOE and Sandia notified NMED that groundwater monitoring at SWMUs 8/58 had been completed, and would be discontinued (SNL/NM October 2014).

2.3.7 SWMU 49 Groundwater

In December 2014, NMED approved CAC without Controls for SWMU 49 in conjunction with renewal of the Permit (NMED December 2014). As a result, no long-term controls are needed, and no future sampling activities are planned at SWMU 49.

2.3.8 SWMU 68 Groundwater

SWMU 68 groundwater sampling was conducted in October 2014. In October 2014, DOE and Sandia notified NMED that groundwater monitoring at SWMU 68 had been completed, and would be discontinued (SNL/NM October 2014).

2.3.9 SWMU 116 Groundwater

In December 2014, NMED approved CAC without Controls at SWMU 116 in conjunction with renewal of the Permit (NMED December 2014). Therefore, no long-term controls are needed, and no future sampling activities are planned at SWMU 116.

2.3.10 SWMU 149 Groundwater

In October 2014, DOE and Sandia notified NMED that groundwater monitoring at SWMU 149 had been completed, and would be discontinued (SNL/NM October 2014).

2.3.11 SWMU 154 Groundwater

In October 2014, DOE and Sandia notified NMED that groundwater monitoring at SWMU 154 had been completed, and would be discontinued (SNL/NM October 2014).

2.4 Environmental Restoration Operations Documents Submitted to the NMED Pending Regulatory Review and Approval

This section lists ER documents that have been submitted to the NMED and are, as of this reporting period, still pending review and approval:

- The BSG Interim Measures Work Plan submitted to the NMED on May 26, 2005 (SNL/NM May 2005).
- The BSG Current Conceptual Model of Groundwater Flow and Contaminant Transport submitted to the NMED on April 9, 2008 (SNL/NM March 2008).
- The Technical Area (TA)-V Geophysical Logs and Slug Test Results Report submitted to the NMED on November 24, 2010 (SNL/NM November 2010).
- The MWL Groundwater Monitoring Report for CY 2010 submitted to the NMED on September 30, 2011 (SNL/NM September 2011).

3.0 Long-Term Stewardship Work Completed

3.1 Mixed Waste Landfill

The MWL LTMMP was approved by the NMED on January 8, 2014 (Blaine January 2014). Monitoring, inspections, maintenance/repair, and reporting activities required by the LTMMP represent LTS Program activities and are presented in this section. Implementation of all LTMMP inspection and monitoring activities were initiated upon LTMMP approval. The reporting year for the MWL under the LTMMP is April 1 through March 31 of the next year, with Annual Reports due to the NMED by June 30 of each year.

- Quarterly radon air monitoring is ongoing. The detectors deployed on July 3, 2014 were inspected during the reporting period and will be collected for analysis in early January 2015. No repairs were needed.
- Semiannual groundwater monitoring was performed October 16 to 29, 2014. This completes groundwater monitoring activities for the April 1, 2014 through March 31, 2015 reporting period. Results will be included in the June 2015 annual report.
- The second semiannual soil-vapor monitoring sampling event was completed on October 22, 2014. The first two sampling events for the April 1, 2014 through March 31, 2015 annual reporting period were conducted within 2 months (September and October 2014) to allow for the results to be included in the MWL Annual Long-Term Monitoring and Maintenance Report that will be submitted to the NMED in June 2015 (FLUTe™ well installation completed in July). Future semiannual soil-vapor monitoring will be performed in April and October of each year.
- The quarterly ET Cover System Inspection was performed on December 3, 2014. No maintenance or repairs were required.
- ET Cover maintenance (weed removal from the cover and perimeter fence) was performed October 29 through 30, 2014. Approximately 9 cubic yards of highly compressed weeds were removed from the site, mostly from the perimeter fence.
- One supplemental watering (1/2 inch equivalent) was performed on October 28, 2014, and the supplemental watering system was drained and prepared for winter on November 19, 2014.
- Additional information on activities performed at the MWL during this reporting period are provided in Section I.2.1.

3.2 Chemical Waste Landfill

The CWL Post-Closure Care Permit (PCCP) (NMED October 2009) became effective on June 2, 2011, when the NMED approved the CWL Final RCRA Closure Report (Kieling June 2011), transitioning the CWL from SNL/NM ER to LTS. A summary of post-closure care activities at the CWL for this reporting period is provided in this ER Quarterly Report. More detailed documentation of ongoing activities under the PCCP will be reported in the CY 2014 CWL Annual Post-Closure Care Report (due to the NMED in March 2015). Activities for this reporting period include the following:

- ET Cover maintenance work was conducted on October 28, 2014. Dead and live weeds
 were removed from the cover surface, perimeter fence, storm water diversion features,
 and the perimeter area just outside the fence line. A total of approximately 1 cubic yard
 of compressed weeds was removed from the site.
- The quarterly ET Cover System Inspection (surface, storm water diversion structures, security fence, and survey monuments) was performed on December 9, 2014. Excess sediment in the southwest drainage culvert was removed along with windblown weed debris in the perimeter fence. No other issues were identified.
- Supplemental watering (1 inch equivalent event) was performed over two days from October 13 through 14, 2014. The large sprinkler and hose were decommissioned for the winter on October 29, 2014.

3.3 Corrective Action Management Unit

The CAMU post-closure care operations consist of vadose zone monitoring, leachate removal, and post-closure inspections as required in the PCCP.

Activities for this reporting period (October, November, and December 2014) include the following:

- The September 2013 quarterly inspection identified the need to remove sediment accumulation and make minor repairs to the perimeter drainage on the east and north sides, at the toe of the containment cell. After evaluating various options and alternatives, the internal work plan was approved September 23, 2014 and the field effort began September 30, 2014. The work was completed October 29, 2014. The repair work included removal of excess accumulated sediment from the perimeter drainage, grading to repair rill erosion, and placement of gravel on the slope and perimeter road east and north of the containment cell to help prevent future erosion. Figure I-1 is a view looking south on the east side of the containment cell showing work in progress for removing sediment accumulation from the perimeter drainage and repairing rill erosion. Figure I-2 is a view looking north on the east side of the containment cell showing the completed repair work.
- The September 2014 quarterly inspection identified the need to remove excessive weed growth in the northwest retention pond. The weeds were removed on October 29, 2014.

- Quarterly monitoring of the Vadose Zone Monitoring System was conducted in November 2014. The results will be presented in the CAMU Report of Post-Closure Care Activities, July - December (anticipated submittal to the NMED in March 2015).
- Weekly pumping of leachate from the leachate collection and removal system (LCRS) was performed. Waste management associated with the LCRS during this reporting period is presented in Section I.3.3.1.
- Composite leachate sampling for waste characterization was conducted on November 17, 2014.
- Weekly inspections of the RCRA less than 90-day accumulation area were performed.
- Quarterly inspection of the site was performed on December 9 and December 18, 2014, which included the containment cell cover, stormwater diversion structures, security fences, gates, signs, and benchmarks. The findings and maintenance activities include the following:
 - A small number of plants with the potential to develop a deep root system were identified growing on the cover. They are scheduled to be clipped at or below ground level in February or early March of 2015 per the SNL/NM staff biologist recommendation that greatest mortality is achieved when clipped during the winter months.

3.3.1 CAMU Waste Management Activities

CAMU waste management data for the reporting period are documented in this section. Solid waste (i.e., personal protective equipment, paper wipes, and plastic drum pump) generated during this reporting period did not exceed 10 pounds. All waste is removed from the site by Hazardous Waste Handling Facility personnel.

- Leachate and rinsate waste stored on site as of September 30, 2014 equaled 21 and 0 gallons, respectively.
- Leachate and rinsate waste generated on site during the reporting period equaled 79 and 0 gallons, respectively. Leachate waste removed from the site on November 24, 2014 equaled 66 gallons.
- Leachate waste remaining on site at the end of this reporting period equaled 34 gallons.

3.3.2 **CAMU Regulatory Activities**

In December 2014, NMED signed the Final Order supporting the issuance of the Permit (NMED December 2014), which will become effective on February 26, 2015. Post-closure care of the CAMU will be performed under the Permit in the CY 2015.

3.4 Long-Term Stewardship Documents Submitted to the NMED Pending Regulatory Review and Approval

The request for modification to the hazardous waste permit for the CAMU allowing the use of alternative analytical methods for soil-gas samples, including but not limited to, U.S. Environmental Protection Agency Method Technical Order 15 was sent to the NMED on October 25, 2013 (Beausoleil October 2013).

The CAMU Vadose Zone Monitoring System Annual Monitoring Results Report for 2014 (reporting period July 2013 through June 2014) was submitted to the NMED on September 29, 2014 (SNL/NM September 2014).

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Figures



Figure I-1 CAMU Repair Work in Progress



Figure I-2 CAMU Repair Work Completed

Tables

Table I-1 **Environmental Restoration Sites Subject to Corrective Action Regulatory Process**

Solid Waste Management Units				
Site Number	Site Description			
4	LWDS Surface Impoundments (TA-V)			
5	LWDS Drainfield			
8	Open Dump (CCBA)			
28-2	Mine Shafts			
46	Old Acid Waste Line Outfall			
49	Building 9820 Drains (Lurance Canyon)			
52	LWDS Holding Tank			
58	CCBA			
68	Old Burn Site			
76	MWL (TA-III)			
83	Long Sled Track			
84	Gun Facilities			
91	Lead Firing Site (Thunder Range)			
101	Building 9926/9926A Septic System and Seepage Pit (CTF)			
105	Mercury Spill Building 6536			
116	Building 9990 Septic System (CTF)			
138	Building 6630 Septic System (TA-III)			
140	Building 9965 Septic System (Thunder Range)			
147	Building 9925 Septic Systems (CTF)			
149	Building 9930 Septic System (CTF)			
150	Buildings 9939/9939A Septic System and Drain Field (CTF)			
154	Building 9960 Septic System and Seepage Pits (CTF)			
161	Building 6636 Septic System (TA-III)			
196	Building 6597 Cistern (TA-V)			
240	Short Sled Track			
Total	25			
	Areas of Concern			
Site Number	Site Description			
300	TAG Investigation			
1090	Building 6721 Septic System (TA-III)			
1094	Live Fire Range East Septic System (Lurance Canyon)			
1095	Building 9938 Seepage Pit (CTF)			
1101	Building 885 Septic System (TA-I)			
1114	Building 9978 Drywell (CTF)			
1116	Building 9981A Seepage Pit (Solar Tower Complex			
1117	Building 9982 Drywell (Solar Tower Complex)			
Total	8			

Notes

CCBA = Coyote Canyon Blast Area.

CTF = Coyote Carlyon blast Alea.

CTF = Coyote Test Field.

LWDS = Liquid Waste Disposal System.

MWL = Mixed Waste Landfill.

TA = Technical Area.

TA TAG = Tijeras Arroyo Groundwater (Area of Concern).

Table I-2
Groundwater Sampling and Analysis

Investigation Site	Sampling Frequency in CY 2014 ^a	Quarter of Sampling in CY 2014	Location of Analytical Results	Location of Perchlorate Analytical Results	Monitoring Wells in Network
TAVG AOC	Quarterly	1,2,3,4	AGMR	NA	AVN-1, LWDS-MW1, LWDS-MW2, TAV-MW2, TAV-MW3, TAV-MW4, TAV-MW5, TAV-MW6, TAV-MW7, TAV-MW8, TAV-MW9, TAV-MW10, TAV-MW11, TAV-MW12, TAV-MW13, TAV-MW14
BSG AOC	Semiannually	2,4	AGMR	NA	CYN-MW4, CYN-MW7, CYN-MW8, CYN-MW9, CYN-MW10, CYN-MW11, CYN-MW12, CYN-MW13, CYN- MW14A, CYN-MW15
TAG AOC	Quarterly	1,2,3,4	AGMR	NA	PGS-2, TA1-W-01, TA1-W-02, TA1-W-03, TA1-W-04, TA1-W-05, TA1-W-06, TA1-W-08, TA2-NW1-595, TA2-SW1-320, TA2-W-01, TA2-W-19, TA2-W-26, TA2-W-27, TA2-W-28, TJA-2, TJA-3, TJA-4, TJA-6, TJA-7, WYO-3, WYO-4
MWL Groundwater	Semiannually	2,4	AGMR, Section 4 of MWL ALTMM Report	NA	MWL-BW2, MWL-MW7, MWL-MW8, MWL-MW9
CWL Groundwater	Semiannually	1,3	AGMR, Section 4 CWL PCCP Report	NA	CWL-BW5, CWL-MW9, CWL-MW10, CWL-MW11
SWMUs 8/58 Groundwater	Quarterly	1,2,3,4	AGMR, Section IV of ER Quarterly	Section II of ER Quarterly	CCBA-MW1, CCBA-MW2
SWMU 68 Groundwater	Quarterly	1,2,3,4	AGMR, Section IV of ER Quarterly	Section II of ER Quarterly	OBS-MW1, OBS-MW2, OBS-MW3
SWMU 49 Groundwater	Annually	1	AGMR	AGMR and Section II of ER Quarterly Report, First Quarter of CY14	CYN-MW5
SWMU 116 Groundwater	Annually	1	AGMR	AGMR and Section II of ER Quarterly Report, First Quarter of CY14	CTF-MW1

Table I-2 (Concluded) Groundwater Sampling and Analysis

Investigation Site	Sampling Frequency in CY 2014 ^a	Quarter of Sampling in CY 2014	Location of Analytical Results	Location of Perchlorate Analytical Results	Monitoring Wells in Network
SWMU 149	Quarterly	1,2,3,4	AGMR	NA	CTF-MW3
Groundwater					
SWMU 154	Quarterly	1,2,3,4	AGMR, Section III	NA	CTF-MW2
Groundwater	-		of ER Quarterly		

Notes

^aNot all wells in a particular investigation are sampled at the same frequency; this represents the maximum frequency of sampling at a site.

AGMR = Annual Groundwater Monitoring Report.

ALTMM = Annual Long-Term Monitoring and Maintenance.

AOC = Area of Concern. AVN = Area V (North).

BSG = Burn Site Groundwater (Area of Concern).

BW = Background well.

CCBA = Coyote Canyon Blast Area.

CTF = Coyote Test Field. CWL = Chemical Waste Landfill.

CY = Calendar Year. CYN = Lurance Canyon.

ER = Environmental Restoration Operations.

LWDS = Liquid Waste Disposal System.

MW = Monitoring Well. MWL = Mixed Waste Landfill.

NA = Not applicable. No wells in the site network are currently being sampled and analyzed for perchlorate.

OBS = Old Burn Site.

PCCP = Post-Closure Care Permit.
PGS = Parade Ground South.
SWMU = Solid Waste Management Unit.
TA1-W = Technical Area I (Well).
TA2-NW = Technical Area II (Northwest).
TA2-SW = Technical Area II (Southwest).

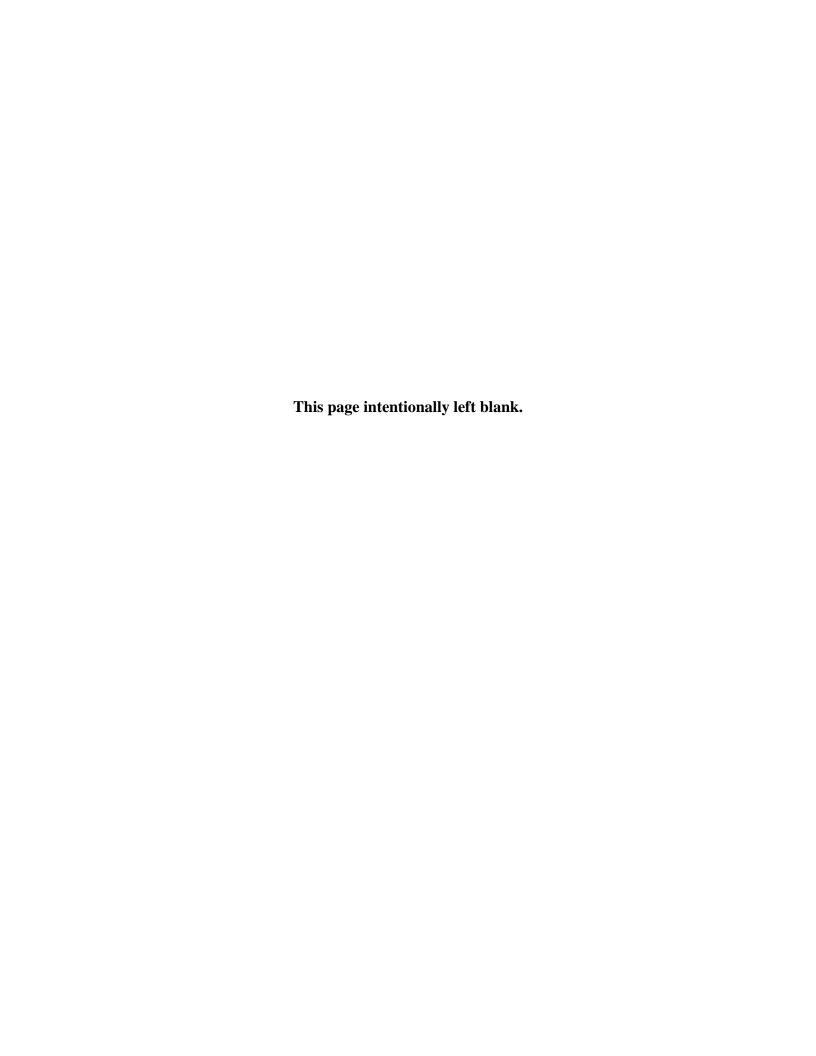
TA2-W = Technical Area II (Well).

TAG = Tijeras Arroyo Groundwater (Area of Concern).

TAV = Technical Area V.

TAVG = Technical Area V Groundwater (Area of Concern).

TJA = Tijeras Arroyo. WYO = Wyoming.



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APPENDICES

Appendix A	Analytical Laboratory Certificates of Analysis for the Perchlorate Data
Appendix B	Data Validation Sample Findings Summary Sheets for the Perchlorate Data

SECTION II PERCHLORATE SCREENING QUARTERLY GROUNDWATER MONITORING REPORT, October – December 2014

1.0 Introduction

Section IV.B of the Compliance Order on Consent (the Consent Order), between the New Mexico Environment Department (NMED), the U.S. Department of Energy (DOE), and Sandia Corporation (Sandia), jointly referred to as DOE/Sandia, for Sandia National Laboratories, New Mexico (SNL/NM), effective on April 29, 2004, stipulates that a select group of groundwater monitoring wells at SNL/NM be sampled for perchlorate (NMED April 2004). This section of the Environmental Restoration Operations (ER) Consolidated Quarterly Report (ER Quarterly Report) summarizes the perchlorate screening groundwater monitoring completed during the Fourth Quarter of Calendar Year (CY) 2014 (October, November, and December) in response to the requirements of the Consent Order. The outline of this report is based on the required elements of a "Periodic Monitoring Report" described in Section X.D. of the Consent Order (NMED April 2004).

In November 2005, DOE/Sandia submitted a letter report on the status of perchlorate screening in groundwater at SNL/NM monitoring wells (SNL/NM November 2005). The purpose of the letter report was to summarize previous correspondence and sampling results, and to outline proposed future work to comply with NMED requirements for perchlorate screening of groundwater. As specified in the letter report, quarterly reports will be submitted for wells active in the perchlorate screening monitoring well network.

Based on the NMED response (NMED January 2006), DOE/Sandia will submit each quarterly report within 90 days following the quarter that the data represent. In November 2008, DOE/Sandia received approval from the NMED to proceed to semiannual reporting (NMED November 2008); however, upon further consideration, the NMED once more required quarterly reporting (NMED April 2009). This did not alter the previously negotiated frequency for monitoring well CYN-MW6, an existing Burn Site Groundwater (BSG) Area of Concern (AOC) monitoring well that has been under the sampling and reporting requirements of the Consent Order since the well was installed, which remains at a semiannual frequency for sampling and reporting. Due to declining water levels, CYN-MW6 has insufficient water to sample and the replacement monitoring well (CYN-MW15) has assumed the negotiated frequency. In September 2011, DOE/Sandia requested an extension of the submittal dates by one month for ER Quarterly Reports (SNL/NM September 2011). The request was approved by the NMED (September 2011), which allows DOE/Sandia to submit perchlorate quarterly reports within 120 days following the quarter that the data represent.

This report is the thirty-sixth to be submitted since the November 2005 letter report; the previous reports were submitted for Fourth Quarter of CY 2005 through the Third Quarter of CY 2014 (SNL/NM February 2006 and January 2015).

Groundwater at Solid Waste Management Units (SWMUs) 8/58 monitoring wells CCBA-MW1 and CCBA-MW2 has been sampled 13 times; and SWMU 68 monitoring wells OBS-MW1, OBS-MW2, and OBS-MW3 has been sampled 13 times; and newly installed BSG AOC monitoring wells was sampled for the first time (Table II-1). The Consent Order requires that new wells be sampled for perchlorate for a minimum of four quarters (NMED April 2004). Reporting will continue as long as groundwater monitoring wells remain active in the perchlorate screening monitoring well network unless otherwise negotiated with the NMED.

2.0 Scope of Activities

This report provides perchlorate screening groundwater monitoring analytical results for the Fourth Quarter of CY 2014 (October, November, and December) for the wells currently active in the perchlorate screening program as shown on Figure II-1 and listed in Table II-1. In accordance with the requirements of Table XI-1 of the Consent Order, a well with four consecutive quarters of nondetects (NDs) for perchlorate at the screening level/method detection limit (MDL) of 4 micrograms per liter (μ g/L) is removed from the requirement of continued monitoring for perchlorate.

Data for numerous wells identified in the Consent Order have satisfied this requirement; therefore, these wells have been removed from the perchlorate screening program. The perchlorate results for these wells have been provided in previous reports and are not discussed in this current report. Wells discussed in previous perchlorate screening reports are included in Table II-2.

SNL/NM personnel performed groundwater sampling for perchlorate at seven wells on the dates listed in Table II-1. Several of the wells were installed after the Consent Order was finalized (NMED April 2004) and were therefore required to be sampled for perchlorate as "new" wells; the other wells were sampled to meet other regulatory requirements (discussed in Section II.3.0).

Groundwater sampling activities were conducted in accordance with procedures outlined in the following investigation-specific sampling and analysis plans (SAPs) entitled:

- "SWMUs 8/58 Groundwater Monitoring, Mini-SAP for First Quarter, Fiscal Year 2015" (SNL/NM September 2014a)
- "SWMU 68 Groundwater Monitoring, Mini-SAP for First Quarter, Fiscal Year 2015" (SNL/NM September 2014b)
- "Burn Site Groundwater Monitoring, Mini-SAP for First Quarter, Fiscal Year 2015" (SNL/NM November 2014)

As described in the Mini-SAPs, groundwater sampling was performed in accordance with current SNL/NM Environmental Management, Long-Term Stewardship Project Field Operating Procedures (FOPs). A portable Bennett[™] groundwater sampling system was used to collect the groundwater samples. The sampling pump and tubing bundle were decontaminated prior to insertion into monitoring wells in accordance with procedures described in FOP 05-03, "Groundwater Monitoring Equipment Decontamination" (SNL/NM January 2012a). Each well was purged a minimum of one saturated screen volume before sampling in accordance with FOP 05-01, "Groundwater Monitoring Well Sampling and Field Analytical Measurements" (SNL/NM January 2012b).

Field water quality measurements for turbidity, pH, temperature, specific conductance (SC), oxidation-reduction potential (ORP), and dissolved oxygen (DO) were obtained from the well prior to collecting groundwater samples. Groundwater temperature, SC, ORP, DO, and pH were measured with an YSITM Model EXO1 water quality meter. Turbidity was measured with a HACHTM Model 2100Q turbidity meter. Purging continued until four stable measurements for turbidity, pH, temperature, and SC were obtained. Groundwater stability is considered acceptable when the following parameters are achieved:

- Turbidity measurements are less than 5 nephelometric turbidity units (NTU), or within 10 percent for turbidity values greater than 5 NTU.
- pH is within 0.1 units.
- Temperature is within 1.0 degree Celsius.
- SC is within 5 percent.

Field measurement logs documenting details of well purging and water quality measurements have been submitted to the SNL/NM Records Center.

The groundwater samples were submitted to GEL Laboratories LLC (GEL) for chemical analysis of perchlorate using U.S. Environmental Protection Agency (EPA) Method 314.0 (EPA November 1999). The sample identification, Analysis Request/Chain-of-Custody form number, and the associated groundwater investigation are provided in Table II-3. The analytical report from GEL, including certificates of analyses (COA) (Appendix A), analytical methods, MDLs, practical quantitation limits, dates of analyses, and results of quality control (QC) analyses and data validation findings (Appendix B), have been submitted to the SNL/NM Records Center.

3.0 **Regulatory Criteria**

For a given monitoring well, four consecutive ND results using the screening level/MDL of 4 μ g/L are considered by the NMED as evidence of the absence of perchlorate, such that additional monitoring for perchlorate in that well is not required. If perchlorate is detected using the screening level/MDL of 4 μ g/L in a specific well, then monitoring will continue at that well at a frequency negotiated with the NMED. The Consent Order (NMED April 2004) also requires that for detections equal to or greater than 4 μ g/L, DOE/Sandia will evaluate the nature and extent of perchlorate contamination, based on a screening level/MDL of 4 μ g/L, and incorporate the results of this evaluation into a Corrective Measures Evaluation (CME). Section VII.C of the Consent Order clarifies that the CME process will be initiated where there is a documented release to the environment, and where corrective measures are necessary to protect human health and the environment.

3.1 **Burn Site Groundwater Area of Concern**

In March 2007, DOE/Sandia received a letter of approval from the NMED, which stated the requirement that DOE/Sandia "determine the nature and extent of the contamination and complete a CME for the perchlorate-impacted groundwater in the vicinity of CYN-MW6" (NMED March 2007). As this was based solely on four quarters of monitoring results, DOE/Sandia submitted a letter to the NMED in April 2007 (SNL/NM April 2007) recommending further characterization through continued quarterly monitoring of monitoring well CYN-MW6 for four additional quarters, ending in December 2007, to ensure appropriate characterization of this well. In January 2008, DOE/Sandia requested a meeting with the NMED to discuss the need for continued monitoring or additional characterization work and, potentially, a CME.

In preparation for discussing the perchlorate-impacted groundwater in the vicinity of monitoring well CYN-MW6, and to show that the requirement "to determine the nature and extent of contamination" (NMED March 2007) has been met, DOE/Sandia provided supporting information to the NMED (SNL/NM March 2008). Perchlorate in surface soil has been characterized at several SWMUs in the study area (SNL/NM June 2006 and March 2008–Appendix C). Based on these data, DOE/Sandia considers the nature and extent of perchlorate in groundwater at the BSG AOC to be sufficiently characterized. Since 2004, groundwater samples from four other monitoring wells in the vicinity of the BSG AOC have been analyzed for perchlorate, including monitoring wells CYN-MW1D, CYN-MW5, CYN-MW7, and CYN-MW8. All wells were sampled for four quarters and all results were ND for perchlorate (SNL/NM March 2008–Appendix D).

In accordance with the requirements of Section VI.K.1.b of the Consent Order (NMED April 2004), a human health risk assessment has been performed to evaluate the potential for adverse health effects from the concentrations of perchlorate detected in monitoring well CYN-MW6 groundwater samples. The maximum perchlorate concentration to date of 8.93 μ g/L was used in the risk assessment. The calculated hazard quotient (HQ) of 0.35 is less than the NMED target level of a hazard index (the sum of all HQs) of 1.0 (NMED June 2006, SNL/NM March 2008–Appendix E).

Because perchlorate concentrations in samples from monitoring well CYN-MW6 have exceeded the screening level, DOE/Sandia initiated a negotiation process with the NMED (SNL/NM March 2007) to determine the frequency of continued monitoring. In November 2008, DOE/Sandia received approval from the NMED to proceed with semiannual monitoring of perchlorate in monitoring well CYN-MW6 and proceed with semiannual reporting of all perchlorate results (NMED November 2008). Upon further consideration, the NMED once more required that DOE/Sandia resume quarterly reporting of perchlorate results with the exception of monitoring well CYN-MW6 (NMED April 2009). Due to declining water levels, CYN-MW6 has insufficient water to sample and the replacement monitoring well (CYN-MW15) has assumed the negotiated frequency.

In April 2009, DOE/Sandia received a letter from the NMED requiring DOE/Sandia to characterize the nature and extent of the perchlorate contamination in soil and groundwater in the BSG AOC (NMED April 2009). A characterization work plan was prepared and submitted to the NMED (SNL/NM November 2009), approved by the NMED (February 2010), and implemented in July 2010.

3.2 Tijeras Arroyo Groundwater and Technical Area V Groundwater Areas of Concern

The April 2009 letter from the NMED to DOE/Sandia was not limited to the BSG AOC (NMED April 2009). In the April 2009 letter, the NMED had also requested that DOE/Sandia monitor perchlorate concentrations for a minimum of four quarters at several Tijeras Arroyo Groundwater AOC and Technical Area V AOC monitoring wells (NMED April 2009); all of these wells have been sampled for four consecutive monitoring events with no perchlorate detections and have since been removed from the perchlorate sampling list.

3.3 March 2006 and January 2008 Permit Modification Requests

During the First Quarter of CY 2011, four monitoring wells were added to the perchlorate monitoring network based on the NMED letter of April 8, 2010, entitled, "Class 3 Permit Modification Requests for Granting Corrective Action Complete Status for 26 SWMUs/AOCs (Request of March 1, 2006) and 5 Other SWMUs/AOCs (Request of January 7, 2008), Sandia National Laboratories, EPA ID #NM5890110518 HWB-SNL-06-007 and HWB-SNL-08-001" (NMED April 2010). The sites and the requests are described in Section I.2.2 of this ER Quarterly Report. The NMED letter required work plans and groundwater monitoring at the following SWMUs:

- SWMU 8/58—Installation of at least two groundwater monitoring wells west of and near Features YY and OO, submittal and approval of a work plan.
- SWMU 49—Annual sampling of existing monitoring well CYN-MW5.
- SWMU 68—Installation of monitoring wells near the burn pan and associated ditch/surface impoundments, submittal and approval of a work plan.
- SWMU 116—Annual sampling of existing monitoring well CTF-MW1.
- SWMU 149—Submittal of a SAP and quarterly sampling of existing monitoring well CTF-MW3 for a minimum of eight quarters.
- SWMU 154—Submittal of a SAP and quarterly sampling of existing monitoring well CTF-MW2 for a minimum of eight quarters.

To fulfill the requirements of the April 2010 NMED letter, DOE/Sandia submitted a SAP for monitoring wells CTF-MW2 and CTF-MW3 (SNL/NM June 2010) that was subsequently

approved (with modifications) by the NMED (December 2010). As of this reporting period, all of the requirements of the April 2010 NMED letter have been met and CTF-MW2 and CTF-MW3 will no longer be sampled for perchlorate.

The NMED letter of April 8, 2010, also required work plans, installation of groundwater monitoring wells, and groundwater monitoring at the following SWMUs:

- SWMUs 8/58—Two groundwater monitoring wells must be installed (CCBA-MW1 and CCBA-MW2) and sampled quarterly for a minimum of eight quarters.
- SWMU 68—Three groundwater monitoring wells must be installed (OBS-MW1, OBS-MW2, and OBS-MW3) and sampled quarterly for a minimum of eight quarters.

To fulfill the requirements of the April 2010 NMED letter, DOE/Sandia submitted a Well Installation Plan/SAP for monitoring wells CCBA-MW1, CCBA-MW2, OBS-MW1, OBS-MW2, and OBS-MW3 (SNL/NM September 2010) that was subsequently approved (with modification) by the NMED (January 2011). As of this reporting period, all of the requirements of the April 2010 NMED letter have been met and CCBA-MW1, CCBA-MW2, OBS-MW1, OBS-MW2, and OBS-MW3 will no longer be sampled for perchlorate.

4.0 Monitoring Results

Table II-3 summarizes the details of samples collected from monitoring wells CCBA-MW1, CCBA-MW2, CYN-MW14A, CYN-MW15, OBS-MW1, OBS-MW2, and OBS-MW3 in the Fourth Quarter of CY 2014. Table II-4 summarizes current and historical perchlorate results for wells currently in the perchlorate screening monitoring network. The analytical laboratory COA for the Fourth Quarter of CY 2014 perchlorate data is provided in Appendix A. Consistent with historical analytical results, no perchlorate was detected above the screening level in any samples collected from monitoring wells CCBA-MW1, CCBA-MW2, OBS-MW1, OBS-MW2, or OBS-MW3. Also, there was no perchlorate detected above the screening level in any samples collected from the new/replacement monitoring wells CYN-MW14A and CYN-MW15.

Table II-5 summarizes the stabilized water quality values measured immediately before the groundwater samples were collected. The field water quality measurements include turbidity, pH, temperature, SC, ORP, and DO.

The analytical data were reviewed and validated in accordance with Administrative Operating Procedure 00-03, "Data Validation Procedure for Chemical and Radiochemical Data," Revision 3 (SNL/NM May 2011). No problems were identified with the analytical data that resulted in qualification of the data as unusable. The data are acceptable, and reported QC measures are adequate. The data validation sample findings summary sheets for the perchlorate data are provided in Appendix B.

No variances or nonconformances in perchlorate sampling field activities, or field conditions from requirements in the groundwater monitoring Mini-SAPs (SNL/NM September 2014a, September 2014b, and November 2014), were identified during the Fourth Quarter of CY 2014 sampling activities.

5.0 **Summary and Conclusions**

Based on the analytical data presented in Table II-4 and in previous reports, the following statements can be made:

- No perchlorate was detected in the environmental samples from groundwater monitoring wells CCBA-MW1, CCBA-MW2, CYN-MW14A, CYN-MW15, OBS-MW1, OBS-MW2, or OBS-MW3 at the screening level/MDL of 4 μg/L.
- Since June 2004 (the start of sampling as required by the Consent Order), perchlorate was detected above the screening level/MDL (4 μg/L) in groundwater samples from only one of the wells (CYN-MW6) in the perchlorate screening monitoring well network. Due to a deficiency of water in CYN-MW6, replacement well CYN-MW15 was installed adjacent to CYN-MW6. No perchlorate was detected in samples collected from this replacement well.

Because regulatory requirements have been met, DOE/Sandia will discontinue monitoring of perchlorate for monitoring wells CTF-MW1, CYN-MW5, CCBA-MW1, CCBA-MW2, CTF-MW2, CTF-MW3, OBS-MW1, OBS-MW2, and OBS-MW3. DOE/Sandia will continue periodic monitoring of perchlorate for monitoring wells CYN-MW14A and CYN-MW15.

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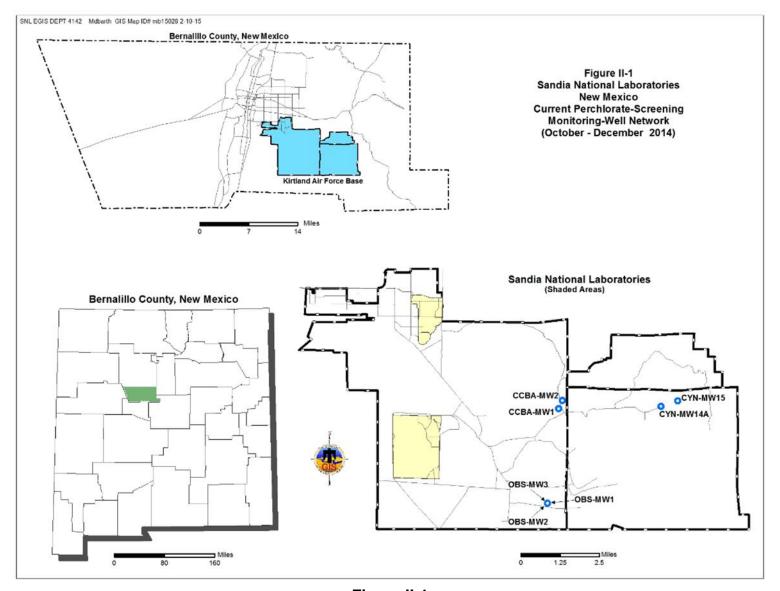


Figure II-1
Sandia National Laboratories, New Mexico
Current Perchlorate Screening Monitoring Well Network, October – December 2014

Tables

Table II-1 Current Perchlorate Screening Monitoring Well Network Fourth Quarter, CY 2014

Well	Date Sampled	Number of Consecutive Sampling Events ^a	Remaining Number of Sampling Events ^b	Sampling Equipment
CCBA-MW1	13-Oct-14	13	0	Bennett™ Pump
CCBA-MW2	14-Oct-14	13	0	Bennett™ Pump
CYN-MW14A	17-Dec-14	1	3	Bennett™ Pump
CYN-MW15	17-Dec-14	1	TBD ^c	Bennett™ Pump
OBS-MW1	06-Oct-14	13	0	Bennett™ Pump
OBS-MW2	07-Oct-14	13	0	Bennett™ Pump
OBS-MW3	08-Oct-14	13	0	Bennett™ Pump

Notes

^bPer the requirements of Table XI-1 of the Consent Order (NMED April 2004), a well will be removed from the perchlorate screening monitoring well network after four quarters unless perchlorate is detected above the screening level/MDL of 4 μg/L.

^cTBD = To be determined. This well was installed as a replacement well for CYN-MW6. Because perchlorate concentrations in CYN-MW6 have exceeded the screening level, DOE/Sandia and the NMED have agreed to further characterization requirements in the Burn Site Groundwater Area of Concern (NMED February 2010).

 μ g/L = Microgram(s) per liter. CCBA = Coyote Canyon Blast Area.

CY = Calendar Year.

CYN = Canyons (Burn Site Groundwater Area of Concern).

DOE/Sandia = U.S. Department of Energy/Sandia Corporation.

MDL = Method Detection Limit.

MW = Monitoring Well.

NMED = New Mexico Environment Department.

OBS = Old Burn Site.

The Consent Order = The Compliance Order on Consent.

^aIncludes this sampling event.

Table II-2 Monitoring Wells Discussed in Previous Perchlorate Screening Reports

Well
CTF-MW1
CTF-MW2
CTF-MW3
CYN-MW1D
CYN-MW5
CYN-MW6
CYN-MW7
CYN-MW8
CYN-MW9
CYN-MW10
CYN-MW11
CYN-MW12
LWDS-MW1
MRN-2
MRN-3D
MWL-BW1
MWL-BW2
MWL-MW1
MWL-MW7
MWL-MW8
MWL-MW9
NWTA3-MW2
SWTA3-MW4
TA1-W-03
TA1-W-06
TA1-W-08
TA2-W-01
TA2-W-27
TAV-MW11
TAV-MW12
TAV-MW13
TAV-MW14

Notes

BW = Background Well. CTF = Coyote Test Field.

CYN = Canyons (Burn Site Groundwater Area of Concern).

LWDS = Liquid Waste Disposal System.

MRN = Magazine Road North. MW = Monitoring Well. MWL = Mixed Waste Landfill.

NWTA = Northwest Technical Area (III). SWTA = Southwest Technical Area (III).

= Technical Area. TA

= Well. W

Table II-3 Sample Details for Fourth Quarter, CY 2014 Perchlorate Sampling

Well	Sample Identification	AR/COC Number	Associated Groundwater Investigation
CCBA-MW1	096685-020	615822	
CCBA-MW2	096691-020	615824	SWMUs 8/58
CCBA-MW2 (Duplicate)	096692-020	013024	
CYN-MW14A	096977-020	615940	BSG AOC
CYN-MW15	096979-020	615941	BSG AOC
OBS-MW1	096653-020	615811	
OBS-MW2	096658-020	615813	SWMU 68
OBS-MW2 (Duplicate)	096659-020	013013	SVVIVIO 66
OBS-MW3	096661-020	615814	

Notes

AR/COC = Analysis Request/Chain-of-Custody.

BSG AOC = Burn Site Groundwater Area of Concern.

CCBA

CY

= Coyote Canyon Blast Area.
= Calendar Year.
= Canyons (Burn Site Groundwater Area of Concern). CYN

MW = Monitoring Well. = Old Burn Site. OBS

SWMU = Solid Waste Management Unit.

Table II-4
Summary of Perchlorate Screening Analytical Results for the
Current Monitoring Well Network as of Fourth Quarter, CY 2014

Well	Sample	AR/COC	Sample	Result	MDL	PQL	MCL	Laboratory	Validation	Analytical	Comments
	Date	Number	Number	(μ g/L)	(μg/L)	(μg/L)	(μg/L)	Qualifier ^a	Qualifier ^b	Method ^c	
SWMUs 8/58			,		1	ľ	1				T
	31-Oct-11	613883	091345-020	ND	4.0	12	NE	U		EPA 314.0	
	16-Jan-12	613958	091615-020	ND	4.0	12	NE	U		EPA 314.0	
			091616-020	ND	4.0	12	NE	U		EPA 314.0	Duplicate sample
	23-Apr-12	614155	092291-020	ND	4.0	12	NE	U		EPA 314.0	
	16-Jul-12	614288	092615-020	ND	4.0	12	NE	U		EPA 314.0	
			092616-020	ND	4.0	12	NE	U		EPA 314.0	Duplicate sample
	22-Oct-12	614466	093013-020	ND	4.0	12	NE	U		EPA 314.0	
	16-Jan-13	614567	093341-020	ND	4.0	12	NE	U		EPA 314.0	
			093342-020	ND	4.0	12	NE	U		EPA 314.0	Duplicate sample
CCBA-MW1	24-Apr-13	614745	093873-020	ND	4.0	12	NE	U		EPA 314.0	
	16-Jul-13	614939	094376-020	ND	4.0	12	NE	U		EPA 314.0	
			094377-020	ND	4.0	12	NE	J		EPA 314.0	Duplicate sample
	10-Oct-13	615095	094779-020	ND	4.0	12	NE	U		EPA 314.0	
	27-Jan-14	615211	095213-020	ND	4.0	12	NE	J		EPA 314.0	
	27-Jan-14	013211	095214-020	ND	4.0	12	NE	U		EPA 314.0	Duplicate sample
	07-Apr-14	615424	095725-020	ND	4.0	12	NE	U		EPA 314.0	
	22-Jul-14	615628	096269-020	ND	4.0	12	NE	U		EPA 314.0	
	22-Jul-14	013020	096270-020	ND	4.0	12	NE	U		EPA 314.0	Duplicate sample
	13-Oct-14	615822	096685-020	ND	4.0	12	NE	U		EPA 314.0	
	01-Nov-11	613885	091349-020	ND	4.0	12	NE	U		EPA 314.0	
	01-NOV-11	013000	091350-020	ND	4.0	12	NE	U		EPA 314.0	Duplicate sample
	12-Jan-12	613956	091610-020	ND	4.0	12	NE	U		EPA 314.0	
	04 4 40	C4.44.E7	092296-020	ND	4.0	12	NE	U		EPA 314.0	
	24-Apr-12	614157	092297-020	ND	4.0	12	NE	U		EPA 314.0	Duplicate sample
	12-Jul-12	614286	092610-020	ND	4.0	12	NE	U		EPA 314.0	
	23-Oct-12	614468	093018-020	ND	4.0	12	NE	U		EPA 314.0	
	23-001-12	014400	093019-020	ND	4.0	12	NE	U		EPA 314.0	Duplicate sample
	15-Jan-13	614565	093336-020	ND	4.0	12	NE	U		EPA 314.0	
CCBA-MW2	05 0 10	C4 47 47	093878-020	ND	4.0	12	NE	U		EPA 314.0	
CCBA-IVIVV2	25-Apr-13	614747	093879-020	ND	4.0	12	NE	U		EPA 314.0	Duplicate sample
	15-Jul-13	614937	094371-020	ND	4.0	12	NE	U		EPA 314.0	
	14-Oct-13	615095	094779-020	ND	4.0	12	NE	U		EPA 314.0	
	14-Oct-13	615095	094780-020	ND	4.0	12	NE	U		EPA 314.0	Duplicate sample
	23-Jan-14	615209	095208-020	ND	4.0	12	NE	U		EPA 314.0	,
			095730-020	ND	4.0	12	NE	U		EPA 314.0	
	08-Apr-14	615426	095731-020	ND	4.0	12	NE	U		EPA 314.0	Duplicate sample
	21-Jul-14	615626	096263-020	ND	4.0	12	NE	U		EPA 314.0	'
			096691-020	ND	4.0	12	NE	U		EPA 314.0	
	14-Oct-14	615824	096692-020	ND	4.0	12	NE	U		EPA 314.0	Duplicate sample

Table II-4 (Continued) Summary of Perchlorate Screening Analytical Results for the Current Monitoring Well Network as of Fourth Quarter, CY 2014

Well	Sample Date	AR/COC Number	Sample Number	Result (μg/L)	MDL (μg/L)	PQL (μg/L)	MCL (μg/L)	Laboratory Qualifier ^a	Validation Qualifier ^b	Analytical Method ^c	Comments
Burn Site Grou	ındwater Area	of Concern)								
CYN-MW14A	17-Dec-14	615940	096977-020	ND	4.0	12	NE	U		EPA 314.0	
CYN-MW15	17-Dec-14	615941	096979-020	ND	4.0	12	NE	U		EPA 314.0	

Table II-4 (Continued)
Summary of Perchlorate Screening Analytical Results for the
Current Monitoring Well Network as of Fourth Quarter, CY 2014

Well	Sample	AR/COC	Sample	Result	MDL	PQL	MCL	Laboratory	Validation	Analytical	Commonto
weii	Date	Number	Number	(μg/L)	(μg/L)	(μg/L)	(µg/L)	Qualifier ^a	Qualifier ^b	Method^c	Comments
WMU 68			•	,, ,							•
	25-Oct-11	613879	091335-020	ND	4.0	12	NE	U		EPA 314.0	
	09-Jan-12	613952	091600-020	ND	4.0	12	NE	U		EPA 314.0	
	18-Apr-12	614081	092022-020	ND	4.0	12	NE	U		EPA 314.0	
	10-Api-12	014001	092023-020	ND	4.0	12	NE	U		EPA 314.0	Duplicate sample
	17-Jul-12	614289	092618-020	ND	4.0	12	NE	U		EPA 314.0	
	16-Oct-12	614462	093003-020	ND	4.0	12	NE	U		EPA 314.0	
	22-Jan-13	614570	093349-020	ND	4.0	12	NE	U		EPA 314.0	
	22-Jan-13	614570	093350-020	ND	4.0	12	NE	U		EPA 314.0	Duplicate sample
DBS-MW1	18-Apr-13	614741	093863-020	ND	4.0	12	NE	U		EPA 314.0	
	09-Jul-13	614933	094361-020	ND	4.0	12	NE	U		EPA 314.0	
	08-Oct-13	615091	094767-020	ND	4.0	12	NE	U		EPA 314.0	
	00-001-13	013091	094768-020	ND	4.0	12	NE	U		EPA 314.0	Duplicate sample
	20-Jan-14	615205	095196-020	ND	4.0	12	NE	U		EPA 314.0	
	14-Apr-14	615427	095733-020	ND	4.0	12	NE	U		EPA 314.0	
	16-Jul-14	615624	096255-020	ND	4.0	12	NE	U		EPA 314.0	
			096256-020	ND	4.0	12	NE	U		EPA 314.0	Duplicate sample
	06-Oct-14	615811	096653-020	ND	4.0	12	NE	U		EPA 314.0	
	26-Oct-11	613880	091337-020	ND	4.0	12	NE	U		EPA 314.0	
	10-Jan-12	613954	091604-020	ND	4.0	12	NE	U		EPA 314.0	
	10-Jan-12	013934	091605-020	ND	4.0	12	NE	U		EPA 314.0	Duplicate sample
	19-Apr-12	614082	092025-020	ND	4.0	12	NE	U		EPA 314.0	
	18-Jul-12	614290	092620-020	ND	4.0	12	NE	U		EPA 314.0	
	17-Oct-12	614464	093007-020	ND	4.0	12	NE	U		EPA 314.0	
	17-001-12		093008-020	ND	4.0	12	NE	U		EPA 314.0	Duplicate sample
	21-Jan-12	614568	093344-020	ND	4.0	12	NE	U		EPA 314.0	
DBS-MW2	22-Apr-13	614742	093866-020	ND	4.0	12	NE	U		EPA 314.0	
JDO WWYZ	10-Jul-13	614935	094365-020	ND	4.0	12	NE	U		EPA 314.0	
			094366-020	ND	4.0	12	NE	U		EPA 314.0	Duplicate sample
	07-Oct-13	615089	094762-020	ND	4.0	12	NE	U		EPA 314.0	
	22-Jan-14	615207	095201-020	ND	4.0	12	NE	U		EPA 314.0	
	22-Jan-14	010207	095202-020	ND	4.0	12	NE	U		EPA 314.0	Duplicate sample
	15-Apr-14	615428	095736-020	ND	4.0	12	NE	U		EPA 314.0	
	15-Jul-14	615622	096251-020	ND	4.0	12	NE	U		EPA 314.0	
	07-Oct-14	615813	096658-020	ND	4.0	12	NE	U		EPA 314.0	
	07-00:14	010013	096659-020	ND	4.0	12	NE	U		EPA 314.0	Duplicate sample

Table II-4 (Continued)

Summary of Perchlorate Screening Analytical Results for the Current Monitoring-Well Network as of Fourth Quarter, CY 2014

Well	Sample Date	AR/COC Number	Sample Number	Result (μg/L)	MDL (μg/L)	PQL (μg/L)	MCL (μg/L)	Laboratory Qualifier ^a	Validation Qualifier ^b	Analytical Method ^c	Comments
SWMU 68 (C	ontinued)										
	24-Oct-11	613882	091342-020	ND	4.0	12	NE	U		EPA 314.0	
	24-OCI-11	013002	091343-020	ND	4.0	12	NE	U		EPA 314.0	Duplicate sample
	11-Jan-12	613955	091607-020	ND	4.0	12	NE	U		EPA 314.0	
	17-Apr-12	614079	092018-020	ND	4.0	12	NE	U		EPA 314.0	
	19-Jul-12	614292	092625-020	ND	4.0	12	NE	U		EPA 314.0	
	19-Jul-12	014292	092626-020	ND	4.0	12	NE	U		EPA 314.0	Duplicate sample
	18-Oct-12	614465	093010-020	ND	4.0	12	NE	U		EPA 314.0	
	23-Jan-12	614571	093352-020	ND	4.0	12	NE	U		EPA 314.0	
OBS-MW3	23-Apr-12	614744	093870-020	ND	4.0	12	NE	U		EPA 314.0	
	23-Apr-12	014744	093871-020	ND	4.0	12	NE	U		EPA 314.0	Duplicate sample
	11-Jul-13	614936	094368-020	ND	4.0	12	NE	U		EPA 314.0	
	09-Oct-13	615092	094771-020	ND	4.0	12	NE	U		EPA 314.0	
	21-Jan-14	615208	095205-020	ND	4.0	12	NE	U		EPA 314.0	
	16 Apr 11	645420	095741-020	ND	4.0	12	NE	U		EPA 314.0	
	16-Apr-14	615430	095742-020	ND	4.0	12	NE	U		EPA 314.0	Duplicate sample
	17-Jul-14	615625	096259-020	ND	4.0	12	NE	U		EPA 314.0	
	08-Oct-14	615814	096661-020	ND	4.0	12	NE	U		EPA 314.0	

Notes

^aLaboratory Qualifier

U = Analyte is absent or below the method detection limit.

^bValidation Qualifier

If cell is blank, then all quality control samples meet acceptance criteria with respect to submitted samples and no qualifier was assigned.

^cAnalytical Method

EPA 314.0: EPA, November 1999, "Perchlorate in Drinking Water Using Ion Chromatography," EPA 815/R-00-014 (EPA November 1999).

 μ g/L = Micrograms per liter.

AR/COC = Analysis Request/Chain-of-Custody.

CCBA = Coyote Canyon Blast Area. CFR = Code of Federal Regulations.

CY = Calendar Year.

CYN = Canyons (Burn Site Groundwater Area of Concern).

EPA = U.S. Environmental Protection Agency.

Table II-4 (Concluded)

Summary of Perchlorate Screening Analytical Results for the Current Monitoring-Well Network as of Fourth Quarter, CY 2014

Notes (continued)

MCL = Maximum contaminant level. Established by the U.S. Environmental Protection Agency Primary Water Regulations (40 CFR 141.11, Subpart B) and subsequent

amendments or Title 20, Chapter 7, Part 1 of the New Mexico Administrative Code, incorporating 40 CFR 141.

MDL = Method Detection Limit. The minimum concentration that can be measured and reported with 99% confidence that the analyte is greater than zero; analyte is matrix-specific.

MW = Monitoring Well.

ND = Not detected (at MDL).

NE = Not Established.

OBS = Old Burn Site.

PQL = Practical Quantitation Limit. The lowest concentration of analytes in a sample that can be reliably determined within specified limits of precision and accuracy by the

indicated method under routine laboratory operating conditions.

SWMU = Solid Waste Management Unit.

Table II-5
Perchlorate Screening Groundwater Monitoring
Field Water Quality Measurements^a, Fourth Quarter, CY 2014

Well	Sample Date	Temperature (°C)	Specific Conductivity (µmhos/cm)	Oxidation- Reduction Potential (mV)	рН	Turbidity (NTU)	Dissolved Oxygen (% Sat)	Dissolved Oxygen (mg/L)
SWMUs 8/58								
CCBA-MW1	13-Oct-14	16.10	481.5	305.4	6.42	0.32	33.3	3.28
CCBA-MW2	14-Oct-14	16.52	559.0	297.4	7.38	0.16	63.6	6.20
Burn Site Grou	ındwater Area of	f Concern						
CYN-MW14A	17-Dec-14	14.59	904.2	49.6	7.39	3.95	12.4	1.26
CYN-MW15	17-Dec-14	15.22	1036.5	190.6	7.01	2.86	10.9	1.09
SWMU 68								
OBS-MW1	06-Oct-14	17.89	511.0	298.8	7.27	0.22	38.8	3.66
OBS-MW2	07-Oct-14	18.70	517.1	301.1	7.22	0.23	37.3	3.47
OBS-MW3	08-Oct-14	17.46	503.1	254.0	7.21	0.18	46.9	4.48

Notes

^aField measurements obtained immediately before the groundwater sample was collected.

°C = Degrees Celsius.
% Sat = Percent saturation.
μmhos/cm = Micromhos per centimeter.
CCBA = Coyote Canyon Blast Area.

CY = Calendar Year.

CYN = Canyons (Burn Site Groundwater Area of Concern).

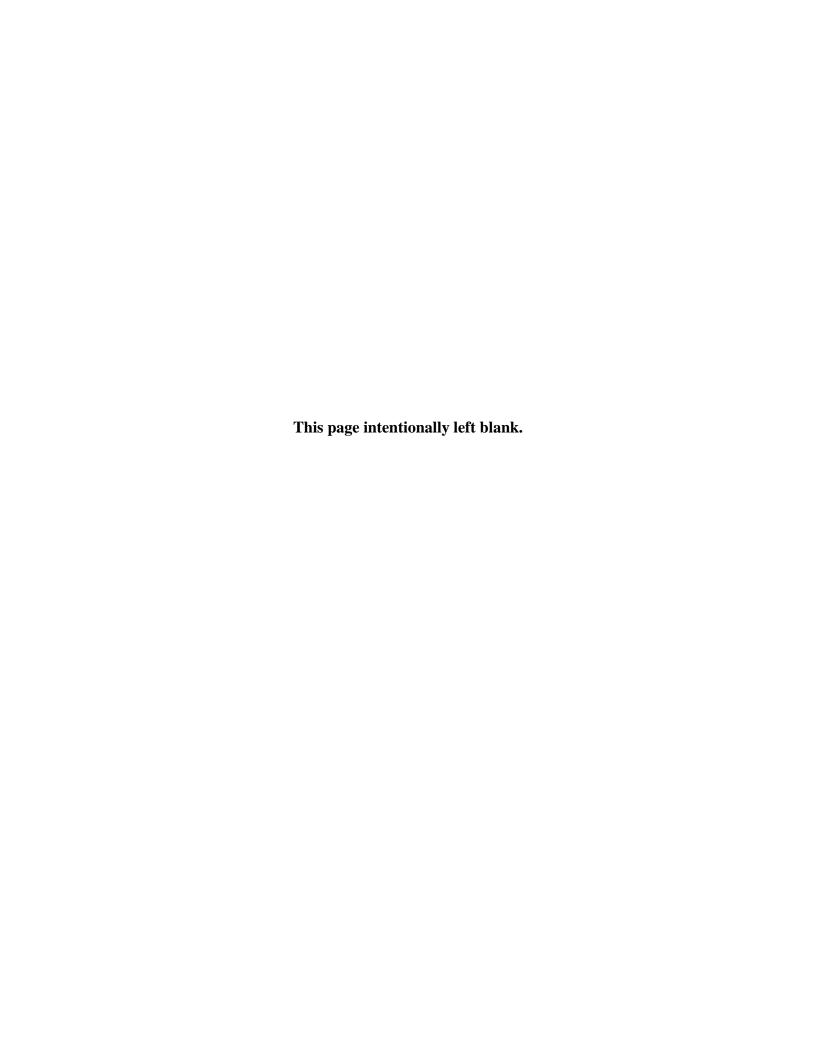
mg/L = Milligrams per liter.
mV = Millivolt(s).
MW = Monitoring Well.

NTU = Nephelometric turbidity unit.

OBS = Old Burn Site.

pH = Potential of hydrogen (negative logarithm of the hydrogen ion concentration).

SWMU = Solid Waste Management Unit.



Appendix A Analytical Laboratory Certificates of Analysis for the Perchlorate Data

CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab		make a majoranje a menjenje me				to the contract of the contrac	e e anno mora ano a de			tier and a financial resource observation in the contraction and						Page <u>1</u> o	of _2
Batch No. N						SMO Use	1		i.		1	01			AR/COC	61581	1
Project Name: Project/Task M		SWMU 68 G		Date Samples			0 14	6.16.95		uthorization	8/4	Elin		Was	ste Characterization		
Project/Task N		146422.10.1		Carrier/Waybill	No.	22		65	ѕмо с	ontact Phone		V	Emos	RMI	MA		
Service Order:		CF263-15		Lab Contact:		Edie Kent/8	03-556-	8171				5-844-3199		Rele	eased by COC No.		
Corvice Order.		CI 203-13		Lab Destination	n:	PO 130387	2		Send R	eport to SMC				March Street Street	**************************************	✓ 4° Cel	
Tech Area:				Contract No.:	. 45 (SG. A	PO 130367	3		<u> </u>	Rita Kava	inaugh/505	5-284-2553		Bill to:Sand	ia National Laboratorie:	s (Accounts Paya	able),
Building:		Room:		Operational	Cito									P.O. Box 58	800, MS-0154		
		TOOM:			Depth	Date/T		01-	_		Τ=			Albuquerqu	e, NM 87185-0154		
Sample No. F	Fraction	Sampl	e Location De		(ft)	Collec		Sample Matrix	Type	ontainer		Collection	to a significance and account of	Pa	rameter & Method	La La	ab
000050	004			-				Wallix	Type	Volume	ative	Method	Type		Requested	Samp	
096652 -	-001	OBS-FB1	***************************************		NA	-10/6/14	9:20	DIW	G	3x40ml	HCL	G	FB	TCL VOC	(SW846-8260B)	358	
096653 -	-001	OBS-MW1			153	'10/6/14	9:21	+ GW	G	3x40ml	HCL	G	SA	TCL VOC	(C)M040 0000D)	358	337
096653 -	-002	OBS-MW1			450					OXTOINI	HOL		- SA	TICE VOC	(SW846-8260B)	358	227
090033 -	-002	OBS-IVIVV I			153	10/6/14	9:22	GW	AG	4x1 L	None	G	SA	TCL SVO	C (SW846-8270C)		03
096653 -	-010	OBS-MW1			153	10/6/14	9:23 -	GW	Р	500 ml	HNO3	G	SA	TAL Metals	+U (SW846-6010/6020	358	3371
096653 -	-014	OBS-MW1	~		153	10/6/14	9:24	GW	Р	250 ml	None	G	SA	Hexavalent	Chromium (SW846-71	96A) 02	
096653 -	-016	OBS-MW1			153	`10/6/14	9:25 -	GW	Р	125 ml	None	G	SA	Anions (S)	W846-9056)	358	371
096653 -0	017	OBS-MW1			153	10/6/14	9:26	FGW	Р	500 ml	HNO3	G	SA	Metals-Ca	,Mg,K,Na (SW846-6	358	
096653 -0	018	OBS-MW1			153	10/6/14	9:27	GW	Р	125 ml	H2SO4	G	SA	Nitrate+Ni	trite (EPA 353.2)	358	37
096653 -0	020	OBS-MW1			153	10/6/14	9:30	GW	Р	250 ml	None	G	SA	Perchlorat	e (EPA 314.0)	35%	371
	022	OBS-MW1			153	10/6/14	9:31	gw	Р	500 ml	None	G		Alkalinity (358	37/
Last Chain:		Yes		s	ample	Tracking		SMO	Use	Special Ins	tructions/	QC Require	ements:		The second second	Conditions of	
Validation Re		Yes			ate Ent					EDD		✓ Yes		No		Receipt	
Background:		☐ Yes		E	ntered t	oy:	gediliti.			Turnaround	d Time	7 Day	<u>,*</u>	15 Day*	✓ 30 Day		
Confirmatory		☐ Yes			C inits.:					Negotiated	TAT						
Sample		me /	Signatur		Init.	Company/				Sample Dis	sposal	Return	to Client	J	Disposal by Lab		
	Robert Ly		2791	ich 1		SNL/4142/50				Return San	nples By:				9		
Members A	Alfred Sar	ntillanes	4/2/500	GPP-	a	SNL/4142/50	-844-513	30/505-228	3-0710	Comments		Send report to	Tim Jackson/	/4142/MS 0729	0/284-2547		
<u> </u>										If perchlorate	detected, pe	rform verifica	tion analysi	is using SW8	46-6850M Filtered		
						A Company of the Comp				fraction collec	ted in field u	sing a 0.45 m	icron in line	filter.Report	Anions (as		EZEG
1.Relinquished	hu Al	17-88 ci	100			مدا دامد				as short list is	otopes).	s total CaCO	o,nco3,cc	3), and Gam	nma Spectroscopy (Lab Use	
Received by	-	0 1/		Org. 4147	Date	10/6/14	Time 1			uished by	12.00		Org.		Date	Time	
2.Relinquished		14 Em		Org. 4142	***************************************	10/0/14	Time ,		3. Recei				Org.		Date	Time	
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e. neceiven nv	•	11/1-16		Org. Lea	Date	10-7-14	Time .	0800	4 Recei	ved by			Org.		Date	Time	

CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY (Continuation)

Page 2 of 2 AR/COC 615811 Project Name: **SWMU 68** Project/Task Manager: Clinton Lum Project/Task No.: 146422.10.11.01 Tech Area: **Building:** Room: Lab use Depth Date/Time Sample Container Collection Sample Parameter & Method Presery-Lab Sample No. Fraction Sample Location Detail (ft) Collected Matrix Type Volume ative Method Type Requested Sample ID 096653 -024 OBS-MW1 358371 153 - 10/6/14 9:33 GW AG 4x1 L None G SA High Explosives (SW846-8321A mod 010 -027 096653 OBS-MW1 15837 153 10/6/14 9:34 GW P 250 mi NaOH G SA Total Cyanide (SW846-9012) 011 096653 -033 OBS-MW1 35837 153 -10/6/14 9:35 GW P 1 L HN₀3 G SA Gamma Spectroscopy (EPA 901.0) 012 096653 -034 OBS-MW1 35837 153 10/6/14 9:36 GW P 1 L HNO3 G SA Gross Alpha and Beta (EPA 900.0) 35837 096653 -035 OBS-MW1 153 10/6/14 9:38 GW 1 L HNO3 G SA Isotopic Uranium (HASL 300) 096654 -001 OBS-TB1 358371 NA 10/6/14 9:21 DIW G 3x40 ml HCL TB TCL VOC (SW846-8260B) Recipient Initials

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: November 7, 2014

Company:

Sandia National Laboratories

Address:

MS-0756, Org. 06765, Bldg. 823/Rm. 4276

1515 Eubank SE

Albuquerque, New Mexico 87123

Contact:

Ms. Pamela M. Puissant

Project:

Groundwater, Level C Package

Sample ID:

Client Sample ID: 096653-020

358371008

Matrix:

AQUEOUS

Collect Date:

06-OCT-14 09:30

Receive Date: Collector:

07-OCT-14 Client

Project:

SNLSGWater

Client ID:

SNLS004

Client Desc.: OBS-MW1

Vol. Recv.:

Parameter	Qualifier	Result	DL	RL	Units	DF Analyst Date Time Batch Method
Ion Chromatograp	phy					
EPA 314.0 Perch	lorate by IC "As Re	ceived"				
Perchlorate	U	ND	0.004	0.012	mg/L	1 MAR1 10/16/14 0104 1426176 1
The following A	nalytical Methods v	vere performed:				
Method	Description	1			Ana	alyst Comments
1	EPA 314.0 DC	E-AL				

Notes:

Internal Lab

AOP 95-16

CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

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	Batch No. Project Nam	NA	CIAMALLO	20.01404	Esta resultation in the	Ta 1000	SMO Use	1	***************************************				10	1	AR/COC	615813
	Project/Task		SWMU 6		Date Sample	Section of the least of the			H CLAZ		uthorization:		19c 1	ner	Waste Characterization	
	Project/Task		146422.1		Carrier/Wayl	4.231.53		1 10		ISMO C	ontact Phon		, , , p	5mo	RMMA	
1	Service Orde		CF263-1		Lab Destinat		Edie Kent	803-556-	81/1	<u> </u>			5-844-3199	mo	Released by COC No.	
	Photological extension of processing photological processing and		0. 200 1		Contract No.		PO 13038	70		Send F	Report to SMC					4º Celsius
	Tech Area:				Contract No.	-V-03-5-304	F.O 13036	13		<u> </u>	Rita Kava	anaugh/50	5-284-2553		Bill to:Sandia National Laboratories	(Accounts Payable),
	Building:		Room:		Operation	al Cito:									P.O. Box 5800, MS-0154	
		T			Operation	Depth	Data	Time	I						Albuquerque, NM 87185-0154	
	Sample No.	Fraction	Sa	mple Location D	etail	(ft)	The second second	cted	Sample Matrix	Type	ontainer	Preserv-	Collection		Parameter & Method	Lab
,	096658	004		· · · · · · · · · · · · · · · · · · ·		- ' · ·			IVIALITY	Type	Volume	ative	Method	Type	Requested	Sample ID
	090000	-001	OBS-MV			252	• 10/7/14	9:21	GW	G	3x40ml	HCL	G	SA	TCL VOC (SW846-8260B)	358371
-	096658	-002	OBS-MW	/2		252	10/7/14	9:23	+GW	AG	4x1 L	None				358377
,	096658	-010	ODC MA	10						7.0	+ 4X1 L	None	G	SA	TCL SVOC (SW846-8270C)	032
		1-010	OBS-MW	12		252	.10/7/14	9:27	1 GW	Р	500 ml	HNO3	G	SA	TAL Metals+U (SW846-6010/6020/	7470) 358377 7470) 033
8	096658	-014	OBS-MW	/2		252	- 10/7/14	9:28	GW	P	250 ml	None	_			250071
a	096658	-016	OBS-MW	10	· · · · · · · · · · · · · · · · · · ·				1	<u> </u>	230 1111	None	G	SA	Hexavalent Chromium (SW846-719	96A) 034
						252	• 10/7/14	9:29	GW	Р	125 ml	None	G	SA	Anions (SW846-9056)	35837/
0	096658	-017	OBS-MW	12		252	- 10/7/14	9:31	FGW	Р	500 ml	HNO3	G	SA	Matala Ca Mark N. (Sura ca a	350372
0	096658	-018	OBS-MW	12		252	10/7/14	0.20						SA	Metals-Ca,Mg,K,Na (SW846-6	
,						232	-10/7/14	9:32	GW	Р	125 ml	H2SO4	G	SA	Nitrate+Nitrite (EPA 353.2)	35837/
1	096658	-020	OBS-MW	2		252	10/7/14	9:33	t gw	Р	250 ml	None	G	SA	Perchlorate (EPA 314.0)	35837/
4	096658	-022	OBS-MW	12		252	- 10/7/14	0.24	-	_				- OA	reichiorate (EPA 314.0)	358371
4						202	10///14	9:34	GW	Р	500 ml	None	G	SA	Alkalinity (SM2320B)	038
"	096658		OBS-MW	2		252	10/7/14	9:35	GW	AG	4x1 L	None	G	SA	High Explosives (SW846-8321	15537/
-	Last Chain		Yes			Sample	Tracking		SMO	Use	Special Ins	tructions			ingii Explosives (GVVB40-8321	A mod 039 Conditions on
r	Validation		✓ Yes			Date Ent	ered:				EDD		☑ Yes		No	1. The Belle of the Control of the C
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	Members	Alfred Sa	ntillanes	481150	telle		SNL/4142/50				Comments		Cond second to			
1		William G	ibson 1	Weller &	M		SNL/4142/50						oena report to	im Jackson/ tion analysi	4142/MS 0729/284-2547 s using SW846-6850M.Filtered	
1		PROFESSION AND STREET	*****	01		11	CONTRACTOR OF STATE O				traction collect	ted in field u	sing a 0.45 m	icron in line	filter Report Anione /ac	- we can be a second as a seco
L		1								*************	Br,C,F,SO4),	Alkalinity (a	s total CaCO	3,HCO3,CO	3), and Gamma Spectroscopy (
Ŀ	I.Relinquishe	d by	6-95	orlice	Org. 4/4:	2 Date	10/7/14	Time /	008	3 Relina	as short list iso uished by	otopes).				Lab Use
1	. Received b	У	1419	Fra grant	Org. 4143		10714		^	3. Recei				Org.	Date	Time
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_	Received b	J 16 4 94		and (Org. COA	- Date		Time (4. Recei				Org.	Date	Time
*	Prior confirm	nation wi	h SMO red	quired for 7 and	5 day TAT		V 19 01 7	THIO E	170	T. NECE	ved by			Org.	Date	Time

CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY (Continuation)

F	roject Nam	e:	SWMU 68	Project/Task Mana	iaer:	Clinton Lun	n		Project/Tas	sk No ·	146422	.10.11.01		95585588
1	ech Area:				.9	Olimon Edi			i rojecu ras	SK NO	140422	10. 11.01		
E	Building:		Room:	71										Lab use
1				Depth		Date/Time		Со	ntainer	Preserv-	Collection	Sample	Parameter & Method	Lab
-	Sample No.				 	ected	Matrix	Туре	Volume	ative	Method	Type	Requested	Sample I
H	096658	-027	OBS-MW2	252	- 10/7/14	9:39	GW	Р	250 ml	NaOH	G	SA	Total Cyanide (SW846-9012)	35837
L	096658	-033	OBS-MW2	252	10/7/14	9:40 /	GW	Р	1 L	HNO3	G	SA	Gamma Spectroscopy (EPA 901.0)	35837
L	096658	-034	OBS-MW2	252	10/7/14	9:42	GW	Р	1 L	HNO3	G	SA	Gross Alpha and Beta (EPA 900.0)	35837
L	096658	-035	OBS-MW2	252	10/7/14	9:44 -	GW	Р	1 L	ниоз	G	SA	Isotopic Uranium (HASL 300)	35837
	096659	-001	OBS-MW2	252	10/7/14	9:21 ~	GW	G	3x40ml	HCL	G	DU	TCL VOC (SW846-8260B)	044
L	096659	-002	OBS-MW2	252	10/7/14	9:23	GW	AG	4x1 L	None	G	DU	TCL SVOC (SW846-8270C)	35837
	096659	-010	OBS-MW2	252	10/7/14	9:27	GW	Р	500 ml	HNO3	G	DU	TAL Metals+U (SW846-6010/6020/7470)	35837
_	096659	-014	OBS-MW2	252	10/7/14	9:28 -	GW	Р	250 ml	None	G	DU	Hexavalent Chromium (SW846-7196A)	35837
	096659	-016	OBS-MW2	252	10/7/14	9:29 -	GW	Р	125 ml	None	G	DU	Anions (SW846-9056)	35837
	096659	-017	OBS-MW2	252	- 10/7/14	9:31 ~	FGW	P	500 ml	НИОЗ	G	DU	Metals-Ca,Mg,K,Na (SW846-6020)	35837
	096659	-018	OBS-MW2	252	10/7/14 ر	9:32	GW	Р	125 ml	H2SO4	G	DU	Nitrate+Nitrite (EPA 353.2)	35837
L	096659	-020	OBS-MW2	252	10/7/14	9:33 -	GW	Р	250 ml	None	G	DU	Perchlorate (EPA 314.0)	35837
_	096659	-022	OBS-MW2	252	10/7/14	9:34	GW	Р	500 ml	None	G	DU	Alkalinity (SM2320B)	35837
_	096659	-024	OBS-MW2	252	10/7/14	9:35 <	GW	AG	4x1 L	None	G	DU	High Explosives (SW846-8321A mod	120027
L	096659	-027	OBS-MW2	252	`10/7/14	9:39 -	GW	Р	250 ml	NaOH	G	DU	Total Cyanide (SW846-9012)	35837
_	096659	-033	OBS-MW2	252	10/7/14	9:40 -	-GW	Р	1 L	HNO3	G	DU	Gamma Spectroscopy (EPA 901.0)	35837
	096659	-034	OBS-MW2	252	10/7/14	9:42	GW	Р	1 L	HNO3	G	DU	Gross Alpha and Beta (EPA 900.0)	35837
_	096659	-035	OBS-MW2	252	*10/7/14	9:44	GW	Р	1 L	HNO3	G	DU	Isotopic Uranium (HASL 300)	35537
	096660	-001	OBS-TB3	NA	-10/7/14	9:21	DIW	G	3x40 mi	HCL	G		TCL VOC (SW846-8260B)	35837
-				and a second sec	WARRY TO THE THE TAXABLE PARTY.		****	*************						05/

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: November 7, 2014

Company:

Sandia National Laboratories

Address:

MS-0756, Org. 06765, Bldg. 823/Rm. 4276

1515 Eubank SE

Albuquerque, New Mexico 87123

Contact:

Ms. Pamela M. Puissant

Project:

Groundwater, Level C Package

Sample ID:

Client Sample ID: 096658-020

Matrix:

358371037 AQUEOUS

Collect Date:

07-OCT-14 09:33

Receive Date:

08-OCT-14

Collector:

Client

Project:

SNLSGWater

Client ID:

SNLS004

Client Desc.: OBS-MW2

Vol. Recv.:

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time Batch	Method			
Ion Chromatograp	phy												
EPA 314.0 Perch	lorate by IC "As Re	ceived"											
Perchlorate	U	ND	0.004	0.012	mg/L	1	MAR1 1	0/16/14	0221 1426176	1			
The following A	nalytical Methods v	vere performed:											
Method	Description		Analyst Comments										
1	EPA 314.0 DC	DE-AL						110000					

Notes:

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: November 7, 2014

Company:

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MS-0756, Org. 06765, Bldg. 823/Rm. 4276

1515 Eubank SE

Albuquerque, New Mexico 87123

Contact:

Ms. Pamela M. Puissant

Project:

Groundwater, Level C Package

Sample ID:

Client Sample ID: 096659-020 358371050

Matrix:

AQUEOUS

Collect Date:

07-OCT-14 09:33

Receive Date: Collector:

08-OCT-14

Client

Project:

SNLSGWater

Client ID:

SNLS004

Client Desc.: OBS-MW2

Vol. Recv.:

Parameter Qualifier Result DL RL Units DF Analyst Date Time Batch Method Ion Chromatography EPA 314.0 Perchlorate by IC "As Received" Perchlorate 0.004 0.012 mg/L 1 MAR1 10/16/14 0240 1426176 1 The following Analytical Methods were performed: Method Description **Analyst Comments** EPA 314.0 DOE-AL

Notes:

Internal Lab

CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

	NA	_			SMO Use	/				_/	1011	7		А	R/COC		5814
Project Name: SWMU 68 GWM Date Samples Project/Task Manager: Clinton Lum Carrier/Waybi Project/Task Number: 146422.10.11.01 Lab Contact: Service Order: CF263-15 Lab Destination			No.	324747 Edie Kent/803-556-8171 GEL			SMO Authorization SMO Contact Phone: Lorraine Herrera/505-844-3199 Send Report to SMO:						Waste Cha RMMA Released b	racterization y COC No.	1	4º Celsius	
Contract No.:				PO 1303873				Rita Kavanaugh/505-284-2553					Bill to:Sandia National Laboratories (Accounts Payable),				
Building:	************	Room:	Operational	Site										x 5800, MS			
	Fraction			Depth (ft)	Date/		Sample Matrix	Co Type	ontainer Volume	Preserv- ative	Collection Method	Sample Type	ones in the second of the seco			neter & Method	
096661	-001	OBS-MW3		208	10/8/14	9:17	GW	G	3x40ml	HCL	G	SA	TCL VOC (SW846-8260B)				358371
096661	-002	OBS-MW3		208	10/8/14	9:19 ′	GW	AG	4x1 L	None	G	SA	TCL SVOC (SW846-8270C)				058 358371 059
096661	-010	OBS-MW3		208	10/8/14	9:20 -	GW	Р	500 ml	HNO3	G	SA	TAL Metals+U (SW846-6010/602			20/7470)	358371
096661	-014	OBS-MW3		208	10/8/14	9:21	GW	Р	250 ml	None	G	SA	Hexavalent Chromium (SW846-7				358371
096661	-016	OBS-MW3		208	`10/8/14	9:22	GW	Р	125 ml	None	G	SA	Anions (SW846-9056)			10011	358371
096661	-017	OBS-MW3		208	10/8/14	9:23	FGW	Р	500 ml	ниоз	G	SA	Metals-Ca,Mg,K,Na (SW846-			-6020)	358373
096661	-018	OBS-MW3		208	`10/8/14	9:24	GW	Р	125 ml	H2SO4	G	SA	Nitrate+Nitrite (EPA 353.2)				358371
096661	-020	OBS-MW3		208	10/8/14	9:25	GW	Р	250 ml	None	G	SA	Perchlorate (EPA 314.0)				358371
096661	-022	OBS-MW3		208	¹ 10/8/14	9:26	GW	Р	500 ml	None	G	SA	Alkalinity (SM2320B)			358371	
096661	-024	OBS-MW3		208	10/8/14	9:28 /	GW	AG	4x1 L	None	G	SA	High Explosives (SW846-83		21A mod	353371	
Last Chain: Validation I		✓ Yes ✓ Yes	11	ample ate Ent	Fracking ered		SMO	Use	Special Ins	structions/					2		ditions on
Background: Yes			Entered by:				rate de la companya d Nata de la companya d	EDD ✓ Yes Turnaround Time 7 Day*			Coreson .	No 15 Day	<u> </u>	√ 30 Day	R	eceipt	
Confirmatory: Yes			QC inits.:					Negotiated TAT				15 Day	<u></u>	√] 30 Day			
Sample	N	ame Signa	ature ,	Init.	Company	/Organizat	ion/Phone	e/Cell	Sample Disposal			V Dispr	sal by Lab				
Team	Robert L	ynch Kalff		20	SNL/4142/50	5-844-401	3/505-250							out by Lub			
Members	Alfred Sa	antillanes Affact	odle	-az	SNL/4142/50	5-844-513	0/505-228	3-0710	Comments: Send report to Tim Jackson If perchlorate detected, perform verification analys fraction collected in field using a 0.45 micron in lin				is usina :	SW846-685	6850M.Filtered		
		10							Br,C,F,SO4), as short list is	Alkalinity (a	s total CaCO	3,HCO3,C0	03), and	Gamma Sp	ectroscopy (La	ıb Use
1.Relinquishe		My punt	- 1110	Date					uished by			Org.		Date		Time	
				7 //				eceived by Org				Date Ti		Time	Time		
								linquished by Org.				Date	Date Time				
2. Received by Org. Cen D Prior confirmation with SMO required for 7 and 15 day TAT				Date	10-9-14	Time Ø	725	4. Recei	ved by			Org.		Date		Time	

5SMO 2012-ARCOC (4-2012)

CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY (Continuation)

AOP 95-16

Page 2 of 2 AR/COC 615814 Project Name: SWMU 68 GWM Project/Task Manager: Clinton Lum Project/Task No.: 146422.10.11.01 **Tech Area:** Building: Room: Lab use Depth Date/Time Sample Container Collection Sample Preserv-Parameter & Method Sample No. Fraction Sample Location Detail (ft) Collected Matrix Type Volume ative Method Type Requested Sample ID 096661 -027 OBS-MW3 35837 208 10/8/14 9:29 P GW 250 ml NaOH G SA Total Cyanide (SW846-9012) 3583 1 3583 1 3583 7 35837 096661 -033 OBS-MW3 208 10/8/14 9:30 GW P 1 L HNO₃ G Gamma Spectroscopy (EPA 901.0) SA 096661 -034 OBS-MW3 208 10/8/14 9:31 **GW** P 1 L Gross Alpha and Beta (EPA 900.0) HNO3 G SA 35837 096661 -035 OBS-MW3 208 10/8/14 9:33 GW P 1 L HNO₃ G SA Isotopic Uranium (HASL 300) 35837 096662 -001 OBS-TB4 NA 10/8/14 9:17 DIW G 3x40 ml HCL G TB TCL VOC (SW846-8260B) Recipient Initials MK

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: November 7, 2014

Company:

Sandia National Laboratories

Address:

MS-0756, Org. 06765, Bldg. 823/Rm. 4276

1515 Eubank SE

Albuquerque, New Mexico 87123

Contact:

Ms. Pamela M. Puissant

Project:

Groundwater, Level C Package

Client Sample ID: Sample ID: 096661-020 358371064

Matrix:

AQUEOUS

Collect Date:

08-OCT-14 09:25

Result

Receive Date: Collector: 09-OCT-14 Client Project:

SNLSGWater

Client ID:

SNLS004

Client Desc.: OBS-MW3

Analyst Comments

Vol. Recv.:

RL Units DF Analyst Date Time Batch Method

Ion Chromatography

EPA 314.0 Perchlorate by IC "As Received"

erchlorate

Parameter

U N

0.004

DL

0.012

2 mg/L

1 MAR1 10/16/14 0259 1426176

1

The following Analytical Methods were performed:

Qualifier

Method

Description EPA 314.0 DOE-AL

Notes:

Internal Lab

CONTRACT LABORATORY

ANALYSIS RI	EQU	ES	T	MD	CH	AINL	ΩE	CHE	TODY

Batch No. /	19 1				SMO Use						,	4		Page _1_ of _2
Project Nar		SWMU 8/58 GWM	Date Sam	oles Shipped		3/14		lava.			10		AR/COC	615822
Project/Tas	k Manage	: Clinton Lum	Carrier/Wa			1914	/		Authorization:		4711	2 94	Waste Characterization	
Project/Tas			Lab Conta	ct:	Edie Kent/			JSIVIO	Contact Phore			and the second second second second	RMMA	
Service Ord	er:	CF262-15	Lab Destin	ation:	GEL	3	0171	Sand F	Report to SM	Herrera/50	5-844-3199		Released by COC No.	
			Contract N		PO 130387	73		Joena r	The state of the s					☑ 4º Celsiu
Tech Area:				***************************************					Kita Kava	anaugh/50	5-284-2553		Bill to:Sandia National Laboratori	es (Accounts Payable
Building:		Room:	Operatio	nal Site:									P.O. Box 5800, MS-0154	
				Depth	Date/1	Time	Cometa	T -		T			Albuquerque, NM 87185-0154	
Sample No.	Fraction	Sample Locat	ion Detail	(ft)	Collec		Sample Matrix		ontainer	Preserv	Collection	Sample	Parameter & Metho	d Lab
096685	-001	CCBA-MW1	7				Wallix	Type	Volume	ative	Method	Туре	Requested	Sample I
				79	10/13/14	9:24	GW	G	3x40ml	HCL	G	SA	TCL VOC (SW846-8260B)	35894
096685	-002	CCBA-MW1		79	10/13/14	9:26	1 GW	AG	4x1 L					35894
096685	-010	CCBA-MW1		70				- 10	1 4/1 L	None	G	SA	TCL SVOC (SW846-8270C)	002
000005				79	10/13/14	9:27	GW	Р	500 ml	HNO3	G	SA	TAL Metals+U (SW846-6010/602	358946
096685	-016	CCBA-MW1		79	10/13/14	9:28	t gw l	Р	125 ml	None				0/7470) 003 358946
096685	-017	CCBA-MW1		79	.404044				1231111	None	G	SA	Anions (SW846-9056)	004
096685	040			19	10/13/14	9:29	FGW	Р	500 ml	HNO3	G	SA	Metals-Ca,Mg,K,Na (SW846-	35894
090000	-018	CCBA-MW1		79	10/13/14	9:30	GW	Р	125 ml	H2SO4	G			35894
096685	-020 CCBA-MW1			79	10/13/14	9:31				112004	- 6	SA	Nitrate+Nitrite (EPA 353.2)	005
096685					10/13/14	9.31	GW	Р	250 ml	None	G	SA	Perchlorate (EPA 314.0)	358946
030003	-022	CCBA-MW1		79	10/13/14	9:32 -	GW	Р	500 ml	None	G			358946
096685	-024	CCBA-MW1		79	10/13/14	9:34	GW	40				- SA	Alkalinity (SM2320B)	007
096685	-027	CCBA-MW1					GVV	AG	4x1 L	None	G	SA	High Explosives (SW846-832	1A mod 358946
Last Chain		Yes			10/13/14	9:35	GW	Р	250 ml	NaOH	G			200000
Validation		✓ Yes	anna an air ag an air ag an air an	Sample 1			SMO	Use	Special Inst	ructions/	QC Require	mente	Total Cyanide (SW846-9012)	009
Backgroun		Yes		Date Ente					EDD	ii.	☑ Yes		No	Conditions on
Confirmato		Yes		Entered b	y:			to each	Turnaround	Time	7 Day			Receipt
Sample				QC inits.:				State 1	Negotiated '				15 Day* ✓ 30 Day	
	Alfred Sa	1 / 019	nature	Init.	Company/0	Organizati	on/Phone/	/Cell	Sample Dis		Return	to Client	/ Disposal bull at	
Secretary and Company of the Company				-600	SNL/4142/505	-844-5130	0/505-228-	-0710	Return Sam		retuin	to Cheff	Disposal by Lab	
Members	William G	ibson Willu	Jacky	WYZ S	SNL/4142/505	-284-3307	7/505-239-		Comments:		and roport to T	:		
			/ /	0					If perchlorate d	etected, per	form verificati	on analysis	4142/MS 0729/284-2547 s using SW846-6850M.Filtered	
										ou ill liciu us	inu a u as mi	Cron in line	filter Deve - 1 4	
I Dolinaviata	1				1				Br,C,F,SO4), A as short list iso	arominty 192	total CaCO3	HC03,C0	3), and Gamma Spectroscopy (
.Relinquishe		golf offile	Org. 414		10/13/14	Time 10	2/3 3		ished by	iopes).				Lab Use
Received b			NO Org. 4146			Time 10		Receiv				Org.	Date	Time
Relinquished by Received by		My Hylly 9	WOrg. 414	Z Date (Time / C			ished by			Org.	Date	Time
		Miller	Org. Ger	Date/C	1 . 1	Time o		Receiv				Org.	Date	Time
i iloi contirn	iation wit	h SMO required for 7 a	and 15 day TAT						-3.03			Org.	Date	Time

7SMO 2012-ARCOC (4-2012) of 123

CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY (Continuation)

AOP 95-16

Page 2 of 2

Project Nam Tech Area:	ie:	SWMU 8/58 GWM	Project/Task Mana	ager:	Clinton Lu	.10.11.01		15822					
Building:		Room:										**************************************	
Sample No.			Depth etail (ft)		/Time	Sample Matrix	Co Type	ntainer Volume	Preserv- ative	Collection		Parameter & Method	Lab use
096685	-033	CCBA-MW1	79	10/13/14	9:36	GW	P	1 L	HNO3	Method G	Туре	Requested	Sample 358944
096685	-034	CCBA-MW1	79	10/13/14	9:38	GW	P	1 L	HNO3		200000	Gamma Spectroscopy (EPA 901.0)	35894
096686	-001	CCBA-TB1	NA	10/13/14	9:24	DIW	G	3x40 ml	HCL	G G	SA TB	Gross Alpha and Beta (EPA 900.0) TCL VOC (SW846-8260B)	35894
					*****							(6446.16.02505)	0/2
					-								1747.38
Print de Printere America de Print, An	**************************************		e apin direct primarium and se an este ani an este ani an este ani ani ani	Afficia soften as a factor and a new contraction	**************************************	an taga at a construent state of the galaxy and the same	No. 10 (10 (10 (10 (10 (10 (10 (10 (10 (10	an and a section of the section of the section of	The A harmon Principle and the Principle Indian	A Principal Community Community of the Community of the Community	and of a side Walter College of College of		
							155					01 1900 1 1000 1000 1000 1000 1000 1000	
OPENERAL OCCUPANT	35-00-18-15-171V	Services Modern second room to present a co	OR 10 75% 122 0 122 0 12										

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: November 12, 2014

Company:

Sandia National Laboratories

Address:

MS-0756, Org. 06765, Bldg. 823/Rm. 4276

1515 Eubank SE

Albuquerque, New Mexico 87123

Contact:

Ms. Pamela M. Puissant

Project:

Groundwater, Level C Package

Client Sample ID: 096685-020

Sample ID:

358946006

Matrix:

AQUEOUS

Collect Date:

Collector:

13-OCT-14 09:31

Receive Date:

14-OCT-14

Client

Project:

SNLSGWater

Client ID:

SNLS004

Client Desc.: CCBA-MW1

Vol. Recv.:

Parameter	Qualifier	Result	DL	RL	Units	DF Analyst Date	Time Batch	Method
Ion Chromatograp	ohy			0				
EPA 314.0 Perchl	lorate by IC "As Re	eceived"						
Perchlorate	U	ND	0.004	0.012	mg/L	1 MAR1 10/21/14	1422 1427862	1
The following Ar	nalytical Methods v	vere performed:						
Method	Description				Ana	alyst Comments		
1	EPA 314.0 DC	DE-AL			000000000000000000000000000000000000000	*	-	

Notes:

SMO	2012-ARCOC	(4-2012)
		·/

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

AOP 95-16

Internal Lab														D 4 6 - 6
Batch No.	VA				SMO Use						1. 1	•	ADVOCA	Page 1 of 2
Project Nam	e:	SWMU 8/58 GV	VM Date S	amples Shipped		1/14	TO ACHECULARIZED	SMO	Authorization	10/	911		AR/COC	615824
		Clinton Lum	The state of the s	Waybill No.		4990	,		Contact Phone		4.7m		Waste Characterization	
Project/Task	Number:	146422.10.11.0	1 Lab Co		Edie Kent/			00	to the second and accommodate as		5-844-3199	Sinte		**************************************
Service Orde	er:	CF262-15	Lab De	stination:	GEL		2712 2448	Send F	Report to SMO		3-044-3199		Released by COC No.	
			Contrac	ct No.:	PO 13038	73		lociid i			5-284-2553		Dill. C	☑ 4º Celsius
Tech Area:									7 lita Maye	arraugi 1750.	J-204-2000		Bill to:Sandia National Laboratorie	s (Accounts Payable),
Building:		Room:	Opera	tional Site:									P.O. Box 5800, MS-0154	
			1	Depth	Date/	Time	Sample	C	ontainer	Preserv-	Collection	Sample	Albuquerque, NM 87185-0154	
Sample No.	Fraction	Sample L	ocation Detail	(ft)	Colle		Matrix	Туре	Volume	ative	Method	Type		
096690	-001	CCBA-FB2		NA	·10/14/14	0.00		7.				Type	Requested	Sample ID 358946
000001				INA	10/14/14	9:23	DIW	G	3x40ml	HCL	G	FB	TCL VOC (SW846-8260B)	026
096691	-001	CCBA-MW2		117	10/14/14	9:23 /	GW	G	3x40ml	HCL	G	SA	TCL VOC (SW846-8260B)	358986
096691	-002	CCBA-MW2		117	10/14/14	9:25	CIN	4.0						355046
000001	0.40				10/14/14	9.20	GW	AG	4x1 L	None	G	SA	TCL SVOC (SW846-8270C)	358946 028
096691	-010	CCBA-MW2		117	-10/14/14	9:29	GW	Р	500 ml	HNO3	G	SA	TAL Metals+U (SW846-6010/6020	35894
096691	-016	CCBA-MW2		117	10/14/14	9:30 /	GW	Р	405	l				358946
096691	047	0004 1440	- V. II - V. II - P. V. II - V				GVV	Р	125 ml	None	G	SA	Anions (SW846-9056)	030
090091				117	'10/14/14	9:32	FGW	Р	500 ml	HNO3	G	SA	Metals-Ca,Mg,K,Na (SW846-	358947
096691	691 -018 CCBA-MW2			117	10/14/14	9:33 ~	GW	Р	125 ml	H2SO4	G	0.4		358946
096691	-020	CCBA-MW2		445					1207111	112304	G	SA	Nitrate+Nitrite (EPA 353.2)	03/
000001	-020	CCBA-IVIVVZ		117	10/14/14	9:34 /	GW	P	250 ml	None	G	SA	Perchlorate (EPA 314.0)	358946
096691	-022	CCBA-MW2		117	70/14/14	9:35	GW	P	500 ml	None	G			358946
096691	-024	CCBA-MW2		117	40/44/44					None	G	SA	Alkalinity (SM2320B)	033
Last Chain:		Yes			40/14/14	9:36	GW	AG	4x1 L	None	G	SA	High Explosives (SW846-832	1A mod) 034
Validation I		y Yes	The state of the s		Tracking		SMO	Use	Special Ins	tructions/		ements:		Conditions on
Backgroun		Yes		Date Ent				W. S. C. C.	EDD		✓ Yes		No	Receipt
Confirmato		Yes	- Name	Entered					Turnaround	d Time	7 Day	<u> </u>	15 Day* (30 Day	
Sample		ime /	Cianatura	QC inits.		BERTY.		地流地	Negotiated	TAT				
1 _ '	Robert Ly		Signature	Init.		/Organizat			Sample Dis		Return	to Client	☑ Disposal by Lab	
Members-		1/00	Tynch		SNL/4142/50				Return San	nples By:				
1 - 1 -			1 19 00		SNL/4142/50				Comments		Send report to	Tim Jackson/	/4142/MS 0729/284-2547	
1 mg	William G	ibson Will	wyger	wy	SNL/4142/50	5-284-330	7/505-239	-7367	If perchlorate	detected, pe	rform verifica	tion analysi	S USING SIMBAR BREOM Filtered	
			/ /						maction collec	ted in field u	sing a 0.45 m	nicron in line	filter Report Anions (as	
4 Delines ist	/	13.	01					Br,C,F,SO4), Alkalinity (as total CaCO3,HCO3, as short list isotopes).					3), and Gamma Spectroscopy (Lab Use
1.Relinquished		year for	Org. 4		10/14/14	Time / (3.Relinq	uished by			Org.		
Received by Relinaviate	- //	7 91 3	Grue Org. 4		19/14/14	Time / t	128	3. Recei	ived by			Org.	Date	Time
2.Relinquished	The second second	11496	Sugorg. 4	17	10/14/14	Time /	100	4.Relinq	uished by			Org.	Date	Time
2. Received by	62 10	4 tow	Org.	Date .	10-15-14	Time O	745	4. Recei	ved by			Org.	Date	Time

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SMO	2012-ARCOC	(4 2012)
OINIO	2012-ANCOC	(4-2012)
J		

CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY (Continuation)

AOP 95-16

Page _2_ of _2_

Tech Area:				Task Mana	<u></u>	Clinton Lur	<u></u>		Project/Ta	SK NO.:	146422	.10.11.01		
Building:		Room:											Constitute the title (15 constitute of the const	
Sample No.	Fraction	Sample Locatio	n Detail	Depth (ft)	Date/ Colle		Sample Matrix	Co Type	ntainer Volume	Preserv-	Collection Method	Sample Type		Lab us
096691	-027	CCBA-MW2		117	40/14/14	9:40 -	GW	Р	250 ml	NaOH	G	SA	Requested	Sample 3589
096691	-033	CCBA-MW2		117	-10/14/14	9:41	GW	Р	1 L	HNO3	G		Total Cyanide (SW846-9012)	35899
096691	-034	CCBA-MW2		117	10/14/14	9:43	GW	Р	1 L	HNO3	G	SA	Gamma Spectroscopy (EPA 901.0)	35894
096692	-001	CCBA-MW2		117	10/14/14	9:23	GW	G	3x40ml	HCL			Gross Alpha and Beta (EPA 900.0)	35894
096692	-002	CCBA-MW2		117	`10/14/14	9:25 /	GW	AG	4x1 L		G	DU	TCL VOC (SW846-8260B)	35899
096692	-010	CCBA-MW2		117	10/14/14	9:29	GW	P	500 ml	None	G	DU	TCL SVOC (SW846-8270C)	35894
096692	-016	CCBA-MW2		117	10/14/14	9:30 <	GW	P	125 ml	HNO3	G	DU	TAL Metals+U (SW846-6010/6020/7470)	040
096692	-017	CCBA-MW2			10/14/14	9:32	FGW	P		None	G		Anions (SW846-9056)	35899
096692	-018	CCBA-MW2		1	10/14/14	9:33	GW	P	500 ml	HNO3	G		Metals-Ca,Mg,K,Na (SW846-6020)	004
096692	-020	CCBA-MW2		117	10/14/14	9:34			125 ml	H2SO4	G	DU	Nitrate+Nitrite (EPA 353.2)	35894
096692	-022	CCBA-MW2			10/14/14	9:35	GW	Р	250 ml	None	G	DU	Perchlorate (EPA 314.0)	35894 043
096692	-024	CCBA-MW2			10/14/14		GW	Р	500 mi	None	G	DU	Alkalinity (SM2320B)	35899
096692		CCBA-MW2				9:36	GW	AG	4x1 L	None	G	DU	High Explosives (SW846-8321A mod	
096692		CCBA-MW2	<u> </u>		10/14/14	9:40	GW	Р	250 ml	NaOH	G	DU	Total Cyanide (SW846-9012)	35844 046
096692		CCBA-MW2	rough at antique process of a party of antique to		10/14/14	9:41	GW	Р	1 L	HNO3	G	DU	Gamma Spectroscopy (EPA 901.0)	35899
		CCBA-TB3			10/14/14	9:43	GW	Р	1 L	HNO3	G	DU	Gross Alpha and Beta (EPA 900.0)	35899
		00BA-1B3		NA I	10/14/14	9:23	DIW	G	3x40 ml	HCL	G	тв	TCL VOC (SW846-8260B)	358992 649
		<u>.</u>						10 1						
cipient Init		I/-		Residence in		(Medisonal	STABLE SOUTH	Objection:	Salari Mantanalar Chi	March Control of the	Tolkhor Vision			

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: November 12, 2014

Company:

Sandia National Laboratories

Address:

MS-0756, Org. 06765, Bldg. 823/Rm. 4276

1515 Eubank SE

Albuquerque, New Mexico 87123

Contact:

Ms. Pamela M. Puissant

Project:

Groundwater, Level C Package

Sample ID:

Client Sample ID: 096691-020

358946032

Matrix:

AQUEOUS 14-OCT-14 09:34

Collect Date:

Collector:

15-OCT-14

Receive Date:

Client

Project:

SNLSGWater

Client ID:

SNLS004

Client Desc.: CCBA-MW2

Vol. Recv.:

Parameter	Qualifier	Result	DL	RL	Units	DF Analyst Date	Time Batch	Method
Ion Chromatograp	phy							
EPA 314.0 Perch	lorate by IC "As Re	ceived"						
Perchlorate	U	ND	0.004	0.012	mg/L	1 MAR1 10/21/14	1539 1427862	1
The following A	nalytical Methods v	ere performed:						
Method	Description				Ana	alyst Comments		
1	EPA 314.0 DC	E-AL				•		

Notes:

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: November 12, 2014

Company:

Sandia National Laboratories

Address:

MS-0756, Org. 06765, Bldg. 823/Rm. 4276

1515 Eubank SE

Albuquerque, New Mexico 87123

Contact:

Ms. Pamela M. Puissant

Project:

Groundwater, Level C Package

Sample ID:

Client Sample ID: 096692-020 358946043

Matrix:

Collector:

AQUEOUS

Collect Date:

14-OCT-14 09:34

Receive Date:

15-OCT-14

Client

Project:

SNLSGWater

Client ID:

SNLS004

Client Desc.: CCBA-MW2

Vol. Recv.:

Parameter	Qualifier	Result	DL	RL	Units	DF Analyst Date	Time Batch	Method
Ion Chromatograp	phy							
EPA 314.0 Perch	lorate by IC "As Re	ceived"						
Perchlorate	U	ND	0.004	0.012	mg/L	1 MAR1 10/21/14	1558 1427862	1
The following A	nalytical Methods v	vere performed:						
Method	Description				Ana	alyst Comments		
1	EPA 314.0 DC	E-AL						

Notes:

CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab	4.															Page	e <u>1</u> of <u>1</u>
Project Nam	VIA	BSG		Ta the base	a Julius and a second	SMO Use			20 2		0/	10)		AR/COC	61	5940
Project/Task Project/Task Service Orde	Manager Number:	Mike Skell	0.11.01	Date Sample: Carrier/Wayb Lab Contact Lab Destination Contract No.	ili No				SMO	Report to SM	e: Herrera/50 O:	7. /1 5-844-3199	Sme	RMMA Released	haracterization		4º Celsiu
Tech Area: Building:		Room:		Operationa	l Site:	1.0 10000		e Zue S	1	Kita Kava	anaugn/50	5-284-2553		P.O. Box 5800, N		_	
Sample No.	Fraction	San	ple Location D		Depth (ft)	Date/ Colle		Sample Matrix	C Type	ontainer Volume	Preserv- ative	Collection Method	Sample Type		M 87185-0154 leter & Method lequested		63/60 Lab Sample II
096977	-005	CYN-MW1	14A		281	12/17/14	10:17	GW	AG	4x1 L	None	G	SA	TPH DRO (SW		SVOC)	014
096977	-006	CYN-MW1	14A		281	12/17/14	10:14	GW	AG	3x40ml	None	G	SA	TPH GRO (SW			0/5
096977	-018	CYN-MW1	14A		281	12/17/14	10:21	† gw	Р	125 ml	H2SO4	G	SA	NPN (EPA 353	· · · · · · · · · · · · · · · · · · ·		016
096977	-020	CYN-MW1	14A		281	-12/17/14	10:22	d GW	Р	250 ml	None	G	SA	Perchlorate (El	PA 314.0)		017
096978	-006	CYN-TB10)		NA	-12/17/14	10:14	DIW	AG	3x40ml	None	G	ТВ	TPH GRO (SW846-8015A/B VO		VOC)	018
							-										
								-									
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Last Chain Validation		✓ Yes ✓ Yes			Sample 1	Tracking		SMO	Use	Special Ins	tructions		The state of the s	<u> </u>	900	Condi	ltions on
Backgroun	d:	Yes			Entered t	CANATATIVE NEW YORK			en e	EDD Turnaround	1 Time	✓ Yes Z Dav		No 15 Day*	✓ 30 Day	Re	eceipt
Confirmato Sample Team		Yes ame	Signatu	ire .	QC inits :			tion/Phone		Negotiated Sample Dis	TAT		to Client		posal by Lab		
	Gilbert Qu		sulve for	lin		SNL/4142/50 SNL/4143/50				Return San Comments If Perchlorat		Send report to	Tim Jackson verificatio	/4142/MS 0729/284-2 on analysis SW8	2547		
1.Relinquishe	- AMERICA	uf popular		Org. 4142	Date	2/17/14	Time /	118 3	3.Reling	uished by			Org.	Date) Use
 Received b Relinquishe 	- 1/2	27/	The state of the s	Org. 4/47		12/17/14	Time]	118	3. Recei	ved by			Org.	Date		Time Time	
2. Received b		TO XOOLO	7	Org. 4147 Org.	Z Date Date	12/17/19		-	Relinq	uished by	w1997 65		Org.	Date		Time	An
Prior confirm	nation wi	h SMO requ	uired for 7 and			1/8/1	11116	1001	. necel	ved by			Org.	Date	3	Time	

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: January 12, 2015

Company:

Sandia National Laboratories

Address:

MS-0756, Org. 06765, Bldg. 823/Rm. 4276

1515 Eubank SE

Albuquerque, New Mexico 87123

Contact:

Ms. Pamela M. Puissant

Project:

Groundwater, Level C Package

Sample ID:

Client Sample ID: 096977-020

Matrix:

363160017 **AQUEOUS**

Collect Date:

17-DEC-14 10:22

Receive Date:

18-DEC-14

Collector:

Client

Project:

Client ID:

Client Desc.: CYN-MW14A

SNLSGWater

SNLS004

Vol. Recv.:

Parameter	Qualifier	Result	DL	RL	Units	DF Analys	t Date	Time Batch	Method
Ion Chromatograp	phy								
EPA 314.0 Perch	lorate by IC "As Re	ceived"							
Perchlorate	U	ND	0.004	0.012	mg/L	1 MAR1	12/23/14	2300 1445114	1
The following A	nalytical Methods v	vere performed:							
Method	Description				Ana	alyst Comments	10000		11
1	EPA 314.0 DC	DE-AL							

Notes:

CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab	1															Page	1_of_1
Batch No.	NA	8				SMO Use	,					10			AR/COC	-	5941
Project Name		BSG		Date Sample	es Shipped	12/1	7/11	1	SMO A	uthorization	0	49	10	Waste Ci	naracterization		
Project/Task				Carrier/Way	bill No.	227	645		ѕмо с	ontact Phon	e:	(SMO	RMMA			l
Project/Task	Number:	146422.1		Lab Contact		Edie Kent/8	303-556-	8171		Lorraine I	Herrera/50	5-844-3199	w.a	Released	by COC No.		İ
Service Orde	r:	CF058-1	5	Lab Destinat	tion:	GEL	. M. 2441	description	Send R	eport to SM	0:				,	1	4º Celsius
				Contract No.		PO 130387	'3			Rita Kava	anaugh/50	-284-2553		Bill to:Sandia Nat	tional Laboratories		
Tech Area:														P.O. Box 5800, N		(Account	its rayable),
Building:		Room:		Operation	al Site:											3	36316
					Depth	Date/1	ime	Sample	C	ontainer	Preserv-	Collection	Sample	Albuquerque, NM			
Sample No.	Fraction	Sa	mple Location I	Detail	(ft)	Collec		Matrix	Type	Volume	ative	Method	Type	to successive	eter & Method		Lab
000070	005				T				1,000	Volume	auve	Metriou	туре	R	equested		Sample ID
096979	-005	CYN-MW	/15		187	112/17/14	9:37	GW	AG	4x1 L	None	G	SA	TPH DRO (SW	/846-8015A/B S	(voc	009
096979	-006	CYN-MW	′ 15		187	12/17/14	9:35	+ GW	AG	3x40ml	None	G	SA				6.0
					1	1		1.	-10	OX40IIII	None	G	- SA	IPH GRO (SVI	/846-8015A/B\	(OC)	010
096979	-018	CYN-MW	15		187	•12/17/14	9:38	1 GW	Р	125 ml	H2SO4	G	SA	NPN (EPA 353	5.2)	1	011
096979	-020	CYN-MW	115		187	12/17/14	9:39	GW	Р	2501							
					1.07	12/1//14	9.59	GVV	<u> </u>	250 ml	None	G	SA	Perchlorate (El	PA 314.0)		012
096980	-006	CYN-TB1	1		NA	-12/17/14	9:35	DIW	AG	3x40ml	None	G	тв	TPH GRO (SW	/846-8015A/B \	(OC)	013
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											1						
					 												
			-				*				 						
Last Chain:		☐ Yes			Sample	Tracking		SMO			<u> </u>						
Validation I		✓ Yes			Date En	All and the second second second		SIVIO	use	1	structions	QC Requir				Condi	itions on
Backgroun					 				A No Hills	EDD		✓ Yes		No		Re	eceipt
		Yes			Entered					Turnaroun		7 Da	<u>y*</u>	15 Day* (✓ 30 Day)		
Confirmato		i! Yes	r		QC inits					Negotiated	TAT						garage (Albert
Sample		ame	Signat		Init.	Company				Sample Di	sposal	Return	to Client	∠ Dis	posal by Lab		
	Robert Ly	nch	141191	roh	PL	SNL/4142/50	5-844-401	13/505-250	0-7090	Return Sar	mples By:						
Members	Alfred Sa	ntillanes	Hellesite	ll_	1X	SNL/4142/50	5-844-513	30/505-228	3-0710	Comments	s:	Send report to	Tim Jackson/	4142/MS 0729/284-2	2547		
7.			0							If Perchlora	te detecte			analysis using §			
							****							,	1		
		1 .		***************************************			***************************************								1		ANY STATE
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1. Received b		49	a GNO			12/17/14							Org.	Dat		Time	
2.Relinquishe		y uy	Q THE	Org / 1/4		12/17/2		/ /	3. Recei				Org.	Dat	e	Time	
2. Received b		10000	00/0				Time /	-		uished by			Org.	Dat	e	Time	
		MOUND	quired for 7 and	Org.	Date	12/18/14	Time ()	T50	4. Recei	ved by			Org.	Dat	е	Time	
LHOL COULL	nation W	m Sivio re	quired for / and	1 15 day TA										Colored William William			

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: January 12, 2015

Company:

Sandia National Laboratories

Address:

MS-0756, Org. 06765, Bldg. 823/Rm. 4276

1515 Eubank SE

Albuquerque, New Mexico 87123

Contact:

Ms. Pamela M. Puissant

Project:

Groundwater, Level C Package

Sample ID:

Client Sample ID: 096979-020 363160012

Matrix:

AQUEOUS

Collect Date:

17-DEC-14 09:39

Receive Date:

Collector:

18-DEC-14

Client

Client Desc.: CYN-MW15

Project:

Client ID:

SNLSGWater

SNLS004

Vol. Recv.:

Parameter Qualifier DL RL Units Result DF Analyst Date Time Batch Method Ion Chromatography EPA 314.0 Perchlorate by IC "As Received" Perchlorate 0.004 0.012 mg/L 1 MAR1 12/23/14 2241 1445114 1 The following Analytical Methods were performed: Description Method **Analyst Comments** EPA 314.0 DOE-AL

Notes:

Appendix B Data Validation Sample Findings Summary Sheets for the Perchlorate Data





PO Box 21987 Albuquerque, NM 87154 1-888-678-5447

www.againc.net

Memorandum

Date: November 13, 2014

To: File

From: Monica Dymerski

Subject: Inorganic Data Review and Validation – SNL

Site: SWMU 68 GWM

AR/COC: 615811, 615812, 615813 and 615814

SDG: 358371 Laboratory: GEL

Project/Task: 146422.10.11.01 Analysis: General Chemistry

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM ER Project AOP 00-03 Rev 4.

Summary

Five samples were prepared and analyzed with accepted procedures using methods EPA 7196A (hexavalent chromium), EPA 9012A (total cyanide), EPA 314.0 (perchlorate), EPA 9056 (anions by IC), EPA 353.2 (nitrate/nitrite) and SM 2320B (total alkalinity). Data were reported for all required analytes. Problems were identified with the data package that resulted in the qualification of data.

Hexavalent chromium:

- 1. Sample 358371020 was analyzed beyond the 24 hour method-specified holding time but within 2X the HT. The associated sample result was a non-detect and will be **qualified UJ.H2**.
- 2. The %D was >10% but ≤25% with a negative bias for hexavalent chromium in the ICV associated with samples -005 and -020. The associated samples were non-detects and will be **qualified UJ,C3.**

Total cyanide:

- 1. The intercept for total cyanide was negative with an absolute value > the MDL but ≤3X the MDL. The associated sample results were non-detects and will be **qualified UJ,15.**
- 2. Total cyanide was detected in the ICB at a negative concentration with absolute value > the MDL. The associated sample results were non-detects and will be **qualified UJ,B4.**

Data are acceptable and reported QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times and Preservation

The samples were prepared and analyzed within the prescribed holding times and properly preserved except as noted above in the Summary section and as follows. Samples -034, -047, and -061 were prepared and analyzed very slightly beyond the 24 hour method-specified holding time for hexavalent chromium. Based on professional judgment, no data will be qualified.

Calibration

All initial and continuing calibration met QC acceptance criteria except as noted above in the Summary section.

Blanks

No target analytes were detected in the blanks except as noted above in the Summary section.

Alkalinity blank results were reported, but were not assessed for data validation.

Laboratory Control Sample (LCS)

All LCS acceptance criteria were met.

Matrix Spike (MS)

All MS/PS recoveries met QC acceptance criteria.

Laboratory Replicate

The replicate analyses met all QC acceptance criteria.

Detection Limits/Dilutions

All detection limits were properly reported. The samples were not diluted except as follows.

Nitrate/Nitrite:

All samples except -022 (EB) were diluted 5X.

Anions:

All samples *except* -021 (EB) were diluted 10X for chloride and sulfate.

Other QC

An EB was submitted with ARCOC 615812 and it was associated with the samples from ARCOC 615813. A field duplicate pair was submitted with ARCOC 615813. There are no "required" review criteria for field duplicate analyses comparability; no data will be qualified as a result.

No other specific issues that affect data quality were identified.

Reviewed by: Mary Donivan Level: I Date: 11/17/14



Sample Findings Summary



AR/COC: 615822, 615823, 615824 Page 1 of 3

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
EPA 900.0/SW846 9310			
	096685-034/CCBA-MW1	ALPHA (12587-46-1)	J, FR7,MS1
	096685-034/CCBA-MW1	BETA (12587-47-2)	J, FR7,MS1
	096688-034/CCBA-EB1	ALPHA (12587-46-1)	BD, FR3,MS1
	096688-034/CCBA-EB1	BETA (12587-47-2)	BD, FR3,MS1
	096691-034/CCBA-MW2	ALPHA (12587-46-1)	J, MS1
	096691-034/CCBA-MW2	BETA (12587-47-2)	J, FR7,MS1
	096692-034/CCBA-MW2	ALPHA (12587-46-1)	J, MS1
	096692-034/CCBA-MW2	BETA (12587-47-2)	BD, FR3,MS1
EPA 901.1			
	096685-033/CCBA-MW1	Americium-241 (14596-10-2)	BD, FR3
	096685-033/CCBA-MW1	Cesium-137 (10045-97-3)	BD, FR3
	096685-033/CCBA-MW1	Cobalt-60 (10198-40-0)	BD, FR3
	096685-033/CCBA-MW1	Potassium-40 (13966-00-2)	BD, FR3
	096688-033/CCBA-EB1	Americium-241 (14596-10-2)	BD, FR3
	096688-033/CCBA-EB1	Cesium-137 (10045-97-3)	BD, FR3
	096688-033/CCBA-EB1	Cobalt-60 (10198-40-0)	BD, FR3
	096688-033/CCBA-EB1	Potassium-40 (13966-00-2)	BD, FR3
	096691-033/CCBA-MW2	Americium-241 (14596-10-2)	BD, FR3
	096691-033/CCBA-MW2	Cesium-137 (10045-97-3)	BD, FR3
	096691-033/CCBA-MW2	Cobalt-60 (10198-40-0)	BD, FR3
	096691-033/CCBA-MW2	Potassium-40 (13966-00-2)	BD, FR3
	096692-033/CCBA-MW2	Americium-241 (14596-10-2)	BD, FR3
	096692-033/CCBA-MW2	Cesium-137 (10045-97-3)	BD, FR3
	096692-033/CCBA-MW2	Cobalt-60 (10198-40-0)	BD, FR3

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
	096692-033/CCBA-MW2	Potassium-40 (13966-00-2)	BD, FR3
SW846 3005/6020 DOE-AL			
	096691-010/CCBA-MW2	Copper (7440-50-8)	0.0042U, B2
	096692-010/CCBA-MW2	Copper (7440-50-8)	0.0042U, B2
SW846 3535/8321A Modifie	ed		
	096685-024/CCBA-MW1	m-Nitrotoluene (99-08-1)	UJ, 14
	096685-024/CCBA-MW1	o-Nitrotoluene (88-72-2)	UJ, I4
	096685-024/CCBA-MW1	p-Nitrotoluene (99-99-0)	UJ, 14
	096685-024/CCBA-MW1	Tetryl (479-45-8)	UJ, L3,MS3
	096688-024/CCBA-EB1	m-Nitrotoluene (99-08-1)	UJ, 14
	096688-024/CCBA-EB1	o-Nitrotoluene (88-72-2)	UJ, 14
	096688-024/CCBA-EB1	p-Nitrotoluene (99-99-0)	UJ, 14
	096688-024/CCBA-EB1	Tetryl (479-45-8)	UJ, L3,MS3
	096691-024/CCBA-MW2	m-Nitrotoluene (99-08-1)	UJ, 14
	096691-024/CCBA-MW2	o-Nitrotoluene (88-72-2)	UJ, 14
	096691-024/CCBA-MW2	p-Nitrotoluene (99-99-0)	UJ, 14
	096691-024/CCBA-MW2	Tetryl (479-45-8)	UJ, L3,MS3
	096692-024/CCBA-MW2	m-Nitrotoluene (99-08-1)	UJ, 14
	096692-024/CCBA-MW2	o-Nitrotoluene (88-72-2)	UJ, 14
	096692-024/CCBA-MW2	p-Nitrotoluene (99-99-0)	UJ, 14
	096692-024/CCBA-MW2	Tetryl (479-45-8)	UJ, L3,MS3
SW846 8260B DOE-AL			
	096686-001/CCBA-TB1	Bromomethane (74-83-9)	UJ, 13,C3
	096687-001/CCBA-FB1	Bromomethane (74-83-9)	UJ, 13,C3
	096688-001/CCBA-EB1	Bromomethane (74-83-9)	UJ, 13,C3
	096689-001/CCBA-TB2	Bromomethane (74-83-9)	UJ, I3,C3
	096690-001/CCBA-FB2	Bromomethane (74-83-9)	UJ, 13,C3
SW846 9012B			
	096685-027/CCBA-MW1	Cyanide, Total (57-12-5)	UJ, 15

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
	096688-027/CCBA-EB1	Cyanide, Total (57-12-5)	UJ, 15
	096691-027/CCBA-MW2	Cyanide, Total (57-12-5)	UJ, 15
	096692-027/CCBA-MW2	Cyanide, Total (57-12-5)	UJ, 15

All other analyses met QC acceptance criteria; no further data should be qualified.





PO Box 21987 Albuquerque, NM 87154 1-888-678-5447

www.againc.net

Memorandum

Date: November 21, 2014

To: File

From: Monica Dymerski

Subject: Inorganic Data Review and Validation – SNL

Site: SWMU 8/58 GWM

AR/COC: 615822, 615823, and 615824

SDG: 358946 Laboratory: GEL

Project/Task: 146422.10.11.01 Analysis: General Chemistry

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM ER Project AOP 00-03 Rev 4.

Summary

Four samples were prepared and analyzed with accepted procedures using methods EPA 9012A (total cyanide), EPA 314.0 (perchlorate), EPA 9056 (anions by IC), EPA 353.2 (nitrate/nitrite) and SM 2320B (total alkalinity). Data were reported for all required analytes. Problems were identified with the data package that resulted in the qualification of data.

Total cyanide:

1. The intercept for total cyanide was negative with an absolute value > the MDL but $\le 3X$ the MDL. The associated sample results were non-detects and will be **qualified UJ,15.**

Data are acceptable and reported QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times and Preservation

The samples were prepared and analyzed within the prescribed holding times and were properly preserved.

Calibration

All initial and continuing calibration met QC acceptance criteria except as noted above in the Summary section.

Blanks

No target analytes were detected in the blanks except as follows. Chloride was detected in a CCB bracketing sample -017 at < the PQL. The associated sample result was a non-detect and will not be qualified.

Alkalinity blank results were reported, but were not assessed for data validation.

Laboratory Control Sample (LCS)

All LCS acceptance criteria were met.

Matrix Spike (MS)

All MS/PS recoveries met QC acceptance criteria.

Nitrate/nitrite – N:

The MS analysis was performed on an SNL sample from another SDG. No sample data will be qualified as a result.

Laboratory Replicate

The replicate analyses met all QC acceptance criteria.

Nitrate/nitrite – N:

The replicate analysis was performed on an SNL sample from another SDG. No sample data will be qualified as a result.

Detection Limits/Dilutions

All detection limits were properly reported. The samples were not diluted except as follows.

Nitrate/Nitrite:

All samples except -018 (EB) were diluted 5X.

Anions:

Sample -004 was diluted 5X, and samples -030 and -041 were diluted 10X for chloride and sulfate.

Other QC

An EB was submitted with ARCOC 615823 and it was associated with the samples from ARCOC 615824. A field duplicate pair was submitted with ARCOC 615824. There are no "required" review criteria for field duplicate analyses comparability; no data will be qualified as a result.

No other specific issues that affect data quality were identified.

Reviewed by: Mary Donivan Level: I Date: 11/24/14



Sample Findings Summary



AR/COC: 615935, 615938, 615940, 615941 Page 1 of 1

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC

All other analyses met QC acceptance criteria; no further data should be qualified.



Sample Findings Summary



AR/COC: 615811, 615812, 615813, 615814

Page 1 of 3

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
DOE EML HASL-300, U-02-R	С		
	096656-035/OBS-EB1	Uranium-233/234 (13968-55-3/13966-29-)	BD, FR3
	096656-035/OBS-EB1	Uranium-235/236 (15117-96- 1/13982-70-)	BD, FR3
	096656-035/OBS-EB1	Uranium-238 (7440-61-1)	BD, FR3
EPA 900.0/SW846 9310			
	096653-034/OBS-MW1	ALPHA (12587-46-1)	J, MS1
	096653-034/OBS-MW1	BETA (12587-47-2)	J, MS1
	096656-034/OBS-EB1	ALPHA (12587-46-1)	BD, FR3,MS1
	096656-034/OBS-EB1	BETA (12587-47-2)	BD, FR3,MS1
	096658-034/OBS-MW2	ALPHA (12587-46-1)	J, MS1
	096658-034/OBS-MW2	BETA (12587-47-2)	J, MS1
	096659-034/OBS-MW2	ALPHA (12587-46-1)	J, MS1
	096659-034/OBS-MW2	BETA (12587-47-2)	J, MS1
	096661-034/OBS-MW3	ALPHA (12587-46-1)	J, MS1
	096661-034/OBS-MW3	BETA (12587-47-2)	J, MS1
EPA 901.1			
	096653-033/OBS-MW1	Americium-241 (14596-10-2)	BD, FR3
	096653-033/OBS-MW1	Cesium-137 (10045-97-3)	BD, FR3
	096653-033/OBS-MW1	Cobalt-60 (10198-40-0)	BD, FR3
	096653-033/OBS-MW1	Potassium-40 (13966-00-2)	J, FR7
	096656-033/OBS-EB1	Americium-241 (14596-10-2)	BD, FR3
	096656-033/OBS-EB1	Cesium-137 (10045-97-3)	BD, FR3
	096656-033/OBS-EB1	Cobalt-60 (10198-40-0)	BD, FR3
	096656-033/OBS-EB1	Potassium-40 (13966-00-2)	BD, FR3

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
	096658-033/OBS-MW2	Americium-241 (14596-10-2)	BD, FR3
	096658-033/OBS-MW2	Cesium-137 (10045-97-3)	BD, FR3
	096658-033/OBS-MW2	Cobalt-60 (10198-40-0)	BD, FR3
	096658-033/OBS-MW2	Potassium-40 (13966-00-2)	BD, FR3
	096659-033/OBS-MW2	Americium-241 (14596-10-2)	BD, FR3
	096659-033/OBS-MW2	Cesium-137 (10045-97-3)	BD, FR3
	096659-033/OBS-MW2	Cobalt-60 (10198-40-0)	BD, FR3
	096659-033/OBS-MW2	Potassium-40 (13966-00-2)	BD, FR3
	096661-033/OBS-MW3	Americium-241 (14596-10-2)	BD, FR3
	096661-033/OBS-MW3	Cesium-137 (10045-97-3)	BD, FR3
	096661-033/OBS-MW3	Cobalt-60 (10198-40-0)	BD, FR3
	096661-033/OBS-MW3	Potassium-40 (13966-00-2)	R, Z2
SW846 3510C/8270D			
	096653-002/OBS-MW1	4-Nitrophenol (100-02-7)	UJ, MS5
	096656-002/OBS-EB1	4-Nitrophenol (100-02-7)	UJ, MS5
	096658-002/OBS-MW2	4-Nitrophenol (100-02-7)	UJ, MS5
	096659-002/OBS-MW2	4-Nitrophenol (100-02-7)	UJ, MS5
	096661-002/OBS-MW3	4-Nitrophenol (100-02-7)	UJ, MS5
SW846 3535/8321A Modifi			
	096653-024/OBS-MW1	m-Nitrotoluene (99-08-1)	UJ, 14
	096653-024/OBS-MW1	o-Nitrotoluene (88-72-2)	UJ, 14
	096653-024/OBS-MW1	p-Nitrotoluene (99-99-0)	UJ, 14
	096653-024/OBS-MW1	Tetryl (479-45-8)	UJ, L3,MS3
	096656-024/OBS-EB1	m-Nitrotoluene (99-08-1)	UJ, 14
	096656-024/OBS-EB1	o-Nitrotoluene (88-72-2)	UJ, 14
	096656-024/OBS-EB1	p-Nitrotoluene (99-99-0)	UJ, 14
	096656-024/OBS-EB1	Tetryl (479-45-8)	UJ, L3,MS3
	096658-024/OBS-MW2	m-Nitrotoluene (99-08-1)	UJ, 14
	096658-024/OBS-MW2	o-Nitrotoluene (88-72-2)	UJ, 14

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
	096658-024/OBS-MW2	p-Nitrotoluene (99-99-0)	UJ, 14
	096658-024/OBS-MW2	Tetryl (479-45-8)	UJ, L3,MS3
	096659-024/OBS-MW2	m-Nitrotoluene (99-08-1)	UJ, 14
	096659-024/OBS-MW2	o-Nitrotoluene (88-72-2)	UJ, 14
	096659-024/OBS-MW2	p-Nitrotoluene (99-99-0)	UJ, 14
	096659-024/OBS-MW2	Tetryl (479-45-8)	UJ, L3,MS3
	096661-024/OBS-MW3	m-Nitrotoluene (99-08-1)	UJ, 14
	096661-024/OBS-MW3	o-Nitrotoluene (88-72-2)	UJ, 14
	096661-024/OBS-MW3	p-Nitrotoluene (99-99-0)	UJ, 14
	096661-024/OBS-MW3	Tetryl (479-45-8)	UJ, L3,MS3
SW846 7196A			
	096653-014/OBS-MW1	Hexavalent Chromium (18540-29-9)	UJ, H2,C3
	096656-014/OBS-EB1	Hexavalent Chromium (18540-29-9)	UJ, C3
SW846 9012B			
	096653-027/OBS-MW1	Cyanide, Total (57-12-5)	UJ, 15,B4
	096656-027/OBS-EB1	Cyanide, Total (57-12-5)	UJ, 15,B4
	096658-027/OBS-MW2	Cyanide, Total (57-12-5)	UJ, 15,B4
	096659-027/OBS-MW2	Cyanide, Total (57-12-5)	UJ, 15,B4
	096661-027/OBS-MW3	Cyanide, Total (57-12-5)	UJ, 15,B4

All other analyses met QC acceptance criteria; no further data should be qualified.





PO Box 21987 Albuquerque, NM 87154 1-888-678-5447

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Memorandum

Date: January 23, 2015

To: File

From: Mary Donivan

Subject: Inorganic Data Review and Validation – SNL

Site: BSG

AR/COC: 615935, 615938, 615940 and 615941

SDG: 363160 Laboratory: GEL

Project/Task: 146422.10.11.01 Analysis: General Chemistry

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM ER Project AOP 00-03 Rev 4.

Summary

Four samples were prepared and analyzed with accepted procedures using method EPA 353.2 (nitrate/nitrite) and two samples were prepared and analyzed with accepted procedures using method EPA 314.0 (perchlorate). Data were reported for all required analytes. No problems were identified with the data package that resulted in the qualification of data.

Data are acceptable and reported QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times and Preservation

The samples were prepared and analyzed within the prescribed holding times.

Calibration

All initial and continuing calibration met QC acceptance criteria.

Blanks

No target analytes were detected in the blanks except as follows.

Nitrate/nitrite-N:

Nitrate/nitrite was detected in the ICB at negative concentration with an absolute value \leq the PQL. The associated sample results were detects \geq 5X the MDL and will not be qualified.

Laboratory Control Sample (LCS)

All LCS acceptance criteria were met.

Matrix Spike (MS)

All MS/PS recoveries met QC acceptance criteria.

Perchlorate:

The PS analysis was performed on a sample of similar matrix from another SNL SDG. No sample data will be qualified as a result.

Laboratory Replicate

The replicate analyses met all QC acceptance criteria.

Perchlorate:

The replicate analysis was performed on a sample of similar matrix from another SNL SDG. No sample data will be qualified as a result.

Detection Limits/Dilutions

All detection limits were properly reported.

Nitrate/nitrite-N:

Sample 363160003 was diluted 25X and samples -007, -011 and -016 were diluted 50X.

Other QC

No other specific issues that affect data quality were identified.

Reviewed by: Monica Dymerski Level I Date: 01/26/15

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SECTION III

SOLID WASTE MANAGEMENT UNITS 8/58 AND 68 QUARTERLY GROUNDWATER MONITORING REPORT, October – December 2014

1.0 Introduction

This section of the Environmental Restoration Operations (ER) Consolidated Quarterly Report (ER Quarterly Report) has been prepared pursuant to the "SWMU 68 and SWMUs 8/58 Groundwater Characterization Work Plans – U.S. Department of Energy (DOE)/Sandia Corporation (Sandia) Response to the New Mexico Environment Department (NMED) letter of April 8, 2010, entitled, Class 3 Permit Modification Requests for Granting Corrective Action Complete Status for 26 SWMUs/AOCs (Request of March 1, 2006) and 5 Other SWMUs/AOCs (Request of January 7, 2008), Sandia National Laboratories, EPA ID #NM5890110518 HWB-SNL-06-007 and HWB-SNL-08-001" (SNL/NM September 2010) and the NMED approval of "Solid Waste Management Units 8 and 58, Proposed Groundwater Monitoring Well Location Adjustment" (NMED June 2011). The activities associated with the groundwater monitoring task for Solid Waste Management Units (SWMUs) 8/58 and 68 at Sandia National Laboratories, New Mexico (SNL/NM) are summarized in this section.

This is the thirteenth quarterly groundwater sampling event following the April 8, 2010 letter by NMED requiring eight quarters of groundwater monitoring. The Coyote Canyon Blast Area (CCBA) monitoring wells CCBA-MW1 and CCBA-MW2 are located within SWMUs 8/58, and Old Burn Site (OBS) monitoring wells OBS-MW1, OBS-MW2, and OBS-MW3 are located within SWMU 68. These five monitoring wells were installed in August 2011 (SNL/NM November 2011). The location of CCBA monitoring wells are shown in Figure III-1 and OBS monitoring wells in Figure III-2.

The supplemental groundwater monitoring at these monitoring wells is designed to meet the requirements of Section VII.D.6 of the Compliance Order on Consent (the Consent Order) (NMED April 2004) and the letter dated April 8, 2010, from the NMED Hazardous Waste Bureau (NMED April 2010). The analytical results discussed in this report correspond to the Fourth Quarter, Calendar Year (CY) 2014 reporting period (October – December 2014).

This groundwater sampling event was conducted in conformance with procedures outlined in the "Groundwater Characterization Work Plan for SWMU 8 – Open Dump (Coyote Canyon Blast Area) and SWMU 58 – Coyote Canyon Blast Area, Foothills Test Area" and "Groundwater Characterization Work Plan for SWMU 68, Old Burn Site" (SNL/NM September 2010). These work plans were approved with modification by NMED in January 2011 (NMED January 2011).

Monitoring wells CCBA-MW1 and CCBA-MW2 were sampled on October 13 and October 14, 2014, respectively. The samples were analyzed for the required constituents, consisting of volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), high explosive (HE) compounds, nitrate plus nitrite (NPN), major anions (i.e., bromide, chloride, fluoride, and sulfate), major cations (i.e., calcium, magnesium, potassium, and sodium), alkalinity, Target Analyte List (TAL) metals plus uranium, perchlorate, total cyanide, radionuclides by gamma spectroscopy, and gross alpha/beta activity.

Monitoring wells OBS-MW1, OBS-MW2, and OBS-MW3 were sampled from October 6 to October 8, 2014. The samples were analyzed for the required constituents, consisting of VOCs, SVOCs, HE compounds, NPN, major anions, major cations, alkalinity, TAL metals plus uranium, hexavalent chromium, perchlorate, total cyanide, radionuclides by gamma spectroscopy, gross alpha/beta activity, and isotopic uranium.

Analytical results for the groundwater samples were compared with the U.S. Environmental Protection Agency (EPA) maximum contaminant levels (MCLs) for drinking water (EPA 2009). Except for fluoride, none of the analytical results for the groundwater samples from SWMUs 8/58 exceed the MCLs. Fluoride was detected above the established MCL of 4.0 milligrams per liter (mg/L) in the CCBA-MW1 groundwater sample at a concentration of 4.81 mg/L. Fluoride in the CCBA-MW2 groundwater sample and groundwater duplicate sample were both above the method detection limit (MDL), and both reported a concentration of 1.50 mg/L. None of the analytical results from the groundwater samples from SWMU 68 exceeded the MCLs.

Quality control (QC) samples consisting of duplicate groundwater, equipment blank (EB), trip blank (TB), and field blank (FB) samples were also submitted for analysis during this quarterly sampling event. The following sections provide descriptions of the field methods used and discussions of the analytical and QC sampling results.

2.0 Field Methods and Measurements

Groundwater monitoring at SWMUs 8/58 and 68 was performed according to work plans submitted as Attachments A and B to the DOE/Sandia Response (SNL/NM September 2010) and SNL/NM Administrative Operating Procedures (AOPs) (SNL/NM May 2011) and Field Operating Procedures (FOPs) (SNL/NM January 2012a and January 2012b). Groundwater samples were analyzed for relevant parameters listed in Table III-1. Table III-2 presents the details for groundwater samples collected from all five monitoring wells during the Fourth Quarter, CY 2014.

2.1 **Equipment Decontamination**

A portable Bennett[™] groundwater sampling system was used to collect the groundwater samples from both wells. The Bennett[™] sampling pump and tubing bundle were decontaminated prior to installation into the monitoring wells in accordance with the procedures described in SNL/NM FOP 05-03, "Groundwater Monitoring Equipment Decontamination" (SNL/NM January 2012a). Section III.4.1.2 discusses the QC results for the EB samples.

2.2 Well Evacuation

In accordance with procedures described in SNL/NM FOP 05-01, "Groundwater Monitoring Well Sampling and Field Analytical Measurements" (SNL/NM January 2012b), all wells were purged a minimum of one saturated casing volume (the volume of one length of the saturated screen plus the borehole annulus around the saturated screen interval) and monitored for stability of water quality parameters.

Field water quality measurements for turbidity, pH, temperature, specific conductance (SC), oxidation-reduction potential (ORP), and dissolved oxygen (DO) were obtained from the wells prior to collecting groundwater samples. Groundwater temperature, SC, ORP, DO, and pH were measured with an YSI[™] Model EXO1 water quality meter. Turbidity was measured with a HACH[™] Model 2100Q turbidity meter. Purging continued until four stable measurements for turbidity, pH, temperature, and SC were obtained.

Groundwater stability is considered acceptable when the following parameters are achieved:

- Turbidity measurements are within 10 percent, or less than 5 nephelometric turbidity units.
- pH is within 0.1 units.
- Temperature is within 1.0 degree Celsius.
- SC is within 5 percent as micromhos per centimeter.

Table III-3 summarizes the temperature, pH, SC, and turbidity measurements, which are discussed in Section III.3.1. Field Measurement Logs documenting details of well purging, and water quality measurements are included in Appendix A and have been submitted to the SNL/NM Records Center.

2.3 Groundwater Sample Collection

All groundwater samples were collected directly from the sample discharge tubing into laboratory-prepared sample containers. Chemical preservatives for samples intended for chemical analyses were added to the sample containers at the laboratory prior to shipment to SNL/NM. The groundwater samples were submitted to GEL Laboratories LLC (GEL) for chemical analysis using methods outlined in Table III-1. Table III-1 also lists the sample containers and preservation requirements. Section III.3.0 summarizes the analytical results.

The sample identification number, Analysis Request/Chain-of-Custody form number, and the associated groundwater investigation are provided in Table III-2. Chain-of-custody forms are included in Appendix B.

3.0 Analytical Results

Groundwater samples were submitted to GEL and Test America Laboratories for chemical and radiological analyses. Samples were analyzed in accordance with applicable EPA analytical methods (EPA 1980, 1984, 1986, and 1999; Clesceri et al. 1998; DOE 1990). Table III-4 lists the MDLs for VOCs and SVOCs and Table III-5 lists the MDLs for HE compounds. Groundwater sampling results are compared with

established EPA MCLs for drinking water (EPA 2009). Analytical results for samples collected from all five monitoring wells are shown in tabulated form in Tables III-6 through III-14. Analytical reports, including certificates of analyses, analytical methods, MDLs, minimum detectable activity (MDA), critical level, practical quantitation limits, dates of analyses, results of QC analyses, and data validation findings are filed in the SNL/NM Records Center.

The analytical data were reviewed and qualified in accordance with AOP 00-03, "Data Validation Procedure for Chemical and Radiochemical Data," Revision 3 (SNL/NM May 2011). The data are acceptable, and reported QC measures are adequate. The data validation summary sheets are provided in Appendix C.

3.1 Field Water Quality Measurements

SWMUs 8/58, Monitoring Wells CCBA-MW1 and CCBA-MW2. Table III-3 summarizes field water quality measurements (turbidity, pH, temperature, SC, ORP, and DO) collected prior to sampling.

SWMU 68, Monitoring Wells OBS-MW1, OBS-MW2, and OBS-MW3. Table III-3 summarizes field water quality measurements (turbidity, pH, temperature, SC, ORP, and DO) collected prior to sampling.

3.2 Volatile Organic Compounds

SWMUs 8/58, Monitoring Wells CCBA-MW1 and CCBA-MW2. No VOCs were detected above laboratory MDLs in any groundwater sample from SWMUs 8/58. Table III-4 lists MDLs for associated VOCs analyzed.

SWMU 68, Monitoring Wells OBS-MW1, OBS-MW2, and OBS-MW3. No VOCs were detected above laboratory MDLs in any groundwater sample from SWMU 68. Table III-4 lists MDLs for associated VOCs analyzed.

3.3 Semivolatile Organic Compounds

SWMUs 8/58, Monitoring Wells CCBA-MW1 and CCBA-MW2. No SVOCs were detected above laboratory MDLs in any groundwater sample from SWMUs 8/58. Table III-4 lists MDLs for associated SVOCs analyzed.

SWMU 68, Monitoring Wells OBS-MW1, OBS-MW2, and OBS-MW3. No SVOCs were detected above laboratory MDLs in any groundwater sample from SWMU 68. Table III-4 lists MDLs for associated SVOCs analyzed.

3.4 **High Explosive Compounds**

SWMUs 8/58, Monitoring Wells CCBA-MW1 and CCBA-MW2. No HE compounds were detected above laboratory MDLs in any groundwater sample from SWMUs 8/58. Table III-5 lists MDLs for associated HE compounds analyzed.

SWMU 68, Monitoring Wells OBS-MW1, OBS-MW2, and OBS-MW3. No HE compounds were detected above laboratory MDLs in any groundwater sample from SWMU 68. Table III-5 lists MDLs for associated HE compounds analyzed.

3.5 **Nitrate Plus Nitrite**

SWMUs 8/58, Monitoring Wells CCBA-MW1 and CCBA-MW2. Table III-6 summarizes NPN results. NPN was not detected above the MCL of 10 mg/L in any groundwater sample. NPN was reported at a maximum concentration of 3.47 mg/L in the CCBA-MW2 groundwater duplicate sample.

SWMU 68, Monitoring Wells OBS-MW1, OBS-MW2, and OBS-MW3. Table III-6 summarizes NPN results. NPN was not detected above the MCL of 10 mg/L in any groundwater sample. NPN was reported at a maximum concentration of 1.89 mg/L in the OBS-MW3 groundwater sample.

3.6 Anions and Alkalinity

SWMUs 8/58, Monitoring Wells CCBA-MW1 and CCBA-MW2. Table III-7 summarizes alkalinity, major anion (i.e., bromide, chloride, fluoride, and sulfate), and total cyanide results. Fluoride was detected above the established MCL of 4.0 mg/L in the CCBA-MW1 groundwater sample at a concentration of 4.81 mg/L. The detection is most likely attributable to the presence of fluorite mineralization in the unconsolidated alluvium and possible weathered quartzite bedrock in which the well is completed, and not associated with SNL/NM testing activities. Review of nearby ore deposits demonstrates that there are large, but uneconomic deposits of fluorite-bearing minerals in the Precambrian and Paleozoic rocks in the eastern portion of Kirtland Air Force Base (Skelly August 2013). Fluoride in the CCBA-MW2 groundwater sample and groundwater duplicate sample were both reported at a concentration of 1.50 mg/L. No

other anions or total cyanide were detected above established MCLs. There are no established MCLs for bromide, chloride, sulfate, or alkalinity.

SWMU 68, Monitoring Wells OBS-MW1, OBS-MW2, and OBS-MW3. Table III-7 summarizes alkalinity, major anion (i.e., bromide, chloride, fluoride, and sulfate) and total cyanide results. No parameters were detected above established MCLs in groundwater samples from the SWMU 68 monitoring wells.

3.7 **Perchlorate**

SWMUs 8/58, Monitoring Wells CCBA-MW1 and CCBA-MW2. Perchlorate was not detected above the NMED-specified screening level/MDL of 4.0 micrograms per liter (μ g/L) (0.004 mg/L) in any groundwater sample from SWMUs 8/58. Table III-8 presents perchlorate results.

SWMU 68, Monitoring Wells OBS-MW1, OBS-MW2, and OBS-MW3.

Perchlorate was not detected above the NMED-specified screening level/MDL of 4 μ g/L (0.004 mg/L) in any groundwater sample from SWMU 68. Table III-8 presents perchlorate results.

Perchlorate results are discussed in more detail in Section II of this ER Quarterly Report.

3.8 Hexavalent Chromium

SWMUs 8/58, Monitoring Wells CCBA-MW1 and CCBA-MW2. Analysis of hexavalent chromium is not required for SWMUs 8/58.

SWMU 68, Monitoring Wells OBS-MW1, OBS-MW2, and OBS-MW3. Hexavalent chromium results for SWMU 68 are summarized in Table III-9. No hexavalent chromium was detected above laboratory MDLs. No MCL is established for this analyte.

3.9 **Metals**

SWMUs 8/58, Monitoring Wells CCBA-MW1 and CCBA-MW2. TAL metals plus uranium were analyzed in samples from both monitoring wells at SWMUs 8/58. Metal results for SWMUs 8/58 are summarized in Table III-10. No metal parameters were detected above established MCLs in any groundwater sample.

SWMU 68, Monitoring Wells OBS-MW1, OBS-MW2, and OBS-MW3. TAL metals plus uranium were analyzed in samples from all SWMU 68 monitoring wells. No metal parameters were detected above established MCLs in any groundwater sample. Metal results for SWMU 68 are summarized on Table III-11.

3.10 Cations

SWMUs 8/58, Monitoring Wells CCBA-MW1 and CCBA-MW2. Filtered fractions for major cations as calcium, magnesium, potassium, and sodium were analyzed in all groundwater samples from SWMUs 8/58. There are no established MCLs for these analytical parameters. The results are presented in Table III-12.

SWMU 68, Monitoring Wells OBS-MW1, OBS-MW2, and OBS-MW3. Filtered fractions for major cations as calcium, magnesium, potassium, and sodium were analyzed in all SWMU 68 groundwater samples. There are no established MCLs for these analytical parameters. The results are presented in Table III-12.

3.11 Gamma Spectroscopy and Radioisotopic Analyses

All groundwater samples collected from SWMUs 8/58 and 68 were screened for gamma-emitting radionuclides and gross alpha/beta activity (EPA 1980 and DOE 1990). Additional samples for isotopic uranium were collected to support the evaluation of gross alpha activity results from SWMU 68. Gross alpha activity is measured as a screening tool. The results for gamma spectroscopy, gross alpha/beta activity, and isotopic uranium are presented in Table III-13.

SWMUs 8/58, Monitoring Wells CCBA-MW1 and CCBA-MW2. All radiological results were reviewed by a SNL/NM Certified Health Physicist and determined as nonradioactive. The corrected gross alpha activity was below the MCL of 15 picocuries per liter (pCi/L) in all groundwater samples. Gross beta activity results do not exceed established MCLs.

SWMU 68, Monitoring Wells OBS-MW1, OBS-MW2, and OBS-MW3. All radiological results were reviewed by a SNL/NM Certified Health Physicist and determined as nonradioactive. The corrected gross alpha activity was below the MCL of 15 pCi/L in all groundwater samples. Gross beta activity results do not exceed established MCLs.

3.12 Sample Results Exceeding Maximum Contaminant Levels

Table III-14 lists the results for all constituents that have been detected at concentrations exceeding the EPA MCLs (EPA 2009) during the quarterly sampling events at SWMUs 8/58 and 68. The only constituent that is exceeding the MCLs in samples collected during this quarter is fluoride, detected in the CCBA-MW1 groundwater sample. Fluoride detected in the CCBA-MW1 sample is most likely from the mineralized fluorite-bearing unconsolidated alluvium and possible quartzite bedrock in which the well is completed, and not associated with SNL/NM testing activities.

4.0 Quality Control Samples

Field and laboratory QC samples are prepared to determine the accuracy of the methods used, and to detect inadvertent sample contamination that may have occurred during the sampling and analysis process. The following sections discuss each sample type.

4.1 Field Quality Control Samples

Field QC samples for this sampling event included duplicate groundwater, EB, TB, and FB samples. The field QC samples were submitted for analysis, along with the groundwater samples in accordance with QC procedures specified in the Groundwater Characterization Work Plans for SWMUs 8/58 and 68 (SNL/NM September 2010).

4.1.1 **Duplicate Groundwater Samples**

Duplicate groundwater samples were collected from monitoring wells CCBA-MW2 and OBS-MW2, and analyzed to estimate the overall reproducibility of the sampling and analytical process. The duplicate groundwater samples were collected immediately after the original groundwater sample to reduce variability caused by time and/or sampling mechanics. Duplicate groundwater samples were analyzed for all parameters.

Table III-15 summarizes the results for duplicate sample analyses and calculated relative percent difference (RPD) values for monitoring wells CCBA-MW2 and OBS-MW2. RPD values were calculated only for detected chemical parameters. The work plans for SWMUs 8/58 and 68 do not specify QC acceptance criteria for duplicate groundwater sample data; however, duplicate sample results show good correlation (RPD values of less than 35 for inorganic analytes) for all calculated parameters.

4.1.2 **Equipment Blank Samples**

EB samples are collected to verify the effectiveness of the equipment decontamination process. EB samples were collected prior to sampling monitoring well CCBA-MW2 and OBS-MW2 and were submitted for all analyses. EB samples were collected according to procedures described in SNL/NM FOP 05-03 "Groundwater Monitoring Equipment Decontamination" (SNL/NM January 2012a).

SWMUs 8/58, Monitoring Well CCBA-MW2. Acetone, bromodichloromethane, chloroform, and copper were detected above the laboratory MDLs or MDAs. With the exception of copper, no corrective action was necessary because compounds were not detected in groundwater samples. Copper was qualified as not detected in both the CCBA-MW2 groundwater and groundwater duplicate samples during data validation, because copper was reported in the EB sample at a concentration greater than associated groundwater samples.

SWMU 68, Monitoring Well OBS-MW2. Acetone, bromodichloromethane, chloroform, chloride, and copper were detected above the laboratory MDLs. No corrective action was necessary because these analytes were not detected in associated groundwater samples.

4.1.3 Trip Blank Samples

TB samples are submitted whenever groundwater samples are collected for VOC analyses to assess whether contamination of the samples occurred during shipment and storage. TBs were brought to the field and accompanied each sample shipment.

SWMUs 8/58. A total of three trip blanks were submitted with the October 2014 samples. No VOCs were detected above associated laboratory MDLs.

SWMU 68. A total of four trip blanks were submitted with the October 2014 samples. No VOCs were detected above associated laboratory MDLs.

4.1.4 Field Blank Samples

FB samples were collected for VOC analysis to assess whether contamination of the samples resulted from ambient field conditions.

SWMUs 8/58, Monitoring Well CCBA-MW1. The VOCs bromodichloromethane and chloroform were detected above associated laboratory MDLs. Bromodichloromethane and chloroform are common byproducts of the water deionization process. No corrective action was required, because these compounds were not detected in the associated groundwater sample.

SWMU 68, Monitoring Well OBS-MW3. The VOCs acetone, bromodichloromethane, and chloroform were detected above laboratory MDLs. Acetone is a common pervasive laboratory solvent, and bromodichloromethane and chloroform are common byproducts of the water deionization process. No corrective action was required, because these compounds were not detected in the associated groundwater samples.

4.2 Laboratory Quality Control Samples

Internal laboratory QC samples, including method blanks and duplicate laboratory control samples, were analyzed concurrently with all groundwater samples. All chemical data were reviewed and qualified in accordance with AOP 00-03, "Data Validation Procedure for Chemical and Radiochemical Data" (SNL/NM May 2011).

All data are determined to be acceptable and reported QC measures are adequate, except for potassium-40 in the monitoring well OBS-MW3 groundwater sample. Potassium-40 was qualified as unusable during data validation, because the result was rejected by GEL due to the peak not meeting identification criteria. No other significant data quality problems were noted. The data validation sample findings summary sheets are provided in Appendix C.

4.3 Variances and Nonconformances

No variances or nonconformances from requirements in the Groundwater Characterization Work Plan for SWMU 8/58 (SNL/NM September 2010) occurred during the October 2014 sampling activities.

No variances or nonconformances from requirements in the Groundwater Characterization Work Plan for SWMU 68 (SNL/NM September 2010) occurred during the October 2014 sampling activities.

5.0 **Summary**

During the Fourth Quarter of CY 2014, samples were collected from SWMUs 8/58 monitoring wells CCBA-MW1 and CCBA-MW2, and SWMU 68 monitoring wells OBS-MW1, OBS-MW2, and OBS-MW3. Sampling results were compared with EPA MCL guidelines for drinking water (EPA 2009).

Analytical parameters for monitoring wells CCBA-MW1 and CCBA-MW2 consist of VOCs, SVOCs, HE compounds, NPN, major anions, major cations, alkalinity, TAL metals plus uranium, perchlorate, total cyanide, radionuclides by gamma spectroscopy, gross alpha/beta activity, and isotopic uranium. No parameters were detected above established MCLs, except for fluoride in CCBA-MW1. Fluoride was detected above the established MCL of 4.0 mg/L in the monitoring well CCBA-MW1 groundwater sample at a concentration of 4.81 mg/L. This detection is similar to historical concentrations and is most likely attributable to the fluorite-bearing minerals in the unconsolidated alluvium and possible quartzite bedrock in which the well is completed (Skelly August 2013). Fluoride is not a site contaminant of concern and is not associated with SNL/NM testing activities.

Analytical parameters for monitoring wells OBS-MW1, OBS-MW2, and OBS-MW3 consist of VOCs, SVOCs, HE compounds, NPN, major anions, major cations, alkalinity, TAL metals plus uranium, hexavalent chromium, perchlorate, total cyanide, radionuclides by gamma spectroscopy, gross alpha/beta activity, and isotopic uranium. No parameters were detected above established MCLs in groundwater samples collected from SWMU 68 monitoring wells.

In October 2014, DOE and Sandia notified NMED that groundwater monitoring at SWMUs 8/58 and 68 had been completed, and would be discontinued (SNL October, 2014).

6.0 References

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Figures

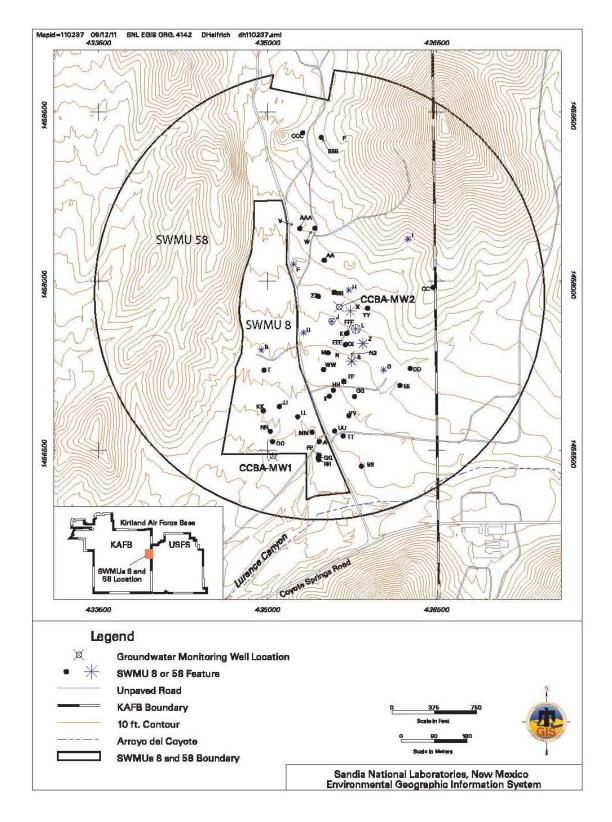


Figure III-1
Location of Monitoring Wells CCBA-MW1 and CCBA-MW2 within SWMUs 8/58

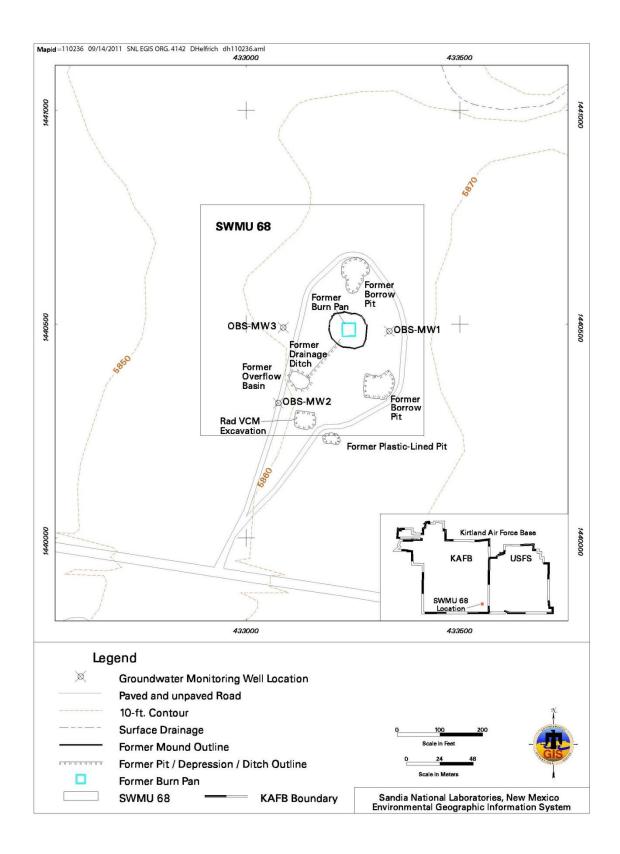


Figure IIII-2
Location of Monitoring Wells OBS-MW1, OBS-MW2, and OBS-MW3 within SWMU 68

Tables

Table III-1

Laboratory Analytical Methods, Container Types, and Preservation Requirements for SWMUs 8/58 and 68 Groundwater Samples

Analysis	Analytical Method ^a	Volume and Container Type/ Preservation Requirements
Volatile Organic Compounds	EPA 8260B	3 x 40-mL glass, HCl, 4°C
Semivolatile Organic Compounds	EPA 8270C	3 x 1-L Amber Glass, 4°C
High Explosives	EPA 8321A	4 x 1-L Amber Glass, 4°C
Metals ^b	EPA 6010/6020/7470	1 x 500-mL polyethylene, HNO ₃ , 4°C
Hexavalent Chromium	EPA 7196A	1 x 250-mL polyethylene, 4°C
Perchlorate	EPA 314.0	1 x 250-mL polyethylene, 4°C
Major Anions and Cations ^c	EPA 6020/9056	1 x 500-mL polyethylene, 4°C
Alkalinity as Total, Carbonate, and Bicarbonate	SM 2320B	1 x 500-mL polyethylene, 4°C
Total Cyanide	EPA 9012	1 x 250-mL polyethylene, NaOH, 4°C
Nitrate plus Nitrite as Nitrogen	EPA 353.2	1 x 250-mL polyethylene, H ₂ SO ₄ , 4°C
Gross Alpha/Beta	EPA 900.0	1 x 1-L polyethylene, HNO ₃ , 4°C
Gamma Spectroscopy ^d	EPA 901.1	1 x 1-L polyethylene, HNO ₃ , 4°C
Isotopic Uranium	HASL-300	1 x 1-L polyethylene, HNO ₃ , 4°C

Notes

^aClesceri, L.S., A.E. Greenburg, and A.D. Eaton, 1998. *Standard Methods for the Examination of Water and Wastewater*, 20th ed., Standard Method 2320B, published jointly by American Public Health Association. American Water Works Association, and Water Environment Federation, Washington, D.C.

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U.S. Environmental Protection Agency, 1999, "*Perchlorate in Drinking Water Using Ion Chromatography*," EPA 815/R-00-014, U.S. Environmental Protection Agency, Washington, D.C. ^bMetals = TAL metals including barium, calcium, magnesium, potassium, and sodium, plus uranium.

^cMajor anions include bromide, chloride, fluoride, and sulfate; major cations include calcium, magnesium, potassium, and sodium.

^dGamma spectroscopy = Americium-241, Cesium-137, Cobalt-60, and Potassium-40.

°C = Degrees Celsius.

EPA = U.S. Environmental Protection Agency.

 H_2SO_4 = Sulfuric acid.

HASL = Health and Safety Laboratory.

HCl = Hydrochloric acid. HNO₃ = Nitric acid.

L = Liter.
mL = Milliliter(s).
NaOH = Sodium Hydroxide.
SM = Standard Method.

SWMU = Solid Waste Management Unit.

TAL = Target Analyte List.

Table III-2 Sample Details for Fourth Quarter, CY 2014 Groundwater Sampling **SWMUs 8/58 and 68 Groundwater Monitoring Quarterly Assessment** October - December 2014

Well	Sample Identification	AR/COC Number	Associated Groundwater Investigation		
SWMUs 8/58					
CCBA-MW1	096685	615822			
CCBA-MW2	096691	615824	SWMUs 8/58		
CCBA-MW2 (duplicate)	096692	013624			
SWMU 68					
OBS-MW1	096653	615811			
OBS-MW2	096658	615813	SWMU 68		
OBS-MW2 (duplicate)	096659	010013	5001010-68		
OBS-MW3	096661	615814			

Notes

AR/COC = Analysis Request/Chain-of-Custody. CCBA = Coyote Canyon Blast Area.

CY = Calendar Year. = Monitoring Well. = Old Burn Site. MW OBS

Table III-3 Summary of Field Water Quality Measurements^a SWMUs 8/58 and 68 Groundwater Monitoring **Quarterly Assessment, October – December 2014**

Well	Sample Date	Temperature (°C)	Specific Conductivity (µmhos/cm)	Oxidation Reduction Potential (mV)	рН	Turbidity (NTU)	Dissolved Oxygen (% Sat)	Dissolved Oxygen (mg/L)
SWMUs 8/58								
CCBA-MW1	13-Oct-14	16.10	481.5	305.4	6.42	0.32	33.3	3.28
CCBA-MW2	14-Oct-14	16.52	559.0	297.4	7.38	0.16	63.6	6.20
SWMU 68								
OBS-MW1	06-Oct-14	17.89	511.0	298.8	7.27	0.22	38.8	3.66
OBS-MW2	07-Oct-14	18.70	517.1	301.1	7.22	0.23	37.3	3.47
OBS-MW3	08-Oct-14	17.46	503.1	254.0	7.21	0.18	46.9	4.48

Notes

^aField measurements collected prior to sampling.

= Degrees Celsius. °C % Sat = Percent saturation. μmhos/cm = Micromhos per centimeter. = Coyote Canyon Blast Area. CCBA

= Milligrams per liter. mg/L

= Millivolts. mΫ MW

Monitoring Well.Nephelometric turbidity units. NTU

= Old Burn Site. OBS

pН = Potential of hydrogen (negative logarithm of the hydrogen ion concentration).

= Solid Waste Management Unit. SWMU

Table III-4

Method Detection Limits for Volatile and Semivolatile Organic Compounds

SWMUs 8/58 and 68 Groundwater Monitoring

Quarterly Assessment, October – December 2014

SWMU 8/58									
Analyte	MDL (µg/L)	Analytical Method ^a	Analyte	MDL (µg/L)	Analytical Method ^a				
1,1,1-Trichloroethane	0.300	EPA 8260B	Chlorobenzene	0.300	EPA 8260B				
1,1,2,2-Tetrachloroethane	0.300	EPA 8260B	Chloroethane	0.300	EPA 8260B				
1,1,2-Trichloroethane	0.300	EPA 8260B	Chloroform	0.300	EPA 8260B				
1,1-Dichloroethane	0.300	EPA 8260B	Chloromethane	0.300	EPA 8260B				
1,1-Dichloroethene	0.300	EPA 8260B	Cyclohexane	0.300	EPA 8260B				
1,2,3-Trichlorobenzene	0.300	EPA 8260B	Dibromochloromethane	0.300	EPA 8260B				
1,2,4-Trichlorobenzene	0.300	EPA 8260B	Dichlorodifluoromethane	0.300	EPA 8260B				
1,2-Dibromo-3-chloropropane	0.500	EPA 8260B	Ethyl benzene	0.300	EPA 8260B				
1,2-Dibromoethane	0.300	EPA 8260B	Isopropylbenzene	0.300	EPA 8260B				
1,2-Dichlorobenzene	0.300	EPA 8260B	Methyl acetate	1.50	EPA 8260B				
1,2-Dichloroethane	0.300	EPA 8260B	Methylcyclohexane	0.300	EPA 8260B				
1,2-Dichloropropane	0.300	EPA 8260B	Methylene chloride	1.70	EPA 8260B				
1,3-Dichlorobenzene	0.300	EPA 8260B	Styrene	0.300	EPA 8260B				
1,4-Dichlorobenzene	0.300	EPA 8260B	Tert-butyl methyl ether	0.300	EPA 8260B				
2,2-trifluoroethane, 1,1,2-Trichloro-1	1.50	EPA 8260B	Tetrachloroethene	0.300	EPA 8260B				
2-Butanone	2.00	EPA 8260B	Toluene	0.300	EPA 8260B				
2-Hexanone	2.20	EPA 8260B	Trichloroethene	0.300	EPA 8260B				
4-methyl-, 2-Pentanone	1.50	EPA 8260B	Trichlorofluoromethane	0.300	EPA 8260B				
Acetone	2.50	EPA 8260B	Vinyl chloride	0.300	EPA 8260B				
Benzene	0.300	EPA 8260B	Xylene	0.300	EPA 8260B				
Bromochloromethane	0.300	EPA 8260B	cis-1,2-Dichloroethene	0.300	EPA 8260B				
Bromodichloromethane	0.300	EPA 8260B	cis-1,3-Dichloropropene	0.300	EPA 8260B				
Bromoform	0.300	EPA 8260B	m-, p-Xylene	0.300	EPA 8260B				
Bromomethane	0.300	EPA 8260B	o-Xylene	0.300	EPA 8260B				
Carbon disulfide	1.50	EPA 8260B	trans-1,2-Dichloroethene	0.300	EPA 8260B				
Carbon tetrachloride	0.300	EPA 8260B	trans-1,3-Dichloropropene	0.300	EPA 8260B				

Table III-4 (Continued)

Method Detection Limits for Volatile and Semivolatile Organic Compounds SWMUs 8/58 and 68 Groundwater Monitoring Quarterly Assessment, October – December 2014

SWMU 8/58 (Continued)										
Analyte	MDL (µg/L)	Analytical Method ^a	Analyte	MDL (µg/L)	Analytical Method ^a					
1'-Biphenyl 1	3.00-3.26	EPA 8270C	Butylbenzyl phthalate	3.00–3.26	EPA 8270C					
1,2,4-Trichlorobenzene	3.00-3.26	EPA 8270C	Caprolactam	3.00-3.26	EPA 8270C					
1,4-Dioxane	3.00-3.26	EPA 8270C	Carbazole	0.300-0.326	EPA 8270C					
2,4,5-Trichlorophenol	3.00-3.26	EPA 8270C	Chrysene	0.300-0.326	EPA 8270C					
2,4,6-Trichlorophenol	3.00-3.26	EPA 8270C	Di-n-butyl phthalate	3.00-3.26	EPA 8270C					
2,4-Dichlorophenol	3.00-3.26	EPA 8270C	Di-n-octyl phthalate	3.00-3.26	EPA 8270C					
2,4-Dimethylphenol	3.00-3.26	EPA 8270C	Dibenz[a,h]anthracene	0.300-0.326	EPA 8270C					
2,4-Dinitrophenol	5.00-5.43	EPA 8270C	Dibenzofuran	3.00-3.26	EPA 8270C					
2,4-Dinitrotoluene	3.00-3.26	EPA 8270C	Diethylphthalate	3.00-3.26	EPA 8270C					
2,6-Dinitrotoluene	3.00-3.26	EPA 8270C	Dimethylphthalate	3.00-3.26	EPA 8270C					
2-Chloronaphthalene	0.410-0.446	EPA 8270C	Dinitro-o-cresol	3.00-3.26	EPA 8270C					
2-Chlorophenol	3.00-3.26	EPA 8270C	Diphenyl amine	3.00-3.26	EPA 8270C					
2-Methylnaphthalene	0.300-0.326	EPA 8270C	Fluoranthene	0.300-0.326	EPA 8270C					
2-Nitroaniline	3.00-3.26	EPA 8270C	Fluorene	0.300-0.326	EPA 8270C					
2-Nitrophenol	3.00-3.26	EPA 8270C	Hexachlorobenzene	3.00-3.26	EPA 8270C					
3,3'-Dichlorobenzidine	3.00-3.26	EPA 8270C	Hexachlorobutadiene	3.00-3.26	EPA 8270C					
3-Nitroaniline	3.00-3.26	EPA 8270C	Hexachlorocyclopentadiene	3.00-3.26	EPA 8270C					
4-Bromophenyl phenyl ether	3.00-3.26	EPA 8270C	Hexachloroethane	3.00-3.26	EPA 8270C					
4-Chloro-3-methylphenol	3.00-3.26	EPA 8270C	Indeno(1,2,3-c,d)pyrene	0.300-0.326	EPA 8270C					
4-Chlorobenzenamine	3.30-3.59	EPA 8270C	Isophorone	3.50-3.80	EPA 8270C					
4-Chlorophenyl phenyl ether	3.00-3.26	EPA 8270C	Naphthalene	0.300-0.326	EPA 8270C					
4-Nitroaniline	3.00-3.26	EPA 8270C	Nitro-benzene	3.00-3.26	EPA 8270C					
4-Nitrophenol	3.00-3.26	EPA 8270C	Pentachlorophenol	3.00-3.26	EPA 8270C					
Acenaphthene	0.300-0.326	EPA 8270C	Phenanthrene	0.300-0.326	EPA 8270C					
Acenaphthylene	0.300-0.326	EPA 8270C	Phenol	3.00-3.26	EPA 8270C					
Acetophenone	3.00-3.26	EPA 8270C	Pyrene	0.300-0.326	EPA 8270C					
Anthracene	0.300-0.326	EPA 8270C	bis(2-Chloroethoxy)methane	3.00-3.26	EPA 8270C					
Atrazine	3.00-3.26	EPA 8270C	bis(2-Chloroethyl)ether	3.00-3.26	EPA 8270C					
Benzaldehyde	3.00-3.26	EPA 8270C	bis(2-Chloroisopropyl)ether	3.00-3.26	EPA 8270C					
Benzo(a)anthracene	0.300-0.326	EPA 8270C	bis(2-Ethylhexyl)phthalate	3.00-3.26	EPA 8270C					
Benzo(a)pyrene	0.300-0.326	EPA 8270C	m,p-Cresol	3.70-4.02	EPA 8270C					
Benzo(b)fluoranthene	0.300-0.326	EPA 8270C	n-Nitrosodipropylamine	3.00-3.26	EPA 8270C					
Benzo(ghi)perylene	0.300-0.326	EPA 8270C	o-Cresol	3.00-3.26	EPA 8270C					
Benzo(k)fluoranthene	0.300-0.326	EPA 8270C								

Table III-4 (Continued)

Method Detection Limits for Volatile and Semivolatile Organic Compounds SWMUs 8/58 and 68 Groundwater Monitoring Quarterly Assessment, October – December 2014

		SWMU	68		
Analyte	MDL (µg/L)	Analytical Method ^a	Analyte	MDL (µg/L)	Analytical Method ^a
1,1,1-Trichloroethane	0.300	EPA 8260B	Chlorobenzene	0.300	EPA 8260B
1,1,2,2-Tetrachloroethane	0.300	EPA 8260B	Chloroethane	0.300	EPA 8260B
1,1,2-Trichloroethane	0.300	EPA 8260B	Chloroform	0.300	EPA 8260B
1,1-Dichloroethane	0.300	EPA 8260B	Chloromethane	0.300	EPA 8260B
1,1-Dichloroethene	0.300	EPA 8260B	Cyclohexane	0.300	EPA 8260B
1,2,3-Trichlorobenzene	0.300	EPA 8260B	Dibromochloromethane	0.300	EPA 8260B
1,2,4-Trichlorobenzene	0.300	EPA 8260B	Dichlorodifluoromethane	0.300	EPA 8260B
1,2-Dibromo-3-chloropropane	0.500	EPA 8260B	Ethyl benzene	0.300	EPA 8260B
1,2-Dibromoethane	0.300	EPA 8260B	Isopropylbenzene	0.300	EPA 8260B
1,2-Dichlorobenzene	0.300	EPA 8260B	Methyl acetate	1.50	EPA 8260B
1,2-Dichloroethane	0.300	EPA 8260B	Methylcyclohexane	0.300	EPA 8260B
1,2-Dichloropropane	0.300	EPA 8260B	Methylene chloride	1.70	EPA 8260B
1,3-Dichlorobenzene	0.300	EPA 8260B	Styrene	0.300	EPA 8260B
1,4-Dichlorobenzene	0.300	EPA 8260B	Tert-butyl methyl ether	0.300	EPA 8260B
2,2-trifluoroethane, 1,1,2-Trichloro-1	1.50	EPA 8260B	Tetrachloroethene	0.300	EPA 8260B
2-Butanone	2.00	EPA 8260B	Toluene	0.300	EPA 8260B
2-Hexanone	2.20	EPA 8260B	Trichloroethene	0.300	EPA 8260B
4-methyl-, 2-Pentanone	1.50	EPA 8260B	Trichlorofluoromethane	0.300	EPA 8260B
Acetone	2.50	EPA 8260B	Vinyl chloride	0.300	EPA 8260B
Benzene	0.300	EPA 8260B	Xylene	0.300	EPA 8260B
Bromochloromethane	0.300	EPA 8260B	cis-1,2-Dichloroethene	0.300	EPA 8260B
Bromodichloromethane	0.300	EPA 8260B	cis-1,3-Dichloropropene	0.300	EPA 8260B
Bromoform	0.300	EPA 8260B	m-, p-Xylene	0.300	EPA 8260B
Bromomethane	0.300	EPA 8260B	o-Xylene	0.300	EPA 8260B
Carbon disulfide	1.50	EPA 8260B	trans-1,2-Dichloroethene	0.300	EPA 8260B
Carbon tetrachloride	0.300	EPA 8260B	trans-1,3-Dichloropropene	0.300	EPA 8260B

Table III-4 (Continued)

Method Detection Limits for Volatile and Semivolatile Organic Compounds SWMUs 8/58 and 68 Groundwater Monitoring Quarterly Assessment, October – December 2014

		SWMU 6	8 (Continued)		
Analyte	MDL (µg/L)	Analytical Method ^a	Analyte	MDL (µg/L)	Analytical Method ^a
1'-Biphenyl 1	3.00–3.13	EPA 8270C	Butylbenzyl phthalate	3.00–3.13	EPA 8270C
1,2,4-Trichlorobenzene	3.00–3.13	EPA 8270C	Caprolactam	3.00-3.13	EPA 8270C
2,4,5-Trichlorophenol	3.00–3.13	EPA 8270C	Carbazole	0.300-0.313	EPA 8270C
1,4-Dioxane	3.00–3.13	EPA 8270C	Chrysene	0.300-0.313	EPA 8270C
2,4,6-Trichlorophenol	3.00–3.13	EPA 8270C	Di-n-butyl phthalate	3.00–3.13	EPA 8270C
2,4-Dichlorophenol	3.00-3.13	EPA 8270C	Di-n-octyl phthalate	3.00-3.13	EPA 8270C
2,4-Dimethylphenol	3.00-3.13	EPA 8270C	Dibenz[a,h]anthracene	0.300-0.313	EPA 8270C
2,4-Dinitrophenol	5.00-5.21	EPA 8270C	Dibenzofuran	3.00-3.13	EPA 8270C
2,4-Dinitrotoluene	3.00-3.13	EPA 8270C	Diethylphthalate	3.00-3.13	EPA 8270C
2,6-Dinitrotoluene	3.00-3.13	EPA 8270C	Dimethylphthalate	3.00-3.13	EPA 8270C
2-Chloronaphthalene	0.410-0.427	EPA 8270C	Dinitro-o-cresol	3.00-3.13	EPA 8270C
2-Chlorophenol	3.00-3.13	EPA 8270C	Diphenyl amine	3.00-3.13	EPA 8270C
2-Methylnaphthalene	0.300-0.313	EPA 8270C	Fluoranthene	0.300-0.313	EPA 8270C
2-Nitroaniline	3.00-3.13	EPA 8270C	Fluorene	0.300-0.313	EPA 8270C
2-Nitrophenol	3.00-3.13	EPA 8270C	Hexachlorobenzene	3.00-3.13	EPA 8270C
3,3'-Dichlorobenzidine	3.00-3.13	EPA 8270C	Hexachlorobutadiene	3.00-3.13	EPA 8270C
3-Nitroaniline	3.00-3.13	EPA 8270C	Hexachlorocyclopentadiene	3.00-3.13	EPA 8270C
4-Bromophenyl phenyl ether	3.00-3.13	EPA 8270C	Hexachloroethane	3.00-3.13	EPA 8270C
4-Chloro-3-methylphenol	3.00-3.13	EPA 8270C	Indeno(1,2,3-c,d)pyrene	0.300-0.313	EPA 8270C
4-Chlorobenzenamine	3.30-3.44	EPA 8270C	Isophorone	3.50-3.65	EPA 8270C
4-Chlorophenyl phenyl ether	3.00-3.13	EPA 8270C	Naphthalene	0.300-0.313	EPA 8270C
4-Nitroaniline	3.00-3.13	EPA 8270C	Nitro-benzene	3.00-3.13	EPA 8270C
4-Nitrophenol	3.00-3.13	EPA 8270C	Pentachlorophenol	3.00-3.13	EPA 8270C
Acenaphthene	0.300-0.313	EPA 8270C	Phenanthrene	0.300-0.313	EPA 8270C
Acenaphthylene	0.300-0.313	EPA 8270C	Phenol	3.00-3.13	EPA 8270C
Acetophenone	3.00-3.13	EPA 8270C	Pyrene	0.300-0.313	EPA 8270C
Anthracene	0.300-0.313	EPA 8270C	bis(2-Chloroethoxy)methane	3.00-3.13	EPA 8270C
Atrazine	3.00-3.13	EPA 8270C	bis(2-Chloroethyl)ether	3.00-3.13	EPA 8270C
Benzaldehyde	3.00-3.13	EPA 8270C	bis(2-Chloroisopropyl)ether	3.00-3.13	EPA 8270C
Benzo(a)anthracene	0.300-0.313	EPA 8270C	bis(2-Ethylhexyl)phthalate	3.00-3.13	EPA 8270C
Benzo(a)pyrene	0.300-0.313	EPA 8270C	m,p-Cresol	3.70-3.85	EPA 8270C
Benzo(b)fluoranthene	0.300-0.313	EPA 8270C	n-Nitrosodipropylamine	3.00-3.13	EPA 8270C
Benzo(ghi)perylene	0.300-0.313	EPA 8270C	o-Cresol	3.00-3.13	EPA 8270C
Benzo(k)fluoranthene	0.300-0.313	EPA 8270C			

Table III-4 (Concluded)

Method Detection Limits for Volatile and Semivolatile Organic Compounds SWMUs 8/58 and 68 Groundwater Monitoring **Quarterly Assessment, October – December 2014**

Notes

^aU.S. Environmental Protection Agency, 1984, "Methods for Chemical Analysis of Water and Wastes," EPA 600-4-79-020.

U.S. Environmental Protection Agency, 1986 (and updates), "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," SW-846, 3rd ed.

= Micrograms per liter.

μg/L EPA = U.S. Environmental Protection Agency.

MDL = Method detection limit. The minimum concentration that can be measured and reported with 99% confidence that the analyte is greater than zero; analyte is matrix-specific.

Table III-5 Method Detection Limits for High Explosive Compounds (EPA Method 8321A) SWMUs 8/58 and 68 Groundwater Monitoring **Quarterly Assessment, October – December 2014**

Analyte	MDL (μg/L)				
,	SWMUs 8/58	SWMU 68			
1,3,5-Trinitrobenzene	0.0833-0.0874	0.0847-0.0894			
1,3-Dinitrobenzene	0.0833-0.0874	0.0847-0.0894			
2,4,6-Trinitrotoluene	0.0833-0.0874	0.0847-0.0894			
2,4-Dinitrotoluene	0.0833-0.0874	0.0847-0.0894			
2,6-Dinitrotoluene	0.0833-0.0874	0.0847-0.0894			
2-Amino-4,6-dinitrotoluene	0.0833-0.0874	0.0847-0.0894			
2-Nitrotoluene	0.0854-0.0896	0.0868 -0.0916			
3-Nitrotoluene	0.0833-0.0874	0.0847-0.0894			
4-Amino-2,6-dinitrotoluene	0.0833-0.0874	0.0847-0.0894			
4-Nitrotoluene	0.156-0.164	0.159-0.168			
HMX	0.0833-0.0874	0.0847-0.0894			
Nitrobenzene	0.0833-0.0874	0.0847-0.0894			
Pentaerythritol tetranitrate	0.104-0.109	0.106-0.112			
RDX	0.0833-0.0874	0.0847-0.0894			
Tetryl	0.0833-0.0874	0.0847-0.0894			

Notes

μg/L EPA = Micrograms per liter.= U.S. Environmental Protection Agency.

HMX = Tetrahexamine tetranitramine.

= Method detection limit. The minimum concentration that can be measured and reported with 99% MDL

confidence that the analyte is greater than zero; analyte is matrix-specific.

= Hexahydro-1,3,5-trinitro-1,3,5-triazine. SWMU = Solid Waste Management Unit. Tetryl = 2,4,6-trinitrophenylmethylnitramine.

Table III-6
Summary of Nitrate Plus Nitrite Results
SWMUs 8/58 and 68 Groundwater Monitoring
Quarterly Assessment, October – December 2014

Well	Analyte	Result (mg/L)	MDL (mg/L)	PQL (mg/L)	MCL (mg/L)	Laboratory Qualifier ^a	Validation Qualifier ^b	Sample Number	Analytical Method ^c
SWMUs 8/58									
CCBA-MW1 13-Oct-14	Nitrate plus nitrite	1.59	0.085	0.250	10.0			096685-018	EPA 353.2
CCBA-MW2 14-Oct-14	Nitrate plus nitrite	3.32	0.085	0.250	10.0			096691-018	EPA 353.2
CCBA-MW2 (Duplicate) 14-Oct-14	Nitrate plus nitrite	3.47	0.085	0.250	10.0			096692-018	EPA 353.2
SWMU 68									
OBS-MW1 06-Oct-14	Nitrate plus nitrite	1.79	0.085	0.250	10.0			096653-018	EPA 353.2
OBS-MW2 07-Oct-14	Nitrate plus nitrite	1.55	0.085	0.250	10.0			096658-018	EPA 353.2
OBS-MW2 (Duplicate) 07-Oct-14	Nitrate plus nitrite	1.56	0.085	0.250	10.0			096659-018	EPA 353.2
OBS-MW3 08-Oct-14	Nitrate plus nitrite	1.89	0.085	0.250	10.0			096661-018	EPA 353.2

Notes

^aLaboratory Qualifier

If cell is blank, then all quality control samples met acceptance criteria with respect to submitted samples.

^bValidation Qualifier

If cell is blank, then all quality control samples met acceptance criteria with respect to submitted samples.

^cAnalytical Method

- U.S. Environmental Protection Agency, 1984, "Methods for Chemical Analysis of Water and Wastes," EPA 600-4-79-020.
- U.S. Environmental Protection Agency, 1986 (and updates), "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," SW-846, 3rd ed.

Table III-6 (Concluded)

Summary of Nitrate Plus Nitrite Results

SWMUs 8/58 and 68 Groundwater Monitoring

Quarterly Assessment, October – December 2014

Notes (continued)

CCBA = Coyote Canyon Blast Area.

EPA = U.S. Environmental Protection Agency.

MCL = Maximum contaminant level. Established by the EPA Primary Water Regulations (40 Code of Federal Regulations 141.11, Subpart B), National Primary Drinking Water Standards (EPA, 2009).

MDL = Method detection limit. The minimum concentration that can be measured and reported with 99% confidence that the analyte is greater than zero; analyte is matrix-specific.

mg/L = Milligrams per liter. MW = Monitoring Well.

OBS = Old Burn Site.

PQL = Practical quantitation limit. The lowest concentration of analytes in a sample that can be reliably determined within specified limits of precision and accuracy by that indicated method under routine laboratory operating conditions.

Table III-7
Summary of Alkalinity, Anion, and Total Cyanide Results
SWMUs 8/58 and 68 Groundwater Monitoring
Quarterly Assessment, October – December 2014

Well	Analyte	Result (mg/L)	MDL (mg/L)	PQL (mg/L)	MCL (mg/L)	Laboratory	Validation Qualifier ^b	Sample Number	Analytical Method ^c
SWMUs 8/58		(ilig/L)	(IIIg/L)	(mg/L)	(IIIg/L)	Qualifier	Qualifier	Number	Wietiloa
CCBA-MW1	Bicarbonate Alkalinity	178	0.725	1.00	NE			096685-022	SM 2320B
13-Oct-14	Carbonate Alkalinity	ND	0.725	1.00	NE	U		096685-022	SM 2320B
	Bromide	0.320	0.067	0.200	NE			096685-016	EPA 9056
	Chloride	28.8	0.335	1.00	NE			096685-016	EPA 9056
	Fluoride	4.81	0.033	0.100	4.0			096685-016	EPA 9056
	Sulfate	55.9	0.665	2.00	NE			096685-016	EPA 9056
	Total Cyanide	ND	0.00167	0.005	0.200	U	UJ	096685-027	EPA 9012
CCBA-MW2	Bicarbonate Alkalinity	175	0.725	1.00	NE			096691-022	SM 2320B
14-Oct-14	Carbonate Alkalinity	ND	0.725	1.00	NE	U		096691-022	SM 2320B
	Bromide	0.558	0.067	0.200	NE			096691-016	EPA 9056
	Chloride	38.2	0.670	2.00	NE			096691-016	EPA 9056
	Fluoride	1.50	0.033	0.100	4.0			096691-016	EPA 9056
	Sulfate	93.8	1.33	4.00	NE			096691-016	EPA 9056
	Total Cyanide	ND	0.00167	0.005	0.200	U	UJ	096691-027	EPA 9012
CCBA-MW2 (Duplicate)	Bicarbonate Alkalinity	179	0.725	1.00	NE			096692-022	SM 2320B
14-Oct-14	Carbonate Alkalinity	ND	0.725	1.00	NE	U		096692-022	SM 2320B
	Bromide	0.553	0.067	0.200	NE			096692-016	EPA 9056
	Chloride	37.9	0.670	2.00	NE			096692-016	EPA 9056
	Fluoride	1.50	0.033	0.100	4.0			096692-016	EPA 9056
	Sulfate	94.1	1.33	4.00	NE			096692-016	EPA 9056
	Total Cyanide	ND	0.00167	0.005	0.200	U	UJ	096692-027	EPA 9012

Table III-7 (Continued)

Summary of Alkalinity, Anion, and Total Cyanide Results SWMUs 8/58 and 68 Groundwater Monitoring

Quarterly Assessment, October – December 2014

Well	Analyte	Result	MDL	PQL	MCL	Laboratory		Sample	Analytical
014/14/14 00	,	(mg/L)	(mg/L)	(mg/L)	(mg/L)	Qualifier ^a	Qualifier	Number	Method ^c
SWMU 68		ı	T	T		_	1		
OBS-MW1	Bicarbonate Alkalinity	186	0.725	1.00	NE			096653-022	SM 2320B
06-Oct-14	Carbonate Alkalinity	ND	0.725	1.00	NE	U		096653-022	SM 2320B
	Bromide	0.359	0.067	0.200	NE			096653-016	EPA 9056
	Chloride	23.0	0.670	2.00	NE			096653-016	EPA 9056
	Fluoride	2.01	0.033	0.100	4.00			096653-016	EPA 9056
	Sulfate	79.3	1.33	4.00	NE			096653-016	EPA 9056
	Total Cyanide	ND	0.00167	0.005	0.200	U	UJ	096653-027	EPA 9012
OBS-MW2	Bicarbonate Alkalinity	183	0.725	1.00	NE			096658-022	SM 2320B
07-Oct-14	Carbonate Alkalinity	ND	0.725	1.00	NE	U		096658-022	SM 2320B
	Bromide	0.343	0.067	0.200	NE			096658-016	EPA 9056
	Chloride	21.9	0.670	2.00	NE			096658-016	EPA 9056
	Fluoride	2.13	0.033	0.100	4.00			096658-016	EPA 9056
	Sulfate	81.5	1.33	4.00	NE			096658-016	EPA 9056
	Total Cyanide	ND	0.00167	0.005	0.200	U	UJ	096658-027	EPA 9056
OBS-MW2 (Duplicate)	Bicarbonate Alkalinity	183	0.725	1.00	NE			096659-022	SM 2320B
07-Oct-14	Carbonate Alkalinity	ND	0.725	1.00	NE	U		096659-022	SM 2320B
	Bromide	0.367	0.067	0.200	NE			096659-016	EPA 9056
	Chloride	21.9	0.670	2.00	NE			096659-016	EPA 9056
	Fluoride	2.15	0.033	0.100	4.00			096659-016	EPA 9056
	Sulfate	81.3	1.33	4.00	NE			096659-016	EPA 9056
	Total Cyanide	ND	0.00167	0.005	0.200	U	UJ	096659-027	EPA 9012
OBS-MW3	Bicarbonate Alkalinity	181	0.725	1.00	NE			096661-022	SM 2320B
08-Oct-14	Carbonate Alkalinity	ND	0.725	1.00	NE	U		096661-022	SM 2320B
	Bromide	0.375	0.067	0.200	NE			096661-016	EPA 9056
	Chloride	22.4	0.670	2.00	NE			096661-016	EPA 9056
	Fluoride	2.16	0.033	0.100	4.00			096661-016	EPA 9056
	Sulfate	80.8	1.33	4.00	NE			096661-016	EPA 9056
	Total Cyanide	ND	0.00167	0.005	0.200	U	UJ	096661-027	EPA 9012

Table III-7 (Concluded)

Summary of Alkalinity, Anion, and Total Cyanide Results SWMUs 8/58 and 68 Groundwater Monitoring Quarterly Assessment, October – December 2014

Notes

^aLaboratory Qualifier

If cell is blank, then all quality control samples met acceptance criteria with respect to submitted samples.

U = Analyte is absent or below the MDL.

^bValidation Qualifier

If cell is blank, then all quality control samples met acceptance criteria with respect to submitted samples.

JJ = The analyte was analyzed for, but not detected. The associated value is an estimate and may be inaccurate or imprecise.

^cAnalytical Method

Clesceri, Greenburg, and Eaton, 1998, Standard Methods for the Examination of Water and Wastewater, 20th ed., Method 2320B.

U.S. Environmental Protection Agency, 1984, "Methods for Chemical Analysis of Water and Wastes," EPA 600-4-79-020, U.S. Environmental Protection Agency, Washington, D.C.

U.S. Environmental Protection Agency, 1986 (and updates), "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," SW-846, 3rd ed.

Bold = Indicates that a result exceeds the MCL.

CCBA = Coyote Canyon Blast Area.

EPA = U.S. Environmental Protection Agency.

MCL = Maximum contaminant level. Established by the EPA Primary Water Regulations (40 Code of Federal Regulations 141.11, Subpart B), National Primary Drinking Water Standards (EPA, 2009).

MDL = Method detection limit. The minimum concentration that can be measured and reported with 99% confidence that the analyte is greater than zero; analyte is matrix-specific.

mg/L = Milligrams per liter.

MW = Monitoring Well.

ND = Not detected (at MDL).

NE = Not established.

OBS = Old Burn Site.

PQL = Practical quantitation limit. The lowest concentration of analytes in a sample that can be reliably determined within specified limits of precision and accuracy by that indicated method under routine laboratory operating conditions.

SM = Standard Method.

Table III-8
Summary of Perchlorate Results
SWMUs 8/58 and 68 Groundwater Monitoring
Quarterly Assessment, October – December 2014

Well	Result (mg/L)	MDL (mg/L)	PQL (mg/L)	MCL (mg/L)	Laboratory Qualifier ^a	Validation Qualifier ^b	Sample Number	Analytical Method ^c
SWMUs 8/58								
CCBA-MW1 13-Oct-14	ND	0.004	0.012	NE	U		096685-020	EPA 314.0
CCBA-MW2 14-Oct-14	ND	0.004	0.012	NE	U		096691-020	EPA 314.0
CCBA-MW2 (Duplicate) 14-Oct-14	ND	0.004	0.012	NE	U		096692-020	EPA 314.0
SWMU 68	•							
OBS-MW1 06-Oct-14	ND	0.004	0.012	NE	U		096653-020	EPA 314.0
OBS-MW2 07-Oct-14	ND	0.004	0.012	NE	U		096658-020	EPA 314.0
OBS-MW2 (Duplicate) 07-Oct-14	ND	0.004	0.012	NE	U		096659-020	EPA 314.0
OBS-MW3 08-Oct-14	ND	0.004	0.012	NE	U		096661-020	EPA 314.0

Notes

^aLaboratory Qualifier

If cell is blank, then all quality control samples met acceptance criteria with respect to submitted samples.

J = Analyte is absent or below the MDL.

^bValidation Qualifier

If cell is blank, then all quality control samples met acceptance criteria with respect to submitted samples.

^cAnalytical Method

U.S. Énvironmental Protection Agency, 1999 (and updates), "Perchlorate in Drinking Water Using Ion Chromatography," EPA 815/R-00-014.

Table III-8 (Concluded)

Summary of Perchlorate Results

SWMUs 8/58 and 68 Groundwater Monitoring

Quarterly Assessment, October – December 2014

Notes (continued)

CCBA = Coyote Canyon Blast Area.

EPA = U.S. Environmental Protection Agency.

MCL = Maximum contaminant level. Established by the EPA Primary Water Regulations (40 Code of Federal Regulations 141.11, Subpart B), National Primary Drinking Water

Standards (EPA, 2009).

MDL = Method detection limit. The minimum concentration that can be measured and reported with 99% confidence that the analyte is greater than zero; analyte is matrix-specific.

mg/L = Milligrams per liter.

MW = Monitoring Well.

ND = Not detected (at MDL).

NE = Not established.
OBS = Old Burn Site.

PQL = Practical quantitation limit. The lowest concentration of analytes in a sample that can be reliably determined within specified limits of precision and accuracy by that indicated

method under routine laboratory operating conditions.

Table III-9

Summary of Hexavalent Chromium Results

SWMU 68 Groundwater Monitoring

Quarterly Assessment, October – December 2014

Well	Result (mg/L)	MDL (mg/L)	PQL (mg/L)	MCL (mg/L)	Laboratory Qualifier ^a	Validation Qualifier ^b	Sample Number	Analytical Method ^c
OBS-MW1 06-Oct-14	ND	0.003	0.010	NE	U	UJ	096653-014	EPA 7196A
OBS-MW2 07-Oct-14	ND	0.003	0.010	NE	U		096658-014	EPA 7196A
OBS-MW2 (Duplicate) 07-Oct-14	ND	0.003	0.010	NE	U		096659-014	EPA 7196A
OBS-MW3 08-Oct-14	ND	0.003	0.010	NE	U		096661-014	EPA 7196A

Notes

^aLaboratory Qualifier

If cell is blank, then all quality control samples met acceptance criteria with respect to submitted samples.

U = Analyte is absent, or below the MDL.

^bValidation Qualifier

If cell is blank, then all quality control samples met acceptance criteria with respect to submitted samples.

JJ = The analyte was analyzed for, but not detected. The associated value is an estimate and may be inaccurate or imprecise.

^cAnalytical Method

U.S. Environmental Protection Agency, 1986 (and updates), "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," SW-846, 3rd ed.

EPA = U.S. Environmental Protection Agency.

MCL = Maximum contaminant level. Established by the EPA Primary Water Regulations (40 Code of Federal Regulations 141.11, Subpart B), National Primary Drinking Water Standards (EPA, 2009).

MDL = Method detection limit. The minimum concentration that can be measured and reported with 99% confidence that the analyte is greater than zero; analyte is matrix-specific.

mg/L = Milligrams per liter.

MW = Monitoring Well.

ND = Not detected (at MDL).

NE = Not established.

OBS = Old Burn Site.

PQL = Practical quantitation limit. The lowest concentration of analytes in a sample that can be reliably determined within specified limits of precision and accuracy by that indicated method under routine laboratory operating conditions.

Table III-10
Summary of Unfiltered Total Metal Results
SWMUs 8/58 Groundwater Monitoring
Quarterly Assessment, October – December 2014

Well	Analysta	Result	MDL	PQL	MCL	Laboratory	Validation	Sample	Analytical
weii	Analyte	(mg/L)	(mg/L)	(mg/L)	(mg/L)	Qualifier ^a	Qualifier ^b	Number	Method ^c
CCBA-MW1	Aluminum	0.0199	0.015	0.050	NE	J		096685-010	EPA 6020
13-Oct-14	Antimony	ND	0.001	0.003	0.006	U		096685-010	EPA 6020
	Arsenic	ND	0.0017	0.005	0.010	U		096685-010	EPA 6020
	Barium	0.00193	0.0006	0.002	2.00	J		096685-010	EPA 6020
	Beryllium	0.000467	0.0002	0.0005	0.004	J		096685-010	EPA 6020
	Cadmium	ND	0.00011	0.001	0.005	U		096685-010	EPA 6020
	Calcium	54.0	0.300	1.00	NE			096685-010	EPA 6020
	Chromium	ND	0.002	0.010	0.100	U		096685-010	EPA 6020
	Cobalt	0.0001	0.0001	0.001	NE	J		096685-010	EPA 6020
	Copper	0.000509	0.00035	0.001	NE	J		096685-010	EPA 6020
	Iron	0.0617	0.033	0.100	NE	J		096685-010	EPA 6020
	Lead	ND	0.0005	0.002	NE	U		096685-010	EPA 6020
	Magnesium	10.6	0.010	0.030	NE			096685-010	EPA 6020
	Manganese	0.00221	0.001	0.005	NE	J		096685-010	EPA 6020
	Mercury	ND	0.000067	0.0002	0.002	U		096685-010	EPA 7470
	Nickel	0.000673	0.0005	0.002	NE	J		096685-010	EPA 6020
	Potassium	4.36	0.080	0.300	NE			096685-010	EPA 6020
	Selenium	0.00207	0.0015	0.005	0.050	J		096685-010	EPA 6020
	Silver	ND	0.0002	0.001	NE	U		096685-010	EPA 6020
	Sodium	67.3	0.400	1.25	NE			096685-010	EPA 6020
	Thallium	ND	0.00045	0.002	0.002	U		096685-010	EPA 6020
	Uranium	0.00249	0.000067	0.0002	0.03			096685-010	EPA 6020
	Vanadium	ND	0.001	0.005	NE	U		096685-010	EPA 6010
	Zinc	ND	0.0035	0.010	NE	U		096685-010	EPA 6020

Table III-10 (Continued)

Summary of Unfiltered Total Metal Results

SWMUs 8/58 Groundwater Monitoring

Quarterly Assessment, October – December 2014

NA/ a II	Analuta	Result	MDL	PQL	MCL	Laboratory	Validation	Sample	Analytical
Well	Analyte	(mg/L)	(mg/L)	(mg/L)	(mg/L)	Qualifier ^a	Qualifier ^b	Number	Method ^c
CCBA-MW2	Aluminum	ND	0.015	0.050	NE	U		096691-010	EPA 6020
14-Oct-14	Antimony	ND	0.001	0.003	0.006	U		096691-010	EPA 6020
	Arsenic	ND	0.0017	0.005	0.010	U		096691-010	EPA 6020
	Barium	0.0464	0.0006	0.002	2.00			096691-010	EPA 6020
	Beryllium	ND	0.0002	0.0005	0.004	U		096691-010	EPA 6020
	Cadmium	ND	0.00011	0.001	0.005	U		096691-010	EPA 6020
	Calcium	84.1	0.300	1.00	NE			096691-010	EPA 6020
	Chromium	ND	0.002	0.010	0.100	U		096691-010	EPA 6020
	Cobalt	0.000106	0.0001	0.001	NE	J		096691-010	EPA 6020
	Copper	0.000561	0.00035	0.001	NE	J	0.0042U	096691-010	EPA 6020
	Iron	0.0812	0.033	0.100	NE	J		096691-010	EPA 6020
	Lead	ND	0.0005	0.002	NE	U		096691-010	EPA 6020
	Magnesium	15.6	0.010	0.030	NE			096691-010	EPA 6020
	Manganese	ND	0.001	0.005	NE	U		096691-010	EPA 6020
	Mercury	ND	0.000067	0.0002	0.002	U		096691-010	EPA 7470
	Nickel	0.00086	0.0005	0.002	NE	J		096691-010	EPA 6020
	Potassium	1.33	0.080	0.300	NE			096691-010	EPA 6020
	Selenium	0.00418	0.0015	0.005	0.050	J		096691-010	EPA 6020
	Silver	ND	0.0002	0.001	NE	U		096691-010	EPA 6020
	Sodium	52.3	0.400	1.25	NE			096691-010	EPA 6020
	Thallium	ND	0.00045	0.002	0.002	U		096691-010	EPA 6020
	Uranium	0.00585	0.000067	0.0002	0.03		·	096691-010	EPA 6020
	Vanadium	0.00999	0.001	0.005	NE			096691-010	EPA 6010
	Zinc	ND	0.0035	0.010	NE	U		096691-010	EPA 6020

Table III-10 (Continued)

Summary of Unfiltered Total Metal Results

SWMUs 8/58 Groundwater Monitoring

Quarterly Assessment, October – December 2014

Well	Anglista	Result	MDL	PQL	MCL	Laboratory	Validation	Sample	Analytical
weii	Analyte	(mg/L)	(mg/L)	(mg/L)	(mg/L)	Qualifier	Qualifier ^b	Number	Method ^c
CCBA-MW2	Aluminum	ND	0.015	0.050	NE	U		096692-010	EPA 6020
(Duplicate)	Antimony	ND	0.001	0.003	0.006	U		096692-010	EPA 6020
14-Oct-14	Arsenic	ND	0.0017	0.005	0.010	U		096692-010	EPA 6020
	Barium	0.0458	0.0006	0.002	2.00			096692-010	EPA 6020
	Beryllium	ND	0.0002	0.0005	0.004	U		096692-010	EPA 6020
	Cadmium	ND	0.00011	0.001	0.005	U		096692-010	EPA 6020
	Calcium	82.1	0.300	1.00	NE			096692-010	EPA 6020
	Chromium	ND	0.002	0.010	0.100	U		096692-010	EPA 6020
	Cobalt	ND	0.0001	0.001	NE	U		096692-010	EPA 6020
	Copper	0.000569	0.00035	0.001	NE	J	0.0042U	096692-010	EPA 6020
	Iron	0.0814	0.033	0.100	NE	J		096692-010	EPA 6020
	Lead	ND	0.0005	0.002	NE	U		096692-010	EPA 6020
	Magnesium	15.5	0.010	0.030	NE			096692-010	EPA 6020
	Manganese	ND	0.001	0.005	NE	U		096692-010	EPA 6020
	Mercury	ND	0.000067	0.0002	0.002	U		096692-010	EPA 7470
	Nickel	0.00087	0.0005	0.002	NE	J		096692-010	EPA 6020
	Potassium	1.31	0.080	0.300	NE			096692-010	EPA 6020
	Selenium	0.00385	0.0015	0.005	0.050	J		096692-010	EPA 6020
	Silver	ND	0.0002	0.001	NE	U		096692-010	EPA 6020
	Sodium	50.7	0.400	1.25	NE			096692-010	EPA 6020
	Thallium	ND	0.00045	0.002	0.002	U		096692-010	EPA 6020
	Uranium	0.00611	0.000067	0.0002	0.03			096692-010	EPA 6020
	Vanadium	0.0107	0.001	0.005	NE			096692-010	EPA 6010
	Zinc	ND	0.0035	0.010	NE	U		096692-010	EPA 6020

Table III-10 (Concluded)

Summary of Unfiltered Total Metal Results

SWMUs 8/58 Groundwater Monitoring

Quarterly Assessment, October – December 2014

Notes

^aLaboratory Qualifier

If cell is blank, then all quality control samples met acceptance criteria with respect to submitted samples.

J = Estimated value, the analyte concentration fell above the effective MDL and below the effective PQL.

U = Analyte is absent or below the MDL.

^bValidation Qualifier

If cell is blank, then all quality control samples met acceptance criteria with respect to submitted samples.

U = The analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.

^cAnalytical Method

U.S. Environmental Protection Agency, 1986 (and updates), "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," SW-846, 3rd ed.

CCBA = Coyote Canyon Blast Area.

EPA = U.S. Environmental Protection Agency.

MCL = Maximum contaminant level. Established by the EPA Primary Water Regulations (40 Code of Federal Regulations 141.11, Subpart B), National Primary Drinking Water

Standards (EPA, 2009).

MDL = Method detection limit. The minimum concentration that can be measured and reported with 99% confidence that the analyte is greater than zero; analyte is matrix-specific.

mg/L = Milligrams per liter.

MW = Monitoring Well.

ND = Not detected (at MDL).

NE = Not established.

PQL = Practical quantitation limit. The lowest concentration of analytes in a sample that can be reliably determined within specified limits of precision and accuracy by that indicated

method under routine laboratory operating conditions.

Table III-11
Summary of Unfiltered Total Metal Results
SWMU 68 Groundwater Monitoring
Quarterly Assessment, October – December 2014

Wall	Analuta	Result	MDL	PQL	MCL	Laboratory	Validation	Sample	Analytical
Well	Analyte	(mg/L)	(mg/L)	(mg/L)	(mg/L)	Qualifier	Qualifier ^b	Number	Method ^c
OBS-MW1	Aluminum	ND	0.015	0.050	NE	U		096653-009	EPA 6020
06-Oct-14	Antimony	ND	0.001	0.003	0.006	U		096653-009	EPA 6020
	Arsenic	ND	0.0017	0.005	0.010	U		096653-009	EPA 6020
	Barium	0.0175	0.0006	0.002	2.00			096653-009	EPA 6020
	Beryllium	ND	0.0002	0.0005	0.004	U		096653-009	EPA 6020
	Cadmium	ND	0.00011	0.001	0.005	U		096653-009	EPA 6020
	Calcium	81.6	0.300	1.00	NE			096653-009	EPA 6020
	Chromium	ND	0.002	0.010	0.100	U		096653-009	EPA 6020
	Cobalt	ND	0.0001	0.001	NE	U		096653-009	EPA 6020
	Copper	ND	0.00035	0.001	NE	U		096653-009	EPA 6020
	Iron	ND	0.033	0.100	NE	U		096653-009	EPA 6020
	Lead	ND	0.0005	0.002	NE	U		096653-009	EPA 6020
	Magnesium	17.5	0.010	0.030	NE			096653-009	EPA 6020
	Manganese	ND	0.001	0.005	NE	U		096653-009	EPA 6020
	Mercury	ND	0.000067	0.0002	0.002	U		096653-009	EPA 7470
	Nickel	ND	0.0005	0.002	NE	U		096653-009	EPA 6020
	Potassium	1.84	0.080	0.300	NE			096653-009	EPA 6020
	Selenium	0.00278	0.0015	0.005	0.050	J		096653-009	EPA 6020
	Silver	ND	0.0002	0.001	NE	U		096653-009	EPA 6020
	Sodium	25.0	0.080	0.250	NE			096653-009	EPA 6020
	Thallium	ND	0.00045	0.002	0.002	U		096653-009	EPA 6020
	Uranium	0.00945	0.000067	0.0002	0.03			096653-009	EPA 6020
	Vanadium	ND	0.001	0.005	NE	U		096653-009	EPA 6010
	Zinc	ND	0.0035	0.010	NE	U		096653-009	EPA 6020

Table III-11 (Continued)

Summary of Unfiltered Total Metal Results

SWMU 68 Groundwater Monitoring

Quarterly Assessment, October – December 2014

Well	Analyte	Result	MDL	PQL	MCL	Laboratory	Validation	Sample	Analytical
		(mg/L)	(mg/L)	(mg/L)	(mg/L)	Qualifier ^a	Qualifier ^b	Number	Method ^c
OBS-MW2	Aluminum	ND	0.015	0.050	NE	U		096658-009	EPA 6020
07-Oct-14	Antimony	ND	0.001	0.003	0.006	U		096658-009	EPA 6020
	Arsenic	ND	0.0017	0.005	0.010	U		096658-009	EPA 6020
	Barium	0.0206	0.0006	0.002	2.00			096658-009	EPA 6020
	Beryllium	ND	0.0002	0.0005	0.004	U		096658-009	EPA 6020
	Cadmium	ND	0.00011	0.001	0.005	U		096658-009	EPA 6020
	Calcium	81.6	0.300	1.00	NE			096658-009	EPA 6020
	Chromium	ND	0.002	0.010	0.100	U		096658-009	EPA 6020
	Cobalt	ND	0.0001	0.001	NE	U		096658-009	EPA 6020
	Copper	ND	0.00035	0.001	NE	U		096658-009	EPA 6020
	Iron	ND	0.033	0.100	NE	U		096658-009	EPA 6020
	Lead	ND	0.0005	0.002	NE	U		096658-009	EPA 6020
	Magnesium	17.8	0.010	0.030	NE			096658-009	EPA 6020
	Manganese	ND	0.001	0.005	NE	U		096658-009	EPA 6020
	Mercury	ND	0.000067	0.0002	0.002	U		096658-009	EPA 7470
	Nickel	ND	0.0005	0.002	NE	U		096658-009	EPA 6020
	Potassium	1.84	0.080	0.300	NE			096658-009	EPA 6020
	Selenium	0.00327	0.0015	0.005	0.050	J		096658-009	EPA 6020
	Silver	ND	0.0002	0.001	NE	U		096658-009	EPA 6020
	Sodium	25.2	0.080	0.250	NE			096658-009	EPA 6020
	Thallium	ND	0.00045	0.002	0.002	U		096658-009	EPA 6020
	Uranium	0.0128	0.000067	0.0002	0.03			096658-009	EPA 6020
	Vanadium	ND	0.001	0.005	NE	U		096658-009	EPA 6010
	Zinc	ND	0.0035	0.010	NE	U		096658-009	EPA 6020

Table III-11 (Continued)

Summary of Unfiltered Total Metal Results

SWMU 68 Groundwater Monitoring

Quarterly Assessment, October – December 2014

Well	Analyta	Result	MDL	PQL	MCL	Laboratory	Validation	Sample	Analytical
WEII	Analyte	(mg/L)	(mg/L)	(mg/L)	(mg/L)	Qualifier ^a	Qualifier ^b	Number	Method ^c
OBS-MW2 (Duplicate)	Aluminum	ND	0.015	0.050	NE	U		096659-009	EPA 6020
07-Oct-14	Antimony	ND	0.001	0.003	0.006	U		096659-009	EPA 6020
	Arsenic	ND	0.0017	0.005	0.010	U		096659-009	EPA 6020
	Barium	0.0205	0.0006	0.002	2.00			096659-009	EPA 6020
	Beryllium	ND	0.0002	0.0005	0.004	U		096659-009	EPA 6020
	Cadmium	ND	0.00011	0.001	0.005	U		096659-009	EPA 6020
	Calcium	81.0	0.300	1.00	NE			096659-009	EPA 6020
	Chromium	ND	0.002	0.010	0.100	U		096659-009	EPA 6020
	Cobalt	ND	0.0001	0.001	NE	U		096659-009	EPA 6020
	Copper	ND	0.00035	0.001	NE	U		096659-009	EPA 6020
	Iron	ND	0.033	0.100	NE	U		096659-009	EPA 6020
	Lead	ND	0.0005	0.002	NE	U		096659-009	EPA 6020
	Magnesium	17.3	0.010	0.030	NE			096659-009	EPA 6020
	Manganese	ND	0.001	0.005	NE	U		096659-009	EPA 6020
	Mercury	ND	0.000067	0.0002	0.002	U		096659-009	EPA 7470
	Nickel	ND	0.0005	0.002	NE	U		096659-009	EPA 6020
	Potassium	1.72	0.080	0.300	NE			096659-009	EPA 6020
	Selenium	0.00289	0.0015	0.005	0.050	J		096659-009	EPA 6020
	Silver	ND	0.0002	0.001	NE	U		096659-009	EPA 6020
	Sodium	24.7	0.080	0.250	NE			096659-009	EPA 6020
	Thallium	ND	0.00045	0.002	0.002	U		096659-009	EPA 6020
	Uranium	0.0128	0.000067	0.0002	0.03			096659-009	EPA 6020
	Vanadium	0.00108	0.001	0.005	NE	J		096659-009	EPA 6010
	Zinc	ND	0.0035	0.010	NE	U		096659-009	EPA 6020

Table III-11 (Continued)

Summary of Unfiltered Total Metal Results

SWMU 68 Groundwater Monitoring

Quarterly Assessment, October – December 2014

VA/ a II	Amalasta	Result	MDL	PQL	MCL	Laboratory	Validation	Sample	Analytical
Well	Analyte	(mg/L)	(mg/L)	(mg/L)	(mg/L)	Qualifier ^a	Qualifier ^b	Number	Method ^c
OBS-MW3	Aluminum	ND	0.015	0.050	NE	U		096661-009	EPA 6020
08-Oct-14	Antimony	ND	0.001	0.003	0.006	U		096661-009	EPA 6020
	Arsenic	ND	0.0017	0.005	0.010	U		096661-009	EPA 6020
	Barium	0.0268	0.0006	0.002	2.00			096661-009	EPA 6020
	Beryllium	ND	0.0002	0.0005	0.004	U		096661-009	EPA 6020
	Cadmium	ND	0.00011	0.001	0.005	U		096661-009	EPA 6020
	Calcium	81.5	0.300	1.00	NE			096661-009	EPA 6020
	Chromium	ND	0.002	0.010	0.100	U		096661-009	EPA 6020
	Cobalt	ND	0.0001	0.001	NE	U		096661-009	EPA 6020
	Copper	ND	0.00035	0.001	NE	U		096661-009	EPA 6020
	Iron	ND	0.033	0.100	NE	U		096661-009	EPA 6020
	Lead	ND	0.0005	0.002	NE	U		096661-009	EPA 6020
	Magnesium	18.2	0.010	0.030	NE			096661-009	EPA 6020
	Manganese	ND	0.001	0.005	NE	U		096661-009	EPA 6020
	Mercury	ND	0.000067	0.0002	0.002	U		096661-009	EPA 7470
	Nickel	ND	0.0005	0.002	NE	U		096661-009	EPA 6020
	Potassium	1.88	0.080	0.300	NE			096661-009	EPA 6020
	Selenium	0.00363	0.0015	0.005	0.050	J		096661-009	EPA 6020
	Silver	ND	0.0002	0.001	NE	U		096661-009	EPA 6020
	Sodium	25.9	0.080	0.250	NE			096661-009	EPA 6020
	Thallium	ND	0.00045	0.002	0.002	U		096661-009	EPA 6020
	Uranium	0.0122	0.000067	0.0002	0.03			096661-009	EPA 6020
	Vanadium	0.00124	0.001	0.005	NE	J		096661-009	EPA 6010
	Zinc	ND	0.0035	0.010	NE	U		096661-009	EPA 6020

Table III-11 (Concluded)

Summary of Unfiltered Total Metal Results

SWMU 68 Groundwater Monitoring

Quarterly Assessment, October – December 2014

Notes

^aLaboratory Qualifier

If cell is blank, then all quality control samples met acceptance criteria with respect to submitted samples.

J = Estimated value, the analyte concentration fell above the effective MDL and below the effective PQL.

U = Analyte is absent or below the MDL.

^bValidation Qualifier

If cell is blank, then all quality control samples met acceptance criteria with respect to submitted samples.

^cAnalytical Method

U.S. Environmental Protection Agency, 1986 (and updates), "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," SW-846, 3rd ed.

EPA = U.S. Environmental Protection Agency.

MCL = Maximum contaminant level. Established by the EPA Primary Water Regulations (40 Code of Federal Regulations 141.11, Subpart B), National Primary Drinking Water

Standards (EPA, 2009).

MDL = Method detection limit. The minimum concentration that can be measured and reported with 99% confidence that the analyte is greater than zero; analyte is matrix-specific.

mg/L = Milligrams per liter.

MW = Monitoring Well.

ND = Not detected (at MDL).

NE = Not established.

OBS = Old Burn Site.

PQL = Practical quantitation limit. The lowest concentration of analytes in a sample that can be reliably determined within specified limits of precision and accuracy by that indicated

method under routine laboratory operating conditions.

SWMU = Solid Waste Management Unit.

Table III-12
Summary of Filtered Cation Results
SWMUs 8/58 and 68 Groundwater Monitoring
Quarterly Assessment, October – December 2014

Well	Analyte	Result (mg/L)	MDL (mg/L)	PQL (mg/L)	MCL (mg/L)	Laboratory Qualifier ^a	Validation Qualifier ^b	Sample Number	Analytical Method ^c
SWMUs 8/58	1	, , ,			, , ,	•			
CCBA-MW1	Calcium	54.1	0.300	1.00	NE			096685-017	EPA 6020
13-Oct-14	Magnesium	10.7	0.010	0.030	NE			096685-017	EPA 6020
	Potassium	4.41	0.080	0.300	NE			096685-017	EPA 6020
	Sodium	69.9	0.400	1.25	NE			096685-017	EPA 6020
CCBA-MW2	Calcium	83.2	0.300	1.00	NE			096691-017	EPA 6020
14-Oct-14	Magnesium	15.5	0.010	0.030	NE			096691-017	EPA 6020
	Potassium	1.30	0.080	0.300	NE			096691-017	EPA 6020
	Sodium	53.2	0.400	1.25	NE			096691-017	EPA 6020
CCBA-MW2 (Duplicate)	Calcium	81.1	0.300	1.00	NE			096692-017	EPA 6020
14-Oct-14	Magnesium	15.5	0.010	0.030	NE			096692-017	EPA 6020
	Potassium	1.30	0.080	0.300	NE			096692-017	EPA 6020
	Sodium	52.0	0.400	1.25	NE			096692-017	EPA 6020
SWMU 68		•							
OBS-MW1	Calcium	80.3	0.300	1.00	NE			096653-017	EPA 6020
06-Oct-14	Magnesium	17.0	0.010	0.030	NE			096653-017	EPA 6020
	Potassium	1.74	0.080	0.300	NE			096653-017	EPA 6020
	Sodium	23.5	0.080	0.250	NE			096653-017	EPA 6020
OBS-MW2	Calcium	78.3	0.300	1.00	NE			096658-017	EPA 6020
07-Oct-14	Magnesium	16.9	0.010	0.030	NE			096658-017	EPA 6020
	Potassium	1.72	0.080	0.300	NE			096658-017	EPA 6020
	Sodium	23.7	0.080	0.250	NE			096658-017	EPA 6020
OBS-MW2 (Duplicate)	Calcium	81.6	0.300	1.00	NE			096659-017	EPA 6020
07-Oct-14	Magnesium	17.3	0.010	0.030	NE			096659-017	EPA 6020
	Potassium	1.76	0.080	0.300	NE			096659-017	EPA 6020
	Sodium	24.0	0.080	0.250	NE			096659-017	EPA 6020
OBS-MW3	Calcium	79.0	0.300	1.00	NE			096661-017	EPA 6020
08-Oct-14	Magnesium	17.0	0.010	0.030	NE			096661-017	EPA 6020
	Potassium	1.70	0.080	0.300	NE			096661-017	EPA 6020
	Sodium	24.4	0.080	0.250	NE			096661-017	EPA 6020

Table III-12 (Concluded)

Summary of Filtered Cation Results

SWMUs 8/58 and 68 Groundwater Monitoring

Quarterly Assessment, October – December 2014

Notes

^aLaboratory Qualifier

If cell is blank, then all quality control samples met acceptance criteria with respect to submitted samples.

^bValidation Qualifier

If cell is blank, then all quality control samples met acceptance criteria with respect to submitted samples.

^cAnalytical Method

U.S. Environmental Protection Agency, 1986 (and updates), "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," SW-846, 3rd ed.

CCBA = Coyote Canyon Blast Area.

EPA = U.S. Environmental Protection Agency.

MCL = Maximum contaminant level. Established by the EPA Primary Water Regulations (40 Code of Federal Regulations 141.11, Subpart B), National Primary Drinking Water Standards (EPA, 2009).

MDL = Method detection limit. The minimum concentration that can be measured and reported with 99% confidence that the analyte is greater than zero; analyte is matrix-specific.

mg/L = Milligrams per liter.
MW = Monitoring Well.
NE = Not established.
OBS = Old Burn Site.

PQL = Practical quantitation limit. The lowest concentration of analytes in a sample that can be reliably determined within specified limits of precision and accuracy by that indicated method under routine laboratory operating conditions.

SWMU = Solid Waste Management Unit.

Table III-13
Summary of Gamma Spectroscopy, Gross Alpha, Gross Beta, and Isotopic Uranium Results
SWMUs 8/58 and 68 Groundwater Monitoring
Quarterly Assessment, October – December 2014

Well	Analyte	Activity ^a (pCi/L)	MDA (pCi/L)	Critical Level ^b (pCi/L)	MCL	Laboratory Qualifier ^c	Validation Qualifier ^d	Sample Number	Analytical Method ^e
SWMUs 8/58	GWMUs 8/58								
CCBA-MW1	Americium-241	7.63 ± 11.7	17.6	8.62	NE	U	BD	096685-033	EPA 901.1
13-Oct-14	Cesium-137	0.457 ± 2.06	3.54	1.70	NE	U	BD	096685-033	EPA 901.1
	Cobalt-60	1.33 ± 2.06	3.64	1.72	NE	U	BD	096685-033	EPA 901.1
	Potassium-40	-11.5 ± 36.2	46.2	22.1	NE	U	BD	096685-033	EPA 901.1
	Gross Alpha	1.62	NA	NA	15 pCi/L	NA	None	096685-034	EPA 900.0
	Gross Beta	4.88 ± 1.38	1.70	0.825	4mrem/yr		J	096685-034	EPA 900.0
CCBA-MW2	Americium-241	0.919 ± 25.1	29.1	14.2	NE	U	BD	096691-033	EPA 901.1
14-Oct-14	Cesium-137	0.105 ± 2.17	3.90	1.86	NE	U	BD	096691-033	EPA 901.1
	Cobalt-60	1.51 ± 2.28	4.20	1.96	NE	U	BD	096691-033	EPA 901.1
	Potassium-40	-3.67 ± 47.9	52.9	25.0	NE	U	BD	096691-033	EPA 901.1
	Gross Alpha	5.39	NA	NA	15 pCi/L	NA	None	096691-034	EPA 900.0
	Gross Beta	2.76 ± 1.04	1.44	0.694	4mrem/yr		J	096691-034	EPA 900.0
CCBA-MW2 (Duplicate)	Americium-241	4.06 ± 5.66	7.89	3.88	NE	U	BD	096692-033	EPA 901.1
14-Oct-14	Cesium-137	-2.89 ± 3.47	5.28	2.53	NE	U	BD	096692-033	EPA 901.1
	Cobalt-60	-3.78 ± 5.01	6.16	2.90	NE	U	BD	096692-033	EPA 901.1
	Potassium-40	-8.69 ± 55.1	68.6	32.5	NE	U	BD	096692-033	EPA 901.1
	Gross Alpha	6.61	NA	NA	15 pCi/L	NA	None	096692-034	EPA 900.0
	Gross Beta	1.22 ± 0.997	1.62	0.783	4mrem/yr	U	BD	096692-034	EPA 900.0

Table III-13 (Continued)

Summary of Gamma Spectroscopy, Gross Alpha, Gross Beta, and Isotopic Uranium Results SWMUs 8/58 and 68 Groundwater Monitoring

Quarterly Assessment, October – December 2014

Well	Analyte	Activity ^a (pCi/L)	MDA (pCi/L)	Critical Level ^b (pCi/L)	MCL	Laboratory Qualifier ^c	Validation Qualifier ^d	Sample Number	Analytical Method ^e
SWMU 68									
OBS-MW1	Americium-241	-2.95 ± 7.02	11.8	5.75	NE	U	BD	096653-033	EPA 901.1
06-Oct-14	Cesium-137	-0.302 ± 3.41	3.41	1.64	NE	U	BD	096653-033	EPA 901.1
	Cobalt-60	-0.133 ± 1.82	3.17	1.48	NE	U	BD	096653-033	EPA 901.1
	Potassium-40	41.4 ± 39.0	30.4	14.2	NE		J	096653-033	EPA 901.1
	Gross Alpha	7.13	NA	NA	15 pCi/L	NA	None	096653-034	EPA 900.0
	Gross Beta	5.79 ± 1.47	1.64	0.795	4 mrem/yr		J	096653-034	EPA 900.0
	Uranium-233/234	16.3 ± 2.12	0.104	0.0465	NE			096653-035	HASL-300
	Uranium-235/236	0.220 ± 0.0754	0.0729	0.0295	NE			096653-035	HASL-300
	Uranium-238	2.75 ± 0.406	0.0555	0.0221	NE			096653-035	HASL-300
OBS-MW2	Americium-241	-10.8 ± 17.6	29.4	14.3	NE	U	BD	096658-033	EPA 901.1
07-Oct-14	Cesium-137	-0.468 ± 2.27	3.93	1.87	NE	U	BD	096658-033	EPA 901.1
	Cobalt-60	2.21 ± 3.01	4.84	2.27	NE	U	BD	096658-033	EPA 901.1
	Potassium-40	9.73 ± 54.6	42.9	20.0	NE	U	BD	096658-033	EPA 901.1
	Gross Alpha	-0.81	NA	NA	15 pCi/L	NA	None	096658-034	EPA 900.0
	Gross Beta	6.76 ± 1.50	1.38	0.669	4 mrem/yr		J	096658-034	EPA 900.0
	Uranium-233/234	21.7 ± 2.77	0.0836	0.0373	NE			096658-035	HASL-300
	Uranium-235/236	0.345 ± 0.0863	0.0585	0.0237	NE			096658-035	HASL-300
	Uranium-238	4.27 ± 0.585	0.0445	0.0178	NE			096658-035	HASL-300
OBS-MW2 (Duplicate)	Americium-241	-0.956 ± 6.74	10.4	5.10	NE	U	BD	096659-033	EPA 901.1
07-Oct-14	Cesium-137	1.59 ± 2.14	3.63	1.75	NE	U	BD	096659-033	EPA 901.1
	Cobalt-60	-0.696 ± 2.88	3.62	1.71	NE	U	BD	096659-033	EPA 901.1
	Potassium-40	-35.6 ± 38.2	46.5	22.2	NE	U	BD	096659-033	EPA 901.1
	Gross Alpha	2.41	NA	NA	15 pCi/L	NA	None	096659-034	EPA 900.0
	Gross Beta	7.12 ± 1.70	1.81	0.880	4 mrem/yr		J	096659-034	EPA 900.0
	Uranium-233/234	22.4 ± 2.88	0.0877	0.0391	NE			096659-035	HASL-300
	Uranium-235/236	0.693 ± 0.139	0.0614	0.0249	NE			096659-035	HASL-300
	Uranium-238	4.60 ± 0.631	0.0467	0.0186	NE			096659-035	HASL-300

Table III-13 (Continued)

Summary of Gamma Spectroscopy, Gross Alpha, Gross Beta, and Isotopic Uranium Results

SWMUs 8/58 and 68 Groundwater Monitoring

Quarterly Assessment, October - December 2014

Well	Analyte	Activity ^a (pCi/L)	MDA (pCi/L)	Critical Level ^b (pCi/L)	MCL	Laboratory Qualifier ^c	Validation Qualifier ^d	Sample Number	Analytical Method ^e
SWMU 68 (Continued)									
OBS-MW3	Americium-241	3.56 ± 5.80	9.83	4.81	NE	U	BD	096661-033	EPA 901.1
08-Oct-14	Cesium-137	-0.854 ± 1.92	3.24	1.56	NE	U	BD	096661-033	EPA 901.1
	Cobalt-60	-0.454 ± 1.90	3.32	1.56	NE	U	BD	096661-033	EPA 901.1
	Potassium-40	40.8 ± 44.8	33.6	15.8	NE	X	R	096661-033	EPA 901.1
	Gross Alpha	4.59	NA	NA	15 pCi/L	NA	None	096661-034	EPA 900.0
	Gross Beta	7.31 ± 1.61	1.44	0.698	4 mrem/yr		J	096661-034	EPA 900.0
	Uranium-233/234	21.6 ± 2.78	0.0863	0.0385	NE			096661-035	HASL-300
	Uranium-235/236	0.330 ± 0.0859	0.0604	0.0245	NE			096661-035	HASL-300
	Uranium-238	4.18 ± 0.577	0.046	0.0183	NE			096661-035	HASL-300

Notes

^aActivities of zero or less are considered to be not detected. Gross alpha activity measurements were corrected by subtracting out the total uranium activity (40 Code of Federal Regulations Parts 9, 141, and 142, Table I-4).

^bThe lowest concentration of analytes in a sample that can be reliably determined within specified limits of precision and accuracy by that indicated method under routine laboratory operating conditions. The minimum activity that can be measured and reported with 99% confidence that the analyte is greater than zero; analyte is matrix-specific.

NA = Not applicable.

^cLaboratory Qualifier

If cell is blank, then all quality control samples met acceptance criteria with respect to submitted samples.

NA = Not applicable.
U = Analyte is abse

= Analyte is absent or below the MDL.

X = Data rejected due to peak not meeting identification criteria.

^dValidation Qualifier

If cell is blank, then all quality control samples met acceptance criteria with respect to submitted samples.

BD = Below detection limit as used in radiochemistry to identify results that are not statistically different from zero.

= The associated value is an estimated quantity.

R = The data are unusable, and resampling and reanalysis are necessary for verification.

None = No data validation for corrected gross alpha activity.

^eAnalytical Method

J

U.S. Department of Energy, 1990, "EML Procedures Manual," 27th ed., Vol. 1, Rev. 1992, Environmental Measurements Laboratory HASL-300.

U.S. Environmental Protection Agency, 1980, "Prescribed Procedures for Measurement of Radioactivity in Drinking Water," EPA-600/4-80-032, U.S. Environmental Protection Agency, Cincinnati, Ohio.

Table III-13 (Concluded)

Summary of Gamma Spectroscopy, Gross Alpha, Gross Beta, and Isotopic Uranium Results SWMUs 8/58 and 68 Groundwater Monitoring

Quarterly Assessment, October – December 2014

Notes (continued)

CCBA = Coyote Canyon Blast Area.

EPA = U.S. Environmental Protection Agency.

HASL = Health and Safety Laboratory.

MCL = Maximum contaminant level. The following are the MCLs for gross alpha particles and beta particles in community water systems:

15 pCi/L = Gross alpha particle activity, excluding total uranium (40 Code of Federal Regulations Parts 9, 141, and 142, Table I-4)

4 mrem/yr = any combination of beta and/or gamma emitting radionuclides (as dose rate).

MDA = The minimal detectable activity or minimum measured activity in a sample required to ensure a 95% probability that the measured activity is accurately quantified above the

critical level.

mrem/yr = Millirem per year. MW = Monitoring Well.

NA = Not applicable for gross alpha activities. The MDA or critical level could not be calculated as the gross alpha activity was corrected by subtracting out the total uranium activity.

NE = Not established.
OBS = Old Burn Site.
pCi/L = Picocuries per liter.

SWMU = Solid Waste Management Unit.

Table III-14
Summary of Constituents Detected above Established MCLs
SWMUs 8/58 and 68 Groundwater Monitoring
Quarterly Assessments through December 2014

Well	Date	Analyte	Result	MCL	Laboratory Qualifier ^a	Validation Qualifier ^b	Sample Number	Analytical Method ^c
SWMUs 8/58								
CCBA-MW1	31-Oct-11	Fluoride	5.36 mg/L	4.0 mg/L			091345-016	EPA 9056
CCBA-MW1	16-Jan-12	Fluoride	4.94 mg/L	4.0 mg/L			091615-016	EPA 9056
CCBA-MW1 (Duplicate)	16-Jan-12	Fluoride	4.94 mg/L	4.0 mg/L			091616-016	EPA 9056
CCBA-MW1	23-Apr-12	Fluoride	4.93 mg/L	4.0 mg/L			092291-016	EPA 9056
CCBA-MW1	16-Jul-12	Fluoride	5.03 mg/L	4.0 mg/L			092615-016	EPA 9056
CCBA-MW1 (Duplicate)	16-Jul-12	Fluoride	5.00 mg/L	4.0 mg/L			092616-016	EPA 9056
CCBA-MW1	22-Oct-12	Fluoride	5.32 mg/L	4.0 mg/L			093013-016	EPA 9056
CCBA-MW2	15-Jan-13	Benzo(a)pyrene	0.640 μg/L	0.440 µg/L	J		093336-002	EPA 8270C
CCBA-MW1	16-Jan-13	Fluoride	4.97 mg/L	4.0 mg/L			093341-016	EPA 9056
CCBA-MW1 (Duplicate)	16-Jan-13	Fluoride	5.00 mg/L	4.0 mg/L			093342-016	EPA 9056
CCBA-MW1	24-Apr-13	Fluoride	4.57 mg/L	4.0 mg/L			093863-016	EPA 9056
CCBA-MW1	16-Jul-13	Fluoride	4.78 mg/L	4.0 mg/L			094376-016	EPA 9056
CCBA-MW1 (Duplicate)	16-Jul-13	Fluoride	4.82 mg/L	4.0 mg/L			094377-016	EPA 9056
CCBA-MW1	10-Oct-13	Fluoride	4.93 mg/L	4.0 mg/L			094774-016	EPA 9056
CCBA-MW1	27-Jan-14	Fluoride	4.68 mg/L	4.0 mg/L			095213-016	EPA 9056
CCBA-MW1 (Duplicate)	27-Jan-14	Fluoride	4.74 mg/L	4.0 mg/L			095214-016	EPA 9056
CCBA-MW1	07-Apr-14	Fluoride	4.97 mg/L	4.0 mg/L			095725-016	EPA 9056
CCBA-MW1	22-Jul-14	Fluoride	4.99 mg/L	4.0 mg/L		•	096269-016	EPA 9056
CCBA-MW1 (Duplicate)	22-Jul-14	Fluoride	5.02 mg/L	4.0 mg/L		•	096270-016	EPA 9056
CCBA-MW1	13-Oct-14	Fluoride	4.81 mg/L	4.0 mg/L			096685-016	EPA 9056

Notes

^aLaboratory Qualifier

If cell is blank, then all quality control samples met acceptance criteria with respect to submitted samples.

J = Estimated value, the analyte concentration fell above the effective MDL and below the effective PQL.

^bValidation Qualifier

If cell is blank, then all quality control samples met acceptance criteria with respect to submitted samples.

^cAnalytical Method

- U.S. Environmental Protection Agency, 1984, "Methods for Chemical Analysis of Water and Wastes," EPA 600-4-79-020.
- U.S. Environmental Protection Agency, 1986 (and updates), "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," SW-846, 3rd ed.

Table III-14 (Concluded)

Summary of Constituents Detected above Established MCLs SWMUs 8/58 and 68 Groundwater Monitoring

Quarterly Assessments through December 2014

Notes (continued)

Bold = Indicates that a result exceeds the MCL.

 μ g/L = Micrograms per liter.

CCBA = Coyote Canyon Blast Area.

EPA = U.S. Environmental Protection Agency.

MCL = Maximum contaminant level. Established by the EPA Primary Water Regulations (40 Code of Federal Regulations 141.11, Subpart B), National Primary Drinking Water

Standards (EPA, 2009).

mg/L = Milligrams per liter. MW = Monitoring Well.

SWMU = Solid Waste Management Unit.

Table III-15
Summary of Duplicate Samples
SWMUs 8/58 and 68 Groundwater Monitoring
Quarterly Assessment, October – December 2014

Well/Parameter	Environmental Sample (R1)	Duplicate Sample (R2)	RPD^a
	mg/L unless other	erwise noted	
CCBA-MW2			
Nitrate plus Nitrite	3.32	3.47	4
Bicarbonate Alkalinity	175	179	2
Bromide	0.558	0.553	1
Chloride	38.2	37.9	1
Fluoride	1.50	1.50	< 1
Sulfate	93.8	94.1	< 1
Barium	0.0464	0.0458	1
Calcium	84.1	82.1	2
Iron	0.0812	0.0814	< 1
Magnesium	15.6	15.5	1
Nickel	0.00086	0.00087	1
Potassium	1.33	1.31	2
Selenium	0.00418	0.00385	8
Sodium	52.3	50.7	3
Uranium	0.00585	0.00611	4
Vanadium	0.00999	0.0107	7
Filtered Calcium	83.2	81.1	3
Filtered Magnesium	15.5	15.5	< 1
Filtered Potassium	1.30	1.30	< 1
Filtered Sodium	53.2	52.0	2
OBS-MW2			
Nitrate plus Nitrite	1.55	1.56	1
Bicarbonate Alkalinity	183	183	< 1
Bromide	0.343	0.367	7
Chloride	21.9	21.9	< 1
Fluoride	2.13	2.15	1
Sulfate	81.5	81.3	< 1
Barium	0.0206	0.0205	< 1
Calcium	81.6	81.0	1
Magnesium	17.8	17.3	3
Potassium	1.84	1.72	7
Selenium	0.00327	0.00289	12
Sodium	25.2	24.7	2
Uranium	0.0128	0.0128	< 1

Table III-15 (Concluded)

Summary of Duplicate Samples

SWMUs 8/58 and 68 Groundwater Monitoring

Quarterly Assessment, October – December 2014

Well/Parameter	Environmental Sample (R1)	Duplicate Sample (R2)	RPD ^a
	mg/L unless othe	rwise noted	
OBS-MW1 (Continued)	•		
Filtered Calcium	78.3	81.6	4
Filtered Magnesium	16.9	17.3	2
Filtered Potassium	1.72	1.76	2
Filtered Sodium	23.7	24.0	1

Notes

^aRPD

RPD = Relative percent difference is calculated with the following equation and rounded to nearest whole number.

$$RPD = \frac{|R_I - R_2|}{[(R_I + R_2)/2]} \times 100$$

where: R_1 = analysis result.

R₂ = duplicate analysis result.

CCBA = Coyote Canyon Blast Area.

mg/L = Milligrams per liter.

MW = Monitoring Well.

OBS = Old Burn Site.

SWMU = Solid Waste Management Unit.

Appendix A Field Measurement Logs for SWMUs 8/58 and 68 Groundwater Monitoring Data

Project Name: SWMU 8/58	Project No.: 146422.10.11	1.01
Well I.D.: CCBA-MW 1	Date: 10/13/14	
Well Condition:	Weather Condition:	
Method: Portable pump X	Dedicated pump	Pump depth: <u>79'</u>

PURGE MEASUREMENTS

				IONGE	MILIED	CICLIVII				
Depth to Water (ft)	Time 24 hr	Vol. (L/gal)	Temp (°C)	SC (μS/cm)	ORP (mV)	рН	Turbidity (NTU)	DO (%)	Comments Domg/L	
48.12	0824									
49 62	0837	5	1429	515.8	336:3	635	1.72	17,4	1.77	
49.71	0843	10	1487	503.6	317.6		1.32	21.4	2,14	
49.83	0850	15		476.3	309.1	7	1-24	30.5	3.04	
49.92	0857	20		476.2	308,2			32.9	3.25	
49,92		25		- 476. 8	309.9	6.44	0.47	33-8	3.35	
49,89	2912	30	15.95	472.2	308,4	6.43	0.44	33.7	3.32	
49.89	6916	32	15,99	478,9	306.8	6.43	0.28	33.8	3.33	
49.89	2919	34	16.02	478.4	306.7	6.43	0.30	33.8	3.33	
	5923	36	1.50	481.5	198			33.3	3.28	
,	0924		- <	Ampi	-ING				_	
	, ,									
									2 4gal. purge pr	1100
									measurement	
									0830	
					_					

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FIRED MEACUREMENT LOCKED CROUNDWATER CAMBLE COLLECTION

FIELD MEASUREMENT LOG FOR GROUNDWATER SAMPLE COLLECTION

Project Name: SWMU 8/58	Project No.: 146422.10.11.0	01
Well I.D.: CCBA-MW 2	Date: 10/14/14	
Well Condition:	Weather Condition:	
Method: Portable pump X	Dedicated pump	Pump depth: 117'

PURGE MEASUREMENTS

Depth to Water	Time 24	Vol. (L/gal)	Temp (°C)	SC (µS/cm)	ORP (mV)	рН	Turbidity (NTU)	DO (%)	Male	Comments
(ft)										
71.93	8080		STA	R+ ~						>
72.42		5		547.2	356.7	7.16	0.48	59.4	5.85	
	0834	10	16.03	547.7	3418.5	7.30	0.43	58.9	5.80	
72.46		15	15.97	547.5	342.5	7.34	0.28	60.3	5.95	
72.46		20	16.06	C .	338.7	7.35	0.27	61.9	6.09	
72.47			16.28		329./	7.36	0.26	63.1	6.18	
72.46		30		557.8	315.5	7.37	0.14	63.4		
72.46	0914	32	16.47		308.6		0.13		6.21	
72.46	0918	34		558.9	301.3	7.38	0.18	63.7		
72.46	0922	36	16.52	559.0	297.4	7.38	0.16		6.20	
	0923		SX	mpli	200					
	,,,,,			/	0					
						e:				
								-	4.00a	als oursed
									Sram	als purged tubing
									08	3/6

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4 Time

GROUNDWATER SAMPLE COLLECTION FIELD EQUIPMENT CHECK LOG Page I of 2 SNL/NM Project No.: 146422.10.11.01 SNL/NM Project Name SWMU 8-58 Calibrations done by RLynch W. Gibson 10-13-14 Date: Make & Model: YSI EXO1 YSI 6820 Sonde (S/N) with DO, Ec, pH, ORP, and temperature probes. 13C101167 YSI 650 MDS (S/N) NA pH Calibration pH Calibrated to (std): 7.00 pH sloped to (std): 10.00 Reference value: 4.00 7 00 10.00 Value Value Temp Temp Value Temp 21.3 1. Time: 4.00 21.3 997 6.98 21.7 2. Time 4.00 697 9.97 3. Time 4. Time: Standard lot no. 4AE635 4AE330 4AD984 Expiration date: 5/16 5/16 4/16 SC Calibration Reference Value: 1225 uS Standard Lot No. 4AE659 Temp Value Expiration Date: 5/15 1. Time: 0807 774 2. Time 3. Time. 4. Time: **ORP** Calibration 220 mV Reference Value: Standard Lot No 4AE189 Temp 2/15 Value Expiration Date: 0805 1. Time: 21.1 21.7 2. Time 219.7 3. Time: 4 Time. DO Calibration 81% air saturation @ 5200 ft Calibration Value Atmospheric Pressure in Hg 81.4 1. Time 82.0 2. Time 3. Time.

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GROUNDWATER SAMPLE COLLECTION FIELD EQUIPMENT CHECK LOG (continued) Page 2 of 2

SNL/NM Project Name: SW	Project No.:	Project No.: 146422.10.11.01			
Calibration done by: R Lynch	Date: 1	0-13-14			
	Tt	URBIDIMETER			
Make & Model: HACH 21	()()P HACH 2100Q	Serial No. S/	N 10060C003010		
Reference Value	W/2-10	20	100	800	
Standard Lot No.	A4164	A4211	A4195	A4193	
. Time 0812	9.74	19.1	101	800	
2. Time 1110	9 79	193	i 0 l	797	
. Time					
. Time					

4. Time:

GROUNDWATER S	AMPLE COL	LECTION FI	ELD EQUIP	MENT CHECK	K LOG I	Page I of 2	
SNL/NM Project Name; SWMU	8-58		SNL/NM Project No.: 146422.10.11.01				
Calibrations done by R Lynch	Date: 16/14/14						
Make & Model: YSI EXO1				, , , , , , , , , , , , , , , , , , , ,			
YSI 6820 Sonde (S/N) with DO,	Ec, pH, ORP, and	temperature probe	s 13C101167			_	
YSI 650 MDS (S/N): NA						_	
		рН Са	libration				
pH Calibrated to (std): 7.00			pH sloped to (s	std): 10.00	-		
Reference value:	4.	.00		7.00		0.00	
	Value	Temp	Value	Temp	Value	Temp	
1. Time: 0639	4.01	17.8	6.99	17.8	9.99	17.8	
1. Time: 0639 2. Time: 1632	4.00	17.9	6.99	17.8	10.00	17.9	
3. Time							
4. Time.							
Standard lot no.	4AE330		4AE635 4AD984				
Expiration date:	5/16		5/16 4/16				
		SC Cal	libration				
Reference Value: 1225 uS			Standard Lot No.: 4AE659				
	Value	Temp	Expiration Date: 5/15				
1, Time: 0638	1220	17.8		《基础》			
2. Time: 1631	1221	17.9					
3. Time						THE PERSON	
4. Time:					经基础的		
		ORP Ca	alibration				
Reference Value	220 mV		Standard Lot No 4AE189				
	Value	Temp	Expiration Dat	e:	2/15		
1, Time: 0641	219.9	17.8					
2. Time 1034	220.2	17.9					
3. Time:							
4. Time:							
		DO Ca	libration				
Calibration Value	81% air satura	tion @ 5200 ft		Atmospheric	Pressure in Hg		
1 Time: 0637	81,	8	2	4.37			
2. Time: 1030	81.	7	7	4.39			
3. Time:							

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LTS GW-2012-002 (11-2012) FOP 05-02

GROUNDWATER SAMPLE COLLECTION FIELD EQUIPMENT CHECK LOG (continued) Page 2 of 2

SNL/NM Project Name: SW	MU 8-58	Project No.:	Project No.: 146422.10.11.01		
Calibration done by: R Lynch	Date: 18//	4/14			
		TURBIDIMETER	7		
Make & Model: HACH 210)()] ² HACH 2100Q	Serial No. S	S/N 10060C003010		
Reference Value	.1	20	100	800	
Standard Lot No.	A4164	A4211	A4195	A4193	
1. Time 08 <i>0</i> 3	-09	20.1	101	796	
2. Time 0947	.12	20.3	99.7	798	
3. Time					
4. Time					

Portable Pump and Tubing / Water Level Indicator Decontamination Log Form

Project Name: SWMU 8/58	Monitoring Well ID # :	CCBA-MW1		Date: 10/13/14	
The following equipment was decontaminated at completion of sampling activities in accordance with FOP-05-03					
Pump and Tubing Bundle ID #: 1806-587	Water Level Indicator ID #: 210269				
Personnel Performing Decontamination: Alfred Santillanes Print Name: William Gibson Print Name: Initial: Initial:		Personnel Performing Decontamination: Alfred Santillanes Print Name: William Gibson Print Name: Initial:			
		of Equipment			
Pump: Good Tubi	ng Bundle: Good		Water Level Indicator: Goo	<u>od</u>	
	List of Deconta	mination Materials			
Distilled or Deonized (circle one)		Grade:	HNO ₃		
Source: Culligan		UN #:	2021 2031 -23		
Lot Number: 91714		Manufacturer:	Fisher Scientific IARCO	2013	
		Lot Number:	A0316863		

LTS GW-2012-003 (11-2012) FOP 05-03

Portable Pump and Tubing / Water Level Indicator Decontamination Log Form

Project Name: SWMU 8/58	Monitoring Well ID # : CCBA-MW2		Date: 10-14-14			
The following equipment was decontaminated at completion of sampling activities in accordance with FOP-05-03						
Pump and Tubing Bundle ID #: 1807-35	Water Level Indi	cator ID #: 210269				
Personnel Performing Decontamination: William Gibson	Personnel Perfor William Gibson Print Name: Robert Lynch Print Name:	Print Name: Initial: Robert Lynch				
	Condition of Equipment	_				
Pump: Good Tubing	g Bundle: Good	_ Water Level Indicator: Goo	od			
	List of Decontamination Materials					
Divini Davidica		HNO ₃				
Distilled or Deonized (circle o		Reagent				
Source: Culligan	UN #:	4: 2031				
Lot Number: 09-17-14	Manufacturer:	ARCO				
	Lot Number:	A0316863				

Groundwater Monitoring Waste Generation Log

Waste Generator :	Alfred Santillanes Phone:	844-5130 project le	eader: Clinton Lum
Project Name	SWMU 8/58	SWMU 8/58	SWMU 8/58
Container ID # (site-date-sequence)	CCBA-MW1-101314-01	CCBA-MW1-101314-02	CCBA-101314
Initial Label Type (Hazardous or Non- Regulated)	Non-Regulated	Non-Regulated	Non-Regulated
Waste Matrix (purge water, decon water, HACH Accu- Vac ampule)	Purge Water	Purge Water	Decon Water
Container Type / Volume	CHPD 55 gallon	CHPD 55 gallon	CHPD 55 gallon
Volume of Waste	19 gallons	21 gallons	30 gallons
Total Container Weight	170 lbs	190 lbs	250 lbs
COC#: Sample#- Fraction	615822 096685 096686— T7 10-24-14	615822 096685 096686 T/ 10-24-14	615822 096685 -096686- Tf 10-24-14
Accumulation Date	Start: 10/13/14 Full: 10/13/14	Start: 10/13/14 Full: 10/13/14	Start: 10/13/14 Full: 10/13/14
Date Waste Moved to Accumulation Area	10/13/14	10/13/14	10/13/14
Accumulation Area Name	9925	9925	9925
Comments:			

Groundwater Monitoring Waste Generation Log

Waste Generator :	William Gibson Phone:	239-7367 project l	eader: Clinton Lum
Project Name	SWMU-8/58	SWMU-8/58	SWMU-8/58
Container ID # (site-date-sequence)	CCBA-MW2-101414-01	CCBA-MW2-101414-02	CCBA-101414
Initial Label Type (Hazardous or Non-Regulated)	Non-Regulated	Non-Regulated	Non-Regulated
Waste Matrix (purge water, decon water, HACH Accu- Vac ampule)	Purge Water	Purge Water	Decon Water
Container Type / Volume	CHPD / 55 gal.	CHPD / 55 gal.	CHPD / 55 gal.
Volume of Waste	~ 19 gal.	~ 21 gal.	~ 30 gal.
Total Container Weight	~ 150 lbs.	~ 170 lbs.	~ 240 lbs.
COC#: Sample#-	CoC# 615824	CoC# 615824	CoC# 615824
Fraction	Sample # 096691, 096692	Sample # 096691, 096692	Sample # 096691, 096692
Accumulation Date	Start: 10-14-14 Full: 10-14-14	Start: 10-14-14 Full: 10-14-14	Start: 10-14-14 Full: 10-14-14
Date Waste Moved to Accumulation Area	10-14-14	10-14-14	10-14-14
Accumulation Area Name	9925	9925	9925
Comments:			

TAILGATE SAFETY MEETING FORM

1/1120.11125.11	DIT MEDITION CAME
Dept: 4142 Well Location: CCBA - MW	Date: 10-13-14 Time: 0759
Activities: Groundwater Monitoring and Sampling (Anyone has the right to cease field activities for safe	fety concerns. The buddy system will be used when needed.)
Weather Conditions: Temp: 48 °F Wind Speed: MPH	1 19
Chemicals Used: Acids in sample containers, standa Other:	urd solutions, Hach ACCU VAC ampules
Safety To	opics Presented
Be aware of slips, trips, and falls. Keep work area clean and use a stepping stool when necessary.	 ☑ Be aware of environmental conditions (heat / cold stress). Dress accordingly. Wear sunscreen if necessary. Stay hydrated.
☑ Wear safety boots.	☑ Be aware of electrical hazards
Use safe lifting practices. Wear leather gloves if necessary.	☑ Be aware of pressure hazards.
☑ Be aware of pinch points on pump cable reel and hydraulic tailgate lift.	☑ No eating or drinking at sampling counter.
☒ Be aware of chemical hazards.	☑ Be aware of biohazards (snakes, spiders, etc.)
☑ Wear nitrile or latex gloves when sampling.	☑ Wear communication device (cell phone, EOC pager).
Wear chemical safety goggles.	☑ Avoid spilling purge / decon water.
Hospital/Clinic: <u>Sandia Medical Clinic</u> Phone:	
Printed Name ALFRED SANTILLANCES Printed Name	Attendees Nillian Lily Signature Signature
Printed Name	Signature
Printed Name	Signature
Printed Name	Signature

TAILGATE SAI	FETY MEETING F●RM
Dept: 4142 Well Location: CCBA - MW	Date: 10/14/14 Time: 0800
Activities: Groundwater Monitoring and Sampling	fety concerns. The buddy system will be used when needed.)
Weather Conditions: Temp: 61.8 °F Wind Speed:MPH	
Chemicals Used: <u>Acids in sample containers, standa</u> Other:	ard solutions. Hach ACCU-VAC ampules 71
Safety T	opics Presented
Be aware of slips, trips, and falls. Keep work area clean and use a stepping stool when necessary.	Be aware of environmental conditions (heat / cold stress). Dress accordingly. Wear sunscreen if necessary. Stay hydrated.
☑ Wear safety boots.	☑ Be aware of electrical hazards
☑ Use safe lifting practices. Wear leather gloves if necessary.	☑ Be aware of pressure hazards.
Be aware of pinch points on pump cable reel and hydraulic tailgate lift.	☑ No eating or drinking at sampling counter.
Be aware of chemical hazards.	Be aware of biohazards (snakes, spiders, etc.)
Wear nitrile or latex gloves when sampling.	
Wear chemical safety goggles.	A void spilling purge / decon water.
Hospital/Clinic: Sandia Medical Clinic Phone:	844-0911/911 Attendees
Printed Name	Signature 7 ncl
Printed Name	Signature Signature
HAFRED SANTIL LANES Printed Name	Signature Scattle
Printed Name	Signature
Printed Name	Signature

Project Name: SWMU 68	Project No.: 146422.10.1	1.01
Well I.D.: OBS-MW1	Date: 10/06/14	
Well Condition:	Weather Condition:	
Method: Portable pump X	Dedicated pump	Pump depth: <u>153'</u>

PURGE MEASUREMENTS

Depth to	Time 24	Vol.	Temp	SC	ORP	рН	Turbidity	DO	Comments
Water	hr	(Legal)	(°C)	(µS/cm)	(mV)	pri	(NTU)	(%)	mg/L
(ft)									
72.31	0803		STI	4R+-					
72.39	0819	5	16.14	490.3	321.8	7.03	1.34	38.7	3.81
72.37	0827	10	16.64	496.0	314.4	7.19	1.12	30.3	3.73
72.37	0834	15	16.92	500.4	311.1	7.23	0.51	38.2	3.69
72.37	0845	20	17.27	504.7	309.4	7.25	0.30	38.4	3.68
72.37	0853	24	1755	508.1	305.4	7.26	46.0	38.4	3.66
72.37	0858	26	17.68	509.4	304.6	7.26	0.20	38.5	3.66
72.37	0903	28	17.79	511.0	302.8		0.24	38.6	
72.37	0907	30	17.89	512.1	299.1	7.27		38.6	3.66
72.37	0911	32	17.88	511.3	299.2	7.27	0.26	38.7	3.66
72-36	0916	34	17.90	511.4	298.9	7.27		38.7	_
72.36	0920	36	17.89	511.0		7.27		38.8	3.66
	0921		SA	moliv	15-				~
				1	0				
									24.00 gals puraped
									From tubing
									0810

Project Name: SWMU 68	Project No.: 146422.10.11.01
Well I.D.: OBS-MW 2	Date: 10/07/14
Well Condition:	Weather Condition:
Method: Portable pump XDedi	cated pump Pump depth: 252'

PURGE MEASUREMENTS

Depth to	Time 24	Vol.	Temp	SC	ORP	рН	Turbidity	DO	Da	Comments
Water	lnr	(L/gal)	(°C)	(µS/cm)	(mV)	Pir	(NTU)	(%)	DOMAL	
(ft)	111								ar	
				20 07						
174.77	0803		27	ART-						
175.81		5	17.37	500.1	354.4	7.03	0.32	38.0	3.64	
175.82	0832	10	17.53	502.3	345.6	7-12	0.22	37. 1	3.54	
175.88	0841	15	17.80	501.4	338.4	7.18	0.19	36.9	3.50	
175.87	0850	20	18.08	508.7	331.1	7-20	0.25	37.0	3.51	
175.84	0859	25	18.31	509.4	318.2	7.21	0.20	36.8	3.46	
175.82		30	18.46	513.5	306-1	7.22	0.19	36.9	3.46	
175.81	0912	32	18.62	515.6	301.7	7.22		37.2	3.47	
175.80		34	18.68	516.2	300.1	7.22	0.19	37.3	3.48	
175.78	0920	36	18.70	517.1	301.1	7.22	0.23	37.3	3.47	
	0921		SA	nolin	(
	761		2111	nplin	9					
	_									
	10,									
									1100	- 1-
								_~	9.00	gals purge
									From	tubing
									08	313

Project Name: SWMU 68	Project No.: 146422.10.1	1.01
Well I.D.: OBS-MW 3	Date: 10/08/14	
Well Condition:	Weather Condition:	
Method: Portable pump X	Dedicated pump	Pump depth: 208'

PURGE MEASUREMENTS

			1)		1	1	
Depth to	Time 24	Vol.	Temp	SC	ORP	рΗ	Turbidity	DO	Pal Comments
Water	hr	(Lega)	(°C)	(μS/cm)	(mV)		(NTU)	(%)	11771
(ft)									
69.53	0803	/	SJA	Rt-					
73.59		5	17.39	501.9	359.5	7.13	0.48	47.7	4.56
75.50	0827	10	17.37	501.8	346.2	7.18	0.51	46.8	4.48
76.59		15	17.36	501.7	3)9.3	7.21	0.34	46.7	4.47
77.18	0845	20	17.39	502.2	289.2	7.21	0.55	46.8	4.48
77.48	0855	25	17.41	502.4	272.0	7.21	0.29	46.5	4.45
77.62		30	17.42	502.4	263.1	7.21	0.25	46.7	4.46
77.68	0908	32	17.43	502.7	259.3	7.21	0.21	46.7	
77.70		34	17.44	502.6	256.0	7.21	0.16	46.7	4.46
77.70	0916	36	17.46	503.1	254.0	7.21	0.18	46.9	4.48
	0917		SA	molin	a-				
				/	0				
								-	-4.00 gals Durged
									From tubing 0808
									0808

GROUNDWATER SAMPLE COLLECTION FIELD FOUIPMENT CHECK LOG Page 1 of 2

GROUNDWATER SAMPLE COLLECTION FIELD EQUIPMENT CHECK LOG FAGET 012							
SNL/NM Project Name:	SWMU 68		SNL/NM Project No.: 146422.10.11.01				
Calibrations done by: R l	_ynch		Date: 10/6/14				
Make & Model: YSI E	XO1						
YSI 6820 Sonde (S/N) w	ith DO, Ec, pH, ORP, and	temperature probe	s: <u>13C101167</u>			_	
YSI 650 MDS (S/N): NA	A					_	
pH Calibration							
pH Calibrated to (std): 7.	00		pH sloped to (s	std): 10.00			
Reference value	4	.00		7 00	1	0.00	
	Value	Temp	Value	Temp	Value	Temp	
1 Time: 0643	2 4.01	20.2	7.00	20.2	10.00	20.2	
2. Time: 1053	400	20.3	7.00	20.2	10.00	20.3	
3. Time:							
4. Time.							
Standard lot no.:	4AE330		4AE635 4AD984				
Expiration date:	5/16		5/16 4/16				
SC Calibration							
Reference Value 1225	uS		Standard Lot No.: 4AE659				
	Value	Temp	Expiration Dat	e e	5/15		
1. Time. 0641	1226	20.2	MARKET SET				
2. Time: 1052	1228	20.3					
3. Time:							
4. Time:							
		ORP Ca	libration				
Reference Value:	220 mV		Standard Lot No. 4AE189				
	Value	Temp	Expiration Dat	e	2/15		
1. Time: 0644		20 2	4.3				
2. Time: 1054	220.2	20.2		41 1 3 1			
3 Time							
4. Time:				HALL S	经基本的基础		
		DO Ca	libration				
Calibration Value:	81% air satura	tion @ 5200 ft	Atmospheric Pressure in Hg				
1. Time: 0640	82.	0	5	4.63			
2. Time: 10 50	82.1		20	1.71			
3. Time:							
4. Time							

LTS GW-2012-002 (11-2012) FOP 05-02

$GROUNDWATER\,SAMPLE\,COLLECTION\,FIELD\,EQUIPMENT\,CHECK\,LOG\,(continued)\quad Page\,2\,of\,2$

SNL/NM Project Name: SWM	MU 68	Project No.: 1	Project No.: 146422.10.11.01			
Calibration done by: R Lynch		Date: (0)	Date: 10/6/14			
TURBIDIMETER						
Make & Model: HACH 210	()P HACH 2100Q	Serial No. S/	Serial No. S/N 10060C003010			
Reference Value	rence Value .1		20 100			
Standard Lot No.	A4164	A4211	A4195	A4193		
1. Time 6800	.12	20.1	103	798		
2. Time 0942	·ll	20.3	99.8	796		
3. Time						
4. Time						

GROUNDWATER S	AMPLE COL	LECTION FI	ELD EQUIPN	MENT CHECK	CLOG P	age 1 of 2	
SNL/NM Project Name: SWMU	68		SNL/NM Project No.: 146422.10.11.01				
Calibrations done by: R Lynch			Date: \0/7/14				
Make & Model: YSI EXO1			1				
YSI 6820 Sonde (S/N) with DO,	Ec, pH, ORP, and	temperature probe	s: 13C101167			_	
YSI 650 MDS (S/N): NA						_	
		рН Са	libration				
pH Calibrated to (std): 7.00	012		pH sloped to (s	td): 10.00			
Reference value:	4.	00	7	00	10	0.00	
	Value	Temp	Value	Temp	Value	Temp	
1. Time: 0647	4-00	19.9	7.00	19.8	9.99	19.9	
2. Time: 1113	4-01	30.1	7.01	20.1	10.00	20.1	
3. Time:							
4. Time:							
Standard lot no.:	4AE330		4AE635 4AD984				
Expiration date:	5/16		5/16 4/16				
		SC Ca	libration				
Reference Value: 1225 uS			Standard Lot N	o.: 4AE659			
	Value	Temp	Expiration Date	5.	5/15		
1. Time: 0645	1299	19.8	The doctor				
2. Time:	1334	19.9					
3. Time:							
4. Time:							
		ORP C	alibration				
Reference Value	220 mV		Standard Lot N	o. 4AE189			
	Value	Temp	Expiration Date	e.	2/15		
1. Time: 06 48	220.1	19.8					
2. Time 1 1	220.3	30.1					
3. Time							
4. Time:							
		DO Ca	libration				
Calibration Value:	81% air satura	tion @ 5200 ft.		Atmospheric	Pressure in Hg		
1. Time: 0644 81.9			24.64				
2. Time:	82.	0	6	P4.49			
3. Time			_				
4 Times							

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LTS GW-2012-002 (11-2012) FOP 05-02

GROUNDWATER SAMPLE COLLECTION FIELD EQUIPMENT CHECK LOG (continued) Page 2 of 2

SNL/NM Project Name: SWA	MU 68	Project No.: 1	Project No.: 146422.10.11.01				
Calibration done by: R Lynch		Date:) 6	Date: 16/7/14				
	,	TURBIDIMETER					
Make & Model: HACH 210	() ' HACH 2100Q	Serial No. S/	Serial No. S/N 10060C003010				
Reference Value	. 1	20	100	800			
Standard Lot No.	A4164	A4211	A4195	A4193			
1. Time 0757	.12	20.2	103	797			
2. Time 0949	.11	20.3	101	801			
3. Time							
4. Time							
Comments:							

GROUNDWATER SAMPLE COLLECTION FIELD EQUIPMENT CHECK LOG Page 1 of 2 SNL/NM Project No.: 146422.10.11.01 SNL/NM Project Name: SWMU 68 Calibrations done by: R Lynch Date: Make & Model: YSI EXO1 YSI 6820 Sonde (S/N) with DO, Ec, pH, ORP, and temperature probes: 13C101167 YSI 650 MDS (S/N): NA pH Calibration pH Calibrated to (std): 7.00 pH sloped to (std): 10.00 4 00 Reference value 7 ()() 10.00 Value Temp Value Temp Value Temp 10.99 9.6 9.6 1. Time: 4.02 10.00 2. Time: 4.01 9,7 1039 9.7 7.00 10.01 19.7 3. Time: 4. Time Standard lot no. 4AE635 4AE330 4AD984 Expiration date: 5/16 5/16 4/16 SC Calibration Reference Value: 1225 uS 4AE659 Standard Lot No. Expiration Date: Value Temp 5/15 1222 9.6 2. Time 3. Time 4. Time: **ORP** Calibration 220 mV Standard Lot No. 4AE189 Reference Value: 2/15 Value Temp Expiration Date: 19.6 1. Time: 2. Time 3. Time 4. Time: DO Calibration 81% air saturation @ 5200 ft Atmospheric Pressure in Hg Calibration Value: 1. Time: 2. Time 3. Time 4. Time

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LTS GW-2012-002 (11-2012) FOP 05-02

GROUNDWATER SAMPLE COLLECTION FIELD EQUIPMENT CHECK LOG (continued) Page 2 of 2

SNL/NM Project Name: Swi	MU 68	Project No.:	Project No.: 146422.10.11.01			
Calibration done by: R Lynch		Date: 10	Date: 10/8/14			
		TURBIDIMETER				
Make & Model: HACH 210	()] ² HACH 2100Q	Serial No. S/	Serial No. S/N 10060C003010			
Reference Value	.1	20	100	800		
Standard Lot No.	A4164	A4211	A4195	A4193		
1. Time 0758	.09	19.8	103	801		
2. Time 0933	111	20.2	105	799		
3. Time						
4. Time						

Portable Pump and Tubing / Water Level Indicator Decontamination Log Form

Project Name: SWMU 68	# : <u>OBS-MW1</u> Date: <u>10-06-14</u>						
The following equipment wa	The following equipment was decontaminated at completion of sampling activities in accordance with FOP-05-03						
Pump and Tubing Bundle ID #: 1807-35	_	Water Level Indicator ID #: 210269					
Personnel Performing Decontamination: Alfred Santillanes Print Name: Robert Lynch Print Name: Initial:	Personnel Performing Decontamination: Alfred Santillanes Print Name: Robert Lynch Print Name: Initial: Initial:						
Pump: Good Tub	ing Bundle: Good	on of Equipment Water Level Indicator: Good					
	List of Deconta	amination Materials					
Distilled or Deonized (circle one)		Grade:	HNO ₃				
Source: Culligan		UN #:	2031				
Lot Number: 09-17-14		Manufacturer:	AROC				
		Lot Number:	A0316368				

LTS GW-2012-003 (11-2012) FOP 05-03

Portable Pump and Tubing / Water Level Indicator Decontamination Log Form

Project Name: SWMU-68	b: OBS-MW2 Date: 10-07-14						
The following equipment wa	The following equipment was decontaminated at completion of sampling activities in accordance with FOP-05-03						
Pump and Tubing Bundle ID #: 1807-35	Water Level Indicator ID #: 210269						
Personnel Performing Decontamination: William Gibson Print Name: Robert Lynch Print Name: Initial:	Personnel Performing Decontamination: William Gibson Print Name: Robert Lynch Print Name: Initial:						
	Condition	of Equipment					
Pump: Good Tub	ing Bundle: Good		_ Water Level Indicator: Go	od			
	List of Deconta	amination Materials					
Distilled or Deonized (circle	, one)	HNO ₃					
Distined of Decimzed (Circle	e one)	Grade:	Reagent				
Source: Culligan		UN #:	2031				
Lot Number: 09-17-14		Manufacturer:	AROC				
		Lot Number:	A0316863				

LTS GW-2012-003 (11-2012) FOP 05-03

Portable Pump and Tubing / Water Level Indicator Decontamination Log Form

Project Name: SWMU 68 GWM	Monitoring Well ID # :	Date: 10/8/14									
The following equipment was	s decontaminated at comp	mpletion of sampling activities in accordance with FOP-05-03									
Pump and Tubing Bundle ID #: 1807-797	_	Water Level Indicator ID #: 210269									
Personnel Performing Decontamination: Robert Lynch Print Name: Alfred Santillanes Print Name: Initial:		Personnel Perfor Robert Lynch Print Name: Alfred Santillane Print Name:	ming Decontamination: Linits Linits	tial:							
	Condition	on of Equipment									
Pump: Good Tubi	ing Bundle: Good	Water Level Indicator: Good									
	List of Deconta	amination Materials									
Distilled or Deonized (circle	ana)		HNO ₃								
Distinct of Deonized (Circle	one)	Grade:	Reagent								
Source: Culligan		UN #:	2021								
Lot Number: 92614		Manufacturer:	Fisher Scientific								
		Lot Number:	A0316863								

Groundwater Monitoring Waste Generation Log

Waste Generator :	Alfred Santillanes Phone:	844-5130 project le	eader: Clinton Lum
Project Name	SWMU 68 GWM	SWMU 68 GWM	SWMU 68 GWM
Container ID # (site-date-sequence)	OBS-MW1-100614-01	OBS-MW1-100614-02	OBS-100614
Initial Label Type (Hazardous or Non- Regulated)	Non-Regulated	Non-Regulated	Non-Regulated
Waste Matrix (purge water, decon water, HACH Accu- Vac ampule)	Purge Water	Purge Water	Decon Water
Container Type / Volume	CHPD 55 gallon	CHPD 55 gallon	CHPD 55 gallons
Volume of Waste	24 gallons	16 gallons	30 gallons
Total Container Weight	180 lbs	120 gallons	240 gallons
COC#: Sample#- Fraction	615811 096652 TJ 18-29-14 096653 096654 TJ 10-29-17	615811 006652	
Accumulation Date	Start: 10/06/14 Full: 10/06/14	Start: 10/06/14 Full: 10/06/14	Start: 10/06/14 Full: 10/06/14
Date Waste Moved to Accumulation Area	10/06/14	10/06/14	10/06/14
Accumulation Area Name	9925	9925	9925
Comments:			

Groundwater Monitoring Waste Generation Log

Waste Generator :	William Gibson Phone:	239-7367 project le	eader: Clinton Lum
Project Name	SWMU-68	SWMU-68	SWMU-68
Container ID # (site-date-sequence)	OBS-MW2-100714-01	OBS-MW2-100714-02	OBS-100714
Initial Label Type (Hazardous or Non- Regulated)	Non-Regulated	Non-Regulated	Non-Regulated
Waste Matrix (purge water, decon water, HACH Accu- Vac ampule)	Purge Water	Purge Water	Decon Water
Container Type / Volume	CHPD / 55gal.	CHPD / 55gal.	CHPD / 55gal.
Volume of Waste	~ 19 gal.	~ 21 gal.	~ 30 gal.
Total Container Weight	~ 150 lbs.	~ 170 lbs.	~ 240 lbs.
COC#, S1-#	CoC # 615813	CoC # 615813	CoC # 615813
COC#: Sample#- Fraction	Sample # 096658, 096659	Sample # 096658, 096659	Sample # 096658, 096659
Accumulation Date	Start: 10-07-14 Full: 10-07-14	Start: 10-07-14 Full: 10-07-14	Start: 10-07-14 Full: 10-07-14
Date Waste Moved to Accumulation Area	10-07-14	10-07-14	10-07-14
Accumulation Area Name	9925	9925	9925
Comments:			

Groundwater Monitoring Waste Generation Log

Waste Generator :	Alfred Santillanes Phone:	844-5130 project l	eader: Clinton Lum
Project Name	SWMU 68 GWM	SWMU 68 GWM	SWMU 68 GWM
Container ID # (site-date-sequence)	OBS-MW3-100814-01	OBS-MW3-100814-02	OBS-100814
Initial Label Type (Hazardous or Non- Regulated)	Non-Regulated	Non-Regulated	Non-Regulated
Waste Matrix (purge water, decon water, HACH Accu- Vac ampule)	Purge Water	Purge Water	Decon Water
Container Type / Volume	CHPD 55 gallon	CHPD 55 gallon	CHPD 55 gallon
Volume of Waste	19 gallons	21 gallons	30 gallons
Total Container Weight	170 lbs	190 lbs	250 lbs
COC#: Sample#- Fraction	615814 096661 096662 71 10-24-14	615814 096661 096662 TA 10-24-14	
Accumulation Date	Start: 10/8/14 Full: 10/8/14	Start: 10/8/14 Full: 10/8/14	Start: 10/8/14 Full: 10/8/14
Date Waste Moved to Accumulation Area	10/8/14	10/8/14	10/8/14
Accumulation Area Name	9925	9925	9925
Comments:			

TAILGATE SAFETY MEETING FORM

Dept: 4142 Well Location: 085-mwl	Date: 10/6/14 Time: 0750
Activities: Groundwater Monitoring and Sampling (Anyone has the right to cease field activities for sampling)	afety concerns. The buddy system will be used when needed.)
Weather Conditions: Temp: 44.7°F Wind Speed: MPH	Humidity: 37.] % Wind Chill MA °F
Chemicals Used: Acids in sample containers, stand Other:	lard solutions. Hach ACCU-VAC ampules 7/10-29-17
Safety	Topics Presented
Be aware of slips, trips, and falls. Keep work area clean and use a stepping stool when necessary.	Be aware of environmental conditions (heat / cold stress). Dress accordingly. Wear sunscreen if necessary. Stay hydrated.
Wear safety boots.	☐ Be aware of electrical hazards
☑ Use safe lifting practices. Wear leather gloves if necessary.	☑ Be aware of pressure hazards.
☑ Be aware of pinch points on pump cable reel and hydraulic tailgate lift.	☑ No eating or drinking at sampling counter.
☒ Be aware of chemical hazards.	☑ Be aware of biohazards (snakes, spiders, etc.)
■ Wear nitrile or latex gloves when sampling.	
	☑ Avoid spilling purge / decon water.
RoberT Lynch Printed Name William 6165 Printed Name Autres Santill ANOS	Attendees Signature William J. Fully Signature Albo Satilo
Printed Name	Signatule
Printed Name	Signature
Printed Name AIPORTANT NOTICE: A printed court of this document	Signature the document currently in effect. The official version is

TAILGATE SAFETY MEETING FORM

Dept: 4142 Well Location: OBS-Mw2	Date: 10/7/14 Time: 0755
Activities: Groundwater Monitoring and Sampling (Anyone has the right to cease field activities for sa	afety concerns. The buddy system will be used when needed.)
Weather Conditions: Temp: 6/.3 °F Wind Speed: MPH	Humidity: 33.3 % Wind Chill KA °F
Chemicals Used: <u>Acids in sample containers, stand</u> Other:	ard solutions, Hach ACCU VAC ampules 71 10-24
Safety 7	Topics Presented
Be aware of slips, trips, and falls. Keep work area clean and use a stepping stool when necessary.	 ☑ Be aware of environmental conditions (heat / cold stress). Dress accordingly. Wear sunscreen if necessary. Stay
☑ Wear safety boots.	hydrated. ☑ Be aware of electrical hazards
Use safe lifting practices. Wear leather gloves if necessary.	☑ Be aware of pressure hazards.
☑ Be aware of pinch points on pump cable reel and hydraulic tailgate lift.	☑ No eating or drinking at sampling counter.
Be aware of chemical hazards.	
Wear nitrile or latex gloves when sampling.	✓ Wear communication device (cell phone, EOC pager).
M Wear chemical safety goggles.	☑ Avoid spilling purge / decon water.
Printed Name Printed Name HOSPITALY NAMES Printed Name Printed Name Printed Name Printed Name Printed Name Printed Name	Attendees Signature William Jaluf Signature Hold Satura
Printed Name	Signature
Printed Name IMPORTANT NOTICE: A printed copy of this documen located on the Sandia Restrict	Signature It may not be the document currently in effect. The official version is

TAILGATE SAFETY MEETING FORM

TAILOATE SA	TELL MEELING FORM
Dept: 4142 Well Location: 0BS-mw3	Date: 10/8/14 Time: 0.755
Activities: Groundwater Monitoring and Sampling (Anyone has the right to cease field activities for sampling	afety concerns. The buddy system will be used when needed.)
Weather Conditions: Temp: 63.6 °F Wind Speed: MPH	Humidity: 35.2% Wind Chill \(\alpha 4 °F
Chemicals Used: <u>Acids in sample containers, stand</u> Other:	ard solutions, Hach ACCU-VAC ampules 79 10-
Safety T	Topics Presented
Be aware of slips, trips, and falls. Keep work area clean and use a stepping stool when necessary.	 ☑ Be aware of environmental conditions (heat / cold stress). Dress accordingly. Wear sunscreen if necessary. Stay hydrated.
	☑ Be aware of electrical hazards
☐ Use safe lifting practices. Wear leather gloves if necessary.	☑ Be aware of pressure hazards.
Be aware of pinch points on pump cable reel and hydraulic tailgate lift.	☑ No eating or drinking at sampling counter.
Be aware of chemical hazards.	☑ Be aware of biohazards (snakes, spiders, etc.)
Wear nitrile or latex gloves when sampling.	
Wear chemical safety goggles.	☑ Avoid spilling purge / decon water.
Hospital/Clinic: Sandia Medical Clinic Phone: Robert Lynch	Attendees Collyncl
Printed Name ALFRED SANTILLANDS Printed Name	Signature Signature Signature
Printed Name	Signature
Printed Name	Signature
Printed Name	Signature

Appendix B Analytical Laboratory Certificates of Analysis for SWMUs 8/58 and 68 Groundwater Monitoring Data

Internal Lab Page _												Page <u>1</u> of <u>2</u>				
Batch No. N	A					SMO Use	1					101	1	AR/COC	615822	
Project Name		SWMU 8/		Date Samples	Shipped:	10113	114	5.5	SMO AL	thorization:	101	11/10	2 240	Waste Characterization		
Project/Task I	Manager:			Carrier/Waybi	ill No.				SMO Co	ntact Phone	w			RMMA		
Project/Task I	Number:	146422.10	0.11.01	Lab Contact:		Edie Kent/8	03-556-8	171		Lorraine H	lerrera/505	-844-3199		Released by COC No.		
Service Order	:	CF262-15		Lab Destination	on:	GEL			Send Re	port to SMC):			✓ 4º Celsius		
				Contract No.:		PO 130387	3			Rita Kava	naugh/505	-284-2553		Bill to:Sandia National Laboratories (Accounts Payable),		
Tech Area:														P.O. Box 5800, MS-0154		
Building:		Room:	_	Operationa	l Site:								Albuquerque, NM 87185-0154			
Dep					Depth	Date/T	ime	Sample	Co	ntainer	Preserv-	Collection	Sample	Parameter & Method	Lab	
Sample No.	Fraction	San	nple Location D	etail	(ft)	Collec	ted	Matrix	Туре	Volume	ative	Method	Туре	Requested	Sample ID	
096685	-001	CCBA-MV	V1		79	10/13/14	9:24	GW	G	3x40ml	HCL	G	SA	TCL VOC (SW846-8260B)		
096685	-002	CCBA-MV	V1		79	10/13/14	9:26	GW	AG	4x1 L	None	G	SA	TCL SVOC (SW846-8270C)		
096685	-010	CCBA-MV	V1		79	10/13/14	9:27	GW	Р	500 ml	HNO3	G	SA	TAL Metals+U (SW846-6010/6020/74	70)	
096685	-016	-016 CCBA-MW1			79	10/13/14	9:28	GW	Р	125 ml	None	G	SA	Anions (SW846-9056)		
096685	-017	017 CCBA-MW1			79	10/13/14	9:29	FGW	Р	500 ml	HNO3	G	SA	Metals-Ca,Mg,K,Na (SW846-60)	20)	
096685	-018	8 CCBA-MW1				ኅ0/13/14	9:30	GW	Р	125 ml	H2SO4	G	SA	Nitrate+Nitrite (EPA 353.2)		
096685	-020	CCBA-MV	V1		79	10/13/14	9:31	GW	Р	250 ml	None	G	SA	Perchlorate (EPA 314.0)		
096685	-022	CCBA-MV	V1		79	10/13/14	9:32	GW	Р	500 ml	None	G	SA	Alkalinity (SM2320B)		
096685	-024	CCBA-MV	V1		79	-10/13/14	9:34	GW	AG	4x1 L	None	G	SA	High Explosives (SW846-8321A	mod	
096685	-027	CCBA-MV	V1		79	10/13/14	9:35	GW	Р	250 ml	NaOH	G	SA	Total Cyanide (SW846-9012)		
Last Chain:		Yes			Sample	Tracking		SMC) Use	Special Ins	structions		_	1	Conditions on	
Validation I	Req'd:	✓ Yes			Date En	tered:				EDD		✓ Yes		No	Receipt	
Backgroun	d:	Yes			Entered	by:				Turnaroun	d Time	7 Da	<u>y*</u>	<u>15 Day*</u> ✓ 30 Day		
Confirmato	ry:	Yes			QC inits					Negotiated	TAT					
Sample	N	ame	Signat		Init.	Company	Organiza	tion/Phon	e/Cell	Sample Dis	sposal	Return	to Client	✓ Disposal by Lab		
Team	Alfred Sa	intillanes	Helpolsa	tilla	164	SNL/4142/50	5-844-513	30/505-22	8-0710	Return Sar	mples By:					
Members	William (Gibson	Willen	Bull	ZUYZ	SNL/4142/50	5-284-330	7/505-23	9-7367	Comments	s:	Send report to	Tim Jackson	v/4142/MS 0729/284-2547		
			/	7	0									sis using SW846-6850M.Filtered		
														e filter.Report Anions (as		
										as short list is		is total CaCC	3,HCO3,C	O3), and Gamma Spectroscopy (Lab Use	
1.Relinquishe	d by A	1/2015	-still	Org. 417	Z Date	10/13/14	Time /	013	3.Relino	uished by			Org.	Date	Time	
1. Received b		49		Org. 4/4			Time /		3. Rece				Org.		Time	
2.Relinquishe		v	1 000	Org.	Date	1 / 1	Time		4.Relino	uished by			Org.		Time	
					Date		Time		4. Rece	ived by			Org.	Date Time		

^{*}Prior confirmation with SMO required for 7 and 15 day TAT

SMO 2012-ARCOC (4-2012) CONTRACT LABORATORY AOP 95-16

ANALYSIS REQUEST AND CHAIN OF CUSTODY (Continuation)

Page 2 of 2

													AR/COC 61	5822
Project Nar	ne:	SWMU 8/58 GWM	Project/Ta	sk Mana	ger: (Clinton Lur	m		Project/Tas	sk No.:	146422	.10.11.01		
Tech Area:			ļ											
Building:		Room:												Lab use
				Depth	Date/1		Sample		ntainer	-	Collection		Parameter & Method	Lab
Sample No	. Fraction	Sample Location [Detail	(ft)	Collected		Matrix	Туре	Volume	ative	Method	Туре	Requested	Sample ID
096685	-033	CCBA-MW1		79	10/13/14	9:36	† GW	Р	1 L	HNO3	G	SA	Gamma Spectroscopy (EPA 901.0)	
096685	-034	CCBA-MW1		79	10/13/14	9:38	GW	Р	1 L	HNO3	G	SA	Gross Alpha and Beta (EPA 900.0)	
096686	-001	CCBA-TB1		NA	10/13/14	9:24	DIW	G	3x40 ml	HCL	G	ТВ	TCL VOC (SW846-8260B)	
				Î										
Recipient I				. 14		189	76.7							

Internal Lab Page												Page <u>1</u> of <u>2</u>				
Batch No.	(A					SMO Use	,				,	101		AR/COC 615824		
Project Name	:	SWMU 8/	58 GWM	Date Sample:	s Shipped:	10/14	114		SMO Au	thorization	13.4	l. tin	_	Waste Characterization		
Project/Task	Manager:	Clinton Lu	m	Carrier/Wayb	ill No.	-	A POST	- 1549	SMO Co	ntact Phone	9		Sulp	RMMA		
Project/Task	Number:	146422.10	0.11.01	Lab Contact:		Edie Kent/8	03-556-8	3171		Lorraine H	lerrera/50	5-844-3199		Released by COC No.		
Service Order	r:	CF262-15		Lab Destinati	on:	GEL			Send Re	port to SMC):				✓ 4° Celsius	
				Contract No.:		PO 130387	3			Rita Kava	naugh/505	5-284-2553	Bill to:Sandia National Laboratories (Accounts Payable),			
Tech Area:				İ									P.O. Box 5800, MS-0154			
Building:		Room:		Operationa	al Site:								Albuquerque, NM 87185-0154			
	Depi					Date/T	ime	Sample	Co	ntainer	Preserv-	Collection	Sample	Parameter & Method	Lab	
Sample No.	Fraction	San	nple Location [Detail	(ft)	Collected Matrix		Туре	Volume	ative	Method	Туре	Requested	Sample ID		
		0004 50	^		İ	40/44/44	0.00	- 504						TOL 1/00 (0)4/0 40 0000D)		
096690	-001	CCBA-FB	2		NA	·10/14/14	9:23	DIW	G	3x40ml	HCL	G	FB	TCL VOC (SW846-8260B)		
096691	-001	CCBA-MV	V2		117	10/14/14	9:23	GW	G	3x40ml	HCL	G	SA	TCL VOC (SW846-8260B)		
		0004.404			447	404444	0.05									
096691	-002	CCBA-MV	V2		117	10/14/14	9:25	GW	AG	4x1 L	None	G	SA	TCL SVOC (SW846-8270C)		
096691	-010	CCBA-MW2				-10/14/14	9:29	∱ GW	Р	500 ml	HNO3	G	SA	TAL Metals+U (SW846-6010/6020/7	470)	
096691	-016	CCBA-MW2			117	10/14/14	9:30 -	GW	Р	125 ml	None	G	SA	Anions (SW846-9056)		
096691	-017	CCBA-MW2				10/14/14	9:32	FGW	Р	500 ml	HNO3	G	SA	Metals-Ca,Mg,K,Na (SW846-60	20)	
096691	-018	ССВА-МУ	V2		117	`10/14/14	9:33	GW	Р	125 ml	H2SO4	G	SA	Nitrate+Nitrite (EPA 353.2)		
096691	-020	ССВА-МУ	V2		117	10/14/14	9:34	GW	Р	250 ml	None	G	SA	Perchlorate (EPA 314.0)		
096691	-022	CCBA-MV	V2		117	ገ0/14/14	9:35	GW	Р	500 ml	None	G	SA	Alkalinity (SM2320B)		
096691	-024	CCBA-MV			117	10/14/14	9:36	+ GW	AG	4x1 L	None	G	SA	High Explosives (SW846-8321A	mod)	
Last Chain	:	√ Yes			Sample	Tracking		SMC	Use	Special Ins	structions	/QC Requi	rements:		Conditions on	
Validation		✓ Yes	=		Date En					EDD		✓ Yes		No	Receipt	
Backgroun		Yes			Entered		_		- 3	Turnaroun	d Time	7 Da	v*	15 Day* / 30 Day		
Confirmato		Yes			QC inits		100			Negotiated						
Sample		lame	Signa	turo	Init.		//Organiza	tion/Phon	e/Cell	Sample Di		Retur	n to Client	Disposal by Lab		
Team	Robert L		111 1000	ch	RL	SNL/4142/50				Return Sa	<u> </u>		ii to Chem	Disposar by Lab		
		-	1001 /00	in	/	SNL/4142/50				Comments	· ·		Tim Indiana	144 40 B4C 0700/004 05 47		
Members			1111	2.01	2.41	SNL/4142/50				-				n/4142/MS 0729/284-2547 sis using SW846-6850M.Filtered		
William Gibson William Gibson William Gibson William Gibson							J5-284-33(077505-23	9-7367					e filter.Report Anions (as		
			/		<u> </u>							as total CaCC	03,HC03,C	O3), and Gamma Spectroscopy (
			12-11							as short list i	sotopes).				Lab Use	
1.Relinquishe		Muy	your !	Org. 414		10/14/14			•	uished by			Org.		Time	
1. Received I		19 5.0	11_ and	org. 414.		10111111			Received by Org.					Time		
2.Relinquishe						te Time 4			4.Relino	uished by			Org.	Date Time		
2. Received	by			Org.	Date	e Time			4. Received by Org.				Date	Time		

^{*}Prior confirmation with SMO required for 7 and 15 day TAT

CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY (Continuation)

AR/COC 615824

	Project Name	e:	SWMU 8/58 GWM	Project/Ta	sk Mana	ger: (Clinton Lun	n		Project/Tas	sk No.:	146422	.10.11.01		
	Tech Area:														
	Building:		Room:												Lab use
	Sample No.	Fraction	Sample Location	Detail	Depth (ft)	Date/1 Collec		Sample Matrix	Co:	tainer Volume	Preserv- ative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
P	096691	-027	CCBA-MW2		117	10/14/14	9:40 /	GW	Р	250 ml	NaOH	G	SA	Total Cyanide (SW846-9012)	
/	096691	-033	CCBA-MW2		117	10/14/14	9:41	GW	Р	1 L	HNO3	G	SA	Gamma Spectroscopy (EPA 901.0)	
	096691	-034	CCBA-MW2		117	10/14/14	9:43	gw	Р	1 L	HNO3	G	SA	Gross Alpha and Beta (EPA 900.0)	
,	096692	-001	CCBA-MW2		117	10/14/14	9:23	GW	G	3x40ml	HCL	G	DU	TCL VOC (SW846-8260B)	
9	096692	-002	CCBA-MW2		117	`10/14/14	9:25 <	GW	AG	4x1 L	None	G	DU	TCL SVOC (SW846-8270C)	
•	096692	-010	CCBA-MW2		117	10/14/14	9:29	∤ gw	Р	500 ml	HNO3	G	DU	TAL Metals+U (SW846-6010/6020/7470)	
1	096692	-016	CCBA-MW2		117	10/14/14	9:30	GW	Р	125 ml	None	G	DU	Anions (SW846-9056)	
,	096692	-017	CCBA-MW2		117	10/14/14	9:32	FGW	Р	500 ml	HNO3	G	DU	Metals-Ca,Mg,K,Na (SW846-6020)	
,	096692	-018	CCBA-MW2			10/14/14	9:33	- GW	Р	125 ml	H2SO4	G	DU	 Nitrate+Nitrite (EPA 353.2)	
F	096692	-020	CCBA-MW2		117	10/14/14	9:34	GW	Р	250 ml	None	G	DU	Perchlorate (EPA 314.0)	
,	096692	-022	CCBA-MW2		117	10/14/14	9:35	† gw	Р	500 ml	None	G	DU	Alkalinity (SM2320B)	
•	096692	-024	CCBA-MW2		117	10/14/14	9:36	GW	AG	4x1 L	None	G	DU	High Explosives (SW846-8321A mod)
۵	096692	-027	CCBA-MW2		117	·10/14/14	9:40	f gw	Р	250 ml	NaOH	G	DU	Total Cyanide (SW846-9012)	
,	096692	-033	CCBA-MW2		117	`10/14/14	9:41	∤ gw	Р	_1 L	HNO3	G	DU	Gamma Spectroscopy (EPA 901.0)	
,	096692	-034	CCBA-MW2		117	'10/14/14	9:43	GW	Р	1 L	HNO3	G	DU	Gross Alpha and Beta (EPA 900.0)	
ð	096693	-001	ССВА-ТВЗ		NA	10/14/14	9:23	DIW	G	3x40 ml	HCL	G	ТВ	TCL VOC (SW846-8260B)	
	ayr Latin	Sheni	1-15-00-00-00-00-00-00-00-00-00-00-00-00-00		Vacano	with the last	74.7 E								

Internal Lab																_	Page	_1_ of _2_
Batch No. N	A					SMO Use	1				/	00				AR/COC	61	5823
Project Name		SWMU 8/5		Date Samples	Shipped:	10 11	1/14			ıthorization∠	24	9 th				Chara cterization		
Project/Task I	_			Carrier/Wayb					SMO Co	ntact Phone			Eme		RMM			
Project/Task I		146422.10	0.11.01	Lab Contact:		Edie Kent/8	303-556-8	3171				-844-3199			Relea	sed by COC No.		40.00-1.30
Service Order	r:	CF262-15		Lab Destination		GEL			Send Re	eport to SMC				✓ 4º Celsius				
Tech Area:				Contract No.:		PO 1303873 Rita Kavanaugh/505-284-2553							i		National Laboratories	(Accour	nts Payable),	
Building:	-	Room:] Operationa	l Site:									l		0, MS-0154 NM 87185-0154		
Dunuing.				Торогаціона	Depth	Date/1	ime	Sample	Cc	ntainer	Preserv-	Collection	Sample			ameter & Method		Lab
Sample No.	Fraction	Sam	ple Location D	etail	(ft)				Туре	Volume	ative	Method	Туре			Requested		Sample ID
096687	-001	CCBA-FB	1		NA	10/13/14	10:55	DIW	G	3x40ml	HCL	G	FB	TCL VOC (SW846-8260B)				
096688	-001	ССВА-ЕВ	1		NA	10/13/14	10:55 /	DIW	G	3x40ml	HCL	G	EB	TCL	VOC (SW846-8260B)		
096688	-002	ССВА-ЕВ	1		NA	10/13/14	10:57	DIW	AG	4x1 L	None	G	EB	TCL	svoc	(SW846-8270C)		
096688	-010	CCBA-EB1			NA	.10/13/14	10:58	DIW	Р	500 ml	HNO3	G	EB	TAL Metals+U (SW846-6010/6020/747			/7470)	
096688	-016	CCBA-EB1			NA	10/13/14	10:59	DIW	Р	125 ml	None	G	EB	Anio	ns (SV	V846-9056)		
096688	-017	CCBA-EB1 N				10/13/14	11:00	FDIW	Р	500 ml	HNO3	G	EB	Meta	als-Ca,	Mg,K,Na (SW846-	3020)	
096688	-018	CCBA-EB	1		NA	10/13/14	11:01	DIW	Р	125 ml	H2SO4	G	EB	Nitrate+Nitrite (EPA 353.2)				
096688	-020	CCBA-EB	1		NA	ነ0/13/14	11:02	DIW	Р	250 ml	None	G	EB	Perchlorate (EPA 314.0)				
096688	-022	CCBA-EB	1		NA	10/13/14	11:03 ′	DIW	Р	500 ml	None	G	EB	Alka	linity (S	SM2320B)		
096688	-024	ССВА-ЕВ	1		NA	10/13/14	11:05 *	DIW	AG	4x1 L	None	G	EB	High	Explo	sives (SW846-832	1A mod)
Last Chain	:	☐ Yes			Sample	Tracking		SMC	Use	Special Ins	structions	QC Requi	rements:				Cond	itions on
Validation I	Req'd:	☑ Yes			Date En	tered:				EDD		✓ Yes		No			R	eceipt
Backgroun		☐ Yes			Entered	by:				Turnaroun	d Time	7 Da	<u>y*</u>	15 D	ay*	(☑ 30 Day		
Confirmato	ry:	☐ Yes			QC inits.					Negotiated		Ц						
Sample		lame	Signat	ure	Init.		//Organiza			Sample Di		☐ Retur	n to Client		V	Disposal by Lab		
Team		antillanes	4442	tiller		SNL/4142/5				Return Sar	<u> </u>							
Members	Members William Gibson Will Start W						05-284-330	07/505-23	9-7367	Comments		Send report to						
1	<u> </u>			V	,	1				If perchiorate			,		-	46-6850M.Filtered Anions (as		
										Br,C,F,SO4), Alkalinity (as total CaCO3,HCO3,CO3), and Gamma Spectroscopy (
1 Polinguish	nd by	14-15	atilo	Org. 414	7 Date	10/14/14	Time 6	29.4	2 Poline	as short list is	sotopes).		Ora			Date	Time	b Use
Received I		1/9	SV40			1	Time C		3.Relinquished by Org 3. Received by Org				Org.			Date	Time	
	Relinquished by Org. Da						Time						Org.					
2. Received I										4. Received by								

^{*}Prior confirmation with SMO required for 7 and 15 day TAT

SMO 2012-ARCOC (4-2012)

CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY (Continuation)

Page 2 of 2

AR/COC 615823 **SWMU 8/58 GWM** Project/Task Manager: Clinton Lum Project/Task No.: 146422.10.11.01 **Project Name:** Tech Area: Room: Lab use Building: Collection Sample Parameter & Method Depth Date/Time Sample Container Lab Preserv Type Volume Method Sample ID Sample No. Fraction Sample Location Detail (ft) Collected Matrix ative Type Requested 096688 -027 CCBA-EB1 NA 10/13/14 11:06 DIW Р 250 ml NaOH G EB Total Cyanide (SW846-9012) 096688 -033 CCBA-EB1 NA 10/13/14 11:07 DIW Ρ HNO3 G Gamma Spectroscopy (EPA 901.0) 1 L EB 11:09 096688 -034 CCBA-EB1 NA 10/13/14 DIW Р 1 L HNO3 G EB Gross Alpha and Beta (EPA 900.0) 096689 -001 CCBA-TB2 NA 10/13/14 10:55 DIW G 3x40 ml HCL G TB TCL VOC (SW846-8260B) **Recipient Initials**

Internal Lab														Page <u>1</u> of <u>2</u>
Batch No. N	A				SMO Use	1				1	01		AR/COC	615811
Project Name	e:	SWMU 68 GWM	Date Sample	s Shipped:	1014	0 14	- Milier	SMO AL	thorization	8/4/	7. Tin		Waste Characterization	
Project/Task	Manager:	Clinton Lum	Carrier/Wayb	ill No.	22	456	55	SMO C	ontact Phone	7	V	Smes	RMMA	
Project/Task	Number:	146422.10.11.01	Lab Contact:		Edie Kent/8			ĺ	Lorraine H	lerrera/505	5-844-3199		Released by COC No.	1
Service Orde		CF263-15	Lab Destinati	ion:	GEL	- 13 5		Send Re	eport to SMC					√ 4º Celsius
1			Contract No.:		PO 1303873	3			Rita Kava		-284-2553		Bill to:Sandia National Laboratories	
Tech Area:			Contract No.		1 0 1000011			I.	Tilla Tiava	naugii/000	-204-2000		P.O. Box 5800, MS-0154	(Accounts Payable),
Building:		Room:	Operationa	al Site:									Albuquerque, NM 87185-0154	
				Depth	Date/Ti	me	Sample	Co	ontainer	Preserv-	Collection	Sample	Parameter & Method	Lab
Sample No.	Fraction	Sample Location D	etail	(ft)	Collec	ted	Matrix	Туре	Volume	ative	Method	Туре	Requested	Sample ID
096652	-001	OBS-FB1		NA	.10/6/14	9:20	DIW	G	3x40ml	HCL	G	FB	TCL VOC (SW846-8260B)	
096653	-001	OBS-MW1		153	'10/6/14	9:21	GW	G	3x40ml	HCL	G	SA	TCL VOC (SW846-8260B)	
096653	-002	OBS-MW1		153	10/6/14	9:22	GW	AG	4x1 L	None	G	SA	TCL SVOC (SW846-8270C)	
096653	-010	OBS-MW1		153	10/6/14	9:23	GW	Р	500 ml	HNO3	G	SA	TAL Metals+U (SW846-6010/6020	7470)
096653	-014	OBS-MW1		153	10/6/14	9:24	GW	Р	250 ml	None	G	SA	Hexavalent Chromium (SW846-719	96A)
096653	-016	OBS-MW1		153	`10/6/14	9:25	GW	Р	125 ml	None	G	SA	Anions (SW846-9056)	
096653	-017	OBS-MW1		153	10/6/14	9:26	FGW	Р	500 ml	HNO3	G	SA	Metals-Ca,Mg,K,Na (SW846-6	020)
096653	-018	OBS-MW1		153	10/6/14	9:27	GW	Р	125 ml	H2SO4	G	SA	Nitrate+Nitrite (EPA 353.2)	
096653	-020	OBS-MW1		153	10/6/14	9:30	GW	Р	250 ml	None	G	SA	Perchlorate (EPA 314.0)	
096653	-022	OBS-MW1		153	10/6/14	9:31	GW	Р	500 ml	None	G	SA	Alkalinity (SM2320B)	
Last Chain	:	Yes		Sample	Tracking		SMC) Use	Special Ins	structions	/QC Requir	rements:		Conditions on
Validation	Req'd:	✓ Yes		Date En	tered:				EDD		✓ Yes		No	Receipt
Backgroun	d:	Yes		Entered	by:				Turnaroun	d Time	7 Da	y*	<u>15 Day*</u> ✓ 30 Day	
Confirmato	гу:	☐ Yes		QC inits				1	Negotiated	I TAT				
Sample	l N	ame Signat	ure	Init.	Company	'Organiza	tion/Phon	e/Cell	Sample Dis	sposal	Return	to Client	Disposal by Lab	
Team	Robert L	ynch 2013	nch	RI	SNL/4142/50	5-844-40	13/505-25	0-7090	Return Sar	mples By:				
Members	Alfred Sa	antillanes Aug	car.	B	SNL/4142/50	5-844-51	30/505-22	8-0710	Comments	s:	Send report to	Tim Jackson	n/4142/MS 0729/284-2547	
		10							If perchlorate	detected, p	erform verific	ation analys	sis using SW846-6850M.Filtered	
											•		ne filter.Report Anions (as	
									as short list is		as total CaCC	3,HCO3,C	O3), and Gamma Spectroscopy (Lab Use
1.Relinguishe	Relinquished by All Settle Org. 4147 Dat				10/6/14	Time	1115	3.Relino	quished by	solopes).		Org.	Date	Time
	Received by 2944. Km Swan Org. 4142 Dat					Time	45	3. Rece				Org.		Time
				Date		Time		i 	quished by			Org.		Time
2. Received I	by		Org.	Date		Time		4. Rece	ived by			Org.		Time

^{*}Prior confirmation with SMO required for 7 and 15 day TAT

CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY (Continuation)

Page _2_ of _2

AR/COC 6158

													A10000 01	••••
Project Nam	e:	SWMU 68	Project/Ta	sk Mana	ger:	Clinton Lui	m		Project/Tas	sk No.:	146422	2.10.11.01		
Tech Area:														
Building:		Room:												Lab use
Sample No.	Fraction	Sample Location [Detail	Depth (ft)	Date/ Colle		Sample Matrix	Co Type	ntainer Volume	Preserv- ative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
096653	-024	OBS-MW1		153	e 10/6/14	9:33	GW	AG	4x1 L	None	G	SA	High Explosives (SW846-8321A mod	
096653	-027	OBS-MW1		153	•10/6/14	9:34	+ GW	Р	250 ml	NaOH	G	SA	Total Cyanide (SW846-9012)	
096653	-033	OBS-MW1		153	-10/6/14	9:35	+ GW	Р	1 L	HNO3	G	SA	Gamma Spectroscopy (EPA 901.0)	
096653	-034	OBS-MW1		153	, 10/6/14	9:36	+ gw	Р	1 L	HNO3	G	SA	Gross Alpha and Beta (EPA 900.0)	
096653	-035	OBS-MW1		153	-10/6/14	9:38	+ gw	Р	1 L	HNO3	G	SA	Isotopic Uranium (HASL 300)	
096654	-001	OBS-TB1		NA	10/6/14	9:21	DIW	G	3x40 ml	HCL	G	ТВ	TCL VOC (SW846-8260B)	
<u></u>														
											1			
											181			
		1												-
Recipient In	nitials					13:-/		2 10						

Internal Lab															Page <u>1</u> of <u>2</u>
Batch No.	NA				SMO	Ųse	1					10	1	AR/COC	615813
Project Name	9:	SWMU 68 GWM	Date Samples	Shipped:	10		14		SMO Au	thorization:	Pole	, ge of	w	Waste Characterization	
Project/Task	Manager:	Clinton Lum	Carrier/Waybi	II No.	2		172		SMO Co	ntact Phone			5mo	RMMA	
Project/Task	Number:	146422.10.11.01	Lab Contact:			Cent/80	03-556-8	3171		Lorraine H	lerrera/50	5-844-3199	TIMO	Released by COC No.	
Service Orde	r:	CF263-15	Lab Destination	on:	GEL			- 9	Send Re	eport to SMC):				✓ 4° Celsius
			Contract No.:		PO 13	03873	3			Rita Kava	naugh/505	-284-2553		Bill to:Sandia National Laboratories (Accounts Payable),
Tech Area:														P.O. Box 5800, MS-0154	
Building:		Room:	Operationa	I Site:										Albuquerque, NM 87185-0154	
Sample No.	Eraction	Sample Location [Dotail	Depth (ft)	1	Date/Ti		Sample Matrix	Co Type	ntainer Volume	Preserv- ative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
Sample No.	I	Sample Location t	Jetan					Wattix	Гуре	Votaine	ative	IVICTIO	Туре	Requested	Sample ID
096658	-001	OBS-MW2		252	10/7/		9:21	GW	G	3x40ml	HCL	G	SA	TCL VOC (SW846-8260B)	
096658	-002	OBS-MW2		252	10/7	/14	9:23	GW	AG	4x1 L	None	G	SA	TCL SVOC (SW846-8270C)	_
096658	-010	OBS-MW2		252	. 10/7/	/14	9:27	GW	Р	500 ml	HNO3	G	SA	TAL Metals+U (SW846-6010/6020/7	470)
096658	-014	OBS-MW2		252	- 10/7	/14	9:28	GW	Р	250 ml	None	G	SA	Hexavalent Chromium (SW846-7196	3A)
096658	-016	OBS-MW2		252	10/7	/14	9:29 -	GW	Р	125 ml	None	G	SA	Anions (SW846-9056)	
096658	-017	OBS-MW2		252	• 10/7	/14	9:31	FGW	Р	500 ml	HNO3	G	SA	Metals-Ca,Mg,K,Na (SW846-60)20)
. 096658	-018	OBS-MW2		252	•10/7/	/14	9:32	GW	Р	125 ml	H2SO4	G	SA	Nitrate+Nitrite (EPA 353.2)	7.1
096658	-020	OBS-MW2		252	•10/7	/14	9:33	GW	Р	250 ml	None	G	SA	Perchlorate (EPA 314.0)	
096658	-022	OBS-MW2		252	- 10/7	/14	9:34	GW	Р	500 ml	None	G	SA	Alkalinity (SM2320B)	
096658	-024	OBS-MW2		252	-10/7	/14	9:35	GW	AG	4x1 L	None	G	SA	High Explosives (SW846-8321)	
Last Chain		Yes		Sample	Tracki	ng		SMC) Use	Special Ins	structions		rements:	100	Conditions on
Validation	Req'd:	Yes		Date En	tered:	12.45		PAPE TO SE		EDD		✓ Yes		No	Receipt
Backgroun	ıd:	Yes		Entered	by:	3	10.2			Turnaroun	d Time	7 Da	Λ. []	15 Day* (30 Day	
Confirmato	ory:	Yes		QC inits	.:.					Negotiated	TAT				15
Sample	N	ame Signa	ture	Init.	Co	mpany/	Organiza	tion/Phon	e/Cell	Sample Di	sposal	Retur	n to Cli en t	✓ Disposal by Lab	4.1.1.2
Team	Robert L	ynch LOT4x	ich	RL	SNL/4	142/50	5-844-40	13/505-25	0-7090	Return Sa	mples By:				
Members	Alfred Sa	antillanes 40	Egetle	ar	SNL/4	142/50	5-844-513	30/505-22	8-0710	Comments		Send report to	Tim Jackson	V4142/MS 0729/284-2547	
	William	Gibson W. Meil	Sill	2119	SNL/4	142/50	5-284-330	07/505-23	9-7367	1 '				sis using SW846-6850M.Filtered	
1			7	1	i									ne filter.Report Anions (as	
		1								as short list is		as luiai CaCl	J3, TCO3, C	O3), and Gamma Spectroscopy (Lab Use
1.Relinguishe	Relinquished by Albak Southern Org. 4(42			2 Date	10/7	2/14	Time /	008	3.Relino	uished by	,,-		Org.	Date	Time
	Received by 34 4 for group org. 4172				-	2)14	Time	1008	3. Rece				Org.		Time
2.Relinquish	ed by		Org.	Date	,		Time		4.Relino	quished by			Org.	Date	Time
2. Received	by		Org.	Date)		Time		4. Rece	ived by			Org.	Date	Time

^{*}Prior confirmation with SMO required for 7 and 15 day TAT

CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY (Continuation)

Page 2 of 2

AR/COC 615813 SWMU 68 Project/Task Manager: Clinton Lum **Project Name:** Project/Task No.: 146422.10.11.01 Tech Area: **Building:** Room: Lab use Depth Date/Time Sample Container Collection Sample Parameter & Method Lab Preserv-Sample No. Fraction Sample Location Detail (ft) Collected Matrix Type Volume ative Method Type Requested Sample ID 096658 -027 OBS-MW2 252 10/7/14 9:39 GW Ρ G 250 ml NaOH SA Total Cyanide (SW846-9012) 096658 -033 OBS-MW2 252 10/7/14 9:40 Ρ G GW 1 L HNO3 SA Gamma Spectroscopy (EPA 901.0) 096658 -034 OBS-MW2 252 10/7/14 9:42 GW Ρ 1 L HNO3 G Gross Alpha and Beta (EPA 900.0) 096658 -035 OBS-MW2 252 10/7/14 9:44 Р G GW 1 L HNO3 SA Isotopic Uranium (HASL 300) 096659 -001 OBS-MW2 252 10/7/14 9:21 G GW G 3x40ml HCL DU TCL VOC (SW846-8260B) 096659 -002 OBS-MW2 252 10/7/14 9:23 GW AG 4x1 L G DU TCL SVOC (SW846-8270C) None 096659 -010 **OBS-MW2** 252 10/7/14 9:27 Р G GW 500 ml HNO3 TAL Metals+U (SW846-6010/6020/7470) 096659 -014 OBS-MW2 252 10/7/14 9:28 GW Р 250 ml G DU None Hexavalent Chromium (SW846-7196A) 096659 -016 OBS-MW2 252 10/7/14 9:29 GW 125 ml G DU None Anions (SW846-9056) 096659 -017 OBS-MW2 252 - 10/7/14 9:31 **FGW** 500 ml HNO3 G DU Metals-Ca,Mg,K,Na (SW846-6020) 096659 -018 OBS-MW2 252 ۱0/7/14 م 9:32 GW Р H2SO4 G 125 ml DU Nitrate+Nitrite (EPA 353.2) -020 096659 OBS-MW2 252 10/7/14 9:33 Ρ G GW 250 ml None DU Perchlorate (EPA 314.0) 9:34 096659 -022 OBS-MW2 252 10/7/14 GW Р G DU 500 ml None Alkalinity (SM2320B) 096659 -024 252 10/7/14 OBS-MW2 9:35 G GW AG 4x1 L None DU High Explosives (SW846-8321A mod 096659 -027 OBS-MW2 252 10/7/14 9:39 Р GW G DU 250 ml NaOH Total Cyanide (SW846-9012) 096659 -033 OBS-MW2 252 9:40 Ρ 10/7/14 GW 1 L HNO3 G DU Gamma Spectroscopy (EPA 901.0) 096659 -034 OBS-MW2 252 10/7/14 9:42 Р G GW 1 L HNO3 DU Gross Alpha and Beta (EPA 900.0) 096659 -035 OBS-MW2 252 10/7/14 9:44 GW HNO3 G 1 L DU Isotopic Uranium (HASL 300) 096660 -001 OBS-TB3 NA -10/7/14 9:21 DIW G HCL G 3x40 ml TB TCL VOC (SW846-8260B) Recipient Initials

Internal Lab													2		Page	2_1_of_2
Batch No.	VIA					SMO Use	/				-/	1011	7	AR/CO	61	5814
Project Name	1=	SWMU 68	GWM	Date Samples	Shipped:	10/8	114	- 72	SMO A	thorization	0/4	4.00	_	Waste Characterizatio	n	
Project/Task I	Manager:	Clinton Lu	m	Carrier/Waybi	ill No.	(SMO Co	ntact Phone	:	Cr.	Sugo	RMMA		
Project/Task I	Number:	146422.10	0.11.01	Lab Contact:		Edie Kent/8	03-556-8	3171		Lorraine H	lerrera/50	5-844-3199		Released by COC No.	_	
Service Order	r:	CF263-15		Lab Destination	on:	GEL			Send Re	port to SMC):				4	4° Celsius
				Contract No.:		PO 130387	3	-5 L.F]	Rita Kava	naugh/50	5-284-2553		Bill to:Sandia National Laborate	ories (Accou	nts Payable),
Tech Area:														P.O. Box 5800, MS-0154		
Building:		Room:		Operationa	l Site:									Albuquerque, NM 87185-0154		
Sample No.	Fraction	San	nple Location D	etail	Depth (ft)	Date/T Collect		Sample Matrix	Type	ontainer Volume	Preserv-	Collection Method	Sample Type	Parameter & Meth Requested	od	Lab Sample ID
096661	-001	OBS-MW	•		208	10/8/14	9:17	GW	G	3x40ml	HCL	G	SA	TCL VOC (SW846-8260B)		
096661	-002	OBS-MW			208	10/8/14	9:19	GW	AG	4x1 L	None	G	SA	TCL SVOC (SW846-82700	C)	3 1 7 3
096661	-010	OBS-MW			208	`10/8/14	9:20	GW	Р	500 ml	HNO3	G	SA	TAL Metals+U (SW846-6010/6	,	Q-,-3
096661	-014	OBS-MW:	3		208	10/8/14	9:21	+ GW	Р	250 ml	None	G	SA	Hexavalent Chromium (SW846	5-7196A)	
096661	-016	OBS-MW:	3		208	`10/8/14	9:22	+ GW	Р	125 ml	None	G	SA	Anions (SW846-9056)		
096661	-017	OBS-MW:	3		208	-10/8/14	9:23	FGW	Р	500 ml	HNO3	G	SA	Metals-Ca,Mg,K,Na (SW846-60		3-1-3
096661	-018	OBS-MW:	3		208	`10/8/14	9:24	GW	Р	125 ml	H2SO4	G	SA	Nitrate+Nitrite (EPA 353.2)		
096661	-020	OBS-MW:	3		208	10/8/14	9:25	† gw	Р	250 ml	None	G	SA	Perchlorate (EPA 314.0)		
096661	-022	OBS-MW:	3		208	10/8/14	9:26	† gw	Р	500 ml	None	G	SA	Alkalinity (SM2320B)		
096661	-024	OBS-MW	3		208	-10/8/14	9:28 ′	† gw	AG	4x1 L	None	G	SA	High Explosives (SW846-8	321A mod	ı
Last Chain:		✓ Yes			Sample	Tracking		SMC) Use	1 '	structions	/QC Requi	rements:		Cond	ditions on
Validation 1		✓ Yes			Date En	tered:		3/11/		EDD		✓ Yes		No	_	eceipt
Backgroun	d:	Yes			Entered	by:				Turnaroun	d Time	7 Da	<u>y*</u>] <u>15 Day*</u>		
Confirmato	ry:	☐ Yes			QC inits					Negotiated	TAT	. 📙				
Sample	N	lame	Signat	ure ,	Init.	Company	/Organiza	tion/Phon	e/Cell	Sample Di	sposal	Retur	n to Client	t Disposal by La	b	
	Robert L	,	Kaltzn	ch	20	SNL/4142/50				Return Sa	mples By					
Members	Alfred S	antillanes	1480065	attle	-02	SNL/4142/50	5-844-51	30/505-22	28-0710	Comments	s :	Send report to	Tim Jackson	n/4142/MS 0729/284-2547		
			10							1 '				sis using SW846-6850M.Filtered		
,														ne filter.Report Anions (as CO3), and Gamma Spectroscopy	(
		11.								as short list i	•			, , , , , , , , , , , , , , , , , , ,		ab Use
1.Relinquishe	Relinquished by A Parketong 4142 Da					10 8 14	Time		3.Relino	quished by			Org	. Date	Time	,
1. Received b	Received by Any Grand Org. 414			Date	10/8/14	Time	0955	3. Rece	ived by			Org	. Date	Time	>	
2.Relinquishe	ed by			Org.	Date	' (Time		4.Relino	quished by			Org	. Date	Time	>
2. Received b	ру			Org.	Date		Time		4. Rece	ived by			Org	. Date	Time)
*Prior confir	mation v	vith SMO re	quired for 7 and	15 day TA	Г											

CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY (Continuation)

AR/COC 615814

													A10000 01	
Project Nam	e:	SWMU 68 GWM	Project/Task	Manag	ger: (Clinton Lun	1		Project/Tas	sk No.:	146422	.10.11.01		
Tech Area:														
Building:		Room:												Lab use
				Depth	Date/1	ime	Sample	Coi	ntainer	Preserv-	Collection	Sample	Parameter & Method	Lab
Sample No.	Fraction	Sample Location I	Detail	(ft)	Colle	cted	Matrix	Туре	Volume	ative	Method	Туре	Requested	Sample ID
096661	-027	OBS-MW3		208	,10/8/14	9:29	GW	Р	250 ml	NaOH	G	SA	Total Cyanide (SW846-9012)	
096661	-033	OBS-MW3		208	.10/8/14	9:30 <	GW	Р	1 L	HNO3	G	SA	Gamma Spectroscopy (EPA 901.0)	
096661	-034	OBS-MW3		208	· 10/8/14	9:31 <	GW	Р	1 L	HNO3	G	SA	Gross Alpha and Beta (EPA 900.0)	
096661	-035	OBS-MW3		208	, 10/8/14	9:33	GW	Р	1 L	HNO3	G	SA	Isotopic Uranium (HASL 300)	
096662	-001	OBS-TB4		NA	10/8/14	9:17	DIW	G	3x40 ml	HCL	G	ТВ	TCL VOC (SW846-8260B)	
														= 2
														5
														192
														200
Recipient In	itials								AC.					

Internal Lab												1		Page _1_ of _2_
Batch No.	1A				SMO Use	, ,					10		AR/COC	615812
Project Name		SWMU 68 GWM	Date Sam	ples Shipped:		6/14		SMO Au	thorization	- DN	421	v	Waste Characterization	
Project/Task	Manager:	Clinton Lum	Carrier/W	aybill No.	20	1456	5	SMO Co	ntact Phone		V	Suo	RMMA	
Project/Task	Number:	146422.10.11.01	Lab Conta	act:	Edie Kent/	803-556-8	3171		Lorraine F	lerrera/505	5-844-3199		Released by COC No.	
Service Orde	r:	CF263-15	Lab Desti	nation:	GEL	1 - 10	38	Send Re	port to SMC):			1	√ 4° Celsius
			Contract	No.:	PO 13038	73		ĺ	Rita Kava	naugh/505	5-284-2553		Bill to:Sandia National Laboratories	(Accounts Payable),
Tech Area:													P.O. Box 5800, MS-0154	
Building:		Room:	Operati	onal Site:									Albuquerque, NM 87185-0154	
				Depth	Date/	Time	Sample	Co	ntainer	Preserv-	Collection	Sample	Parameter & Method	Lab
Sample No.	Fraction	Sample Loca	tion Detail	(ft)	Colle	ected	Matrix	Туре	Volume	ative	Method	Туре	Requested	Sample ID
096655	-001	OBS-FB2		NA	10/6/14	10:46	DIW	G	3x40ml	HCL	G	FB	TCL VOC (SW846-8260B)	
096656	-001	OBS-EB1		NA	10/6/14	10:46	DIW	G	3x40ml	HCL	G	EB	TCL VOC (SW846-8260B)	
096656	-002	OBS-EB1		NA	1 0/6/14	10:48	+ DIW	AG	4x1 L	None	G	· EB	TCL SVOC (SW846-8270C)	
096656	-010	OBS-EB1		NA	•10/6/14	10:49	DIW	Р	500 ml	HNO3	G	EB	TAL Metals+U (SW846-6010/6020/7	7470)
096656	-014	OBS-EB1		NA	10/6/14	10:50	DIW	Р	250 ml	None	G	EB	Hexavalent Chromium (SW846-719	6A)
096656	-016	OBS-EB1		NA	•10/6/14	10:51	DIW	Р	125 ml	None	G	EB	Anions (SW846-9056)	
096656	-017	OBS-EB1		NA	·10/6/14	10:52	FDIW	Р	500 ml	HNO3	G	EB	Metals-Ca,Mg,K,Na (SW846-6	020)
096656	-018	OBS-EB1		NA	- 10/6/14	10:53	DIW	Р	125 ml	H2SO4	G	EB	Nitrate+Nitrite (EPA 353.2)	
096656	-020	OBS-EB1		NA	10/6/14	10:54	DIW	P	250 ml	None	G	EB	Perchlorate (EPA 314.0)	
096656	-022	OBS-EB1		NA	10/6/14	10:55	T DIW	Р	500 ml	None	G	EB ₂	Alkalinity (SM2320B)	
Last Chain	:	Yes		Sample	Tracking		SMC) Use	Special Ins	structions		rements:		Conditions on
Validation	Req'd:	✓ Yes		Date En	tered:				EDD ,		✓ Yes		No	Receipt
Backgroun	d:	Yes		Entered	by:				Turnaroun	d Time	7 Da	ıy*	<u>15 Day*</u>	
Confirmato	ory:	Yes		QC inits		and the second			Negotiated	TAT				
Sample	N	lame	Signature ,	Init.	Compar	ny/Organiza	tion/Phon	e/Cell	Sample Di	sposal	Retur	n to Client	Disposal by Lab	
Team	Robert L	ynch /W	Zuch	KL	SNL/4142/	505-844-40	13/505-25	0-7090	Return Sa	mples By:				
Members		antillanes Alle	Satille		SNL/4142/	505-844-51	30/505-22	28-0710	Comments	s:	Send report to	Tim Jackson	n/4142/MS 0729/284-2547	
		10											sis using SW846-6850M.Filtered	- 4
													ne filter.Report Anions (as	
	-	1.			· ,				as short list i		as total CaCt	J3,HCU3,C	O3), and Gamma Spectroscopy (Lab Use
1 Relinquish	Relinquished by Holy Spatial Org. 4/42			147 Date	10/6/14	/ Time /	124	3.Relino	quished by			Org	Date	Time
					- I-F-I-	_	1124	3. Rece				Org		Time
2.Relinquish			Date	1 11 /			4.Relinquished by Org.			Date	Time			
2. Received	by		Org.	Date		Time		4. Rece	ived by			Org	Date	Time

^{*}Prior confirmation with SMO required for 7 and 15 day TAT

SMO 2012-ARCOC (4-2012)

CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY (Continuation)

Page 2 of 2

AR/COC 146422.10.11.01 Project Name: **SWMU 68** Project/Task Manager: Clinton Lum Project/Task No.: **Tech Area:** Room: **Building:** Lab use Date/Time Collection Sample Depth Sample Container Parameter & Method Preserv-Sample Location Detail Collected **Matrix** Volume Method Sample No. Fraction Type ative Type Requested Sample ID (ft) 10/6/14 096656 -024 OBS-EB1 NA 10:57 DIW AG 4x1 L None G EB High Explosives (SW846-8321A mod 096656 -027 OBS-EB1 NA 10/6/14 10:58 Р G Total Cyanide (SW846-9012) DIW 250 ml NaOH EΒ -033 OBS-EB1 096656 NA 10/6/14 10:59 DIW Ρ 1 L HNO3 G EΒ Gamma Spectroscopy (EPA 901.0) 096656 -034 OBS-EB1 NA 10/6/14 11:00 Р 1 L HNO3 G EΒ Gross Alpha and Beta (EPA 900.0) DIW 096656 -035 OBS-EB1 NA •10/6/14 11:01 DIW Р 1 L HNO3 G EΒ Isotopic Uranium (HASL 300) 096657 -001 OBS-TB2 10/6/14 10:46 HCL G TCL VOC (SW846-8260B) NA DIW G 3x40 ml **Recipient Initials**

Appendix C Data Validation Sample Findings Summary Sheets for SWMUs 8/58 and 68 Groundwater Monitoring Data



Sample Findings Summary



AR/COC: 615811, 615812, 615813, 615814

Page 1 of 3

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
DOE EML HASL-300, U-02-R	С		
	096656-035/OBS-EB1	Uranium-233/234 (13968-55-3/13966-29-)	BD, FR3
	096656-035/OBS-EB1	Uranium-235/236 (15117-96- 1/13982-70-)	BD, FR3
	096656-035/OBS-EB1	Uranium-238 (7440-61-1)	BD, FR3
EPA 900.0/SW846 9310			
	096653-034/OBS-MW1	ALPHA (12587-46-1)	J, MS1
	096653-034/OBS-MW1	BETA (12587-47-2)	J, MS1
	096656-034/OBS-EB1	ALPHA (12587-46-1)	BD, FR3,MS1
	096656-034/OBS-EB1	BETA (12587-47-2)	BD, FR3,MS1
	096658-034/OBS-MW2	ALPHA (12587-46-1)	J, MS1
	096658-034/OBS-MW2	BETA (12587-47-2)	J, MS1
	096659-034/OBS-MW2	ALPHA (12587-46-1)	J, MS1
	096659-034/OBS-MW2	BETA (12587-47-2)	J, MS1
	096661-034/OBS-MW3	ALPHA (12587-46-1)	J, MS1
	096661-034/OBS-MW3	BETA (12587-47-2)	J, MS1
EPA 901.1			
	096653-033/OBS-MW1	Americium-241 (14596-10-2)	BD, FR3
	096653-033/OBS-MW1	Cesium-137 (10045-97-3)	BD, FR3
	096653-033/OBS-MW1	Cobalt-60 (10198-40-0)	BD, FR3
	096653-033/OBS-MW1	Potassium-40 (13966-00-2)	J, FR7
	096656-033/OBS-EB1	Americium-241 (14596-10-2)	BD, FR3
	096656-033/OBS-EB1	Cesium-137 (10045-97-3)	BD, FR3
	096656-033/OBS-EB1	Cobalt-60 (10198-40-0)	BD, FR3
	096656-033/OBS-EB1	Potassium-40 (13966-00-2)	BD, FR3

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
	096658-033/OBS-MW2	Americium-241 (14596-10-2)	BD, FR3
	096658-033/OBS-MW2	Cesium-137 (10045-97-3)	BD, FR3
	096658-033/OBS-MW2	Cobalt-60 (10198-40-0)	BD, FR3
	096658-033/OBS-MW2	Potassium-40 (13966-00-2)	BD, FR3
	096659-033/OBS-MW2	Americium-241 (14596-10-2)	BD, FR3
	096659-033/OBS-MW2	Cesium-137 (10045-97-3)	BD, FR3
	096659-033/OBS-MW2	Cobalt-60 (10198-40-0)	BD, FR3
	096659-033/OBS-MW2	Potassium-40 (13966-00-2)	BD, FR3
	096661-033/OBS-MW3	Americium-241 (14596-10-2)	BD, FR3
	096661-033/OBS-MW3	Cesium-137 (10045-97-3)	BD, FR3
	096661-033/OBS-MW3	Cobalt-60 (10198-40-0)	BD, FR3
	096661-033/OBS-MW3	Potassium-40 (13966-00-2)	R, Z2
SW846 3510C/8270D			
	096653-002/OBS-MW1	4-Nitrophenol (100-02-7)	UJ, MS5
	096656-002/OBS-EB1	4-Nitrophenol (100-02-7)	UJ, MS5
	096658-002/OBS-MW2	4-Nitrophenol (100-02-7)	UJ, MS5
	096659-002/OBS-MW2	4-Nitrophenol (100-02-7)	UJ, MS5
	096661-002/OBS-MW3	4-Nitrophenol (100-02-7)	UJ, MS5
SW846 3535/8321A Modifi			
	096653-024/OBS-MW1	m-Nitrotoluene (99-08-1)	UJ, 14
	096653-024/OBS-MW1	o-Nitrotoluene (88-72-2)	UJ, 14
	096653-024/OBS-MW1	p-Nitrotoluene (99-99-0)	UJ, 14
	096653-024/OBS-MW1	Tetryl (479-45-8)	UJ, L3,MS3
	096656-024/OBS-EB1	m-Nitrotoluene (99-08-1)	UJ, 14
	096656-024/OBS-EB1	o-Nitrotoluene (88-72-2)	UJ, 14
	096656-024/OBS-EB1	p-Nitrotoluene (99-99-0)	UJ, 14
	096656-024/OBS-EB1	Tetryl (479-45-8)	UJ, L3,MS3
	096658-024/OBS-MW2	m-Nitrotoluene (99-08-1)	UJ, 14
	096658-024/OBS-MW2	o-Nitrotoluene (88-72-2)	UJ, 14

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
	096658-024/OBS-MW2	p-Nitrotoluene (99-99-0)	UJ, 14
	096658-024/OBS-MW2	Tetryl (479-45-8)	UJ, L3,MS3
	096659-024/OBS-MW2	m-Nitrotoluene (99-08-1)	UJ, 14
	096659-024/OBS-MW2	o-Nitrotoluene (88-72-2)	UJ, 14
	096659-024/OBS-MW2	p-Nitrotoluene (99-99-0)	UJ, 14
	096659-024/OBS-MW2	Tetryl (479-45-8)	UJ, L3,MS3
	096661-024/OBS-MW3	m-Nitrotoluene (99-08-1)	UJ, 14
	096661-024/OBS-MW3	o-Nitrotoluene (88-72-2)	UJ, 14
	096661-024/OBS-MW3	p-Nitrotoluene (99-99-0)	UJ, 14
	096661-024/OBS-MW3	Tetryl (479-45-8)	UJ, L3,MS3
SW846 7196A			
	096653-014/OBS-MW1	Hexavalent Chromium (18540-29-9)	UJ, H2,C3
	096656-014/OBS-EB1	Hexavalent Chromium (18540-29-9)	UJ, C3
SW846 9012B			
	096653-027/OBS-MW1	Cyanide, Total (57-12-5)	UJ, 15,B4
	096656-027/OBS-EB1	Cyanide, Total (57-12-5)	UJ, 15,B4
	096658-027/OBS-MW2	Cyanide, Total (57-12-5)	UJ, 15,B4
	096659-027/OBS-MW2	Cyanide, Total (57-12-5)	UJ, 15,B4
	096661-027/OBS-MW3	Cyanide, Total (57-12-5)	UJ, 15,B4

All other analyses met QC acceptance criteria; no further data should be qualified.





PO Box 21987 Albuquerque, NM 87154 1-888-678-5447

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Memorandum

Date: November 13, 2014

To: File

From: Monica Dymerski

Subject: Inorganic Data Review and Validation – SNL

Site: SWMU 68 GWM

AR/COC: 615811, 615812, 615813 and 615814

SDG: 358371 Laboratory: GEL

Project/Task: 146422.10.11.01 Analysis: General Chemistry

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM ER Project AOP 00-03 Rev 4.

Summary

Five samples were prepared and analyzed with accepted procedures using methods EPA 7196A (hexavalent chromium), EPA 9012A (total cyanide), EPA 314.0 (perchlorate), EPA 9056 (anions by IC), EPA 353.2 (nitrate/nitrite) and SM 2320B (total alkalinity). Data were reported for all required analytes. Problems were identified with the data package that resulted in the qualification of data.

Hexavalent chromium:

- 1. Sample 358371020 was analyzed beyond the 24 hour method-specified holding time but within 2X the HT. The associated sample result was a non-detect and will be **qualified UJ.H2**.
- 2. The %D was >10% but ≤25% with a negative bias for hexavalent chromium in the ICV associated with samples -005 and -020. The associated samples were non-detects and will be **qualified UJ,C3.**

Total cyanide:

- 1. The intercept for total cyanide was negative with an absolute value > the MDL but ≤3X the MDL. The associated sample results were non-detects and will be **qualified UJ,15.**
- 2. Total cyanide was detected in the ICB at a negative concentration with absolute value > the MDL. The associated sample results were non-detects and will be **qualified UJ,B4.**

Data are acceptable and reported QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times and Preservation

The samples were prepared and analyzed within the prescribed holding times and properly preserved except as noted above in the Summary section and as follows. Samples -034, -047, and -061 were prepared and analyzed very slightly beyond the 24 hour method-specified holding time for hexavalent chromium. Based on professional judgment, no data will be qualified.

Calibration

All initial and continuing calibration met QC acceptance criteria except as noted above in the Summary section.

Blanks

No target analytes were detected in the blanks except as noted above in the Summary section.

Alkalinity blank results were reported, but were not assessed for data validation.

Laboratory Control Sample (LCS)

All LCS acceptance criteria were met.

Matrix Spike (MS)

All MS/PS recoveries met QC acceptance criteria.

Laboratory Replicate

The replicate analyses met all QC acceptance criteria.

Detection Limits/Dilutions

All detection limits were properly reported. The samples were not diluted except as follows.

Nitrate/Nitrite:

All samples except -022 (EB) were diluted 5X.

Anions:

All samples *except* -021 (EB) were diluted 10X for chloride and sulfate.

Other QC

An EB was submitted with ARCOC 615812 and it was associated with the samples from ARCOC 615813. A field duplicate pair was submitted with ARCOC 615813. There are no "required" review criteria for field duplicate analyses comparability; no data will be qualified as a result.

No other specific issues that affect data quality were identified.

Reviewed by: Mary Donivan Level: I Date: 11/17/14





PO Box 21987 Albuquerque, NM 87154 1-888-678-5447

www.againc.net

Memorandum

Date: November 13, 2014

To: File

From: Monica Dymerski

Subject: LC/MS/MS Organic Data Review and Validation – SNL

Site: SWMU 68 GWM

AR/COC: 615811, 615812, 615813 and 615814

SDG: 358371 Laboratory: GEL

Project/Task: 146422.10.11.01 Analysis: High Explosives (HE)

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. Data are evaluated using SNL/NM SMO AOP 00-03 Rev 4.

Summary

Five samples were prepared and analyzed with accepted procedures using method EPA 8321A Mod. (HE by LCMSMS). All compounds were successfully analyzed. Problems were identified with the data package that resulted in the qualification of data.

- 1. The ICAL RFs for m-nitrotoluene, o-nitrotoluene and p-nitrotoluene were <0.05 but ≥0.01. All associated sample results were NDs and will be **qualified UJ,I4.**
- 2. The LCS %R was < the lower acceptance limit but ≥10% for Tetryl. The associated sample results were non-detects and will be **qualified UJ,L3.**
- 3. The MS and MSD %Rs were < the lower acceptance limit but ≥10% for Tetryl. The associated sample results were non-detects and will be **qualified UJ,MS3.**

Data are acceptable and reported QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times

The samples were extracted and analyzed within the prescribed holding times and were properly preserved.

Instrument Tune

The instrument tune was not reported or evaluated.

Calibration

All initial and continuing calibration met QC acceptance criteria except as noted above in the Summary section.

Reporting Limit Verification

All CRI recoveries met QC acceptance criteria.

Blanks

No target analytes were detected in the blanks.

Surrogates

All surrogate recoveries met QC acceptance criteria.

Internal Standards

All internal standards met QC acceptance criteria.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

The MS/MSD analyses met all QC acceptance criteria except as noted above in the Summary section.

Laboratory Control Sample (LCS)

All LCS recoveries met QC acceptance criteria except as noted above in the Summary section.

Detection Limits/Dilutions

All detection limits were properly reported. According to laboratory procedure, all sample and QC extracts were diluted 2X with HPLC grade water.

Other QC

An EB was submitted with ARCOC 615812 and it was associated with the samples from ARCOC 615813. A field duplicate pair was submitted with ARCOC 615813. There are no "required" review criteria for field duplicate analyses comparability; no data will be qualified as a result.

No other specific issues that affect data quality were identified.

Reviewed by: Mary Donivan Level: I Date: 11/17/14





PO Box 21987 Albuquerque, NM 87154 1-888-678-5447

www.aqainc.net

Date: November 13, 2014

To: File

From: Monica Dymerski

Subject: Inorganic Data Review and Validation – SNL

Site: SWMU 68 GWM

AR/COC: 615811, 615812, 615813 and 615814

SDG: 358371 and 358373

Laboratory: GEL

Project/Task: 146422.10.11.01

Analysis: Metals

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM ER Project AOP 00-03 Rev 4.

Summary

Five unfiltered samples were prepared and analyzed with approved procedures using methods EPA 6010B (ICP-AES), EPA 6020 (ICP-MS) and EPA 7470A (CVAA mercury) and five filtered samples were prepared and analyzed with approved procedures using methods EPA 6020 (ICP-MS). Data were reported for all required analytes. No problems were identified with the data package that resulted in the qualification of data.

Data are acceptable and reported QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times and Preservation

The samples were prepared and analyzed within the prescribed holding times and properly preserved.

ICP-MS Instrument Tune

The ICP-MS tunes met QC acceptance criteria.

Calibration

All initial and continuing calibration criteria met QC acceptance criteria.

Reporting Limit Verification

All CRA/CRI recoveries associated with the samples met QC acceptance criteria.

It should be noted that the CRI was analyzed at the PQL and not at 2X the PQL for all target analytes.

Blanks

No target analytes were detected in the blanks except as follows. Cu was detected at > the PQL in unfiltered EB sample 358371019, which was associated with samples -033 and -046. The associated sample results were non-detects and will not be qualified.

U was detected at < the PQL in the ICB. The associated sample results were either detects >5X the ICB concentration or non-detects and will not be qualified.

ICP -MS Internal Standards

The ICP-MS internal standards met QC acceptance criteria.

Matrix Spike (MS)

The MS met all QC acceptance criteria except as follows.

ICP-MS:

The unfiltered parent sample concentrations for Ca, Mg and Na were >4X the spike and the %Rs for Ca, Mg, and Na did not meet acceptance criteria. The filtered parent sample concentrations for Ca, Mg and Na were >4X the spike and the %Rs for Mg and Na did not meet acceptance criteria. However, an MS analysis is not required for these analytes. Therefore, no sample data will be qualified.

Laboratory Replicate

The replicate met all QC acceptance criteria.

Laboratory Control Sample (LCS)

The LCS met all QC acceptance criteria.

Detection Limits/Dilutions

All detection limits were properly reported. All unfiltered samples *except* 358371019 were diluted 5X for Ca and all filtered samples *except* 358373002 were diluted 5X for Ca.

ICP Interference Check Sample (ICS A and AB)

Results of the ICS A and AB analyses were not evaluated because the sample concentration of Ca, Mg, Al and Fe were < that in the ICS solution.

ICP Serial Dilution

The serial dilutions met all QC acceptance criteria.

Other QC

An EB was submitted with ARCOC 615812 and it was associated with the samples from ARCOC 615813. A field duplicate pair was submitted with ARCOC 615813. There are no "required" review criteria for field duplicate analyses comparability; no data will be qualified as a result.

No other specific issues that affect data quality were identified.

Reviewed by: Mary Donivan Level: I Date: 11/17/14





PO Box 21987 Albuquerque, NM 87154 1-888-678-5447

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Memorandum

Date: November 13, 2014

To: File

From: Monica Dymerski

Subject: Radiochemical Data Review and Validation – SNL

Site: SWMU 68 GWM

AR/COC: 615811, 615812, 615813 and 615814

SDG: 358371 Laboratory: GEL

Project/Task: 146422.10.11.01

Analysis: RAD

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM ER Project AOP 00-03 Rev 4.

Summary

Five samples were prepared and analyzed with approved procedures using methods EPA 901.1 (gamma spec – short list), DOE EML HASL 300 (alphaspec uranium) and EPA 900.0 (gross alpha/beta). Problems were identified with the data package that resulted in the qualification of data.

All analyses:

1. All sample results which were either < the associated 2-sigma TPU or < the associated MDA will be **qualified BD,FR3.**

Gross Alpha/Beta:

1. The relative dilution factor between the parent sample and the gross alpha/beta MS/MSD QC samples was >5 and, as a result, the MS/MSD analyses were not used to evaluate gross alpha and gross beta sample data. The associated sample results will be **qualified J,MS1**.

Gammaspec:

- 1. The K-40 result for sample 358371068 was rejected by the laboratory due to the peak not meeting identification criteria and will be **qualified R,Z2**.
- 2. All sample results that were > the MDA but $\le 3X$ the MDA will be **qualified J,FR7.**

Holding Times and Preservation

The samples were prepared and analyzed within the prescribed holding times and were properly preserved with the following exception. The gamma spec container for sample -068 was received at a pH of 7. Nitric acid was added by the laboratory upon receipt. No sample data will be qualified as a result.

Quantification

All quantification criteria were met except as noted above in the Summary section.

Calibration

The case narratives stated that the instruments used were properly calibrated.

Blanks

No target analytes were detected in the blanks at concentrations > the MDA and 2-sigma TPU.

Tracer/Carrier Recovery

The sample tracer recoveries met QC acceptance criteria.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

The MS/MSD met all QC acceptance criteria except as noted above in the Summary section.

Gross Alpha/Beta:

It should be noted that the MS/MSD was performed on a sample of similar matrix from another SNL SDG. No sample data will be qualified as a result.

Laboratory Replicate

All replicate error ratio acceptance criteria were met.

Gross Alpha/Beta:

It should be noted that the replicate was performed on a sample of similar matrix from another SNL SDG. No sample data will be qualified as a result.

Laboratory Control Sample (LCS)

All LCS recoveries met QC acceptance criteria.

Detection Limits/Dilutions

The samples were not diluted. All required detection limits were met.

Other QC

An EB was submitted with ARCOC 615812 and it was associated with the samples from ARCOC 615813. A field duplicate pair was submitted with ARCOC 615813. There are no "required" review criteria for field duplicate analyses comparability; no data will be qualified as a result.

No other specific issues that affect data quality were identified.

Reviewed by: Mary Donivan Level: I Date: 11/17/14





www.againc.net

Memorandum

Date: November 13, 2014

To: File

From: Monica Dymerski

Subject: GC/MS Organic Data Review and Validation – SNL

Site: SWMU 68 GWM

AR/COC: 615811, 615812, 615813 and 615814

SDG: 358371 Laboratory: GEL

Project/Task: 146422.10.11.01

Analysis: SVOCs

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. Data are evaluated using SNL/NM SMO AOP 00-03 Rev 4.

Summary

Five samples were prepared and analyzed with accepted procedures using methods EPA 3510C/8270D (SVOCs). All compounds were successfully analyzed. Problems were identified with the data package that resulted in the qualification of data.

1. The MS/MSD RPD was > the acceptance limit for 4-nitrophenol. The associated sample results were non-detects and will be **qualified UJ,MS5.**

Data are acceptable and reported QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times

The samples were analyzed within the prescribed holding times and were properly preserved.

Instrument Tune

All instrument tune requirements were met.

Calibration

The initial calibration and continuing calibration data met QC acceptance criteria except as follows.

The CCV %Ds were >20% but ≤40% with negative bias for bis(2-chloro-1-methylethyl)ether, 2,4-dinitrophenol, p-nitroaniline, and pentachlorophenol. The associated sample results were non-detects and since no other calibration infractions occurred, will not be qualified.

The CCV %D was >20% with positive bias for atrazine. All associated sample results were non-detects, and will not be qualified.

Blanks

No target analytes were detected in the blanks.

Surrogates

All surrogate recoveries met QC acceptance criteria except as follows. The 2-fluorophenol, 2,4,6-tribromophenol, nitrobenzene-d5, 2-fluorobiphenyl, and p-terphenyl-d14 surrogate %Rs were > the upper acceptance limits for sample 358371045. All associated sample results were non-detects and will not be qualified.

Internal Standards

All internal standards met QC acceptance criteria.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

All MS/MSD acceptance criteria were met except as noted above in the Summary section.

Laboratory Control Sample (LCS)

All LCS acceptance criteria were met.

Detection Limits/Dilutions

All detection limits were properly reported. The samples were not diluted.

Tentatively Identified Compounds (TICs)

TIC reports were not required.

Other QC

An EB was submitted with ARCOC 615812 and it was associated with the samples from ARCOC 615813. A field duplicate pair was submitted with ARCOC 615813. There are no "required" review criteria for field duplicate analyses comparability; no data will be qualified as a result.

No other specific issues that affect data quality were identified.

Reviewed by: Mary Donivan Level: I Date: 11/17/14





www.againc.net

Memorandum

Date: November 13, 2014

To: File

From: Monica Dymerski

Subject: GC/MS Organic Data Review and Validation – SNL

Site: SWMU 68 GWM

AR/COC: 615811, 615812, 615813 and 615814

SDG: 358371 Laboratory: GEL

Project/Task: 146422.10.11.01

Analysis: VOCs

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. Data are evaluated using SNL/NM SMO AOP 00-03 Rev 4.

Summary

Eleven samples were prepared and analyzed with accepted procedures using method EPA 8260B (VOCs). All compounds were successfully analyzed. No problems were identified with the data package that resulted in the qualification of data.

Data are acceptable and reported QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times

The samples were analyzed within the prescribed holding time and were properly preserved.

Instrument Tune

All instrument tune requirements were met.

Calibration

The initial calibration and continuing calibration data met QC acceptance criteria except as follows.

The ICV %D was >20% but ≤40% with negative bias for 2-butanone. All associated sample results were non-detects, and, since no other calibration infractions occurred, no sample results will be qualified.

The CCV %D was >20% with positive bias for dichlorodifluoromethane. The associated results for all samples were non-detects and will not be qualified.

Blanks

No target analytes were detected in the blanks except as follows. Acetone and bromodichloromethane were detected at a concentration < the PQL and chloroform at a concentration > the PQL in FB sample -001, associated with sample -002, and in EB sample -017, associated with samples -031 and -044. The associated sample results were non-detects and will not be qualified.

Bromodichloromethane was detected at a concentration < the PQL and chloroform was detected at a concentration > the PQL in FB, sample -016, which was not associated with any samples. No sample data will be qualified as a result.

Surrogates

All surrogate recoveries met QC acceptance criteria.

Internal Standards

All internal standards met QC acceptance criteria.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

All MS/MSD acceptance criteria were met except as follows. The MS %Rs were > the upper acceptance limits for benzene and methylene chloride. The associated sample results were non-detects and will not be qualified.

Laboratory Control Sample (LCS)

All LCS acceptance criteria were met.

Detection Limits/Dilutions

All detection limits were properly reported. The samples were not diluted.

Tentatively Identified Compounds (TICs)

TIC reports were not required.

Other QC

Four TBs were submitted, one associated with each ARCOC. An EB was submitted with ARCOC 615812 and it was associated with the samples from ARCOC 615813. An FB was submitted with ARCOC 615811 and was associated with the sample from that ARCOC. A second FB was submitted with ARCOC 615812, and was not associated with any field samples. A field duplicate pair was submitted with ARCOC 615813. There are no "required" review criteria for field duplicate analyses comparability; no data will be qualified as a result.

No other specific issues that affect data quality were identified.

Reviewed by: Mary Donivan Level: I Date: 11/17/14

Data Validation Summary Worksheet

AR/COC #: 615811, 615812, 615813 and 615814

Site/Project: SWMU 68 GWM

Validation Date: 11/13/2014

SDG #: 353871 and 358373

Laboratory: GEL Laboratories LLC

Validator: Monica Dymerski

Matrix: Aqueous

of Samples: 76

CVR present: Yes

Analysis Type: X Organic X Metals

AR/COC(s) present: Yes

Sample Container Integrity: OK

X Rad X Gen Chem

		Requ	ested Anal	yses Not R	eported	
Sample Number	Laboratory ID	organic	genchem	metals	rad	Comments
None						

		Hold Time	e/Preservatio	on Outliers				
Sample Number	Laboratory ID	Analysis	Pres.	Coll. Date	Prep. Date	Anal. Date	Anal. within 2X HT	Anal. beyond 2X HT
096653-014	358371020	EPA 7196A Cr ⁺⁶	4°C	10/06/14 09:24	NA	10/07/14 11:08	yes	no
096658-014	358371034	EPA 7196A Cr ⁺⁶	4°C	10/07/14 09:28	NA	10/08/14 10:17	yes	no
096659-014	358371047	EPA 7196A Cr ⁺⁶	4°C	10/07/14 09:28	NA	10/08/14 10:19	yes	no
096661-014	358371061	EPA 7196A Cr ⁺⁶	4°C	10/08/14 09:21	NA	10/09/14 10:16	yes	no

Comments: Samples collected 10/06-08/2014. Sample 0969661-033 was received at a pH of 7 and was acidified with HNO₃ upon receipt.

Revised 7/2007

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Organic Worksheet (GC/MS)

AR/COC #: 615811, 615812, 615813 and 615814 SDG #:358371 Matrix: Aqueous

Laboratory Sample IDs: 358371001, -002, -015, -016, -017, -030, -031, -044, -057, -058 and -071

Method/Batch #s: 8260B: **1428028** Tuning (pass/fail): pass TICs Required? (yes/no) no

			C	alibration			5X				MS/		5X				
Analyte (outliers)		Int.	RF	RSD/R ²	CCV (ICV) %D	Method Blank	(10X) Blank	LCS %R	MS %R	MSD %R	MSD RPD	FB1 -001	(10X) FB1	FB2 - 016	5X (10X) FB1	EB1 -017	5X (10X) EB1
acetone		NA	✓	✓	✓	✓	NA	✓	✓	✓	✓	3.19J	(31.9)	✓	NA	2.72J	(27.2)
bromodichlorometh	ane	NA	✓	✓	✓	✓	NA	✓	✓	✓	✓	0.540J	2.7	0.480J	2.4	0.420J	2.1
chloroform		NA	✓	✓	✓	✓	NA	✓	✓	✓	✓	5.53	27.65	4.86	24.3	4.64	23.2
benzene		NA	✓	✓	✓	✓	NA	✓	119	✓	✓	✓	NA	✓	NA	✓	NA
methylene chloride		✓	✓	✓	✓	✓	NA	✓	121	✓	✓	✓	NA	✓	NA	✓	NA
2-butanone		NA	✓	✓	(-21.3)	✓	NA	✓	✓	✓	✓	✓	NA	✓	NA	✓	NA
dichlorofluorometh	ane	NA	✓	✓	23.0	✓	NA	✓	✓	✓	✓	✓	NA	✓	NA	✓	NA
-							Surroga	ate Reco	very (Jutliers	3						
Sample ID																	
None																	
								IS Out	tliers								
Sample ID Ar	ea	RT	Area	RT	Area	n RT		Area	R	T	Area	1	RT			Aı	rea RT
None																	

Comments: HTs OK, ICAL VOA6 09/05/14; samples analyzed 10/17/14. MS/MSD performed on -002

Organic Worksheet (GC/MS)

AR/COC #: 615811, 615812, 615813 and 615814 SDG #:358371 Matrix: Aqueous

Laboratory Sample IDs: 358371003, -018, -032, -045 and -059

Method/Batch #s: 3510C/8270D 1425971/1425972 Tuning (pass/fail): pass TICs Required? (yes/no) no

				Calib	ration			EV.				MC				
	nalyte utliers)		Int.	RF	RSD/ R ²	CCV (ICV) %D	Method Blank	5X (10X) Blank	%R	MS %R	MSD %R	MS/ MSD RPD	EB -018	5X (10X) EB		
4-nitrophenol			✓	✓	✓	✓	✓	NA	√	✓	✓	31.8	✓	NA		
Bis(2-chloro-1-methy	lethyl)ether		NA	✓	✓	-28.35	✓	NA	✓	✓	✓	✓	√	NA		1
2,4-dinitrophenol			✓	✓	✓	-24.73	✓	NA	✓	✓	✓	✓	√	NA		1
p-nitroaniline			✓	✓	✓	-20.6	✓	NA	✓	✓	✓	✓	√	NA		
pentachlorophenol			✓	✓	✓	-28.75	✓	NA	✓	✓	✓	✓	✓	NA		
atrazine			NA	✓	✓	24.5	✓	NA	√	√	✓	✓	✓	NA		
							Recovery	Outline								
														1		
Sample ID 358371045		ophenol 8%		Phenol	-d5	2,4,6-1	tribromop 282%	henol	Nitrober 20	nzene-d5 4%		2-fluorob 201		p-te	erphen 263%	
						l	S Outliers							[
Sample ID	Area	RT	Ar	ea	RT	Are	a I	RT	Area	RT		Area	RT	Are	a	RT
None																

Comments: HTs OK, ICAL MSD8.I 09/16/14 and 09/23/14. Samples analyzed 10/12/14.

MS/MSD performed on sample -003.

High Explosives Worksheet (LC/MS/MS)

AR/COC #: 615811, 615812, 615813 and 615814

SDG #: 358371

Matrix: Aqueous

Laboratory Sample IDs: 358371010, -025, -039, -052 and -066

Method/Batch #s: 3535/8321A 1426109/1426110

Analyte	In	itial Cal	libration	(Continuing	Calibration	on	Method	5X (10X)	LCS	MS	MSD	MS/ MSD		EB	
(Outliers)	Int.	RF	COD RSD/R ²	ICV	CCV	ICB	ССВ	Blank	Blank	%R	%R	%R	RPD	CRI	-044	
m-nitrotoluene	✓	0.022	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
o-nitrotoluene	✓	0.027	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
p-nitrotoluene	✓	0.012	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
tetryl	✓	✓	✓	✓	✓	✓	✓	✓	✓	34.8	31.8	31.6	✓	✓	✓	
																ig
						Su	rrogate	Recovery O	 utliers							
Sample ID																
None																
				 		Ir	iternal S	tandard Ou	tliers							
Sample ID	Are	ea	RT		Sampl	e ID		Area	R'	Т		Sample	ID	Ar	ea 📗	RT
None																
	1															

Comments: HTs OK; MS/MSD performed on sample -010; all sample and QC extracts diluted 1:1 with LC reagent grade water ICAL LCMSMS3 10/17/2014. Samples analyzed on 10/17-18/2014.

Inorganic Metals Worksheet

AR/COC #: 615811, 615812, 615813 and 615814

SDG #: 358371 and 358373

Laboratory Sample IDs: 358371004, -019, -033, -046 and -060 (UF); 358373001 through -005 (F, 6020 Ca, Mg, K, and Na only)

Method/Batch #s: 3005A/6010B (ICP-AES): 1425949(prep)/1425950 3005A/6020 (ICP-MS): UF: 1426070(prep)/1426074 F: 1426118(prep)/1426122 7470A (Hg):

1426760(prep)/1426761

ICPMS Mass Cal (pass/fail) pass

ICPMS Resolution (pass/fail) pass

Analyte			Cal	libratio	n		Method	5X Blank or	LCS	MS	Lab Rep.	Serial Dil.	ICS AB	ICS A ±	CRA/ CRI	UF EB	5X	
(outliers)	Int.	\mathbb{R}^2	ICV	ccv	ICB	ССВ	Blank	5X MDL	%R	%R	RPD	%D	%R	MDL	%R	358371019	EB	
Cu (UF)	✓	✓	✓	✓	✓	✓	✓	NA	✓	✓	✓	✓	NA	NA	✓	0.00194	0.0097	
Ca (UF)	✓	✓	✓	✓	✓	✓	✓	NA	✓	220*	✓	✓	NA	NA	✓	✓	NA	
Mg (UF)	✓	✓	✓	✓	✓	✓	✓	NA	✓	150*	✓	✓	NA	NA	✓	✓	NA	
Na (UF)	✓	✓	✓	✓	✓	✓	✓	NA	✓	160*	✓	✓	NA	NA	✓	✓	NA	
U (UF)	√	✓	✓	✓	0.07J	√	✓	0.35	✓	✓	✓	✓	NA	NA	✓	✓	NA	\blacksquare
Mg(F)	√	✓	√	✓	√	√	✓	NA	✓	135*	✓	✓	NA	NA	✓	✓	NA	\top
Na (F)	✓	✓	✓	√	√	✓	✓	NA	√	185*	✓	√	NA	NA	√	✓	NA	
																		$\perp \!\!\! \perp \!\!\! \parallel$

	IS Outliers	60-125%			IS Outliers	80-120%	
Sample ID	%Recovery	%Recovery	%Recovery	CCV/CCB ID	%Recovery	%Recovery	%Recovery
None				None			

Comments: HTs OK. Matrix QC performed on 352683004 for ICP-MS, ICP-AES and Hg. *Ca, Mg, and Na >4X spike amount.

All unfiltered samples except 358371019 were diluted 5X for Ca and all filtered samples except 358373002 were diluted 5X for Ca.

Matrix: Aqueous

General Chemistry Worksheet

AR/COC #: 615811, 615812, 615813 and 615814 SDG #: 358371 Matrix: Aqueous

Laboratory Sample IDs: 358371 - See below

Method/Batch #s: EPA 9012A (total cyanide): Batch 1426060(prep)/1426061 Samples -011, -026, -040, -053 and -067

Method/Batch #s: EPA 314.0 (perchlorate): Batch 1426176 Samples -008, -023, -037, -050 and -064

Method/Batch #s: EPA 9056 (anions): Batch 1426695 Samples -006, -021, -035, -048 and -062

Method/Batch #s: EPA 353.2 (NO₃/NO₂ – N): Batch 1425672 Samples -007, -022, -036, -049 and -063

Method/Batch #s: EPA 7196A (hexavalent Cr): Batch 1425131 Samples -005 and -020; Batch 1425575 Samples -034 and -047; Batch 1425936 Sample -061

Method/Batch #s: SM2320B (alkalinity): Batch 1427551 Samples -009, -024, -038, -051, and -065

Amalysta			Calib	ration				5X Blank			Lab Rep.			
Analyte (outliers)	Int.	\mathbb{R}^2	ICV %D	CCV %D	ICB	ССВ	Method Blank	or (5X MDL)	LCS %R	MS %R	RPD	EB	5X EB	
total cyanide	-0.00186	✓	✓	✓	-0.00208	✓	✓	(0.00835)	✓	✓	✓	✓	NA	
hexavalent Cr	✓	✓	-11.6*	✓	✓	✓	✓	NA	✓	✓	✓	✓	NA	

Comments: HTs OK for all analyses except Cr⁺⁶. **Matrix QC: 9012A:** performed on sample -011; **314.0:** performed on sample -008; **9056**: performed on sample -006; **353.2**: performed on sample -007; **7196A;** performed on sample -005(1425131), -034(1425575) and -061(1425936); **SM2320B**: performed on sample -009.

 $Anions-all\ samples\ except\ EB\ diluted\ 10X\ for\ Cl\ and\ SO4.\ NO_3/NO_2-all\ samples\ except\ EB\ diluted\ 5X$

*associated with samples -005 and -020.

Radiochemistry Worksheet

AR/COC #: 615811, 615812, 615813 and 615814 SDG #: 358371 Matrix: Aqueous

Laboratory Sample IDs: 358371- See below

Method/Batch #s: EML HASL 300 (alphaspec U): Batch 1426102 Samples -014, -029, -043, -056 and -070

Method/Batch #s: EPA 901.1 (gamma spec): Batch 1426848 Samples -012, -027, -041, -054 and -068

Method/Batch #s: EPA 900.0 (Gross alpha/beta): Batch 1430818 Samples -013, -028, -042, -055 and -069

Analyte (outliers)	Control Freq.	Control Eval.	Method Blank	5X Blank or 5X MDC	LCS %R	MS %R	MSD %R	N	MS/ MSD RER	Lab Rep. RER	ЕВ			
None														
				Tracer/C	arrier Re	covery Ou	tliers							
Sample ID	Tracer/Ca	arrier %	R	Sample ID		Tracer/	Carrier	%R		Sample	ID	Trac	cer/Carrier	%R
None														

Comments: Matrix QC: HASL 300: performed on -014 901.1: Performed on sample -012. 900.0: Performed on an SNL sample from another SDG.

Gross alpha/beta parent and DUP = 150 ml, MS/MSD=25 ml (6X dilution)-results qualified.

Peak rejected by laboratory due to peak not meeting identification criteria:-068 (K-40)

CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab														_	Page	e <u>1</u> of <u>2</u>
Batch No. N	A					SMO Use	1				1	011		AR/COC	61	5811
Project Name		SWMU 6		Date Samples	Shipped:		0 14		SMO A	uthorization	8/4	Lin	`	Waste Characterization		
Project/Task	Manager:			Carrier/Waybi	ll No.	22	451	1,5	SMO C	ontact Phone	e: *	0	GMO	RMMA		
Project/Task	Number:			Lab Contact:		Edie Kent/8	03-556-8	8171		Lorraine I	Herrera/50	5-844-3199		Released by COC No.		
Service Orde	er:	CF263-15	5	Lab Destination	on:	GEL			Send Re	eport to SM0	O:				4	4° Celsius
				Contract No.:		PO 1303873	3			Rita Kava	anaugh/505	-284-2553		Bill to:Sandia National Laboratorio	es (Accou	ınts Payable),
Tech Area:														P.O. Box 5800, MS-0154		
Building:		Room:		Operationa	l Site:									Albuquerque, NM 87185-0154		
	T			<u> </u>	Depth	Date/T	me	Sample	Co	ntainer	Preserv-	Collection	Sample	Parameter & Metho	d	Lab
Sample No.	Fraction	Sar	nple Location D	etail	(ft)	Collec	ted	Matrix	Туре	Volume	ative	Method	Туре	Requested	-	Sample ID
000050	204	000 504				40/0/44	0.00				1					358371
096652	-001	OBS-FB1			NA	-10/6/14	9:20	DIW	G	3x40ml	HCL	G	FB	TCL VOC (SW846-8260B)		35837
096653	-001	OBS-MW	1		153	'10/6/14	9:21	十 GW	G	3x40ml	HCL	G	SA	TCL VOC (SW846-8260B)		002
000000	000	000 101	. 4		450	. 10/0/11						_			······································	358371
096653	-002	OBS-MW	1		153	10/6/14	9:22	GW	AG	4x1 L	None	G	SA	TCL SVOC (SW846-8270C)		003
096653	-010	OBS-MW	1		153	10/6/14	9:23 -	├ GW	Р	500 ml	HNO3	G	SA	TAL Metals+U (SW846-6010/602	(0/7470)	358371
										<u> </u>				,		358371
096653	-014	OBS-MW	1		153	10/6/14	9:24 7	GW	Р	250 ml	None	G	SA	Hexavalent Chromium (SW846-7	196A)	020
096653	-016	OBS-MW	1		153	`10/6/14	9:25 -	t _{GW}	P	125 ml	None	G	SA	Anions (SW846-9056)		358371
200050	047	000 100			450	* 40/0/44	000 1				T	_		· ·		358373
096653	-017	OBS-MW	1		153	10/6/14	9:26 ′	FGW	Р	500 ml	HNO3	G	SA	Metals-Ca,Mg,K,Na (SW846	-6020)	001
096653	-018	OBS-MW	1		153	10/6/14	9:27	∤ gw	P	125 ml	H2SO4	G	SA	Nitrate+Nitrite (EPA 353.2)		358371
		000.000			450	*			_					<u> </u>		358377
096653	-020	OBS-MW	1		153	10/6/14	9:30	GW	Р	250 ml	None	G	SA	Perchlorate (EPA 314.0)		008
096653	-022	OBS-MW	1		153	10/6/14	9:31	T GW	Р	500 ml	None	G	SA	Alkalinity (SM2320B)		358371
Last Chain	:	Yes			Sample	Tracking		SMO	Use	Special Ins	structions	QC Requir	ements:		Conc	ditions on
Validation	Req'd:	✓ Yes			Date Ent	ered:				EDD		Yes		No	R	eceipt
Backgroun	d:	Yes			Entered	by:	WALL THE			Turnaroun	d Time	7 Day	Č	<u>15 Day*</u>		
Confirmato	ry:	Yes			QC inits.					Negotiated	I TAT		***************************************			
Sample	N	ame	Signatu	ire	Init.	Company/	Organiza	tion/Phone	e/Cell	Sample Dis	sposal	Return	to Client	Disposal by Lab		
Team	Robert L	ynch		rch	RI	SNL/4142/50	5-844-401	13/505-250	0-7090	Return Sar	nples By:	******				
1	Alfred Sa		AUGE	p.M		SNL/4142/50				Comments	··	Send report to	Tim Jackson	/4142/MS 0729/284-2547		
1			100	<i>414-</i>						l				is using SW846-6850M.Filtered		
			*************************************											e filter Report Anions (as		The second second
		9								Br,C,F,SO4), as short list is		s total CaCO	3,HCO3,C0	O3), and Gamma Spectroscopy (Le	ab Use
1.Relinquishe	ed by	47-83	attle_	Org. 4142	Date	10/6/14	Time	1115	3.Relinq	uished by	······································		Org.	Date	Time	
1. Received b	ر کیک ور	AG Br	S SIMO	Org. 4142	Date	10/4/14	Time ,	(1.5	3. Recei	ved by			Org.	Date	Time	,
2.Relinquishe		19			7 Date	10/10/19	Time ,			uished by			Org.	Date	Time	,
2. Received b	ру	ML	CE	Org. Cel	Date	1017-14	Time	0800	4. Recei	ved by	****		Org.	Date	Time	,
**************************************		ith SMO re	quired for 7 and					***					<u></u>			

Recipient Initials_ MI

CONTRACT LABORATORY **ANALYSIS REQUEST AND CHAIN OF CUSTODY (Continuation)**

Page 2 of 2 AR/COC 615811 Project Name: **SWMU 68** Project/Task Manager: Clinton Lum Project/Task No.: 146422.10.11.01 Tech Area: Room: **Building:** Lab use Depth Date/Time Sample Container Collection Sample Parameter & Method Lab Preserv-Sample No. Fraction Sample Location Detail (ft) Collected Matrix Type Volume ative Method Type Requested Sample ID 358371 096653 -024 OBS-MW1 153 £10/6/14 9:33 GW AG 4x1 L None G SA High Explosives (SW846-8321A mod 010 15837 096653 -027 OBS-MW1 10/6/14 153 9:34 Р GW 250 ml NaOH G SA Total Cyanide (SW846-9012) 35837 096653 -033 OBS-MW1 153 -10/6/14 9:35 GW Р 1 L HNO₃ G SA Gamma Spectroscopy (EPA 901.0) 012 35837 013 096653 -034 OBS-MW1 153 10/6/14 9:36 Р GW 1 L HNO3 G SA Gross Alpha and Beta (EPA 900.0) 35837 096653 -035 OBS-MW1 153 *10/6/14 9:38 GW Ρ 1 L HNO3 G SA Isotopic Uranium (HASL 300) 35837, 096654 -001 OBS-TB1 NA ·10/6/14 9:21 DIW G 3x40 ml HCL G TB TCL VOC (SW846-8260B)

CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab					www.common.com								A		Page	e <u>1</u> of <u>2</u>
Batch No. /	VIA					SMO Use	, ,					10		AR/COC	61	5812
Project Name	e:	SWMU 68	GWM	Date Samples	Shipped:	10	6/14		SMO A	uthorization:		471	w	Waste Characterization	Desire Control of Control	
Project/Task	Manager:	Clinton Lu	m	Carrier/Waybill	No.	720	456	5	sмо с	ontact Phon	e:	V	Swa	RMMA		
Project/Task	Number:	146422.10	0.11.01	Lab Contact:		Edie Kent/	803-556-8	3171	1	Lorraine I	Herrera/50	5-844-3199		Released by COC No.		l
Service Orde	r:	CF263-15	~~~	Lab Destination	η;	GEL			Send R	eport to SMC	O;	~2>-2>-2				4º Celsius
				Contract No.:		PO 13038	73		1	Rita Kava	anaugh/505	5-284-2553		Bill to:Sandia National Laboratorie	s (Accou	unts Payable),
Tech Area:							***************************************		***************************************	***************************************				P.O. Box 5800, MS-0154		
Building:		Room:		Operational	Site:									Albuquerque, NM 87185-0154		
				<u>'</u>	Depth	Date/	Time	Sample	Co	ontainer	Preserv-	Collection	Sample	Parameter & Method	<u> </u>	Lab
Sample No.	Fraction	San	nple Location D		(ft)	Colle		Matrix	Type	Volume	ative	Method	Type	Requested	-	Sample ID
								†	 	 				<u> </u>		358377
096655	-001	OBS-FB2			NA	10/6/14	10:46	T DIW	G	3x40ml	HCL	G	FB	TCL VOC (SW846-8260B)		0/6
096656	-001	OBS-EB1			NA	₹10/6/14	10:46	+ DIW	G	3x40ml	HCL	G	EB	TCL VOC (SW846-8260B)		358377
																358371
096656	-002	OBS-EB1			NA	10/6/14	10:48	DIW	AG	4x1 L	None	G	EB	TCL SVOC (SW846-8270C)		018
096656	-010	OBS-EB1			NA	1 0/6/14	10:49	+ DIW	Р	500 ml	HNO3	G	EB	TAL Metals+U (SW846-6010/6020	0/7470)	358311
-								t		000	1			77. E Metalo 10 (0.1010 0010/0020	<i>21110)</i>	3583 77
096656	-014	OBS-EB1			NA	·10/6/14	10:50 <	DIW	Р	250 ml	None	G	EB.	Hexavalent Chromium (SW846-71		005
096656	-016	OBS-EB1			NA	₹10/6/14	10:51	+ DIW	Р	125 ml	None	G	EB	Anions (SW846-9056) 10 8	14 021	358371
								1_	<u> </u>	İ	 					359373
096656	-017	OBS-EB1			NA	10/6/14	10:52	FDIW	Р	500 ml	HNO3	G	EB	Metals-Ca,Mg,K,Na (SW846-	6020)	200
096656	-018	OBS-EB1		1	NA	- 10/6/14	10:53	t _{DIW}	P	125 ml	H2SO4	G	EB	Nitrate+Nitrite (EPA 353.2)		358371
								 	•	1	1			THRUIC (ET 71 000.E)		35837/
096656	-020	OBS-EB1			NA	10/6/14	10:54	DIW	Р	250 ml	None	G	EB	Perchlorate (EPA 314.0)		023
096656	-022	OBS-EB1			NA	10/6/14	10:55	DIW	Р	500 ml	None	G	EB	Alkalinity (SM2320B)		358371
Last Chain	* •	Yes		s	Sample	Tracking		SMC	Use	Special Ins	structions	/QC Reguir	ements:		Conc	ditions on
Validation	Rea'd:	✓ Yes		Ē	Date Ent	ered:				EDD		✓ Yes		No	R	Receipt
Backgroun		Yes		le le	Entered	bv:			VANE SAA	Turnaroun	d Time	7 Da	***************************************	15 Day*		
Confirmato		Yes	······································		QC inits.				Tankillar.	Negotiated	TAT					
Sample	T	ame	Signatu		Init.		y/Organiza	tion/Phon	e/Cell	Sample Di		Return	to Client	☑ Disposal by Lab		
, -	Robert L		VATZU			SNL/4142/5				Return Sai						
Members	Alfred Sa		1101.05	tille		SNL/4142/5				Comments		Sand report to	Tim lockson	/4142/MS 0729/284-2547		
Mellipers	Allieu 3e	indinanes	Hygasan	nee	056	ONL/4142/0	00-044-010	00/000-22	0-07 10	1		•		is using SW846-6850M.Filtered		
			,											e filter.Report Anions (as		
												as total CaCC	3,HCO3,C0	D3), and Gamma Spectroscopy (
	<u> </u>	111		<u> </u>	P44	ate los		>	I	as short list is	sotopes).					ab Use
1.Relinquishe		THE C		Org. 4142			Time			uished by		***************************************	Org.	Date	Time	
1. Received b		17/	7.7	Org. 4/12		10/11/14	<u>-</u>	124	3. Rece				Org.	Date	Time	
2.Relinquishe	4.00	7/4/40	LA GIV		<u> </u>	10/6/19	Time j			uished by			Org.	Date	Time	
2. Received b		1/1/1/		Org. Lel	Date	10-7-14	Time 2	<u> </u>	4. Rece	ived by			Org.	Date	Time	<u> </u>
*Prior confir	mation w	ith SMO red	guired for 7 and	15 day TAT		·										

CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY (Continuation)

*******	manufacture amount for any for any and a present service								· · · · · · · · · · · · · · · · · · ·		·			AR/GUG 61	381Z
	Project Nam	e:	SWMU 68	Project/Ta:	sk Mana	ger:	Clinton Lur	n		Project/Ta:	sk No.:	146422	2.10.11.01		
	Tech Area:	Tech Area:													
	Building:		Room:	-											Lab use
electro po	~~~~			**************************************	Depth	Date/	Time	Sample	Co	ntainer	Preserv-	Collection	Sample	Parameter & Method	Lab
	Sample No.	Fraction	Sample Location D	etail	(ft)	Colle	cted	Matrix	Туре	Volume	ative	Method	Type	Requested	Sample ID
ø	096656	-024	OBS-EB1		NA	10/6/14	10:57 <	DIW	AG	4x1 L	None	G	EB	High Explosives (SW846-8321A mod	358371
ø	096656	-027	OBS-EB1		NA	10/6/14	10:58	DIW	Р	250 ml	NaOH	G	EB	Total Cyanide (SW846-9012)	35837/ 026
,	096656	-033	OBS-EB1		NA	10/6/14	10:59	DIW	Р	1 L	HNO3	G	EB	Gamma Spectroscopy (EPA 901.0)	358377
,	096656	-034	OBS-EB1		NA	- 10/6/14	11:00	DIW	Р	1 L	ниоз	G	EB	Gross Alpha and Beta (EPA 900.0)	027 358371 028
,	096656	-035	OBS-EB1		NA	•10/6/14	11:01 -	DIW	Р	1 L	HNO3	G	EB	Isotopic Uranium (HASL 300)	358371
8	096657	-001	OBS-TB2		NA	10/6/14	10:46 ′	DIW	G	3x40 ml	HCL	G	TB	TCL VOC (SW846-8260B)	358371 030

						\$10.4 STEELS TO STEELS TO STEELS TO STEELS TO STEELS TO STEELS TO STEELS TO STEELS TO STEELS TO STEEL TO STEEL									
	100		. /												
	Recipient Ini	tials <u>///</u>	<u> </u>												

CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab						·				***********		Page 1 of 2
Batch No. N			SMO Use	1					10	1	AR/COC	615813
Project Name:	SWMU 68 GWM	Date Samples Shipped		44			uthorization:		19c 1	mar/	Waste Characterization	
Project/Task Mana		Carrier/Waybill No.	<u> </u>	472	12]sмо с	ontact Phon	e:		-	RMMA	
Project/Task Numb		Lab Contact:	Edie Kent/8	03-556-8	3171		Lorraine I	Herrera/50	5-844-3199	5m0	Released by COC No.	
Service Order:	CF263-15	Lab Destination:	GEL			Send R	eport to SM0	<u>):</u>				— ☑ 4º Celsius
		Contract No.:	PO 1303873	3 4 4]	Rita Kava	anaugh/50	5-284-2553		Bill to:Sandia National Laboratorie	
Tech Area:											P.O. Box 5800, MS-0154	o (riccounts r ayabic),
Building:	Room:	Operational Site:									Albuquerque, NM 87185-0154	
		Depth	Date/Ti	me	Sample	C	ontainer	Preserv-	Collection	Sample		Delegation and Constraint
Sample No. Fract	ion Sample Location D		Collect		Matrix	Type	Volume	ative	Method	Type		
000050 004	000 1010				1	1300	+ Cianic	auve	metrou	Type	Requested	Sample ID 358377
096658 -001	OBS-MW2	252	10/7/14	9:21 /	GW	G	3x40ml	HCL	G	SA	TCL VOC (SW846-8260B)	03/
096658 -002	OBS-MW2	252	10/7/14	9:23	Gw	AG	4x1 L	None	G	C 4	TO! 0\/00 (0\\\)	358371
				***************************************	200	7.0	7/16	None	<u> </u>	SA	TCL SVOC (SW846-8270C)	1092
096658 -010	OBS-MW2	252	. 10/7/14	9:27	GW	P	500 ml	HNO3	G	SA	TAL Metals+U (SW846-6010/6020	<i>35</i> 837/ /7470) <i>0</i> 33
096658 -014	OBS-MW2	252	- 10/7/14	9:28	014				_			358271
	OBO-MV2		10///14	9.20	GW	Р	250 ml	None	G	SA	Hexavalent Chromium (SW846-71	96A) 034
096658 -016	OBS-MW2	252	10/7/14	9:29	GW	Р	125 ml	None	G	SA	Anions (SW846-9056)	35837/
096658 -017	OBS-MW2	050	40.544								7 (110/13 (077040-9030)	<u> </u>
090000 -017	OBS-IVIVV2	252	-10/7/14	9:31	FGW	<u> P</u>	500 ml	HNO3	G	SA	Metals-Ca,Mg,K,Na (SW846-6	020) 003
096658 -018	OBS-MW2	252	-10/7/14	9:32	GW	P	125 ml	H2SO4	G	SA	Nitrate+Nitrite (EPA 353.2)	35837/
000050 000	000.000		T				1-201111	112004		<u> </u>	Nitale+Nitile (EPA 353.2)	036 3 58371
096658 -020	OBS-MW2	252	•10/7/14	9:33	GW	Р	250 ml	None	G	SA	Perchlorate (EPA 314.0)	034
096658 -022	OBS-MW2	252	- 10/7/14	9:34	Gw	Р	500!	N	_			358377
		202	10/7/14	9.54	GVV		500 ml	None	G	SA	Alkalinity (SM2320B)	038
096658 -024	OBS-MW2	252	10/7/14	9:35	GW	AG	4x1 L	None	G	SA	High Explosives (SW846-8321	A mod 35837/
Last Chain:	Yes	Sample	Tracking		SMO	Use	Special Ins	tructions/	QC Require			Conditions on
Validation Req'd	: 🛂 Yes	Date En	tered:				EDD		☑ Yes		No	
Background:	Yes	Entered	by:			On to your	Turnaround	1 Time	7 Day	A	15 Day* / 30 Day	Receipt
Confirmatory:	Yes	QC inits					Negotiated		<u> </u>		13 Day 30 Day	
Sample	Name Signatu		Company/C)raonizoti	on/Dhono	/Call			\			
-							Sample Dis	·	∟ Return	to Client	☑ Disposal by Lab	
ļ	Santillanes All	h ze	SNL/4142/505				Return San		·	······		
		The all	SNL/4142/505				Comments				/4142/MS 0729/284-2547	
VVIIIIar	n Gibson William	upun	SNL/4142/505	-284-3307	7/505-239	-7367	If perchlorate	detected, pe	rform verificat	ion analysi	is using SW846-6850M.Filtered	
		and the second second second second second second second second second second second second second second second					Br.C.F.SO4)	ed in field u Alkalinity /20	sing a 0.45 m s total CaCO3	ICTON IN line	e filter.Report Anions (as 03), and Gamma Spectroscopy (
as short list isotopes).								,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	, and Gamma Speciroscopy (Lab Use		
1.Relinquished by	Relinquished by MAN See Clark Org M/W7 Date 10/7/14 Time 1000 13 Delinquished by									Time		
1. Received by	ZMY for grun	Org. 4142 Date	10714	Time ,		3. Recei			······································	Org.	Date	Time
2.Relinquished by			· · · · · · · · · · · · · · · · · · ·				uished by			Org.	Date	
2. Received by			-1 27 11 1	Time ()	2 43	4. Recei						Time
*Prior confirmation	with SMO required for 7 and		17	<i>U</i>	IFU			····		Org.	Date	Time

CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY (Continuation)

	Project Name: SWMU Tech Area:		SWMU 68	Project/I	Project/Task Manager: Clinton Lum Project/Task No.: 146422.10.11.01										
Build			Room:												Lab use
		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~			Depth	Date/	Time	Sample	Col	ntainer	Preserv-	Collection	Sample	Parameter & Method	Lab
Sam	ple No.	Fraction	Sample Loca	tion Detail	(ft)	Colle	cted	Matrix	Туре	Volume	ative	Method	Type	Requested	Sample I
090	6658	-027	OBS-MW2		252	- 10/7/14	9:39	- GW	Р	250 ml	NaOH	G	SA	Total Cyanide (SW846-9012)	35837
090	6658	-033	OBS-MW2		252	10/7/14	9:40 -	GW	Р	1 L	HNO3	G	SA	Gamma Spectroscopy (EPA 901.0)	35837
090	6658	-034	OBS-MW2		252	10/7/14	9:42 6	GW	Р	1 L	HNO3	G	SA	Gross Alpha and Beta (EPA 900.0)	35837
090	6658	-035	OBS-MW2	_	252	10/7/14	9:44 -	GW	Р	1 L	HNO3	G	SA	Isotopic Uranium (HASL 300)	35837
096	6659	-001	OBS-MW2		252	10/7/14	9:21	GW	G	3x40ml	HCL	G	DU	TCL VOC (SW846-8260B)	044
096	6659	-002	OBS-MW2		252	10/7/14	9:23	GW	AG	4x1 L	None	G	DU	TCL SVOC (SW846-8270C)	35837
096	6659	-010	OBS-MW2		252	10/7/14	9:27	GW	Р	500 ml	HNO3	G	DU	TAL Metals+U (SW846-6010/6020/7470)	35837
090	6659	-014	OBS-MW2		252	·10/7/14	9:28 -	GW	Р	250 ml	None	G	DU	Hexavalent Chromium (SW846-7196A)	35837
096	6659	-016	OBS-MW2		252	10/7/14	9:29	GW	Р	125 ml	None	G	UQ	Anions (SW846-9056)	35837
096	6659	-017	OBS-MW2		252	- 10/7/14	9:31 /	FGW	Р	500 ml	HNO3	G	DU	Metals-Ca,Mg,K,Na (SW846-6020)	35837
096	6659	-018	OBS-MW2		252	، 10/7/14	9:32 🕜	GW	Р	125 ml	H2SO4	G	DU	Nitrate+Nitrite (EPA 353.2)	35837
096	6659	-020	OBS-MW2		252	10/7/14	9:33	GW	Р	250 ml	None	G	DU	Perchlorate (EPA 314.0)	35837
096	6659	-022	OBS-MW2		252	10/7/14	9:34	GW	Р	500 ml	None	G	DU	Alkalinity (SM2320B)	35837
096	6659	-024	OBS-MW2		252	10/7/14	9:35	GW	AG	4x1 L	None	G	DU	High Explosives (SW846-8321A mod	35837 052
096	6659	-027	OBS-MW2		252	`10/7/14	9:39	GW	Р	250 ml	NaOH	G	DU	Total Cyanide (SW846-9012)	35837 05
096	6659	-033	OBS-MW2		252	10/7/14	9:40 -	GW	Р	1 L	HNO3	G	DU	Gamma Spectroscopy (EPA 901.0)	35837
096	6659	-034	OBS-MW2		252	-10/7/14	9:42 <	GW	Р	1 L	HNO3	G	DU	Gross Alpha and Beta (EPA 900.0)	35837 055
096	6659	-035	OBS-MW2		252	*10/7/14	9:44	GW	Р	1 L	HNO3	G	DU	Isotopic Uranium (HASL 300)	35537
096	6660	-001	OBS-TB3		NA	-10/7/14	9:21	DIW	G	3x40 ml	HCL	G	TB	TCL VOC (SW846-8260B)	35337 057

## **CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY**

Internal Lab	*************				~~~~~~~									Page <u>1</u> of <u>2</u>	
Batch No.	NA			SMO Use						1011	7		AR/COC	615814	
Project Name	Project Name: SWMU 68 GWM Date Samples S			1: 10/8	114		SMO A	uthorization	-4/4	4/1		Waste	Characterization		
Project/Task Manager: Clinton Lum Carrier/Waybil				DIII No. <u> </u>					SMO Contact Phone: Swo				RMMA		
Project/Task	Number:	146422.10.11.01	Lab Contact:	Edie Kent/	803-556-	8171		Lorraine I	Herrera/50	5-844-3199		Relea	sed by COC No.		
Service Orde	r:	CF263-15	Lab Destination:	GEL			Send R	eport to SM0	<b>)</b> ;;	***************************************				4º Celsius	
			Contract No.:	PO 13038	73			Rita Kava	anaugh/50	5-284-2553		Bill to:Sandia	National Laboratorie	s (Accounts Payable),	
Tech Area:												P.O. Box 580	0, MS-0154		
Building:		Room:	Operational Site:									Albuquerque,	NM 87185-0154		
			Depth	Date/	Time	Sample	C	ontainer	Preserv-	Collection	Sample	·	ameter & Method	Lab	
Sample No.	Fraction	Sample Location D	Detail (ft)	Colle	cted	Matrix	Туре	Volume	ative	Method	Туре		Requested	Sample ID	
096661	-001	OBS-MW3	208	10/8/14	9:17	GW	G	3x40ml	HCL	G	SA	TCL VOC (	SW846-8260B)	358371 058	
096661	-002	OBS-MW3	208	10/8/14	9:19 ′	GW	AG	4x1 L	None	G	SA	TCL SVOC	(SW846-8270C)	358371 059	
096661	-010	OBS-MW3	208	10/8/14	9:20	+ gw	Р	500 ml	HNO3	G	SA	TAL Metals+t	J (SW846-6010/6020		
096661	-014	OBS-MW3	208	10/8/14	9:21	- GW	Р	250 ml	None	G	SA	Hexavalent C	hromium (SW846-71		
096661	-016	OBS-MW3	208	`10/8/14	9:22	GW	Р	125 ml	None	G	SA	Anions (SW	/846-9056)	358371 062	
096661	-017	OBS-MW3	208	-10/8/14	9:23	FGW	Р	500 ml	HNO3	G	SA	Metals-Ca,N	/lg,K,Na (SW846-6		
096661	-018	OBS-MW3	208	10/8/14	9:24 '	GW	Р	125 ml	H2SO4	G	SA	Nitrate+Nitri	ite (EPA 353.2)	35837/ 063 35837/	
096661	-020	OBS-MW3	208	10/8/14	9:25 ′	GW	Р	250 ml	None	G	SA	Perchlorate	(EPA 314.0)	064	
096661	-022	OBS-MW3	208	10/8/14	9:26	GW	Р	500 ml	None	G	SA	Alkalinity (S	M2320B)	35537/ 8537/	
096661	-024	OBS-MW3	208	10/8/14	9:28 /	GW	AG	4x1 L	None	G	SA	High Explos	ives (SW846-832 ²	1A mod 066	
Last Chain:		✓ Yes	Sample	Tracking		SMC	) Use	Special Ins	structions	/QC Requir	ements:		10	Conditions on	
Validation I	Req'd:	⊻ Yes	Date Er	tered:				EDD		✓ Yes		No		Receipt	
Backgroun	d:	Yes	Entered	by:				Turnaroun	d Time	7 Day	<u>y*</u>	15 Day*	✓ 30 Day		
Confirmato	ry:	Yes	QC inits					Negotiated	TAT						
Sample	N	ame Signat	ure Init.	Company	//Organiza	tion/Phone	e/Cell	Sample Di	sposal	Return	to Client	7	Disposal by Lab		
	Robert L		ch RL	SNL/4142/5	)5-844-40°	13/505-25	0-7090	Return Sar	nples By:						
Members	Alfred Sa	antillanes Aller S	Me 1	SNL/4142/5	05-844-513	30/505-22	8-0710	Comments	;;	Send report to	Tim Jacksor	/4142/MS 0729/2	284-2547		
		1/6				***************************************				erform verifica	ation analys	is using SW84	6-6850M.Filtered		
	Commence of a second control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the						**********					e filter.Report /			
	s							as short list is		as total CaCO	13,HCO3,C	ادی), and Gamn	na Spectroscopy (	Lab Use	
1.Relinquishe	d by 🖊	MAGUES	Grg-414∠ Date	10 8 14	Time 4	0955	3.Relino	uished by			Org.		Date	Time	
1. Received b	y <u> </u>	My has some	Org. 4147 Date	10/8/14	Time	0955	3. Rece	ived by			Org.		Date	Time	
2.Relinquishe	d by	49/1 Some	Org. 4/4Z Date	10/8/14	Time /	115	4.Relino	uished by			Org.		Date	Time	
2. Received b	y	Millely	Org. Cel_ Date	10-9-14	Time 🛭	7745	4. Rece	ived by			Org.		Date	Time	
*Drior confin		ith CMO required for 7 and													

## **CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY (Continuation)**

Page 2 of 2

				T										AR/COC 61	15814
	Project Nam	e:	SWMU 68 GWW	Project/Ta	sk Mana	ger:	Clinton Lun	n		Project/Ta	sk No.:	146422	2.10.11.01		
	Tech Area:		1	1											
	Building:	г	Room:		r						·	·			Lab use
****	Sample No.	Eraction	Sample Location I		Depth	Date/ Colle	***********	Sample		ntainer	4	Collection			- Lab
,				Jetan	(ft)		······································	Matrix	Type	Volume	ative	Method	Type	Requested	Sample ID
	096661	-027	OBS-MW3		208	,10/8/14	9:29 -	GW	Р	250 ml	NaOH	G	SA	Total Cyanide (SW846-9012)	3287
•	096661	-033	OBS-MW3	***************************************	208	.10/8/14	9:30 <	GW	Р	1 L	HNO3	G	SA	Gamma Spectroscopy (EPA 901.0)	268
٤	096661	-034	OBS-MW3		208	10/8/14	9:31 <	GW	Р	1 L	HNO3	G	SA	Gross Alpha and Beta (EPA 900.0)	069
	096661	-035	OBS-MW3		208	, 10/8/14	9:33	GW	Р	1 L	HNO3	G	SA	Isotopic Uranium (HASL 300)	35837 35837 068 35837 069 35837
	096662	-001	OBS-TB4		NA	. 10/8/14	9:17	DIW	G	3x40 ml	HCL	G	ТВ	TCL VOC (SW846-8260B)	358371
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L	Recipient Init	ials <u>//</u> []						angura en e							



Sample Findings Summary



AR/COC: 615822, 615823, 615824 Page 1 of 3

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
EPA 900.0/SW846 9310			
	096685-034/CCBA-MW1	ALPHA (12587-46-1)	J, FR7,MS1
	096685-034/CCBA-MW1	BETA (12587-47-2)	J, FR7,MS1
	096688-034/CCBA-EB1	ALPHA (12587-46-1)	BD, FR3,MS1
	096688-034/CCBA-EB1	BETA (12587-47-2)	BD, FR3,MS1
	096691-034/CCBA-MW2	ALPHA (12587-46-1)	J, MS1
	096691-034/CCBA-MW2	BETA (12587-47-2)	J, FR7,MS1
	096692-034/CCBA-MW2	ALPHA (12587-46-1)	J, MS1
	096692-034/CCBA-MW2	BETA (12587-47-2)	BD, FR3,MS1
EPA 901.1			
	096685-033/CCBA-MW1	Americium-241 (14596-10-2)	BD, FR3
	096685-033/CCBA-MW1	Cesium-137 (10045-97-3)	BD, FR3
	096685-033/CCBA-MW1	Cobalt-60 (10198-40-0)	BD, FR3
	096685-033/CCBA-MW1	Potassium-40 (13966-00-2)	BD, FR3
	096688-033/CCBA-EB1	Americium-241 (14596-10-2)	BD, FR3
	096688-033/CCBA-EB1	Cesium-137 (10045-97-3)	BD, FR3
	096688-033/CCBA-EB1	Cobalt-60 (10198-40-0)	BD, FR3
	096688-033/CCBA-EB1	Potassium-40 (13966-00-2)	BD, FR3
	096691-033/CCBA-MW2	Americium-241 (14596-10-2)	BD, FR3
	096691-033/CCBA-MW2	Cesium-137 (10045-97-3)	BD, FR3
	096691-033/CCBA-MW2	Cobalt-60 (10198-40-0)	BD, FR3
	096691-033/CCBA-MW2	Potassium-40 (13966-00-2)	BD, FR3
	096692-033/CCBA-MW2	Americium-241 (14596-10-2)	BD, FR3
	096692-033/CCBA-MW2	Cesium-137 (10045-97-3)	BD, FR3
	096692-033/CCBA-MW2	Cobalt-60 (10198-40-0)	BD, FR3

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
	096692-033/CCBA-MW2	Potassium-40 (13966-00-2)	BD, FR3
SW846 3005/6020 DOE-AL			
	096691-010/CCBA-MW2	Copper (7440-50-8)	0.0042U, B2
	096692-010/CCBA-MW2	Copper (7440-50-8)	0.0042U, B2
SW846 3535/8321A Modifie	ed		
	096685-024/CCBA-MW1	m-Nitrotoluene (99-08-1)	UJ, 14
	096685-024/CCBA-MW1	o-Nitrotoluene (88-72-2)	UJ, I4
	096685-024/CCBA-MW1	p-Nitrotoluene (99-99-0)	UJ, 14
	096685-024/CCBA-MW1	Tetryl (479-45-8)	UJ, L3,MS3
	096688-024/CCBA-EB1	m-Nitrotoluene (99-08-1)	UJ, 14
	096688-024/CCBA-EB1	o-Nitrotoluene (88-72-2)	UJ, 14
	096688-024/CCBA-EB1	p-Nitrotoluene (99-99-0)	UJ, 14
	096688-024/CCBA-EB1	Tetryl (479-45-8)	UJ, L3,MS3
	096691-024/CCBA-MW2	m-Nitrotoluene (99-08-1)	UJ, 14
	096691-024/CCBA-MW2	o-Nitrotoluene (88-72-2)	UJ, 14
	096691-024/CCBA-MW2	p-Nitrotoluene (99-99-0)	UJ, 14
	096691-024/CCBA-MW2	Tetryl (479-45-8)	UJ, L3,MS3
	096692-024/CCBA-MW2	m-Nitrotoluene (99-08-1)	UJ, 14
	096692-024/CCBA-MW2	o-Nitrotoluene (88-72-2)	UJ, I4
	096692-024/CCBA-MW2	p-Nitrotoluene (99-99-0)	UJ, 14
	096692-024/CCBA-MW2	Tetryl (479-45-8)	UJ, L3,MS3
SW846 8260B DOE-AL			
	096686-001/CCBA-TB1	Bromomethane (74-83-9)	UJ, 13,C3
	096687-001/CCBA-FB1	Bromomethane (74-83-9)	UJ, 13,C3
	096688-001/CCBA-EB1	Bromomethane (74-83-9)	UJ, I3,C3
	096689-001/CCBA-TB2	Bromomethane (74-83-9)	UJ, I3,C3
	096690-001/CCBA-FB2	Bromomethane (74-83-9)	UJ, 13,C3
SW846 9012B			
	096685-027/CCBA-MW1	Cyanide, Total (57-12-5)	UJ, 15

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
	096688-027/CCBA-EB1	Cyanide, Total (57-12-5)	UJ, 15
	096691-027/CCBA-MW2	Cyanide, Total (57-12-5)	UJ, 15
	096692-027/CCBA-MW2	Cyanide, Total (57-12-5)	UJ, 15

All other analyses met QC acceptance criteria; no further data should be qualified.





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Memorandum

Date: November 21, 2014

To: File

From: Monica Dymerski

Subject: Inorganic Data Review and Validation – SNL

Site: SWMU 8/58 GWM

AR/COC: 615822, 615823, and 615824

SDG: 358946 Laboratory: GEL

Project/Task: 146422.10.11.01 Analysis: General Chemistry

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM ER Project AOP 00-03 Rev 4.

Summary

Four samples were prepared and analyzed with accepted procedures using methods EPA 9012A (total cyanide), EPA 314.0 (perchlorate), EPA 9056 (anions by IC), EPA 353.2 (nitrate/nitrite) and SM 2320B (total alkalinity). Data were reported for all required analytes. Problems were identified with the data package that resulted in the qualification of data.

Total cyanide:

1. The intercept for total cyanide was negative with an absolute value > the MDL but $\le 3X$ the MDL. The associated sample results were non-detects and will be **qualified UJ,15.**

Data are acceptable and reported QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times and Preservation

The samples were prepared and analyzed within the prescribed holding times and were properly preserved.

Calibration

All initial and continuing calibration met QC acceptance criteria except as noted above in the Summary section.

Blanks

No target analytes were detected in the blanks except as follows. Chloride was detected in a CCB bracketing sample -017 at < the PQL. The associated sample result was a non-detect and will not be qualified.

Alkalinity blank results were reported, but were not assessed for data validation.

Laboratory Control Sample (LCS)

All LCS acceptance criteria were met.

Matrix Spike (MS)

All MS/PS recoveries met QC acceptance criteria.

Nitrate/nitrite – N:

The MS analysis was performed on an SNL sample from another SDG. No sample data will be qualified as a result.

Laboratory Replicate

The replicate analyses met all QC acceptance criteria.

Nitrate/nitrite – N:

The replicate analysis was performed on an SNL sample from another SDG. No sample data will be qualified as a result.

Detection Limits/Dilutions

All detection limits were properly reported. The samples were not diluted except as follows.

Nitrate/Nitrite:

All samples except -018 (EB) were diluted 5X.

Anions:

Sample -004 was diluted 5X, and samples -030 and -041 were diluted 10X for chloride and sulfate.

Other QC

An EB was submitted with ARCOC 615823 and it was associated with the samples from ARCOC 615824. A field duplicate pair was submitted with ARCOC 615824. There are no "required" review criteria for field duplicate analyses comparability; no data will be qualified as a result.

No other specific issues that affect data quality were identified.

Reviewed by: Mary Donivan Level: I Date: 11/24/14





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Memorandum

Date: November 21, 2014

To: File

From: Monica Dymerski

Subject: LC/MS/MS Organic Data Review and Validation – SNL

Site: SWMU 8/58 GWM

AR/COC: 615822, 615823, and 615824

SDG: 358946 Laboratory: GEL

Project/Task: 146422.10.11.01 Analysis: High Explosives (HE)

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. Data are evaluated using SNL/NM SMO AOP 00-03 Rev 4.

Summary

Four samples were prepared and analyzed with accepted procedures using method EPA 8321A Mod. (HE by LCMSMS). All compounds were successfully analyzed. Problems were identified with the data package that resulted in the qualification of data.

- 1. The ICAL RFs or calibration slope for m-nitrotoluene, o-nitrotoluene and p-nitrotoluene were <0.05 but ≥0.01. All associated sample results were non-detects and will be **qualified UJ,14.**
- 2. The LCS %R was < the lower acceptance limit but ≥10% for Tetryl. The associated sample results were non-detects and will be **qualified UJ,L3.**
- 3. The MS %R was < the lower acceptance limit but \geq 10% for Tetryl. The associated sample results were non-detects and will be **qualified UJ,MS3.**

Data are acceptable and reported QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times

The samples were extracted and analyzed within the prescribed holding times and were properly preserved.

Instrument Tune

The instrument tune was not reported or evaluated.

Calibration

All initial and continuing calibration met QC acceptance criteria except as noted above in the Summary section.

Reporting Limit Verification

All CRI recoveries met QC acceptance criteria.

Blanks

No target analytes were detected in the blanks.

Surrogates

All surrogate recoveries met QC acceptance criteria.

Internal Standards

All internal standards met QC acceptance criteria.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

The MS/MSD analyses met all QC acceptance criteria except as noted above in the Summary section.

Laboratory Control Sample (LCS)

All LCS recoveries met QC acceptance criteria except as noted above in the Summary section.

Detection Limits/Dilutions

All detection limits were properly reported. According to laboratory procedure, all sample and QC extracts were diluted 2X with HPLC grade water.

Other QC

An EB was submitted with ARCOC 615823 and it was associated with the samples from ARCOC 615824. A field duplicate pair was submitted with ARCOC 615824. There are no "required" review criteria for field duplicate analyses comparability; no data will be qualified as a result.

No other specific issues that affect data quality were identified.

Reviewed by: Mary Donivan Level: I Date: 11/24/14





www.againc.net

Date: November 21, 2014

To: File

From: Monica Dymerski

Subject: Inorganic Data Review and Validation – SNL

Site: SWMU 8/58 GWM

AR/COC: 615822, 615823, and 615824

SDG: 358946 and 358947

Laboratory: GEL

Project/Task: 146422.10.11.01

Analysis: Metals

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM ER Project AOP 00-03 Rev 4.

Summary

Four unfiltered samples were prepared and analyzed with approved procedures using methods EPA 6010B (ICP-AES), EPA 6020 (ICP-MS) and EPA 7470A (CVAA mercury) and four filtered samples were prepared and analyzed with approved procedures using methods EPA 6020 (ICP-MS). Data were reported for all required analytes. Problems were identified with the data package that resulted in the qualification of data.

ICP-MS:

1. Cu was detected at < the PQL in EB sample 358946016, associated with samples -029 and -040. The associated sample results were detects ≤5X the EB concentration and will be **qualified 0.0042U,B2** at 5X the EB value.

Data are acceptable and reported QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times and Preservation

The samples were prepared and analyzed within the prescribed holding times and properly preserved.

ICP-MS Instrument Tune

The ICP-MS tunes met QC acceptance criteria.

Calibration

All initial and continuing calibration criteria met QC acceptance criteria.

Reporting Limit Verification

All CRA/CRI recoveries associated with the samples met QC acceptance criteria.

It should be noted that the CRI was analyzed at the PQL and not at 2X the PQL for all target analytes.

Blanks

No target analytes were detected in the blanks except as noted above in the Summary section and as follows. Sb was detected in the MB at < the PQL. The associated sample results were non-detects and will not be qualified.

ICP -MS Internal Standards

The ICP-MS internal standards met QC acceptance criteria.

Matrix Spike (MS)

The MS met all QC acceptance criteria except as follows.

ICP-MS:

The parent sample concentrations for Ca, Mg and Na were >4X the spike and the %Rs for Ca and Na did not meet acceptance criteria. However, an MS analysis is not required for these analytes. Therefore, no sample data will be qualified.

Laboratory Replicate

The replicate met all QC acceptance criteria.

Laboratory Control Sample (LCS)

The LCS met all QC acceptance criteria.

Detection Limits/Dilutions

All detection limits were properly reported. All unfiltered samples *except* 358946016 were diluted 5X for Ca and Na, and all filtered samples *except* 358947002 were diluted 5X for Ca and Na.

ICP Interference Check Sample (ICS A and AB)

Results of the ICS A and AB analyses were not evaluated because the sample concentration of Ca, Mg, Al and Fe were < that in the ICS solution.

ICP Serial Dilution

The serial dilutions met all QC acceptance criteria.

Other QC

An EB was submitted with ARCOC 615823 and it was associated with the samples from ARCOC 615824. A field duplicate pair was submitted with ARCOC 615824. There are no "required" review criteria for field duplicate analyses comparability; no data will be qualified as a result.

No other specific issues that affect data quality were identified.

Reviewed by: Mary Donivan Level: I Date: 11/24/14





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Memorandum

Date: November 21, 2014

To: File

From: Monica Dymerski

Subject: Radiochemical Data Review and Validation – SNL

Site: SWMU 8/58 GWM

AR/COC: 615822, 615823, and 615824

SDG: 358946 Laboratory: GEL

Project/Task: 146422.10.11.01

Analysis: RAD

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM ER Project AOP 00-03 Rev 4.

Summary

Four samples were prepared and analyzed with approved procedures using methods EPA 901.1 (gamma spec – short list) and EPA 900.0 (gross alpha/beta). Problems were identified with the data package that resulted in the qualification of data.

All analyses:

1. All sample results which were either < the associated 2-sigma TPU or < the associated MDA will be **qualified BD,FR3.**

Gross Alpha/Beta:

- 1. The relative dilution factor between the parent sample and the gross alpha/beta MS/MSD QC samples was >5 and, as a result, the MS/MSD analyses were not used to evaluate gross alpha and gross beta sample data. The associated sample results will be **qualified J,MS1**.
- 2. All sample results that were > the MDA but $\le 3X$ the MDA will be qualified J,FR7.

Holding Times and Preservation

The samples were prepared and analyzed within the prescribed holding times and were properly preserved.

Quantification

All quantification criteria were met except as noted above in the Summary section.

Calibration

The case narratives stated that the instruments used were properly calibrated.

Blanks

No target analytes were detected in the blanks at concentrations > the MDA and 2-sigma TPU.

Tracer/Carrier Recovery

Tracers and /or carriers are not required for the methods used.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

The MS/MSD met all QC acceptance criteria except as noted above in the Summary section.

Laboratory Replicate

All replicate error ratio acceptance criteria were met.

Gamma spec:

It should be noted that the replicate was performed on a sample of similar matrix from another SNL SDG. No sample data will be qualified as a result.

Laboratory Control Sample (LCS)

All LCS recoveries met QC acceptance criteria.

Detection Limits/Dilutions

The samples were not diluted. All required detection limits were met.

Other QC

An EB was submitted with ARCOC 615823 and it was associated with the samples from ARCOC 615824. A field duplicate pair was submitted with ARCOC 615824. There are no "required" review criteria for field duplicate analyses comparability; no data will be qualified as a result.

No other specific issues that affect data quality were identified.

Reviewed by: Mary Donivan Level: I Date: 11/24/14





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Memorandum

Date: November 21, 2014

To: File

From: Monica Dymerski

Subject: GC/MS Organic Data Review and Validation – SNL

Site: SWMU 8/58 GWM

AR/COC: 615822, 615823, and 615824

SDG: 358946 Laboratory: GEL

Project/Task: 146422.10.11.01

Analysis: SVOCs

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. Data are evaluated using SNL/NM SMO AOP 00-03 Rev 4.

Summary

Four samples were prepared and analyzed with accepted procedures using methods EPA 3510C/8270D (SVOCs). All compounds were successfully analyzed. No problems were identified with the data package that resulted in the qualification of data.

Data are acceptable and reported QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times

The samples were extracted and analyzed within the prescribed holding times and were properly preserved.

Instrument Tune

All instrument tune requirements were met.

Calibration

The initial calibration and continuing calibration data met QC acceptance criteria except as follows.

The ICAL %RSD was >15% but ≤40% and the ICV %D was >20% with a positive bias for p-nitroaniline. The associated sample results were non-detects and, since a positively biased calibration verification outlier is not considered a second calibration infraction, will not be qualified.

The ICV or CCV %Ds were >20% but ≤40% with negative bias for hexachlorocyclopentadiene, 2,4-dinitrophenol, pentachlorophenol, 1,4-dioxane, and benzaldehyde. The associated sample results were non-detects and since no other calibration infractions occurred, will not be qualified.

Blanks

No target analytes were detected in the blanks.

Surrogates

All surrogate recoveries met QC acceptance criteria.

Internal Standards

All internal standards met QC acceptance criteria.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

All MS/MSD acceptance criteria were met.

Laboratory Control Sample (LCS)

All LCS acceptance criteria were met.

Detection Limits/Dilutions

All detection limits were properly reported. The samples were not diluted.

Tentatively Identified Compounds (TICs)

TIC reports were not required.

Other QC

An EB was submitted with ARCOC 615823 and it was associated with the samples from ARCOC 615824. A field duplicate pair was submitted with ARCOC 615824. There are no "required" review criteria for field duplicate analyses comparability; no data will be qualified as a result.

No other specific issues that affect data quality were identified.

Reviewed by: Mary Donivan Level: I Date: 11/24/14





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Memorandum

Date: November 21, 2014

To: File

From: Monica Dymerski

Subject: GC/MS Organic Data Review and Validation – SNL

Site: SWMU 8/58 GWM

AR/COC: 615822, 615823, and 615824

SDG: 358946 Laboratory: GEL

Project/Task: 146422.10.11.01

Analysis: VOCs

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. Data are evaluated using SNL/NM SMO AOP 00-03 Rev 4.

Summary

Nine samples were prepared and analyzed with accepted procedures using method EPA 8260B (VOCs). All compounds were successfully analyzed. Problems were identified with the data package that resulted in the qualification of data.

1. The ICAL %RSD was >15% but ≤40%, and the ICV and CCV %Ds were >20% but ≤40% with negative bias for bromomethane for the calibration associated with samples -012, -013, -014, -025, and -026. The associated sample results were non-detects and will be **qualified UJ,I3,C3.**

Data are acceptable and reported QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times

The samples were analyzed within the prescribed holding time and were properly preserved.

Instrument Tune

All instrument tune requirements were met.

Calibration

The initial calibration and continuing calibration data met QC acceptance criteria except as noted above in the Summary section and as follows.

For the ICAL associated with samples -012, -013, -014, -025, and -026, the %RSDs were >15% but ≤40% for dibromochloromethane, bromoform, and 1,2-dibromo3-chloropropane, and the ICV %Ds were >20% positive bias for bromoform and 1,2-dibromo-3-chloropropane. The associated sample results were non-detects, and since a positively biased ICV outlier is not considered to be a second calibration infraction, will not be qualified.

For the ICAL associated with samples -001, -027, -038, and -049, the %RSDs were >15% but $\le 40\%$ for acetone and carbon disulfide, and the ICV %D was >20% with positive bias for carbon disulfide. The associated sample results were non-detects, and since a positively biased ICV outlier is not considered to be a second calibration infraction, will not be qualified.

Blanks

No target analytes were detected in the blanks except as follows. Acetone and bromodichloromethane were detected at a concentration < the PQL and chloroform at a concentration > the PQL in EB sample -014, associated with samples -027 and -038. Bromodichloromethane was detected at < the PQL, and chloroform was detected at > the PQL in FB sample -026, associated with samples -027 and -038. The associated sample results were non-detects and will not be qualified.

Acetone and bromodichloromethane were detected at a concentration < the PQL and chloroform was detected at a concentration > the PQL in FB sample -013, which was not associated with any samples. No sample data will be qualified as a result.

Surrogates

All surrogate recoveries met QC acceptance criteria.

Internal Standards

All internal standards met QC acceptance criteria.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

All MS/MSD acceptance criteria were met.

Laboratory Control Sample (LCS)

All LCS acceptance criteria were met.

Detection Limits/Dilutions

All detection limits were properly reported. The samples were not diluted.

Tentatively Identified Compounds (TICs)

TIC reports were not required.

Other QC

Three TBs were submitted, one associated with each ARCOC. An EB was submitted with ARCOC 615823 and it was associated with the samples from ARCOC 615824. An FB was submitted with ARCOC 615824 and was associated with the sample from that ARCOC. A second FB was submitted with

ARCOC 615823, and was not associated with any field samples. A field duplicate pair was submitted with ARCOC 615824. There are no "required" review criteria for field duplicate analyses comparability; no data will be qualified as a result.

No other specific issues that affect data quality were identified.

Reviewed by: Mary Donivan Level: I Date: 11/24/14

Data Validation Summary Worksheet

AR/COC #: 615822, 615823, and 615824 Site/Project: SWMU 8/58 G Validation Date: 11/21/2014 SDG #: 353946 and 358947 Laboratory: GEL Laboratories LLC Validator: Monica Dymerski

Matrix: Aqueous # of Samples: 53 CVR present: Yes Analysis Type: X Organic X Metals

AR/COC(s) present: Yes Sample Container Integrity: OK X Rad X Gen Chem

		Requ	ested Anal	yses Not R	eported	
Sample Number	Laboratory ID	organic	genchem	metals	rad	Comments
None						

		Hold Time	e/Preservatio	on Outliers				
Sample Number	Laboratory ID	Analysis	Pres.	Coll. Date	Prep. Date	Anal. Date	Anal. within 2X HT	Anal. beyond 2X HT
None								

Comments: Samples collected 10/13-14/2014.

Revised 7/2007

	of the following	,
Validated By:	Moura & Dymuski	

Organic Worksheet (GC/MS)

AR/COC #: 615822, 615823, and 615824 SDG #:358946 Matrix: Aqueous

Laboratory Sample IDs: 358946001, -012, -013, -014, -025, -026, -027, -038, and -049

Method/Batch #s: 8260B: 1430102 Tuning (pass/fail): pass TICs Required? (yes/no) no

			(Calibration			5X				MS/		5X				(4.0)
Analyte (outliers)		Int.	RF	RSD/R ²	CCV (ICV) %D	Method Blank	(10X) Blank	LCS %R	MS %R	MSD %R	MSD RPD	FB1 -013	(10X) FB1	EB1 -014	5X (10X) EB1	FB2 -026	5X (10X) FB2
acetone		NA	✓	22.3*	✓	✓	NA	✓	✓	✓	✓	2.53J	(25.3)	2.70J	(27.0)	✓	NA
bromodichloromet	thane	NA	✓	✓	✓	✓	NA	✓	✓	✓	✓	0.600J	3.00	0.520J	2.6	0.460J	2.3
chloroform		NA	✓	✓	✓	✓	NA	✓	✓	✓	✓	3.70	18.5	3.85	19.25	4.24	21.2
bromomethane		NA	✓	24.6**	(-21.6)**/ -20.6**	✓	NA	✓	✓	✓	√	✓	NA	✓	NA	✓	NA
dibromochloromet	thane	NA	✓	18.0**	✓	✓	NA	✓	✓	✓	✓	✓	NA	✓	NA	✓	NA
bromoform		NA	✓	26.4**	(24.8)**	✓	NA	✓	✓	✓	✓	✓	NA	✓	NA	✓	NA
1,2-dibromo-3- chloropropane		NA	✓	30.6**	(21.3)**	✓	NA	✓	✓	✓	✓	✓	NA	✓	NA	✓	NA
carbon disulfide		NA	✓	18.5*	30.0*	✓	NA	✓	✓	✓	✓	✓	NA	✓	NA	✓	NA
		-		-		-	Surroga	te Reco	very (Outliers	<u> </u>		_	_			
Sample ID																	
None																	
		1						IS Out									
•	Area	RT	Area	RT	Area	RT		Area	R	T	Area		RT			Aı	rea R'
None																	

Comments: HTs OK, *ICAL VOA4 10/20/14; samples -001, 027, -038, and -049 analyzed 10/24/14. ** ICAL VOAA 09/12 through 15/14. Samples -012, -013, -014, -025, and -026 analyzed on 10/23/14. MS/MSD performed on -001

Organic Worksheet (GC/MS)

AR/COC #: 615822, 615823, and 615824 SDG #:358946 Matrix: Aqueous

Laboratory Sample IDs: 358946002, -015, -028, and -039

Method/Batch #s: 3510C/8270D **1428628/1428629** Tuning (pass/fail): pass TICs Required? (yes/no) no

				Calib	ration			5X				MS/				
	nalyte utliers)		Int.	RF	RSD/ R ²	CCV (ICV) %D	Method Blank	(10X) Blank	%R	MS %R	MSD %R	MSD RPD	-015	5X (10X) EB		
p-nitroaniline			NA	✓	19.5	(21.4)	✓	NA	✓	✓	✓	✓	√	NA		
hexachlorocyclopenta	diene		NA	✓	✓	(-26.9)	✓	NA	✓	✓	✓	✓	✓	NA		
2,4-dinitrophenol			✓	✓	✓	-23.8	✓	NA	✓	✓	✓	✓	✓	NA		
pentachlorophenol			NA	✓	✓	-30.6	✓	NA	✓	✓	✓	✓	✓	NA		
1,4-dioxane			NA	✓	✓	-21.5	✓	NA	✓	✓	✓	✓	✓	NA		
benzaldehyde			NA	√	✓	-21.9	✓	NA	✓	√	√	√	√	NA		
				<u>L</u>	S	urrogate	Recovery	Outliers	3	<u>L</u>	<u></u>	<u> </u>	L	<u>L</u>		<u>. L</u>
Sample ID None	2-fluor	ophenol		phenol	·d5	2,4,6-1	tribromop	henol	nitrobei	nzene-d5		2-fluorob	oiphenyl	p-te	rphen	yl-d14
			Ī			, I	S Outliers				<u> </u>			-		
Sample ID	Area	RT	Ar	ea	RT	Are	a I	RT	Area	RT		Area	RT	Are	a	RT
None																

Comments: HTs OK, ICAL MSD3.I 10/02/14 and 10/03/14. Samples analyzed 10/20/14.

MS/MSD performed on sample -002.

High Explosives Worksheet (LC/MS/MS)

AR/COC #: 615822, 615823, and 615824 SDG #: 358946 Matrix: Aqueous

Laboratory Sample IDs: 358946008, -021, -034, and -045

Method/Batch #s: 3535/8321A 1428283/1428291

NA 0.022 NA 0.029 V 0.012 V V	· ·	ICV	CCV	ICB ✓ ✓ ✓	CCB	Blank ✓	(10X) Blank NA NA	%R	%R ✓	LCSD RPD ✓	%R	%R ✓	MSD RPD	CRI ✓	EB -021 ✓
NA 0.029 • 0.012	9	✓ ✓	✓	✓ ✓	✓	✓	1	-						1	
√ 0.012	2 🗸	√	✓	✓	·		NA	√	./	./	./	./	1	./	,
					✓			, ,	V	V	•	•	•	v	✓
✓ ✓ ———————————————————————————————————	V	√	✓	✓		✓	NA	✓	✓	✓	✓	✓	✓	✓	✓
					✓	✓	NA	37	33	✓	30.4	✓	✓	✓	✓
															<u> </u>
I.	1	<u> </u>		Surroga	te Recov	ery Outli	ers					1			
				Interna	d Standa	rd Outlie	ers								
Area	RT		Samp	le ID		Area		RT		Sample	ID		Area		RT
	Area	Area RT	Area RT	Area RT Sampl	Interna	Internal Standa	Internal Standard Outlie	Surrogate Recovery Outliers Internal Standard Outliers Area RT Sample ID Area	Internal Standard Outliers	Internal Standard Outliers	Internal Standard Outliers	Internal Standard Outliers	Internal Standard Outliers	Internal Standard Outliers	Internal Standard Outliers

Comments: HTs OK; MS/MSD performed on sample -008; all sample and QC extracts diluted 1:1 with LC reagent grade water ICAL LCMSMS3 10/30/2014. Samples analyzed on 10/31/2014.

Inorganic Metals Worksheet

AR/COC #: 615822, 615823, and 615824

SDG #: 358946 and 358947

Laboratory Sample IDs: 358946003, -016, -029, and -040 (UF); 358947001 through -004 (F, 6020 Ca, Mg, K, and Na only)

Method/Batch #s: 3005A/6010B (ICP-AES): 1427723(prep)/1427725 3005A/6020 (ICP-MS): 1427697(prep)/1427698 7470A (Hg): 1431585 (prep)/1431587

ICPMS Mass Cal (pass/fail) pass

ICPMS Resolution (pass/fail) pass

Analyte			Cali	bration	l		Method	5X Blank	LCS	MS %R	Lab Rep. RPD	Serial Dil. %D	ICS AB	ICS A±	CRA/ CRI	UF EB	5X	
(outliers)	Int.	R ²	ICV	CCV	ICB	ССВ	Blank	or 5X MDL	%R	%K	KPD	%D	%K	MDL	%R	358946016	EB	
Cu	✓	✓	✓	✓	✓	✓	✓	NA	✓	✓	✓	✓	NA	NA	✓	0.000835J	0.0042	
Sb	✓	✓	✓	✓	✓	✓	0.00101J	0.00505	✓	✓	✓	✓	NA	NA	✓	✓	NA	
Ca	✓	✓	✓	✓	✓	✓	✓	NA	✓	20*	✓	✓	NA	NA	✓	✓	NA	
Na	√	√	√	√	✓	√	√	NA	√	-5*	✓	√	NA	NA	√	✓	NA	

	IS Outliers	60-125%			IS Outliers	80-120%	
Sample ID	%Recovery	%Recovery	%Recovery	CCV/CCB ID	%Recovery	%Recovery	%Recovery
None				None			

Comments: HTs OK. Matrix QC: ICP-MS: Performed on 358947001. ICP-AES and Hg: performed on 358946003. *Ca, Mg, and Na >4X spike amount.

All unfiltered samples except 358946016 were diluted 5X for Ca and Na, and all filtered samples except 358947002 were diluted 5X for Ca and Na.

Matrix: Aqueous

General Chemistry Worksheet

AR/COC #: 615822, 615823, and 615824 SDG #: 358946 Matrix: Aqueous

Laboratory Sample IDs: 358946 - See below

Method/Batch #s: EPA 9012B (total cyanide): Batch 1427815(prep)/1427816 Samples -009, -022, -035, and -046

Method/Batch #s: EPA 314.0 (perchlorate): Batch 1427862 Samples -006, -019, -032, and -043

Method/Batch #s: EPA 9056 (anions): Batch 1427860 Samples -004, -017, -030, and -041

Method/Batch #s: EPA 353.2 (NO₃/NO₂ – N): Batch 1425672 Samples -005, -018, -031, and -042

Method/Batch #s: SM2320B (alkalinity): Batch 1430054 Samples -007, -020, -033, and -044

Analysta			Calib	ration				5X Blank			Lab Rep.			
Analyte (outliers)	Int.	R ²	ICV %D	CCV %D	ICB	ССВ	Method Blank	or (5X MDL)	LCS %R	MS %R	RPD	EB	5X EB	
total cyanide	-0.00186	✓	✓	✓	✓	✓	✓	NA	✓	✓	✓	✓	NA	
Chloride	✓	✓	✓	✓	✓	0.103*	✓	0.515	✓	✓	✓	✓	NA	

Comments: HTs OK. Matrix QC: 9012A: performed on sample -009; 314.0: performed on sample -006; 9056: performed on sample -004; 353.2: performed on an SNL sample from another SDG; SM2320B: performed on sample -033.

Anions – Sample -004 was diluted 5X for chloride and sulfate. Samples -030 and -041 were diluted 10X for chloride and sulfate. NO₃/NO₂ – all samples except EB diluted 5X

^{*}Associated with sample -017 only.

Radiochemistry Worksheet

AR/COC #: 615822, 615823, and 615824 SDG #: 358946 Matrix: Aqueous

Laboratory Sample IDs: 358946- See below

Method/Batch #s: EPA 901.1 (gamma spec): Batch 1426848 Samples -010, -023, -036, and -047

Method/Batch #s: EPA 900.0 (Gross alpha/beta): Batch 1430818 Samples -011, -024, -037, and -048

Analyte (outliers)	Control Freq.	Control Eval.	Method Blank	5X Blank or 5X MDC	LCS %R	MS %R	MSD %R	N	MS/ MSD RER	Lab Rep. RER	ЕВ			
None														
				Two cow/C	annian Da		tli ana							
	1	. 1			arrier Rec									
Sample ID	Tracer/Ca	rrier %	R	Sample ID		Tracer/	Carrier	%R		Sample	ID	Trac	er/Carrier	%R
None														

Comments: Matrix QC: 901.1: Performed on SNL samples from other SDGs. 900.0: Performed on sample -011.

Gross alpha/beta parent and DUP = 150 ml, MS/MSD=25 ml (6X dilution)-results qualified.

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Of 1239

CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

AOP 95-16

Internal Lab												,			Par	70 1 of 1
Batch No. A	10.1					SMO Uşe						10	1	AR/COC		ge <u>1</u> of _
Project Nan		SWMU 8/58 GV	٧M	Date Samp	oles Shippe	d: 1011	3/14	y chipling	SMO	Authorization:		1.41	/		0	15822
		: Clinton Lum		Carrier/Wa			4914	7		Contact Phori		4100	1 Suy	Waste Characterization		
		146422.10.11.0	1	Lab Contac		Edie Kent			1			5-844-3199		RMMA		
Service Ord	er:	CF262-15		Lab Destina	ation:	GEL			Send	Report to SM	nerrera/50	5-844-3199	}	Released by COC No.		7
				Contract No		PO 13038	73	e na serie de la companya de la companya de la companya de la companya de la companya de la companya de la comp La companya de la companya de la companya de la companya de la companya de la companya de la companya de la co	Joena i							4º Celsiu
Tech Area:							1. Y - 1	<u> </u>		Kita Kava	anaugn/50:	5-284-2553		Bill to:Sandia National Laboratorie	es (Accor	unts Payable)
Building:		Room:		Operation	nal Sito:									P.O. Box 5800, MS-0154		
	7			Operation		T 8-4-1	·····	T			·	·	•	Albuquerque, NM 87185-0154		
Sample No.	Fraction	Sample Lo	ncation De	ntail	Depth	1		Sample		ontainer	Preserv-	Collection	Sample		4	Lab
	1		Jeation De	rian	(ft)	Colle	cted	Matrix	Туре	Volume	ative	Method	Туре	Requested	-	Sample I
096685	-001	CCBA-MW1			79	10/13/14	9:24	∤ gw	G	3x40ml	HCL	G	SA	TCL VOC (SW846-8260B)		358794
096685	-002	CCBA-MW1			79	10/13/14	9:26	1 011	1	1			- OA			200/
200007					+ 13	10/13/14	9.26	1 GW	AG	4x1 L	None	G	SA	TCL SVOC (SW846-8270C)		358942
096685	-010	CCBA-MW1			79	10/13/14	9:27	GW	Р	500 ml	HNO3	G	SA			358946
096685	-016	CCBA-MW1			70	140/40/44			 		111100	9	- SA	TAL Metals+U (SW846-6010/6020)/7470)	003
	1	OOD/Y-WIVV I			79	10/13/14	9:28 ′	GW	Р	125 ml	None	G	SA	Anions (SW846-9056)		358946
096685	-017	CCBA-MW1			79	10/13/14	9:29	FGW	Р	500 ml	UNOS					35894
096685	-018	CCBA-MW1	*****							300 mi	HNO3	G	SA	Metals-Ca,Mg,K,Na (SW846-	6020)	001
00000		CCDA-IVIVV I			79	10/13/14	9:30	GW	Р	125 ml	H2SO4	G	SA	Nitrate+Nitrite (EPA 353.2)		358946
096685	-020	CCBA-MW1			79	10/13/14	9:31 •	GW	P	2501						005 358946
096685	-022	CCDA MAG			1	1	· · · · · · · · · · · · · · · · · · ·	1 000		250 ml	None	G	SA	Perchlorate (EPA 314.0)		006
090003	-022	CCBA-MW1			79	10/13/14	9:32 -	GW	Р	500 ml	None	G	SA	Alkalinity (SM2320B)		358946
096685	-024	CCBA-MW1			79	-10/13/14	9:34	- 014	4.0					raidanity (GW2320B)		2007
000005	007	0004.4444	·····		 		9.34	GW	AG	4x1 L	None	G	SA	High Explosives (SW846-832	IA mod	358946
096685		CCBA-MW1			79	10/13/14	9:35	GW	Р	250 ml	NaOH	G		Total Cyanide (SW846-9012)		358946
Last Chain:		Yes			Sample	Tracking		SMO	Use	Special Inst				Total Cyallide (SVV846-9012)		1009
Validation I		✓ Yes			Date Ent	ered:				EDD		☑ Yes	·		Cond	litions on
Backgroun		Yes			Entered	by:				Turnaround	I Time		-	No	Re	eceipt
Confirmato	ry:	∐ Yes		***************************************	QC inits.		624. 3. 4.		a sa a sa a sa sa sa sa sa sa sa sa sa s			7 Day		15 Day*		
Sample	Na	me a	Signature	9	Init.	Company	Organizati	on/Dhann	/O-II	Negotiated		<u> </u>	······································			
Team	Alfred Sar	tillanes H	Sat	00	L	SNL/4142/50	E OAA CAO	On/Phone.		Sample Dis		☐ Return	to Client			
Members	***************************************			177	WY	CAN 444 42/50	0-844-5130	0/505-228	-0710	Return Sam						
		2000	my 2	M	WILL	SNL/4142/50	5-284-3307	7/505-239	-7367	Comments:		Send report to T	im Jackson/4	1142/MS 0729/284-2547		
ŀ							·			If perchlorate d	etected, per	form verificat	ion analysis	Lucina SIMOAG COCOLA TILL		
ŀ										machon conect	eu in neia us	ing a 0.45 mi	cron in line	filter Penert Aniena (as		
1.5.11	1		-							as short list iso	topes).	total CaCO3	HCO3,CO	3), and Gamma Spectroscopy (
1.Relinquished	· · · · · · · · · · · · · · · · · · ·	19-415 APE		rg. 4148		10/19/14	Time 16	2/3 3		uished by			Org.			Use
I. Received by		11990	ENDO	rg. 4/4 <i>3</i>	≀ Date	10/13/14	Time /6		Recei					Date	Time	
2.Relinquished	100	My July	grup	rg. 41 47	Z Date	10/13/14	Time / 6			uished by			Org.	Date	Time	
2. Received by		Mickely	0	rg. Cer	Date/	0-14-14	Time Ø		. Receiv				Org.	Date	Time	
Prior confirm	ation wit	n SMO required fo	r 7 and 15	day TAT		- '1 / / 		17	. recen	rea by			Org.	Date	Time	

CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY (Continuation)

Page 2 of 2

Project Nam	ie:	SWMU 8/58 GWM	Project/	Task Mana	ger:	Clinton Lu	m		Project/Ta	sk No.:	146422	2.10.11.01		
Tech Area:		<u> </u>												
Building:	T	Room:				····	· ·····			7				Lab use
Sample No.	Fraction	Sample Location	n Detail	Depth (ft)	Date/1 Collec		Sample Matrix	Co Type	ntainer Volume	Preserv- ative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample I
096685	-033	CCBA-MW1		79	10/13/14	9:36	f gw	P	1 L	HNO3	G		Gamma Spectroscopy (EPA 901.0)	358946
096685	-034	CCBA-MW1		79	10/13/14	9:38	GW	Р	1 L	HNO3	G	SA	Gross Alpha and Beta (EPA 900.0)	358999
096686	-001	CCBA-TB1		NA	·10/13/14	9:24 ~	DIW	G	3x40 ml	HCL	G	ТВ	TCL VOC (SW846-8260B)	35894

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ecipient Ini	tiale MV	_												

CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab	/ 1 A															Page <u>1</u> of <u>2</u>
Batch No. A	- / -					SMO Use	1					00			AR/COC	615823
Project Name		SWMU 8/		Date Sample	es Shipped		4/14		SMO A	uthorization	P. M	9 11		∏ Wa	iste Characterization	
Project/Task				Carrier/Way	bill No.		499		змо с	ontact Phone	9:		Eme		IMA	
Project/Task		146422.1		Lab Contact		Edie Kent/	803-556-8	3171		Lorraine F	Herrera/50	5-844-3199		J .	leased by COC No.	
Service Orde	r:	CF262-15	5	Lab Destinat	tion:	GEL	94600		Send R	eport to SMC	D:			1	•	
				Contract No.		PO 130387	73			Rita Kava	naugh/505	5-284-2553		Bill to:Sand	dia National Laboratorie	
Tech Area:												***************************************		7	800, MS-0154	(10000/110
Building:		Room:		Operation	al Site:									1	ue, NM 87185-0154	
					Depth	Date/		Sample	C	ontainer	Preserv-	Collection	Sample		arameter & Method	l Lab
Sample No.	Fraction	Sar	nple Location D	etail	(ft)	Colle	cted	Matrix	Type	Volume	ative	Method	Type		Requested	Sample ID
096687	-001	CCBA-FB	11		NA	10/13/14	10:55 4	DIW	G	3x40ml	HCL	G	FB	TCL VOC	C (SW846-8260B)	358946
096688	-001	CCBA-EB	-1			1.		1_	<u> </u>	1						35897.6
1 090000	-001	CCDA-ED) !		NA	10/13/14	10:55 <	DIW	G	3x40ml	HCL	G	EB	TCL VOC	(SW846-8260B)	0/4
096688	-002	CCBA-EB	1		NA	10/13/14	10:57	- DIW	AG	4x1 L	None	G	EB	TCL SVO	C (SW846-8270C)	358946
096688	-010	CCBA-EB	•4		NIA	10/12/14	40.50								0 (0110 10 021 00)	358946
090000	-010	CCDA-ED) [NA	.10/13/14	10:58	DIW	Р	500 ml	HNO3	G	EB	TAL Metals	s+U (SW846-6010/602	0/7470) 0/6
096688	-016	CCBA-EB	1	~~~	NA	10/13/14	10:59 🕯	DIW	Р	125 ml	None	G	EB	Anions (S	SW846-9056)	358946 1)/7
096688	-017	CCBA-EB	:1		NA	10/13/14	11:00	FDIW	Р	500 ml	HNO3	G	EB	-	a,Mg,K,Na (SW846-	358997
096688	-018	CCBA-EB	.1		1					1				INICIAIS-C	a,Mg,N,Na (300040-	6020) <u>クロユ</u> 358796
		CCDM-ED	· I		NA	10/13/14	11:01 -	DIW	P	125 ml	H2SO4	G	EB	Nitrate+N	itrite (EPA 353.2)	0/8
096688	-020	CCBA-EB	1		NA	<u> </u> 10/13/14	11:02	DIW	Р	250 ml	None	G	EB	Perchlora	te (EPA 314.0)	358946 019
096688	-022	CCBA-EB	1		NA	10/13/14،	11:03	DIW	Р	500 ml	None	G	EB	Alkalinity	(SM2320B)	358946 020
096688	-024	CCBA-EB	1		NA	10/13/14	11:05	DIW	AG	4x1 L	None	G	EB		osives (SW846-832	358946
Last Chain		Yes		······································	artizeli curumme vareas	Tracking		SMO		Special Ins				ir iigir Expi	USIVES (3VV040-032	1A mod) <i>の之/</i> Conditions on
Validation I	Rea'd:	☑ Yes			Date Ent					EDD	ti dottorio,	☑ Yes		Nia		Propagation of the Control of Control of the Contro
Backgroun		☐ Yes		·	Entered					Turnaround	d Time	☐ 7 Day		15 Day*	② 30 Day	Receipt
Confirmato		∐ Yes		······································	QC inits.					Negotiated	***************************************	U 1 Day		10 Day	U 30 Day	
Sample		me	Signatu	re	Init.		/Organizat	ion/Phone	2/Cell	Sample Dis	······································		to Client	V	Disposal by Lab	
	Alfred Sa	ntillanes	Alfoldon	ille		SNL/4142/50	5-844-513	0/505-228	3-0710	Return San		- ixetuin	to Chefft	·	Disposal by Lab	
Members	William G		Wille NO	sull-	1/1/8	SNL/4142/50	5-284-330	7/505-239	7.7367	Comments		Cond consider	Ties to store	144 40 340 070	0.000 1.00 1.00	
Mellipers			and ap.	124	all	011271172700	0 204 000	77000-200	<i>3-1301</i>	j		Send report to			9/284-2547 846-6850M.Filtered	
			<u>V</u>							fraction collec	ted in field u	sing a 0.45 m	icron in line	s using Svv e filter Renoi	rt Anions (as	
										Br,C,F,SO4), /	Alkalinity (a:	s total CaCO	з,нсоз,сс	03), and Gar	mma Spectroscopy (
1.Relinquishe	d by	11-15	4 E/12	Org. 4142	2 Date	10/14/14	Time 0	a , u T	2 Dalie -	as short list is	otopes).					Lab Use
1. Received b		14,		Org. 4147			Time 0			uished by		· · · · · · · · · · · · · · · · · · ·	Org.		Date	Time
2.Relinquishe	de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la	3 / A		Org. 414					3. Recei			····	Org.		Date	Time
2. Received b		/// ///		Org. GEL		10/14/14				uished by			Org.		Date	Time
	<u> </u>	CA 2 Commi	quired for 7 and		- Date	10-115-14	Time C	7/5	4. Recei	ved by			Org.	***************************************	Date	Time

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CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY (Continuation)

AOP 95-16

Page 2 of 2

r			T				····						AR/COC 61	15823
Project Nam	e:	SWMU 8/58 GWM	Project/Ta	ask Mana	ger: (Clinton Lur	n	w	Project/Ta	sk No.:	146422	2.10.11.01		
Tech Area:		T	-											
Building:	T	Room:	<u> </u>	1	T		Sample			· · · · · · · · · · · · · · · · · · ·				Lab use
Sample No.	Eraction	Sample Location	Doto:I	Depth (ft)	5	Date/Time Collected			ntainer	-	Collection		1	Lab
		<u> </u>	Jelan				Matrix	Туре	Volume	ative	Method	Type	Requested	Sample II
096688	1	CCBA-EB1	·····	NA	10/13/14	11:06 -	DIW	Р	250 ml	NaOH	G	EB	Total Cyanide (SW846-9012)	35896
096688	1	CCBA-EB1		NA	-10/13/14	11:07	DIW	Р	1 L	HNO3	G	EB	Gamma Spectroscopy (EPA 901.0)	35899
096688	-034	CCBA-EB1		NA	10/13/14	11:09 1	DIW	Р	1 L	HNO3	G	EB	Gross Alpha and Beta (EPA 900.0)	35894
096689	-001	CCBA-TB2		NA	·10/13/14	10:55 -	DIW	G	3x40 ml	HCL	G	ТВ	TCL VOC (SW846-8260B)	35899
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	Az.													
Recipient Ini	tials <u></u>	<u> </u>												

SMO 2012-ARCOC (4-2012)

CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

AOP	95-1	
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Internal Lab														F	age <u>1</u> of <u>2</u>
Batch No.	VA					SMO Use	,					101	•	general and the second and the secon	315824
Project Nam	e:	SWMU 8	1/58 GWM	Date Sampl	es Shipped	1: 10/1	1/14		SMO A	uthorization	si le	////		Waste Characterization	
Project/Task	Manager:	Clinton L	um	Carrier/Way	bill No.	2/タ	4990	7		ontact Phone		i. fr	Sul	RMMA	
Project/Task	Number:	146422.1	10.11.01	Lab Contac	t	Edie Kent/						5-844-3199		Released by COC No.	
Service Orde	er:	CF262-1	5	Lab Destina	ition:	GEL			Send F	Report to SMC		0 0 1 1 0 1 0 0	····	Thereased by COC No.	☑ 4º Celsius
				Contract No	u.	PO 13038	73			•		5-284-2553		Bill to:Sandia National Laboratories (Ad	
Tech Area:								-	<u> </u>		augiiroo	J 201 2000		P.O. Box 5800, MS-0154	counts Payable),
Building:		Room:		Operation	al Site:									1	
				- 	Depth	Date/	Time	Sample	C	ontainer	Preserv-	Collection	Sample	Albuquerque, NM 87185-0154	Special Control of the Special Control
Sample No.	Fraction	Sa	mple Location D	etail	(ft)	Colle		Matrix	Туре	Volume	ative	Method	Type	į.	Lab
096690	-001	CCBA-FE			1						utive	Method	Type	Requested	Sample ID
090090	1-001	CCBA-FE	52		NA NA	·10/14/14	9:23 <	DIW	G	3x40ml	HCL	G	FB	TCL VOC (SW846-8260B)	358946 026
096691	-001	CCBA-M	W2		117	10/14/14	9:23 /	GW	G	3x40ml	HCL	G	SA	TCL VOC (SW846-8260B)	358986
096691	-002	CCBA-M	A/O	44-					1	 			102 V00 (0VV040-0200B)	358946	
090091	-002	CCBA-IVI	VVZ	117	10/14/14	9:25	GW	AG	4x1 L	None	G	SA	TCL SVOC (SW846-8270C)	7028	
096691	-010	CCBA-M\	W2	117	-10/14/14	9:29	ł gw l	Р	500 ml	HNO3	G	SA	TAL Metals+U (SW846-6010/6020/747	35894	
096691	-016	CCDA M	A/O	447						1			TAL Metals+0 (30048-8010/6020/747	02.9° 358946	
090091	-010	CCBA-MW2			117	10/14/14	9:30 /	GW	Р	125 ml	None	G	SA	Anions (SW846-9056)	030
096691	-017	CCBA-M\	N2	117	10/14/14	9:32	∤ FGW	Р	500 ml	HNO3	G	SA	Metals-Ca,Mg,K,Na (SW846-6020	358949	
096691	-018	CCBA-MW2			117	10/14/14	9:33 ~	L					i) 003 358946
	0.0	CCBA-IVIVV2			 ''' -	10/14/14	9:33 /	GW	<u> P</u>	125 ml	H2SO4	G	SA	Nitrate+Nitrite (EPA 353.2)	1037
096691	-020	CCBA-M\	N2		117	10/14/14	9:34	GW	P	250 ml	None	G	SA	Perchlorate (EPA 314.0)	358946 0 3 2
096691	-022	CCBA-M\	۸۱۶		117	30/44/44	0.05 (- 0,4,1						(21 / (014.0)	
					117	70/14/14	9:35	GW	Р	500 ml	None	G	SA	Alkalinity (SM2320B)	358946 0 3 3
096691		CCBA-MV	N2		117	40/14/14	9:36 ′	GW	AG	4x1 L	None	G	SA	High Explosives (SW846-8321A m	358946 (100) (134)
Last Chain		✓ Yes			Sample	Tracking		SMO	Use	Special Ins	tructions/	QC Requir	ements:		onditions on
Validation I		✓ Yes			Date Ent	ered:				EDD		☑ Yes	-	No	Receipt
Backgroun	d:	Yes			Entered	by:				Turnaround	d Time	7 Dav	processing,	15 Day* 30 Day	rteceipt
Confirmato	ry:	☐ Yes			QC inits.					Negotiated			<u></u>	<u> </u>	
Sample	Na	ime	Signatu	re	Init.	Company	/Organizat	ion/Phone	/Cell	Sample Dis	***************************************	Return	to Client	Disposal by Lab	
Team	Robert Ly	nch	Witten	ch	RL	SNL/4142/50				Return Sam	·	recurr	to onen	C Disposar by Lab	
Members-	Alfred Sa	ntillanes				SNL/4142/50				Comments		Cond round to	Tim Indiana	(44 40 A10 0700 PD 4 07 47	
with	William G		andles 2	12/	12 A X	SNL/4142/50						oenu report to eform verifica	rim Jacksoni tion analysi	/4142/MS 0729/284-2547 is using SW846-6850M.Filtered	
.0'			1		MA		0 20 . 000	77000 <u>200</u>	1001	fraction collect	led in field u	sing a 0.45 m	icron in line	e filter.Report Anions (as	
				<u> </u>	t					Br,C,F,SO4), /	Alkalinity (a	s total CaCO:	3,HCO3,CC	03), and Gamma Spectroscopy (
1.Relinquishe	d by	illie	V2:11	Org. 4/4	7 Date	10/14/14	Time / (070	Dolina	as short list isouished by	otopes).				Lab Use
1. Received b		19 Ed (1		Org. 4 14:		10/14/14	Time / t		3. Recei				Org.	Date Tir	
2.Relinquishe		101.70		Org. 4/4		10/14/14							Org.	Date Tir	
2. Received b	- Allestan	11/4 8		Org. 621.		10-15-14			i.Relinq I. Recei	uished by		····	Org.	Date Tir	
		h SMO red	quired for 7 and			15-17	Time O	7701	+. Recel	veu by	***************************************	·····	Org.	Date Tir	ne

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AOP 95-16

CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY (Continuation)

Page 2 of 2

Project Nan	ne:	SWMU 8/58 GWM	Project/7	rask Mana	ger:	Clinton Lur	n		Project/Ta	sk No ·	1/6/22	.10.11.01		
Tech Area:				***************************************					1. 10,000 ta		140422	10. 1 1.01		
Building:		Room:		· · · · · · · · · · · · · · · · · · ·			· · · · · · · · · · · · · · · · · · ·							Lab us
Sample No	Fraction	Sample Location	n Detail	Depth (ft)	Date/Time Collected		Sample Matrix			Preserv-	Collection Method	Sample Type		Lab
096691	-027	CCBA-MW2		117	10/14/14	9:40 -	GW	P	250 ml	NaOH	G	SA	Requested Total Curries (CW) 49 0040	Sample 3589
096691	-033	CCBA-MW2		117	-10/14/14	9:41 <	GW	P	1 L	HNO3	G	SA	Total Cyanide (SW846-9012)	3589
096691	-034	CCBA-MW2		117	`10/14/14	9:43 ′	GW	P	1 L	HNO3	G	SA	Gamma Spectroscopy (EPA 901.0)	35899
096692	-001	CCBA-MW2		117	10/14/14	9:23	GW	G	3x40ml	HCL	G	DU	Gross Alpha and Beta (EPA 900.0) TCL VOC (SW846-8260B)	35899
096692	-002	CCBA-MW2		117	`10/14/14	9:25 /	GW	AG	4x1 L	None	G		TCL SVOC (SW846-8270C)	35899
096692	-010	CCBA-MW2		117	10/14/14	9:29 ~	GW	Р	500 ml	HNO3	G		TAL Metals+U (SW846-6010/6020/7470)	35874
096692	-016	CCBA-MW2		117	10/14/14	9:30 <	GW	Р	125 ml	None	G		Anions (SW846-9056)	35899
096692	-017	CCBA-MW2		117	10/14/14	9:32	FGW	Р	500 ml	HNO3	G		Metals-Ca,Mg,K,Na (SW846-6020)	3589
096692	-018	CCBA-MW2		117	·10/14/14	9:33 🗸	- GW	Р	125 ml	H2SO4	G		Nitrate+Nitrite (EPA 353.2)	35894
096692	-020	CCBA-MW2	····	117	10/14/14	9:34 ~	/ _{GW}	Р	250 ml	None	G		Perchlorate (EPA 314.0)	35879
096692	-022	CCBA-MW2		117	10/14/14	9:35	, GW	Р	500 ml	None	G		Alkalinity (SM2320B)	35877
096692	-024	CCBA-MW2		117	10/14/14	9:36	´ GW	AG	4x1 L	None	G		High Explosives (SW846-8321A mod	25490
096692	-027	CCBA-MW2		117	10/14/14	9:40	GW	Р	250 ml	NaOH	G		Total Cyanide (SW846-9012)	35878 046
096692	-033	CCBA-MW2		117	10/14/14	9:41	GW	Р	1 L	HNO3	G		Gamma Spectroscopy (EPA 901.0)	35899
096692		CCBA-MW2		117	'10/14/14	9:43	_ GW	Р	1 L	HNO3	G		Gross Alpha and Beta (EPA 900.0)	35899
096693	-001	CCBA-TB3		NA	10/14/14	9:23	DIW	G	3x40 mi	HCL	G		TCL VOC (SW846-8260B)	35899 04
			sanda nastroningas sa sa Av											

