ENTERED

Department of Energy
National Nuclear Security Administration
Sandia Field Office
P.O. Box 5400
Albuquerque, NM 87185

NNSA National Nuclear Security Administration

RECEIVED FEB 13 2018 NMED Hazardous Waste Bureau

FEB 08 2018

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

Subject: Submittal of Updated Reference Documents Cited in the Mixed Waste Landfill Long-Term Monitoring and Maintenance Plan, Sandia National Laboratories/New Mexico, Environmental Protection Agency Identification Number NM5890110518

Dear Mr. Kieling:

The Department of Energy/National Nuclear Security Administration/Sandia Field Office and National Technology and Engineering Solutions of Sandia, LLC are submitting the enclosed updated reference documents to the New Mexico Environment Department. This submittal is required within 30 days of the effective date of the updated documents, which is January 23, 2018.

This submittal is comprised of four procedures used by personnel to conduct groundwater monitoring activities at the Mixed Waste Landfill. The updated reference documents are:

- FOP 05-01 Groundwater Monitoring Well Sampling and Field Analytical Measurements
- FOP 05-02 Groundwater Monitoring Equipment Field Check for Water Quality Measurements
- FOP 05-03 Groundwater Monitoring Equipment Decontamination
- FOP 05-04 Groundwater Monitoring Waste Management

Revisions include updates to keep the reference document current and to reflect ongoing modifications and improvements in industry practices.

If you have questions, contact Steven Black of our staff at (505) 845-6885.

Sincerely,

Jeffrey P. Harrell
Manager

Enclosure

cc: See Page 2

cc w/enclosure:
David Cobrain
NMED/HWB
2905 Rodeo Park Dr. East, Bldg. 1, Santa Fe, New Mexico 87505

Brian Salem
NMED/HWB
121 Tijeras Ave. NE, Suite 1000, Albuquerque, New Mexico 87102

Naomi Davidson
NMED/HWB
121 Tijeras Ave. NE, Suite 1000, Albuquerque, New Mexico 87102

Susan Lucas Kamat
NMED/DOE OB
121 Tijeras Ave. NE, Suite 1000, Albuquerque, New Mexico 87102

Laurie King
Environmental Protection Agency Region 6
Fountain Place Suite 1200, 1445 Ross Ave., Dallas, Texas 75202

Zimmerman Library
MSC05 3020
1 University of New Mexico, Albuquerque, New Mexico 87101-0001

Cynthia Wimberly, SFO/Legal
Steven Black, SFO/ENG

cc w/o enclosure:
Amy Blumberg, SNL/NM
Sue Collins, SNL/NM
Johnathon Huff, SNL/NM
Jaime Moya, SNL/NM
Pamela Puissant, SNL/NM
Anita Reiser, SNL/NM
Michael Mitchell, SNL/NM
Susan Lacy, SFO/ENG
777766

Submittal of Updated Reference Documents Cited in the Mixed Waste Landfill Long-Term Monitoring and Maintenance Plan

Sandia National Laboratories
Albuquerque, New Mexico
EPA ID No. NM5890110518

CERTIFICATION STATEMENT

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.

Johnathon Huff, Senior Manager
Performance Assurance & Engineered Safety
National Technology & Engineering Solutions of Sandia, LLC
Albuquerque, New Mexico
Operator

JAN 25 2018
Date signed

Jeffrey P. Harrell, Manager
U.S. Department of Energy
National Nuclear Security Administration
Sandia Field Office
Owner

1/29/18
Date signed

Enclosure A

Updated Reference Documents Cited in the Mixed Waste Landfill Long-Term Monitoring and Maintenance Plan

FOP 05-01 Groundwater Monitoring Well Sampling And Field Analytical Measurements
FOP 05-02 Groundwater Monitoring Equipment Field Check For Water Quality Measurements
FOP 05-03 Groundwater Monitoring Equipment Decontamination
FOP 05-04 Groundwater Monitoring Waste Management

January 2018

Sandia National Laboratories
EPA ID No. NM5890110518

SANDIA NATIONAL LABORATORIES
LONG-TERM STEWARDSHIP PROGRAM

GROUNDWATER MONITORING WELL SAMPLING AND FIELD ANALYTICAL MEASUREMENTS

FIELD OPERATING PROCEDURE

FOP 05-01
Revision 6

Author: _____ **Date:** 1/8/2018
Tim Jackson, LTS Groundwater Lead

Approved: _____ **Date:** 01/10/18
Robert Lynch, Subject Matter Expert

Approved: _____ **Date:** 1/15/18
Sue Collins, LTS Program Lead

Author: How frequently does this document need to be reviewed and/or revised?	Every 3 years, or when activities change.
Manager: Does this document need to be tracked?	Yes

EFFECTIVE DATE: 1/23/18

IMPORTANT NOTICE: A printed copy of this document may not be the document currently in effect. The official version is located on the Sandia Restricted Network, 600 Controlled Documents home page.

TABLE OF CONTENTS

ACRONYMS & ABBREVIATIONS **4**
1.0 PURPOSE, SCOPE, AND OWNERSHIP **5**
1.1 Purpose 5
1.2 Scope 5
1.3 Ownership 5
2.0 TRAINING QUALIFICATIONS **5**
3.0 HEALTH AND SAFETY **6**
4.0 DATA QUALITY OBJECTIVES **6**
5.0 EQUIPMENT AND MATERIALS **7**
6.0 MONITORING REQUIREMENTS **8**
7.0 FIELD PROCEDURE **8**
7.1 Preparation 8
7.2 Sample Management 9
7.3 Decontamination 9
7.4 Static Water Level Measurements 9
7.5 Well Evacuation (Purging) 9
7.5.1 Portable Non-Dedicated Piston Pump System 10
7.6 Measuring Groundwater Field Parameter Data 11
7.7 Field Analysis 11
7.8 Equipment Blanks, Field Blanks, and Duplicate Samples 11
7.9 Waste Disposal 11
7.10 Well Condition and Security 12
7.11 Quality Assurance 12
8.0 RECORDS **12**
9.0 REFERENCES **12**

LIST OF TABLES

Table 2.1. Training Course List 6

LIST OF FORMS

SMP 2012-ARCOD – Sample Management Office – Analysis Request and Chain of Custody
EP 2009-ALW – Environmental Planning – Activity Level Work Evaluation Form
EP 2009-AUL – Environmental Planning – Authorized Users List
EP 2009-OJT – Environmental Planning – On-the-Job Training
EP 2009-WRA – Environmental Planning – Work Resumption Authorization Form
LTS GW-2012-001 – Field Measurement Log for Groundwater Sample Collection
LTS GW-2012-002 – Groundwater Sample Collection Field Equipment Check Log
LTS GW-2012-006 – Tailgate Safety Meeting Form

IMPORTANT NOTICE: A printed copy of this document may not be the document currently in effect. The official version is located on the Sandia Restricted Network, 600 Controlled Documents home page.

REVISION HISTORY

Revision	Effective Date	Summary of Changes
1	10/10/2005	New document
2	8/16/2007	Formatting changes. Updated section 2, Roles and Responsibilities; section 3, Training Qualifications; section 9, References.
3	11/12/2009	Formatting changes. Added work planning and control information to section 4.0, Health & Safety. Updated section 3, Training Qualifications; section 9, References.
4	1/24/2012	Formatting changes. Revision history changed from 2 years to 3 years. Removal of some forms (attachments) and replaced with hyperlinks to where the forms can be found. Updated section 3, Training Qualifications; section 9, References.
5	1/23/2015	Author change. Updated sections 1, 3, and 4.
6	1/23/2018	Reviewer changes. Format changes. Updated all sections.

IMPORTANT NOTICE: A printed copy of this document may not be the document currently in effect. The official version is located on the Sandia Restricted Network, 600 Controlled Documents home page.

ACRONYMS & ABBREVIATIONS

ALW	Activity Level Work
AOP	administrative operating procedure
AUL	Authorized Users List
ARCOC	analysis request and chain of custody
DI	deionized
DO	dissolved oxygen
FOP	field operating procedure
gal/ft^3	gallon(s)/cubic foot
ft	foot/feet
in	inch(es)
LOP	laboratory operating procedure
LTS	Long-Term Stewardship
OJT	on-the-job training
ORP	oxidation/reduction potential
pH	potential for hydrogen
PLA	plan
SAP	sampling and analysis plan
SC	specific conductance
SMO	Sample Management Office
SNL/NM	Sandia National Laboratories, New Mexico

IMPORTANT NOTICE: A printed copy of this document may not be the document currently in effect. The official version is located on the Sandia Restricted Network, 600 Controlled Documents home page.

1.0 PURPOSE, SCOPE, AND OWNERSHIP

1.1 Purpose

This field operating procedure (FOP) provides instruction on collecting a groundwater sample from a monitoring well that is representative of in situ groundwater conditions and is suitable for laboratory analysis. The sample must be conducted per regulatory requirements and established agency guidance to provide legally defensible analytical data for regulatory compliance.

1.2 Scope

The scope of this procedure is limited to well purging, field analytical measurements, and the collection of samples from monitoring wells as part of Sandia National Laboratories, New Mexico (SNL/NM) groundwater monitoring activities.

1.3 Ownership

The Long-Term Stewardship Program is responsible for development, approval, distribution, revision, and control of this document.

2.0 TRAINING QUALIFICATIONS

Personnel conducting field activities shall complete the following:

- On the Job Training (OJT) for new field personnel performing groundwater sampling activities or new processes and/or equipment. Document training by completing OJT form (EP 2009-OJT).
- Read and sign AOP 95-16, *Sample Management and Custody*.
- Read and sign FOP 03-02, *Groundwater Level Data Acquisition and Management*.
- Read and sign laboratory operating procedure (LOP) LOP 94-03, *Sample Handling, Packaging and Shipping*.
- Read and sign FOP 05-02, *Groundwater Monitoring Equipment Field Check*.
- Read and sign FOP 05-03, *Groundwater Sampling Equipment Decontamination*.
- Read and sign FOP 05-04, *Groundwater Waste Management Plan*.
- Read and sign Plan (PLA) PLA 05-09, *Groundwater Monitoring Health & Safety Plan*.
- Complete training courses listed in Table 3.1.
- Field personnel shall sign the Authorized Users List (AUL) (EP 2009-AUL) to affirm they have read and understand this document, and agree to operate within the stated constraints.

IMPORTANT NOTICE: A printed copy of this document may not be the document currently in effect. The official version is located on the Sandia Restricted Network, 600 Controlled Documents home page.

Table 2.1. Training Course List

Course Code	Course Title
CHM100/103	Chemical Safety Training/Site-Specific Chemical Training
ENV100	OSHA Health & Safety Basic Training - General Worker (40 HR)
ENV103	OSHA Health & Safety Training Refresher (8 HR)
ENV112	Hazardous Waste & Environmental Management Training
ENV216	RCRA - Less Than 90-Day Area Accumulation Area for Owners & Emergency Coordinators
ENV416	RCRA - Less Than 90-Day Area Accumulation Area for Waste Workers - Site-Specific
ESH100	ES&H Awareness
FKL153/R	Forklift Operator and Hands-On Training/Refresher
MCH200	Hand and Power Tool Safety
MED102	Standard First Aid
MED104	Heartsaver CPR
OTS101	Occupational Thermal Stress
PKX050	Site Specific Packaging and Transportation of Hazardous Materials Training
PKX100	Basic Hazardous Material Transportation Training
PPE106	Personal Protective Equipment Training
PRS150/R	Pressure Safety Orientation/Refresher
PRS250/R	Advanced Pressure Safety/Refresher
RAD230/R	Radiological Worker II Training/Refresher

CPR = Cardiopulmonary Resuscitation
ES&H = Environment, Safety and Health
HR = hour
OSHA = Occupational Safety and Health Administration
RCRA = Resource Conservation and Recovery Act

3.0 HEALTH AND SAFETY

A task hazard analysis has been performed on the activities described in this FOP as well as a hazard assessment survey performed by a SNL/NM industrial hygienist. They are detailed in the PLA 05-09, *Groundwater Sampling Health and Safety Plan.*

4.0 DATA QUALITY OBJECTIVES

The data quality object (DQO) of this FOP is ensuring regulatory compliance and reducing the risks to human health and the environment.

5.0 EQUIPMENT AND MATERIALS

A portable piston pumping method is used to purge water from the well casing and collect groundwater samples. This method uses an inert gas (nitrogen or equivalent) to operate the pump.

The following list includes equipment and materials necessary to collect a sample, document its collection, and request the laboratory analyses. Not all of the equipment may be required for each sampling event. The list depends on the methods used for purging and sampling, and the potential presence of contaminants in groundwater at the site.

Consumables

- Deionized (DI) water.
- Decontamination supplies listed in FOP 05-03 (detergents, DI water, nitric acid, buckets, brushes, etc.). Additional decontamination requirements and supplies may be specified on a project specific basis.
- Small and large zip-lock and bubble wrap bags.
- Insulated ice chest (coolers), blue ice or ice (as required).
- In-line filters.
- Paper wipes.
- Wash bottles.
- Sample containers with the required reagents for field preservation of samples. They provided by SMO and/or the laboratory. (Note: Visually inspect preservatives for discoloration or degradation prior to use to ensure reagent quality.).
- Seals (custody seal tape).
- Indelible black ink pens.
- Personal protective equipment. Reference PLA 05-09, *Groundwater Sampling Health and Safety Plan.*

Documentation Forms

- All documentation forms are examples and information may be supplemented with specific software applications.
- LTS GW-2012-001, Field Measurement Log for Groundwater Sample Collection
- LTS GW-2012-002, Groundwater Sample Collection Field Equipment Check Log,
- SMO 2012-ARCOC, Analysis request and chain of custody (ARCOC).

IMPORTANT NOTICE: A printed copy of this document may not be the document currently in effect. The official version is located on the Sandia Restricted Network, 600 Controlled Documents home page.

Other Equipment

- Portable Bennett piston pump system or equivalent.
- Compressed nitrogen (or equivalent) gas cylinders with associated regulators, calibrated pressure relief valves and pressure air lines, as necessary, to operate portable piston pump system.
- Water level indicator.
- Empty 55-gallon close head poly drums for purge water/decontamination fluids.
- 0.45 micron membrane filter for filtering the dissolved analytical fractions.
- Equipment for groundwater field parameters (potential for hydrogen [pH], specific conductivity [SC], temperature, turbidity; calibration standards) as specified in FOP 05-02. Additional field parameters may include dissolved oxygen (DO) and oxidation/reduction potential (ORP).
- Equipment for field analysis water chemistry such as a digital titrator and colorimeter (project specific).

Additional Items

- Well construction details of monitoring wells to be sampled (depth from top of casing, casing diameters, screen length and depths).
- Key to well lock(s) and for gate access to site (if applicable).
- Equipment manuals.
- Tools.
- 2-way radio.

6.0 MONITORING REQUIREMENTS

SNL/NM conducts groundwater monitoring for the U.S. Department of Energy, National Nuclear Security Administration (NNSA) at SNL/NM. Monitoring is conducted as part of the SNL/NM Long-Term Stewardship (LTS) Program and Environmental Restoration Program to satisfy applicable regulatory and program requirements. This FOP may be used for additional NNSA groundwater surveillance, as needed.

7.0 FIELD PROCEDURE

7.1 Preparation

The project leader will provide field technician with project information including (but not limited) to health and safety, field objectives, analytical parameters, quality control samples, site-access, sample containers, equipment, vehicles, and waste management requirements that will be implemented to comply with regulatory and programmatic requirements.

7.2 Sample Management

Groundwater sampling shall be performed in strict accordance with "Groundwater Monitoring Well Sampling and Field Analytical Measurements" (SNL/NM FOP 05-01), and SNL/NM SMO procedures and protocols (SNL/NM AOP 95-16). Sample container types depend on the analytical parameters. The EPA method sample containers, sample volumes, preservatives, and maximum holding times for analytical parameters should be verified with selected laboratories or SMO personnel.

7.3 Decontamination

Decontaminate all equipment used to sample groundwater prior to placement in a well. Follow the directions listed in FOP 05-03 for decontaminating equipment.

7.4 Static Water Level Measurements

Water level information is used to calculate the volume of water in a well casing and the minimum amount required for purging. The static water level is measured in each well prior to purging or obtaining a sample. Static water level measurements are taken to the nearest 0.01 foot using a water level indicator or water level data logger. Measurements are referenced to a surveyed mark of known elevation at the top the well casing. See FOP 03-02 for collecting a static water level measurement. (Note: Because the static water level measurement is used to calculate a purge volume it is not necessary to follow every step of FOP 03-02. Use it only as general guidance for obtaining a static water level measurement.)

7.5 Well Evacuation (Purging)

Purging a well removes stagnant water so that a representative sample of the groundwater can be obtained. Purging requirements are affected by one or more of the following:

- Permit requirements
- The pump and sample method used (conventional vs. low-flow)
- Well construction
- Well recharge rate
- Equipment limitations

Purge the well at a rate that creates minimal disturbance to the groundwater flow regime. This ensures the most representative sample of the groundwater. Purge the well until the volume specified in is met and until groundwater field parameters stabilize.

7.5.1 Portable Non-Dedicated Piston Pump System

Install the pump according to its operating manual and project criteria. The pump intake should be set at or near the bottom of a well's screened interval. Nitrogen gas (or equivalent) is used to operate the pump. The flow rate is controlled by varying the gas pressure on the pump. A minimum of one saturated casing volume (unless otherwise specified) needs to be purged when using a portable non-dedicated piston pump system. A saturated casing volume is defined as the volume of one length of the saturated screen (*V1*) plus the borehole annulus surrounding the outside of the well screen interval (*V3*). The following formulas are used to calculate a saturated casing volume:

$V1 = R1^2 \times \pi \times (H2 - H1) \times 7.48$ gallon/cubic feet (gal/ft^3)
$V2 = R2^2 \times \pi \times (H2 - H1) \times 7.48$ gal/ft^3
$V3 = (V2 - V1) \times 0.30$

Minimum purge volume or saturated casing volume = $V3 + V1$

where:

$\pi = 3.14$
R1 = radius of the well casing feet (ft) = [diameter of well casing inch (in) x 1(ft)/12 (in)] / 2
R2 = radius of borehole (ft) = [diameter of borehole (in) x 1 (ft)/12 (in)] / 2
V1 = volume of submerged screen length casing interval
V2 = volume of submerged screen length annulus
V3 = submerged annulus volume
H1 = depth to water in screen (ft) not to exceed length of screen
H2 = well depth (ft)
H2 - *H1* = static water height (ft) in well screen
0.30 = filter pack porosity

Begin purging the well after the minimum purge volume has been determined. If possible, purge the well at a flow rate equal to the recharge rate of the well. Record groundwater field parameters at a minimum of every 5 gallons. Groundwater field parameters must stabilize before samples are collected. See Section 8.6 for more information on collecting groundwater field parameter data.

If the well goes dry during the purging process, allow the water in the well to recover such that the volume of water available is necessary to collect the required samples (given limitations to well characteristics, analytical requirements, shipping requirements, and etc).

IMPORTANT NOTICE: A printed copy of this document may not be the document currently in effect. The official version is located on the Sandia Restricted Network, 600 Controlled Documents home page.

7.6 Measuring Groundwater Field Parameter Data

Connect the water quality meter into the sampling system. The water quality meter includes the sensors used to measure groundwater field parameters (pH, SC, temperature, ORP, DO). Turbidity can be measured separately with a portable turbidimeter or as a separate sensor within the water quality meter.

All instruments and their corresponding probes are function checked prior to recording groundwater field parameters. Function check the instruments in accordance with FOP 05-02.

The samples are collected (see Section 8.8) after the well is properly purged and the groundwater field parameters are stable. The following stability criteria apply (if no others are specified):

Four consecutive measurements of:

- +/- 0.1 standard units for pH.
- +/- 1.0 degrees Celsius for temperature.
- +/- 5 percent for SC.
- +/- 10 percent or ≤ 5 nephelometric turbidity units for turbidity.

Additional field parameters may include ORP and DO, as required on a project specific basis.

7.7 Field Analysis

Samples may be collected for field analysis such as alkalinity, hexavalent chromium, nitrate, and ferrous iron. The field analyses will be specified as required. Digital titrators and colorimeters are used to perform the field analyses. Follow the manufacturer's procedures when performing the analyses. Document the results on the Field Measurement Log for Groundwater Collection (LTS GW-2012-001) or specific field analysis forms if applicable.

7.8 Equipment Blanks, Field Blanks, and Duplicate Samples

Collect any equipment blanks, field blanks, duplicate samples as specified per project requirements.

When collecting duplicate samples, it is important to take them in a consecutive order. The duplicate sample is analyzed to estimate the overall reproducibility of the sampling and analytical process and should be collected immediately after the designated environmental sample, to reduce variability from time and/or sampling mechanics.

7.9 Waste Disposal

Containerize, label, and process all wastes generated during purging, sampling, and decontamination activities in accordance with FOP 05-04.

7.10 Well Condition and Security

Remove all non-dedicated sampling equipment from the well and secure the equipment for transport. Place the casing cap on the well. Secure and lock the outer protective casing cap. Clean up the sampling site. The discovery of any problems with the well (such as missing or damaged hasps, locks, concrete pads, protective posts, obstruction inside the well casings, well access, etc.) shall be documented. Immediately inform the project leader of the problem.

7.11 Quality Assurance

FOP 05-02 is used as the quality assurance mechanism for operations described in this procedure.

8.0 RECORDS

A record of purging and sample collection activities is required. The completed documentation is reviewed by the field members. SMO will review sample management documentation upon delivery of samples to the facility. All of the original documentation with the exception of the ARCOC are provided to the project leader. The project leader reviews and approves, for transmittal to the Customer Funded Record Center.

9.0 REFERENCES

Bennett, Robert and Company, 1988, "Operation Manual for the Bennett Sampling Pump," Amarillo, Texas.

HACH Company, CAT. NO. 48470-22, Colorimeter, Model DR/890, Colorimeter Procedures Manual.

HACH Company, CAT. NO. 16900-08, Digital Titrator, Model 16900, Manual.

HACH Company, CAT. NO. 23145, Alkalinity Test Kit, Model AL-TA, Manual.

Sandia National Laboratories, Sample Management Office, LOP 94-03, *Sample Handling, Packaging and Shipping* (latest edition), SNL/NM.

Sandia National Laboratories, Sample Management Office, AOP 95-16, *Sample Management and Custody* (latest edition), SNL/NM.

Sandia National Laboratories, Environmental Programs and Assurance Department, FOP 03-02, *Long Term Environmental Stewardship Water Level Data Acquisition and Management* (latest edition), SNL/NM.

Sandia National Laboratories, Long-Term Stewardship, FOP 05-02, *Groundwater Monitoring Equipment Field Check for Water Quality Measurements* (latest edition), SNL/NM.

Sandia National Laboratories, Long-Term Stewardship, FOP 05-03, *Groundwater Monitoring Equipment Decontamination* (latest edition), SNL/NM.

Sandia National Laboratories, Long-Term Stewardship, FOP 05-04, *Groundwater Monitoring Waste Management* (latest edition), SNL/NM.

Sandia National Laboratories, Long-Term Stewardship, PLA 05-09, *Groundwater Monitoring Health and Safety Plan* (latest edition), SNL/NM.

IMPORTANT NOTICE: A printed copy of this document may not be the document currently in effect. The official version is located on the Sandia Restricted Network, 600 Controlled Documents home page.

SANDIA NATIONAL LABORATORIES
LONG-TERM STEWARDSHIP PROGRAM

GROUNDWATER MONITORING EQUIPMENT FIELD CHECK FOR WATER QUALITY MEASUREMENTS

FIELD OPERATING PROCEDURE

FOP 05-02
Revision 6

Author: Tim Jackson, LTS Groundwater Lead **Date:** 1/8/2018

Approved: Robert Lynch, Subject Matter Expert **Date:** 01/10/18

Approved: Sue Colling, LTS Program Lead **Date:** 1/15/18

Author: How frequently does this document need to be reviewed and/or revised?	Every 3 years, or when activities change.
Manager: Does this document need to be tracked?	**Yes**

EFFECTIVE DATE: 1/23/18

IMPORTANT NOTICE: A printed copy of this document may not be the document currently in effect. The official version is located on the Sandia Restricted Network, 600 Controlled Documents home page.

TABLE OF CONTENTS

ACRONYMS & ABBREVIATIONS **4**
1.0 PURPOSE, SCOPE, AND OWNERSHIP **5**
1.1 Purpose 5
1.2 Scope 5
1.3 Ownership 5
2.0 TRAINING QUALIFICATIONS **5**
3.0 HEALTH AND SAFETY **6**
4.0 DATA QUALITY OBJECTIVES **7**
5.0 EQUIPMENT AND MATERIALS **7**
6.0 FIELD PROCEDURES **8**
6.1 Equipment Calibration and Function Check 8
6.1.1 Water Quality Instrument *8*
6.1.2 Portable Turbidity Meter *8*
6.2 Equipment Maintenance 8
7.0 RECORDS **8**
8.0 REFERENCES **9**

LIST OF TABLES

Table 2.1. Training Course List 6

LIST OF FORMS

EP 2009-ALW – Environmental Planning – Activity Level Work Evaluation Form
EP 2009-AUL – Environmental Planning – Authorized Users List
EP 2009-OJT – Environmental Planning – On-the-Job Training
EP 2009-WRA – Environmental Planning – Work Resumption Authorization Form
LTS GW-2012-002 – Groundwater Sample Collection Field Equipment Check Log
LTS GW-2012-006 – Tailgate Safety Meeting Form

IMPORTANT NOTICE: A printed copy of this document may not be the document currently in effect. The official version is located on the Sandia Restricted Network, 600 Controlled Documents home page.

REVISION HISTORY

Revision	Effective Date	Summary of Changes
1	10/10/2005	New document
2	8/16/2007	Formatting changes. Updated section 2, Roles and Responsibilities; section 3, Training Qualifications; section 9, References.
3	11/12/2009	Formatting changes. Added work planning and control information to section 4.0, Health & Safety. Updated section 3, Training Qualifications; section 9, References.
4	1/24/2012	Formatting changes. Revision history changed from 2 years to 3 years. Removal of some forms (attachments) and replaced with hyperlinks to where the forms can be found. Updated section 3, Training Qualifications; section 9, References.
5	1/23/2015	Author change. Updates to all sections.
6	1/23/2018	Reviewer change, format change, section changes.

IMPORTANT NOTICE: A printed copy of this document may not be the document currently in effect. The official version is located on the Sandia Restricted Network, 600 Controlled Documents home page.

ACRONYMS & ABBREVIATIONS

DO	dissolved oxygen
FOP	field operating procedure
LTS	**Long-Term Stewardship**
OJT	on-the-job training
ORP	oxidation/reduction potential
pH	potential of hydrogen
PLA	plan
SNL/NM	Sandia National Laboratories, New Mexico

IMPORTANT NOTICE: A printed copy of this document may not be the document currently in effect. The official version is located on the Sandia Restricted Network, 600 Controlled Documents home page.

1.0 PURPOSE, SCOPE, AND OWNERSHIP

1.1 Purpose

This field operating procedure (FOP) provides guidance on operating instruments used to measure groundwater field parameters during groundwater sampling of monitoring wells. Chemical and physical parameters may include potential of hydrogen (pH), specific conductivity (SC), temperature, oxidation/reduction potential (ORP), turbidity, and dissolved oxygen (DO) content. The procedure also provides information on function checks and calibrations of instruments that act as the quality assurance mechanism for FOP 05-01, *Groundwater Monitoring Well Sampling and Field Analytical Measurements*.

1.2 Scope

This procedure applies to groundwater field parameters measured during groundwater sampling activities conducted at Sandia National Laboratories, New Mexico (SNL/NM).

1.3 Ownership

The Long-Term Stewardship Department is responsible for development, approval, and revision of this document.

2.0 TRAINING QUALIFICATIONS

Personnel conducting field activities shall complete the following:

- On-the-job training (OJT) for new field personnel performing field checks of water quality measurement equipment. Document training by completing On-the-Job Training form (EP 2009-OJT).
- Read and sign FOP 03-02, *Groundwater Level Data Acquisition and Management*.
- Read and sign FOP 05-01, *Groundwater Monitoring Well Sampling and Field Analytical Measurements*.
- Read and sign FOP 05-03, *Groundwater Sampling Equipment Decontamination*.
- Read and sign FOP 05-04, *Groundwater Waste Management Plan*.
- Read and sign plan (PLA) PLA 05-09, *Groundwater Monitoring Health & Safety Plan*.
- Complete training courses listed in Table 3.1.
- Field personnel shall sign the Authorized Users List (EP 2009-AUL) to affirm they have read and understand this document, and agree to operate within the stated constraints.

IMPORTANT NOTICE: A printed copy of this document may not be the document currently in effect. The official version is located on the Sandia Restricted Network, 600 Controlled Documents home page.

Table 2.1. Training Course List

Course Code	Course Title
CHM100/103	Chemical Safety Training/Site-Specific Chemical Training
ENV100	OSHA Health & Safety Basic Training - General Worker (40 HR)
ENV103	OSHA Health & Safety Training Refresher (8 HR)
ENV112	Hazardous Waste & Environmental Management Training
ENV216	RCRA - Less Than 90-Day Area Accumulation Area for Owners & Emergency Coordinators
ENV416	RCRA - Less Than 90-Day Area Accumulation Area for Waste Workers - Site-Specific
ESH100	ES&H Awareness
FKL153/R	Forklift Operator and Hands-On Training/Refresher
MCH200	Hand and Power Tool Safety
MED102	Standard First Aid
MED104	Heartsaver CPR
OTS101	Occupational Thermal Stress
PKX050	Site Specific Packaging and Transportation of Hazardous Materials Training
PKX100	Basic Hazardous Material Transportation Training
PPE106	Personal Protective Equipment Training
PRS150/R	Pressure Safety Orientation/Refresher
PRS250/R	Advanced Pressure Safety/Refresher
RAD230/R	Radiological Worker II Training/Refresher

NOTES: CPR = Cardiopulmonary Resuscitation
ES&H = Environment, Safety and Health
HR = hour
OSHA = Occupational Safety and Health Administration
RCRA = Resource Conservation and Recovery Act

3.0 HEALTH AND SAFETY

A task hazard analysishas been performed on the activities described in this FOP as well as a hazard assessment survey performed by a SNL/NM industrial hygienist. They are detailed in the PLA 05-09, *Groundwater Monitoring Health & Safety Plan.*

4.0 DATA QUALITY OBJECTIVES

The data quality object (DQO) of this FOP is ensuring regulatory compliance and reducing the risks to human health and the environment.

5.0 EQUIPMENT AND MATERIALS

The following instruments are used to measure groundwater parameters:

- Water quality instrument capable of measuring chemical parameters including temperature, potential of hydrogen (pH), and conductivity. Additional chemical parameters (DO, ORP, turbidity) and physical parameters (air temperature, barometric pressure, water level) may be required on a project specific basis.
- Portable Turbidity Meter.

Follow manufacturer's instructions for calibration and operation.

The following list includes documentation requirements, equipment and materials necessary to calibrate/check field analytical equipment, and/or to measure the parameters.

Documentation Forms:

- All documentation forms are examples and information may be supplemented with specific software applications.
- Groundwater Sample Collection Field Equipment Check Log

Calibration Standard Solutions – Calibration standard solutions must meet instrument criteria and comply with Corporate Policy ESH100.2.ENV.27.

- pH solutions.
- electrical conductivity solutions: measured in micromhos/centimeter (µmhos/cm).
- standard for oxidation/reduction potential: measured in mV.
- Gelex® or equivalent turbidity standards.

Additional Items:

- manufacturer's instructions/operator/manuals
- deionized water (DI)
- material data sheets

6.0 FIELD PROCEDURES

6.1 Equipment Calibration and Function Check

To obtain the most accurate readings possible follow manufacturer's recommended calibration procedures. Calibrate or perform a function check on the instruments prior to measuring groundwater field parameters. Document function check or calibration using instrument software or complete the Groundwater Sample Collection Field Equipment Check Log. Note the condition and quality of calibration standards. Make sure they have not exceeded their expiration date. Replace if necessary.

6.1.1 Water Quality Instrument

The water quality sensors (except temperature) require periodic calibration, and procedures follow the same basic steps with slight variations. All calibrations should be conducted in a temperature controlled space. Reference the manufacturer's manual for additional calibration procedures or if errors occur during the calibration process. It may be necessary to replace a probe that cannot be calibrated.

6.1.2 Portable Turbidity Meter

The portable turbidity meter requires periodic calibration, and procedures follow the same basic steps with slight variations. Perform instrument check or calibration with Gelex® or equivalent calibration standard. Reference the manufacturer's manual for additional calibration procedures or if errors occur during the calibration process.

6.2 Equipment Maintenance

Store the equipment and perform routine maintenance as required by the manufacturer's instructions.

7.0 RECORDS

The completed documentation is reviewed by the field technician before it is provided to the project leader. The project leader reviews, approves, and transmits the documentation to the Customer Funded Records Center.

8.0 REFERENCES

HACH Company, CAT. NO. 46500-88, Portable Turbidimeter, Model 2100P, Instrument and Procedure Manual.

New Aqua Troll 600 Calibration Procedure.

Sandia National Laboratories, Long-Term Stewardship, FOP 03-02, *Water Level Data Acquisition and Management* (latest edition), SNL/NM.

Sandia National Laboratories, Long-Term Stewardship, FOP 05-01, *Groundwater Monitoring Well Sampling and Field Analytical Measurements* (latest edition), SNL/NM.

Sandia National Laboratories, Long-Term Stewardship, FOP 05-03, *Groundwater Monitoring Equipment Decontamination* (latest edition), SNL/NM.

Sandia National Laboratories, Long-Term Stewardship, FOP 05-04, *Groundwater Monitoring Waste Management* (latest edition), SNL/NM.

Sandia National Laboratories, Long-Term Stewardship, PLA 05-09, *Groundwater Monitoring Health and Safety Plan* (latest edition), SNL/NM.

IMPORTANT NOTICE: A printed copy of this document may not be the document currently in effect. The official version is located on the Sandia Restricted Network, 600 Controlled Documents home page.

SANDIA NATIONAL LABORATORIES
LONG-TERM STEWARDSHIP PROGRAM

GROUNDWATER MONITORING EQUIPMENT DECONTAMINATION

FIELD OPERATING PROCEDURE

FOP 05-03
Revision 6

Author: _____ **Date:** 1/8/2018
Tim Jackson, LTS Groundwater Lead

Approved: _____ **Date:** 01/10/18
Robert Lynch, Subject Matter Expert

Approved: _____ **Date:** 1/15/18
Sue Collins, LTS Program Lead

Author: How frequently does this document need to be reviewed and/or revised?	Every 3 years, or when activities change.
Manager: Does this document need to be tracked?	Yes

EFFECTIVE DATE: 1/23/18

IMPORTANT NOTICE: A printed copy of this document may not be the document currently in effect. The official version is located on the Sandia Restricted Network, 600 Controlled Documents home page.

TABLE OF CONTENTS

ACRONYMS & ABBREVIATIONS **4**
1.0 PURPOSE, SCOPE AND OWNERSHIP **5**
1.1 Purpose 5
1.2 Scope 5
1.3 Ownership 5
2.0 TRAINING QUALIFICATIONS **5**
3.0 HEALTH AND SAFETY **6**
4.0 EQUIPMENT AND MATERIALS **6**
5.0 PROCEDURES **7**
5.1 Equipment Decontamination 7
5.2 Decontamination Waste 8
6.0 RECORDS **8**
7.0 REFERENCES **9**

LIST OF TABLES

Table 2.1. Training Course List 6

LIST OF FORMS

EP 2009-ALW – Environmental Planning – Activity Level Work Evaluation Form
EP 2009-AUL – Environmental Planning – Authorized Users List
EP 2009-OJT – Environmental Planning – On-the-Job Training
EP 2009-WRA – Environmental Planning – Work Resumption Authorization Form
LTS GW-2012-004 – Groundwater Monitoring Waste Generation Log
LTS GW-2012-006 – Tailgate Safety Meeting Form
LTS GW-2012-003 – Portable Pump and Tubing / Water Level Indicator Decontamination Log Form

IMPORTANT NOTICE: A printed copy of this document may not be the document currently in effect. The official version is located on the Sandia Restricted Network, 600 Controlled Documents home page.

REVISION HISTORY

Revision	Effective Date	Summary of Changes
1	10/10/2005	New document
2	8/16/2007	Formatting changes. Updated section 2, Roles and Responsibilities; section 3, Training Qualifications; section 8, References.
3	11/12/2009	Formatting changes. Added work planning and control information to section 4, Health and Safety. Updated section 3, Training Qualifications; section 8, References.
4	1/24/2012	Formatting changes. Revision history changed from 2 years to 3 years. Removal of some forms (attachments) and replaced with hyperlinks to where the forms can be found. Updated section 3, Training Qualifications; section 8, References.
5	1/23/2015	Author change. Updated sections 2, 3, 4, and 6.
6	1/23/2018	Reviewer change, format change, section changes.

IMPORTANT NOTICE: A printed copy of this document may not be the document currently in effect. The official version is located on the Sandia Restricted Network, 600 Controlled Documents home page.

ACRONYMS & ABBREVIATIONS

CHPD	closed head polyethylene drum
DI	deionized
FOP	field operating procedure
HNO_3	nitric acid
LTS	Long-Term Stewardship
ml	milliliter
OJT	on-the-job training
PLA	plan
PPE	personal protective equipment
SNL/NM	Sandia National Laboratories, New Mexico

IMPORTANT NOTICE: A printed copy of this document may not be the document currently in effect. The official version is located on the Sandia Restricted Network, 600 Controlled Documents home page.

1.0 PURPOSE, SCOPE AND OWNERSHIP

1.1 Purpose

This field operating procedure (FOP) provides instruction for decontaminating groundwater sampling equipment.

1.2 Scope

This procedure applies to all groundwater sampling equipment used during groundwater sampling activities conducted at Sandia National Laboratories/New Mexico (SNL/NM).

1.3 Ownership

The Long-Term Stewardship Department is responsible for development, approval, and revision of this document.

2.0 TRAINING QUALIFICATIONS

Personnel conducting equipment decontamination shall complete the following:

- On-the-job training (OJT) for new field personnel performing field checks of water quality measurement equipment. Document training by completing On-the-Job Training form (EP 2009-OJT).
- Read and sign FOP 03-02, *Groundwater Level Data Acquisition and Management*.
- Read and sign FOP 05-01, *Groundwater Monitoring Well Sampling and Field Analytical Measurements*.
- Read and sign FOP 05-02, *Groundwater Monitoring Equipment Field Check for Water Quality Measurements*.
- Read and sign FOP 05-04, *Groundwater Waste Management Plan*.
- Read and sign FOP 09-05, *Conducting Slug Test Using Data Logger & Pressure Transducer* (only necessary if conducting slug test).
- Read and sign plan (PLA) PLA 05-09, *Groundwater Monitoring Health & Safety Plan*.
- Complete training courses listed in Table 3-1.
- Field personnel shall sign the Authorized Users List (EP 2009-AUL) to affirm they have read and understand this document, and agree to operate within the stated constraints.

IMPORTANT NOTICE: A printed copy of this document may not be the document currently in effect. The official version is located on the Sandia Restricted Network, 600 Controlled Documents home page.

Table 2.1. Training Course List

Course Code	Course Title
CHM100/103	Chemical Safety Training/Site-Specific Chemical Training
ELC105	Basic Electrical Safety (Greater than 50 Volts)
ENV100	OSHA Health & Safety Basic Training - General Worker (40 HR)
ENV103	OSHA Health & Safety Training Refresher (8 HR)
ENV112	Hazardous Waste & Environmental Management Training
ENV216	RCRA - Less Than 90-Day Area Accumulation Area for Owners & Emergency Coordinators
ENV416	RCRA - Less Than 90-Day Area Accumulation Area for Waste Workers - Site-Specific
ESH100	ES&H Awareness
FKL153/R	Forklift Operator and Hands-On Training/Refresher
MCH200	Hand and Power Tool Safety
MED102	Standard First Aid
MED104	Heartsaver CPR
OTS101	Occupational Thermal Stress
PKX050	Site Specific Packaging and Transportation of Hazardous Materials Training
PKX100	Basic Hazardous Material Transportation Training
PPE106	Personal Protective Equipment Training
PRS150/R	Pressure Safety Orientation/Refresher
PRS250/R	Advanced Pressure Safety/Refresher
RAD230/R	Radiological Worker II Training/Refresher

NOTES: CPR = Cardiopulmonary Resuscitation
ES&H = Environment, Safety and Health
HR = hour
OSHA = Occupational Safety and Health Administration
RCRA = Resource Conservation and Recovery Act

3.0 HEALTH AND SAFETY

A task hazard analysis has been performed on the activities described in this FOP as well as a hazard assessment survey performed by a SNL/NM industrial hygienist. They are detailed in the PLA 05-09, *Groundwater Monitoring Health & Safety Plan.*

4.0 EQUIPMENT AND MATERIALS

The following list includes equipment and materials necessary for decontaminating groundwater sampling equipment:

- 55-gallon closed head polyethylene drum (CHPD)
- deionized (DI) water
- hand-held squirt bottles containing DI water
- non-phosphate laboratory detergent (e.g., Liqui-Nox®)
- hand-held squirt bottles containing non-phosphate laboratory detergent and tap water
- bottle brushes
- paper wipes
- plastic containers/buckets with lids
- personal protective equipment (PPE) – nitrile or latex gloves, chemical safety goggles, safety boots
- plastic garbage bags and waste storage containers
- Decontamination Log Form, LTS GW-2012-003
- Groundwater Monitoring Waste Generation Log, LTS GW-2012-004
- nitric acid (HNO_3)

5.0 PROCEDURES

5.1 Equipment Decontamination

Wear the PPE specified in the PLA 05-09, *Groundwater Monitoring Health & Safety Plan*, when decontaminating equipment. The following is a list of groundwater monitoring equipment that needs to be decontaminated after each use and a set of instructions for performing the decontamination process:

- **static water level indicator**

  1) Wipe the last three feet of cable and probe with a paper wipe wetted with a Liqui-Nox®/DI or distilled water solution.
  2) Wipe the last three feet of cable and probe with a paper wipe wetted with deionized or distilled water.
  3) Wipe the last three feet of cable and probe with a clean, dry paper wipe.

- **portable non-dedicated piston pump system**
  Complete the following after the pump and its tubing have been removed from the well:

  1) Open and close valves and equipment flow cells, as necessary, to allow flow throughout the groundwater sampling system.
  2) Seal the opening on the flow-through cell with the cap.
  3) Make sure all of the tubing used in purging and sampling remains connected to the pump and is included in the decontamination process (including the flow-through cell).

4) Pump the following solutions (unless otherwise specified) through the tubing in the order listed below: The volume and solution concentrations may be modified per equipment limitations and design, or project specific contamination concerns. Collect solution discharge in a 55-gallon CHPD.
   - 5 gallons of DI or distilled water mixed with 20 ml (milliliter) Liqui-Nox®.
   - 5 gallons of DI or distilled water.
   - 5 gallons of DI or distilled water mixed with 20 ml reagent grade HNO_3.
   - 3 times 5 gallons of DI or distilled water for a total of 15 gallons
5) Rinse outside of pump tubing with DI or distilled water.
6) Complete Decontamination Log form, LTS GW-2012-003
7) Complete a Groundwater Monitoring Waste Generation Log, LTS GW-2012-004 form

- **Pressure Transducer and Cable**

1) Wipe the cable (portion immersed in the water) and pressure transducer with a paper wipe wetted with a Liqui-Nox® /deionized or distilled water solution.
2) Wipe the cable (portion immersed in the water) and pressure transducer with a paper wipe wetted with deionized or distilled water.
3) Wipe the cable (portion immersed in the water) and pressure transducer with a clean, dry paper wipe.

- **Borehole Camera System**

1) Wipe the cable (portion immersed in the water) and pressure transducer with a paper wipe wetted with a Liqui-Nox® /deionized or distilled water solution.
2) Wipe the cable (portion immersed in the water) and pressure transducer with a paper wipe wetted with deionized or distilled water.
3) Wipe the cable (portion immersed in the water) and pressure transducer with a clean, dry paper wipe.

5.2 Decontamination Waste

Handle all decontamination waste according to FOP 05-04, *Groundwater Waste Management Plan.*

6.0 RECORDS

The completed documentation is reviewed by the field technician before it is provided to the project leader. The project leader reviews, approves, and transmits the documentation to the Customer Funded Records Center.

7.0 REFERENCES

Sandia National Laboratories, Environmental Programs and Assurance Department, FOP 03-02, *Long Term Environmental Stewardship Water Level Data Acquisition and Management* (latest edition), SNL/NM.

Sandia National Laboratories, Long-Term Stewardship, FOP 05-01, *Groundwater Monitoring Well Sampling and Field Analytical Measurements* (latest edition), SNL/NM.

Sandia National Laboratories, Long-Term Stewardship, FOP 05-02, *Groundwater Monitoring Equipment Field Check for Water Quality Measurements* (latest edition), SNL/NM.

Sandia National Laboratories, Long-Term Stewardship, FOP 05-04, *Groundwater Monitoring Waste Management* (latest edition), SNL/NM.

Sandia National Laboratories, Long-Term Stewardship, FOP 09-05, *Conducting Slug Test Using Pressure Transducer and Data Logger* (latest edition), SNL/NM.

Sandia National Laboratories, Long-Term Stewardship, PLA 05-09, *Groundwater Monitoring Health and Safety Plan* (latest edition), SNL/NM.

IMPORTANT NOTICE: A printed copy of this document may not be the document currently in effect. The official version is located on the Sandia Restricted Network, 600 Controlled Documents home page.

SANDIA NATIONAL LABORATORIES
LONG-TERM STEWARDSHIP PROGRAM

GROUNDWATER MONITORING WASTE MANAGEMENT

FIELD OPERATING PROCEDURE

FOP 05-04
Revision 6

Author: _____ **Date:** 1/8/2018
Tim Jackson, LTS Groundwater Lead

Approved: _____ **Date:** 01/10/18
Robert Lynch, Subject Matter Expert

Approved: _____ **Date:** 1-15-18
Sue Collins, LTS Program Lead

Author: How frequently does this document need to be reviewed and/or revised?	Every **3** years, or when activities change.
Manager: Does this document need to be tracked?	**Yes**

EFFECTIVE DATE: 1/23/18

IMPORTANT NOTICE: A printed copy of this document may not be the document currently in effect. The official version is located on the Sandia Restricted Network, 600 Controlled Documents home page.

TABLE OF CONTENTS

ACRONYMS & ABBREVIATIONS **4**
1.0 PURPOSE, SCOPE, AND OWNERSHIP **5**
1.1 Purpose 5
1.2 Scope 5
1.3 Ownership 5
2.0 TRAINING QUALIFICATIONS **5**
3.0 HEALTH AND SAFETY **7**
4.0 DESCRIPTION OF ACTIVITIES **7**
5.0 REFERENCES **7**

LIST OF TABLES

Table 2.1. Training Course List 6

LIST OF FORMS

EP 2009-ALW – Environmental Planning – Activity Level Work Evaluation Form
EP 2009-AUL – Environmental Planning – Authorized Users List
EP 2009-MCD – Minor Change/Deviation to Technical Work Document (TWD)
EP 2009-OJT – Environmental Planning – On-the-Job Training
EP 2009-WRA – Environmental Planning – Work Resumption Authorization Form
LTS GW-2012-005 – Work Request Form
LTS GW-2012-004 - Groundwater Monitoring Waste Generation Log
LTS GW-2012-006 – Tailgate Safety Meeting Form

IMPORTANT NOTICE: A printed copy of this document may not be the document currently in effect. The official version is located on the Sandia Restricted Network, 600 Controlled Documents home page.

REVISION HISTORY

Revision	Effective Date	Summary of Changes
1	10/10/2005	New document
2	8/16/2007	Formatting changes. Updated section 3, Roles and Responsibilities; section 4, Training Qualifications; section 7, References.
3	11/12/2009	Formatting changes. Added work planning and control information to section 5, Health and Safety. Updated section 4, Training Qualifications; section 7, References.
4	01/24/2012	Formatting changes. Revision history changed from 2 years to 3 years. Removal of some forms (attachments) and replaced with hyperlinks to where the forms can be found. Updated section 4, Training Qualifications; section 7, References.
5	01/23/2015	Author change and updates to all sections.
6	01/23/2018	Reviewer change, format change, section changes.

IMPORTANT NOTICE: A printed copy of this document may not be the document currently in effect. The official version is located on the Sandia Restricted Network, 600 Controlled Documents home page.

ACRONYMS & ABBREVIATIONS

CHPD	closed-head poly drum
decon	decontamination
FOP	field operating procedure
LTS	Long-Term Stewardship
OJT	on-the-job training
PLA	plan
PPE	personal protective equipment
RCRA	Resource Conservation and Recovery Act
SAP	sampling and analysis plan
SNL/NM	Sandia National Laboratories, New Mexico

IMPORTANT NOTICE: A printed copy of this document may not be the document currently in effect. The official version is located on the Sandia Restricted Network, 600 Controlled Documents home page.

1.0 PURPOSE, SCOPE, AND OWNERSHIP

1.1 Purpose

This field operating procedure (FOP) provides instruction on managing waste generated during groundwater sampling activities. Waste is managed in compliance with Sandia National Laboratories, New Mexico (SNL/NM) Corporate Policy ESH100 Environment Safety & Health. Based upon historical results, groundwater sampling of monitoring wells is not expected to produce waste or contaminated materials requiring special handling or regulated disposal.

SNL/NM conducts groundwater monitoring for the U.S. Department of Energy, National Nuclear Security Administration (NNSA) at SNL/NM. Monitoring is conducted as part of the SNL/NM Long-Term Stewardship (LTS) Program and Environmental Restoration Program to satisfy applicable regulatory and program requirements. This FOP may be used for additional NNSA groundwater surveillance, as needed .

1.2 Scope

The scope of this procedure is limited to management of waste generated during groundwater monitoring activities at SNL/NM sites, and include well purge waste water, equipment decontamination (decon) waste water, and solid waste (such as personnel protective equipment (PPE), plastic, and paper wipes). All other waste generated during groundwater monitoring activities will be managed in accordance with SNL/NM Corporate Policy ESH100 Environment Safety & Health.

1.3 Ownership

The Long-Term Stewardship Department is responsible for development, approval, and revision of this document.

2.0 TRAINING QUALIFICATIONS

Personnel conducting field activities shall complete the following:

- On-the-job training (OJT) for new field personnel performing waste management activities. Document training by completing On-the-Job Training form (EP 2009-OJT).
- Read and sign FOP 03-02, *Groundwater Level Data Acquisition and Management*.
- Read and sign FOP 05-01, *Groundwater Monitoring Well Sampling and Field Analytical Measurements*.
- Read and sign FOP 05-02, *Groundwater Monitoring Equipment Field Check*.
- Read and sign FOP 05-03, *Groundwater Sampling Equipment Decontamination*.

- Read and sign FOP 09-05, *Conducting Slug Test Using Data Logger & Pressure Transducer* (only necessary if conducting slug test).
- Read and sign Plan (PLA) PLA 05-09, *Groundwater Monitoring Health & Safety Plan.*
- Complete training courses listed in Table 3.1.
- Field personnel shall sign the Authorized Users List (EP 2009-AUL) to affirm they have read and understand this document, and agree to operate within the stated constraints.

Table 2.1. Training Course List

Course Code	Course Title
CHM100/103	Chemical Safety Training/Site-Specific Chemical Training
ELC105	Basic Electrical Safety (Greater than 50 Volts)
ENV100	OSHA Health & Safety Basic Training - General Worker (40 HR)
ENV103	OSHA Health & Safety Training Refresher (8 HR)
ENV112	Hazardous Waste & Environmental Management Training
ENV216	RCRA - Less Than 90-Day Area Accumulation Area for Owners & Emergency Coordinators
ENV416	RCRA - Less Than 90-Day Area Accumulation Area for Waste Workers - Site-Specific
ESH100	ES&H Awareness
FKL153/R	Forklift Operator and Hands-On Training/Refresher
MCH200	Hand and Power Tool Safety
MED102	Standard First Aid
MED104	Heartsaver CPR
OTS101	Occupational Thermal Stress
PKX050	Site Specific Packaging and Transportation of Hazardous Materials Training
PKX100	Basic Hazardous Material Transportation Training
PPE106	Personal Protective Equipment Training
PRS150/R	Pressure Safety Orientation/Refresher
PRS250/R	Advanced Pressure Safety/Refresher
RAD230/R	Radiological Worker II Training/Refresher

NOTES: CPR = Cardiopulmonary Resuscitation
ES&H = Environment, Safety and Health
HR = hour
OSHA = Occupational Safety and Health Administration
RCRA = Resource Conservation and Recovery Act

3.0 HEALTH AND SAFETY

A task hazard analysis has been performed on the activities described in this FOP as well as a hazard assessment survey performed by a SNL/NM industrial hygienist. They are detailed in the PLA 05-09, *Groundwater Monitoring Health & Safety Plan*.

4.0 DESCRIPTION OF ACTIVITIES

All waste generated during groundwater monitoring activities will be managed in accordance with Corporate Policy ESH100 Environment Safety & Health. Contact SNL/NM's Environmental Compliance Coordinators for assistance with compliance of applicable environmental laws and regulations regarding waste management. The following is a description of activities for managing waste specific to groundwater monitoring activities and the groundwater monitoring program.

The project leader provides the field technicians with the information necessary for them to perform work and manage waste properly. The field technicians use the information to properly manage waste. The waste generated during monitoring activities may include purge water, decon water, PPE, disposable filters, paper wipes, tubing bundles, and plastic.

All purge water and decon water will be collected in separate 55-gallon closed-head poly drums (CHPDs) and properly labeled. All solid waste will be placed in a plastic trash bag and waste receptacle, and labeled. The field technicians will complete a Groundwater Monitoring Waste Generation Log, LTS GW-2012-004 as the waste is produced at each sampling location. The waste drums will be moved to the appropriate storage area at completion of sampling activities. All hazardous waste will be placed in a RCRA Less Than 90-Day Waste Accumulation Area. The waste drums labeled as containing non-hazardous waste will be kept at an area designated for non-hazardous waste.

All waste generated during groundwater monitoring activities will be properly disposed in accordance with Corporate Policy ESH100 Environment Safety & Health.

5.0 REFERENCES

Sandia National Laboratories, Corporate Policy ESH100 Environment Safety & Health, SNL/NM.

Sandia National Laboratories, Environmental Programs and Assurance Department, FOP 03-02, *Long Term Environmental Stewardship Water Level Data Acquisition and Management* (latest edition), SNL/NM.

Sandia National Laboratories, Long-Term Stewardship, FOP 05-01, *Groundwater Monitoring Well Sampling and Field Analytical Measurements* (latest edition), SNL/NM.

Sandia National Laboratories, Long-Term Stewardship, FOP 05-02, *Groundwater Monitoring Equipment Field Check for Water Quality Measurements* (latest edition), SNL/NM.

Sandia National Laboratories, Long-Term Stewardship, FOP 05-03, *Groundwater Monitoring Equipment Decontamination* (latest edition), SNL/NM.

Sandia National Laboratories, Long-Term Stewardship, FOP 09-05, *Conducting Slug Test Using Pressure Transducer and Data Logger* (latest edition), SNL/NM.

Sandia National Laboratories, Long-Term Stewardship, PLA 05-09, *Groundwater Monitoring Health and Safety Plan* (latest edition), SNL/NM.

IMPORTANT NOTICE: A printed copy of this document may not be the document currently in effect. The official version is located on the Sandia Restricted Network, 600 Controlled Documents home page.