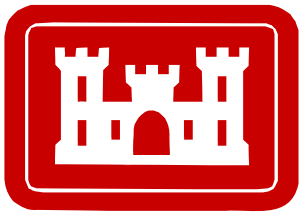
# FINAL
# REMEDIAL DESIGN PLAN ADDENDUM
# REMEDIAL DESIGN/REMEDIAL ACTION (RD/RA)
# SHERMAN HEIGHTS SMALL ARMS RANGE (SHSAR) IMPACT SLOPE

**FORT RILEY, KANSAS**



Prepared for:

**U.S. Army Corps of Engineers, Omaha District**
1616 Capitol Avenue
Omaha, Nebraska 68102-4901

**Contract No. W9128F-16-D-0044**

**Task Order No: W9128F19F0264**

Prepared by:

**TEHAMA, LLC**
1600 Genessee Street, Suite 754
Kansas City, MO 64102

**February 2020**

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**February 2020**

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## LIST OF ATTACHMENTS

# LIST OF ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| ALS | ALS Environmental |
| bgs | Below Ground Surface |
| DoD | Department of Defense |
| ELAP | Environmental Laboratory Accreditation Program |
| EPA | Environmental Protection Agency |
| FFA | Federal Facilities Agreement |
| ft | Feet |
| GPS | Global Positioning System |
| KDHE | Kansas Department of Health and Environment |
| LTM | Long-Term Monitoring |
| mg/kg | Milligrams per Kilogram |
| MMRP | Military Munitions Response Program |
| MRS | Munitions Response Site |
| MS | Matrix Spike |
| MSD | Matrix Spike Duplicate |
| NELAC | National Environmental Laboratory Accreditation Conference |
| POP | Period of Performance |
| RD | Remedial Design |
| RDP | Remedial Design Plan |
| RI | Remedial Investigation |
| RLS | Registered Land Surveyor |
| ROD | Record of Decision |
| RSLs | Regional Screening Levels |
| RTK | Real-Time Kinematic |
| SHSAR | Sherman Heights Small Arms Range |
| SOP | Standard Operating Procedure |
| Tehama | Tehama, LLC |
| TRW | Technical Review Workgroup for Lead |
| Tukuh | Tukuh Technologies, LLC |
| UFP-QAPP | Uniform Federal Policy Quality Assurance Project Plan |
| USACE | United States Army Corps of Engineers |

## 1.0 INTRODUCTION

Tehama, LLC (Tehama), has prepared this Remedial Design Plan (RDP) Addendum on behalf of the U.S. Army Corps of Engineers (USACE), Omaha District, for providing additional Remedial Design/Remedial Action (RD/RA) services for the Sherman Heights Small Arms Range (SHSAR) located at Fort Riley, Kansas (Figure 1). This RDP Addendum is an extension of Tehama's Final RDP, dated September 2017 (Tehama, LLC, 2017), and includes additional detail on composite soil sampling and analysis to be completed at the site. Attachment A includes Standard Operation Procedures (SOPs) for soil sample collection and a project schedule is located in Attachment B.

The objective of this RDP Addendum is to provide a framework for additional investigative sampling to further characterize lead concentrations in the area of three discrete sample locations (SP17, SP38, and SP39) which exceeded the remediation goal of 400 mg/kg listed in the Record of Decision (ROD) (USACE, 2016).

## 2.0 PURPOSE

In November 2017, Tehama performed routine long-term monitoring (LTM) in accordance with the approved ROD, and collected a total of 48 surface soil samples (40 parent samples, 4 duplicate, 2 matrix spikes (MS) and 2 matrix spike duplicates (MSD)) (Tehama, LLC 2018). Lead concentrations at three discrete sample locations (SP17, SP38, and SP39) exceeded the remediation goal of 400 mg/kg listed in the ROD, with concentrations of 462 mg/kg, 446 mg/kg and 460 mg/kg, respectively. The three exceedances occurred near the base of the slope along the southern fence line and side slope on the western fence line. Locations of the three exceedance samples can be seen on Figures 2, 3, and 4.

Due to these exceedances, additional composite sampling to further characterize lead concentrations in the area of these sample locations will be performed in compliance with US Environmental Protection Agency (EPA) and Kansas Department of Health and Environment (KDHE) letters dated 11 September 2018 and 28 June 2018, respectively. EPA and KDHE letters are included in Attachment C. Sampling locations and procedures are detailed in this RDP Addendum and results will be provided in a follow-up Summary Technical Memorandum.

## 3.0 SUMMARY OF WORK

The additional investigative activities include the preparation of this RDP Addendum, composite soil sampling for lead, and the approval of the data validation and Summary Technical Memorandum. All activities will be completed by the end of the period of performance (POP) on December 31, 2020.

### 3.1 Remedial Design Plan Addendum

Tehama has prepared this Addendum to the approved RDP, dated September 2017, to describe in detail the processes in which the composite soil sampling will be implemented and reported. Prior to the start of any field work, review and approval of this Addendum will be completed in Army Draft, Regulator Draft, Draft Final, and Final versions.

### 3.2 Composite Soil Sampling for Lead

Sampling protocol will follow the 2003 Superfund Lead-Contaminated Residential Sites Handbook (EPA, 2003a) and the Technical Review Workgroup for Lead (TRW) Recommendations for Performing Human Health Risk Analyses on Small Arms Shooting Ranges (EPA, 2003b).

Prior to sampling, Tukuh Technologies, LLC (Tukuh) will have a State of Kansas Registered Land Surveyor (RLS) survey and stake the 5-point composite sampling points in the area of SP17, SP38, and SP39, in accordance with the approved RDP. Surveying will be completed using a real-time kinematic (RTK)-global positioning system (GPS). Survey coordinates for the sample points will be included in the Summary Technical Memorandum.

Composite surface soil samples will be collected from a depth of 0 to 0.5 feet (ft) below ground surface (bgs). Samples will be collected from three locations with elevated lead concentrations along the outer perimeter of the downslope portion of the remedy fence line as shown along the Western perimeter in Figure 3 and Southern perimeter in Figure 4.

Five-point composite samples will be collected using disposable sampling equipment, from each of the three sample locations and combined into one representative composite sample, to make a total of three representative parent samples. One duplicate sample and one MS/MSD sample will be collected for a total of 6 representative samples. Samples will undergo sieving twice, first with a No. 4 sieve to remove bulk debris, then with a No. 60 sieve to obtain the fine fraction; followed by submission of the fine fraction material for laboratory analysis as recommended in the TRW Recommendations for Performing Human Health Risk Analyses on Small Arms Shooting Ranges (EPA, 2003b).

Following sample preparation by sieving, samples will be shipped to an off-site laboratory for analysis of lead by EPA method 6020A. Samples will be labeled with pertinent identifying information (e.g., sample ID, sample collection date and time, analysis to be performed, sampler's initials), placed in a cooler with ice and maintained at 4 °C during transportation to the selected laboratory, ALS Global Laboratories (ALS), under standard chain-of-custody protocol.

Soil samples will be collected using disposable sampling equipment and techniques according to the procedures set forth in the following SOPs provided in Attachment A. To reduce the possibility of cross-contamination, disposable stainless steel trowels will be used when collecting surface soil samples. Vegetation will be cleared by hand prior to sample collection.

### 3.3 Approval of the Data Validation and Summary Technical Memorandum

Surface soil sample data collected will be validated and a Quality Control Summary Report (QCSR) will be presented for approval. The QCSR will serve as an attachment to the Summary Technical Memorandum and be presented as an Army Draft, Regulator Draft, Draft Final and Final. The memorandum will summarize field activities, including field photos, field forms, and sampling information.

The QCSR will be validated by a chemist and have QA/QC items evaluated in accordance with procedures outlined in the Final Uniform Federal Policy Quality Assurance Project Plan (UFP-QAPP), dated September 2017 (Tehama, LLC, 2017). The QCSR will contain an evaluation for the following components:

- Field and Sampling Information
- Chain-of-Custody Analysis;
- Task Completeness Analysis;
- Holding Times and Sample Preservation;
- Surrogates, Laboratory Control Sample, MS/MSD, and Field Duplicate Analysis;
- Reporting Limits Analysis;
- Method Requirements;
- Field and Analytical Completeness Analysis; and
- Recommendations.

### 3.4 Project Closeout

Upon completion of the field sampling, analysis and approval of the data validation and Summary Technical Memorandum, Tehama will complete the project closeout process. The project closeout process will assess and validate the success of the project, identify best practices, confirm risks and recommendations, outline tasks taken to sampling, and discuss lessons learned.

# 4.0 PROJECT PERSONNEL AND SCHEDULE

## 4.1 Project Organization

A brief description of the roles and responsibilities of key Tehama project personnel and subcontractors are described in the following sections. The Organization Chart is shown in Figure 5.

## 4.2 Key Personnel

Mr. Jerrett Domling will be the Project Manager (PM) for this project. The duties and responsibilities of the PM include the following:

- Contract execution;
- Communication with the USACE Contracting Officer's Representative (COR) regarding technical contract requirements, specifications, and project schedule;
- Overall responsibility for the success and proper execution of the project;
- Designation of the Assistant PM, Geologist, and Contractor Quality Control Supervisor (CQCS);
- Review of all required submittals; and
- Allocation of sufficient resources to ensure successful completion of the project.

Additional personnel are designated in the approved Final RDP.

## 4.3 Subcontractors

Subcontractors will be a part of the Tehama project team.

ALS will perform off-site chemical analysis for the samples collected during field activities. ALS will analyze soil samples in accordance with the UFP-QAPP and provide a standard ten-day turn around. Deliverables will be Standard Level II packages with staged electronic data deliverables. ALS is National Environmental Laboratory Accreditation Conference (NELAC)-accredited, Environmental Laboratory Accreditation Program (ELAP)-accredited and a KDHE-certified laboratory.

Burns and McDonnell (BMcD) will provide a project chemist to perform data validation, interpretation and quality control analysis of the collected composite soil samples. Additionally, BMcD will be responsible for the generation of the QCSR. Procedures to be followed by BMcD will be in compliance with the approved UFP-QAPP.

### 4.4 Schedule

Tehama's project schedule is presented in Attachment B. Field work will not begin until planning documents and permits have been finalized and approved.

## 5.0 REFERENCES

EPA, 2003a. *Superfund Lead-Contaminated Residential Sites Handbook*, EPA, Lead Sites Workgroup. August.

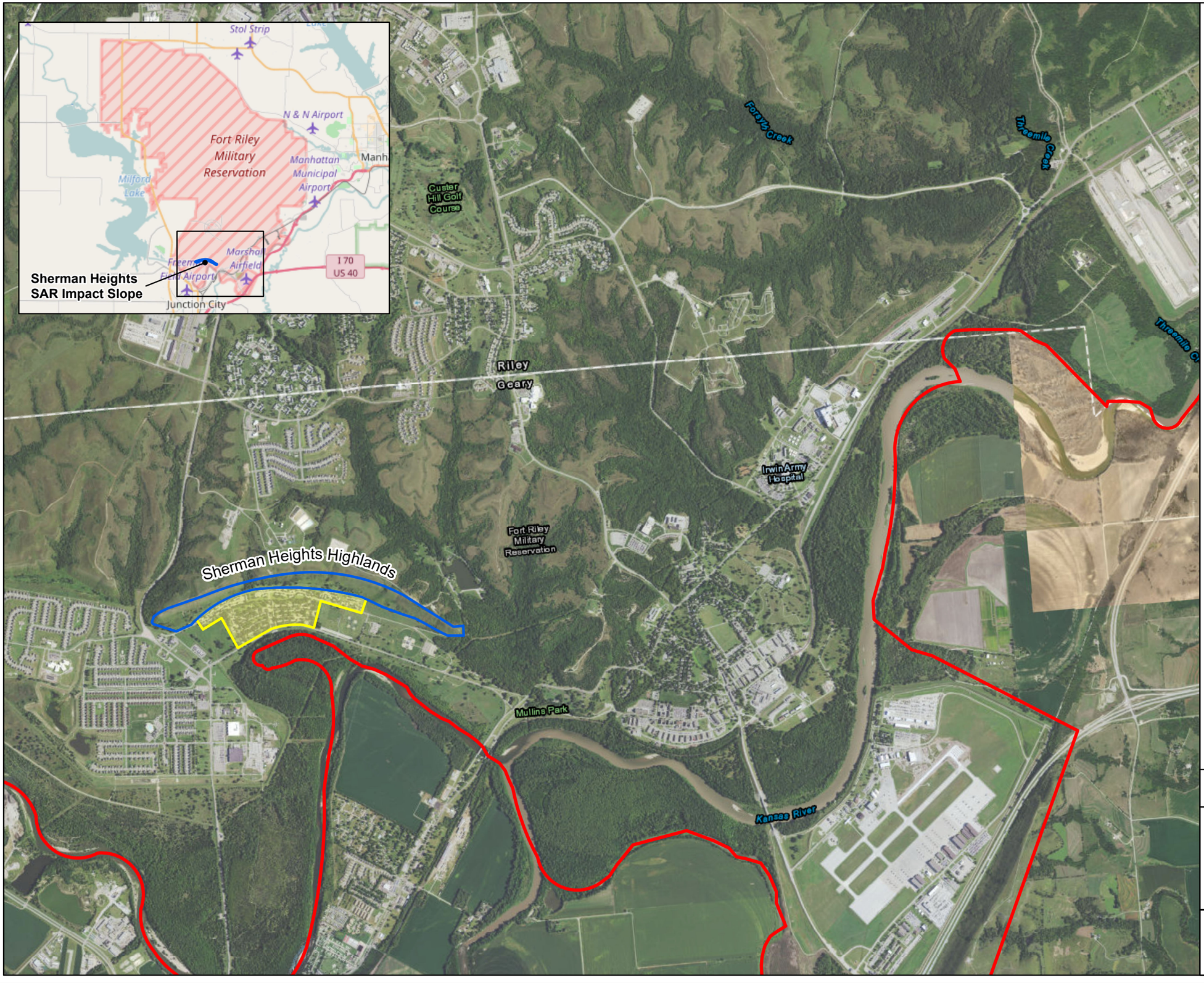
EPA, 2003b. *TRW Recommendations for Performing Human Health Risk Analyses on Small Arms Shooting Ranges,* EPA TRW. March

Tehama, LLC, 2017, *Remedial Design Plan, Sherman Heights Small Arms Range, Impact Slope, Fort Riley, Kansas*. Prepared for the U.S. Army Corps of Engineers, Omaha District. September.

Tehama, LLC, 2018, Final Summary Memorandum 2017 Long-Term Monitoring (LTM) Surface Soil Sampling Event, Sherman Heights Small Arms Range (SHSAR) Impact Slope. October

U.S. Army Corps of Engineers, Omaha District, Record of Decision, Fort Riley, Sherman Heights Small Arms Range, Impact Slope, Junction City, Kansas, January 2016.

# Figures




## Legend

- SHSAR Impact Slope MRS
- Fort Riley Boundary
- Colyer Manor Military Family Housing

N

0 1,750 3,500 7,000

Feet

United States Army
Fort Riley, Kansas

**Site Location Map**

Sherman Heights SAR Impact Slope

| Tehama, LLC | DATE | FIGURE |
|---|---|---|
| | 04/03/2017 | 1 |

## Legend

- 2017 Soil Sample > 400 mg/Kg
- 2017 Soil Sample < 400 mg/Kg
- 2020 Proposed Composite Sample Location
- Fence Location

N

0 112.5 225 450

Feet

Sherman Heights Small Arms Range
Fort Riley, Kansas

**Composite Sample Location Map**

SHSAR RDP

| Tehama, LLC | DATE | FIGURE |
|---|---|---|
| | 1/16/2020 | 2 |

## Legend

- 2017 Soil Sample > 400 mg/Kg
- 2017 Soil Sample < 400 mg/Kg
- 2020 Proposed Composite Sample Location
- Fence Location

N

0 25 50 100

Feet

Sherman Heights Small Arms Range
Fort Riley, Kansas

**Western Boundary**
**Composite Sample Location Map**

SHSAR RDP

| Tehama, LLC | DATE | FIGURE |
|---|---|---|
| | 1/6/2020 | 3 |

## Legend

- 2017 Soil Sample > 400 mg/Kg
- 2017 Soil Sample < 400 mg/Kg
- 2020 Proposed Composite Sample Location
- Fence Location

N

0 37.5 75 150

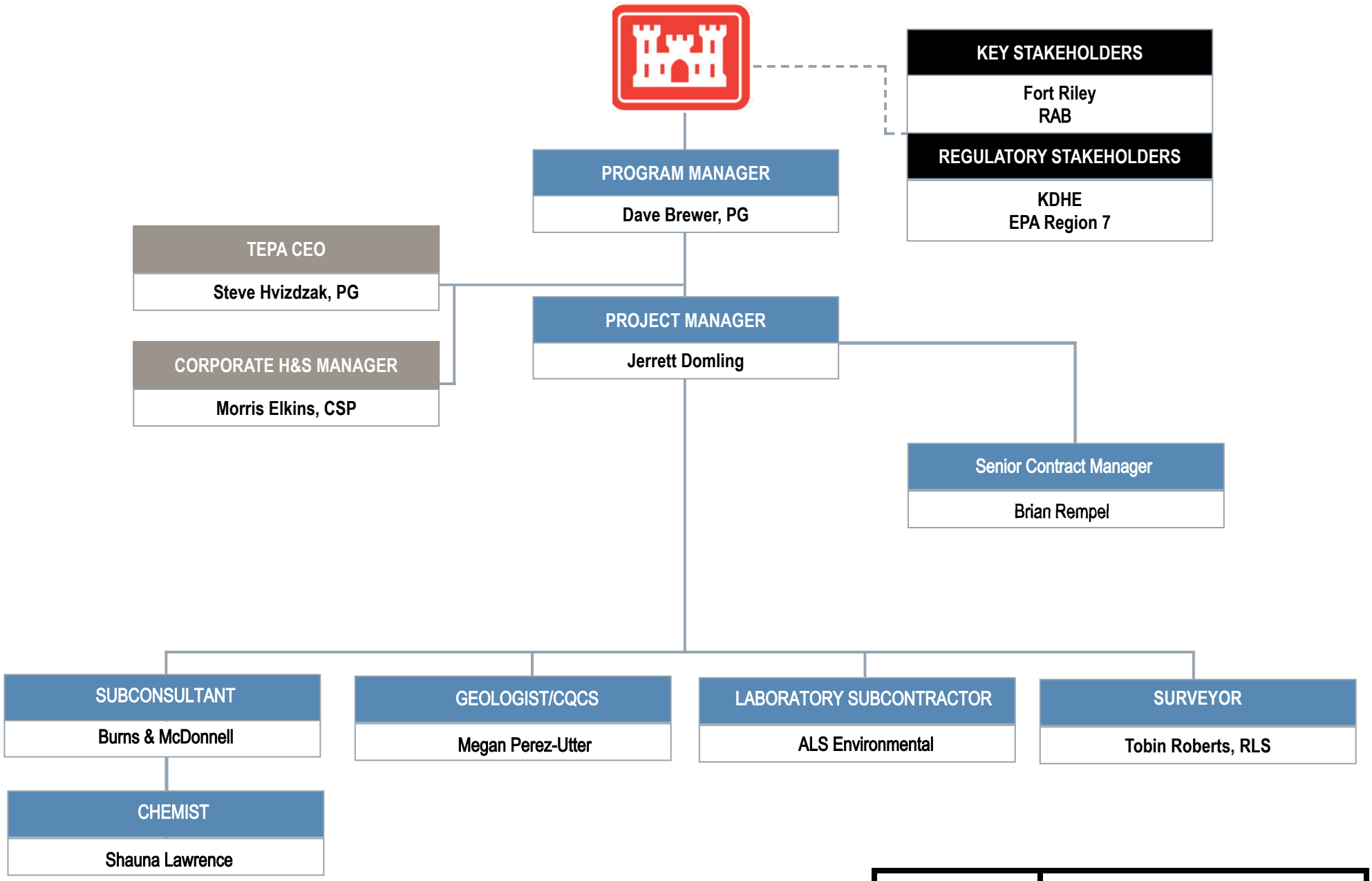
Feet

Sherman Heights Small Arms Range
Fort Riley, Kansas

**Southern Boundary**
**Composite Sample Location Map**

SHSAR RDP

| Tehama, LLC | DATE | FIGURE |
|---|---|---|
| | 1/6/2020 | 4 |




Tehama

Figure 5

Project Organization Chart
SHSAR RDP Addendum

# Attachment A

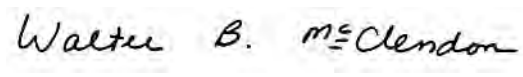
SOPs

# SOP 502
# Acquisition of Survey Data

Revision 0
01/06/2017

Approved by:

Martha Hildebrandt, PG, Associate Geologist, Environmental Division — 01/17/17 Date



Walter McClendon, PG, Associate Geologist, Environmental Division — 02/20/17 Date

Martha Hildebrandt, PG, QC Manager, Environmental Division — 02/20/17 Date

Biennial Review:

| Revision/Review | Date | Responsible Party | Description of Change |
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## 1.0 PURPOSE AND APPLICABILITY

The purpose of *Standard Operating Procedure (SOP) 502 Acquisition of Survey Data* is to establish a uniform procedure to obtain survey data for use in the investigation, evaluation, and remediation of environmental sites. This SOP covers the *process* for the obtaining survey data; specific project requirements including accuracy, precision, datums, and coordinate systems are detailed in the Project-Specific Work Plan(s). *SOP 502 Acquisition of Survey Data* has been prepared in accordance with the *Guidance for the Preparing of Standard Operating Procedures* (USEPA, 2007) and the Burns & McDonnell Engineering Company, Inc. (Burns & McDonnell) *Policy Manual* (Burns & McDonnell, 2015).

## 2.0 SUMMARY OF METHOD

Surveying for environmental work is typically done prior to the start of work to mark where field activities should be conducted and/or upon the completion of work to determine the precise location and elevation of completed activities; but can be completed at any time during field activities. Burns & McDonnell typically subcontracts surveying activities to professional surveyors who are registered and licensed within the state that the site is located. As part of that contracting, Burns & McDonnell includes specifications on the coordinate system to be used, the precision and accuracy required for that project, and the expected submittals upon completion of the survey. Upon receipt of the data, the Project Team is then responsible for checking the quality of the data and incorporating the data into the project data files.

## 3.0 DEFINITIONS

- **Project-Specific Accident Prevention Plan/Site Safety and Health Plan** (Project-Specific APP/SSHP) – A plan or plans that address occupational safety and health hazards associated with site operations.
- **Project-Specific Work Plan** – The plan that details the rationale, scope, and techniques to be used at the site to achieve the project objectives. Project-Specific Work Plans can include work plans, field sampling plans, quality assurance project plans, technical memorandums, and other documentation of proposed work.

## 4.0 HEALTH AND SAFETY

Field activities as detailed in this SOP will be performed in accordance with applicable safety related documents/requirements which may include, but are not limited to: Project-Specific APP/SSHP, the Burns & McDonnell *Corporate Safety and Health Program* (Burns & McDonnell, 2015), and site / client-

specific requirements. Personal protective equipment (PPE) as appropriate and as detailed in the Project-Specific APP/SSHP.

## 5.0 CAUTIONS

The proper coordinate system and the accuracy needed for the project should be conveyed to the surveyor during procurement and should be included in the purchase order or contract. A description of the site including dense vegetation; hazardous terrain such as cliffs, karst features, and water features; and client requirements such as security, training, and hours should also be conveyed to the surveyor during procurement and included in the purchase order or contract.

## 6.0 PERSONNEL QUALIFICATIONS

Contracted surveyors should meet the licensing requirements for jurisdiction in which the site is located. Burns & McDonnell personnel conducting on-site environmental activities will have completed the 40-hour Occupational Safety and Health Administration (OSHA) Hazardous Waste Operations and Emergency Response Standard (HAZWOPER) course and annual 8-hour HAZWOPER refresher courses. At a minimum, one person on site will be certified in first aid and cardiopulmonary resuscitation (CPR) and, if multiple people are on site, at least one person will have completed the 8-hour HAZWOPER Supervisor Training course. If Burns & McDonnell subcontractors are on site then, at a minimum, one Burns & McDonnell person will have completed the OSHA 30-hour Construction Industry Outreach Training course.

## 7.0 EQUIPMENT AND SUPPLIES

Equipment and supplies including PPE for surveying activities will be provided by the contracted surveyor. Prior to the start of field activities, the Field Site Manager and/or the Project Manager should determine that necessary permits and right of entries have been obtained; and the Project-Specific APP/SSHP has been sent to the surveyors, if needed.

## 8.0 PROCEDURES

### 8.1 Surveying Prior to Field Activities

If surveyed locations are needed prior to the start of field activities, the project team should send to the surveyor a table of locations that should be surveyed in the field. The Burns & McDonnell Project Manager or Field Site Manager should schedule the surveying event with the surveyor and ensure that the

surveyor has access to the site. If needed due to site or project constraints, the Project Manager or Field Site Manager should meet and escort the surveyor while on the site.

## 8.2 Surveying During or Post Field Activities

During or upon the completion of field activities, the Burns & McDonnell Project Manager or Field Site Manager should schedule the surveying event with the surveyor and ensure that the surveyor has access to the site. Information that should be relayed to the surveyor includes the number of points to be surveyed and the approximate location of the points. If monitoring wells are to be surveyed, the Burns & McDonnell Project Manager or Field Site Manager should ensure that the surveyor has access to any locked wells. Elevation measurements for monitoring wells typically including both the elevation of the ground surface and the elevation of the top of casing.

# 9.0 DATA AND RECORDS MANAGEMENT

Specifics on submittals should be included in the requirements or specifications given to the surveyor and should be included in the surveying contract. Typically submittals include a copy of horizontal and vertical coordinates corrected to the desired coordinate system in an electronic format. Some projects may also request a sealed flat drawing showing the mapped locations.

# 10.0 QUALITY ASSURANCE/QUALITY CONTROL

Burns & McDonnell personnel will include in the surveying contract the precision and accuracy required for the project. Upon receipt of the data, the Burns & McDonnell Project Manager or project team member will review the data received to determine that the data is in the correct coordinate system and is to the contracted precision. Survey data will be compared to field documentation to ensure that the data is accurate and complete.

# 11.0 REFERENCES

Burns & McDonnell Engineering, Co, Inc. (Burns & McDonnell), 2015. *Policy Manual*,

- Chapter 10, Quality Control Manual, January.
- Chapter 8, Safety and Health Manual, February.

United States Environmental Protection Agency (USEPA), 2007. *Guidance for Preparing Standard Operating Procedures*. EPA/600/B-07/001. April

## 12.0 ATTACHMENTS

None.

# SOP 504
# Decontamination

Revision 000
01/06/2017

Approved by:

01/17/17

Martha Hildebrandt, PG, Associate Geologist, Environmental Division — Date

02/20/17

Chris Hoglund, PG, Senior Geologist, Environmental Division — Date

02/20/17

Martha Hildebrandt, PG, QC Manager, Environmental Division — Date

Biennial Review:

| Revision/Review | Date | Responsible Party | Description of Change |
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## 1.0 PURPOSE AND APPLICABILITY

The purpose of *Standard Operating Procedure (SOP) 504 Decontamination* is to establish a uniform procedure for field personnel in the decontamination of environmental equipment. Proper equipment decontamination is essential in ensuring the quality and integrity of samples collected during a given sampling event. This SOP covers the ***process*** for the equipment decontamination; specifics of decontamination including decontamination fluids and rinses, location of decontamination places and pad, and extra washes and rinses to be used are detailed in the Project-Specific Work Plans. *SOP 504 Decontamination* has been prepared in accordance with the *Guidance for the Preparing of Standard Operating Procedures* (USEPA, 2007) and the Burns & McDonnell Engineering Company, Inc. (Burns & McDonnell) *Policy Manual* (Burns & McDonnell, 2015).

## 2.0 SUMMARY OF METHOD

Decontamination is the process of removing contamination from equipment prior and post sampling. Removing contaminants from equipment minimizes the likelihood of sample cross contamination, reduces transfer of contaminants to clean areas, and prevents the mixing of incompatible substances. Decontamination is typically includes both physical (scrubbing) and chemical (soap and acid or solvent rinses). It is important that decontamination is performed using materials and equipment that can effectively remove anticipated contaminants of concern while not damaging the equipment. After decontamination, equipment should be handled only by personnel wearing clean gloves and moved out of the decontamination area to prevent re-contamination.

## 3.0 DEFINITIONS

- **Distilled Water** - Water that has had many of its impurities removed through distillation. Distillation involves boiling the water and then condensing the steam into a clean container.

- **Laboratory Grade Detergent** – A detergent formulated specifically for use in laboratories to be clean rinsing and phosphate free. Standard brands include Alconox® and Liquinox®.

- **Potable Water** - Treated municipal water or well water used and approved for drinking.

- **Project-Specific Accident Prevention Plan/Site Safety and Health Plan** (Project-Specific APP/SSHP) – A plan or plans that address occupational safety and health hazards associated with site operations.

- **Project-Specific Work Plan** – The plan that details the rationale, scope, and techniques to be used at the Site to achieve the project objectives. Project-Specific Work Plans can include work plans, field sampling plans, quality assurance project plans, technical memorandums, and other documentation of proposed work.

## 4.0 HEALTH AND SAFETY

Field activities as detailed in this SOP will be performed in accordance with applicable safety related documents/requirements which may include, but are not limited to: Site Safety and Health Plans, the Burns & McDonnell Corporate *Safety and Health Program* (Burns & McDonnell, 2015), and site / client-specific requirements. Personal protective equipment (PPE) including safety glasses and gloves should be worn as appropriate and as detailed in the Project-Specific APP/SSHP. Rinses such as acids and solvents should be handled with care during transportation to and from the site and stored properly while on site. A Safety Data Sheet should be on site for all chemical rinses.

## 5.0 CAUTIONS

High concentrations of contaminants or the requirement of very low detection levels may require decontamination procedures that are more stringent than that described in this SOP. This should be considered during work plan development but also recognized if encountered in the field.

Prior to field mobilization, the expected types of contamination should be evaluated to determine if the field cleaning and decontamination activities will generate rinsates and other wastewaters that might be considered Resource Conservation and Recovery Act (RCRA) hazardous waste thus require special handling and disposal procedures.

Care should be taken to remove all visible potential contamination from sample equipment to prevent cross contamination which could result in false positive analytical results.

## 6.0 PERSONNEL QUALIFICATIONS

Burns & McDonnell personnel conducting on-site environmental activities will have completed the 40-hour Occupational Safety and Health Administration (OSHA) Hazardous Waste Operations and Emergency Response Standard (HAZWOPER) course and annual 8-hour HAZWOPER refresher courses. At a minimum, one person on site will be certified in first aid and cardiopulmonary resuscitation (CPR) and, if multiple people are on site, at least one person will have completed the 8-hour HAZWOPER Supervisor Training course. If Burns & McDonnell subcontractors are on site then, at a minimum, one

Burns & McDonnell person will have completed the OSHA 30-hour Construction Industry Outreach Training course.

## 7.0 EQUIPMENT AND SUPPLIES

Typical decontamination equipment and supplies include the following items:

- Potable water
- Distilled water
- Non-phosphate laboratory-grade detergent
- Wash bottles
- Buckets
- Scrub brushes
- Plastic sheeting
- Garbage bags
- PPE and safety equipment per the Project-Specific APP/SSHP

Additional rinsates including methanol, isopropyl, and hexane, may be required dependent upon the chemicals of concern.

Prior to the start of field activities, the Field Site Manager and/or the Project Manager should determine that 1) necessary permits, and right of entries have been obtained; 2) the Project-Specific APP/SSHP has been reviewed by Burns & McDonnell personnel participating in the work and subcontractors who will be on site; 3) appropriate PPE has been obtained for Burns & McDonnell personnel and will be available on site; and 4) equipment and meters are available, in working order, and complete with needed components.

## 8.0 PROCEDURES

### 8.1 Decontamination of Non-Dedicated Bladder Pumps

Non-dedicated bladder pumps will be decontaminated according to the following procedure:

1. Leave or attach approximately 4 feet of air supply and water discharge tubing to the pump. Place the pump inside a 5-foot section of 2-inch inside diameter polyvinyl chloride (PVC) pipe that has one end capped.

2. Attach the air supply tube to the controller, which is attached to the compressed air source, and direct the discharge tube back into the pipe to recirculate the wash water. Fill the PVC pipe with distilled or potable water, adding approximately one-half teaspoon of non-phosphate, laboratory-grade detergent.

3. Turn on the pump and circulate the wash water for approximately one minute.

4. Direct the discharge into a bucket and pump the detergent water from the PVC pipe.

5. Pump 3 to 5 liters of distilled water through the pump, adding water to the pipe as needed, to rinse the detergent from the pump.

6. Retain decontamination fluids per *SOP 601 Investigative Derived Waste Storage, Sampling, and Disposal*.

## 8.2 Decontamination of Other Sample-Contacting Equipment

Non-disposable and other non-dedicated equipment which contacts the sample will be decontaminated prior to the collection of each sample and at the close of each day. This equipment includes, but is not limited to, sampling knives and spoons, mixing bowls, split-sampling barrels, direct-push shoes and subs, and reusable containers.

Sampling equipment will be decontaminated according to the following procedure:

1. Fill a nonmetallic wash tub or bucket to a depth of approximately 6 inches with potable water. Mix a detergent solution in the tub. The solution shall consist of approximately 1 tablespoon of non-phosphate laboratory-grade detergent (e.g. Liquinox) per gallon of water.

2. Scrub sampling equipment with a stiff-bristled brush and detergent solution to physically remove visible gross contamination.

3. Transfer the equipment to another wash tub partially filled with distilled water and rinse.

4. Rinse the sampling equipment again with fresh distilled water.

5. Place the equipment on clean plastic and allow it to air dry.

6. Store the equipment covered with plastic or aluminum foil upon the completion of decontamination.

7. Retain decontamination fluids per *SOP 601 Investigative Derived Waste Storage, Sampling, and Disposal*.

## 8.3 Decontamination of Meters and Probes

Meter probes, water level indicator and oil/water interface probe, will be decontaminated prior to use at each sample location and at the close of each day. Water indicator probes and tapes will be decontaminated per the following procedure.

1. As the tape is being reeled onto the instrument, the tape will be wiped with paper towels that have been sprayed or dampened with a detergent solution. The solution shall consist of approximately 1 tablespoon of non-phosphate laboratory-grade detergent (e.g. Liquinox) per gallon of water.

2. Decontaminate the probe portion of the instrument by spraying with the detergent solution then rinsing with water. If sediment is present on the probe, then ensure the sediment is removed by the cleaning followed by a distilled water rinse.

If nonaqueous phase liquids are encountered or if the measured media is severely impacted, then decontaminate water level indicators and oil/water interface probes by:

1. Fill a nonmetallic wash tub or bucket to a depth of about 6 inches with potable water. Mix a detergent solution in the tub. The solution shall consist of approximately 1 tablespoon of non-phosphate laboratory-grade detergent (e.g. Liquinox) per gallon of water.

2. Clean the portions of the meters and probes that had contact with site media with the detergent solution.

3. Rinse the portions of the meters and probes with distilled water.

4. Place the equipment on clean plastic and allow it to air dry.

5. Store the equipment in the provided case or covered with plastic or aluminum foil.

6. Retain decontamination fluids per *SOP 601 Investigative Derived Waste Storage, Sampling, and Disposal*.

Instruments such as pH meters, conductivity meters, and other instruments that do not come into contact with the material that will be collected for analysis may be decontaminated by thoroughly rinsing the instrument probes.

## 8.4 Decontamination of Non-Sample-Contacting Equipment

Down-hole sampling tools such as drill string, augers, and direct-push rods, as well as drill rigs and direct-push trucks/vans, will be decontaminated prior to the start of work on site, between each borehole, and prior to leaving the site. Decontamination of subcontractor-owned equipment is typically the responsibility of the subcontractor. Decontamination should be according to the following procedure:

1. Construct a three-sided decontamination pad using planks as a frame and plastic sheeting as the bottom. The pad should be constructed on a slight slope with the open side facing uphill.

2. Back the drill rig or direct-push rig into the decontamination pad or place equipment in a rack off the ground inside the pad.

3. Use pressurized, potable water to completely remove visible soil and contamination from surfaces. Include the inside of drill string, augers, and direct-push rods. If necessary, use a stiff-bristled brush to remove soil and contamination. Dependent upon the contaminant present, the Project-Specific Work Plan may require the use of hot, pressurized water with laboratory grade detergent. The use of a detergent wash will require a rinse with potable water.

4. Place the equipment on clean plastic and allow to air dry.

5. Store equipment and cover with plastic after decontamination.

6. Retain decontamination fluids as described in *SOP 601 Investigative Derived Waste Storage, Sampling, and Disposal*.

# 9.0 DATA AND RECORDS MANAGEMENT

A documentation of field activities will be maintained in the field logbook as described in *SOP 701 Field Documentation*. Field documentation will be completed as activities are conducted and will be relayed to the Field Site Manager or Project Manager at a minimum weekly or on a more frequent basis if so stated in the Project-Specific Work Plan.

## 10.0 QUALITY ASSURANCE/QUALITY CONTROL

Equipment rinstate blanks (ERBs) are often collected from non-disposable, sample-contacting equipment to determine if cross contamination is occurring. Procedures for the collection of ERBs can be found in the SOPs for the specific sampling method.

Prior to the start of any field activity, Burns & McDonnell personnel will have read and understood the Project-Specific Plans as well as this SOP. Field personnel will be trained for a minimum of 40 hours prior to their working solo on environmental field activities.

## 11.0 REFERENCES

Burns & McDonnell Engineering, Co, Inc. (Burns & McDonnell), 2015. *Policy Manual*,

- Chapter 10, Quality Control Manual, January.
- Chapter 8, Safety and Health Manual, February.

United States Environmental Protection Agency (USEPA), 2007. *Guidance for Preparing Standard Operating Procedures*. EPA/600/B-07/001. April

## 12.0 ATTACHMENTS

None.

# SOP 592
# Sample Packaging and Shipping

Revision 0
01/06/2017

Approved by:

Martha Hildebrandt, PG, Associate Geologist, Environmental Division — 01/17/17 Date

Justin Carter, PG, Senior Geologist, Environmental Division — 02/17/17 Date

Martha Hildebrandt, PG, QC Manager, Environmental Division — 02/17/17 Date

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## 1.0 PURPOSE AND APPLICABILITY

The purpose of *Standard Operating Procedure (SOP) 592 Sample Packaging and Shipping* is to establish a uniform procedure for field personnel to use in the packaging and shipping of environmental samples for chemical and physical analysis. This SOP only applies to the packaging and shipping of limited quantity, low concentration environmental samples. This procedure does not apply to those samples considered hazardous materials, hazardous waste, mixed waste, radioactive waste, and/or dangerous goods. Requirements for packing and shipping those types of samples are specified in the U.S. Department of Transportation (DOT) 49 Code of Federal Regulation (CFR) 114-327 and the International Air Transport Association (IATA) procedures. This SOP covers the *process* for the packaging and shipping of environmental samples; specific of shippers and shipping dates are detailed in the Project-Specific Work Plan. *SOP 592 Sample Packaging and Shipping* has been prepared in accordance with the *Guidance for the Preparing of Standard Operating Procedures* (USEPA, 2007) and the Burns & McDonnell Engineering Company, Inc. (Burns & McDonnell) *Policy Manual* (Burns & McDonnell, 2015).

## 2.0 SUMMARY OF METHOD

Samples collected for laboratory analysis shall be packed and shipped in a way to maintain quality control and limit breakage of sample containers. Dependent upon the analyses, samples may require placement in coolers with an appropriate amount of ice to maintain an internal temperature of 4° Celsius (C) during shipping from the field to the lab. Chain-of-custody (COC) documentation will be included inside of the cooler.

Samples will be sent to the laboratory via overnight shipment (ie FedEx) or a laboratory courier. If sent via FedEx, a FedEx air bill will be completely filled out and the cooler(s) will be delivered directly to a FedEx agent or to an authorized agent for shipment. The shipment tracking number will be recorded in the field logbook. (For additional questions regarding shipping, contact FedEx at 1-800-463-3339.) If sent via laboratory courier, the courier will sign the COC upon receipt of the packed samples.

## 3.0 DEFINITIONS

- **Environmental Sample** - A limited quantity, low concentration sample that does not require DOT or IATA hazardous waste labeling as a hazardous waste or material.

- **Hazardous Material** - A substance or material in a quantity or form, which may pose an unreasonable risk to health, safety, and/or property when transported in commerce. Hazardous material is defined and regulated by DOT (49 CFR 173.2 and 172.101) and IATA (Section 4.2).

- **Hazardous Waste** - Any substance listed in 40 CFR Subpart D (260.30 et seq.) or otherwise characterized as ignitable, corrosive, reactive, or toxic as specified in Subpart C (261.20 et seq.) that would be subject to manifest and packaging requirements specified in 40 CFR 262. Hazardous waste is defined and regulated by the United States Environmental Protection Agency (USEPA).

- **Hazardous Waste Sample** - A medium or high concentration sample requiring, either DOT or IATA labeling as a hazardous waste or material.

- **Project-Specific Accident Prevention Plan/Site Safety and Health Plan** (Project-Specific APP/SSHP) – A plan or plans that address occupational safety and health hazards associated with site operations.

- **Project-Specific Work Plan** – The plan that details the rationale, scope, and techniques to be used at the Site to achieve the project objectives. Project-Specific Work Plans can include work plans, field sampling plans, quality assurance project plans, technical memorandums, and other documentation of proposed work.

- **Sample** - Physical evidence collected from a facility or the environment which is representative of conditions at the point and time at which the sample is collected.

## 4.0 HEALTH AND SAFETY

Field activities as detailed in this SOP will be performed in accordance with applicable safety related documents/requirements which may include, but are not limited to: Project-Specific APP/SSHP, the Burns & McDonnell *Corporate Safety and Health Program* (Burns & McDonnell, 2015), and site / client-specific requirements. Care should be taken when handling sample bottles that have been prepared with preservatives such as acids or bases. Personal protective equipment (PPE) as listed in the Project-Specific APP/SSHP should be worn while handling and packing filled sample containers.

## 5.0 CAUTIONS

Sample quality is dependent upon proper preservation including sample temperature. Care should be taken not to over or under dilute the preservative within pre-preserved sample containers. Care should be

taken to ensure that sufficient ice is present in the coolers during sampling and that the ice is replenished prior to shipping. Samples that contain liquids (including the ice) should be double bagged so to prevent leakage during shipment.

## 6.0 PERSONNEL QUALIFICATIONS

Burns & McDonnell personnel conducting on-site environmental activities will have completed the 40-hour Occupational Safety and Health Administration (OSHA) Hazardous Waste Operations and Emergency Response Standard (HAZWOPER) course and annual 8-hour HAZWOPER refresher courses. At a minimum, one person on site will be certified in first aid and cardiopulmonary resuscitation (CPR) and, if multiple people are on site, at least one person will have completed the 8-hour HAZWOPER Supervisor Training course. If Burns & McDonnell subcontractors are on site then, at a minimum, one Burns & McDonnell person will have completed the OSHA 30-hour Construction Industry Outreach Training course.

## 7.0 EQUIPMENT AND SUPPLIES

Equipment and supplies required when shipping and handling samples can include:

- Packing materials such as bubble wrap, plastic sealable bags, tape, etc.
- Contractor-grade plastic trash bags
- Ice
- Coolers
- Labeling supplies such as shipping labels, waterproof pens, etc.
- PPE and safety equipment per the Project-Specific APP/SSHP

Equipment to be used for decontamination and documentation can be found in the SOPs for those activities.

Prior to the start of field activities, the Field Site Manager and/or the Project Manager should determine that 1) the Project-Specific APP/SSHP has been reviewed by Burns & McDonnell personnel participating in the work and subcontractors who will be on site; 2) appropriate PPE has been obtained for Burns & McDonnell personnel and will be available on site; 3) equipment and supplies are available, in working order, and complete with needed components; 4) sample containers provided by the laboratory are the correct size and type, are preserved, if required, per the Project-Specific Work Plan, and are sufficient in

number for the planned field activities and 5) sample containers provided by the laboratory are the correct size and type.

## 8.0 PROCEDURES

The sample packaging and shipping procedures to be used for the shipment of samples by an overnight carrier are based on USEPA specifications and Department of Transportation regulations (49 CFR Parts 172 and 173). Samples will be packed and shipped according to requirements for low hazard-level samples. The following procedure will be used to pack samples being shipped by overnight carrier:

1. Arrange sample containers in groups by sample number.

2. At the time of sampling, wipe the outside of each sample container with a paper towel and place a label on each container. Each glass container will be wrapped with bubble wrap. Place each sample bottle in an individual, sealable plastic bag. Volatile organic compound (VOC) vials may be group within a bag by sample.

3. Remove as much air as possible from the plastic bag prior to sealing.

4. Tape drains shut on shipping cooler, if present

5. Place an absorbent pad in the bottom of the cooler, followed by a layer of bubble wrap.

6. Insert a contractor-grade (minimum of 2 mils thick) plastic trash bag into the cooler.

7. Place the sample containers inside the trash bag inside the cooler in an upright position so they do not touch. Place one temperature blank in each cooler.

8. Add ice (double packaged in sealable plastic bags).

9. Sign the COC and indicate the time and date the cooler is sealed. Record the time in the field logbook.

10. If shipping via overnight carrier (i.e. FedEx):

    a. Separate the copies of the COCs. Seal the top form (original) in a large, sealable, plastic bag and tape them to the inside of the cooler lid.

b. Complete shipping paperwork (if applicable). Include air bill number and name of carrier on the COC, and record the information in the field logbook.

c. Close the lid and latch the cooler. Tape the cooler shut on both ends, make several revolutions with the strapping tape. The strapping tape should cover the ends of the clear tape used to secure the shipping label but should not cover the label.

d. Affix signed custody seals over lid openings (opposite corners of the cooler). Cover the seals with clear, plastic tape.

e. Attach the FedEx air-bill to the top of the cooler. Use two strips of clear tape to securely fasten the shipping label to the cooler so that the label will not peel off even if the coolers are stacked during shipment. The clear tape should extend across the entire top of the cooler. Field samples will be shipped to the contracted laboratory(ies).

f. Enter the appropriate information including air-shipping number, and time and date relinquished to the shipper in the field logbook.

11. If shipping via a laboratory courier:

a. Have the courier sign the COC noting receipt of samples.

b. Separate the copies of the COCs. Seal the top form (original) in a large, sealable, plastic bag and tape them to the inside of the cooler lid.

c. Close the lid and latch the cooler. Tape the cooler shut on both ends, make several revolutions with the strapping tape. The strapping tape should cover the ends of the clear tape used to secure the shipping label but should not cover the label.

d. Affix signed custody seals over lid openings (opposite corners of the cooler). Cover the seals with clear, plastic tape.

e. Enter the appropriate information including name of the courier, and time and date relinquished to the courier in the field.

## 9.0 DATA AND RECORDS MANAGEMENT

Shipping information including COC numbers, shipping numbers, and date and times should be entered into the field logbook as detailed in *SOP 701 Field Documentation*. Field documentation will be completed as activities are conducted and will be relayed to the Field Site Manager or Project Manager at a minimum weekly or on a more frequent basis if so stated in the Project-Specific Work Plan.

## 10.0 QUALITY ASSURANCE/QUALITY CONTROL

Prior to the start of any field activity, Burns & McDonnell personnel will have read and understood the Project-Specific Plans as well as this SOP. Field personnel will be trained for a minimum of 40 hours prior to their working solo on environmental field activities.

## 11.0 REFERENCES

Burns & McDonnell Engineering, Co, Inc. (Burns & McDonnell), 2015. *Policy Manual*,

- Chapter 10, Quality Control Manual, January.
- Chapter 8, Safety and Health Manual, February.

United States Environmental Protection Agency (USEPA), 2007. *Guidance for Preparing Standard Operating Procedures*. EPA/600/B-07/001. April

## 12.0 ATTACHMENTS

None.

# SOP 601
# Investigative Derived Waste Storage, Sampling, and Disposal

Revision 0
01/06/2017

Approved by:

01/17/17

Martha Hildebrandt, PG, Associate Geologist, Environmental Division — Date

02/17/17

Reynold Tomes, PG, Senior Geologist, Environmental Division — Date

02/17/17

Martha Hildebrandt, PG, QC Manager, Environmental Division — Date

Biennial Review:

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## 1.0 PURPOSE AND APPLICABILITY

The purpose of *Standard Operating Procedure (SOP) 601 Investigative Derived Waste Storage, Sampling, and Disposal* is to establish a uniform procedure for the storage, sampling, and disposal of investigative derived waste (IDW). Waste management procedures for IDW are based on the requirements specified in Title 40 of the Code of Federal Regulations (CFR), Part 262 (40 CFR 262) *Standards Applicable to Generators of Hazardous Waste* and professional judgment. Waste management procedures should also include consideration of state regulations. State-specific requirements and regulations should be addressed in the Project-Specific Work Plan.

This SOP covers the *process* for the storage, sampling, and disposal of IDW; specifics of characterization, and disposal should be included in the Project-Specific Work Plan. *SOP 601 Investigative Derived Waste Storage, Sampling, and Disposal* has been prepared in accordance with the United States Environmental Protection Agency (USEPA) *Guidance for the Preparing of Standard Operating Procedures* (USEPA, 2007) and the Burns & McDonnell Engineering Company, Inc. (Burns & McDonnell) *Policy Manual* (Burns & McDonnell, 2015).

## 2.0 SUMMARY OF METHOD

During field investigations, various activities such as sampling and decontamination will produce liquid and solid IDW. IDW can include excess sample, soil cuttings, drilling muds, purged groundwater, decontamination fluids (water and other fluids), disposable sampling equipment, disposable personal protective equipment (PPE), and other materials produced during environmental investigation or remediation. Equipment, materials, and supplies needed for containerizing IDW will be selected based on waste characteristics or constituents. Important elements for effective IDW management include: 1) leave a site in no worse condition than existed prior to the investigation; 2) remove IDW that poses an immediate threat to human health or the environment; 3) leave IDW on site that does not require off-site disposal or long-term above-ground containerization; 4) comply with all Federal and State regulations, and; 5) minimize the quantity of IDW generated.

## 3.0 DEFINITIONS

- **Hazardous Waste** - Any substance listed in 40 CFR Subpart D (260.30 et seq.) or otherwise characterized as ignitable, corrosive, reactive, or toxic as specified in Subpart C (261.20 et seq.) that would be subject to manifest and packaging requirements specified in 40 CFR 262. Hazardous waste is defined and regulated by the USEPA.

- **Hazardous Material** - A substance or material in a quantity or form, which may pose an unreasonable risk to health, safety, and/or property when transported in commerce. Hazardous material is defined and regulated by the US Department of Transportation (DOT) (49 CFR 173.2 and 172.101) and International Air Transport Association (IATA) (Section 4.2).

- **Sample** - Physical evidence collected from a facility or the environment which is representative of conditions at the point and time at which the sample is collected.

- **Project-Specific Accident Prevention Plan/Site Safety and Health Plan** (Project-Specific APP/SSHP) – A plan or plans that address occupational safety and health hazards associated with site operations.

- **Project-Specific Work Plan** – The plan that details the rationale, scope, and techniques to be used at the site to achieve the project objectives. Project-Specific Work Plans can include work plans, field sampling plans, quality assurance project plans, technical memorandums, and other documentation of proposed work.

Additional definitions may apply based upon state-specific regulations and guidances.

## 4.0 HEALTH AND SAFETY

Field activities as detailed in this SOP will be performed in accordance with applicable safety related documents/requirements which may include, but are not limited to: Project-Specific APP/SSHP, the Burns & McDonnell Corporate *Safety and Health Program* (Burns & McDonnell, 2015), and site / client-specific requirements. PPE as listed in the Project-Specific APP/SSHP should be worn when transferring IDW to or from a container or collecting an IDW sample.

## 5.0 CAUTIONS

Care must be taken when handling IDW to prevent spills. Appropriate containers for IDW storage and transport should be identified and used (see Section 8.0). Care should be exercised when selecting IDW staging areas so that containerized IDW is reasonably secure while awaiting disposal. Care should be taken when filling and storing containers to ensure that weather such as freezing or heating or other events such as flooding will not compromise IDW storage.

State and local regulations and guidances should be consulted during preparation of the Project-Specific Work Plan.

## 6.0 PERSONNEL QUALIFICATIONS

Burns & McDonnell personnel conducting on-site environmental activities will have completed the 40-hour Occupational Safety and Health Administration (OSHA) Hazardous Waste Operations and Emergency Response Standard (HAZWOPER) course and annual 8-hour HAZWOPER refresher courses. At a minimum, one person on site will be certified in first aid and cardiopulmonary resuscitation (CPR) and, if multiple people are on site, at least one person will have completed the 8-hour HAZWOPER Supervisor Training course. If Burns & McDonnell subcontractors are on site then, at a minimum, one Burns & McDonnell person will have completed the OSHA 30-hour Construction Industry Outreach Training course.

## 7.0 EQUIPMENT AND SUPPLIES

Equipment and supplies for IDW management and storage may include:

- Paint pens and/or weatherproof labels
- Flagging/caution tape
- 5-Gallon buckets
- Pallets
- Lidded drums or rolloffs with liners and covers
- PPE and safety equipment per the Project-Specific APP/SSHP

Equipment and supplies to be used during IDW sampling may include:

- Approved sampling tool - push sampling tools equipped with liners, core sampler, auger, spoon, bailer, drum thief, etc.
- PPE and safety equipment per the Project-Specific APP/SSHP
- Sample containers and sample preservatives per Project-Specific Work Plan

Equipment to be used for decontamination and sample labeling, packing and shipping can be found in the SOPs for those activities.

Prior to the start of field activities, the Field Site Manager and/or the Project Manager should determine that 1) necessary permits, right of entries, and utilities clearances have been obtained; 2) the Project-Specific APP/SSHP has been sent to subcontractors who will be on site; 3) appropriate PPE has been obtained for Burns & McDonnell personnel and will be available on site; 4) sample equipment and meters

are available, in working order, and complete with needed components; and 5) sample containers provided by the laboratory are the correct size and type, are preserved, if required, per the Project-Specific Work Plan, and are sufficient in number for the planned field activities.

# 8.0 PROCEDURES

## 8.1 Containerization, Labeling, and Storage of IDW

### 8.1.1 Liquid IDW

Liquid IDW may include well development, decontamination, purge water, and excess liquid sample. Often through existing groundwater monitoring data and field screening data collected as part of the field effort, it is possible to pre-characterize liquid IDW. Most liquid IDW generated as part of site investigations will not be hazardous waste. Liquid IDW can be stored in a frac tank or containerized separately in drums. Liquid waste known or suspected to be hazardous waste should be stored in drums. Drums and polyethylene tanks can be used for interim storage and transport of liquid IDW. Labeling will be in accordance with the guidelines outlined below. Containers will be closed and secured except when adding to or disposing of the contents. Manufacturer DOT specifications will be followed when sealing containers.

United Nations (UN)-approved drums (49 CFR 173.3), polyethylene tanks, and 5-gallon plastic buckets will be used to collect liquid IDW, depending on the volume, rate of generation, and the accessibility of the IDW source. Liquid IDW collected in 5-gallon buckets will be transferred to drums or polyethylene tanks as soon as possible after collection. Any liquid IDW suspected of being or characterized as hazardous waste will be containerized in UN-approved drums.

Containers of liquid IDW will be labeled to indicate the source and nature of the waste material. The following information will be marked on the top or sides of each container: container number(s) (boring number plus a sequential number); facility name; location number; date of generation; container contents; estimated quantity; and the client point of contact (POC).

Containers will be marked with 2-inch letters and numbers using a waterproof paint pen. An inventory of the IDW will be maintained by the Field Site Manager to facilitate identification and tracking of liquid IDW for appropriate disposal. This inventory will include all of the above information, the location of the container, and initials of the responsible POC. In addition to the inventory, the total number of containers of liquid IDW generated will be noted in the field notebook on a daily basis. Containers of liquid IDW

determined to be hazardous waste or non-hazardous waste that are sent off site for disposal will be relabeled in a manner consistent with applicable state and federal requirements including, but not limited to, Resource Conservation and Recovery Act (RCRA), Toxic Substances Control Act (TSCA), and DOT (40 CFR 171-179).

Containers of liquid IDW are typically temporarily stored until characterized. Containers of liquid IDW that will be stored during winter months should be underfilled (<2/3 full) to allow for expansion during freezing. Issues to consider in identifying storage areas include the potential for unauthorized access to the site, flooding, and freezing. Dependent upon the site and the contaminants present, provision may need to be made for secondary containment at the location where liquid IDW is being stored.

For short-term storage prior to characterization, properly labeled and closed containers of liquid IDW will be left in an upright position placed on level ground. When containers of solid IDW are staged with containers of liquid IDW, they will be clustered together with any liquid-filled containers on the interior of the cluster. Placement of IDW on pallets should be done if the IDW may require movement prior to disposal. If it is not possible to locate a secure IDW staging area with perimeter fencing, warning tape and temporary orange barrier fencing, at a minimum, will be placed around the cluster of containers.

Containers of liquid IDW should not remain in storage for longer than necessary to determine the regulatory status of the waste through laboratory testing and to evaluate disposal options. If it is anticipated that liquid-filled containers will remain in storage for 30 days or longer, the containers will be positioned to allow inspection from all sides to monitor for leakage.

### 8.1.2 Solid IDW

During environmental investigation activities, various activities such as soil sampling, sediment sampling, and monitoring well installation will produce solid IDW, including soil cuttings and excess soil sample material. Most soil IDW, generated as part of site investigations, will be either non-hazardous or have slightly elevated concentrations of contaminants which might classify the material as special waste. Typically, very little solid IDW is classified as hazardous waste. Solid IDW will be containerized and disposal options evaluated based upon laboratory and site historical data.

Solid IDW consisting of used PPE, disposable equipment (bailers, rope, acetate liners, etc.), and other trash that may have come into contact with contamination, will be rendered nonhazardous through the removal of gross contamination. The IDW will be double bagged and disposed with other household type

trash at a local sanitary landfill. Gross contamination removed from the IDW in accordance with the Project-Specific APP/SSHP will be placed with the appropriate IDW.

Solid IDW, consisting of soil cuttings and excess soil sample material, will be placed in rolloff boxes equipped with liners and tarps or UN-approved drums. Five-gallon plastic buckets may be used for interim handling and transport of solid IDW. Any soil suspected of being characterized as hazardous waste will be drummed rather than being placed in the rolloff boxes. Containers will be closed and sealed except when adding to or disposing of the contents. Manufacturer DOT specifications will be followed when sealing containers.

Solid IDW will be containerized on an investigation area basis. Solid IDW requiring characterization from a given area of investigation will not be mixed with that from another area, as per the *Management of Investigation Derived Waste During Site Inspections*, EPA/540/G-91/009 (USEPA, 1991). However, solid IDW from multiple soil borings or direct-push activities within a single area of investigation may be combined into a single waste stream.

Containers of solid IDW will be labeled to indicate the source and nature of the waste material. The following information will be marked on the top or sides of each container: container number(s) (boring number plus a sequential number); site name; monitoring well, direct push, or borehole number; date of generation; container contents; estimated quantity; and the POC.

Containers will be marked with 2-inch letters and numbers using a waterproof paint pen. An inventory of IDW will be maintained by the Field Site Manager to facilitate identification and tracking of solid IDW for appropriate disposal. This inventory will include all of the above information, the location of the container, and initials of the responsible POC. In addition to the IDW inventory, the total number of containers of solid IDW generated will be noted in the field notebook on a daily basis.

Solid IDW determined to be hazardous (based on the outcome of laboratory analysis) will be relabeled in a manner consistent with applicable state and federal requirements including, but not limited to, RCRA, TSCA, and DOT.

Containers of solid IDW will be temporarily stored within until characterized. If deemed necessary, the client will designate a winter storage location. Issues to consider in identifying storage areas include the potentials for freezing, unauthorized access, and flooding.

For short-term storage on site, properly labeled and closed containers of solid IDW will be left in an upright position placed on level ground. Placement of IDW on pallets should be done if the IDW may require movement prior to disposal. When containers of solid IDW are staged with containers of liquid IDW, they will be clustered together with any liquid filled containers on the interior of the cluster. If it is not possible to locate a secure IDW staging area with perimeter fencing, warning tape and temporary orange barrier fencing, at a minimum will be placed around the cluster of containers.

Containers of solid IDW should not remain in storage for longer than necessary to determine the regulatory status of the waste through laboratory testing and to evaluate disposal options.

## 8.2 IDW Sampling

The sampling procedures for liquid and solid IDW contained in drums or rolloffs are described in the following sections.

### 8.2.1 Liquid IDW Drum Sampling Procedures

Within two weeks of the completion of field activities, a sample from each container of liquid IDW that requires characterization will be obtained and composited with the exception of samples for volatile organics analysis. When IDW is to be characterized for volatile organic analysis, one representative samples will be collected from each container of IDW. Samples will be composited on a monitoring well basis for new monitoring wells, or on a per area basis for other field activities. The composite sample will be analyzed for the constituents identified in the Project-Specific Work Plan. If during field investigations, field analytical results indicate elevated levels of contaminant concentrations at some investigation points, then the IDW from these investigation points will be stored in containers separate from the main body and analyzed separately from the other liquid or soil IDW.

The procedures listed below are for collecting samples from liquid IDW stored in drums in which the IDW source is known. The liquid drum sampling procedures are as follows:

1. Conduct field screening near drum storage area. If elevated concentrations are detected, then increase PPE level to C or B based on the Project-Specific APP/SSHP.

2. Wearing clean, disposable gloves, remove bung or drum lid and store on plastic sheeting.

3. Dip sample collector/bailer into the drum and slowly push the device into the middle portion of the drum.

4. Slowly remove sample device and decant into sample container.

5. Repeat Steps 3 and 4 until the correct sample volume has been collected.

6. Replace bung or drum lid.

7. Dispose of sample device and plastic as solid PPE.

8. Label the samples per the Project-Specific Work Plan, pack and ship the samples to the laboratory per *SOP 592 Sample Packing and Shipping*. Decontaminate the equipment per *SOP 701 Field Decontamination.*

### 8.2.2 Soil IDW Drum Sampling Procedures

#### 8.2.2.1 Discrete Samples

The procedures listed below are for collecting discrete samples from soil or solid debris IDW stored in drums in which the IDW source is known. The soil drum sampling procedures are as follows:

1. Conduct field screening near drum storage area. If elevated concentrations are detected, then increase PPE level to C or B based on the Project-Specific APP/SSHP.

2. Wearing clean disposable gloves, remove bung or drum lid and store on plastic sheeting.

3. Using a decontaminated trowel, gently scrape the top portion of the drum contents to one side.

4. Slowly push the sample device into the middle portion of the drum to a depth of approximately four inches.

5. Remove the sample device and transfer the sample immediately into the sample container.

6. Repeat Steps 4 and 5 until the correct sample volume has been collected.

7. Replace bung or drum lid.

8. Label the samples per the Project-Specific Work Plan, and place immediately in a cooler with ice. In general, sample containers will be filled from most volatile to least volatile. Specific sample order, sample containers, and sample preservatives will be detailed in the Project-Specific Work Plan.

9. Decontaminate the equipment per *SOP 701 Field Decontamination.*

10. Pack and ship the samples to the laboratory per *SOP 592 Sample Packing and Shipping*.

#### 8.2.2.2 Composite Samples

The procedures listed below are for collecting composite samples from soil or solid debris IDW stored in drums in which the IDW source is known. The soil drum sampling procedures are as follows:

1. Conduct field screening near drum storage area. If elevated concentrations are detected, then increase PPE level to C or B based on the Project-Specific APP/SSHP.

2. Wearing clean disposable gloves, remove bung or drum lid and store on plastic sheeting.

3. Using a decontaminated trowel, gently scrape the top portion of the drum contents to one side.

4. Slowly push the sample device into the middle portion of the drum to a depth of approximately four inches.

5. Remove the sample device and transfer the sample immediately into a stainless steel bowl.

6. Repeat Steps 4 and 5 until the correct sample volume has been collected.

7. Replace bung or drum lid.

8. Repeat Steps 2 through 7 for each drum to be included in the composite sample.

9. Thoroughly homogenize the sample by mixing in the sample bowl with a spoon or by hand, wearing clean, new gloves. Clean, disposable gloves will be worn and changed after the collection of each composite sample.

10. Place the composited surface soil in appropriate sample containers, label, and place immediately in a cooler with ice. In general, sample containers will be filled from most volatile to least volatile. Specific sample order, sample containers, and sample preservatives will be detailed in the Project-Specific Work Plan.

11. Decontaminate the equipment per *SOP 701 Field Decontamination.*

12. Pack and ship the samples to the laboratory per *SOP 592 Sample Packing and Shipping*.

## 8.3 IDW Disposal

Following IDW sample analysis, analytical results will be compared to the applicable screening levels as defined in the Project-Specific Work Plan and RCRA characteristic limits. The final disposition of the IDW will be determined by the client project manager. The procedures for IDW disposal are described in the following sections.

### 8.3.1 Liquid IDW Disposal Procedures

Depending on the classification of the liquid IDW, several options are available for disposal. The disposal option used will be determined by the client project manager. These options are as follows:

- Non-hazardous liquid IDW may be discharged to the ground surface at some sites. This option ***must have*** client and regulator approval prior to execution. If on-site disposal of non-hazardous liquid IDW is approved, care must be taken to not cause erosion or damage to surface features. Liquid IDW should not be directly discharged to surface water. Non-hazardous liquid IDW can also be disposed at a nearby waste water treatment plant, if available. Field personnel must contact the waste water plant operator and receive approval prior to disposal of any liquid IDW. The drums used to containerize liquid IDW, once emptied, should preferably be recycled but may be disposed of at a sanitary landfill.

- If the liquid IDW is deemed to be hazardous, container labeling will be amended accordingly. At the discretion of the client project manager, hazardous liquid IDW can be disposed of via a wastewater treatment system providing the waste meets the pre-treatment standards set forth in the wastewater treatment system's National Pollutant Discharge Elimination System (NPDES) permit and is approved by the wastewater treatment plant operator. However, if the liquid IDW is above pre-treatment standards or RCRA Toxicity Characteristic Leaching Procedure (TCLP) thresholds, then authorization may also be required from the state regulatory agency. For off-site disposal, Burns & McDonnell may assist the generator (client) of the waste with coordinating manifesting and disposal; however, arrangement for disposal and signature of the waste manifests will be the generator's responsibility. Off-site disposal of IDW must be authorized by the state in which the project is located.

### 8.3.2 Solid IDW Disposal Procedures

Depending on the classification of the solid IDW, several options are available for disposal of soil IDW generated at the site.

- Solid IDW (consisting of used PPE, disposable equipment, and trash) will be rendered non-hazardous by the removal of gross contamination and then double bagged and disposed with other household type trash at a local sanitary landfill.

- Non-hazardous solid IDW (waste soil) may be spread on the ground surface near the point of origin or may be transported off site to a landfill for disposal. Note that on-site disposal of solid IDW to the ground surface ***must have*** client and regulator approval prior to execution. The drums used to containerize solid IDW, once emptied, should preferably be recycled but may be disposed at a sanitary landfill.

- If the solid IDW is deemed to be hazardous, container labeling will be amended accordingly. If the solid IDW is above applicable screening levels or RCRA TCLP thresholds established by 261.24 of RCRA, authorization may be required from the state regulator prior to disposal. For off-site disposal, Burns & McDonnell will assist the generator of the waste (client) with coordinating manifesting and disposal; however, arrangement for disposal and signing of the manifests will be the generator's responsibility.

- Many states also have additional solid IDW classifications (i.e. special waste) for IDW that will be disposed of off site. State authorization for disposal of Special Waste at a Subtitle D municipal solid waste landfill is typically dependent upon the type and concentration of contaminants in the waste. For these classifications, Burns & McDonnell will assist the generator (client) with coordinating disposal; however, arrangement for disposal remains the responsibility of the generator.

## 9.0 DATA AND RECORDS MANAGEMENT

Field documentation will be completed as activities are conducted and will be relayed to the Field Site Manager or Project Manager at a minimum weekly basis or on a more frequent basis if so stated in the Project-Specific Work Plan. Daily logs should be used to document activities associated with IDW. A copy of completed field forms, chain of custody records, lab analytical reports, and waste manifests will be kept in the project files. Field notes will be maintained in a logbook as described in *SOP 701 Field Documentation*.

## 10.0 QUALITY ASSURANCE/QUALITY CONTROL

Prior to the start of any field activity, Burns & McDonnell personnel will have read and understood the Project-Specific Work Plans as well as this SOP. Field personnel will be trained for a minimum of 40 hours prior to their working solo on environmental field activities.

## 11.0 REFERENCES

Burns & McDonnell Engineering, Co, Inc. (Burns & McDonnell), 2015. *Policy Manual*,

- Chapter 8, Safety and Health Program, February.
- Chapter 10, Quality Control Manual, January.

United States Environmental Protection Agency (USEPA), 1991. *Management of Investigation Derived Waste During Site Inspections*, EPA/540/G-91/009.

USEPA, 2007. *Guidance for Preparing Standard Operating Procedures*. EPA/600/B-07/001. April

## 12.0 ATTACHMENTS

None.

# SOP 701
# Field Documentation

Revision 0
01/07/2017

Approved by:

Martha Hildebrandt, PG, Associate Geologist, Environmental Division — Date: 01/17/2017

Ben Clement, R.G., Senior Geologist, Environmental Division — Date: 01/17/2017

Martha Hildebrandt, PG, QC Manager, Environmental Division — Date: 02/17/2017

Biennial Review:

| Revision/Review | Date | Responsible Party | Description of Change |
|---|---|---|---|
| | | | |
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**Burns & McDonnell Engineering Company, Inc.**

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## 1.0 PURPOSE AND APPLICABILITY

The purpose of *Standard Operating Procedure (SOP) 701 Field Documentation* is to establish a uniform procedure for documentation of field activities on environmental sites. Soil and bedrock logging for excavations and borings is not included in this SOP but can be found in *SOP 521 Soil and Bedrock Logging*. This SOP covers the ***process*** for the field documentation; specific documentation requirements that may be required by the client, regulator, or specific processes are detailed in the Project-Specific Work Plan. *SOP 701 Field Documentation* has been prepared in accordance with the *Guidance for the Preparing of Standard Operating Procedures* (USEPA, 2007) and the Burns & McDonnell Engineering Company, Inc. (Burns & McDonnell) *Policy Manual* (Burns & McDonnell, 2015).

## 2.0 SUMMARY OF METHOD

Each sample, field measurement, and field activity will be properly documented to facilitate timely, correct, and complete analyses, and support actions concerning site work. The documentation system will provide a means to identify, track, and monitor individual samples from the point of collection through the final reporting of data. Field forms referenced in this SOP are attached.

## 3.0 DEFINITIONS

- **Field Forms** – Forms prepared for specific activities. Forms used in the field should either be Burns & McDonnell standard forms or be included in the Project-Specific Work Plans.

- **Field Logbook –** A bound logbook that is kept per team during environmental work. Whenever possible, logbooks should have pre-numbered pages and stitched bindings.

- **Project-Specific Accident Prevention Plan/Site Safety and Health Plan** (Project-Specific APP/SSHP) – A plan or plans that address occupational safety and health hazards associated with site operations.

- **Project-Specific Work Plan** – The plan that details the rationale, scope, and techniques to be used at the site to achieve the project objectives. Project-Specific Work Plans can include work plans, field sampling plans, quality assurance project plans, technical memorandums, and other documentation of proposed work.

## 4.0 HEALTH AND SAFETY

Field activities as detailed in this SOP will be performed in accordance with applicable safety related documents/requirements which may include, but are not limited to: Project-Specific APP/SSHP, the Burns & McDonnell Corporate Safety and Health Program (Burns & McDonnell, 2015), and site / client-specific requirements.

## 5.0 CAUTIONS

Field documentation should be completed with indelible marking/ink pens preferably in blue or black. Hand entries should be printed and the author should ensure that the writing is legible and clear. Any errors made should be lined out so that the original writing is still visible, initialed, and dated. Field documentation should stay either with the field personnel on site or be kept within a secure location. Upon completion of the field activities, field documentation is kept with the project files. The Project Manager should ensure that photographs are allowed prior to the start of field activities.

## 6.0 PERSONNEL QUALIFICATIONS

Burns & McDonnell personnel conducting on-site environmental activities will have completed the 40-hour Occupational Safety and Health Administration (OSHA) Hazardous Waste Operations and Emergency Response Standard (HAZWOPER) course and annual 8-hour HAZWOPER refresher courses. At a minimum, one person on site will be certified in first aid and cardiopulmonary resuscitation (CPR) and, if multiple people are on site, at least one person will have completed the 8-hour HAZWOPER Supervisor Training course. If Burns & McDonnell subcontractors are on site then, at a minimum, one Burns & McDonnell person will have completed the OSHA 30-hour Construction Industry Outreach Training course.

## 7.0 EQUIPMENT AND SUPPLIES

Equipment to be used during field documentation may include:

- Field logbooks
- Field forms
- Labels and seals
- Indelible marking pen/ink pens, black or blue in color
- Digital cameras/recorders
- Personal protective equipment (PPE) and safety equipment per the Project-Specific APP/SSHP

Equipment to be used for sampling activities can be found in the SOPs for those activities.

## 8.0 PROCEDURES

Included below are procedures for completing field logbooks and specific forms and labels. Which forms and labels should be completed on a project is a function of the activities to be performed and the preferences of the client and regulator. Refer to the Project-Specific Work Plan for the specific project documentation that is to be completed.

Field documentation should be completed as the activities are being done. On a regular basis, typically not less than once a week, the field personnel should scan their field documentation for placement in the project file. At the completion of a field effort, the field personnel are responsible for ensuring that a complete scan of the documentation is in the files and that the originals have been given to the project manager for inclusion in the project files.

### 8.1 Corrections to Documentation

Original recorded data will be written with indelible, waterproof ink. Accountable serialized documents will not be destroyed or thrown away, even if they are illegible or contain inaccuracies that require a replacement document. Errors will be corrected by marking a line through the error, entering the correct information, and initialing and dating the correction. The erroneous information will not be obliterated. Any subsequent error discovered later on an accountable document will be corrected, initialed, and dated by the person who made the entry.

### 8.2 Field Logbook

Information pertinent to the investigation will be recorded in a bound logbook with consecutively-numbered, water-resistant pages. The field personnel responsible for the entries will sign and date each entry or page. Logbook entries will be made in waterproof, indelible ink. The time and date of each entry will be noted in the logbook.

General rules cannot specify the exact information that must be entered in a logbook for a particular site. However, the logbook should contain sufficient information so that field activities can be reconstructed without discussion with the original author. Logbooks will be kept in the field personnel's possession or a secure place during the investigation. Following the investigation, logbooks will become part of the project file. The following list contains typical field logbook entries to be recorded on a daily basis, depending upon field activities being performed.

- Date
- Weather conditions
- Names of field personnel and site visitors including time on and off the site
- Documentation of daily safety meeting including topics and attendance
- Calibration record of field equipment
- Name and location of area of investigation
- Location of sample (may include a sketch)
- Type of sample (soil, groundwater, sediment, air, etc.)
- Time (military) of sample collection
- Sample identification number
- Interval and depth of sample
- Field screening results
- Sample collection procedure/equipment
- Sample description (color, odor, etc.)
- Field observations of sampling event
- Parameters requested for analyses
- Field measurements
- Quality assurance/quality control (QA/QC) sample information
- Equipment decontamination procedures
- Sample shipment information
- Number assigned to chain of custody (COC)
- Documentation of investigative derived waste (IDW) per *SOP 601 Investigative Derived Waste Storage, Sampling, and Disposal*
- Air monitoring results
- Level of PPE

## 8.3 Field Forms

Field forms can be specific forms for field measurements such as water level forms, sampling forms, forms associated with specific activities such as well development or in-situ testing, equipment calibration forms, or health and safety forms. Specific field forms to be used should be referenced in the Project-Specific Work Plan or the Project-Specific APP/SSHP. In all cases, the forms should be completed in entirety. Items on the forms that do not apply should be filled with NA. Forms should be completed in waterproof, indelible ink. Time entries should be military.

## 8.4 Daily Quality Control Reports

Daily Quality Control Reports (DQCR) are used to transmit a summary of daily activities to the client or to the regulators. DQCRs are used on most Department of Defense projects. DQCRs can be used on state or private projects if the client or regulator requests a daily field summary. With DQCRs, field activities will be recorded daily by the Field Site Manager (FSM) to verify that procedures outlined in the Project-Specific Work Plans are implemented. DQCRs will be completed with the following information:

- **Site Information** - To accurately track field activities from one site location to another, site-specific information will be recorded on the DQCR form. Information such as site location, project number, area of investigation, date, time, crew numbers, names of crew members, and the name of the FSM will be recorded.

- **Weather Conditions** - General weather conditions such as air temperature, relative wind speed and direction, and relative humidity will be estimated daily and recorded on the DQCR forms. Any change in weather conditions encountered during the day will be recorded on the DQCR.

- **Subcontractors and Equipment** - The subcontractors performing work associated with the investigation at the site will be tracked by recording on the DQCR form the subcontractor's company name, crew size, and a list of the major equipment used during daily field activities.

- **Summary of Work Performed -** A brief description of the daily field activities performed at the site will be recorded on the DQCR form. For field measurements, the numerical value and units will be recorded on the DQCR form.

- **Instrument Calibration** - Instrumentation used for sampling and personal protection, and verification of instrument calibration during daily field activities will be recorded on the DQCR form. Additional instruments used will be written in the space provided. Further information on calibration procedures will be recorded on the calibration log for each instrument used during daily field activities.

- **Health and Safety Requirements** - The level of protection used during daily field activities and any other health and safety modifications will be recorded in the DQCR form. Modifications that may occur during field activities, including upgrading to higher levels of protection based on air-monitoring data and other chemical or physical hazards encountered at the site that were not previously known to exist, will also be recorded on the DQCR form.

- **Sample Numbers Collected Including QA/QC Samples** – A summary of the samples collected, including QA/QC samples and the relationship of the QA/QC samples to the original samples, will be recorded on the DQCR form under the "Summary of Work Performed" heading.

- **Deviations from the Approved Site-Specific Documents** - Any anticipated deviation in field activities that is not specified in the site-specific documents will be recorded on the DQCR form. The actual deviation will not be performed until a written request is submitted by the Project Manager to the client and approval, written or verbal, has been granted by the client.

- **Problems Encountered/Corrective Action Taken** - During daily field activities, any problems encountered and the corrective actions taken for each incident will be recorded on the DQCR form. For each problem encountered, the Project Manager will be notified and the date and time recorded of when notification was given.

- **Work Status for the Following Day** - A summary of field activities planned for the following day will be recorded on the DQCR form.

The FSM will verify completion by signing and dating the DQCR form. The DQCR form will be completed and forward to the Project Manager daily. The DQCRs and any attachments will be submitted to the client either daily or weekly as requested. Copies of the completed forms will be placed in the project file.

## 8.5 Chain-of-Custody Records

The COC will be employed as physical evidence of sample custody. Field personnel will initiate a COC with acquisition of the sample. Transferred possession of samples will be recorded on the COC by both the person relinquishing and the person receiving the samples by signing, dating, and noting the time the transfer of possession takes place. Samples are considered to be in a person's custody if they are within that person's line of sight, kept in a locked room or vehicle, or adequately sealed with custody seals.

A COC will be prepared for each cooler shipped or transported to the laboratory. All samples packed in the cooler will be recorded on the COC accompanying that cooler. A document control number consisting of the date and consecutive alphabetic suffix will be completed in the space provided on the COC. For example, if a shipment of samples is prepared on January 31, 2016 with two coolers, the document control numbers will be 01312016A for the COC(s) included with the first cooler and 01312016B for the COC(s) included with the second cooler.

The following information is to be included on the COC:

- Sample numbers
- Signature(s) of field personnel
- Date of collection
- Time (military) of collection
- Sample type (solid, etc.)
- Identification of sampling point (including depth)
- Number of containers
- Preservative used
- Parameters requested for analysis
- Signature of person(s) involved in the chain of possession
- Inclusive dates and times of possession
- Notations regarding the possible compromise of sample integrity
- Notation regarding sample temperature
- Document control number

After completing the COC, the original (white copy) will be enclosed in a plastic bag and secured to the inside of the cooler lid for the laboratory and the yellow copy will be placed in the project file.

## 8.6 Sample Labels

Each sample removed from a site and transferred to a laboratory for analysis will be identified with a sample label containing specific information regarding the sample. Each completed sample identification label will be securely fastened to the sample container. Complete sample labels will include the following information:

- Date
- Time (military) of sample collection
- Type of analyses requested
- Sample number
- Sample collection depth, if appropriate
- Location of sample collection
- Type of preservative
- Initials of sampler

## 8.7 Custody Seals

From the time the coolers are packed until they are opened in the laboratory, custody seals will be used to preserve the integrity of the cooler during shipment. Custody seals must be attached so that it is necessary to break the seals to open the cooler and should be initialized by the person applying the seal. The custody seals will be covered with clear tape. All samples shipped overnight to the laboratory will be shipped in coolers sealed on two opposite sides with custody seals. As long as the COCs are sealed inside the sample cooler and custody seals remain intact, commercial carriers and laboratory couriers are not required to sign the custody form.

## 8.8 Digital Cameras

Sample points and field activities may be documented using photographs. Photographs may include samples, sample collection activities and equipment, and surrounding areas. Photographs taken to document sampling points should include one or more reference points to facilitate relocating the sample location at a later date. Where appropriate, a scale should also be included in the photo. A photograph location sketch may also be drawn in the field logbook. The following information will be recorded in the field logbook for each photograph:

- Date
- Time
- Photographer
- Name of building or area
- General direction faced and description of subject
- Sequential number of the photograph
- Camera type

# 9.0 DATA AND RECORDS MANAGEMENT

## 9.1 Field Activities

Field documentation should be completed as the activities are being done. On a regular basis, typically not less than once a week, the field personnel should scan their field documentation for placement in the project file. At the completion of a field effort, the field personnel are responsible for ensuring that a complete scan of the documentation is in the files and that the originals have been given to the project manager for inclusion in the project files.

## 9.2 Filing System

A project file will be established to organize and maintain data throughout the life of the project. The field data file will include either hard or electronic copies of record documents generated in the field including but will not be limited to the following:

- Field logbooks
- Site planning documents and project-specific plans
- Contract specifications
- Subcontractor agreements/purchase orders
- Safety Data Sheets for chemicals used on the site
- Field instrument operating manuals
- List of important phone numbers
- Shipping forms
- Equipment calibration records
- Health and safety forms
- Applicable field forms
- Applicable laboratory forms

Field forms in hard format should be electronically scanned and placed in the electronic project files upon return to the office.

The project file in the office can also include, but is not limited to:

- Chemical laboratory data file including copies of the COCs, cooler receipt forms, requests for chemical analysis, and the laboratory results
- Physical laboratory data file including requests for physical analysis and the laboratory results
- Field data file including boring log originals, field logbooks, field transmittals, photographs, and field performance and system reviews
- Data record file including backup copies of the computerized data record system.
- Project correspondence including transmittal letters
- Project memoranda including minutes of meetings and progress reports
- QA/QC file including copies of the laboratory's QA/QC manual, the laboratory's QA/QC project plan, the laboratory's QA/QC internal audit, and performance and system QA reviews
- Report originals in pdf (portable document file) format

- Drawing and plan file including original report exhibits, original maps, and miscellaneous plans and drawings related to the field investigation

## 10.0 QUALITY ASSURANCE/QUALITY CONTROL

Prior to the start of any field activity, Burns & McDonnell personnel will have read and understood the Project-Specific Work Plan as well as this SOP. Field personnel will be trained for a minimum of 40 hours prior to their working solo on environmental field activities. Field documentation will be completed as activities are conducted and will be relayed to the FSM or Project Manager at a minimum weekly or on a more frequent basis if so stated in the Project-Specific Work Plan.

## 11.0 REFERENCES

Burns & McDonnell Engineering, Co, Inc. (Burns & McDonnell), 2015. *Policy Manual*,

- Chapter 10, Quality Control Manual, January.
- Chapter 8, Safety and Health Manual, February.

United States Environmental Protection Agency (USEPA), 2007. *Guidance for Preparing Standard Operating Procedures*. EPA/600/B-07/001. April

## 12.0 ATTACHMENTS

The following forms are attached to this SOP:

- DQCR
- COC
- Sample label
- Custody seal

Project-specific forms should be included with the Project-Specific Work Plans.

# Attachments

# DAILY QUALITY CONTROL REPORT

Site: _____
Project No: _____
Date: _____
Crew No: _____
Crew Mem: _____

**Weather (circle)**

| | Bright Sun | Clear | Overcast | Rain | T-storm | Snow |
|---|---|---|---|---|---|---|
| **Temp:** | to 32 | 32-50 | 50-70 | 70-85 | 85+ | |
| **Wind:** | Still | Gusty | Moder. | High | **Direction: NW** | |
| **Humidity:** | Dry | Moder. | Humid | | | |

Subcontractors and Equipment on Site: None

**Health and Safety Levels: (circle)**

| D | Mod. D. | C | B | A |
|---|---|---|---|---|

Summary of Health and Safety Activities: _____

| **Instrument Used: (circle)** | **PID** | **pH** | **Cond.** | **Therm.** | **Turbidity** | **DO** | **ORP** | **Other** |
|---|---|---|---|---|---|---|---|---|
| **Calibrated: (check)** | | | | | | | | |

For actual calibration results, see field calibration forms.

Summary of Work Performed: _____

All Samples Were Collected According to Procedures Outlined in the Work Plan?
Yes _____ No _____

Problems Encountered/Corrective Action Taken: _____

Time Project Manager Contacted: _____

Tomorrow's Expectations: _____

Name: _____ Signature: _____

## Request for Chemical Analysis and Chain of Custody Record

| | | |
|---|---|---|
| Burns & McDonnell Engineering<br>9400 Ward Parkway<br>Kansas City, Missouri 64114<br>Phone: (816) 333-9400 Fax: (816) 270-0575<br>Attention: | Laboratory:<br>Address:<br>City/State/Zip:<br>Telephone: | Document Control No:<br>Lab. Reference No. or Episode No.: |

Project Number:

Client Name:

| Sample Number | Location | Material Sampled | Sample Collection Date | Sample Type Matrix: Air | Wipe | Bulk | Analysis | | | | Remarks (sq. ft, linear ft, volume) |
|---|---|---|---|---|---|---|---|---|---|---|---|
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|---|---|---|---|---|
| Sampler *(signature)*: | | Sampler *(signature)*: | | Special Instructions: |
| Relinquished By *(signature)*:<br>1. | Date/Time | Received By *(signature)*: | Date/Time | Ice Present in Container: Yes ☐ No ☐ / Temperature Upon Receipt: |
| Relinquished By *(signature)*:<br>2. | Date/Time | Received By *(signature)*: | Date/Time | Laboratory Comments: |

032703 Form WCD-KC-105

| ROUTE TO | ANALYSIS |
|---|---|
| Burns & McDonnell WCD<br>9400 Ward Parkway<br>Kansas City, MO 64114<br>Phone: (816) 333-9400 | |

Sample Group: _____

Sample Point: _____

Sample Designator: _____

Sample Round: _____ Year: _____

Sample Depth From: _____ To: _____

Date Sampled: _____

Time Sampled: _____

Preservation: _____

_____

090705 Form WCD-97N

WCD-101

Burns & McDonnell ENV
9400 Ward Parkway
Kansas City, MO 64114-3319

Signature _____

Date _____

# STANDARD OPERATING PROCEDURE

## 4230.19A

## Soil Sampling at Lead-Contaminated Residential Sites

July 3, 2007

Ronald E. King
SUPR/EFLR

APPROVED:

| | |
|---|---|
| RPM Peer Review | Date 7-25-07 |
| OSC Peer Review | Date 7/23/07 |
| Risk Assessor Peer Review | Date 07/31/07 |
| Manager, Federal Facilities/Special Emphasis Branch | Date 8/29/07 |
| Manager, Enforcement/Fund-Lead Removal Branch | Date 9/18/07 |
| Manager, Emergency Response & Removal Branch | Date 9/11/07 |
| Independent QA Reviewer | Date 10/1/07 |

**Recertified:**

| **Branch/Name** | | | | | |
|---|---|---|---|---|---|
| **Date** | | | | | |

30195438

Table of Contents

## A. PURPOSE AND APPLICABILITY

The purpose of this Standard Operating Procedure (SOP) is to describe the procedures for the collection of representative surface soil samples at lead-contaminated residential sites as described in the Superfund Lead-Contaminated Residential Sites Handbook (Handbook, 2003). The sampling depths are specific to investigations for this type of site. Analysis of soil samples may determine whether concentrations of specific pollutants (e.g., lead, barium, cadmium, cobalt, copper, mercury, nickel and zinc) exceed established action levels, or if the concentrations of pollutants present a risk to public health, welfare, or the environment.

These are standard (i.e., typically applicable) operating procedures which may be varied or changed as required, dependent upon site conditions, equipment limitations or limitations imposed by the procedure. In all instances, the actual procedures used should be documented and described in an appropriate site report.

Mention of trade names or commercial products does not constitute U.S. Environmental Protection Agency (EPA) endorsement or recommendation for use.

## B. SUMMARY OF METHOD

Soil samples may be collected using a variety of methods and equipment depending on the depth of the desired sample, the type of sample required (disturbed vs. undisturbed), and the soil type. Surface soils may be easily sampled using a spade, trowel, and scoop.

The major category of sites where sampling will be performed includes, but is not limited to active/former lead mining, milling and smelter sites, areas impacted by mining, milling, and smelter activities, mining depositories, transportation routes from mining, milling and smelter sites and the use of mining wastes in public and residential areas.

## C. DEFINITIONS

Residential properties: As defined in the Handbook, residential properties are any areas with high accessibility to sensitive populations, and include properties containing single- and multi-family dwellings, apartment complexes, vacant lots in residential areas, schools, day-care centers, community centers, playgrounds, parks, green ways, and any other areas where children may be exposed to site-related contaminated media.

X-Ray Fluorescence (XRF) spectrometer: An instrument used to resolve radiation into spectra to determine measurements. Will be used to analyze soils for metals contamination as described in the Instruction Manual for the XRF spectrometer.

Integrated Exposure Uptake Biokinetic Model (IEUBK) – Predicts blood-lead concentrations (PbBs) for an individual child, or group of similarly exposed children (six months to seven 7 years old), who are exposed to lead in the environment.

## D. HEALTH AND SAFETY WARNINGS

Proper health and safety procedures must be observed during the investigation at all times. The Occupational Safety and Health Administration (OSHA) regulation for Hazardous Waste Operations and Emergency Response (HAZWOPER), specified in 29 CFR 1910.120(b)(4), requires a site-specific Health and Safety Plan (HASP) for each site where workers are engaged in handling/operations involving hazardous waste. In compliance with this regulation, all responding Region 7 personnel and their designated representatives are covered by a site-specific HASP developed to address the health and safety hazards, physical and chemical, which may be encountered at each site. The HASP also identifies procedures for protecting employees while on the site.

## E. CAUTIONS

This section is not applicable to this SOP.

## F. INTERFERENCES

This section is not applicable to this SOP.

## G. PERSONNEL QUALIFICATIONS

All field personnel are required to take the 40-hour health and safety training course (as per 29 CFR 1910.120(b)(4)) and regular refresher courses prior to engaging in any field data collection activities.

## H. EQUIPMENT AND SUPPLIES

Equipment and supplies used in the field to perform surface soil sampling may include but are not limited to:

- Maps/plot plan
- Safety equipment, as specified in the site-specific Health and Safety Plan
- Survey equipment or global positioning system (GPS) to locate sampling points
- Tape measure
- Survey stakes or flags
- Camera and film
- Stainless steel, plastic, or other appropriate homogenization bucket, bowl or pan
- Appropriate size sample containers
- Ziplock plastic bags
- Logbook
- Labels
- Chain of Custody records and custody seals

- Field data sheets and sample labels
- Decontamination supplies/equipment
- Canvas or plastic sheet
- Spade or shovel
- Spatula
- Scoop
- Plastic or stainless steel spoons
- Trowel(s)
- Continuous flight (screw) auger
- Bucket auger
- Post hole auger
- Extension rods
- T-handle
- Sampling trier
- Thin wall tube sampler
- Split spoons
- Vehimeyer soil sampler outfit
  - Tubes
  - Points
  - Drive head
  - Drop hammer
  - Puller jack and grip
- Shaker sieve #10
- Shaker sieve (initially 250 micron #60 for risk assessment)
- X-Ray Fluorescence (XRF) spectrometer

## I. PROCEDURAL STEPS

Soil screening activities will be conducted in accordance with the guidelines established in the Handbook.

### 1. PREPARATION

- Determine the extent of the sampling effort, the sampling methods to be employed, and the types and amounts of equipment and supplies required.
- Obtain necessary sampling and monitoring equipment.
- Decontaminate or pre-clean equipment, and ensure that it is in working order.
- Prepare schedules and coordinate with staff, client, and regulatory agencies, if appropriate.
- Perform a general site survey prior to site entry in accordance with the site specific Health and Safety Plan.
- Use stakes, flagging, or buoys to identify and mark all sampling locations.

Specific site factors, including extent and nature of contaminant, should be considered when selecting sample location.

## 2. SAMPLING STRATEGY

The Handbook provides the sampling strategy when sampling residential properties. The sampling strategy is specific to the following categories:

- Residential yards;
- Drip zones;
- Play areas, gardens, and driveways;
- Potable water, lead-based paint, and interior dust; and
- Backfill and waste soil.

Soil sampling will be conducted in accordance with the guidelines established in the Handbook.

## 3. SAMPLING METHOD

### 3.1 Sample Collection

The Handbook describes the sampling depth when sampling residential properties. The following has been taken from this document.

Composite samples should consist of discrete aliquots of equal amounts of soil. The soil from each aliquot should be collected into one clean container, such as a stainless steel bowl or plastic bag, and thoroughly mixed. After mixing, the sample can then be analyzed by XRF spectrometer or sent to the laboratory. Remaining sample volume can then be disposed in the general location from where it was collected, or archived, depending on the requirements of the project. In some, cases material other than grass and/or soil will be encountered at a sample location, e.g., wood chips and sand are often found in recreation areas of day-care and school playgrounds. Samples of the soil below the cover material should be collected.

Collection of samples from near-surface soil can be accomplished with tools such as spades, shovels, trowels, spoons, and scoops. Surface material is removed to the required depth and a stainless steel or plastic scoop is then used to collect the sample.

This method can be used in most soil types but is limited to sampling at or near the ground surface. Accurate, representative samples can be collected with this procedure depending on the care and precision demonstrated by the sample team member. A flat, pointed mason trowel to cut a block of the desired soil is helpful when undisturbed samples are required. Tools plated with chrome or

other materials should not be used. Plating is particularly common with garden implements such as potting trowels.

### 3.2 Sample Depth

The Handbook describes the sampling depth when sampling residential properties. Collection of samples from specified depth intervals serves two primary purposes: risk assessment and remedial decision-making. The following has been taken from this document.

#### 3.2.1 Surface Soil Sampling For Risk Assessment Decision Making

With respect to risk assessment, the top inch of soil best represents current exposure to contaminants and is the source of data typically used in the IEUBK model to represent exposure from soil. This sampling should be done at all properties and will be used to determine whether a property exceeds the cleanup criteria and qualifies for response actions.

A five-point composite surface soil samples should be collected from any portion within the 0- to 1-inch depth interval for human health risk assessment purposes. The samples should be collected using the procedure described in Section 3.1. If a measuring device is not used to determine the 1-inch depth, then the spoon or sampling device should sample the upper portion of the 0- to 1-inch interval to avoid going below the 1-inch depth.

#### 3.2.2 Soil Sampling for Cleanup Decisions

The sampling design discussed below is based on the assumption that a minimum of 12-inch soil cover is adequate.

Initial sampling for lead contamination in residential soils should also be conducted to a depth of at least 18 inches, but does not need to exceed 24 inches to define the vertical extent of contamination for cleanup purposes. Composite samples should be collected at 6 inch depth intervals, i.e., 0-6 inches, 6-12 inches, 12-18 inches, and 18-24 inches. Additional sampling may be required at lead sites when contamination is associated with coarse-grained material. Stone-sized material, such as tailings and crushed battery casings, will, over time, migrate upward through the soil via freeze/thaw effects. At such sites, composite sampling should be conducted at 6-inch intervals to the approximate maximum frost depth. In all cases, composites should consist of aliquots collected from the same depth interval.

In site-specific situations, deeper sampling may be conducted to determine the total vertical extent of contamination for groundwater issues or institutional controls (ICs), and to determine if complete removal of contaminated soil is possible. Depth sampling should be conducted until the vertical extent of contamination has been adequately defined, but does not need to be conducted on every property.

### 3.3 Sample Preparation

The Handbook describes the sampling preparation when sampling residential properties. The following has been taken from this document.

Composite samples should consist of discrete aliquots of equal amounts of soil. The soil from each aliquot should be collected into one clean container, such as a stainless steel bowl or plastic bag, and thoroughly mixed.

Samples collected from all depth intervals should be dried, sieved with a No. 10 sieve (2 mm), and homogenized. Samples should not be ground prior to sieving, as this changes the physical structure of the soil and may bias the analytical results.

For those soil samples that are collected for risk assessment purposes, the sample will also be processed through a No. 60 sieve (250 μm) to obtain the fine fraction. The EPA Technical Review Workgroup (TRW) and American Society for Testing and Materials (ASTM) have issued guidance on sieving (ASTM, 1998; EPA, 2000). To reduce sampling costs, it may be desirable to develop a correlation between sieved and unsieved data, to eliminate the need to sieve all samples. The correlation can be used to predict sieved results from unsieved samples. The EPA TRW guidance addresses appropriate sieve size (No. 60) and a method for predicting the concentration in the fine fraction using concentrations measured in unsieved samples. A portion of each homogenized sample from each sampling area will be screened for lead using XRF spectrometer or submitted for laboratory analysis.

### 3.4 Sample Analysis

The Handbook describes the sampling analysis when sampling residential properties. The 4220.03A SOP should also be consulted for decision making for using the XRF spectrometer.

## J. DATA AND RECORDS MANAGEMENT

Documentation of environmental data collection and analysis procedures (i.e. laboratory documentation, field logbook, photo documentation, chain-of-custody) should be completed and managed using the requirements specified in the Generic Quality Assurance Project Plan for Region 7's Superfund Lead-Contaminated Sites.

## K. QUALITY ASSURANCE AND QUALITY CONTROL

There are no specific quality assurance (QA) activities which apply to the implementation of these procedures. However, the following QA procedures apply:

1. All data must be documented on field data sheets or within site logbooks.

2. The XRF spectrometer is not calibrated. Accuracy checks are performed using certified prepared standards daily. Record these accuracy checks in the field logbook. The following information is recorded.

- Equipment identification (name) and control number.
- Date of accuracy check.
- Activity performed on instrument.
- Adjustments made and accuracy of equipment before and following accuracy check (where applicable).
- Record of equipment failure.
- Identification of person performing accuracy.

## L. REFERENCES

American Society for Testing and Materials (ASTM). 1998. *Standard Test Method for Particle-Size Analysis of Soils*. D 422-63.

U.S. Environmental Protection Agency (EPA). 2000. *Short Sheet: TRW Recommendations for Sampling and Analysis of Soil at Lead (Pb) Sites*. April. OSWER Publication 9285.7-38. U.S. Environmental Protection Agency. Office of Solid Waste and Emergency Response. EPA Publication EPA/540-F-00-010.

U.S. Environmental Protection Agency (EPA). 2003. *Superfund Lead-Contaminated Residential Sites Handbook.* OSWER 9285.7-50. August. U.S. Environmental Protection Agency. Office of Emergency and Remedial Response.

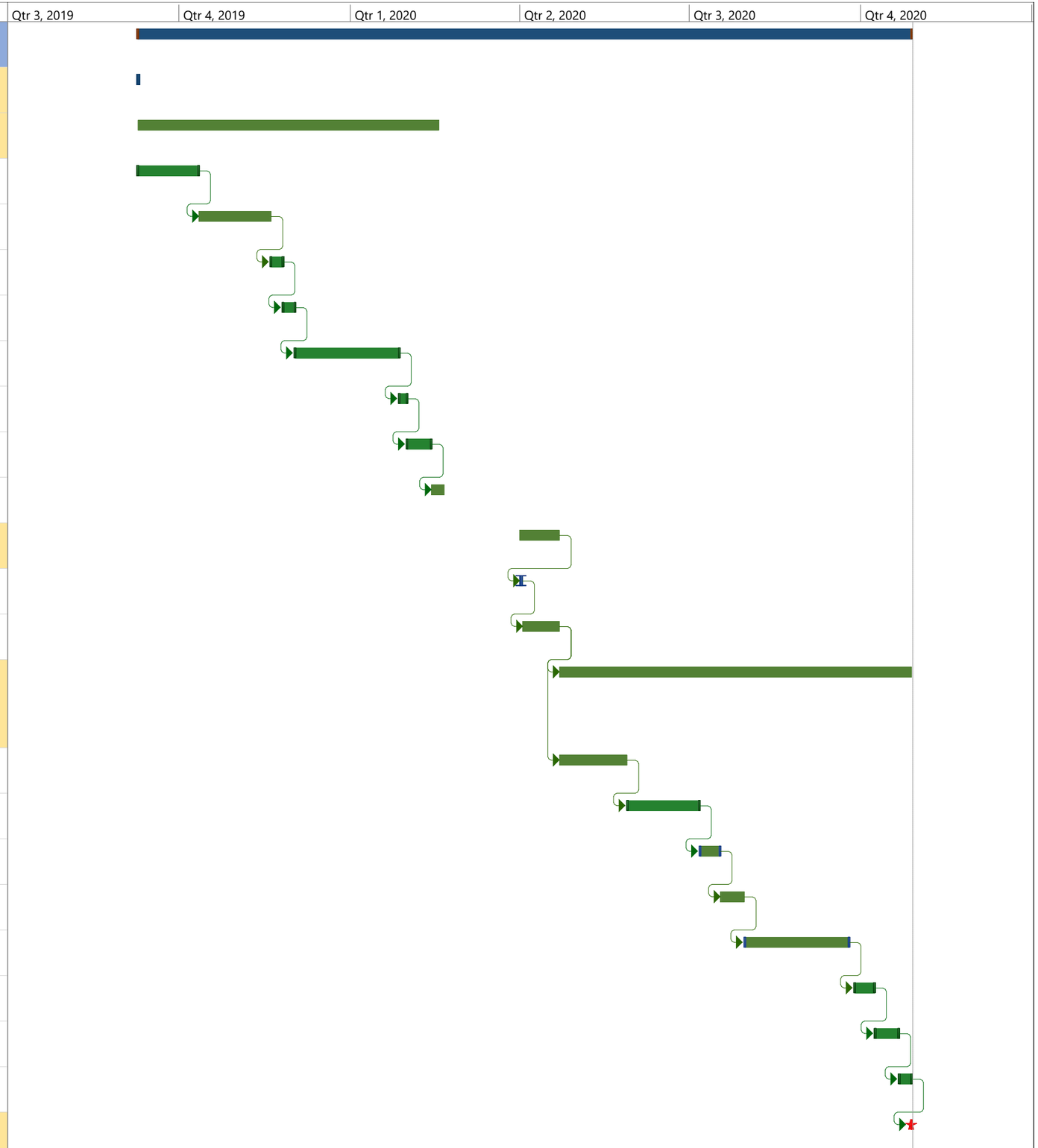
U.S. Department of Housing and Urban Development (HUD). 1995. *Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing*. June.

U.S. Environmental Protection Agency (EPA). Region 7. 2007. *Generic Quality Assurance Project Plan for Region 7's Superfund Lead-Contaminated Sites.* July.

# Attachment B

## Project Schedule

| ID | Task Name | Duration | Start | Finish |
|---|---|---|---|---|
| 1 | SHSAR Composite Lead Sampling | 335 days | Mon 9/9/19 | Wed 10/28/20 |
| 2 | Notice To Proceed/Award Date | 1 day | Mon 9/9/19 | Mon 9/9/19 |
| 3 | Task 1 - Work Plan Addendum | 130 days | Mon 9/9/19 | Mon 2/17/20 |
| 4 | Army Draft RAWP Addendum | 28 days | Mon 9/9/19 | Fri 10/11/19 |
| 5 | Army Review | 30 days | Fri 10/11/19 | Tue 11/19/19 |
| 6 | Army Draft Comment Response | 5 days | Tue 11/19/19 | Tue 11/26/19 |
| 7 | Regulator Draft RAWP Addendum | 5 days | Tue 11/26/19 | Mon 12/2/19 |
| 8 | Regulatory Review | 45 days | Mon 12/2/19 | Mon 1/27/20 |
| 9 | Regulator Draft Comment Response | 5 days | Mon 1/27/20 | Fri 1/31/20 |
| 10 | Draft Final RAWP Addendum | 10 days | Fri 1/31/20 | Thu 2/13/20 |
| 11 | Final RAWP Addendum | 5 days | Thu 2/13/20 | Thu 2/20/20 |
| 13 | TASK 2 - Composite Soil Sampling | 17 days | Wed 4/1/20 | Wed 4/22/20 |
| 14 | Collect composite soil samples | 2 days | Wed 4/1/20 | Thu 4/2/20 |
| 15 | Sample Turnaround time | 15 days | Thu 4/2/20 | Wed 4/22/20 |
| 16 | Task 3 - Data Validation and Summary Technical Memorandum | 152 days | Wed 4/22/20 | Wed 10/28/20 |
| 17 | Army Draft Summary Technical Memorandum | 30 days | Wed 4/22/20 | Thu 5/28/20 |
| 18 | Army Review | 30 days | Fri 5/29/20 | Mon 7/6/20 |
| 19 | Comment Response | 10 days | Tue 7/7/20 | Fri 7/17/20 |
| 20 | Regulator Draft Technical Memorandum | 10 days | Fri 7/17/20 | Thu 7/30/20 |
| 21 | Regulatory Review | 45 days | Fri 7/31/20 | Fri 9/25/20 |
| 22 | Comment Response | 10 days | Mon 9/28/20 | Thu 10/8/20 |
| 23 | Draft Final Summary Technical Memorandum | 10 days | Fri 10/9/20 | Wed 10/21/20 |
| 24 | Final Summary Technical Memorandum and QCSR | 5 days | Thu 10/22/20 | Wed 10/28/20 |
| 25 | Project Closeout | 1 day | Wed 10/28/20 | Wed 10/28/20 |



# Attachment C

Regulatory Agency Correspondence

**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**
**REGION 7**
11201 Renner Boulevard
Lenexa, Kansas 66219

SEP 1 1 2018

Mr. Alan Hynek
Restoration Program Manager
Environmental Division, DPW
407 Pershing Court
IMNW-RLY-PWE
Fort Riley, Kansas 66442

Dear Mr. Hynek:

The U. S. Environmental Protection Agency has completed its review of the Draft Summary Memorandum 2017 Long-Term Monitoring Surface Soil Sampling Event for Operable Unit 8. The EPA's comments are enclosed. This letter and enclosed comments are also being emailed. The date of the email serves as the receipt date for Fort Riley, closing the comment period.

Please update the Federal Facility Agreement schedule for the completion of the EPA review period for the draft report. If you have any questions or concerns, please contact me via email at oconnor.daniel@epa.gov or at (913) 551-7868.

Sincerely,

Danny O'Connor
Remedial Project Manager
Federal Facilities and Post Construction Section
Superfund Division

Enclosure

cc: Ms. Laura Percifield, USACE Omaha District (email only)
Ms. Margaret Townsend, KDHE (email only)

**OU8 Draft 2017 Long-Term Monitoring Surface Soil Sampling Event Report**
**EPA Comments**
**September 2018**

**General Comment** – The EPA agrees with the Kansas Department of Health and Environment's comment made for the Interim Remedial Action Completion Report regarding the elevated lead concentrations detected outside the fenced area. The Army needs to address what action will be taken to either address or further investigate the elevated lead concentrations.

Lead concentrations at three discrete sample locations (SP17, SP38, and SP39) exceeded the remediation goal of 400 milligrams per kilogram (mg/kg) listed in the Record of Decision for Operable Unit 8. The EPA recommends that the Army further characterize lead concentrations surrounding these areas following protocols outlined in the 2003 Superfund Lead-Contaminated Residential Handbook. In general, this would include:

- designating a decision unit, no larger than 100 feet by 100 feet, including and surrounding each of the three sample locations with elevated lead concentrations.
- Collecting a five-point (or aliquot) composite sample from each decision unit. Aliquots should be evenly spaced within each decision unit.
- Submittal of these composite samples for laboratory analysis of lead.

The EPA also recommends that all soil samples be prepared and sieved twice as recommended in the TRW Recommendations for Performing Human Health Risk Analyses on Small Arms Shooting Ranges. The TRW document provides rationale regarding the necessity for sieving samples and provides recommendations regarding the size of screen to be used.

**STATE OF KANSAS**

DEPARTMENT OF HEALTH AND ENVIRONMENT
DIVISION OF ENVIRONMENT
CURTIS STATE OFFICE BUILDING
1000 SW JACKSON ST., SUITE 410
TOPEKA, KS 66612-1367

PHONE: (785) 296-1660
FAX: (785) 559-4261
WWW.KDHEKS.GOV

GOVERNOR JEFF COLYER, M.D.
JEFF ANDERSEN, SECRETARY

June 28, 2018

Mr. Alan Hynek
Directorate of Public Works
Environmental Division
407 Pershing Court
Ft. Riley, Kansas 66442

**RE: Draft Summary Memorandum 2017 LTM Surface Soil Sampling Event**
**Sherman Heights Small Arms Range Site – (SHSAR) Impact Slope, Fort Riley, Kansas**

Dear Mr. Hynek:

The Kansas Department of Health and Environment/Bureau of Environmental Remediation (KDHE/BER) reviewed the above referenced document, received on May 23, 2018, and approves the document. Please provide a change page for the title page and an updated electronic copy (CD). Should you have any questions, please contact me by phone at 785-296-1936 or email at margaret.townsend@ks.gov.

Sincerely,

Margaret Townsend

Margaret Townsend, P.G.
Unit Chief, Federal Facilities
Remedial Section/BER

**C:** Randy Carlson → Margaret Townsend → File, Fort Riley, SHSAR (C5-031-03037-1)
Amer Safadi, EPA- Region 7, electronic
Amanda Chirpich, USACE- KC District, electronic