



Sundance
Consulting Inc.

PARCEL 3 GROUNDWATER
RCRA FACILITY INVESTIGATION
QUALITY CONTROL PLAN

FORT WINGATE DEPOT ACTIVITY
Gallup, New Mexico

Contract No. W912PP-15-C-0014

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ACRONYMS AND ABBREVIATIONS

%	percent
ADR	Automated Data Review
BRAC	Base Realignment and Closure
COR	Contracting Officer's Representative
DQO	Data Quality Objective
DQSR	Data Quality Summary Report
EPA	U.S. Environmental Protection Agency
FTL	Field Team Leader
FWDA	Fort Wingate Depot Activity
FWV	Field Work Variance
HAZWOPER	Hazardous Waste Operations and Emergency Response
NCR	Nonconformance Report
NMED	New Mexico Environment Department
PM	Project Manager
POC	Point of Contact
PWS	Performance Work Statement
QA	Quality Assurance
QC	Quality Control
QCM	Quality Control Manager
QCP	Quality Control Plan
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
SOP	Standard Operating Procedure
Sundance	Sundance Consulting, Inc.
U.S.	United States
USACE	U.S. Army Corps of Engineers
UXO	Unexploded Ordnance

1.0 PURPOSE AND SCOPE

Sundance Consulting Inc. (Sundance) has prepared this Project Quality Control Plan (QCP) to describe the quality control (QC) approach Sundance and its contractors will follow to ensure activities are performed in accordance with section 5.2.4 “Task 17: RFI Quality Control Plan” of the performance work statement (PWS) issued by the United States (U.S.) Army Corps of Engineering (USACE) for *Environmental Consulting Services, Fort Wingate Depot Activity, New Mexico*.

This QCP is applicable to the environmental services and groundwater monitoring performed by Sundance and its subcontractors under contract number W9126PP-15-C-0014, Calendar Year 2016 Facility Wide Groundwater Monitoring Program and Parcel 3 Groundwater Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI). This QCP only covers the southern groundwater RFI at Fort Wingate Depot Activity (FWDA), and will be considered a “Parent Document” to quality-related documents for this RFI. Per section 5.2.5 “Task 18: Parcel 3 Groundwater RFI Work Plan” and corresponding subsection 5.2.5.2 “Data Quality, Sampling and Analysis Methods” of the PWS, an RFI Work Plan will be developed with an optimized Uniform Federal Policy for Quality Assurance Project Plan (UFP-QAPP) presented as an appendix. The UFP-QAPP will contain additional detail for topics covered by this QCP; however, the UFP-QAPP will not be subject to New Mexico Environment Department (NMED) approval prior to commencement of field activities.

Environmental services that will be performed consist of drilling soil borings, installing temporary and permanent monitoring wells, creating and interpreting geologic soil logs, collecting soil samples from borings for chemical and geophysical analysis, collecting groundwater samples from monitoring wells for chemical analysis, measuring groundwater elevations from monitoring wells, interpreting groundwater chemical data, interpreting groundwater elevation data (gradient and flow), providing technical assistance to the USACE, and preparing an RFI report for submission to regulatory agencies (NMED and U.S. Environmental Protection Agency [EPA]), tribal governments, and stakeholders. All work will be performed in accordance with the FWDA RCRA Permit EPA ID No. NM6213820974, applicable RCRA regulations, USACE requirements and regulations, and Base Realignment and Closure (BRAC) procedures and guidelines.

2.0 QUALITY OBJECTIVES

The overall scope of work involves collecting and analyzing soil samples, writing RFI plans, performing RFI fieldwork, and providing environmental consulting services as described in Section 1.0. The objectives of this QCP are to address the specific operating needs of the project and to establish the necessary levels of management and control to ensure all work performed meets the technical requirements of the applicable project plans and conforms in all respects to the requirements of the contract and applicable regulations. Specifically, this QCP describes the QC procedures for:

- Field documentation.
- Sample collection.
- Training personnel.

- Subcontractor deliverables.
- Management and processing of chemical, geologic, hydrogeologic, and other applicable data.

3.0 ORGANIZATION AND RESPONSIBILITIES

Figure 1 presents the project organization chart. The lines between boxes indicate accountability, authority, and communication. Technical direction flows down from management to operations. Reporting flows up the organization chart to provide management feedback and response. Quality-related responsibilities and authorities of essential personnel are outlined in the following sections.

3.1 PROJECT MANAGER

The Project Manager (PM), JohnDavid Nance, reports to the USACE Contracting Officer's Representative (COR) and has overall responsibility for project activities including the work performed by subcontractors. The PM is responsible for implementation of this QCP and related project plans and procedures, development and management of systems to implement project policies, monitoring schedule and cost, coordinating reporting, determining availability of resources, identifying and resolving potential problems or conflicts, verifying safe performance and quality work, and enforcement of compliance to planning documents, including this QCP, to achieve the specified quality levels for the project.

3.2 CONTRACTING OFFICER'S REPRESENTATIVE

Mr. David Henry is the USACE COR and the primary Point of Contact (POC) for the Army. All Sundance communications will be sent through Mr. Henry. The COR monitors all technical aspect of the contract and assists in contact administration. Further detail of the COR's responsibilities to the Army are listed in the PWS, Section 1.6.10, *Contracting Officer's Representative*.

3.3 QUALITY CONTROL MANAGER

Mr. James Lockhart, P.E., Sundance's Vice President of Operations, will serve as the corporate-level Quality Control Manager (QCM), providing supervisory review of all documents and deliverables, ensuring compliance to the PWS, and ensuring that submittals adhere to Sundance's quality standards. He will also serve as the corporate POC if the USACE COR seeks a corporate-level representative within Sundance for communication and/or resolution.

Mr. Steve Townsend, P.G., will serve as the Project QCM. The Project QCM oversees development of project deliverables and oversees fieldwork to ensure established procedures are followed. Any deficiencies will be tracked and subsequent resolution will be documented. If field procedures are found to adversely affect the quality of the project, the Project QCM has the requisite authority, including stop work authority, until the deficiency is properly resolved. This authority applies equally to all project activities, whether performed by Sundance or its subcontractors and suppliers. The Project QCM will be the alternate POC for quality-related issues during project execution.

The Project QCM will be responsible for planning and executing QC oversight of project operations, and will ensure compliance with specified QC requirements in project plans and procedures. Specifically, the responsibilities of the Project QCM include the following:

- Developing, maintaining, and assessing the effectiveness of the project QCP-related procedures, documents, and deliverables.
- Reviewing the qualifications of proposed technical staff and subcontractors, and ensuring they meet contractual requirements.
- Planning and ensuring the performance of periodic inspections of applicable tasks.
- Coordinating with the USACE for split sampling and providing requested information.

If absent from the site during project operations, the Project QCM will designate an alternate as Field QC Representative who will have the equivalent responsibility and authority as the QCM. The QCM will submit, by written notification, the name of the alternate to the PM for approval. Once approved by the PM, the alternate will be allowed to serve in the place of the designated QCM.

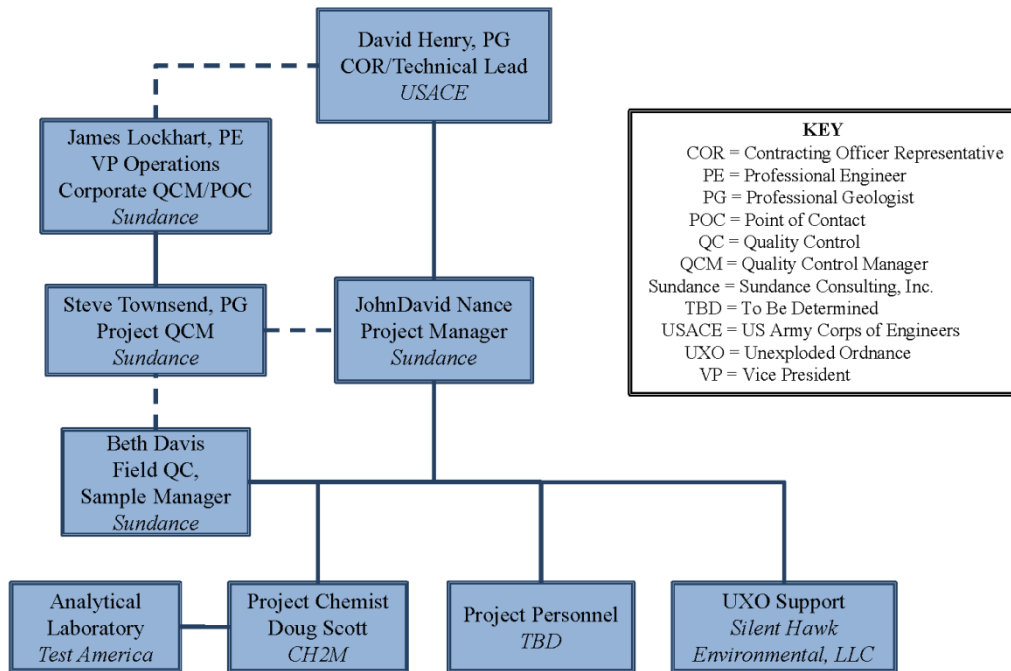
3.4 PROJECT SAMPLE MANAGER

Ms. Beth Davis will serve as the Project Sample Manager and Coordinator. Ms. Davis will also provide field sampling QC, ensuring sampling is being conducted by USACE, RCRA, and industry standards. She will have authority to provide a check and balance to the PM on field activities and provide independent quality reviews of the field activities.

3.5 PROJECT CHEMIST

The Project Chemist, Doug Scott, will report administratively to the PM. Mr. Scott is responsible for managing all project chemical sampling and analysis tasks. Mr. Scott will interact with the subcontractor analytical laboratory to ensure that deliverables meet project data quality objectives (DQO) for the project.

Figure 1: Project Organization



3.6 PROJECT PERSONNEL

Project personnel are responsible for performing work in accordance with defined quality requirements. Project personnel are encouraged to make recommendations regarding process improvements and corrective actions directly to their supervisors. Project personnel will provide immediate notification to the PM and Technical Lead of problems affecting quality.

3.7 UNEXPLODED ORDNANCE SUPPORT STAFF

Unexploded Ordnance (UXO) Support and escort will be provided by Silent Hawk Environmental, LLC. The UXO Technician will report to the Sundance PM. The UXO Technician will have authority to stop work, deem areas unsafe for operations, and direct the field teams to safely locate work sites by implementing munitions avoidance. The UXO technician will work with the onsite Site Safety and Health Officer and the Field Team Leader (FTL) during day-to-day operations for fieldwork planning and execution.

4.0 TRAINING

Project personnel, including subcontractors, will have sufficient training, as applicable, for the tasks being performed at the FWDA in accordance with OSHA 1910.120 and Sundance corporate regulations. Training documentation for each person will be kept onsite and will be managed by the PM. The QCM will ensure that personnel are current with training requirements for the task(s) they are performing, and will notify the PM if there are any deficiencies prior to the commencement of work. These deficiencies will be addressed and corrected by the PM with assistance from the Project QCM before work will be allowed to begin. Types of training required on site will include, but not be limited to:

- 40-hour Hazardous Waste Operations and Emergency Response (HAZWOPER) and 8-hour refresher training.
- Hazardous communication.
- Three-day onsite supervised training.
- Munitions awareness and avoidance.

Other types of training can include heavy machinery and power tool operation, plus licenses obtained from the state of New Mexico for surveying, drilling, and any other discipline as appropriate.

5.0 QUALITY IMPROVEMENT

The Project QCM, with support from the Technical Lead, Project Chemist, and Project Personnel, will be responsible for assisting the Sundance PM in maintaining compliance with this QCP. Compliance will be assessed and maintained through the implementation of the QC inspection process. Inspections may be performed at the discretion of the PM or Project QCM during different phases of work. Inspections will be documented on a designated form outlining if conditions are acceptable or unacceptable, and any actions taken to correct issues. Completion and acceptance inspections may also be performed to verify that project requirements relevant to the plan requirements have been satisfied.

5.1 CORRECTIVE/PREVENTIVE ACTION PROCEDURES

Regular inspections will enhance awareness of quality objectives for project personnel and should prevent deviations from the work plans and methods utilized to perform quality work. However, when unplanned deviations are detected that may affect the quality of the work performed, a nonconformance will be reported. If a change is required prior to beginning work, it will be documented as a revision to the plan document or as a planned field work variance (FWV). Project management personnel will use nonconformance reports (NCRs), FWVs, and feedback from project and client personnel to continually improve the project execution and delivery process.

5.1.1 Nonconformance Documentation

Complex field investigation, sampling, and analysis tasks are sometimes subject to nonconformances. A nonconformance is defined as an unplanned deviation that occurs during the implementation of a task which cannot usually be corrected until after it has occurred. Nonconformances may include using unapproved methods, not following procedures, or substituting unapproved materials or equipment to perform an activity. All nonconformances must go through a cycle of being identified, documented, assessed, and corrected. Nonconformances will be reported to the COR and provided in applicable reports.

The identification of a nonconformance is the responsibility of every person assigned to support the project. As project personnel perform their duties on the project, they must constantly be aware of the scope of the activity and recognize when a deviation from the planned activity has occurred or is occurring. After recognizing deviations, personnel must take action by informing

their supervisors or site leaders, and documenting in writing the specifics of what occurred. The NCR report will include the following:

- Description of the nonconformance (Problem Description).
- Action taken to address the nonconformance.
- Action taken to prevent reoccurrence.

5.1.2 Variance Documentation

Discrepancies, unforeseen conditions, and inaccurate assumptions made during the work planning stages; job site interferences; and other work problems discovered during project activities that conflict with the execution of the work as detailed by work planning documents will be addressed using FWVs. Although FWVs may be initiated for any number of reasons, the chief benefit of an FWV is to provide an expedited, documented, and technically authorized departure from or change to previously approved work planning documents in order to continue with the timely execution of the project. All FWVs will be reported in the RFI report.

5.2 CONTINUAL IMPROVEMENT

In addition to project management evaluation of NCRs and FWVs, project staff at all levels are to be encouraged to provide recommendations for improvements in established work processes and techniques. The intent is to identify activities that are compliant but can be performed in a more efficient or cost-effective manner.

Typical quality improvement recommendations include the identification of an existing practice that should be improved (e.g., “bottlenecks”) and/or recommendations for an alternative practice that provides a benefit without compromising prescribed standards of quality. Project staff members are expected to bring their recommendations to the attention of the project PM, Technical Lead, or QCM through verbal or written means. Once recommendations are addressed and it is determined an alteration/change is needed, the PM, Technical Lead, and/or Project QCM will document the improvement in the daily tailgate meeting form and in the daily field log. The new method will be conveyed to personnel during the morning meetings and also presented on the Daily Tailgate and Safety Meeting form.

Deviations from established protocols are not to be implemented without prior written approval of the PM and concurrence of the Project QCM and, as applicable, the Health and Safety Manager. Staff-initiated recommendations resulting in tangible benefits to the project should be formally acknowledged by project management personnel.

5.3 PROJECT DOCUMENTATION

During the performance of project tasks, Sundance and its subcontractor personnel, if applicable, are required to complete the necessary documentation to record events such as nonconformances, FWVs, and decisions and action items from meetings held with the client. This project documentation will supplement basic documentation, which can consist of field investigation data (e.g., daily logs), sample collection information, analytical data records, and field reconnaissance. Sundance will maintain records of all data and related files. Field data, including

analytical data, survey data, lists, removal results, photographs, and maps will be organized on a site-by-site basis.

6.0 EARTH SCIENCE DATA

Sundance has defined processes, as outlined in the following Standard Operating Procedures (SOPs), for managing earth science data collected in the field including geologic, lithologic, hydrogeologic, and field parameter data. These data are collected as specified in Section 6.2 *Field Operations*, and documented on field log forms designated for the specific medium and data type as specified in Section 6.3 *Documents and Records*. These data are organized in the field into packages that contain all relevant data from a specific site, parcel, or area. Once compiled and organized, all earth science project data will be subjected to a final review by a qualified professional to ensure completeness, consistency, and conformance with site conditions.

6.1 STANDARD OPERATING PROCEDURES

The method for analysis, action, or system operation with thoroughly prescribed techniques and steps are detailed in the SOPs. Individual SOPs are protocols for routine activities, especially those that are involved in environmental data collection, which generally involve repetitive operations performed in a consistent manner. Sundance and its contractors will follow prescribed SOPs to establish consistency and ensure quality. The types of SOPs that will be followed during execution of the related tasks are as follows:

- Procedures specified in the Groundwater RFI work plan(s).
- Manufacturer procedures for pump operation, equipment operation, and equipment calibration.
- Sundance and subcontractor internal corporate standard operating procedures.
- Health and Safety standard operating procedures.

6.2 FIELD OPERATIONS

6.2.1 Sample Collection

Soil, groundwater, and investigative-derived waste samples will be collected and controlled so it can be demonstrated that samples were obtained from the location stated, reached the intended destination without alteration, and were processed in accordance with approved methods and procedures. Chain-of-Custody records will be initiated by sampling personnel prior to relinquishing control and completed by the analytical laboratory performing the analysis. Documentation in the chain-of-custody record will list each sample, test methods, quantities, and the individuals performing the sample collection. Sample shipments to the offsite analytical laboratory will also be documented using chain-of-custody records. Samples will be adequately marked for identification from the time of collection and packaging, through shipping and storage.

6.2.2 Utility Clearance

Proposed soil boring locations will be surveyed prior to any field activities. Locations will be submitted to New Mexico One Call and to the appropriate White Sands Missile Range representative(s) to obtain utility clearance of the surveyed locations. Upon written approval, field operations may commence. If any proposed surveyed location is unapproved by either New Mexico One Call or White Sands Missile Range, then an alternate location will be surveyed and submitted for approval. Documentation of approved locations will be maintained at the project site office.

6.2.3 Laydown/Staging Area

A laydown/staging area will be utilized outside of identified UXO-contaminated areas (outside of Parcel 3 and related kick-out areas). The laydown/staging area will be surveyed and approved by the COR prior to field equipment mobilization. This area will be utilized for equipment and material quality inspections before any equipment and/or material is mobilized to the work area.

6.2.4 Equipment Calibration and Maintenance Requirements

Equipment calibration and instrument standardization procedures will be implemented to ensure accuracy and repeatability of all collected field data. Calibration and maintenance of any field sampling equipment or survey equipment will be documented on standard calibration logs and retained as project records. If equipment is found to be out of calibration, an NCR will be prepared and any data collected with the equipment/instrument will be evaluated to determine whether it is usable. This evaluation will be documented in the NCR.

6.3 DOCUMENTS AND RECORDS

A record contains information that is retained for its expected future value and should be sufficient to support technical and regulatory decisions. In support of this, active and inactive project records will be maintained and controlled to ensure they are readily retrievable and usable. Records management will include the identification of records, transfer to storage, indexing and filing, retrieval, and storage and maintenance. Records are defined as completed documents submitted for acceptance and retention. Retention includes record inventory, disposition, and archives.

Documents and other records furnish evidence of the conduct and quality of work performed by Sundance and its subcontractors. A system is established to ensure sufficient records are prepared, reviewed, approved, and maintained to accurately reflect completed work. This process involves a three-point inspection: the initial author's check and signature, a review and signature from an independent reviewer, and a final review from the Project QCM. Project personnel involved in the preparation of project documents are responsible for ensuring that the documents are complete, legible, and protected from loss or damage until the documents are submitted to the Project QCM. The Project QCM submits all accepted documents to the project files. The types of records that will be generated during this project are as follows:

- Daily Field Activity Logs.
- Groundwater Sample Field Data Sheets (includes sample collection and purge data).

- Calibration logs.
- Well completion diagrams.
- Soil boring logs.
- Safety daily tailgate meeting logs.
- Analytical request/Chain-of-custody forms.
- Well development logs.

6.3.1 Soil Logs

Soil boring logs will be created for every soil boring drilled during the field activities. The logs will be created by a competent degreed geoscientist or engineer in accordance with ASTM D2487 and D2488, *Unified Soil Classification System*. Logs will be submitted daily to the FTL and reviewed for accuracy and completeness by a Professional Geologist. When soil classification is performed by a geotechnical laboratory on collected soil samples, the laboratory will operate in accordance with ASTM D2487, *Unified Soil Classification System*. Upon receipt of this data, Sundance will record the data on the corresponding soil log at the depth the soil sample was collected, noting the date of the revision and the origin of the data entered. Soil boring logs will be presented in the RFI report.

6.3.2 Monitoring Well Construction Logs

Monitoring Well Construction Logs will be created for every installed monitoring well. The logs will be created in the field by the onsite geologist or engineer when the monitoring well is installed. The onsite geologist/engineer will verify that the well construction is within approved specifications in accordance with the RFI Work Plan and applicable RCRA Permit requirements. The logs will then be submitted to the FTL on the day of completion. The logs will be electronically digitized and reviewed before submission to the Office of the State Engineer and in the RFI report.

7.0 ANALYTICAL LABORATORY QUALITY CONTROL

The use of an independent analytical laboratory is required to ensure sample analyses are performed to established standards and meet the intended use of the data. Data generated at FWDA will be verified by the project chemist to provide quality data used in decision processes. The analytical laboratory will be responsible for ensuring that samples are received, handled, stored, and analyzed according to approved laboratory-specific quality assurance (QA) plans and procedures. The analytical laboratory will be accredited by the National Environmental Laboratory Accreditation Program, and will follow the Department of Defense Quality Systems Manual for Environmental Laboratories (DOD QSM, 2013), when applicable.

7.1 CALIBRATION OF LABORATORY EQUIPMENT

Calibration procedures and frequencies used by the analytical laboratories for each type of analysis performed will be documented. Documentation will include calibration procedures, calibration schedules, performance acceptance criteria, and calibration verification requirements.

7.2 INTERNAL QUALITY CONTROL CHECKS

The specific, internal QC methods used by the onsite and offsite laboratories for each type of analysis performed to support the project will be documented in the approved laboratory-specific QA project plans or procedures. Each method includes, as applicable, batch definition, control samples, continuation calibration verifications, blanks, internal standards, surrogates and spike recovery criteria, backgrounds, energy calibration verification, tracers, efficiency checks, QC control charts, etc.

7.3 ANALYSIS

For this project, laboratory analysis is performed to determine the concentration of chemical parameters in soil and groundwater samples. The analytical laboratory will use the latest updates to EPA SW846, *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*. The level of QC applied to laboratory analysis should be determined by the desired data quality level, the type of testing performed, and the intended use of the final data as determined by the DQOs established for the project.

7.4 DATA VALIDATION

Uniform methods for reviewing data should be established so that quality requirements are met, consistently reviewed, and management of analytical data is achieved. The objective of this activity is to establish a method for performing data handling operations intended to identify technical problems associated with a set of data that may affect its usability and to communicate those problems to the user as data qualifiers.

Analytical data will be checked and verified to ensure data are complete, correct, and compliant with standards. The process of data verification will occur at various levels, both internal and external, at the laboratory or data generator. The output of the verification process will be a complete and accurate data package. A data package will consist of analytical results, along with supporting data and documentation. Verification and validation will be performed by the Project Chemist on 100 percent (%) of the data. Results will be subjected to 100% Stage 2a validation using automated data review (ADR). The laboratory data packages will also be subject to 10% Stage 3 validation using ADR. ADR output files will be input into the FWDA Environmental Data Management System database. The Project Chemist will prepare a Data Quality Summary Report (DQSR) that discusses the quality of the data, its usability, flagged data, rejected data, and an overall assessment of the laboratory's performance. The DQSR will be an appendix of the groundwater periodic monitoring reports and any other report that applies, and will be of sufficient quality to meet the requirements of the Permit and the NMED General Reporting Requirements for Routine Groundwater Monitoring at RCRA Sites (NMED, 2013).

7.5 DATA QUALITY CORRECTIVE ACTIONS

Errors, deficiencies, and deviations in project sampling and analysis activities, along with data generated that fall outside of established acceptance criteria, will be investigated to determine why they occurred. In some cases, corrective actions will be needed to resolve the problem and restore proper functioning to the analytical system. Nonconformances to method data quality criteria will have corrective actions performed. The investigation of the problem and subsequent

corrective action taken will be documented. Method performance parameters outside of acceptance criteria will be documented and the usability of the data will be evaluated.

8.0 REFERENCES

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