

Importance of Data Quality in Munitions Response

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Big Picture

We would like to make sustainable and defensible decisions using geophysical data. We currently have the tools to do this, but we need to ensure we are producing data of the necessary quality to be successful.

Topics

- Necessary Data Quality
- Decisions
- Tools
- Establishing Quality Systems
- Establishing Project Quality Needs

Data Quality

- What do I mean by “necessary quality”?
 - ~~Good~~ quality
 - ~~Best~~ quality
 - Programs/Projects need to define the quality needed to make their decisions
 - Must consider the needs of the data’s:
 - Accuracy
 - Completeness
 - Consistency
 - Reliability
 - Reconstructability

Data Quality

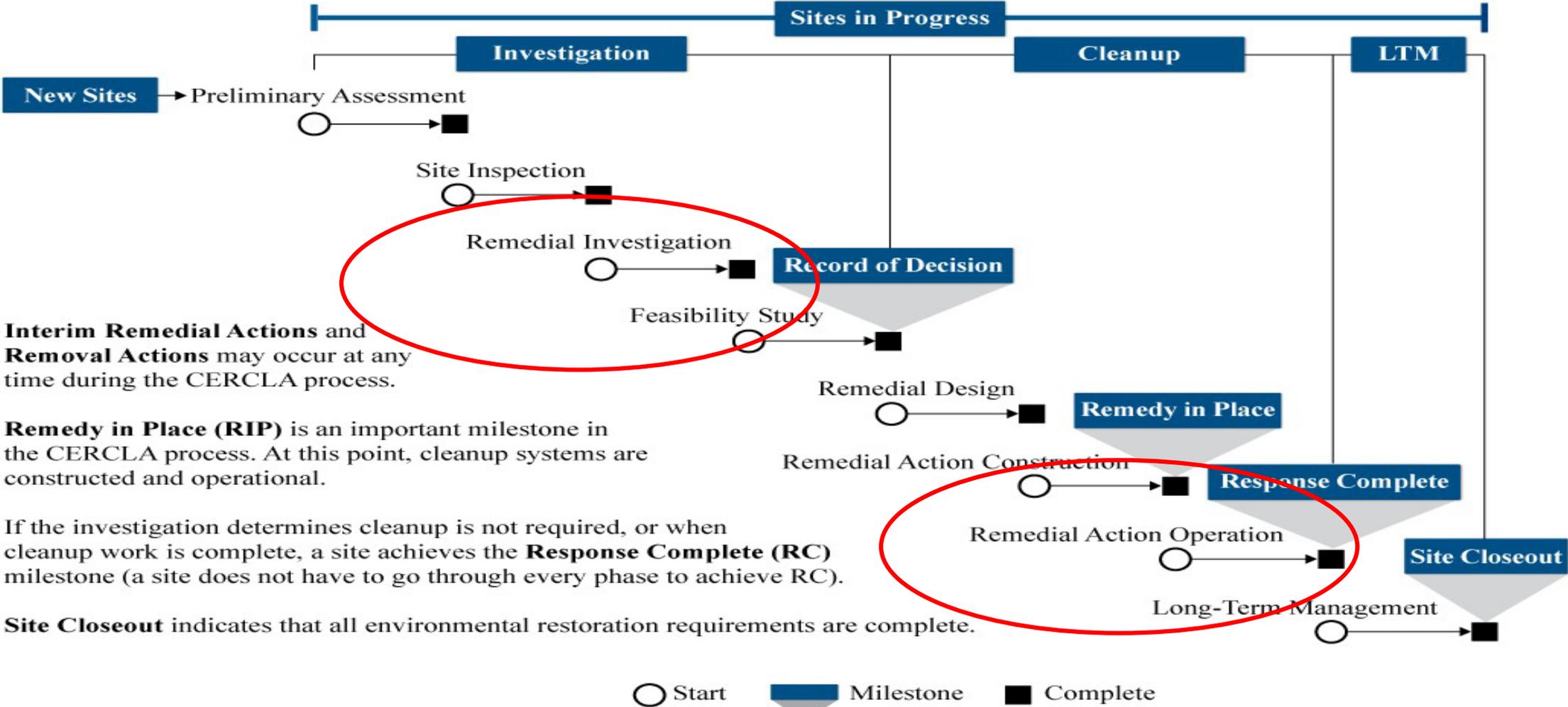
- Regulatorily acceptable
- Defensibility
- Confidence/ Uncertainty
- Best practice

Data Quality

- Satisfy customers
- Long-term revenue and profitability
 - Minimize rework
- Adaptability
- Flexibility
- Higher productivity
- Better Risk Management

Decisions

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)



Decisions

Remedial Investigation(RI)/Feasibility Study (FS)

- Characterize site conditions and determine the nature and extent of contamination from historical site releases of munitions and explosives of concern
- Evaluate potential current and future risks/hazards to human health and the environment
- Provide a basis to distinguish between the need for further evaluation, response action, or no further action. If the site poses an unacceptable risk/hazard, obtain data for the evaluation of *remedial alternatives*

Decisions

Remedial Action (RA)

- Collect data to implement the remedy documented in the record of decision (ROD)
- Demonstrate the remedy met the remedial action objectives

Decisions

- Land Use Controls
- Unlimited Use/Unrestricted Exposure

Technology

- Previous technology limitations did not lend itself to quality system
 - Too many variables that were not controlled
 - No record of measurement
 - No record of completeness
 - Lack of selectivity
 - Lack of reproducibility
- Analog technology non-systematic

Technology

- Advanced Geophysical Classification
 - Record of completeness
 - Selectivity
 - Reproducibility
 - Systematic

Establishing Quality Systems

- Develop and implement a quality system based on national and international standards for the performance of Advanced Classification at DoD Munitions Response Sites
- Develop quality systems documentation for the 3rd-party accreditation of organizations performing advanced classification
 - Implements ISO/IEC 17025
- Develop a Quality Assurance Project Plan toolkit using the Uniform Federal Policy for Quality Assurance Project Plans (UFP-QAPP)
 - Implements ANSI/ASQ E4

Establishing Quality Systems DAGCAP

- Third-party Accreditation Bodies (ABs) conduct assessments (ISO/IEC 17011)
- Applies to use of geophysical classification at all munitions response sites
- Develop Internal Quality Systems Manual i/a/w DoD QSR
 - DoD QSR based on ISO ISO/IEC 17025:2005, “General requirements for the competence of testing and calibration laboratories”
 - As used by ISO/IEC, “laboratory” refers to any organization that conducts testing or calibrations
- Undergo quality systems and technical assessments

Establishing Quality Systems

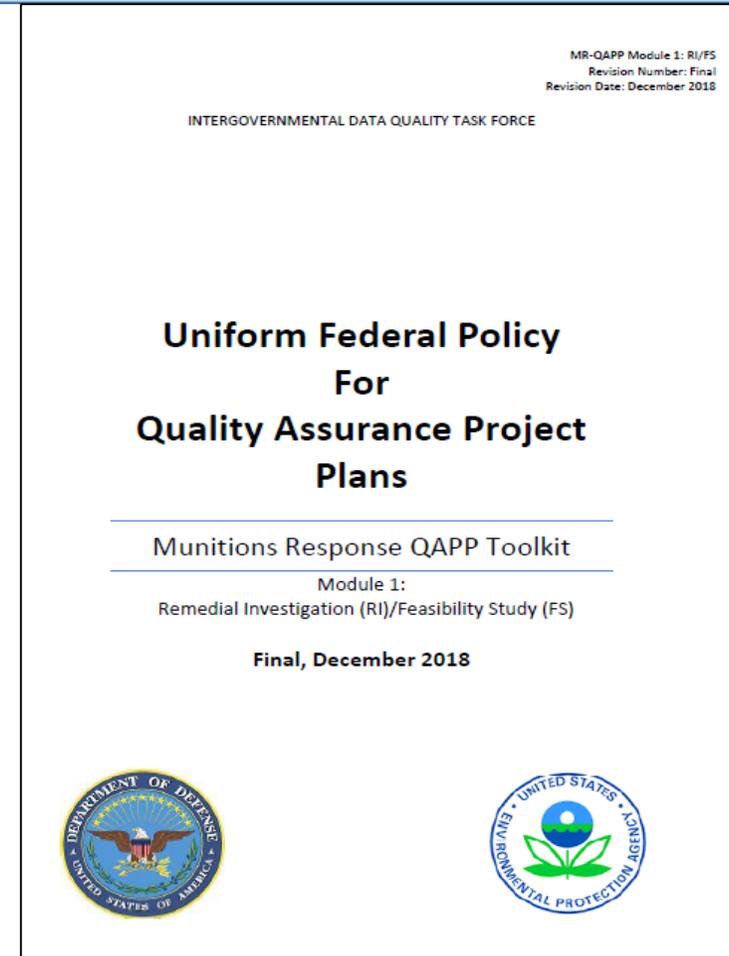
MR-QAPP Toolkit Overview

- Planning tool for characterization and remediation of buried munitions and explosives of concern (MEC) at MRS
- Module 1: RI/FS; Module 2: RA
- Based on Uniform Federal Policy for Quality Assurance Project Plans (UFP-QAPP, IDQTF, 2005)
- Implements a systematic planning process (SPP)

Black text = minimum recommended requirements

Blue text = examples

Green text = instructions



Establishing Project Quality Needs

- Data Quality Objectives (DQOs)
 - Qualitative and quantitative statements describing the type, quantity, and quality of data needed to support decision-making
 - Developed during a systematic planning process based on EPA's seven-step DQO Process

Establishing Project Quality Needs

- Measurement Performance Criteria (MPCs)
 - *“Project-level Criteria”*
 - *Sampling design* specifications
 - Expressed in terms of “data quality indicators”:
*Accuracy, Representativeness, Completeness, Comparability,
Sensitivity*

Establishing Project Quality Needs

- Measurement Quality Objectives (MQOs)
 - *Sampling process specifications*
 - *Component-level criteria*
 - Controls and documents measurement uncertainty
 - Catches and fixes problems before they impact results

Establishing Project Quality Needs

- Root Cause
 - The cause of a non-conformance
- Root-Cause Analysis (RCA)
 - A systematic process for identifying the cause of a non-conformance. Sometimes referred to as the “5 Whys”
- Corrective Action (CA)
 - Improvements to processes taken to correct a non-conformance and prevent it from becoming systemic

Establishing Project Quality Needs

- Data Usability Assessment (DUA)
 - The structured, systematic, evaluation of data, performed by key members of the project team, to determine if data are of the right type, quantity, and quality to satisfy project-specific MPCs and DQOs
 - A “total picture” evaluation of the CSM, DQOs, QA/QC, assumptions, and results
 - Determines whether data can be used as intended, with an acceptable level of confidence

Summary

- Data quality is essential for making informed decisions
- Having a quality system not only assists with meeting regulatory requirements, but it is important for effective management

Improving Environmental Data Quality

... Because the Right Decisions Require Quality Data



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