

**Remedial Action Contract
for Remedial Response, Enforcement Oversight, and Non-Time
Critical Removal Activities at Sites of Release or Threatened Release
of Hazardous Substances in EPA Region 8**

**Uravan Uranium Project (Union Carbide)
Uravan, Colorado**

**Final
Quality Assurance Project Plan
for the Use of Existing Data**

**U.S. EPA Contract EP-W-05-049
Work Assignment Number 354-TATA-0846**

October 2017 (Revision 1)

Prepared for:



U.S. ENVIRONMENTAL PROTECTION AGENCY

1595 Wynkoop Street
Denver, Colorado 80202

Prepared by:



CDM Federal Programs Corporation

555 17th Street, #500
Denver, Colorado 80202

A – Project Management


A1 Title and Approval Sheet

Title: Uravan Uranium Project (Union Carbide), Final Quality Assurance Project Plan for the Use of Existing Data, Contract EP-W-05-049, Work Assignment (WA) Number 354, October 2017 (Revision 1).

Revision Log:

Revision No.	Revision Date	Description of Changes
1	10/9/2017	Minor text modifications, added 2016 Annual Report, 1987 Remedial Action Plan, and EPA Risk Assessment Review Memorandum.

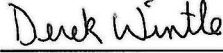
Approvals:



Bob Alexander
CDM Federal Programs Corporation
Quality Assurance Specialist

10/9/2017


Date



Derek Wintle
CDM Federal Programs Corporation
Project Manager – WA 354

10/9/2017

Date



Fran Costanzi
EPA, Remedial Project Manager – WA 354
EPA Quality Assurance Designee

10/10/2017

Date

This page left blank intentionally

A2 Table of Contents

A – Project Management	1
A1 Title and Approval Sheet	1
A2 Table of Contents	3
A2.1 Introduction.....	7
A3 Distribution List.....	8
A4 Project/Task Organization.....	8
A5 Problem Definition/Background.....	9
A6 Project/Task Description	11
A7 Quality Objectives and Criteria	11
A7.1 Data Acceptance Criteria.....	12
A8 Special Training/Certifications.....	13
A9 Documentation and Records.....	13
B – Data Generation/Acquisition	17
B1 – B8.....	17
B9 Use of Existing Data (Non-direct Measurements)	17
B9.1 Data Source Information	18
B9.2 Intended Use of Existing Data	18
B9.3 Establishment of Acceptance Criteria.....	18
B9.4 Key Resources and Support Facilities	19
B9.5 Quality Procedures Used by Data Originators	19
B10 Data Management	19
C – Assessment and Oversight	23
C1 Assessments and Response Actions	23
C2 Reports to Management	23
D – Data Validation and Usability	25
D1 Data Review, Verification, and Validation.....	25
D2 Verification and Validation Methods.....	25
D3 Reconciliation with User Requirements	25
References	27
ATTACHMENT 1	30
EPA Region 8 QA Document Review Crosswalk.....	30

List of Attachments

Attachment 1 EPA Region 8 Quality Assurance Document Review Crosswalk

List of Figures

Figure A-1 Location Map - Uravan Uranium Project (Union Carbide)

Figure A-2 Project Organization - Uravan Uranium Project (Union Carbide)
Figure A-3 Evaluation Process for Existing Data - Uravan Uranium Project (Union Carbide)

List of Tables

Table B-1 Evaluation Summary of Existing Data Reports - Uravan Uranium Project (Union Carbide)

Acronyms

ACL	alternate concentration limit
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CDPHE	Colorado Department of Public Health and Environment
CDM Smith	CDM Federal Programs Corporation
CD/RAP	Consent Decree/Remedial Action Plan
CO	contracting officer
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
FFS	focused feasibility study
MOA	memorandum of agreement
NPL	National Priorities List
NRC	Nuclear Regulatory Commission
PARCCS	precision, accuracy, representativeness, comparability, completeness and sensitivity
PDF	portable document format
PM	project manager
PO	project officer
RP	responsible party
QA	quality assurance
QAPP	quality assurance project plan
QC	quality control
QMP	quality management plan
RAC	Remedial Action Contract
RAP	remedial action plan
RI/FS	remedial investigation/feasibility study
ROD	Record of Decision
RPM	remedial project manager
Site	Uravan Uranium Project (Union Carbide Corp.) site
SOP	standard operating procedure
Umetco	Umetco Minerals Corporation
UMTRCA	Uranium Mill Tailings Radiation Control Act
WA	work assignment

This page left blank intentionally

A2.1 Introduction

This document is a quality assurance project plan (QAPP) for the use of existing data applicable to CDM Federal Programs Corporation (CDM Smith) Work Assignment (WA) 354 under U.S. Environmental Protection Agency (EPA) Contract EP-W-05-049, the Uravan Uranium Project (Union Carbide Corp.) site (Site). The Site is an EPA National Priorities List (NPL) Superfund Site located in Montrose County, Colorado. The location of the Site is shown in Figure A-1.

This QAPP governs the use of existing data for this work assignment. It was first completed and approved by EPA in draft form. The purpose of the draft QAPP was to provide reviewers Site documents containing data interim guidance on determining the usability of the data and whether the data should be used by CDM Smith to complete its assigned tasks, including providing assistance to EPA in developing the Record of Decision (ROD) for the Site. As the data evaluation process described in the draft QAPP proceeded, small refinements and changes were made to the evaluation process which were incorporated into this final QAPP.

The Site is approximately 700 acres and began operating as a radium-recovery plant in 1912. Operations at the Site left a large volume of wastes, which contaminated air, soil, and ground water near the plant and in the San Miguel River. Solid wastes totaled over 10 million cubic yards and contained radioactive elements, metals, and inorganic compounds. Liquid wastes from seepage collection and ground water extraction systems totaled over 350 million gallons at the end of 2004. The contaminants included radioactive products such as raffinates (liquid wastes from the uranium processing operations), raffinate crystals (primarily ammonium sulfate compounds), and mill tailings containing uranium and radium. Other chemicals in the tailings and ground water included arsenic, heavy metals (lead, cadmium, and vanadium), thorium, and residual salts. EPA listed the Site on the NPL in 1986, and the cleanup remedies from the 1987 remedial action plan (RAP), as amended, included:

- Capping and revegetating nearly 10 million cubic yards of radioactive tailings
- Onsite disposing of 530,000 cubic yards of radioactive raffinate crystals
- Eliminating process ponds
- Pumping and treating contaminated ground water
- Securing 12 million yards of tailings waste along the San Miguel River
- Dismantling the two mills and placing all old building demolition materials in a secure area
- Excavating and disposing of contaminated soil in a secure location and replanting excavated areas
- Dismantling and cleaning up the town of Uravan

The wastes are contained on the Site; pollution of the San Miguel River is under control; and there is no longer any residential exposure to radiation from raffinates, raffinate crystals, and mill tailings containing uranium, thorium, and radium. On February 18, 2005, EPA deleted a portion of the Site

from the NPL. This partial deletion pertains to 9.84 acres previously containing two historic structures, the Boarding House and the Community Center. On September 4, 2007, EPA deleted a portion of the Site on Colorado Highway 141.

This QAPP has been prepared in accordance with EPA *Requirements for Quality Assurance Project Plans (QA/R-5)* (EPA 2001) and follows the format contained in the *EPA Region 8 Quality Assurance Document Review Crosswalk* (EPA 2016). The QAPP is organized into four sections, project management, data generation and acquisition, assessment and oversight, and data validation and usability, as they relate to the efforts required to assure and document the suitability of the data used in support of this work assignment. Attachment 1 provides a copy of the completed EPA Region 8 Crosswalk for this document.

A3 Distribution List

The following individuals will receive a copy of the approved QAPP as well as any subsequent amendments or revisions:

Recipient	Organization	Title	Email
Wallace Sermons	EPA, Region 8	Contracting Officer (CO)	velasco.nadia@epa.gov
Jodi Powell	EPA, Region 8	Project Officer (PO)	powell.jodi@epa.gov
Fran Costanzi	EPA, Region 8	Remedial Project Manager (RPM)	costanzi.frances@epa.gov
Jo Nell Mullins	CDM Smith	Quality Assurance (QA) Manager	mullinsjn@cdmsmith.com
Kris Chapman	CDM Smith	Program Manager	chapmanke@cdmsmith.com
Talia Zaczkowski	CDM Smith	Contract Administrator	zaczkowskitn@cdmsmith.com
Derek Wintle	CDM Smith	Project Manager (PM)	wintledn@cdmsmith.com
Todd Bragdon	CDM Smith	Senior Engineer	bragdontr@cdmsmith.com
Robert Alexander	CDM Smith	Senior Scientist	alexanderrr@cdmsmith.com
Terry Crowell	CDM Smith	QA Specialist	crowelltl@cdmsmith.com

The CDM Smith PM, Derek Wintle, is responsible for ensuring that all technical support staff have reviewed this QAPP for existing data.

A4 Project/Task Organization

Figure A-2 provides an organizational chart identifying project managers, project team members, and reporting relationships between the project team.

The EPA CO and PO for the EP-W-05-049 contract are Wallace Sermons and Jodi Powell, respectively. The EPA RPM for the Site is Fran Costanzi. The RPM is responsible for reviewing the work assignment work plans and cost estimates, tracking project budget, and reviewing project status reports and deliverables.

The following lists the key CDM Smith contract and administration individuals who will be involved in this project and identifies their roles and responsibilities:

- **Jo Nell Mullins** – The CDM Smith QA Manager for the EP-W-05-049 contract. The QA manager ensures that all QA requirements are met for all CDM Smith projects under this contract as described in the contract-specific *Quality Management Plan (QMP)* Revision 2, July 2014 (CDM Smith 2014). The QA Manager is independent of the entities providing technical support for these work assignments.
- **Kris Chapman** – The CDM Smith Program Manager for the EP-W-05-049 contract. The program manager is the senior manager responsible for the contract, including resource allocation under the contract; performance, qualifications, and training needs of the contract personnel; and implementation of the QA procedures as described in the contract QMP.
- **Derek Wintle** – The CDM Smith PM for WA 354 Site. The PM is responsible for the overall management and coordination of the work assignment, including maintaining communications with EPA regarding project status, preparing project status reports, tracking planned budgets and schedules, managing project resources and staff, reviewing project deliverables, implementing QA procedures, and any necessary corrective actions. The PM (or designee) is responsible for maintaining and updating this QAPP, as appropriate.
- **Talia Zaczowski** – The CDM Smith Contract Administrator for the EP-W-05-049 contract. The contract administrator will be responsible for project administration, including setup, maintenance, invoice review and approval, and closeout. She will also be involved in reviewing monthly project costs, revenue, and accounts receivables.

The following lists the key CDM Smith technical individuals involved in these projects and identifies their roles and responsibilities:

- Todd Bragdon – senior technical support
- Shawn Oliveira – health and safety
- Robert Alexander – senior scientist
- Terry Crowell – QA Specialist
- Eleonora Borisova – cost estimator

These key support staff will utilize a team of technical staff, scientists, and engineers to support the tasks described in the work assignment statement of work. CDM Smith technical support staff will work in close contact with the EPA RPMs to ensure the work products and deliverables prepared in support of this work assignment meet the objectives for the project.

A5 Problem Definition/Background

The Uravan Uranium Project (Union Carbide Corp.) site is located in a rural part of Montrose County, Colorado, approximately 90 miles southwest of Grand Junction.

The Site was proposed to the NPL in October 1984 and listed in June 1986. The approximately 700-acre Site is not divided into operable units nor were the Site boundaries ever formally defined. It includes the former processing areas, the former town of Uravan, and surrounding areas. Colorado

Scenic Highway 141 is located along and partially through the eastern portion of the Site. The San Miguel River runs through the Site.

A radium-recovery plant began operating in the Site area in 1912. From the 1930s until 1984, various plants operated as a uranium and vanadium processing facilities. The mill was placed on standby status in November 1984, and operations were never resumed prior to closure. The facility was licensed, initially by the Atomic Energy Commission, then the Nuclear Regulatory Commission (NRC), and more recently by the Colorado Department of Public Health & Environment (CDPHE) in their role as an Agreement State. There is a CDPHE radiation license currently in effect.

A memorandum of agreement (MOA) signed in April 1986 between the State of Colorado and EPA Region 8 designated the state to be the lead for this site (this MOA also includes the Lincoln Park NPL Site). In the MOA, the state agreed to follow the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process, including writing the ROD and maintaining the administrative record. No ROD was ever written, and no supporting administrative record established. The majority of the work, however, was accomplished under a Consent Decree/Remedial Action Plan (CD/RAP), to which EPA is not a party, and a Colorado Radiation License. By stipulated agreement between the CD parties, Umetco Minerals Corporation (Umetco) (a wholly owned subsidiary of Union Carbide) was added as a defendant in 1986. Umetco is currently the responsible party (RP) for Site work.

The Site is one of four final NPL sites that is also a Uranium Mill Tailings Radiation Control Act (UMTRCA) Title II site. Congress enacted UMTRCA in 1978 to provide for the disposal, long-term stabilization, and control of these mill tailings in a safe and environmentally sound manner and to minimize or eliminate radiation health hazards to the public. UMTRCA established two programs to protect the public and the environment from uranium mill tailings. Title I of UMTRCA authorizes the U.S. Department of Energy (DOE) to remediate “inactive” processing sites. Inactive processing sites are those that were no longer licensed under the Atomic Energy Act as of January 1, 1978. The UMTRCA Title II program is directed toward uranium mill sites licensed by the NRC or Agreement States on or after 1978. Title II of the Act provides:

- NRC authority to control radiological and non-radiological hazards
- EPA authority to set generally applicable standards for both radiological and non-radiological hazards
- Eventual state or federal ownership of the disposal sites under general license from NRC

Portions of the Uravan site requiring long-term care under UMTRCA will transfer to DOE’s Office of Legacy Management program along with a long-term care fund. Areas not included in long-term care likely will be managed by the Colorado Department of Transportation, Montrose County, and the Bureau of Land Management.

Decision documents or remedial investigation/feasibility study (RI/FS) documents are being finalized for the Site. EPA has stated a ROD is needed. A preliminary closeout report will need to be written and institutional controls implemented before the Site can be designated Sitewide Ready for Anticipated Use. A final closeout report will be needed to delete the Site from the NPL. The RAP does contain some information similar to what would have been in an RI in the 1980s.

EPA is currently writing the ROD as well as compiling the administrative record to support the ROD and subsequently the deletion record to support the deletion. Neither record was compiled over the years. The ROD is being drafted, describing the various areas of the Site by RAP task areas in the CD since sampling, compliance, and construction reports were typically submitted by area. A focused feasibility study (FFS) is being developed that provides this information for the administrative record as well as outlines the alternatives and contains the nine criteria analyses.

After the FFS is developed, a proposed plan will be written and subsequent public meeting and comment period held, outlining the alternatives evaluated, including the preferred alternative.

CDM Smith has been tasked with interpreting Site data and offering technical recommendations to EPA. EPA guidance regarding addressing existing data has been taken from EPA *Guidance for Quality Assurance Project Plans (QA/G-5)*, December 2002 (EPA 2002) as well as the Final Draft *U.S. EPA Guidance on Quality Assurance Project Plans, CIO 2106-G-05 QAPP*, January 2012 (EPA 2012). This QAPP has been prepared for the purpose of providing a framework for the use of existing data used in EPA's decision-making processes at the Site. The review and evaluation of existing Site documents and data has been completed by CDM Smith to support development of an RI/FFS.

A6 Project/Task Description

The EPA Remedial Action Contract (RAC) Region 8 contract with CDM Smith is currently in effect until September 2018. This QAPP is intended to be utilized until the RAC 8 contract ends, reviewed and, if necessary, updated annually as required. Note that CDM Smith is not responsible for conducting any fieldwork, sample collection, data management, or laboratory analysis under the work assignment tasks covered under this QAPP. Any primary data collection efforts would be addressed in separate QAPPs specific to this purpose.

A7 Quality Objectives and Criteria

The tasks presented in this QAPP do not include primary data collection efforts or Site investigations performed by CDM Smith. CDM Smith will use existing data generated from sampling efforts conducted by the Site RP (Union Carbide/Umetco). Additionally, historic data generated by other EPA contractors, data from CDPHE, and data from other miscellaneous sources may be used by CDM Smith in support of EPA at the Site.

Data applicable to the Site exist from many different sources, some originating from the 1980s. All data considered for use will be evaluated using the five general assessment factors as found in the Assessment Factors guidance document (EPA 2003). The basic assessment factors that will be considered are as follows:

- **Soundness** – The extent to which the scientific and technical procedures employed to generate the information are reasonable for, and consistent with, the intended application
- **Applicability and Utility** – The extent to which the information is relevant for the intended use
- **Clarity and Completeness** – The extent to which the clarity and completeness with which the data, assumptions, methods, quality assurance, sponsoring organizations, and analyses employed to generate the information are documented

- **Uncertainty and Variability** – The extent to which the variability and uncertainty (quantitative and qualitative) in the information or in the procedures, measures, methods, or models are evaluated and characterized
- **Evaluation and Review** – The extent of independent verification, validation, and peer review of the information or of the procedures, measures, methods, or models

The appropriate level of review for any information product is necessarily related to how and in what context the information product is to be used. The following section discusses the overall data evaluation process to be used by CDM Smith to evaluate data used in the completion of its assigned tasks and in the preparation of Site decision documents (e.g., ROD).

A7.1 Data Acceptance Criteria

As noted in the Final Draft *U.S. EPA Guidance on Quality Assurance Project Plans, Final Draft, CIO 2106-G-05 QAPP*, January 2012 (EPA 2012), the goal of a QAPP for existing data is to establish performance or acceptance criteria that can be used to evaluate potential data sets. In this case, the quality objective is to compile, review, and utilize data suitable for the completion of the technical memorandums, maps, and tables described in Section A6, ultimately leading to the development of a ROD by EPA. Thus, CDM Smith’s technical support role to EPA for the Site requires evaluating and using data generated by the RP and other entities. Figure A-3 was prepared to depict the overall data evaluation process for Site data. To conduct the evaluation, acceptance criteria for the information obtained from previous studies and reports need to be established. The following items are to be considered for the acceptance of existing data for this project:

- 1) Are the data useful to meeting task objectives (described in Section A6)?
- 2) Were the data generated under an approved quality plan or other sampling document?
- 3) Does the data meet its original objectives in terms of precision, accuracy, representativeness, comparability, completeness, and sensitivity (PARCCS)?
- 4) Are the reporting limits low enough to compare results to the action criteria?
- 5) Did the reported data include laboratory qualifiers and qualifier definitions?
- 6) Are the data collection methods, analytical methods, and resulting data comparable to data sets accepted for use in meeting project objectives?
- 7) Will the data be used in the development of the ROD?
- 8) Are the data representative of current Site conditions?

After answering the questions above, following the Figure A-3 flow chart, CDM Smith categorized the extent to which a Uravan document containing data can be utilized in completing its assigned tasks (Section A6) and assist EPA in the development of the ROD. The results of this evaluation were documented in Table B-1 and included in this final QAPP.

A8 Special Training/Certifications

There is no specialized training or certifications needed by CDM Smith personnel to support this work assignment.

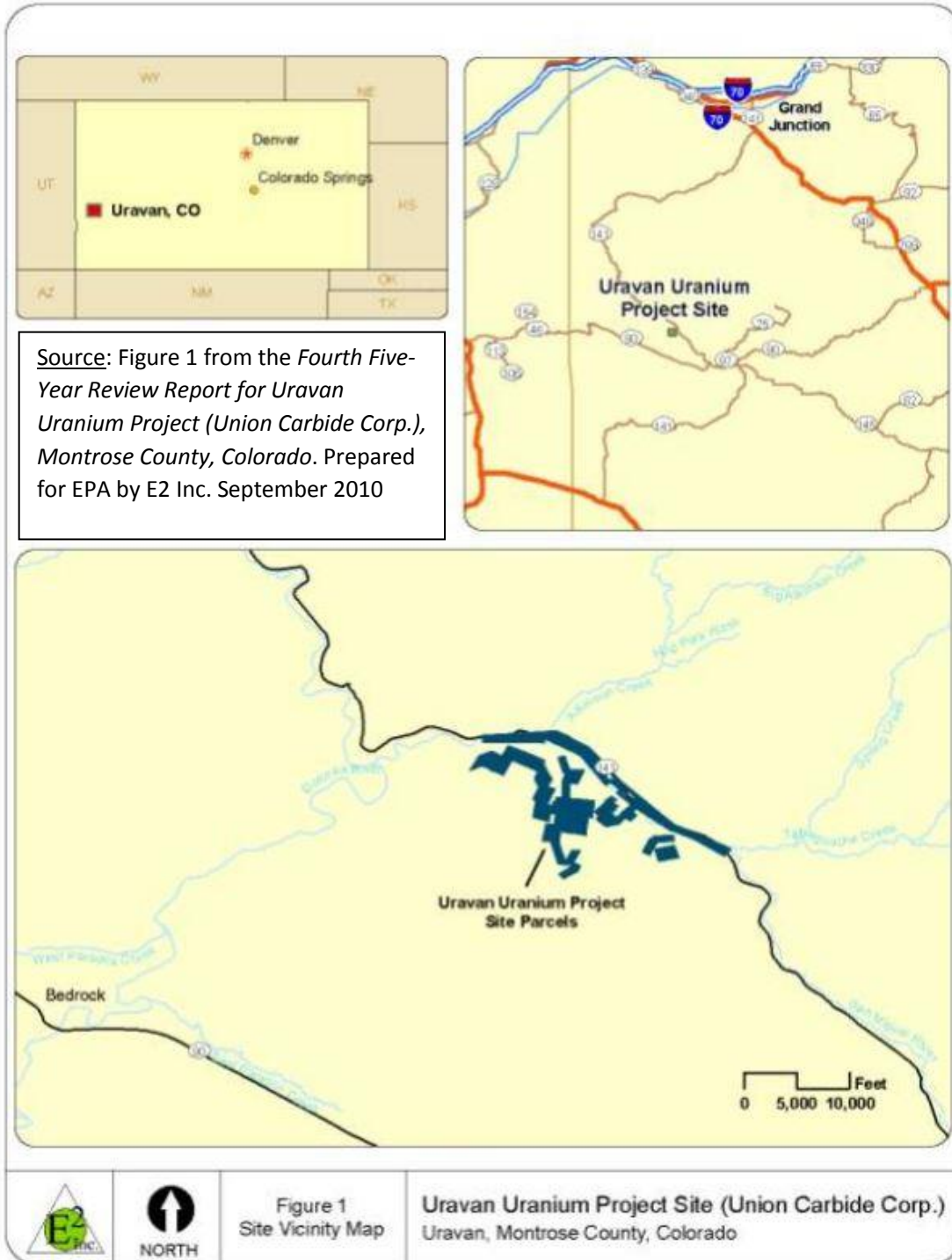
A9 Documentation and Records

CDM Smith has not been tasked by EPA to maintain project databases. However, all documents and review communications prepared under these work assignments will be prepared by CDM Smith technical staff using commercially available software (e.g., Microsoft Office®). All project files will be managed and maintained on the CDM Smith servers to ensure file integrity and security. These servers are backed up nightly. All files will be maintained on the CDM Smith server until EPA directs that files can be archived or deleted.

All deliverables to EPA will be provided in an electronic format such as a portable document format (PDF) (.pdf) or Microsoft Word® document (.doc). Electronic copies will be stored both at the local CDM Smith office and in the corporate-wide data storage/management system (i.e., ProjectWise).

It is the responsibility of the CDM Smith PM (or designee) to ensure appropriate project personnel have the most current approved QAPP, including any revisions or amendments. The approved work assignments QAPP will be distributed in a PDF format via email to the Distribution List (see Section A3) by the CDM Smith PM (or designee).

Figure A-1
Location Map
Uravan Uranium Project (Union Carbide Corp)



Disclaimer: This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding EPA's response actions at the Site, and is not intended for any other purpose.

Figure A-2
Project Organization
Uravan Uranium Project (Union Carbide Corp)

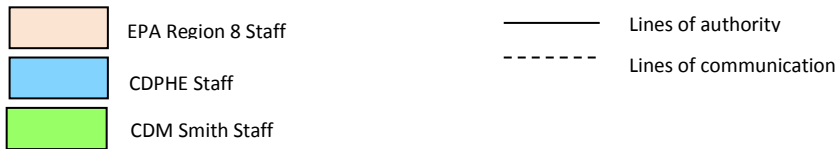
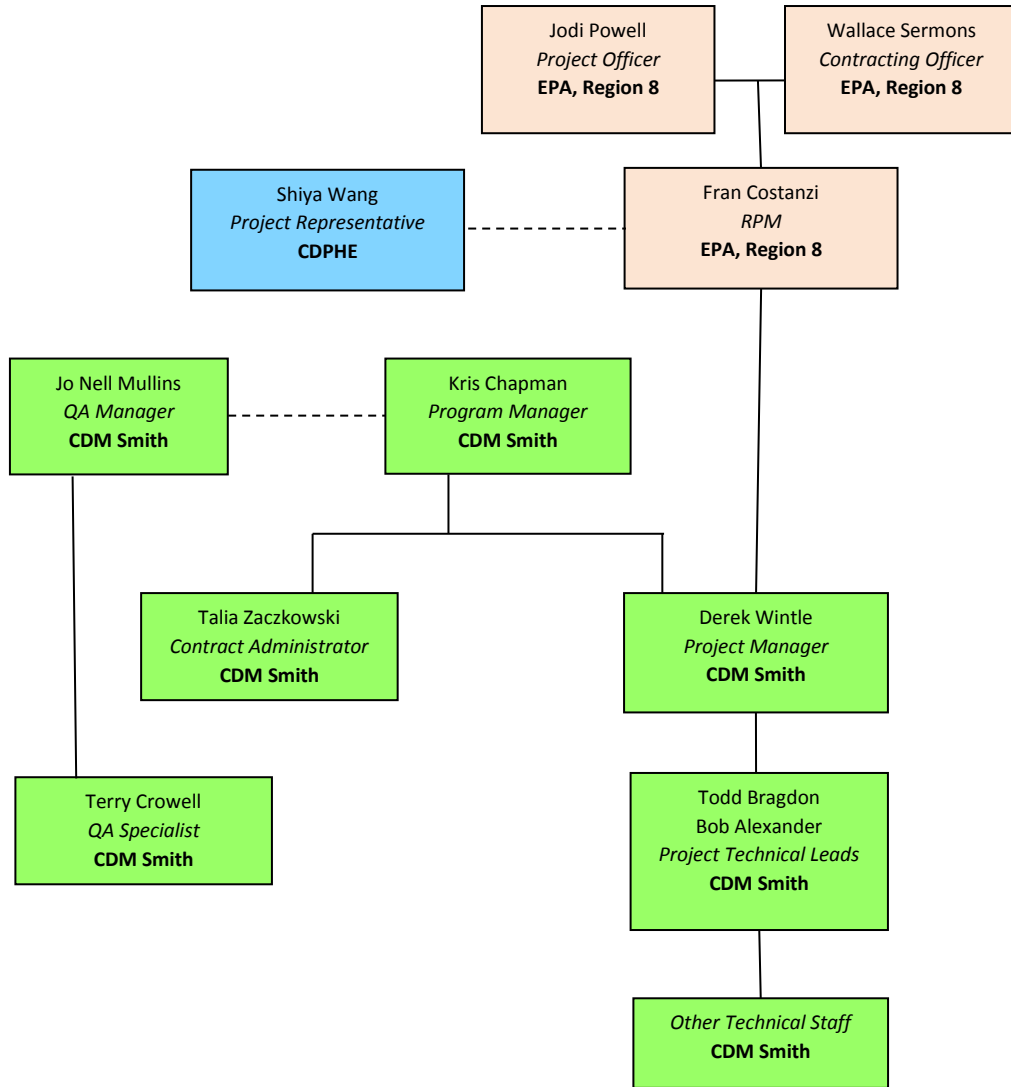
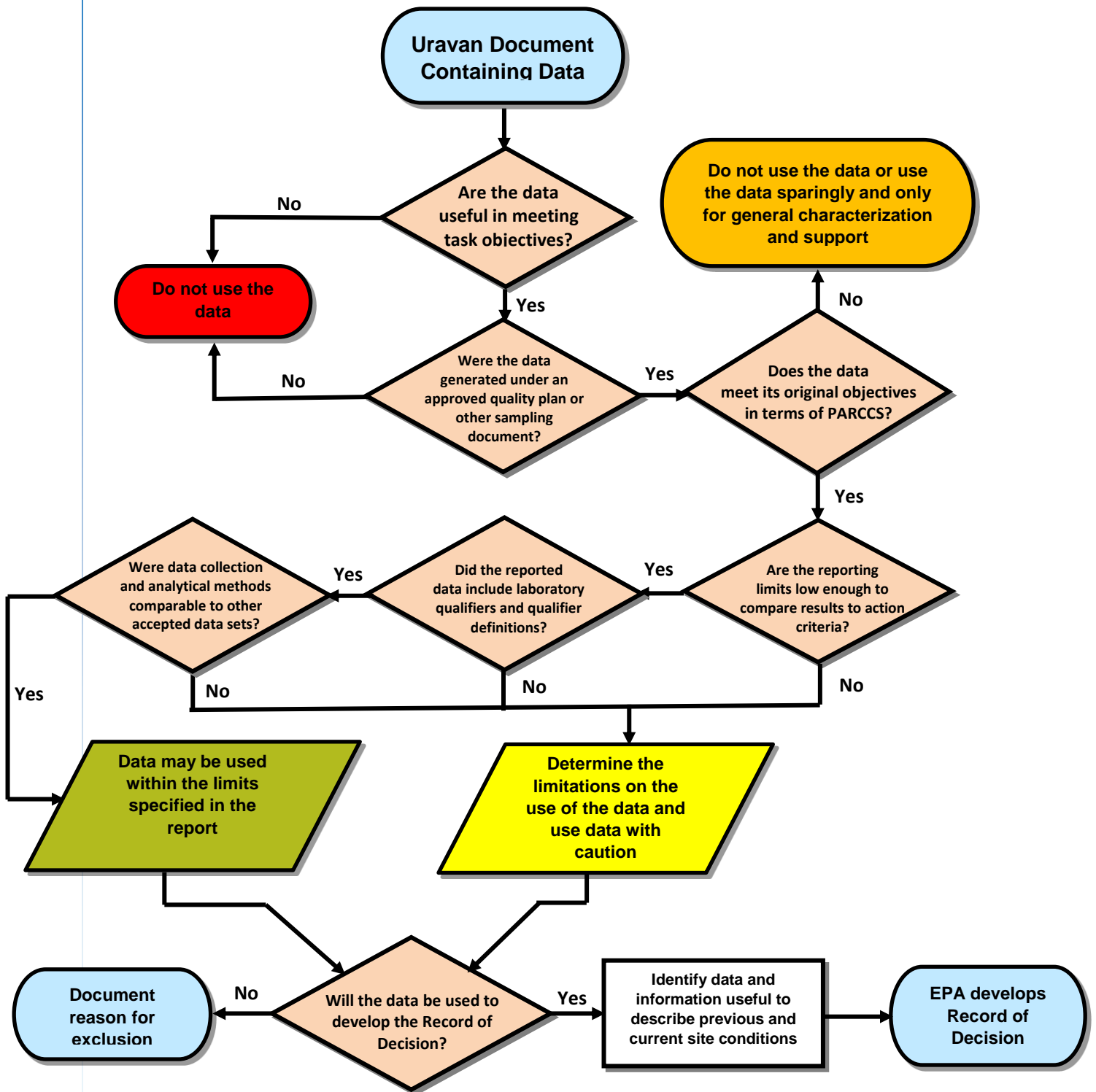


Figure A-3
Evaluation Process for Existing Data
Uravan Uranium Project (Union Carbide Corp)



B – Data Generation/Acquisition

B1 – B8

The following elements as specified in EPA Requirements for Quality Assurance Project Plans EPA QA/R-5 (EPA 2001) were judged not applicable to this QAPP as there are no specific data collection efforts to be performed by CDM Smith under the tasks presented in this QAPP.

- B1. Sampling Process Design
- B2. Sampling Methods
- B3. Sample Handling and Custody
- B4. Analytical Methods
- B5. Quality Control
- B6. Instrument/Equipment Testing, Inspection, and Maintenance
- B7. Instrument/Equipment Calibration and Frequency
- B8. Inspection/Acceptance of Supplies and Consumables

B9 Use of Existing Data (Non-direct Measurements)

Existing data was evaluated against the project tasks and needs according to the process outlined in this QAPP. Acceptance criteria for the project are discussed in Section A7. As portrayed in Figure A-3, when quality issues were identified, the data limitations were defined. When quality information was not available, or the data quality did not meet the quality criteria as presented in the quality plan or sampling plan, the data was not used. Changes to the interim evaluation process described in the draft QAPP be necessary, the changes were formalized in this final QAPP.

For this QAPP, data from non-direct measurement sources were used for project implementation and decision making (i.e., ROD development). Examples of sources of non-direct measurement data include:

- Background information from corporate records
- Data obtained from computer databases
- Literature files/searches
- Meteorological data
- Publications
- Photographs
- Topographical maps

Existing (non-direct measurement) data were assessed for usability, suitability, and quality. Before using existing data, the data were evaluated to identify any limitations on their use. Also, to ensure transparency in the task completion and ROD development processes, criteria and reasons for including and excluding certain data from use were clearly documented in the final QAPP.

Table B-1 was used to document the results of CDM Smith's data evaluation and was a critical component of the evaluation process. Table B-1 also provides the results of the acceptance criteria evaluation, information on how existing data were used and presents the limitations on the data use. Completion of Table B-1 was an essential task for this final QAPP.

B9.1 Data Source Information

Data source information were documented in all EPA deliverables, and the use of the data and decisions based on the data were documented. Non-direct data measurement sources are generally in the PDF and in Microsoft Word® formats. CDM Smith completed a review of available data source information and data pertaining to the Site. These documents formed the basis for the non-measurement data sources and were used to support the development of the technical memorandums and reports needed for development of the proposed plan and ROD. The primary data source originators include:

- CD/RAP
- Previous five-year reviews
- Closeout Report
- RP remedial action completion documents
- Documents related to the Groundwater Alternative Concentration Limits (ACL)
- Documents related to the Alternate Soil Standards

Specific data source information is to be provided in Table B-1.

B9.2 Intended Use of Existing Data

Initially, CDM Smith used the existing data to complete the tasks (mainly the preparation of technical memoranda) outlined in Section A6. Subsequently, CDM Smith assisted EPA with the development of the ROD and other associated elements (e.g., remedial action objectives and applicable or relevant and appropriate requirement). Each document containing data were evaluated and its relevance to the assigned tasks considered; for example, understanding current Site conditions was a critical consideration in the ROD. If limitations of certain data were found, these limitations were documented in Table B-1 in this final QAPP.

B9.3 Establishment of Acceptance Criteria

The acceptance criteria being applied to the project as a whole are presented in Section A7. The results of the evaluation against these acceptance criteria are provided in Table B-1 of this final QAPP.

B9.4 Key Resources and Support Facilities

CDM Smith was tasked to furnish personnel, services, materials, and equipment to provide the required technical assistance in accordance with the Uravan work assignment form (EPA 2015) and the *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA, Interim Final*, (EPA Office of Emergency and Remedial Response, October 1988), *A Guide to Developing and Documenting Cost Estimates During the Feasibility Study* (July 2000), and all other guidance used by EPA in conducting an RI/FS.

B9.5 Quality Procedures Used by Data Originators

The data protocol documents discussed in Section A5 were written to guide the design of sample collection, analytical procedures validation methods, and reporting requirements for all data collection at Site. The use of quality plans or other sampling plans will be verified during the data evaluation process and documented in Table B-1.

For other data generators, their existing data may not have the quality control (QC) information readily at hand. The CDM Smith project team considered carefully the importance of each type of information and determined how its absence may impact the project if this information is not available. Effort was undertaken to ascertain the status of a data generator's quality procedures as part of CDM Smith's data evaluation.

B10 Data Management

Data provided by EPA to CDM Smith for the purpose of evaluation and possible Site use will be controlled by CDM Smith on ProjectWise. ProjectWise is an "enterprise level" electronic document management system for the purpose of creating a repository for all project-related data.

Table B-1
Evaluation Summary of Existing Data Reports
Uravan Uranium Project (Union Carbide Corp)

Non-Direct Measurement (Existing Data)	Data Source (Originating Organization, Report Title, and Date)	Report Description (Originating Organization, Data Types, Data Generation/Collection Dates)	Data generated under an approved quality plan or sampling document?	Does data meet its original PARCCS?	Reporting limits low enough?	Lab qualifiers and definitions provided?	Is data comparable to other accepted data sets?	Is data useful for the Record of Decision?	Does data report contain information on existing site conditions?	How Data Will Be Used	Limitations on Data Use
Confirmation Sampling Report	Umetco Minerals Corporation. 1994. Potential Health Significance of Residual Levels of Metals in Soils at Atkinson Creek Crystal Disposal Area, Uravan, Colorado. Revision 1. March 15.	Remedial action requirements, site history, remedial action confirmation, and human health evaluation.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	To summarize remedial action data for completion of the remedial investigation report.	None.
Confirmation Sampling Report	Umetco Minerals Corporation. 1998. Confirmation Investigation Report: Club Mesa Spray Area: Uravan, Colorado. February.	Project description, club mesa mineralization, dose assessment, and conclusions and recommendations.	Yes	Yes	No	No	Yes	Yes	Yes	To summarize confirmation sampling for the Club Mesa Area for completion of the remedial investigation report.	None.
Confirmation Sampling Report	Umetco Minerals Corporation. 1999a. Confirmation Investigation Report: The Town Dump: Uravan, Colorado. December.	Project description, confirmation investigation, and conclusions and recommendations.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	To summarize confirmation sampling for the Town Dump for completion of the remedial investigation report.	None.
Confirmation Sampling Report	Umetco Minerals Corporation. 1999b. Confirmation Investigation Report: The Nature Conservancy Visitor's Site: Uravan, Colorado. Revision 1, December 1.	Project description, confirmation investigation, and conclusions and recommendations.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	To summarize confirmation sampling for the Nature Conservancy Visitor's Site for completion of the remedial investigation report.	None.
Confirmation Sampling Report	Umetco Minerals Corporation. 2000. Confirmation Investigation Report: Water Storage Ponds: Uravan, Colorado. January.	Project description, confirmation investigation, and conclusions and recommendations.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	To summarize confirmation sampling for the Water Storage Ponds for completion of the remedial investigation report.	None.
Confirmation Sampling Report	Umetco Minerals Corporation. 2002. Confirmation Investigation Report: A-Plant: Uravan, Colorado. December.	Project description, confirmation investigation, and conclusions and recommendations.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	To summarize confirmation sampling for the A-Plant for completion of the remedial investigation report.	None.
Confirmation Sampling Report	Umetco Minerals Corporation. 2002a. Confirmation Investigation Report: B-Plant: Uravan, Colorado. December.	Project description, confirmation investigation, and conclusions.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	To summarize confirmation sampling for the B-Plant for completion of the remedial investigation report.	None.
Confirmation Sampling Report	Umetco Minerals Corporation. 2002b. Confirmation Investigation Report: Mill Hillside: Uravan, Colorado. December.	Project description, confirmation investigation, risk assessment, and conclusions and recommendations.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	To summarize confirmation sampling for the Mill Hillside for completion of the remedial investigation report.	None.
Confirmation Sampling Report	Umetco Minerals Corporation. 2002c. Confirmation Investigation Report: Northeast of Highway 141: Uravan, Colorado. December.	Project description, confirmation investigation, and conclusions and recommendations.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	To summarize confirmation sampling for the Northeast Highway 141 for completion of the remedial investigation report.	None.

Non-Direct Measurement (Existing Data)	Data Source (Originating Organization, Report Title, and Date)	Report Description (Originating Organization, Data Types, Data Generation/Collection Dates)	Data generated under an approved quality plan or sampling document?	Does data meet its original PARCCS?	Reporting limits low enough?	Lab qualifiers and definitions provided?	Is data comparable to other accepted data sets?	Is data useful for the Record of Decision?	Does data report contain information on existing site conditions?	How Data Will Be Used	Limitations on Data Use
Groundwater Alternate Concentration Limits Application	Umetco Minerals Corporation. 2003. Application for Alternate Concentration Limits: Uravan Project Site. July 2003.	Application for the proposed Alternative Concentration Limits for contaminated groundwater at the Uravan site.	NA - document did not contain new data	NA	NA	NA	Yes	Yes	Yes	To acknowledge the ACL application and its intended use for completion of the focused feasibility study report.	None.
Confirmation Sampling Report	Umetco Minerals Corporation. 2003a. Confirmation Investigation Report: Town Area: Uravan, Colorado. June.	Project description, confirmation investigation, and conclusions and recommendations.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	To summarize confirmation sampling for the Town Area for completion of the remedial investigation report.	None.
Confirmation Sampling Report	Umetco Minerals Corporation. 2003b. Characterization of Elevated Radioactivity Levels: The Windblown Area: Uravan, Colorado. June.	Methodology, areas of elevated radioactivity, and photographs	Yes	NA - PARCCS information not provided in this report	NA - Likely yes, but this information was not provided in this report	NA - Could not verify as this information was not provided in this report.	Yes	Yes	Yes	To summarize the results of exposure surveys for completion of the remedial investigation report.	None.
Confirmation Sampling Report	Umetco Minerals Corporation. 2006. An Evaluation of Area E in the Windblown Area, Uravan, Colorado. September 1.	Area E windblown data discussion and analytical data.	Yes	NA - PARCCS information not provided in this report	NA - Likely yes, but this information was not provided in this report	NA - Could not verify as this information was not provided in this report.	Yes	Yes	Yes	To summarize the results of exposure rates in Area E in the Windblown Area for completion of the remedial investigation report.	None.
Confirmation Sampling Report	Umetco Minerals Corporation. 2006a. Final Construction and Soil Confirmation Investigation Report. Colorado Department of Transportation Highway 141, Uravan, Colorado. September.	Project description, confirmation investigation, and conclusions and recommendations.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	To summarize describes the remedial action project activities conducted within the right-of-way on Highway 141 and confirmation sampling for completion of the remedial investigation report.	None.
Confirmation Sampling Report	Umetco Minerals Corporation. 2007a. Appendix to the Confirmation Investigation Report: A-Plant, Uravan, Colorado for A-Plant North. October.	Results of the confirmation investigations conducted by Umetco in the A-Plant North area.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	To summarize confirmation sampling compared to the 1999 Site-Specific Soil Cleanup Objectives for completion of the remedial investigation report.	None.
Confirmation Sampling Report	Umetco Minerals Corporation. 2017. Calendar Year 2016. Annual Summary Report, Uravan, Colorado. May 2016.	Climatic data, "As Low As Reasonably Achievable" report, Off-site radiation dose report, land and water use survey results, groundwater performance, and evaluation of environmental monitoring data.	Yes	Yes	Yes	No	Yes	Yes	Yes	To summarize data collection and monitoring for completion of the remedial investigation report.	None.
Remedial Action Plan and Consent Decree	Umetco Minerals Corporation. 1987. Uravan Remedial Action Plan and Consent Decree, and as amended.	This document incorporates all modifications to the Uravan Remedial Action Plan from 1987 through 2008 and is intended to be used by decision makers to assess site remedial activities against RAP requirements.	NA - document did not contain new data	NA	NA	NA	Yes	Yes	Yes	To summarize previously approved background and site history discussion for completion of the RI report. Document contains settlement information between the State of Colorado and Umetco.	None.

Non-Direct Measurement (Existing Data)	Data Source (Originating Organization, Report Title, and Date)	Report Description (Originating Organization, Data Types, Data Generation/Collection Dates)	Data generated under an approved quality plan or sampling document?	Does data meet its original PARCCS?	Reporting limits low enough?	Lab qualifiers and definitions provided?	Is data comparable to other accepted data sets?	Is data useful for the Record of Decision?	Does data report contain information on existing site conditions?	How Data Will Be Used	Limitations on Data Use
Soil Cleanup Objectives Report	Umetco Minerals Corporation. 1999. Site-Specific Soil Cleanup Objectives: Rationale Document for Uravan Project, Colorado. June.	Soil cleanup objectives, confirmation of site cleanup, and further considerations.	NA - document did not contain new data	NA	NA	NA	Yes	Yes	Yes	To summarize site specific soil cleanup objectives for completion of the remedial investigation report.	None.
Alternative Soil Standards Application	Umetco Minerals Corporation. 2007. Alternative Soil Standards Application: Uravan, Colorado: Including the Mill Hillside, A-Plant North, River Ponds Areas, and County Road Y-11. September 2007.	The Alternative Soil Standards Application contains a description of the alternative standard areas and information to support the application for alternative soil standards in the subject areas.	NA - document did not contain new data	NA	NA	NA	Yes	Yes	Yes	To reference the Alternative Soil Standards Application and its contents for completion of the remedial investigation and focused feasibility study reports.	None.
Final Close Out Report	EPA. 2008. Final Close Out Report: Uravan Mill and Adjacent Areas, Montrose County, Colorado. Dated September 29.	Summary of site conditions, QA/QC, monitoring results, summary of O&M, summary of remediation costs, protectiveness, and five-year review.	NA - document did not contain new data	NA	NA	NA	Yes	Yes	Yes	This Final Close Out Report documents that Umetco has completed all remedial actions at the Uravan Superfund Site in accordance with Close Out Procedures.	None.
Five-Year Review Report	E2 Inc., 2010. Five-Year Review Report: Fourth Five-Year Review Report for Uravan Uranium Project (Union Carbide Corp). September 2010.	Site chronology, background, remedial actions, progress since last five-year review, five-year review process, technical assessment, issues, recommendations and follow-up actions, protectiveness statement, and next review.	NA - document did not contain new data	NA	NA	NA	Yes	Yes	Yes	To summarize five-year review results for completion of the remedial investigation report	None.
Five-Year Review Report	EPA. 2015. Five-Year Review Report for Uravan Uranium Project (Union Carbide). Uravan, Montrose County, Colorado. September.	Site chronology, background, remedial actions, progress since last five-year review, five-year review process, technical assessment, issues, recommendations and follow-up actions, protectiveness statement, and next review.	NA - document did not contain new data	NA	NA	NA	Yes	Yes	Yes	To summarize five-year review results for completion of the remedial investigation report.	None.
Completion Review Report	CDPHE. 2015. Uravan Completion Review Report (Working Draft). February 2015.	Description of licensee's activities associated with decommissioning and remediation.	NA - document did not contain new data	NA	NA	NA	NA	Yes	Yes	To summarize reclamation activities in each cleanup area.	None.
Residual Soil Risk Assessment Review	EPA. 2017. Review of Umetco Risk Assessment, Alternative Soils Standards, and Residual Contamination. August 31.	Risk assessment on existing residual soil data at the Site.	NA - document did not contain new data	NA	NA	NA	Yes	Yes	Yes	Risk assessment review of existing data to support development of additional remedial components at the Site.	None.

C – Assessment and Oversight

C1 Assessments and Response Actions

System assessments are qualitative reviews of different aspects of project work to check on the use of appropriate QC measures and the functioning of the QA system.

The work plan for WA 354 incorporates a QA section that specifies the project's auditing requirements. Based on the level of effort and the duration of the activities discussed in a project work plan, CDM Smith conducts internal office audits or self-assessments, as approved by the QA manager. An audit report will detail both proficiencies and deficiencies and will include any corrective action (and supporting documentation) that was taken to correct the problem. Self-assessments are evaluations of work activities conducted by project personnel who are knowledgeable in the project requirements to determine if technical and QA requirements are being met. They are intended to provide rapid feedback to the project staff to facilitate timely corrective action. The QMP provides guidance for levels of independent assessments required based on WA professional level of effort hours. For WA 354, the number of professional level of effort hours is greater than 500 but less than 1,500; thus, three self-assessments were conducted to assess compliance with CDM Smith quality procedures. All QA activities were documented.

All aspects of project support for these work assignments were conducted in accordance with CDM Smith's formal QA program as documented in the EPA signed, contract-specific QMP (CDM Smith 2014). This QA program is in compliance with the American Society for Quality/American National Standard Institute (ASQ/ANSI) E4:2014, *Quality Systems for Environmental Information and Technology Programs – Requirements with Guidance for Use*. The QMP provides the detailed instructions, responsibilities, and documentation requirements necessary to ensure the effective implementation of the CDM Smith QA program.

C2 Reports to Management

The PM reviewed this QAPP periodically throughout this work assignment and made updates and changes as necessary. Additionally, CDM Smith provided technical progress and project cost reports to the EPA RPM monthly. The technical progress report was prepared by the CDM Smith PM with input from the technical support staff. The monthly progress reports included a summary of tasks completed during the reporting period, costs incurred, any deliverables submitted, any issues identified and their resolution, as well as anticipated activities in the following reporting period. The project cost reports were prepared by the CDM Smith Contract Administrator.

QA reports were provided to management whenever major quality problems were encountered. Monthly QA reports were submitted to CDM Smith's RAC II Region 8 QA manager by the local QA specialist. Topics summarized regularly may include:

- Activities and general program status
- Project meetings
- Corrective action activities

- Any unresolved problem
- Any significant QA/QC problems not included above

D – Data Validation and Usability

D1 Data Review, Verification, and Validation

Determination of existing data quality was based on the criteria outlined in Section A7. Professional judgment and Site knowledge also were used in determining the usability of existing data for task completion and decision-making purposes. CDM Smith considered possible end uses of the data when determining usability; however, CDM Smith did not formally validate site data.

D2 Verification and Validation Methods

CDM Smith evaluated all data for adherence to the quality protocols in force at the time of data generation and provided an evaluation summary in all reports where data were referenced and utilized by CDM Smith to complete assigned tasks. All utilized data was examined for unexpected results, data outliers, and data completeness. This review was performed by appropriate CDM Smith technical staff familiar with project-specific data reporting, analytical methods, and investigation requirements.

An evaluation of existing data quality was included in all Site deliverables to EPA. Data sources were selected for use based on relevance, completeness, accuracy, quality, and the age of the data.

D3 Reconciliation with User Requirements

A tremendous amount of data has been generated at the Site. CDM Smith assessed data pertinent to its tasks for adherence to Site quality plans and for the extent of usability according to Figure A-3. Data not supported by adequate QC documentation, as defined in Site quality plans, may have a higher level of uncertainty than data collected with defined data quality objectives and performance criteria. Specific factors that may cause data to be considered unusable or of limited use include but are not limited to data lacking appropriate or complete guidance documents governing data collection, data that are deemed too out-of-date to accurately reflect present site conditions, data that appear incomplete or significantly conflict with data of known quality, and data that are not characterized in a suitable data summary format. In certain instances, data that have been deemed of lesser than desired quality may be utilized for screening purposes. In those cases, all limitations on how such data should be used and interpreted were documented. Some data may not be used for decision making but rather only for general characterization or support.

This page left blank intentionally

References

- CDM Smith. 2014. EPA Region 8, Quality Management Plan, Revision 2, Contract EP-W-05-049. July 29, 2014.
- CDPHE. 2015. Uravan Completion Review Report (Working Draft). February 2015.
- E2 Inc. (E2). 2010. Five-Year Review Report: Fourth Five-Year Review Report for Uravan Uranium Project (Union Carbide Corp). September 2010.
- EPA. 2001. EPA Requirements for Quality Assurance Project Plans, *QA/R-5*. Office of Environmental Information, U.S. Environmental Protection Agency, Washington, DC. EPA/240/B-01/003. March.
- EPA. 2002. EPA Guidance for Quality Assurance Project Plans, *QA/G-5*. Office of Environmental Information, U.S. Environmental Protection Agency, Washington, DC. EPA/240/R-02/009. December.
- EPA. 2003. A Summary of General Assessment Factors for Evaluating the Quality of Scientific and Technical Information, EPA 100/B-03/001, Science Policy Council, June.
- EPA. 2008. Final Close Out Report: Uravan Mill and Adjacent Areas, Montrose County, Colorado. Dated September 29.
- EPA. 2012. U.S. EPA Guidance on Quality Assurance Project Plans, CIO 2106-G-05 QAPP, Final Draft, January 17.
- EPA. 2015. Five-Year Review Report for Uravan Uranium Project (Union Carbide). Uravan, Montrose County, Colorado. September.
- EPA. 2016. EPA Region 8 Quality Assurance Document Review Crosswalk. Update #2, 8-2012. <http://www2.epa.gov/region8/region-8-qa-guidance-and-requirements>
- EPA. 2017. Review of Umetco Risk Assessment, Alternative Soils Standards, and Residual Contamination. August 31.
- Umetco. 1987. Uravan Remedial Action Plan and Consent Decree.
- Umetco. 1994. Potential Health Significance of Residual Levels of Metals in Soils at Atkinson Creek Crystal Disposal Area, Uravan, Colorado. Revision 1. March 15.
- Umetco. 1998. Confirmation Investigation Report: Club Mesa Spray Area: Uravan, Colorado. February.
- Umetco. 1999. Site-Specific Soil Cleanup Objectives: Rationale Document for Uravan Project, Colorado. June.
- Umetco. 1999a. Confirmation Investigation Report: The Town Dump: Uravan, Colorado. December.
- Umetco. 1999b. Confirmation Investigation Report: The Nature Conservancy Visitor's Site: Uravan, Colorado. Revision 1, December 1.
- Umetco. 2000. Confirmation Investigation Report: Water Storage Ponds: Uravan, Colorado. January.

- Umetco. 2002. Confirmation Investigation Report: A-Plant: Uravan, Colorado. December.
- Umetco. 2002a. Confirmation Investigation Report: B-Plant: Uravan, Colorado. December.
- Umetco. 2002b. Confirmation Investigation Report: Mill Hillside: Uravan, Colorado. December.
- Umetco. 2002c. Confirmation Investigation Report: Northeast of Highway 141: Uravan, Colorado. December.
- Umetco. 2003. Application for Alternate Concentration Limits: Uravan Project Site. July 2003.
- Umetco. 2003a. Confirmation Investigation Report: Town Area: Uravan, Colorado. June.
- Umetco. 2003b. Characterization of Elevated Radioactivity Levels: The Windblown Area: Uravan, Colorado. June.
- Umetco. 2006. An Evaluation of Area E in the Windblown Area, Uravan, Colorado. September 1.
- Umetco. 2006a. Final Construction and Soil Confirmation Investigation Report. Colorado Department of Transportation Highway 141, Uravan, Colorado. September.
- Umetco. 2007. Alternative Soil Standards Application: Uravan, Colorado: Including the Mill Hillside, A-Plant North, River Ponds Areas, and County Road Y-11. September 2007.
- Umetco. 2007a. Appendix to the Confirmation Investigation Report: A-Plant, Uravan, Colorado for A-Plant North. October.
- Umetco. 2017. Calendar Year 2016. Annual Summary Report, Uravan, Colorado. May 2016.

This page left blank intentionally

ATTACHMENT 1

EPA Region 8 QA Document Review Crosswalk

EPA REGION 8 QA DOCUMENT REVIEW CROSSWALK

QAPP/FSP/SAP for: <i>(check appropriate box)</i>	Entity (<i>grantee, contract, EPA AO, EPA Program, Other</i>)	Regulatory Authority	<input type="checkbox"/> 2 CFR 1500 for Grantee/Cooperative Agreements
<input type="checkbox"/> GRANTEE	EPA Contractor (CDM Smith)	and/or	<input type="checkbox"/> 48 CFR 46 for Contracts
<input type="checkbox"/> CONTRACTOR			<input type="checkbox"/> Interagency Agreement
<input type="checkbox"/> EPA			<input type="checkbox"/> EPA/Court Order
<input type="checkbox"/> Other			<input type="checkbox"/> EPA Program Funding
Document Title <i>[Note: Title will be repeated in Header]</i>	Final Quality Assurance Project Plan, Urvan Uranium Project (Union Carbide), Contract EP-W-05-49, WA# 354, October 2017	Funding Mechanism	<input type="checkbox"/> EPA Program Regulation
QAPP/FSP/SAP Preparer	CDM Smith		<input type="checkbox"/> EPA CIO 2105
Period of Performance <i>(of QAPP/FSP/SAP)</i>	WA 354 January 2015 – September 2018	Date Submitted for Review	August 30, 2017, Revised October 2017
EPA Project Officer EPA Project Manager	Jodi Powell Fran Costanzi	PO Phone # PM Phone #	
QA Program Reviewer or Approving Official	Fran Costanzi	Date of Review	

Documents Submitted for QAPP Review (QA Reviewer must complete):

1. QA Document(s) submitted for review:

QA Document	Document Date	Document Stand-alone	Document with QAPP
QAPP	October 2017	Yes / No	
FSP		Yes / No	Yes / No
SAP		Yes / No	Yes / No
SOP(s)			Yes / No

2. WP/SOW/TO/PP/RP Date _____

WP/SOW/TO/RP Performance Period _____

3. QA document consistent with the:

WP/SOW/PP for grants? Yes / No

SOW/TO for contracts? Yes / No

4. QARF signed by R8 QAM Yes / No / NA

Funding Mechanism IA / contract / grant / NA
Amount _____

Notes for Document Submittals:

- A QAPP written by a Grantee, EPA, or Federal Partner must include for review: Work Plan(WP) / Statement of Work (SOW) / Program Plan (PP) / Research Proposal (RP) and funding mechanism
- A QAPP written by Contractor must include for review:
 - Copy of Task Order Work Assignment/SOW
 - Reference to a hard or electronic copy of the contractor’s approved QMP
 - Copy of Contract SOW if no QMP has been approved
 - Copy of EPA/Court Order, if applicable
 - The QA Review must determine (with the EPA CO or PO) if a QARF was completed for the environmental data activity described in the QAPP.
- Field Sampling Plan (FSP) and/or Sampling & Analyses Plan (SAP) must include the Project QAPP or must be a stand-alone QA document that contain all QAPP required elements (Project Management, Data Generation/Acquisition, Assessment and Oversight, and Data Validation and Usability).
 - SOPs must be submitted with a QA document that contains all QAPP required elements.

Summary of Comments (*highlight significant concerns/issues*):

- Comment #1
- Comment #2

3. Comment #3			
4. The EPA Contractor (CDM Smith) must address the comments in the Summary of Comments, as well as those identified in the Comment section(s) that includes a “Response (date)” and Resolved (date)”.			
Element	Acceptable <i>Yes/No/NA</i>	Page/ Section	Comments
A. Project Management			
A1. Title and Approval Sheet			
a. Contains project title		A1, pg. 1	
b. Date and revision number line (for when needed)		A1, pg. 1	
c. Indicates organization=s name		A1, pg. 1	
d. Date and signature line for organization=s project manager		A1, pg. 1	
e. Date and signature line for organization=s QA manager		A1, pg. 1	
f. Other date and signatures lines, as needed		A1, pg. 1	
A2. Table of Contents			
a. Lists QA Project Plan information sections		A2, pg. 3	
b. Document control information indicated		Page footer	
A3. Distribution List			
Includes all individuals who are to receive a copy of the QA Project Plan and identifies their organization		A3, pg. 8	
A4. Project/Task Organization			
a. Identifies key individuals involved in all major aspects of the project, including contractors		A4, pg. 8-9	
b. Discusses their responsibilities		A4, pg. 8-9	
c. Project QA Manager position indicates independence from unit generating data		A4, pg. 8-9	
d. Identifies individual responsible for maintaining the official, approved QA Project Plan		A4, pg. 8-9	
e. Organizational chart shows lines of authority and reporting responsibilities		Fig A-2, pg. 16	
A5. Problem Definition/Background			
a. States decision(s) to be made, actions to be taken, or outcomes expected from the information to be obtained		A5, pg. 9-11	
b. Clearly explains the reason (site background or historical context) for initiating this project		A5, pg. 9-11	

c. Identifies regulatory information, applicable criteria, action limits, etc. necessary to the project		A5, pg. 9-11	
A6. Project/Task Description			
a. Summarizes work to be performed, for example, measurements to be made, data files to be obtained, etc., that support the project=s goals		A6, pg. 11-12	
b. Provides work schedule indicating critical project points, e.g., start and completion dates for activities such as sampling, analysis, data or file reviews, and assessments		A6, pg. 11	
c. Details geographical locations to be studied, including maps where possible		A5, pg. 10 Figure A-1	
d. Discusses resource and time constraints, if applicable		A6, pg. 11	
A7. Quality Objectives and Criteria			
a. Identifies - performance/measurement criteria for all information to be collected and acceptance criteria for information obtained from previous studies, - including project action limits and laboratory detection limits and - range of anticipated concentrations of each parameter of interest		A7, pg. 12-13	
b. Discusses precision		A7, pg. 12-13	
c. Addresses bias		A7, pg. 12-13	
d. Discusses representativeness		A7, pg. 12-13	
e. Identifies the need for completeness		A7, pg. 12-13	
f. Describes the need for comparability		A7, pg. 12-13	
g. Discusses desired method sensitivity		A7, pg. 12-13	
A8. Special Training/Certifications			
a. Identifies any project personnel specialized training or certifications		A8, pg. 13	
b. Discusses how this training will be provided		NA	No special training is necessary
c. Indicates personnel responsible for assuring training/certifications are satisfied		NA	No special training is necessary
d. identifies where this information is documented		NA	No special training is necessary
A9. Documentation and Records			

a. Identifies report format and summarizes all data report package information		A9, pg. 13-14	
b. Lists all other project documents, records, and electronic files that will be produced		A9, pg. 13-4	
c. Identifies where project information should be kept and for how long		A9, pg. 13-4	
d. Discusses back up plans for records stored electronically		A9, pg. 13-14	
e. States how individuals identified in A3 will receive the most current copy of the approved QA Project Plan, identifying the individual responsible for this		A9, pg. 13-14	
B. Data Generation/Acquisition			
B1. Sampling Process Design (Experimental Design)			
a. Describes and justifies design strategy, indicating size of the area, volume, or time period to be represented by a sample		NA - B1, pg. 18	There are no data collection efforts or site investigations planned by CDM Smith under this QAPP.
b. Details the type and total number of sample types/matrix or test runs/trials expected and needed		NA	
c. Indicates where samples should be taken, how sites will be identified/located		NA	
d. Discusses what to do if sampling sites become inaccessible		NA	
e. Identifies project activity schedules such as each sampling event, times samples should be sent to the laboratory, etc.		NA	
f. Specifies what information is critical and what is for informational purposes only		NA	
g. Identifies sources of variability and how this variability should be reconciled with project information		NA	
B2. Sampling Methods			
a. Identifies all sampling SOPs by number, date, and regulatory citation, indicating sampling options or modifications to be taken		NA - B1, pg. 18	There are no data collection efforts or site investigations planned by CDM Smith under this QAPP.
b. Indicates how each sample/matrix type should be collected		NA	
c. If in situ monitoring, indicates how instruments should be deployed and operated to avoid contamination and ensure maintenance of proper data		NA	

d. If continuous monitoring, indicates averaging time and how instruments should store and maintain raw data, or data averages		NA	
e. Indicates how samples are to be homogenized, composited, split, or filtered, if needed		NA	
f. Indicates what sample containers and sample volumes should be used		NA	
g. Identifies whether samples should be preserved and indicates methods that should be followed		NA	
h. Indicates whether sampling equipment and samplers should be cleaned and/or decontaminated, identifying how this should be done and by-products disposed of		NA	
i. Identifies any equipment and support facilities needed		NA	
j. Addresses actions to be taken when problems occur, identifying individual(s) responsible for corrective action and how this should be documented		NA	
B3. Sample Handling and Custody			
a. States maximum holding times allowed from sample collection to extraction and/or analysis for each sample type and, for in-situ or continuous monitoring, the maximum time before retrieval of information		NA - B1, pg. 18	There are no data collection efforts or site investigations planned by CDM Smith under this QAPP.
b. Identifies how samples or information should be physically handled, transported, and then received and held in the laboratory or office (including temperature upon receipt)		NA	
c. Indicates how sample or information handling and custody information should be documented, such as in field notebooks and forms, identifying individual responsible		NA	
d. Discusses system for identifying samples, for example, numbering system, sample tags and labels, and attaches forms to the plan		NA	
e. Identifies chain-of-custody procedures and includes form to track custody		NA	
B4. Analytical Methods			

a. Identifies all analytical SOPs (field, laboratory and/or office) that should be followed by number, date, and regulatory citation, indicating options or modifications to be taken, such as sub-sampling and extraction procedures		NA - B1, pg. 18	There are no data collection efforts or site investigations planned by CDM Smith under this QAPP.
b. Identifies equipment or instrumentation needed		NA	
c. Specifies any specific method performance criteria		NA	
d. Identifies procedures to follow when failures occur, identifying individual responsible for corrective action and appropriate documentation		NA	
e. Identifies sample disposal procedures		NA	
f. Specifies laboratory turnaround times needed		NA	
g. Provides method validation information and SOPs for nonstandard methods		NA	
B5. Quality Control			
a. For each type of sampling, analysis, or measurement technique, identifies QC activities which should be used, for example, blanks, spikes, duplicates, etc., and at what frequency		NA - B1, pg. 17	There are no data collection efforts or site investigations planned by CDM Smith under this QAPP.
b. Details what should be done when control limits are exceeded, and how effectiveness of control actions will be determined and documented		NA	
c. Identifies procedures and formulas for calculating applicable QC statistics, for example, for precision, bias, outliers and missing data		NA	
B6. Instrument/Equipment Testing, Inspection, and Maintenance			
a. Identifies field and laboratory equipment needing periodic maintenance, and the schedule for this		NA - B1, pg. 18	There are no data collection efforts or site investigations planned by CDM Smith under this QAPP.
b. Identifies testing criteria		NA	
c. Notes availability and location of spare parts		NA	
d. Indicates procedures in place for inspecting equipment before usage		NA	
e. Identifies individual(s) responsible for testing, inspection and maintenance		NA	
f. Indicates how deficiencies found should be resolved, re-inspections performed, and effectiveness of corrective action determined and documented		NA	
B7. Instrument/Equipment Calibration and Frequency			

a. Identifies equipment, tools, and instruments that should be calibrated and the frequency for this calibration		NA - B1, pg. 18	There are no data collection efforts or site investigations planned by CDM Smith under this QAPP.
b. Describes how calibrations should be performed and documented, indicating test criteria and standards or certified equipment		NA	
c. Identifies how deficiencies should be resolved and documented		NA	
B8. Inspection/Acceptance for Supplies and Consumables			
a. Identifies critical supplies and consumables for field and laboratory, noting supply source, acceptance criteria, and procedures for tracking, storing and retrieving these materials		NA - B1, pg. 18	There are no data collection efforts or site investigations planned by CDM Smith under this QAPP.
b. Identifies the individual(s) responsible for this		NA	
B9. Use of Existing Data (Non-direct Measurements)			
a. Identifies data sources, for example, computer databases or literature files, or models that should be accessed and used		B9, B9.1 pg. 18-19	
b. Describes the intended use of this information and the rationale for their selection, i.e., its relevance to project		B9.2 pg. 19	
c. Indicates the acceptance criteria for these data sources and/or models		B9.3, pg. 19 Table B-1	
d. Identifies key resources/support facilities needed		B9.4, pg. 20	Not applicable
e. Describes how limits to validity and operating conditions should be determined, for example, internal checks of the program and Beta testing		B9.5, pg. 20	
B10. Data Management			
a. Describes data management scheme from field to final use and storage		B10, pg. 20	CDM Smith does not manage the data. The data management by the PRPs is described in B10
b. Discusses standard record-keeping and tracking practices, and the document control system or cites other written documentation such as SOPs		B10, pg. 20	
c. Identifies data handling equipment/procedures that should be used to process, compile, analyze, and transmit data reliably and accurately		NA	
d. Identifies individual(s) responsible for this		NA	The PRP is responsible for the data management. CDM Smith requests data from this site through the EPA.
e. Describes the process for data archival and retrieval		NA	CDM Smith requests data from this site through the EPA.

f. Describes procedures to demonstrate acceptability of hardware and software configurations		NA	Not applicable
g. Attaches checklists and forms that should be used		NA	Not applicable
C. Assessment and Oversight			
C1. Assessments and Response Actions			
a. Lists the number, frequency, and type of assessment activities that should be conducted, with the approximate dates		C1, pg. 24	
b. Identifies individual(s) responsible for conducting assessments, indicating their authority to issue stop work orders, and any other possible participants in the assessment process		C1, pg. 24	
c. Describes how and to whom assessment information should be reported		C1, pg. 24	
d. Identifies how corrective actions should be addressed and by whom, and how they should be verified and documented		C1, pg. 24	
C2. Reports to Management			
a. Identifies what project QA status reports are needed and how frequently		C1, pg. 24-25	
b. Identifies who should write these reports and who should receive this information		C1, pg. 24-25	
D. Data Validation and Usability			
D1. Data Review, Verification, and Validation			
Describes criteria that should be used for accepting, rejecting, or qualifying project data		D1, pg. 26	
D2. Verification and Validation Methods			
a. Describes process for data verification and validation, providing SOPs and indicating what data validation software should be used, if any		D2, pg. 26	
b. Identifies who is responsible for verifying and validating different components of the project data/information, for example, chain-of-custody forms, receipt logs, calibration information, etc.		D2, pg. 26	
c. Identifies issue resolution process, and method and individual responsible for conveying these results to data users		D2, pg. 26	

EPA Region 8 QA Document Review Crosswalk

Final Quality Assurance Project Plan, UraVan Uranium Project (Union Carbide), Contract EP-W-05-49, WA# 354, October 2017

d. Attaches checklists, forms, and calculations		NA	
D3. Reconciliation with User Requirements			
a. Describes procedures to evaluate the uncertainty of the validated data		D3, pg. 26	
b. Describes how limitations on data use should be reported to the data users		D3, pg. 26	