Use of the Geophysical Classification for Munitions Response Quality Assurance Project Plan Template (GCMR-QAPP) during Project Planning

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(LQAO)

GCMR QAPP Template Highlights

- Based on the Optimized Uniform Federal Policy for Quality Assurance Project Plan (UFP-QAPP) worksheets (IDQTF 2012)
- All decision-makers (DoD, contractors, regulators and stakeholders) participate in planning
- Facilitates and documents the ***systematic planning process*** leading to detection and classification of buried MEC
- Results in stand-alone document addressing all elements of ANSI/ASQ E4
- Provides structured, transparent, reproducible process for decision-making in the field

Ensures a scientific basis for decision-making

Systematic Planning Process (SPP) Elements

- Team-based approach to planning
- Project goal, objectives, questions and issues
- Project schedule, resources, milestones and applicable requirements
- Data collection and analysis process matched to project objectives
- Collection and analysis requirements
- Process for generation, evaluation and assessment of collected data

GCMR-QAPP Template Features

- Includes "crosswalk table" identifying where required quality system elements are addressed
- Green text provides instructions and guidance for completing each worksheet
- Blue text provides examples of the type of information needed
- Black text identifies minimum recommended requirements (where applicable)

Template is based on the RA phase of investigation
Project teams should modify as needed for other phases

Key Worksheets used in Planning

WS #6: Communication Pathways/Procedures

WS #9: Project Planning Session Summary

WS #10: Conceptual Site Model (CSM)

WS #11: Data Quality Objectives (DQOs)

WS #12: Measurement Performance Criteria (MPCs)

WS #17: Sample Design

WS #22: Equipment Testing, Inspection, and Quality Control

WS #6 – Communication Pathways

- One of the first issues addressed during planning
- Identifies issues (communication drivers) that will trigger the need for formal communications
  - ✓ Regulatory agency interfaces
  - ✓ Approvals to proceed from one definable feature of work (DFW) to the next
  - ✓ Field changes
  - ✓ Emergencies, non-conforming work, stop-work orders
- Identifies responsibilities, procedures, timing & documentation
- Critically important for dynamic nature of field decision-making

WS #9 – Project Planning

- QAPP worksheets are completed in a series of planning sessions (e.g., phone conference, web-based, face-to face)
- Participants may very depending on the phase and objectives of the planning session
- WS #9 should be completed for every session
- Provides a concise record of
  - ✓ Purpose of session
  - ✓ Participants
  - ✓ Key decisions/agreements made
  - ✓ Action items

WS #10 – Conceptual Site Model

- The working model of known site conditions used in project planning to assist in developing DQOs
- Uses text, graphics, tables to organize and convey information relevant to proposed investigation:
  - ✓ Site history & uses
  - ✓ Topography, geology, vegetation
  - ✓ Expected types & distribution of MEC
  - ✓ Anticipated land use
  - ✓ Current & future receptors & exposure pathways
  - ✓ Access restrictions or obstacles to investigation
  - ✓ Resources (e.g., endangered species, sensitive habitats, cultural resources) that could be affected by investigation processes
  - ✓ Basis for dividing the site into *survey units*

Conceptual Site Model (cont'd.)

Survey Unit:

- A portion of the site for which geophysical survey data, including QA/QC results, will be collected and reported as a unit, for evaluation by the project team
- Survey units for detection phase need not be the same as those for the classification phase
- Designed so that data evaluation and reporting occurs at regular intervals as agreed upon during planning

WS #11: Data Quality Objectives (DQOs)

Developed and documented by the project team using EPA's 7-step DQO process:

1. State the problem
2. Identify the goals of data collection
3. Identify information inputs
4. Define the boundaries of the project
5. Develop the data collection and analysis approach
6. Specify project-specific measurement performance criteria (WS 12)
7. Develop the Geophysical Classification design (WS 17)

WS #11: DQOs (cont'd.)

Step 1: Problem Statement (example):

"Buried unexploded ordnance (UXO) may be present at site A resulting from its use as an ordnance testing facility. Buried UXO may present an unacceptable risk from explosive hazards to future human receptors based on the site's planned use as a campground and recreational area."

Step 2: Identify the goals of data collection (example):

"Geophysical classification will be used to 1) detect subsurface anomalies resulting from UXO and other harmless metallic debris and 2) classify each item so that informed decisions can be made as to whether the item is a target of interest (TOI), which should be removed, or a non-TOI (non-explosive debris), which may be left in place."

WS #11: DQOs (cont'd)

Step 3: Identify information inputs:

- Up-to-date CSM
- Detection survey results
- Cued survey results
- Intrusive investigation results

WS #11: DQOs (cont'd)

Step 4: Specify the boundaries of the project:

- Spatial boundaries include both the horizontal area and vertical depth of the study
- Spatial boundaries consider any areas that are inaccessible for any reason
- Vertical boundaries consider the following:
  - ✓ maximum expected depth objects are buried
  - ✓ maximum predicted depth of future excavations
  - ✓ maximum depth at which sensors can collect meaningful data for specific munitions

WS #11: DQOs (cont'd)

Step 5: Develop the Data Collection and Analysis Approach (example):

"Geophysical data from advanced sensors will be interpreted with physics-based models to estimate the physical attributes of detected items, and classifier models will be used to evaluate the likelihood that the items are intact munitions. The final product will be a "ranked anomaly list" that classifies each item, justifies the classification, and identifies whether the item will be removed or left in place."

WS #12: Measurement Performance Criteria (MPCs)

Step 6: Specify Project-Specific MPCs necessary to achieve the DQOs

- MPCs are documented in WS #12
- MPCs guide development of the ***sample design***, including the ***technology*** and ***methods*** used for data collection
- Following data collection and reduction, MPCs are the criteria to which the data usability assessment (DUA) is conducted

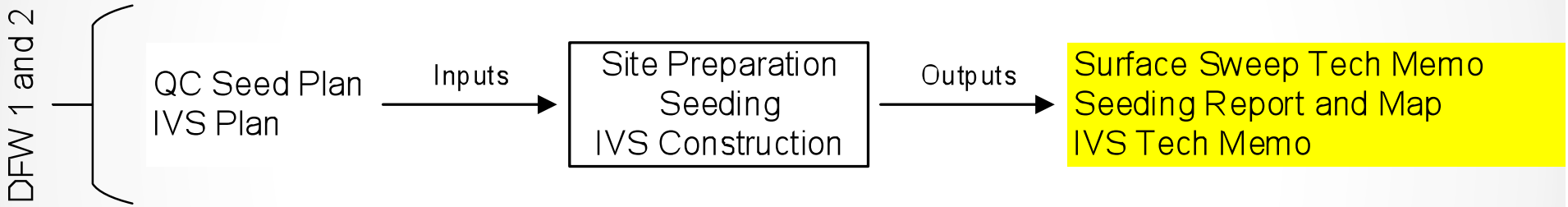
WS #17: Sample Design

Step 7: Use MPCs to develop the survey design and project work flow

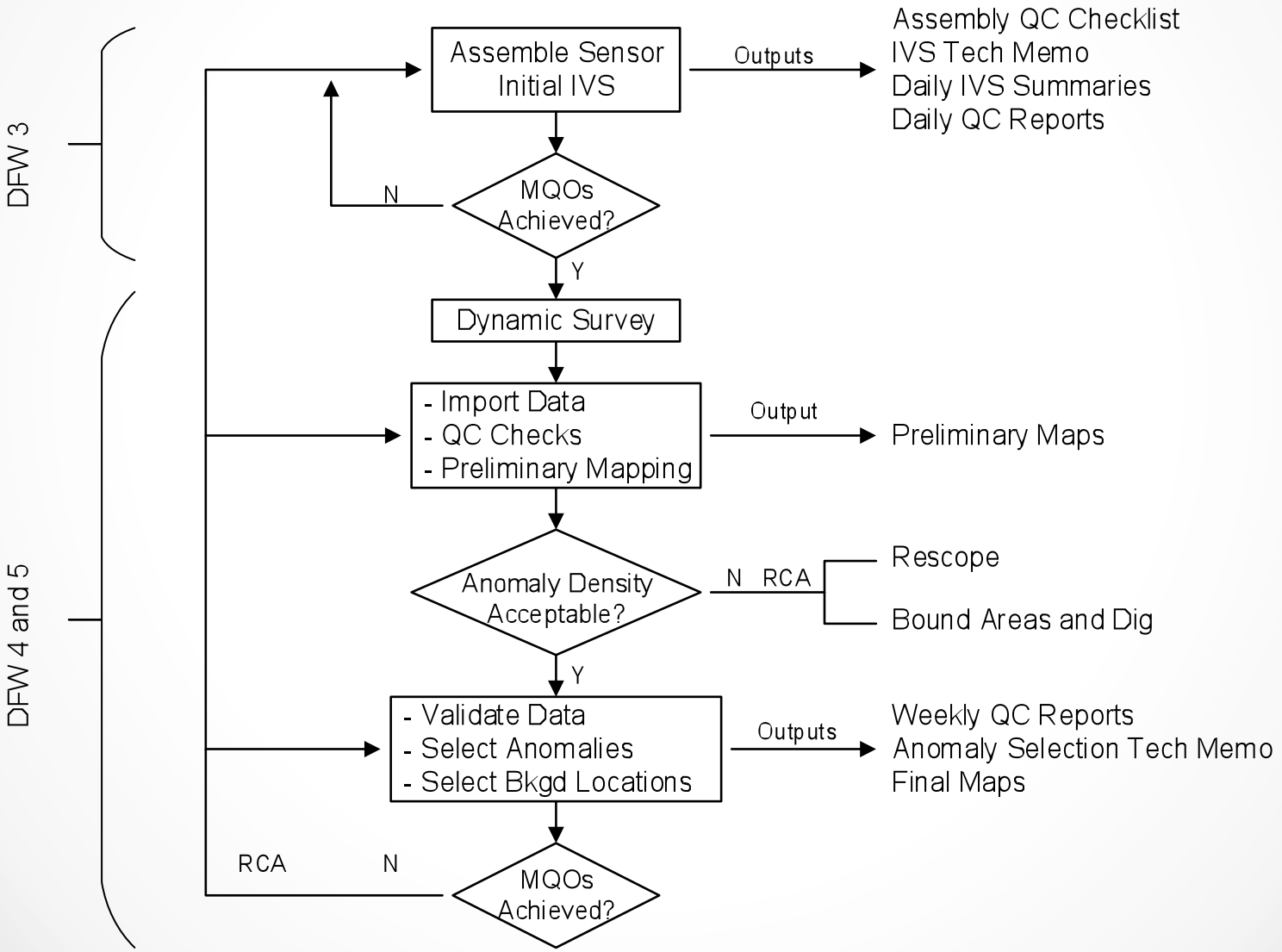
- The sample design is described and justified in WS #17
- Work flow diagram illustrates dynamic decision-making process
- Includes or references detailed procedures (SOPs, maps)
- Includes procedures to handle contingencies in the event field conditions are different than expected

Work Flow Diagram

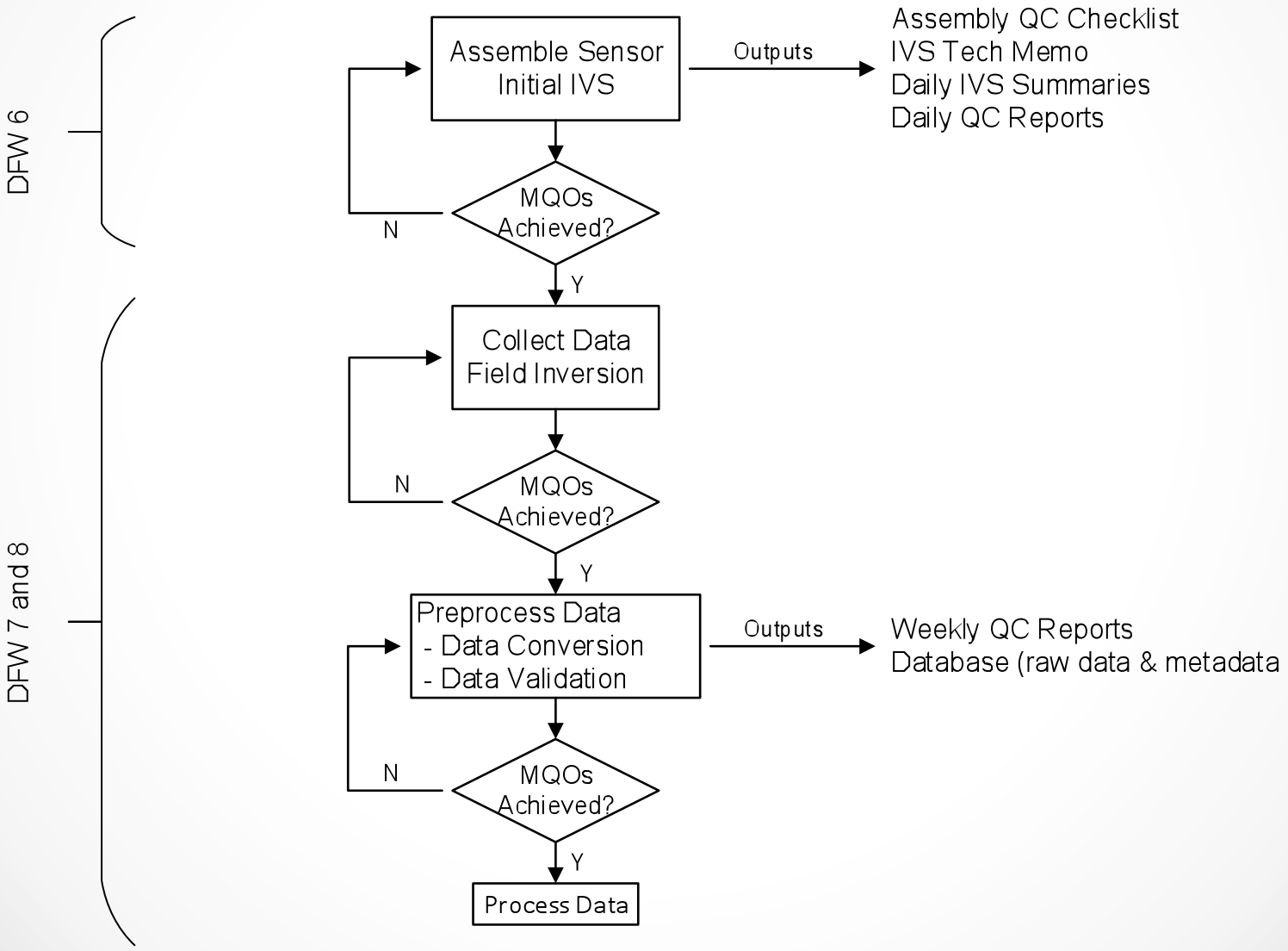
Preliminary Tasks



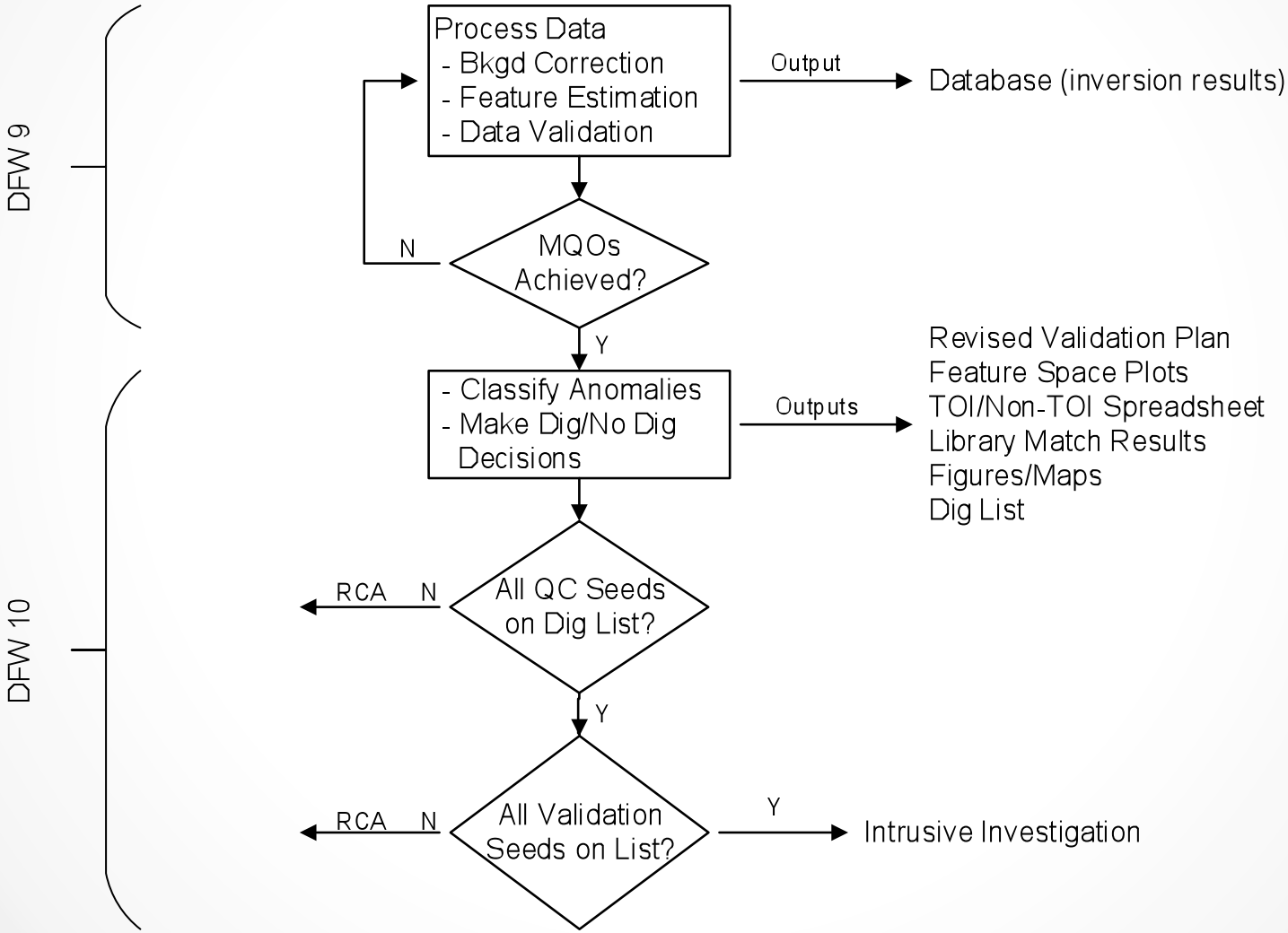
Anomaly Detection Survey



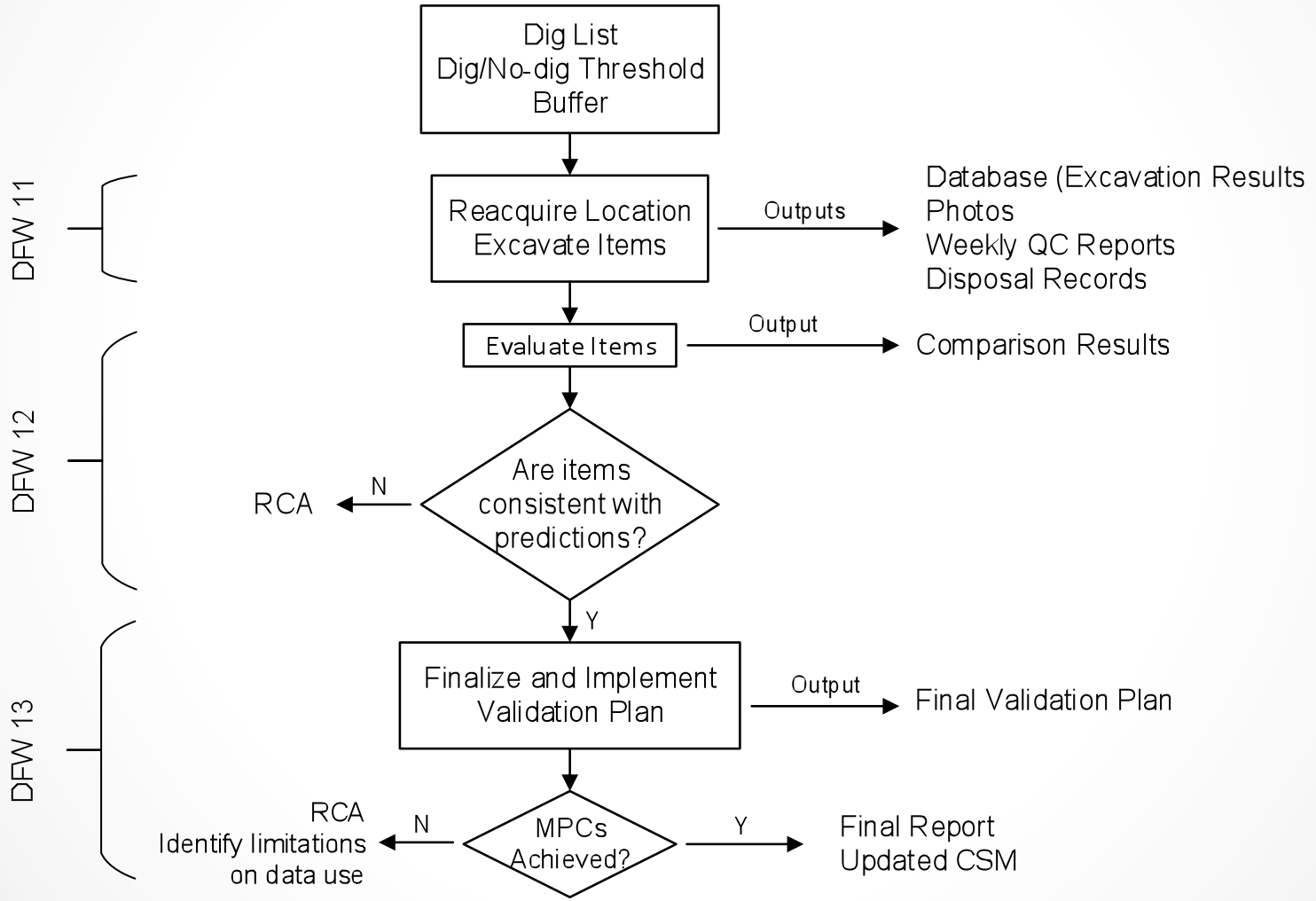
Cued Data Collection



Cued Data Analysis



Intrusive Investigation



WS 22: Equipment Testing, Inspection, & Quality Control (QC)

The project team develops specifications (measurement quality objectives or MQOs) necessary to satisfy the MPCs

- ✓ Describes the frequency and acceptance criteria for each MQO
- ✓ Describes actions that must be taken to correct the data collection process if the MQOs are not met
- ✓ Corrective action (if necessary) is implemented ***at each step, in the field***, before proceeding to the next step

Remaining Worksheets

WS #	Title
1&2	Title & Approval Page
3&5	Project Organization & QAPP Distribution
4,7&8	Personnel Qualifications & Sign-off
13	Secondary Data Uses & Limitations
14&16	Project Tasks & Schedule
29	Project Documents & Records
31,32&33	Assessments & Corrective Action
34	Data Verification and Validation Inputs
35	Data Verification Procedures
36	Data Validation Procedures
37	Data Usability Assessment

WS 34-37 Data Review

- Data Verification
  - ✓ Review for completeness
- Data Validation
  - ✓ Review for compliance with specified procedures
- Data Usability Assessment
  - ✓ Assess results against MPCs (WS 12) to determine whether data can be used as intended

Final Project Reports

- Narrative and timeline of project activities
- Summary of DQO development
- Reconciliation of project data with MPCs
- Summary of major problems encountered and their resolution
- Data summary, including tables, charts, and graphs
- Data usability assessment
- Updated CSM
- Conclusions and recommendations

Next Steps

2nd qtr FY15	Selected beta test site
3rd qtr FY15	Develop project-specific QAPP based on updated template
3rd- 4th qtr FY15	Conduct beta test, and revise template
1st qtr FY16	Conduct formal DoD review and finalize template

Conclusions

- The GCMR-QAPP template facilitates a systematic planning process
- Objectives and data quality requirements are determined up-front and documented in the QAPP
- The GCMR-QAPP template is a win-win for planning, review, and documentation

The bottom line: Confidence in decision-making, expedited cleanups, environmental protection, and wise resource allocation