



USACE-NAOC QUARTERLY M2G2 CALL

EMCX
May 2024



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AGENDA

1. EM 200-1-15 Interim Guidance – Important Changes and Overview
2. NAOC Questions about the New EM 200-1-15

IMPORTANT CHANGES AND OVERVIEW

Chapter 3 Site visits

- Not much is truly new

Chapter 4 Project documents

4.2 MR-QAPP Toolkit



4.3 Additional Planning Documents

4.4 Explosives Safety Plan

4.5 Environmental Protection Plan

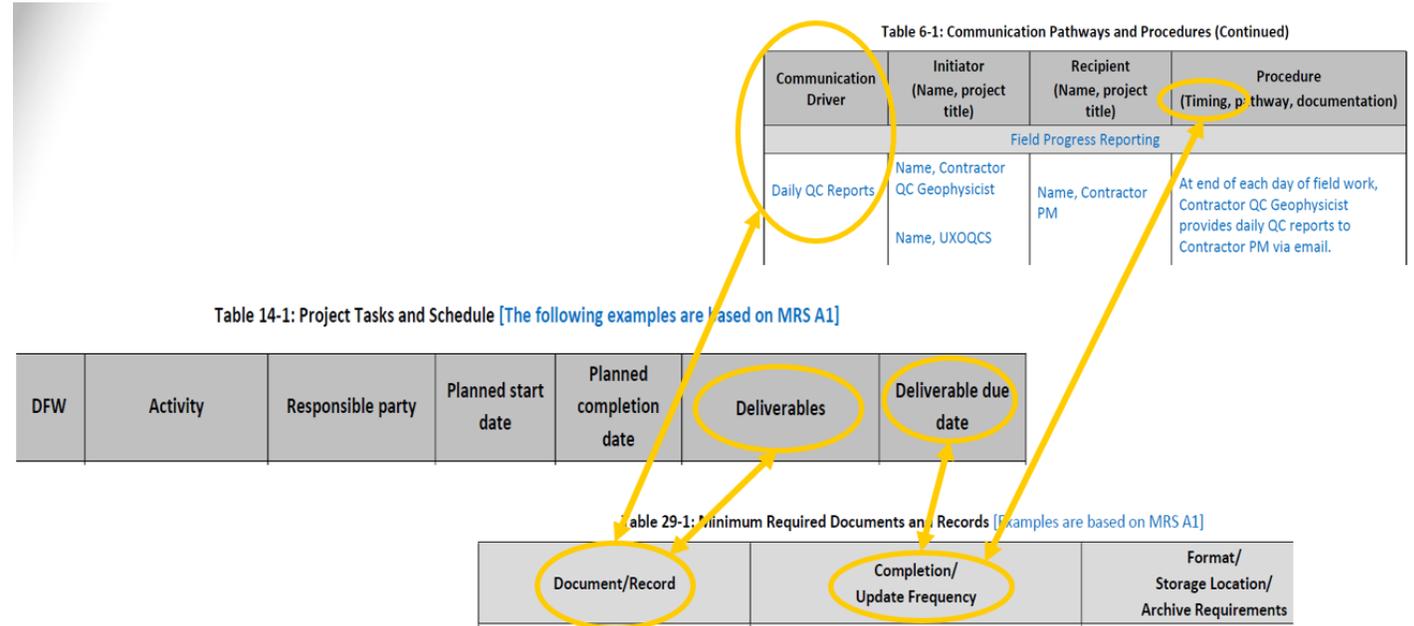
4.6 Property Management Plan

4.7 Standard Operating Procedures

4.8 Project Reporting Documents

NEW!
UPDATED!

NEW!





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IMPORTANT CHANGES AND OVERVIEW

5

Chapter 5, Geospatial data and systems

- Not a lot of change
- Not as disjointed as it had been
- Does require QA&QC of GDS in the Project QAPP

Chapter 6, Geophysical investigation considerations

- Quite a lot of change
 - All technology descriptions moved to Appendix E
 - IVS & ITS
 - Adds implementation topics and specifications not explicitly addressed in the MR-QAPPs to be included in SOPs
 - Adds guidance on SRAs
 - Adds AGC anomaly resolution guidance
 - Adds non-AGC DGM anomaly resolution guidance



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IMPORTANT CHANGES AND OVERVIEW

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Chapter 7, Munitions Constituents Characteristics, Analytical Methodologies, and Data Reporting

- Not much change

Chapter 9, Munitions constituents site characterization

- Some change → ISM and environmental statistics (for chemicals in the environment)

Chapter 8, Strategies for RI Characterization of MEC

- A lot of change
 - CSM profiles align with EM 200-1-12
 - Overall characterization aligns with, and gives expanded guidance on many MR-QAPP TK #1 topics
 - VSP planning and analysis parameters
 - Identifying HD areas as HUAs
 - HUA characterization
 - Drawing HUA boundaries
 - Estimating vertical MEC distributions
 - Mapping bedrock (when it is needed)
 - Designating LUAs
 - Designating NEU areas when it's worth pursuing to achieve the project goals
 - RI DUA
 - RI report format in Appendix H



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IMPORTANT CHANGES AND OVERVIEW

Chapter 10, Baseline risk assessment for MEC and MC

- MEC risk assessment is all new
 - Aligned with OSD's RMM guidance

Chapter 11, Feasibility study for munitions response

- MEC FS guidance is all new
 - RAO guidance and formats
 - 7 General Response Actions (GRAs)
 - Aligns alternatives development with EPA FS guidance
 - RAO→GRAs→Technologies/GRA→Build Alternatives
 - Aligns alternatives analysis with EPA FS guidance
 - FS report format in Appendix I

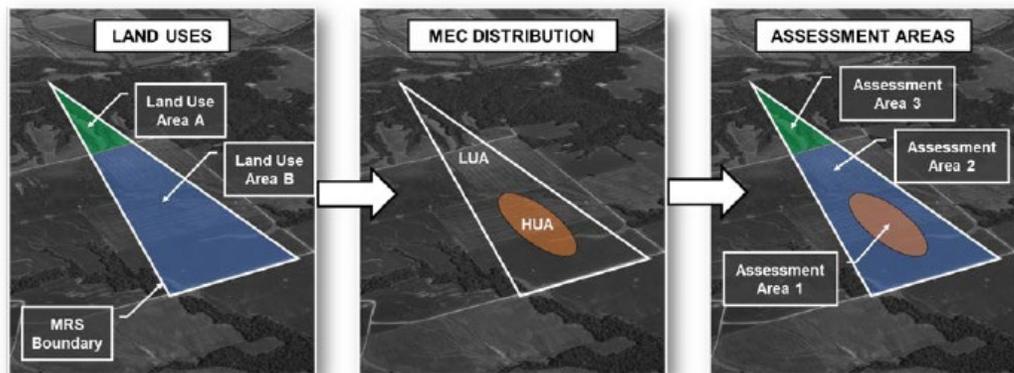


Figure 10-2. Assessment area development example



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IMPORTANT CHANGES AND OVERVIEW

8

Chapter 12, Planning strategies to search and recover MEC for remedial or removal actions

- ROD (or Action Memo) is the starting point
- Purpose is to implement the selected remedy
- Removals focus on showing we searched a volume of soil
- Identifies MPCs for sifting
- Remedial Action Completion Report format in Appendix D.

Chapter 13, Munitions constituents planning considerations for remedial or removal actions

- Not a lot of change



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IMPORTANT CHANGES AND OVERVIEW

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Chapter 14, Quality control and quality assurance for munitions response

- Some notable changes
 - Seeding is clarified for all methods & response phases
 - QC tables align with MR-QAPP TK
 - Adds some performance requirements in the QC tables that are not in the MR-QAPP TK
 - “New & Improved” application notes to the QC tables
 - Introduces statistical sampling of resolved anomaly locations for non-AGC DGM and analog methods in Table 14-7

Some of the things that haven't changed

- Uncommon equipment, or non-standard uses of common equipment require MQOs (and SOPs)
- Factoring for measurement errors in defining anomaly selection thresholds
- Analyses of background geophysical noise
- Managing false-positives (all the varieties)
- The need for an Institutional Analysis
- Surface removals require seeding

On to the Q&A



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TOPICS

1. How do we reconcile the fact that small arms ammunitions are military munitions and evidence of past military use of the land with EM 200-1-15 which declares that the use of small arms only (pdf page 115 last sentence and pdf page 117, 4th bullet) does not provide sufficient justification/evidence for designating an LD area or an HD area determined to be not related to MEC as an LUA? It appears that we are making a clear break between small arms ammunition and larger munitions and explosives of concern (MEC). Recommend that in both this document and the MR QAPP Module 1 that (1) this differentiation be clearly spelled out early in the documents, and (2) the documents be searched for the word "munition" and replaced with "MEC" wherever appropriate (e.g. MR QAPP Module 1 Page 13 of 148 "NEU: No-evidence-of-use area: 1) LD area for which the CSM contains no evidence munitions were MEC was used in the area, or 2) HD area determined to be not related to munitions MEC use.").

- Yes, a clear break was made many years ago (either at the USACE-, Army- or OSD-level) between small arms ammunitions and MEC.
- 8-5a(4) & 8-5n(2)(a) , “Small arms ammunitions use **by itself** will not qualify for designating an [HD area as an HUA][LD area as a LUA] for MEC.”
- The context of section 8-5n(2)(a) sits within the bigger picture of identifying MEC exposure pathways for the MEC risk assessment, which is a primary purpose of designating areas as HUA, LUA and NEU.
- Good observation. The suggestion is added to the errata list.



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TOPICS

1. This guidance is to be used moving forward on contracts where EM 200-1-15 [February 2024] is specified and not retroactively, correct?

It is up to the USACE PDTs to determine if it is appropriate to modify existing TOs to require the new guidance

Some bonus suggestions:

- Specific to the QASP: The government can (and should) use current guidance to strengthen its QASPs in response to contractor's RCAs at any time during the lifecycle of the project.
- Specific to MQOs: The now obsolete EM (2018) requires task-, instrument, deployment-specific quality checks. QC is not limited to what's in Tables 11-3 through 11-6.
 - “The PDT should explicitly define all data quality requirements.”
 - “Once [the critical components of the geophysical systems] and their failure modes have been identified, the PDT technical personnel will develop QC methods and measures (or tests) to ensure or demonstrate that the processes, as used by the contractor, achieve project objectives and produce good data. The QC tests and their related failure criteria must be designed specifically to test one or more key procedures or subsystems”
 - The IGD EM can help a lot.
- Specific to the FS: If your contract, task order, Project QAPP, etc. references the 1988 EPA guidance on RI/FS, then the IGD EM will help a lot.



DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS
441 G STREET, NW
WASHINGTON, DC 20314-1000

CEMP-CED (420-1dd)

19 April 2024

MEMORANDUM FOR SEE DISTRIBUTION

SUBJECT: Implementation of Formerly Used Defense Sites (FUDS) Interim Guidance Document (IGD) – Engineer Manual 200-1-15 Technical Guidance for Military Munitions Response Actions for Current Task Orders

1. CEMP-CED Memorandum, Subject: Formerly Used Defense Sites (FUDS) Interim Guidance Document (IGD) – Engineer Manual 200-1-15 Technical Guidance for Military Munitions Response Actions, dated 27 February 2024, was issued, awaiting publication of the revised EM 200-1-15. This interim guidance is applicable to all USACE elements engaged in munitions response activities and supersedes guidance in EM 200-1-15, dated 30 October 2018. Moving forward, all new contracts should reference this guidance. Please update new performance work statements (PWS) accordingly.
2. We request that project delivery teams (PDT) consult their PWS and contracting staff regarding implementation of this guidance on current task orders. Some elements of the guidance, such as remedial action objective formats (Chapter 11) and report templates (Appendices D, H, and I) may be straightforward to implement on existing contracts with little to no impact on the project. Other parts, such as guidelines for additional strategic project planning meetings (Chapter 2) and quality assurance/quality control (Chapter 14), may be more challenging to incorporate if there is already an approved Munitions Response Quality Assurance Project Plan, or the project is already in the field. Military Munitions Design Centers and PDTs should use their discretion to determine when current task orders will be modified to implement elements of this guidance, while maintaining USACE's and the FUDS program's high standards of quality.
3. For additional information, please contact Ms. Nicole Toth, M2S2 Action Officer at (202) 761-7768 or Nicole.L.Toth@usace.army.mil.

Encl

LARA E. BEASLEY
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(CONT)



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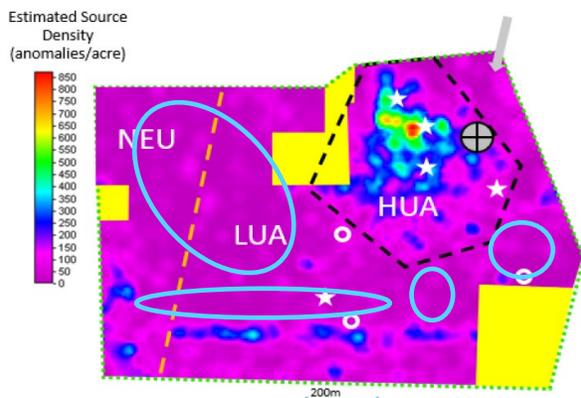
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TOPICS

1. There is a lot of discussion in the document about how to use background density in VSP, but no clear instruction on how to determine background. How do you determine background density? Will this be provided in the CSM?

– See September 2023 CX presentation given to NAOC for additional details

- Background in terms of ApA is a *range*, not a number
 - It has a mean and a standard deviation
 - See 8-2b(1)
- Geostatistical analysis can be used
 - VSP
 - ArcGIS
- Sometimes you know it when you see it
 - Be careful about the color scale you use
- Some things to consider
 - Go outside the MRS or MRA
 - Choose your polygons wisely



Background ApA

- Mean: 42
- Standard Deviation: 23
- Upper bound: 111 (mean+3 x StdDev)

A reasonable critical density to use*

- 134 ApA (mean +4 x StdDev)

A reasonable HUA boundary density to use*

- Between 111 and 134 ApA

*assumes Normal distribution

Range	Expected fraction of population inside range	Expected fraction of population outside range	Approx. expected frequency outside range
$\mu \pm 0.5\sigma$	0.382924922548026	6.171E-01 = 61.71 %	3 in 5
$\mu \pm \sigma$	0.682689492137086	3.173E-01 = 31.73 %	1 in 3
$\mu \pm 1.5\sigma$	0.866385597462284	1.336E-01 = 13.36 %	2 in 15
$\mu \pm 2\sigma$	0.954499736103642	4.550E-02 = 4.550 %	1 in 22
$\mu \pm 2.5\sigma$	0.987580669348448	1.242E-02 = 1.242 %	1 in 81
$\mu \pm 3\sigma$	0.997300203936740	2.700E-03 = 0.270 % = 2.700 ‰	1 in 370
$\mu \pm 3.5\sigma$	0.999534741841929	4.653E-04 = 0.04653 % = 465.3 ppm	1 in 2149
$\mu \pm 4\sigma$	0.999936657516334	6.334E-05 = 63.34 ppm	1 in 15787
$\mu \pm 4.5\sigma$	0.999993204653751	6.795E-06 = 6.795 ppm	1 in 147160

veries
JA

- = High Use Area
- = Low Use Area
- = No Evidence of User area
- = Bomb target location depicted in archives documents
- = Bombing approach described in archives documents



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TOPICS

1. Does intrusive work require its own DUA or can it go into the final DUA?

It depends!

- Generally speaking: Yes it requires its own DUA, and No it shouldn't show-up for the first time in the Final DUA.
 - The Final DUA is for the entire project and will normally occur after demobilization
- If tied to the Final DUA then you're rollin' the dice



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TOPICS

1. Table 14-1 mentions “After excavations, return with original detection system, to original interpreted location and confirm no anomalies remain” but no mention of how often this needs to be performed or if an alternate system can be used in the case of a towed array.
 - Good observation. The suggestion is added to the errata list.
 - That is just one of three examples
 - AGC anomaly resolution (6-11b(1))
 - At the discretion of the PDT (must be in the Project QAPP)
 - Non-AGC DGM anomaly resolution (6-11b(2)) “The anomaly resolution process must include an inspection to confirm that the full areal extent of the anomaly was searched and excavated such that no response above the anomaly selection threshold remains within the entire footprint.”
 - *That’s for each anomaly*
 - Note that 6-11b(2) allows, “The inspection is performed with the same instrument, or one that exceeds the original detection instrument’s performance”



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TOPICS

1. Table 14-4 states “For AGC instruments the required line spacing is the line spacing demonstrated through the AGC instrument’s validation” but most firms erred on the conservative side during the demonstration of capabilities.

Noted.

- Line spacing plays a huge role in overall performance



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TOPICS

1. Are equipment manufacturers being required to generate software that displays current and battery voltage if these are required MQOs?

Either display/record

Or have hardwired to mechanism to stop working is below a given voltage



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TOPICS

1. Table 14-5 states “It is the contractor’s responsibility to not put metallic, ferrous or conductive material back in the excavated hole” but this seems at odds with the goals of AGC to just remove TOI and the requirement to return to excavations with the original instrument.

Please see 6-11b(1) for AGC anomaly resolution and 6-11b(2) for non-AGC DGM anomaly resolution
Also note that *application note c* is specific to non-AGC DGM in Table 14-5



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TOPICS

1. In situations where the “classification logic” [for missed QC seeds] needs to be adjusted, as specified in Section 14-3, will there be a mechanism in place in future contracts to compensate the contractor for this change?

It depends!

- Corrective action is the result of unforeseeable site conditions that precipitated the failure: I hope so
- Otherwise: probably not



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TOPICS

1. Table 14-10 says Data Usability Seeds can be counted as QC seeds. Is the failure response expected to be the same as a QC seed?

Yes

- The CA is likely to be different



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TOPICS

1. If a third party places a Data Usability Seed, does that make it a validation/QA seed?

No, Data Usability Seeds are Data Usability Seeds and are different from validation seeds

- From Table 14-8
 - QA or Validation Seed – Performance: Purpose is to Assess performance of the process used to detect and recover MEC.
 - Data Usability Seed – Assess performance of the detection method in the presence of interference sources.
- See Tables 14-8 through 14-11 for more details



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TOPICS

1. Do internal RCAs need to be approved by the QA Geophysicist or only provided to them?

Depends on QMS and contract

- Should provide all RCA for approval when it could affect meeting an MPC (RA PWS template may attempt to address this)
- Not needed when just administrative



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TOPICS

- EM 200-1-15 includes a requirement for the IVS memorandum to include average amplitude peak responses for IVS seeds (non-AGC). I do not see a performance requirement related to repeatability of sensor response at the IVS. What is the purpose of requiring average amplitude peak responses in the IVS memorandum?

See Table 14-2

Table 14-2

Performance requirements for GSV activities using DGM and for seeding of analog methods

Requirement	Applicability (Specific to Collection Method/Use)	Performance Standard	Frequency	Responsible Person/Reporting Method/Verified By:	Consequence of Failure
Construct IVS: Verify as-built IVS against design plan	DGM	Small ISO seed items buried at 15cm; All seeds buried horizontally in the cross-track orientation	Once following IVS construction	Project Geophysicist/ IVS Technical Memorandum/ Lead Organization	RCA/CA: Make necessary changes to seeded items and re-verify
Construct ITS: Verify as-built ITS against design plan	Analog	All seeds buried per Project QAPP ITS construction specifications ^a	Once following ITS construction	Project Geophysicist/ ITS Technical Memorandum/ Lead Organization	RCA/CA: Make necessary changes to seeded items and re-verify
Verify correct assembly (All sensors)	DGM & analog	As specified in Assembly Checklist	Once following assembly	Field Team Leader/ Instrument Assembly Checklist/ Project Geophysicist	RCA/CA: Make necessary adjustments and re-verify
Seed Detection/Recovery	DGM over IVS	Each sensor passes over an IVS line	Beginning and end of each day	Project Geophysicist/ QC Summary/QC Geophysicist	RCA/CA
	DGM IVS seed location interpretations	Derived positions of IVS seed(s) within 25cm of ground truth ^b	Each IVS seed analysis	Project Geophysicist/ QC Summary/QC Geophysicist	RCA/CA
	AGC IVS seed anomaly interpretations	Library match metric ≥ 0.9	Each IVS seed analysis	Project Geophysicist/ QC Summary/ QC Geophysicist	RCA/CA
	Non-AGC DGM IVS seed anomaly interpretations	Peak response >75% of minimum predicted response ^c	Each IVS seed analysis	Project Geophysicist/QC Summary/QC Geophysicist	RCA/CA



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TOPICS

1. One IVS memorandum requirement is to establish expected blind QC seed minimum responses for all critical target selection parameters. Why would this be in the IVS memorandum and not the QAPP or QC Seed Plan? The IVS memorandum is often completed at the start of a field project under a tight delivery schedule when the attention of senior geophysicists would be more effectively directed to starting the project with the best data quality rather than including arbitrary information in the IVS memorandum.

Excellent observation.

Not sure how to respond...

Maybe thusly:

- That is definitely old-speak harkening back to the good ole GPO days
- If already in the Project QAPP then great (just point to it in the memo and add that you “confirmed”, instead of “established”, the expected minimum responses)
- I don’t think this belongs in the QC Seed Plan



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TOPICS

1. The term IOC is defined at the beginning of chapter 6, including the text “IOCs are documented in the CSM as potentially present at the site and include site specific munitions that may be UXO or DMM as well as munitions constituents that are hazardous pollutants or contaminants.” MR-QAPP module 2 includes in black text an MPC requiring “Site-specific library must include representative signatures for all items considered by the project team to be IOC as listed in the CSM.” Are contractors expected to modify the black text for projects that include munitions constituents in the CSM as IOCs?

Most excellent observation.

- Our lawyers made us write that
- If it's not in the CSM then no changes needed
- If it's in the CSM we're not using AGC to find it



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TOPICS

1. Please discuss the requirement for AGC Background Locations for dynamic and cued AGC in table 14-4. “A TOI [type/depth based on project objectives] synthetically seeded in the ongoing background, and background corrected using the initial background measurement results in polarizabilities with a library match of >0.9 ”. This requirement was discussed extensively for the MR-QAPP module 2 with many contractors arguing that this is not achievable due to sensor drift between the original background measurement and the ongoing background measurement. Why was this requirement removed from the MR-QAPP module 2, but is included in EM 200-1-15? Also, how is this requirement implemented for dynamic AGC?

That’s because we’re [choose one: “~~smarter than~~”, “dumber than”] the IDQTF

.....do we have smarter answer? Yes: added to the errata list to be deleted



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TOPICS

1. Please discuss the statement in 14-2 c “The requirements in Tables 14-2 through 14-6 are to be used together with the MR QAPP Toolkit, and as such, all MQOs in the MR QAPP Toolkit that are applicable to the methods being used, but are not specifically included in the tables, need to be included in the Project QAPP.” Are there MQOs in the MR QAPP Toolkit that are not specifically included in the tables? It is unclear if some of the performance requirements that are in tables 14-2 through 14-6 but not in the MR-QAPP need to be in project QAPPs. If so, why were they not included in the MR-QAPP toolkits?
 - Yes all relevant MR-QAPP Toolkit MQOs and all relevant IGD EM performance requirements (aka MQOs) need to be in your Project QAPP WS #22
 - Yes there are at least five not in the IGD EM (see Table 22-1 for below examples)
 - Survey loop closure
 - Dynamic noise assessment
 - Verification of Target Selection (non-AGC DGM)
 - Verification of leveling (non-AGC DGM)
 - Verification of leveling (amplitude suppression) (non-AGC DGM)
 - This is somewhat a consequence of both documents being developed during the same time period
 - That language allows us to include everything we need whether it originates from current or future revisions to the MR-QAPP Toolkit or the IGD EM



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TOPICS

1. For complex seed scenarios, are 2-4 per system per week (0.4-0.8 per system per day) required? If a complex seed scenario is not classified as a TOI or included on the dig list, is this considered a failure requiring corrections, or is it simply providing information for the data usability assessment? Are AGC systems expected to achieve the same reliable classification depth for complex seed scenarios as they do for isolated seed items? Please explain the guidance for depth, “Depth distribution profile mimics that anticipated for MEC”. If MEC has only been found at shallow depths < 10 cm but the reliable classification depth for isolated items is 30 cm, should complex seed scenarios not be buried below 10 cm?

- “... is this considered a failure requiring corrections, or is it simply providing information for the data usability assessment? Yes, it is a failure. No, it is not simply providing data for the DUA

Are AGC systems expected to achieve the same reliable classification depth for complex seed scenarios as they do for isolated seed items? That is unlikely.
Develop a plan to test the detection and classification depth capabilities for complex seed scenarios.

The IGD EM makes a clear distinction between ‘depth distribution anticipated for MEC’ vs. ‘MEC has only been found to x depth’; 8-5I, “For the limited investigation conducted during an RI, the maximum recovered depths of MEC or MD are not reliable indicators of potential maximum MEC depth.”

THANK YOU



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