Civilian Radioactive Waste Management System

Management & Operating Contractor

QA: L

MOL.19981016.0121

QUALITY ADMINISTRATIVE PROCEDURE

Title:	**CLASSIFICATION OF PERMANENT ITEMS**
Procedure Number:	**QAP-2-3**
Revision:	**9**
Effective Date:	**07/20/98**
Author:	**D.W. Gwyn**
Responsible Manager:	**E.P. Stroupe**

Approvals:

for E.P. Stroupe — 7/10/98

Manager, Responsible Organization — Approval Date

7/15/98

General Manager, CRWMS M&O — Approval Date

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CHANGE HISTORY

Rev/Change Number	Effective Date	Description and Reason for Change
0	None	Initial Version not issued
1	None	Procedure in external review
2	None	Procedure in external review
3	None	Procedure in external review
4	Canceled	The classification checklist for the MGDS was revised. The footnote in class 1 for the MGDS was added and the criteria for class 2 and 4 were revised. The definition of Class 1 was revised to reflect the definitions in the 10 CFR requirements. The actions for generation of the Q-list were rewritten. The MC list was added to provide the mechanism for determining if an item that is not on the Q-list has been evaluated. The guidance for determining activities affecting quality were moved to QAP-2-0.
5	10/30/93	No changes were performed for revision 5. Revision 4 was canceled prior to its effective date. Revision 5 was issued with a new effective date.
5/P01	01/12/94	All references to 10 CFR Part 50 were removed because Part 50 is not part of the OCRWM program. All references to temporary items were deleted. The baseline change control process was deleted because it was redundant to the requirements of QAP-3-9.

CHANGE HISTORY (Continued)

Rev/Change Number	Effective Date	Description and Reason for Change
		In attachment I, "restricted" was changed to "unrestricted" to be more definitive about the actual boundary that must be considered. Attachment III was changed to checklist for transportation issues. The checked by and approved by fields were deleted from attachment III (now attachment IV) because they were redundant to QAP-3-9.
6	02/15/94	Formalize expedited PCN (R05/P01). Incorporate QRB minor comments and two mandatory comments on classification of permanent items and use of QAP-3-9 for preparation of analyses.
6/P01	03/29/94	Changes in response to OCRWM QA comments. Revised classification. Added discussion of iterative preparation of classification analysis. Clarified responsibilities of users of classification analyses.
6/P02	06/29/94	Deleted Section 5.1.4; added clarification note 3 under procedure Section 5.1.3.F. Added lifetime QA records requirements under procedure Section 6, RECORDS, as required by QAP-5-1. Deleted requirements presented in step 2.3, page 2 of Attachment I. Deleted the word "construction" from step 2.2 and (new) 2.3, page 2 of Attachment I.
7	01/31/95	Responded to CAR HQ-94-016. Substituted "certified" for "licensed" as regards Transportation items. Added requirement to include appropriate QA representative in review of classification analysis.

CHANGE HISTORY (Continued)

Rev/Change Number	Effective Date	Description and Reason for Change
		Added section for incorporating external participants' Q-List information.
		Deleted Attachment IV.
		Deleted "or use" from QA-1 and -2 classification criteria (Att. I).
8	06/16/97	System Engineer Manager, WAST, was replaced with Waste Management and Integration Manager. Department Manager replaced with Responsible Manager.
		WAST Q-List was replaced with "new" or "other" Q-Lists.
		Incorporated definitions and requirements of January 3, 1997, revision of 10 CFR 60 in procedure and checklist attachments.
		Requirement for QA organization reviews deleted.
		Requirement for inclusion of checklist revised.
		Deleted reference to MC-List.
		Changed MGDS Q-List submittal process to address requirements of YAP-2.7Q.
		Minor changes to Attachment I and II QA class 4 and Attachment II QA class 7.
9	07/20/98	Moved several questions from the checklist for MGDS QA Class 2 to QA Class 5.
		Revised wording in QA Class 3 checklist questions.
		Provided clarified wording in checklist for QA Class 4.

CHANGE HISTORY (Continued)

Rev/Change Number	Effective Date	Description and Reason for Change
		Clarified wording in checklist for QA Class 5 to match definition in QARD.
		Deleted QA Class 6 and QA Class 7.
		Changed title of organization manager responsible for this procedure due to reorganization.

1. PURPOSE

The purpose of this procedure is to define the process for classifying permanent items subject to the requirements of the *Quality Assurance Requirements and Description*, DOE/RW-0333P. This procedure defines the process for the development of and revision to the *Q-List*, YMP/90-55Q, to be referred to in this procedure as the Mined Geologic Disposal System (MGDS) *Q-List*, and other Q-Lists, as required, by the Civilian Radioactive Waste Management System Program.

2. SCOPE

This procedure applies to individuals responsible for classifying permanent items subject to *Quality Assurance Requirements and Description* requirements. Permanent items characterized or developed under the Civilian Radioactive Waste Management System Management and Operating contract, the development of and revision to the MGDS *Q-List*, and other Q-Lists are subject to this procedure.

NOTE: This revision of QAP-2-3 removes items required for physical protection (as defined by 10 CFR 73) and items required to control occupational radiological exposure from the Q-List. Until these items are removed from the applicable Q-Lists, they will continue to be controlled via existing Q-List QA requirements.

3. APPLICABLE DEFINITIONS

3.1 Barrier–Any material or structure that prevents or substantially delays movement of water or radionuclides (10 Code of Federal Regulations [CFR] 60, *Disposal of High-Level Radioactive Wastes in Geologic Repositories*, Section 2).

3.2 Classification Analysis–A design analysis, prepared in accordance with QAP-3-9, *Design Analysis*, that documents evaluation of the criteria from the classification checklists in this procedure. The results of the analysis establish the importance of systems, structures, or components (SSCs), per the classifications defined in Subsection 3.3.

3.3 Classifications:

Classification 1 - Important to Radiological Safety

A. With reference to MGDS SSCs, those engineered features of the repository whose function is: (1) to provide reasonable assurance that high-level waste can be received, handled, packaged, stored, emplaced, and retrieved without exceeding the requirements of 10 CFR 60.111(a) for Category 1 design basis events; or (2) to prevent or mitigate Category 2 design basis events that could result in doses equal to or greater than the values specified in 10 CFR 60.136 to any individual located on or beyond any point on the boundary of the preclosure controlled area;

B. As defined by 10 CFR 72, *Licensing Requirements for the Independent Storage of Spent Nuclear Fuel and High-Level Radioactive Waste*, those SSCs for storage whose function is:

1. to maintain the conditions required to store spent fuel safely;

2. to prevent damage to the spent fuel during handling and storage; or

3. to provide reasonable assurance that spent fuel can be received, handled, packaged, stored, and retrieved without undue risk to the health and safety of the public; and

C. For Transportation, those items identified by the requirements of 10 CFR 71, *Packaging and Transportation of Radioactive Material*, that prevent or mitigate the effects of an accident resulting in a radiological release.

Classification 2 - Important to Waste Isolation–Those engineered and natural barriers that are relied upon for achieving the postclosure performance objectives in 10 CFR 60, Subpart E, *Technical Criteria*.

Classification 3 - Important to Radioactive Waste Control–Those items associated with the control and management of site-generated liquid, gaseous, and solid radioactive waste. This does not include spent nuclear fuel or high-level waste forms.

Classification 4 - Important to Fire Protection–Those items whose function is required to detect, control, or extinguish a fire that could impact the radiological safety or waste isolation functions of Classification 1 and 2 SSCs.

Classification 5 - Important to Potential Interaction–Those items not intended to perform a radiological safety or waste isolation function, but whose consequential failure during a design basis event could impair the capability of other items to perform their intended radiological safety or waste isolation function.

NOTE: The classification numbers do not imply an order of importance.

3.4 **Controlled Area**–In accordance with 10 CFR 72, the area surrounding the interim storage facility for which the U.S. Department of Energy (DOE) has authority to control its use.

3.5 **Conventional Quality**–Not meeting any of the criteria of any classification in Attachments I, II, or III. Program management controls are applied to ensure a level of quality commensurate with regulatory requirements, industry standards, local codes, and good engineering practices.

3.6 **Category 1 Design Basis Events**–Those natural and human-induced events that are reasonably likely to occur regularly, moderately frequently, or one or more times before permanent closure of the geologic repository operations area.

3.7 **Category 2 Design Basis Events**–Other natural and man-induced events that are considered unlikely, but sufficiently credible prior to permanent closure of the geologic repository operations area to warrant consideration, taking into account the potential for significant radiological impacts on public health and safety.

NOTE: Credibility is established in the analyses in support of this procedure. A nominal probability of 10^{-6} Design Basis Events per year has been established for the MGDS (except for seismic events). In cases where data are limited, however, engineering judgment and conservative bounding assumptions will be required as described in NUREG-1318, *Technical Position on Items and Activities in the High-Level Waste Geologic Repository Program Subject to Quality Assurance Requirements.*

3.8 **Permanent Items**–Those SSCs, including the natural barrier at MGDS, that will be part of a licensed facility or system.

3.9 **Preclosure Controlled Area**–In accordance with 10 CFR 60, that surface area surrounding the geologic repository operations area for which the licensee exercises authority over its use until permanent closure has been completed.

3.10 **Q-Lists**–One or more lists controlled by DOE consisting of permanent items determined by analysis to be subject to mandatory quality assurance (QA) requirements.

4. RESPONSIBILITIES

4.1 The Manager, MGDS System Engineering and Integration Office, is responsible for the preparation and maintenance of this procedure.

4.2 The following have responsibilities for implementing this procedure:

A. MGDS System Engineering and Integration Office Manager
B. Manager, Waste Management and Integration Systems Engineering and Integration
C. Responsible Manager

5. PROCEDURE

If an individual is performing work that is subject to this procedure and cannot accomplish that work in full compliance with this procedure, the individual shall suspend work and shall resume work only after this procedure has been revised to correct the affected work practices. Process steps applicable to the given activity are to be accomplished sequentially unless otherwise indicated.

5.0 PROCESS OUTLINE

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5.1 CLASSIFICATION PROCESS

5.1.1 The **Manager, MGDS System Engineering and Integration Office**, shall ensure that any recommended changes to the MGDS *Q-List* are created based on evaluation of permanent items per Subsection 5.1.3.

5.1.2 The **Manager, Waste Management and Integration Systems Engineering and Integration (or designated responsible manager)** shall ensure that any new Q-Lists or changes to these Q-Lists are created based on evaluations performed per Subsection 5.1.3.

5.1.3 The **Responsible Manager** shall:

A. ensure that all permanent items identified throughout the design process are classified to ensure they are described in sufficient subsystem or component detail to allow for control of the items commensurate with their importance;

B. ensure an appropriate classification analysis has been prepared for an item prior to approval of any associated design output document (i.e., procurement specification, construction specification, or drawing) in accordance with QAP-3-9;

C. ensure that the classification analysis addresses the evaluation criteria from the appropriate checklist provided in Attachment I, II, and III, or alternate criteria approved by the MGDS System Engineering and Integration Office Manager or the Manager, Waste Management and Integration Systems Engineering and Integration, as appropriate, either within the analysis or as completed checklists attached to the analysis;

D. ensure that approval of alternate criteria, if used, is documented (e.g., by memorandum or concurrence of the analysis); and

NOTE: Attachment I is for SSCs to be licensed under 10 CFR 60. Attachment II is for SSCs to be licensed under 10 CFR 72. Attachment III is for SSCs to be certified under 10 CFR 71.

NOTE: For any permanent item not covered by the CFRs listed above, an analysis should be performed in accordance with QAP-3-9 to provide objective evidence that the item is either classified as conventional quality or is

subject to mandatory quality assurance requirements in accordance with the requirements of another regulation.

E. ensure that, upon approval of the analysis (in accordance with QAP-3-9), controlled distribution of the analysis under AP-6.1Q, *Distribution, Maintenance, and Use of Controlled and Managed Documents*, includes, as a minimum, affected organizations.

NOTE: An item may have more than one classification, depending on its functions.

NOTE: The preparer responsible for performing the classification analysis should base the evaluation on best available design information. The preparer should work with the cognizant designer(s) or vendor(s) to collect and provide for updates of preliminary drawings and specifications as the design proceeds, in support of an iterative design-classification process. During verification of the final design outputs (i.e., drawings and specifications) which apply to the items evaluated by the classification analysis, the verifier of the design outputs is responsible for ensuring that the assumptions and methods used by the classification analyst are valid for the final design outputs. This responsibility extends to those responsible for preparing revisions or field changes to previously verified outputs as well.

5.2 DEVELOPMENT, REVISION, AND APPROVAL OF Q-LISTS

5.2.1 The **Responsible Manager** shall:

A. based on new or revised classification analyses, initiate a proposed Q-List or Q-List revision if an item's classification has been determined or changed as a result of the analyses;

B. review the proposed Q-List or revision to ensure it:

1. is organized in a logical fashion;

2. contains (as a minimum) the permanent item name and any identifier, QA classification, and reference to the classification analysis document identifier;

NOTE: The Q-List may also contain additional information, such as summary of basis, item description, and critical characteristics, at the request of DOE.

3. contains the permanent item name and any identifier, and reference to the classification analysis document identifier for conventional quality items (i.e., for those items evaluated in accordance with this procedure and determined to not meet QA classification criteria);

4. is consistent with the results of the classification analysis; and

C. forward the proposed revision to the appropriate manager.

5.2.2 The **MGDS System Engineering and Integration Office Manager** shall:

A. review the prepared MGDS *Q-List* revision for impact from other classification analyses; and

B. if acceptable, process the proposed *Q-List* revision in accordance with YAP-2.7Q, *Item Classification and Maintenance of the Q-List.*

5.2.3 The **Manager, Waste Management and Integration Systems Engineering and Integration (or designated responsible manager)** shall:

A. submit a recommendation for items to be placed on a Q-List, or revision thereof, to the appropriate DOE/Office of Civilian Radioactive Waste Management Manager;

B. after DOE approval of the recommended Q-List, or revision thereof, submit it for distribution in accordance with AP-6.1Q; and

C. submit the new or revised Q-List to the Records Processing Center.

5.3 INCORPORATION OF EXTERNAL Q-LIST INFORMATION

NOTE: External participants or vendors may provide Q-List information as a result of procurement actions through DOE.

5.3.1 Upon receipt of a Q-List developed by other participants or vendors (for items to be licensed or certified within a DOE project), the **MGDS System Engineering and Integration Office Manager**, or **the Manager, Waste Management and Integration Systems Engineering and Integration (or designated responsible manager)**, as appropriate, shall review the external Q-List information and process it as follows:

A. if the external Q-List is prepared under a DOE-approved QA program, process a revision to the respective Q-List in accordance with Subsection 5.2.1; or

B. if a classification analysis is deemed necessary, forward the external Q-List information to the appropriate design organization and instruct them to prepare a classification analysis in accordance with Subsection 5.1.

6. RECORDS

The following Lifetime QA records generated as a result of this procedure shall be collected, as applicable, and submitted to the Records Processing Center in accordance with AP-17.1Q, *Record Source Responsibilities for Inclusionary Records.*

6.1 Records to be assembled into a QA records package include:

QA: L: Classification analysis, including appropriate checklists in Attachment I, II, or III, if used in the analysis (submitted as a record in accordance with QAP-3-9)

Documentation of alternate criteria approval, if alternate criteria are used in the analysis (submitted as a record in accordance with QAP-3-9)

Documentation proposing any non-MGDS Q-List or revision thereto (per Subsection 5.2.3.A)

New non-MGDS Q-Lists or revision thereto (per Subsection 5.2.3.C)

QA: N: None

6.2 Individual QA records:

None

7. ATTACHMENTS

The attachments and forms listed below shall be used with this QAP. Revisions to any attachment shall be made only by revision to this QAP.

ATTACHMENT	TITLE
I	CLASSIFICATION CHECKLISTS FOR MGDS Important to Radiological Safety - Form 0168 (07/20/98) Important to Waste Isolation - Form 0169 (07/20/98) Important to Radioactive Waste Control - Form 0170 (07/20/98) Important to Fire Protection - Form 0171 (07/20/98) Important to Potential Interaction - Form 0172 (07/20/98)
II	CLASSIFICATION CHECKLISTS FOR STORAGE Important to Radiological Safety - Form 0175 (07/20/98) Important to Radioactive Waste Control - Form 0177 (07/20/98) Important to Fire Protection - Form 0178 (07/20/98) Important to Potential Interaction - Form 0179 (07/20/98)
III	CLASSIFICATION CHECKLISTS FOR TRANSPORTATION Important to Radiological Safety - Form 0441 (07/20/98)

CRWMS/M&O	QA Classification 1 **Important to Radiological Safety**	QA: L

Classification Checklists for MGDS Page 1 of 5

Name and Item Identifier: _____

Yes	No		
		1.1	*Is the item required:*
☐	☐	a.	To provide reasonable assurance that high-level waste can be received, handled, packaged, stored, emplaced, and retrieved without exceeding the requirements of 10 CFR 60.111(a) for Category 1 Design Basis Events (DBEs)?
☐	☐	b.	To prevent or mitigate Category 2 DBEs that could result in doses equal to or greater than the values specified in 10 CFR 60.136 to any individual located on or beyond any point on the boundary of the preclosure controlled area?
☐	☐	c.	To monitor and/or control the important-to-radiological-safety functions of QA Classification 1 SSCs?
☐	☐	d.	For the functioning of any equipment required to mitigate the effects of a Category 1 or 2 DBE as defined by the methods described in the analysis?
		1.2	*Can failure of the item:*
☐	☐	a.	Initiate a Category 1 or 2 DBE that would result in a dose equal to or greater than the values specified in 10 CFR 60.111(a) or 10 CFR 60.136, respectively?
☐	☐	b.	Directly cause a credible release of radioactive materials that would result in a dose greater than 10 CFR 60.111(a) or 10 CFR 60.136 limits?
☐	☐	*1.3*	Is the item a consumable/expendable item that is part of, or contained within, and directly effects the safety function of any component identified in Section 1.1 or 1.2 above?
☐	☐	*1.4*	Are there other factors, such as previous analyses or a body of consensus, that lead to the conclusion that the item is Important to Radiological Safety?

If the answer to any question in 1.1, 1.2, 1.3, or 1.4 is Yes, then the item is QA Classification 1.

CRWMS/M&O

QA Classification 2
Important to Waste Isolation

Classification Checklists for MGDS Page 2 of 5

Yes	No		
		2.1	*Does the item perform a waste isolation function by:*
☐	☐	a.	Forming part of the natural or engineered barrier subject to the requirements of 10 CFR 60.112 or 60.113.?
☐	☐	b.	Inhibiting water or radionuclide transport within the extent of the natural barrier (as indicated on the Q-list)?
☐	☐	c.	Preventing or discouraging human intrusion into the engineered or natural barrier?
☐	☐	d.	Inhibiting degredation of the engineered barrier?
☐	☐	*2.2*	Are there other factors, such as previous analyses or a body of consensus, that lead to the conclusion that the item is Important to Waste Isolation?

If the answer to any question in 2.1 or 2.2 is Yes, then the item is QA Classification 2.

CRWMS/M&O

QA Classification 3
Important to Radioactive Waste Control

Classification Checklists for MGDS Page 3 of 5

Yes	No		
		3.1	*Is the item part of:*
☐	☐	a.	A system designed for the control and management of site-generated radioactive waste that, if failed, would result in a dose less than 10 CFR 60.111(a) or 10 CFR 60.136 limits?
☐	☐	b.	A portion of the radiological, meteorological, and environmental monitoring required to assess radionuclide release or dispersion?

If the answer to any question in 3.1 is Yes, then the item is QA Classification 3.

CRWMS/M&O

QA Classification 4
Important to Fire Protection

Classification Checklists for MGDS Page 4 of 5

Yes	No	
☐	☐	*4.1* Is the item required to provide fire detection, fire suppression, and/or mitigate the impacts of a fire to important-to-radiological-safety or waste-isolation functions of QA Classification 1 or 2 SSCs?

NOTE: If the answer to question 4.1 is No, then the item is not QA Classification 4 and Sections 4.2 and 4.3 are not applicable.

4.2 Is the item part of the pressure boundary of:

☐	☐	a. Interior fire protection, including hose stations and sprinkler systems?
☐	☐	b. Exterior fire protection, including fire pumps and hydrants?
☐	☐	c. A CO_2, Halon, or other chemical fire suppression system?

4.3 Is the item part of:

☐	☐	a. Structures, barriers, doors, or dampers designed to prevent the spread of fire and smoke?
☐	☐	b. Fire/smoke detectors or associated supporting equipment?
☐	☐	c. Instrumentation that actuates or demonstrates operability of fire protection systems?

If the answer to any question in 4.2 or 4.3 is Yes, then the item is QA Classification 4.

CRWMS/M&O

QA Classification 5
Important to Potential Interaction

Classification Checklists for MGDS Page 5 of 5

Yes	No		
☐	☐	5.1	During a Design Basis Event, could consequential failure of the item, which is not intended to perform a QA 1 radiological safety function, impair the capability of other items to perform their intended radiological safety function?
		5.2	*During a Design Basis Event, could consequential failure of the item, which is not intended to perform a waste isolation function:*
☐	☐	a.	Result in changes to the hydrological characteristics of natural barriers (as indicated on the *Q-List*) by creating significant ponding or the possibility for drainage into the underground facility?
☐	☐	b.	Result in the introduction of fluids or other materials that might affect the geochemical characteristics of natural barriers (as indicated on the *Q-List*)?
☐	☐	c.	Affect the geomechanical characteristics of natural barriers (as indicated on the *Q-List*)?
☐	☐	d.	Otherwise compromise the ability of natural or engineered barriers to isolate waste?

If the answer to any question in 5.1 or 5.2 is Yes, then the item is QA Classification 5.