

Number: ORNL/TM-13288, Rev. 6  
Date: August 7, 2000

**Waste Certification Program Plan for UT-Battelle, LLC at Oak Ridge National Laboratory**

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**WASTE CERTIFICATION PROGRAM  
PLAN**

**for**

**UT-BATTELLE, LLC**

**at**

**OAK RIDGE NATIONAL LABORATORY**

**August 2000**

**Prepared by the  
ORNL/UT-Battelle Waste Certification Team**

**UT-Battelle, LLC  
Oak Ridge, Tennessee**

**Prepared for the U.S. Department of Energy  
under U.S. Government contract DE-AC05-00OR22725**

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**August 2000**

\_\_\_\_\_  
Kelly J. Beierschmitt, Director  
Environment, Safety, Health, and Quality

Date: \_\_\_\_\_

\_\_\_\_\_  
K. M. Downer, Director  
Environmental Protection & Waste Services Division

Date: \_\_\_\_\_

\_\_\_\_\_  
P.B. Hoke, Director  
Quality Services Division

Date: \_\_\_\_\_

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## ACRONYMS AND ABBREVIATIONS

CFR	Code of Federal Regulations
CH	Contact-Handled
DOE	U. S. Department of Energy
DOT	U.S. Department of Transportation
ESH&Q	Environment, Safety, Health, & Quality
GI	Generator Interface
GIE	Generator Interface Equivalent
IP	implementing procedures
L <sub>D</sub>	detection limit
TPM	Transportation and Packaging Management
LWS	Laboratory Waste Services
NDA	nondestructive assay
NDE	nondestructive examination
NRA	no-radioactivity-added
OEMP	Office of Environmental Management Programs
EP	Environmental Protection
ORNL	Oak Ridge National Laboratory
ORP	Office of Radiation Protection
PCB	polychlorinated biphenyl
PK	process knowledge
QA	quality assurance
QAC	Quality Assurance Coordinator
QAS	Quality Assurance Specialist
QSD	Quality Services Division
RCRA	Resource Conservation and Recovery Act
RFD	Request for Disposal - - [generic term for current form set used to document waste information (e.g., 2109 form set)]
RH	Remote-Handled
RMMA	Radioactive Materials Management Areas
SLLW	solid low-level waste
SME	Subject Matter Expert
TID	tamper indicating device
TRU	transuranic waste
TSCA	Toxic Substances Control Act
TSD	treatment, storage, and/or disposal
UT-Battelle	UT-Battelle, LLC
WAC	Waste Acceptance Criteria [generic term for any type of acceptance requirements (e.g., Waste Profiles)]

ACRONYMS AND ABBREVIATIONS (continued)

WCO	Waste Certification Official
WCP	Waste Certification Program
WCPP	Waste Certification Program Plan
WID	waste item description
WMIF	Waste Management Issues Forum
WSPS	Waste Stream Profile Sheet

## **ABOUT THIS REVISION**

The primary changes that have been made to this revision reflect the adoption of DOE Order 435.1, “*Radioactive Waste Management*,” into the ORNL contract (with deletion of DOE Order 5820.2A), organizational changes implemented by the new ORNL contractor (UT-Battelle, LLC), modification of the scope to address applicability questions, revision of the training section to allow tailoring of training, a need to upgrade waste item traceability and container access control, and revision of Table 2. The certification process itself has not been modified.

## **1. PURPOSE**

This document defines the waste certification program (WCP) developed and implemented by UT-Battelle, LLC (UT-Battelle) at Oak Ridge National Laboratory (ORNL). The WCP applies to all UT-Battelle personnel, its subcontractors, guests, and visitors that do work at ORNL. This program does not include wastes generated by other U.S. Department of Energy (DOE) prime contractors, their employees, or their subcontractors working on this site except by special arrangement. The document describes the program structure, logic, and methodology for certification of UT-Battelle wastes. The purpose of the WCP is to provide assurance that wastes are properly characterized, that adequate information is provided to enable correct U.S. Department of Transportation (DOT) classification, and that the programmatic certification requirements and the Waste Acceptance Criteria (WAC) for receiving organizations/facilities are met. The program meets the waste certification requirements outlined in DOE Order 435.1, "*Radioactive Waste Management*," in the *DOE Performance Objective for Certification of Non-Radioactive Hazardous Waste* (DOE, February 1995), and ensures that 40 Code of Federal Regulations (CFR) documentation requirements for waste characterization are met for mixed (both radioactive and hazardous) and hazardous [including polychlorinated biphenyls (PCBs)] waste. Program activities are conducted according to ORNL directives and guidance.

Requirements for managing radioactive and mixed wastes are established in DOE Order 435.1, "*Radioactive Waste Management*." As part of the Order, heads of DOE field organizations are assigned the authority to establish waste management requirements for waste-receiving facilities under their jurisdiction. The development of WACs is one of the requirements specified by the Order for appropriate management of radioactive and mixed wastes generated by DOE operations. The Order also specifies that each generator of waste will implement a WCP for low-level, transuranic and mixed wastes to provide assurance that the WACs of the receiving facilities are met. Generators of waste and the waste receiving organization are independently responsible for their actions in ensuring compliance with the receiving organization WAC.

In addition to the DOE Order requirements, DOE has mandated that no mixed wastes be shipped off-site to a facility unless it is licensed for receipt of the radioactive component of the waste. As a result, DOE sites are required to implement a program to ensure that (1) DOE activities added no measurable radioactivity, within statistical limits, to hazardous waste and (2) hazardous waste meets the DOE Order 5400.5 surface contamination guidelines. These requirements are described in the *Performance Objective for Certification of Non-Radioactive Hazardous Waste* (DOE, February 1995). The no-radioactivity-added (NRA) process described in this WCP Plan meets these requirements. Effective December 30, 1997, the NRA process described in this WCP Plan replaced ORNL/TM-13189, *Oak Ridge National Laboratory Program Plan for Certification of Nonradioactive Waste* and ORNL-WM-002, *Certification of Nonradioactive Hazardous Waste – ORNL*.

Finally, the regulations implemented under the Resource Conservation and Recovery Act (RCRA) and the Toxic Substances Control Act (TSCA) require accurate characterization of wastes such that development of a WCP for hazardous and toxic wastes is a responsible management practice.

## 2. SCOPE AND LIMITATIONS

UT-Battelle waste types covered under this program are solid low-level waste (SLLW); transuranic (TRU) waste, including TRU mixed waste; hazardous waste, including both RCRA hazardous waste (40 CFR 261–268) and PCB waste (40 CFR 761); mixed waste and industrial and solid wastes destined for landfill disposal. Both TRU wastes and SLLW wastes containing PCB, asbestos, or other such regulated toxic components must be managed in accordance with requirements derived from the TSCA and DOE Order 435.1 (including the 435.1 Manual), and are therefore included in the scope of the WCP. Asbestos wastes and asbestos mixed with both PCB and RCRA hazardous wastes are also included in the scope of this WCP. Requirements for management of these wastes have been incorporated into four UT-Battelle implementing procedures (IP). The four IPs used by this program are ORNL-WC-006 for SLLW, ORNL-WC-007 for TRU and TRU mixed wastes, ORNL-WC-005 for hazardous and mixed waste, and ORNL-EP-P03 for industrial and solid wastes. Hold-For-Decay wastes are included in the WCP and are managed in accordance with ORNL procedure ORNL-EP-013. NRA determination requirements apply to hazardous and PCB wastes destined for commercial treatment, storage, or disposal that are not licensed to handle radioactivity.

With respect to applicability of this program to the ORNL facilities located at the Y-12 site, the following general guidance applies.

- o Sanitary/Industrial wastes and waste packages are to be processed in accordance with Y-12 contractor's requirements defined in Y71-903. This waste stream is handled entirely by Y-12 staff.
- o RCRA/TSCA wastes and non-regulated chemical wastes must be processed through the UT-Battelle/ORNL Waste Certification Program.
- o Wastes that contain any radioactive components (e.g., mixed, SLLW, etc.) must be processed through the UT-Battelle/ORNL Waste Certification Program. [NOTE: This includes certification documentation packages for containerized wastewater targeted for treatment/disposal at any Y-12 wastewater treatment facility.]

A listing of waste types *not* included under this Program and pertinent information as to what other management/acceptance requirements may apply follows.

- o Storm Water, Coal Yard Runoff, Other Non-Radioactive Wastewaters -  
(Management of these wastes is covered under ORNL-EP-P09)
- o Air Emissions -  
(Air emissions management requirements are covered under ORNL-EP-P02)
- o Radioactive Liquid wastes treated at the ORNL Liquid Low-Level and Process Waste treatment facilities -  
(Transfer of these wastes to the treatment/disposal contractor is covered by "Waste Acceptance Criteria for ORNL Liquid Waste Treatment Systems", OEMP-WC-100)
- o ORNL Radioactive Gaseous/Vapor Emissions -

(Transfer of these wastes to the treatment/disposal contractor is covered by “Effluent Control Guidelines for Central Radioactive Gaseous Disposal Facility - Building 3039 at ORNL”, WM-GS-WAC) NOTE: This is a DRAFT document at this time.

- o Spent nuclear fuel is not considered waste and is therefore not included in the Program
- o Recyclable materials that are not hazardous waste regulated under RCRA, 40 CFR 261-268 - (Free release of these type materials [e.g., used oil, silver sludge, fluorescent bulbs, etc] is addressed under ORNL-RP-420)
- o Materials qualifying for reuse under the Pollution Prevention Program - (Pollution prevention and recycling are managed by the ORNL Pollution Prevention Program. Information about the Program can be accessed through: <http://www.ornl.gov/ornlp2/p2main.htm>.)

Affirmation that the industrial and solid waste destined for landfill disposal meets the requirements of the receiving organization’s WAC is accomplished through implementing the actions defined in ORNL-EP-03 and verifying (when applicable) that those actions have been executed by signature of an Environmental Protection (EP) representative on the Request for Disposal (RFD) form submitted with the waste. Because the affirmation process applied to the industrial and solid waste is a straight-forwarded two-step process (as opposed to a four-step process used for the other waste types), it is not addressed further in this program plan. Note, however, that the WCP quality assurance/oversight activities and method for determining the WAC, which are described later in this document for the other waste types, are also applicable to the industrial and solid wastes.

### **3. BASIC CERTIFICATION PROGRAM REQUIREMENTS**

DOEM 435.1-1 “*Radioactive Waste Management Manual*” requires “development, review, approval, and implementation of a program for waste generation planning, characterization, certification, and transfer.” All of these aspects are covered by this WCP and its implementing procedures. The document further explicitly states that a waste certification program will be developed, documented, and implemented to ensure that the waste acceptance requirements of facilities receiving transuranic and low-level wastes for storage, treatment, or disposal are met. The manual goes on to define the types of records that are to be maintained for SLLW and TRU and references requirements for implementing waste minimization programs including proper waste segregation. Waste are to be characterized with sufficient accuracy as to permit proper segregation, treatment, storage, and disposal.

UT-Battelle’s WCP meets each of the above defined elements associated with waste certification. Waste minimization requirements are implemented under a separate program (see 2. above). The process begins with proper waste segregation, includes steps to provide for accurate characterization by the generator, and includes generator and Laboratory Waste Services (LWS) defined steps (i.e., control points) to ensure that the waste will meet the WAC of the receiving organization. Verification of the certification process is maintained through an overarching quality assurance function. Figure 1, *Schematic of Waste Certification Process*, illustrates the overall process. UT-

Battelle generators, LWS staff, and the UT-Battelle Waste Certification Official (WCO) are jointly responsible for assuring compliance with the WAC. The generator is responsible for meeting the requirements of the WAC and LWS is responsible for verifying the generator data and packaging. UT-Battelle generators retain the overall responsibility for their wastes until it is programmatically certified and accepted by the receiving organization. Satisfaction of programmatic quality assurance (QA) requirements is achieved through compliance with *ORNL-QA-PO1* for non-nuclear/radiological facilities and *ORNL-QA-PO2* for nuclear and radiological facilities. Amplification of particular elements within these procedures is included in Section 7, 8, 9, and 10 of this document.

The *DOE Performance Objective for Certification of Non-Radioactive Hazardous Waste* requires criteria and procedures “aimed at determining if there is a measurable increase in radioactivity above background from DOE operations. This may be done by either process knowledge, surface contamination surveys, sampling and analysis (radioassay), or by a combination of these techniques.”

UT-Battelle’s WCP meets the NRA requirements identified in the Performance Objective. NRA determination is made by process knowledge (PK), surface surveys, and sampling and analysis (radioassay), or a combination of these methods.

State and Federal regulations implemented under RCRA and TSCA mandates accurate characterization of wastes, certification of waste information identified on manifests, certification that a waste minimization program is in place, and RCRA also mandates certifications for land disposal restricted wastes. These mandated certifications are imposed on both the generator as well as treatment, storage, and disposal facilities handling wastes. Required records [waste generation, tracking, and certifications for both generators and treatment, storage, and disposal (TSD) facilities are identified in the regulations.

UT-Battelle’s WCP meets each of the above defined elements related to waste certifications based on waste characterization. For UT-Battelle, the WCP provides: (a) steps to ensure the basic information needed (i.e., generator waste characterization) to comply with RCRA and TSCA will be collected and maintained and (b) establishment of means to ensure the accuracy of that information (i.e., the certification process).

Hence, the DOE Order, Performance Objective, and regulatory standards related to waste certification are being met by the UT-Battelle WCP.

Figure 1. Schematic of Waste Certification Process

## **4. PROGRAM DESCRIPTION**

### **4.1 PROGRAM ELEMENTS**

In keeping with Necessary and Sufficient or Work Smart Standards, the UT-Battelle WCP is designed to meet applicable DOE orders, the DOE NRA Performance Objective, and regulatory requirements through development or use of existing program documents and ORNL directives and guidance. Figure 2, *UT-Battelle Waste Certification Program Elements*, illustrates the elements of this program. The elements include four program drivers (requirements identified in Section 3); the *Waste Certification Program Plan* (this document); WAC and Implementing Procedures (as

described in Section 4.1.1); LWS staff (Section 4.1.2) and the UT-Battelle Waste Certification Official (Section 4.1.3). This program has been designed to ensure compliance and provide flexibility in meeting the acceptance requirements of the waste receiving organization(s).

#### **4.1.1 Program Documents**

Waste receiving organization's WAC documents are developed (and controlled) to specify requirements that must be met for their acceptance of each waste type (or sub-type). WAC documents typically specify the necessary characterization, physical constraints, packaging, labeling, prohibited items, and documentation requirements that must be met. The process for physically transferring certified waste and their data packages to the receiving organization may be defined in either the WAC documents or a separate document specifically prepared by the receiving organization for that purpose. The process for requesting deviations or variances from the WAC or transfer requirements may be addressed in either or both types of documents.

The applicable WAC and waste transfer documents for UT-Battelle wastes are provided by waste type in the WAC and Waste Transfer Requirements Index located on the worldwide web at UT-Battelle WCP Home Page: [http:// nt\\_server\\_3/wmdireccerf/Home%20Page/Default.htm](http://nt_server_3/wmdireccerf/Home%20Page/Default.htm). The index specifies for each waste type the applicable WAC and transfer requirements document identification, revision, effective date at UT-Battelle, and web location (if any).

Waste generator implementation procedures have been issued to provide waste generators with specific instructions to meet the receiving organization's WAC. These procedures describe, for example, when and how PK can be used to characterize a waste. They describe the methods by which generators would properly characterize, segregate, package, and label waste. These procedures can be accessed on the web at the **UT-Battelle WCP Home Page**.

- HAZ/MIXED (ORNL-WC-005)
- SLLW (ORNL-WC-006)
- TRU (ORNL-WC-007)

Figure 2. UT-Battelle Waste Certification Program Elements

The following guidance documents have been issued to support generators in meeting characterization requirements and are available on the **UT-Battelle WCP Home Page**.

- Radiological Characterization Plan for Solid Low-Level Waste (ORNL-WC-507)
- Guidance on No-Radioactivity-Added Characterization for Hazardous and PCB Waste at ORNL (WM-SWO-407).

#### **4.1.2 Laboratory Waste Services Staff**

The LWS element of the WCP consists of three principal groups that provide generator support (and WCP verification functions), waste data verification, and waste package field verification.

The generator support element of the WCP provides expert waste management support to UT-Battelle divisions. This support is provided by a core team consisting of waste management experts assigned to generator locations. The team members are either LWS generator interface (GI) staff or assigned divisional staff [referred to as GI equivalents (GIEs)]. Roles and responsibilities of the GI/GIE are to provide assistance to the waste generators with waste categorization, characterization, packaging, and request for disposal (RFD) preparation. Waste types include radioactive, hazardous, mixed, and TSCA (PCB). Sanitary/industrial waste and recyclables do not require GI/GIE involvement, but may be included in work scope as requested by divisions. GI/GIE personnel review the waste data package, perform random verifications of contents prior to closure, and verify that the waste has been properly characterized, packaged, and accurately documented, by signing the RFD form. The signature of a GI/GIE is required on every RFD confirming that the waste meets the applicable WAC. GI/GIE support is required for preparation of all waste packages. By utilizing a core team (GI/GIE) of waste management experts, regulatory requirements for accurately characterizing and packaging waste are efficiently satisfied.

GI personnel are assigned to generators on the basis of the level of support required and the types of waste generated. GI personnel, as a minimum, will review the waste characterization methods and sign RFD forms. GIs are available to provide other required divisional waste management responsibilities such as assisting with waste characterization, PK and Waste Stream Profile Sheets (WSPS) document preparation, packaging, and completing RFD forms; assisting with or managing waste accumulation areas; assisting with pollution prevention, waste minimization, recycle/reuse; and supporting audits and assessments.

GIEs provide the same types of services as GIs; however, the GIEs provide services primarily within their own organization and only within the limits of their specific waste type training, (e.g., solid low level).

Both GIs and GIEs are required to meet specific qualification and training standards to be eligible for these roles and responsibilities (see Section 6). GIs are trained on all UT-Battelle waste types, while GIE qualification and training may be limited to the specific waste types GIEs will be handling. New GI/GIE personnel must demonstrate prerequisite qualifications and complete the requisite training. All GIs and GIEs are members of the Generator Interface Group, which has periodic meetings to communicate lessons learned and share information.

UT-Battelle divisions have the option of selecting and training their respective division staff or requesting that an LWS GI serve in the GI function. However, waste-generating divisions must utilize a GI or GIE as the verifier ("verification officer") of waste forms and confirmation (including verification checks) that the waste meets the applicable WAC.

The waste data verification element of the WCP is provided by Waste Acceptance Coordinators. This staff is qualified by training and experience to perform expert review of the waste characterization data and packaging information provided via the RFD. The signature of a Waste Acceptance Coordinator is required on every RFD to indicate that the waste and packaging meet the acceptance requirements of the receiving organization. The Waste Acceptance Coordinators also provide advisory services to generators and GI/GIE staff on unique wastes and situations.

The waste package field verification element of the WCP is provided by Waste Handling Group staff. This staff is qualified by training and experience to evaluate the acceptability of certain features of packaged waste in the field. The signature of a Waste Handler is required to verify that a field review has been completed on every waste package and to indicate (within the limits of the review) that the package(s) meets the requirement of the receiving organization.

#### **4.1.3 UT-Battelle Waste Certification Official**

The formal UT-Battelle waste certification element of the WCP is performed by an authorized UT-Battelle Waste Certification Official (WCO), who is qualified by training and experience to accurately assess the certification status of wastes intended for transfer to the receiving organization. Based on a satisfactory review of the data verification and field review activities, coupled with any supplementary review deemed prudent, the WCO certifies for UT-Battelle (as the corporate "generator") that the waste and waste packaging meet the receiving organization's WAC by signing the certification statement on the RFD.

## **4.2 CERTIFICATION PROCESS**

In the most elementary view, the certification process consists of an LWS staff trained in waste management verifying at three control points that the characterization and packaging of waste items to be disposed comply with the receiving organization's WAC, followed by a formal certification (via the WCO) that the packaged wastes meet the acceptance requirements of the receiving organization/facility. Note that, due to the nature of research-generated waste, the certification process is based primarily on waste items as opposed to waste containers. There are, however, instances where characterization and certification are applied to waste containers. Regardless of whether the objects to be certified are waste items or waste containers, the same basic certification process is employed.

### **4.2.1 Certification Control Points**

To comply with DOE Order 435.1, certification of waste is accomplished through the joint efforts of waste generators, LWS personnel, and a UT-Battelle WCO. The waste certification process requires:

1. generators/GI/GIE declaring that the waste and packaging meet the requirements of the appropriate WAC;
2. LWS verifying through review of waste documentation that the waste and packaging meet the applicable WAC;
3. LWS verifying through a field check that the packaged waste meets the applicable WAC.

Waste must successfully pass through all three control points prior to being programmatically certified. The process requires information from the generator (waste characteristics, origin, etc.) as well as the more knowledgeable LWS organization (WAC requirements, disposal options, etc.). Thus, participation from both entities is required to pass the three control points. The last step in the process is a review of the control point completion documentation and (assuming the review results are satisfactory) the WCO signing a certification statement that the waste meets the receiving organization's acceptance requirements. Waste becomes "certified" and released for transfer *only* after the RFD certification statement is signed by a UT-Battelle WCO. The WCO is responsible for resolving instances where it appears that the WAC requirements cannot be met.

Waste certification, including NRA determination for hazardous waste, is implemented through the process identified in Fig. 3, *Certification Activities*, and Fig. 4, *NRA Determination*. The generator/GI/GIE characterizes and ensures that the waste is packaged to meet the WAC; establishes and maintains access control (e.g., locked room or cabinet) to preclude incorrect addition or removal of package/container contents; and completes/signs the required waste RFD forms. The signature of the actual generator is optional, but either the actual generator or the person within the UT-Battelle organization sponsoring the work who is the most knowledgeable of the waste characteristics at the time the waste is generated will be identified as the generator on the RFD form. The signature of the GI/GIE on the RFD as verification officer is mandatory. This serves as the first process control point (characterization and documentation completed). This includes the NRA determination for hazardous waste. LWS provides controls for ensuring compliance with the appropriate WAC. The second control point is the review of the RFD forms and supplementary documents (PK, WSPS, analytical, etc.) supplied by the generator/GI/GIE and verification by LWS that applicable WAC requirements have been met. Control Point 2 verification is indicated on the RFD Waste Pickup Request by the signature of the Waste Acceptance Coordinator who performed the paperwork verification. In the third control point, a routine field inspection of the waste package (to the extent safe work practices are followed in the field) is conducted to verify the waste package meets the WAC. Control Point 3 verification is indicated by the signature of the Waste Handler who performed the verification. The signatures of the GI/GIEs and Control Point 2 and 3 verifiers denote accountability for these process steps. The specific meaning of the signatures is provided in Attachment A, *Meaning of Signatures*. [Note: "Electronic Approval" of WCP forms by Control Points 1, 2, and 3 verifiers is equivalent to their written signature.]

Figure 3. Certification Activities

Figure 4. NRA Determination

## **4.2.2 Error Handling**

In general, waste that does not meet WAC requirements can be rejected at any control point or quality assurance (QA) validation check (see Sect. 4.6). When waste is rejected, LWS/WCO communicates with the generator regarding the problem(s), and the generator is then responsible for correcting the problem. In addition, information related to the waste rejected (e.g., generator, GI/GIE, waste type, reason for rejection) is documented for trending, tracking, and programmatic evaluation. More specific information on error handling is provided in the following paragraph.

Control point reviews can result in the identification of errors. The existence of errors does not automatically cause the rejection of a waste package. The severity of the errors may range from simple typographical mistakes that cause no impact on the waste characterization to serious mistakes that cause misclassification of wastes and/or mistakes in packaging. Typical errors identified during control point reviews are listed in Table 1. Table 1 also indicates typical notification and resolution actions for the most common error types.

Tracking, trending, and evaluation of errors at Control Points 1, 2, and 3, and any subsequent determination of needed corrective actions are a function of the LWS self-assessment program.

Tracking, trending, and evaluation of errors that cause rejection of certified waste by a receiving organization are performed by the WCO. Determinations of needed corrective actions based on these error evaluations can result in a suspension of certification activities for part or all of the WCP until the corrective actions are implemented.

## **4.3 NRA DETERMINATION FOR HAZARDOUS WASTE**

### **4.3.1 Introduction**

NRA determination is one of the requirements in the WAC for hazardous waste to be shipped to an off-site commercial TSD that is not licensed to handle radioactivity. The requirement is mandated by the “*DOE Performance Objective for Certification of Non-Radioactive Hazardous Waste.*” The decision to pursue an NRA determination for a hazardous waste package is based on having adequate and appropriate PK for the package or on the amount of analysis required to make a determination. Analysis beyond that which is required to meet WAC or analytical expenditures that are not cost-effective based on the type and volume of waste are neither required nor desirable. NRA determinations will be based on documented PK, surface surveys, sampling and analysis or a combination of these methods. Hazardous waste that does not qualify for NRA will be classified as mixed waste.

### **4.3.2 Scope and Limitations**

NRA classification requirements apply to hazardous waste as defined in 40 CFR 261-268 and Tennessee (TN) Rule 1200-1-11-.01 to .10 as RCRA regulated and waste defined by 40 CFR 761 as TSCA-regulated. Recyclables including used oil, silver sludge, and fluorescent bulbs are specifically excluded from the NRA determination process under this plan, but are subject to

ORNL's RPP420 for free release of materials. Hazardous waste is eligible for NRA evaluation when there is no prior knowledge or evidence that would indicate that the waste has radioactivity added resulting from DOE operations.

### 4.3.3 NRA Determination Process

Generator determination of adequate PK is the first step in the process (Figure 4). If adequate PK exists, classification of waste as NRA requires only documentation of the PK by the generator [and a surface survey if the waste is being removed from a Radioactive Materials Management Area (RMMA)]. If adequate PK does not exist, a surface survey and/or sampling and analysis is required. Certification process control points are incorporated into the NRA process by reviewing the generator RFD forms to ensure that the documentation, including the PK and any analytical results, is sufficient for making the NRA determination.

The NRA determination process allows maximum use of any PK that exists for a waste item. Generators are encouraged to collect and document as much PK information as possible about the material while it is being used, generated, and stored. PK is useful in two ways. First, with sufficient PK, wastes can be classified as NRA without additional sampling and analysis (although a surface survey is required per DOE Order 5400.5 and 10 CFR 835 if the waste is exiting an RMMA). Second, if PK is insufficient to classify the waste as NRA, the information may be used to limit the analysis that would be required for NRA classification or mixed waste characterization. Guidance on what constitutes adequate PK for NRA has been issued in WM-SWO-407, *“Guidance on No-Radioactivity-Added Characterization for Hazardous and PCB Waste at ORNL.”*

Sampling for NRA determination is conducted using WCP-approved methodologies and criteria (see procedure ORNL-WC-005, *“ORNL Compliance with Hazardous, PCB, and Low-Level Mixed Waste Acceptance Criteria”*). This procedure designates the requirements for sampling, sample management, and who can do the sampling [generator, EP, etc.]. Sampling is conducted only as required to provide information necessary to classify the waste as NRA.

The analytical protocols that can be used for NRA determination address the majority of UT-Battelle NRA wastes. These protocols are based on best-available and affordable technology (including appropriate screening methods) and the ability of the method to distinguish added radioactivity in the sample. Acceptable methods must meet established criteria based on sample size, background, efficiency, and count time, or have demonstrated equivalency (on a case-by-case basis approved by the WCO).

Interpretation of analytical data is based on the Curie method of determining the detection limit ( $L_D$ ) on a per sample basis. This method is used to ensure a maximum 5% probability of false positives and negatives in a single measurement. Analytical results below  $L_D$  qualify as NRA. Sample results above  $L_D$  are declared mixed waste, or are eligible for a second sample and/or re-analysis at the generator's option. Items containing or suspected to contain naturally occurring radioactivity or radioactive material “as received” are evaluated on a case-by-case basis for NRA determination by PK. Use of other protocols requires approval by the WCO based on demonstrated equivalency.

Guidance on sufficient PK, sampling, analysis, and interpretation is provided in *Guidance on No-Radioactivity-Added Characterization for Hazardous and PCB Waste at ORNL*(WM-SWO-407).

#### **4.3.4 Radioactive Materials Management Area Designation**

Under this program plan, generators are responsible for identifying their RMMAs per Radiation Protection Procedure ORNL-RP-420. For UT-Battelle, RMMAs are: (1) contamination areas, high contamination areas, and airborne radioactivity areas; (2) radiological buffer areas established for contamination control; and (3) areas posted to prevent loss of control of activated items. At UT-Battelle, generators are responsible for characterizing the wastes generated in their RMMAs. The WCP does not track or maintain lists of UT-Battelle RMMAs because areas change status over time. The Office of Radiation Protection can provide information on the location of RMMA's.

#### **4.3.5 NRA Certification for Hazardous Wastes**

Under the WCP, generators make an NRA determination on the RFD forms. The WCO supplies programmatic certification for NRA-hazardous wastes based on the combined efforts of the generator, LWS, and the WCO (through oversight of the WCP). The WCP-based NRA certification by the WCO is traceable to each hazardous waste item to meet the DOE Performance Objective requirement for certification of NRA. Programmatic certification is documented before the hazardous waste is released to the receiving organization/facility.

### **4.4 WASTE ITEM TRACEABILITY AND CONTAINER ACCESS CONTROL**

Waste items packaged in shipping containers are individually traceable back to the generators/generation process/process area through use of the 2109 form set and/or packing lists/log-in sheets.

Access to waste containers that are in the process of being filled is controlled through use of physical locks or tamper indicating devices on the container, or through the use of access control areas (e.g., locked doors). It is left to the discretion of the generator as to which control method will be employed.

Validation of container contents is achieved by an independent inspection performed on approximately 10% of the filled containers. In the validation process, waste items/packages are removed from the containers and compared to the description provided for that item/package. See Table 2 for validation process details.

Consistent with standard QA practices, tamper-indicating devices (TIDs) are used (unless impractical) to ensure the contents of completed waste containers are not modified after the RFD is completed. TIDs are to be applied prior to release of waste containers from custody of the waste generator or GI/GIE.

### **4.5 PACKAGING/CONTAINER PROCUREMENT, INSPECTION, AND CONTROL**

Waste packaging materials/containers obtained through ORNL Central Stores are procured by the UT-Battelle Procurement organization using a purchase specification developed by the Transportation and Packaging Management (TPM) organization. These specifications are reviewed by the WCO to ensure the purchased items meet the appropriate WAC requirements. The document which describes the design control, procurement control, vendor assessments, and receipt inspection process is described in TPM-QA-2, *Management Plan for the Procurement of Department of Transportation Regulated Packaging*. To confirm implementation of the procurement process stated in the above document, the WCO will review these activities as part of the annual UT-Battelle certification program assessments (see Table 2).

The procured packaging/container products are stocked as ORNL Central Stores items and purchased by generators as needed. Maintenance of product physical integrity while in Central Stores is the responsibility of the Central Stores organization. After purchase from Central Stores, ensuring packaging/containers (loaded or unloaded) are protected from effects of weather (particularly over long periods of time) is the responsibility of the generators (or their GI/GIE) until the waste packages are transferred to the receiving organization. Packages that will contain DOT regulated material and which are procured directly (i.e., not from stores) must be approved by TPM and inspected by TPM or TPM designated personnel.

#### **4.6 QUALITY ASSURANCE VERIFICATION**

QA verification is an integral part of the certification program. The verification process is the responsibility of the WCOs, who are independent from the generating organizations. Under the verification process, some SLLW and TRU waste containers undergo an additional verification. This verification may include nondestructive examination (NDE) and/or Real-Time Radiography to ensure that prohibited waste materials are not included in waste packaging; the verification may also evaluate certain waste characteristics. For example, TRU waste may be subjected to nondestructive assay (NDA) in addition to NDE. Hazardous waste that has been classified as NRA will be subject to an additional verification of NRA through final random surveying/resurveying of some waste packages. In addition, a percentage of hazardous waste will be randomly selected for additional QA verification of contents. After the final verification is completed, the RFD forms become the quality records for that particular waste package and provide item traceability for the waste.

QA verification specifics are presented in Table 2, *Quality Assurance Verification Plan*. These include: objectives, responsibility assignments, verification frequencies, evaluation criteria, reporting and result disposition. Similar to the certification process, error rates will be calculated and tracked by the WCOs to determine certification program strengths and weaknesses in both specific areas and across the entire program. Error rates will also be used to adjust the verification frequencies which are given in Table 2 when deemed necessary by the WCOs. Error rates equal to or greater than 5% of assessments performed will trigger a review of specific process steps or an overall program concept by the WCOs to determine if suspension of any or all certification activities is warranted. Upon suspension, corrective actions must be defined and implemented before reactivating the certification process.

#### **4.7 OFFSITE SHIPMENT REVIEW PROCESS**

The waste characterization data provided under this certification program are reviewed to ensure that they are accurate and sufficient for correct classification of material under DOT regulations. The information may be used by any DOE contractor/subcontractor or UT-Battelle to make compliant off-site shipments. The agent for reviewing all UT-Battelle off-site waste shipments for DOT compliance is TPM. When off-site shipment of hazardous or mixed waste is to be made, the review will include agents of both TPM and EP. (NOTE: The review process defined in the J. H Swanks letter of April 28, 1998, for making off-site shipments is superseded by this paragraph.)

## 5. ORGANIZATIONAL RESPONSIBILITIES

Figure 5, *Organizational Chart*, shows the organizational structure for the WCO.

### 5.1 WASTE GENERATORS

Within the WCP, waste generators are responsible for the waste categorization, characterization, packaging, and safe management of waste until it is physically transferred to the receiving organization/facility. At a minimum, GI/GIEs support generators in meeting their waste characterization responsibilities. As part of the certification program, generators have the following responsibilities:

- completing Waste Awareness Training;
- attending waste certification and waste characterization training; appropriate to their operation;<sup>1</sup>
- properly characterizing, segregating, handling, categorizing, labeling, and packaging the waste per implementing procedure requirements to meet the applicable WAC;
- providing complete, accurate characterization information on RFD forms;
- attesting to completeness of characterization information provided;
- meeting all WAC requirements for transfer of waste or requesting variance;
- participating in waste certification audits as scheduled;
- maintaining records of how waste was generated and categorized/classified;
- participating in divisional self-assessments;
- complying with site requirements for RMMA identification per ORNL-RP-420.

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<sup>1</sup>Refer to Section 6

Figure 5. Organizational Chart

## 5.2 LWS

LWS is responsible for the following:

- preparation and implementation of the WCP Training Program based on the training requirements established by the WCO;
- reviewing WACs and IPs;
- transferring and approving transfers of hazardous/mixed waste from generator's satellite accumulation area/90-day areas (SAA/90DA) to consolidated 90DA;
- verifying that waste is in compliance with WAC requirements (i.e., executing Control Points 1, 2, & 3);
- transferring waste to the receiving organization (when applicable);
- controlling records per WCP implementing procedures;

- resolving Control Point errors with generators/GI/GIE/WCO drawing on resources such as EP and ORP as needed.
- conducting internal self-assessments;
- verifying generators and GIs/GIEs, Waste Acceptance Coordinator, and waste-handling staff are properly trained per the WCP;
- overseeing the Generator Interface Group function;
- appointing GI, Waste Acceptance Coordinator, and waste-handling personnel;
- providing GI, Waste Acceptance Coordinator, and waste-handling services as requested
- verifying generators and GI/GIE staff are properly trained per the WCP; and
- preparation of waste packaging materials specifications for procurement of packaging materials from commercial suppliers.

Specific responsibilities for GIs are established on a case-by-case basis through the use of a *Memorandum of Agreement* between the generator and LWS (optional). The primary responsibility of GI/GIE is to assist the waste generators in meeting their responsibilities (Section. 5.1) and to indicate by their signature the generator waste characterization and packaging meet the applicable WAC. This includes notifying generators of changes to WAC requirements. In addition, GI/GIE personnel may be asked to provide the following services:

- assisting in waste characterization;
- completing waste disposal forms;
- coordinating waste removal;
- forecasting waste generation;
- assisting managing waste accumulation areas;
- performing routine inspections/walkthroughs;
- providing assistance in pollution prevention and waste minimization; and
- providing assistance in program audits

### **5.3 UT-BATTELLE WASTE CERTIFICATION OFFICIAL (WCO)**

The UT-Battelle WCO(s) is responsible for the overall coordination and implementation of the program. Specific responsibilities include the following:

- overseeing and maintaining the WCP;
- communicating program requirements and any changes through the UT-Battelle ORNL *Waste Certification Home Page* ([http:// nt\\_server\\_3/wmdireccerf/Home%20Page/Default.htm](http://nt_server_3/wmdireccerf/Home%20Page/Default.htm));
- establishing and implementing the QA verification program – assessing the need for corrective actions based on analysis of error rate tracking and trending;
- coordinating the certification program audits;
- establishing waste certification requirements and verification of the training program implementation;
- approval of sampling groups and individual samplers for NRA determination;

- overseeing review of NRA analytical protocols for demonstrated equivalency;
- overseeing case-by-case evaluation of naturally occurring radioactive material for NRA determination;
- coordinating the surveillance program;
- conducting surveillances and tracking completion and results of divisional surveillances;
- verifying implementation of corrective actions for identified issues;
- tracking and trending WCO error rates and taking appropriate actions when error rate limits are exceeded;
- implementing program changes when necessary;
- preparing and maintaining implementing procedures and guidance documents related to them;
- negotiating variances, deviations, modifications to WACs with the receiving organization;
- certifying waste for transfer to the receiving organization/facility;
- ensuring that programmatic requirements of the receiving organization/facility certification program are addressed by the UT-Battelle WCP;
- interfacing with generators, WCT, LWS, TPM, EP, and ORP as needed;
- reviewing packaging materials specifications;
- performing QA reviews of characterization data and techniques; and
- qualifying (via typical QA practices) waste characterization methodologies;
- managing program documents and records.

#### **5.4 WASTE MANAGEMENT ISSUES FORUM (WMIF)**

The WMIF comprises representatives of the waste-generating organizations and the Laboratory Waste Services, Environmental Protection, Packaging and Transportation, QA, and radiation protection organizations. Specific responsibilities include:

- providing technical and programmatic recommendations;
- reviewing related program documents prepared by others;
- communicating waste certification guidance, direction, and other information to their home divisions; and
- providing a forum for program issues and waste generator problems to be presented, discussed, and resolved using a consensus approach.

#### **5.5 OEMP**

The Director, OEMP is responsible for the following:

- interfacing with DOE-ORO, DOE Site, UT-Battelle Waste Generating and Service Organizations and other DOE prime contractors on Environmental Management Program issues (including Waste Certification);
- serving as chair person of WMIF

#### **5.6 EP**

The EP is responsible for the following:

- reviewing WACs and implementing procedures;
- reviewing RFDs as Subject Matter Experts (SME) for RCRA/PCB compliance as requested;

- providing guidance on regulatory compliance issues; and
- reviewing and approving compliance-oriented variances to WAC requirements and;
- supporting other UT-Battelle organizations (e.g., TPM) as SMEs when requested

## **5.7 QUALITY SERVICES DIVISION (QSD)**

The QSD is responsible for the following:

- scheduling, completing, and transmitting periodic waste certification surveillances in their area of responsibility;
- designating a WCO(s) and an alternate WCO(s) [QSD Director (with input from LWS, EP and WS, and OEMP Directors)];
- approval of the WCP [QSD Director]
- coordinating divisional surveillances through the WCO;
- providing surveillance results to the WCO and division management for review, evaluation, and distribution;
- assisting divisional management in preparation of lessons-learned reports and action plans for correction of deficiencies as necessary following existing ORNL/UT-Battelle procedures; and
- performing receipt inspection of waste-packaging materials in accordance with appropriate inspection plan

## **5.8 ENVIRONMENTAL PROTECTION AND WASTE SERVICES DIVISION (EP & WS)**

The Director, EP & WS, is responsible for the following:

- approval of the WCPP

## **5.9 OFFICE OF RADIATION PROTECTION (ORP)**

The ORP is responsible for:

- setting standards for the maintenance of RMMAs;
- performing radiological surveys as required/requested for needed RFD data;
- providing assistance (SMEs) when requested

## **5.10 TRANSPORTATION AND PACKAGING MANAGEMENT (TPM)**

TPM is responsible for:

- providing assistance (as SMEs), when requested, in waste characterization and packaging efforts to ensure DOT regulations for classification are met; and
- preparing, approving, and issuing specifications used to procure waste packaging materials

## 5.11 PROCUREMENT ORGANIZATION

The Procurement Organization is responsible for:

- purchase of waste packaging materials in accordance with specifications issued by TPM

## 5.12 DOE OAK RIDGE OPERATIONS (ORO)

DOE-ORO is responsible for:

- providing funding to UT-Battelle for the safe and compliant management of wastes;
- overseeing the WCP to ensure compliance with the requirements of DOE Order 435.1 and the NRA Performance Objective

## 6. TRAINING

Graduated levels of training are required for WCP participants. Generators (as identified in Sect. 4.2.1) are, at a minimum, required to complete a Waste Awareness Training course in addition to General Employee Training. GIs, GIEs, Waste Acceptance Coordinators, Waste Handlers, and the WCO(s) must complete a more detailed in-depth certification training.

UT-Battelle employees, visitors, and subcontractors who generate waste covered under the WCP are required to complete a Waste Awareness Training course. The training includes an overview of the waste types, the WCP, review of generator responsibilities, and instructions on when, where, and how to obtain assistance on waste management matters. Updates to the Waste Awareness Training are provided when program requirements affecting the generators are changed. Notification to generators of the need to update training is handled through the Division Training Officers. Generator compliance with training requirements is verified by LWS during the RFD review process.

The specific training requirements for the GIs, GIEs, Waste Acceptance Coordinators, Waste Handlers, and personnel performing verification (affirmation) of Sanitary/Industrial wastes are determined for each person via completion of a training matrix. Use of the training matrix allows tailoring of training to the specific needs of the organization, job function, person, etc. Typically the training includes an in-depth review of the WCP process, waste acceptance criteria, implementing procedures, and characterization guidance documents. This training requires class attendance and successful completion of exams. In general, GIs are required to take the training for all waste types included in the WCP, while GIEs are only required to take the training for waste types they are expected to handle. Training updates are provided to the appropriate staff when program documents change. Updates are announced to LWS, EP, and Division Training Officers to ensure training is updated promptly.

The qualifications and training requirements for the WCO position are given in Attachment B, “*WCO Qualifications and Training Requirements*”.

## 7. PROGRAM ASSESSMENTS

The WCP will be validated through assessments of the entire program. The majority of the assessment activities are contained in Table 2, *Quality Assurance Verification Plan*, which provides for validation of generator-sampling activities, sampling results, and analyses for waste characterization. A program assessment will be conducted annually (i.e., at least once in every calendar year).

Additional assessments will be completed by the divisional self-assessment program and/or divisional QA personnel. To ensure that the assessment requirements are completed, QA personnel may participate in the divisional self-assessment. If this approach is taken, QA personnel will need to participate in the actual oversight function. The other method to implement these requirements is for QA personnel to complete either independent oversight(s), with focus on the technical aspect of the division's waste-generation, characterization, and certification, or programmatic review(s) of the divisional waste certification activities. The frequency of participation is determined by the overall involvement in the program. For divisions that have major roles, a minimum of two reviews are required each year. For other generating or support organizations, one annual review is required. The levels are defined in documents on the UT-Battelle ORNL *Waste Certification Home Page* under the heading **QAS/QAC** (Quality Assurance Specialist/Quality Assurance Coordinator) **Participation in the WCP**.

If program deficiencies are indicated, additional assessment focus will be provided to ensure that those areas are improved to meet the expected quality.

## 8. CORRECTIVE ACTIONS

Corrective actions will be developed for all deficiencies identified during WCP audits or assessments. A corrective action report will be prepared to document actions taken. These corrective actions will be reviewed and concurred by the WCO. All activities associated with corrective actions will be conducted in accordance with existing UT-Battelle corrective action procedures (*ORNL Issues Management Program*, ORNL-QA-P04). Nonconformances arising from program deficiencies will be handled in accordance with the UT-Battelle nonconformance procedure (*ORNL Nonconformance Control Procedure*, ORNL-QA-P05). Program deficiencies will be corrected without interruption of the ongoing program. This can be accomplished because each waste package is traceable. Individual waste item rejections are jointly resolved by LWS/WCO and generators, however generators are responsible for any costs associated with correcting waste item problems.

## 9. RECORDS MANAGEMENT

Program documents that provide evidence of compliance will be physically maintained in an area under control of the WCO. At a minimum, the following documents will be considered record documents.:

- record copies of waste certification packages submitted to the receiving organization; including supporting information;
- records generated from Table 2 activities;
- internal program characterization methodology approvals;
- WAC variance or exemption approvals;
- final assessment reports with auditors qualifications;
- final corrective action reports;
- completed program surveillance reports;
- QAS/QAC divisional surveillance schedules and final surveillance reports;
- program nonconformance reports;
- official program communications;
- other programmatic approvals (e.g., approved suppliers)

LWS is responsible for management of WCP training records.

All of these records will be held a minimum of five years or as directed by applicable regulations or DOE requirements.

## 10. DOCUMENT CONTROL

Program documents will be controlled as specified in the ORNL Standard Practice Procedure ORNL-IO-003, "*ORNL Records Management and Document Control*", and ORNL-10-002, "*ORNL Information Servers and Electronic Information Release*".

When existing procedures require revision, and as new UT-Battelle program procedures are needed, requests for these additions or revisions will be presented to the UT-Battelle procedure review committee for concurrence and permission to proceed. As WAC revisions are proposed, UT-Battelle will participate in review process. At least once every five years, all related plans and procedures will be reviewed for relevancy and revised as necessary.

## 11. REFERENCES

(NOTE: Documents are available on the Web at the *WCP Home Page* unless noted otherwise)

Guidance on No-Radioactivity-Added Characterization for Hazardous and PCB Waste at ORNL, WM-SWO-407, Oak Ridge National Laboratory, Oak Ridge, Tennessee.

Oak Ridge Reservation Waste Certification Program Plan Bechtel Jacobs Company, LLC/Oak Ridge (BJC/OR-57), Oak Ridge, Tennessee. (Not yet available on WCP Home Page.)

ORNL Compliance with Hazardous/Low-Level Mixed Waste Acceptance Criteria ORNL-WC-005, Oak Ridge National Laboratory, Oak Ridge, Tennessee.

ORNL Compliance with Solid Low-Level Waste Acceptance Criteria ORNL-WC-006; Oak Ridge National Laboratory, Oak Ridge, Tennessee.

ORNL Compliance with Transuranic Waste Acceptance Criteria ORNL-WC-007, Oak Ridge National Laboratory, Oak Ridge, Tennessee.

Performance Objective for Certification of Non-Radioactive Hazardous Waste, U.S. Department of Energy, Washington, D. C., February 1995. (Not available on Web)

Radiological Characterization Plan for Solid Low-Level Waste, ORNL-WC-507, Oak Ridge National Laboratory, Oak Ridge, Tennessee.