NUCLEAR WASTE MANAGEMENT PROGRAM PROCEDURE

SP 20-2
WASTE SURROGATE COMPACTION
Revision 0

Effective Date: 08/23/99

Author:	Deborah S. Coffey	*Original signed by Deborah S. Coffey*	*8-16-99*
	(printed name)	(signature)	date

1.0 Purpose and Scope

The purpose of this procedure is to define the methods for compaction of samples to be tested in the vertical sediment flume and in container compaction experiments.

The scope of this procedure applies to the compaction process, which will occur using two different load frames in two separate locations. Quarter-scale compaction and sample preparation for the vertical sediment flume samples will be done at the Geomechanics Laboratory, Sandia National Laboratories (SNL), Area 1, Building 849. using an MTS 1,000,000-lb capacity load frame. Full-scale compaction testing will be done at Los Alamos National Laboratory (LANL), Tech Area 3, Building 35 using a Lake Erie double-action 10,000,000 lb load frame.

Acronyms and definitions not located in the glossary will be defined in the text of this procedure. Some acronyms and definitions used in this procedure are contained in the Nuclear Waste Management Program (NWMP) Glossary located by accessing the SNL NWMP On-Line Documents website. The website provides access to controlled documents [NWMP procedures (NPs), Activity/Project Specific Procedures (SPs), forms, controlled documents such as technical operating procedures, and other quality assurance (QA) program information]. Website access is obtained by using the following:

http://www.nwmp.sandia.gov

2.0 Implementation Actions

2.1 Prerequisites

Work at LANL will require either (1) a Q-level security clearance or, (2) escorted access of L-level security-cleared staff by a Q-level security-cleared person from Los Alamos. The QA and environmental health and safety (ES&H) requirements that are prerequisites for this work are listed below.

2.1.1 Quality Assurance

All personnel providing technical support to WIPP are required to follow the Waste Isolation Pilot Plant (WIPP) QA Program as described in the document, "*U.S. Department of Energy, Carlsbad Area Office, Quality Assurance Program Document, CAO-94-1012,* most recent revision. The implementation of the Carlsbad Area Office (CAO) QA Program Document (QAPD) by the Sandia WIPP QA Program is through NPs. All Sandia personnel working under this procedure (SNL staff, contractors) will be required to view the Annual Refresher Training Video and complete form NP 2-1-1 (Qualification and Training Form) prior *to* beginning work.

Non-Sandia participants at other facilities such as Los Alamos, although not formally working to Sandia's QA Program under a contractual mechanism, will document their qualifications using Form NP 2-1-1, *Qualification and Training Form* as per NP 2-1, Qualification and Training. QA Program and NP training will be attained by completing the WIPP Annual Refresher QA Training, either by attendance at training seminars or by viewing a training video.

All participants will be required to read this and any other pertinent procedure prior to beginning work. A copy of any required pertinent procedures will be available in the work area. The most recent version of any applicable WIPP procedure is available on the web site. When the procedures are updated, participants will be informed. The procedure for initiating, using and completing a scientific notebook, NP 20-2, most recent revision is required to be read and followed for this work activity.

2.1.2 Environmental Safety and Health (ES&H)

Compaction for the quarter-scale tests will be done in the Sandia Geomechanics Laboratory in Building 849 in Technical Area 1. The work will done under the supervision of Nancy Brodsky (6117) under the operating and ES&H procedures approved for use in that facility. These documents are available in Building 823, Room 2490 and in the Geomechanics Laboratory in Building 849.

Document Number	Title
Preliminary Hazard Screening (PHS) 9720546929-002	Geotechnology Research Facility
OP-6117-1100	Operating Procedure for the 5 MN (1100 KIP) Triaxial Testing System

The authorized user list for work performed in Building 849 is

Nancy Brodsky, 6117	Primary Point of Contact
Deborah Coffey, 6832	Technical Support
Ben Flexner, 6832	Student intern
Bob Hardy, 6117	Technical Support
Dan Lucero, 6832	Technical Support

Compaction for the full-sale tests will be done at LANL in Building 35 in Tech Area 3. The work will be done under the supervision of Diane Albert under the operating and ES&H procedures approved for use in that facility. The documents listed below will be revised to be specific for this project. Therefore, the titles or document numbers listed below may change. If so, this will be noted in the project notebook and copies of the final documents will be included. These documents will be available in the load press work area at the time of testing.

Document Number	Title
OWP 6-3-35-101-1	Primary Hazard Screening 5000 Ton Press
OWP: 6-3-35-101-1	Operational Report for Lake Erie 5000 Ton Press
6-3-35-101-1	Hazard Control Plan Lake Erie 5000 Ton Press

The authorized user list for work performed at LANL is

LANL Participants

Diane Albert, LANL — Primary Point of Contact
Sam Atencio, LANL
Others to be assigned by LANL.

Sandia Participants (will perform in a limited capacity while at LANL)

Deborah Coffey, 6832 — Technical Support
Ben Flexner, 6832 — Student Intern
Bob Hardy, 6117 — Technical Support
Dan Lucero, 6832 — Technical Support

The Sandia ES&H Manual is applicable to all Sandia-directed work. However, basic environmental health and safety knowledge applies. All Sandia participants should have completed

SNL ESH 100 — ES&H Awareness,
LAB 100 (this requirement can also be met by taking HAZ101I)

Additionally, LANL requires Sandia staff doing work in Building 35 to complete

LANL General Employee Training. (GET),

and other training as listed in the Primary Hazard Screening, OWP: 6-3-35-101-2, as applicable to the job being performed.

The assembly of waste surrogate materials will be conducted in Building 6600 in Technical Area 3. The work will done under the supervision of Dan Lucero (6832) under the operating and ES&H procedures approved for use in that facility. The acquisition of materials will be from or around Sandia as much as possible. However, materials may be collected from construction sites, laboratories, and other locations in the Albuquerque area. Sample assembly is addressed in SP 20-1.

2.1.3 Hazards

Magnesium oxide (MgO) will be used in some of the compaction testing. MgO is an odorless white powder, which is used as a WIPP repository backfill in pellet form. The hard-burned form of MgO is used which is less reactive than the pure powder form. MgO in the pellet or powder form is not hazardous. There are no designated threshold limit values. Some people are sensitive to MgO particulates in the air in the same way that they would be sensitive to dust. The MgO dust in the two work areas will be controlled by wetting down the MgO with a light spray when needed.

Both the quarter-scale tests and the full-scale tests will use MgO in relatively large quantities. A hose with a fog-type nozzle will be used to spray down any airborne particulate. At LANL, participants will work behind a glass wall during the test duration.

The primary exposure routes from working with MgO are expected to be from inhalation or skin contact. In some sensitive persons, MgO can cause a mild irritation of the upper respiratory tract and flu-like symptoms, referred to as “metal fume fever.” The symptoms are transitory and usually subside within 24-36 hours. Symptoms for upper respiratory tract exposure are coughing and a dryness of the mucus membranes. Flu-like symptoms are nausea, dizziness, feelings of lassitude or drunkenness, fever, chills muscular pain, mild to severe headache, profuse sweating, or diarrhea.

Precautions are the following:

- Avoid handling MgO that is not in enclosed containers.
- If MgO dust is present, control the dust.
- Sensitive people should vacate the work area.

To ensure that the emergency response system is activated when needed, the appropriate telephone contact numbers are listed below.

EMERGENCY TELEPHONE NUMBERS

9-1-1 cell phones dial 844-0911	Fire, Police, Ambulance
844-4189	Sandia On-Duty Incident Commander
311 or 844-6515	Non-emergencies

2.2 Environmental Conditions

All work will be conducted in a laboratory environment with adequate lighting, and at ambient temperatures. There are no specific requirements for temperature or other environmental conditions. The laboratory areas where sample compaction will occur should be relatively clean and relatively free of dust. Good housekeeping practices are expected. Raw materials and samples are required to be made prior to compaction under procedure SP 20-1, Waste Surrogate Development: Sample Material Acquisition and Preparation. Samples are required to be stored under conditions that will not affect the weight and composition of the materials or samples. Sample integrity must be maintained to keep the samples free from pests, insects, dust and dirt. Although there are no specific temperature requirements for materials or sample storage, samples must not be stored in temperature extremes causing brittleness, melting, or other conditions affecting integrity. Also, materials and samples must be stored in areas that are not open to the weather or where excessive humidity or moisture might affect the materials or samples or sample labeling.

2.3 Equipment Descriptions and Use

Table 1 lists the equipment expected to be used in waste compaction testing. SNL Equipment requiring calibration is identified and calibration methods and frequencies are specified. LANL equipment will be calibrated under LANL’s calibration and testing program. Calibration will be verified and documented in the project scientific notebook before use.

Table 1. Equipment and Calibration Requirements				
Equipment	**Measure**	**Calibration**	**Primary Standard**	**Secondary Standard**
Video camera	Video documentation of sample materials, sample compositions, sample compaction, and final sample morphology will be provided.	A measurement scale will be used whenever possible and in-the-picture tags will be used to provide labeling of photographs	NA. Indoor film or a digital video camera will be used. A time stamp will show in the video frame.	NA. Narration may be used to provide a record of the interpretation of the video. A scientific notebook will be used to document test details.
Pressensor – Pressure Sensitive Film	Low (pressures between 355-1400 psi) and medium (pressures between 1400 – 7100 psi) grades will be tested	Color/Density relationship provided by the manufacturer	SNL calibration of color/density relationship using known pressures to compare to manufacturer's specifications.	None.
SNL Compaction				
Load Frame – MTS Geomechanics Laboratory, SNL, Building 849	Load applied,	The load cell will be annually calibrated by MTS and the calibration certificate will be on file in the project records.	The primary standard is defined in the MTS procedure for balance calibration. NIST-traceability will be maintained.	There is no additional continuing calibration step or standard for this instrument.
Extensometers	Force and deflection over time	Extensometers are calibrated as needed against micrometers which are calibrated annually by the SNL Primary Standards Laboratory (PSL)	The primary standard is defined in the PSL procedure for micrometer calibration. NIST-traceability will be maintained.	Replicate measures of displacement v. the standard gage block are used to check calibration before use.
Axial Linear Variable Deformation Transformers (LVDTs)	Axial Deformation	LVDTs are calibrated as needed against micrometers which are calibrated annually by the SNL PSL	The primary standard is defined in the PSL procedure for micrometer calibration. NIST-traceability will be maintained.	Replicate measures of displacement v. the standard gage block are used to check calibration before use.
Lateral LVDTs	Lateral Deformation	LVDTs are calibrated as needed against micrometers which are calibrated annually by the SNL PSL	The primary standard is defined in the PSL procedure for LVDT calibration. NIST-traceability will be maintained.	Replicate measures of displacement v. the standard gage block are used to check calibration before use.

Table 1. Continued.

Equipment	Measure	Calibration	Primary Standard	Secondary Standard
LANL Compaction				
Load Frame-Lake Erie, LANL	Load applied, volume displacement	A commercial calibration firm (MTS) will be requested to provide calibration using a standard method or the method used to calibrate the press for the jet engine stress test (Parrish, 1989).	In the past calibration was obtained by the following approach (Parrish, 1989): A load cell was placed between the upper and lower platens *of the load press. Two 680-tonne (1.5 million lb) load cells and two 450-tonne (1.0 million lb) load cells were placed side-by-side between the platens and a 2268-tonne force applied. This is the method used for the jet engine stress test, and it may be modified. Any modifications will be documented.	An axial LVDT will be used to verify continuing calibration
Extensometers	Force and deflection over time	Extensometers are calibrated as needed against micrometers which are calibrated annually by the LANL Primary Standards Laboratory	The primary standard is defined in the PSL procedure for micrometer calibration. NIST-traceability will be maintained.	Replicate measures of displacement v. the standard gage block are used to check calibration before use.
Axial LVDTs	Axial Deformation	LVDTs are calibrated as needed against micrometers which are calibrated annually by the LANL Primary Standards Laboratory	The primary standard is defined in the LANL procedure for micrometer calibration. ASTM or NIST-traceability will be maintained.	Replicate measures of displacement v. the standard gage block are used to check calibration before use.
Lateral LVDTs	Lateral Deformation	LVDTs are calibrated as needed against micrometers which are calibrated annually by the LANL Primary Standards Laboratory	The primary standard is defined in the LANL procedure for micrometer calibration. ASTM or NIST-traceability will be maintained.	Replicate measures of displacement v. the standard gage block are used to check calibration before use

To assure acceptable accuracy and reliability, each piece of equipment used for sample preparation activities will be maintained and calibrated according to the procedures provided by its manufacturer. If these procedures are unavailable or deficient, calibration procedures will be developed and reviewed following the guidelines provided in NP 12-1 and NP 5-1. In addition, all requirements identified in NP 12-1 regarding staff qualification and training, calibration records including calibration labels, and unique identification and traceability of measurement standards to the National Institute of Standards and Technology (NIST) or other nationally-recognized standard will be observed.
The stack dimensions for full-scale testing follow:

Top	salt platen	6 inches	15	cm
	MgO supersack	24 inches	61	cm
↓	plastic slip sheet	0.25 inches	0.6	cm
	55-gallon drum	34 inches	86.4	cm
↓	reinforcing plate	0.25 inches	0.6	cm
	55-gallon drum	34 inches	86.4	cm
↓	reinforcing plate	0.25 inches	0.6	cm
	55-gallon drum	34 inches	86.4	cm
	reinforcing plate	0.25 inches	0.6	cm
Bottom	salt platen	6 inches	15	cm
	total	11.5 ft	352	cm

Attempts to obtain mined WIPP salt platens are in progress. Salt platens are desirable to place above and under the full-and quarter-scale, three-tiered seven-packs to evaluate the creep of the salt around the container configuration. It is planned to test the behavior and response of the platens to pressure in the quarter-scale tests to determine if this approach is feasible for implementation the full-scale tests. If the salt platens can not be mined and shipped within a reasonable budget and schedule, the use of the salt platens will be deleted from planned activities.

The material used to contain the MgO is a woven polyethylene. For full-scale tests the MgO is contained in a hexagon-shaped bag, fitted to a 61 " inscribed circle and 24.50 inches high when unfilled. This bag is termed a "Supersack". The quarter-scale container will be constructed using the same dimensions divided by four. Since the MgO pellets themselves will not be scaled, the weight of the MgO quarter-scale Supersacks will need to be measured when the bags are filled. The six MgO sacks that are placed lengthwise around the base of the stack in the space where the drums touch are referred to as the mini-sacks. The full-scale MgO Supersack weighs 4,200 lb. and each mini-sack weighs 25 lb.

The diameter of the full-scale seven-pack (one drum with 6 drums surrounding the center drum) is 73 inches, with an area of 4183 inches. The lithostatic load in the repository is 13.8 MPa (2000 psi.) Therefore, the required compaction force is 8,366,000 lb.

Each full-scale drum will have a 30 ml plastic liner and material within the drums will also be bagged in 4 mil plastic bags. Drums will contain the materials specified in Table 3. Quarter-scale containers will not utilize the 30 and 4 mil liners.

The diameter of the quarter-scale seven-pack is 19.25" with an area of 290.9 inches. The same compaction force used in full-scale tests will be applied. In the three-tiered seven-pack tests performed at quarter scale, the thicknesses of the reinforcing plates and the slip sheet will not be scaled. The manufacturer quoted a high price to retool the equipment to meet this specification. The contents of the containers will be quarter-scaled as much as possible.

The forces listed in Table 2 are estimated to be those required to compact specific containers and container configurations. The force needed to compact the MgO is not known, and has not been considered in these calculations.

Table 2. Estimated Forces Required to Compact Containers in Specific Configurations

Container, Scale	Force
Single, Full-Scale A = 447 in^2	892,000 lb.
7-Pack, Full-Scale A = 4183 in^2	8,366,000 lb.
3-Tiered 7-Pack, Full-Scale A = 4183 in^2	8,366,000 lb.
Single, Quarter-Scale A= 25.5 in^2	51,009 lb.
7-Pack, Quarter-Scale A=291 in^2	582,000 lb.
3-Tiered 7-pack, Quarter-Scale A=291 in^2	582,000 lb.

2.4 Material Acquisition and Procurement

As specified in SP 20-1, materials will be acquired from routine laboratory processes (plastics, glass ware, paper products such as Kim Wipes), from sources such as junk yards (discarded fire brick, graphite foundry parts, concrete, sheet metal, discarded piping and reinforcing steel), from SNL facilities such as laboratories or reapplication (plastic and rubber-based trash, PVC pipe, copper pipe, wood, plastic containers, from donations from home shops (rags, plastics, wood, metal objects), and from purchases (sorbents, stabilized oils and resins, sludges, portland cement).

There are four primary waste classifications:

1. Compressible; typically having a large amount of void space and representative of contaminated paper, rags, plastic and rubber-based trash produced in abundance by both laboratory and production activities. This compressible waste was often referred to as “combustible” in prior similar studies.
2. Rigid; containing broken and discarded glass, graphite foundry parts, fire brick, and construction debris including concrete, wood, sheet metal, and elongate objects such as wooden 2x4’s, discarded piping and reinforcing steel.
3. High density, semi-plastic; primarily low compressibility paste-like materials, principally stabilized oils, resins and (inorganic) sludges.
4. Rigid monoliths; postulated that only a very few drums (Portland cement stabilized organic complexing agents from Rocky Flats) meeting this criterion are expected, and so it is not a major waste category.

Classifications #3 and #4 will be combined into a “sludge and sorbents” category.

The exact waste compositions by weight and material will be specified in a memorandum requesting sample fabrication. The weights of each large component (e.g., individual metal pieces) and each aggregate component (bulk plastic from rubber gloves, all ¼” inner diameter PVC pipe cut into 5” sections) and subsets of the individual components (n=3 at a minimum) of aggregate components will be recorded. The percent by weight of the components will be documented as well. The materials will be as clean as possible so as not to introduce any undesired contaminates into the samples.

However, since some of the components will be recycled materials, metal pieces may be corroded or rubbers and plastics already partially degraded from use.

Surrogate samples prepared and used in the tests conducted by Butcher *et. al.* (1991) and described in Butcher (1989) provide the basis for defining the 1999 waste surrogate sample compositions. An analysis of the BIR inventory by Larry Sanchez (personal communication, 1999; SNL, 6832) combined both contact handled (CH) and remote handled (RH) wastes. RH wastes are not expected to be packaged in 55-gallon drums. Compaction of 55-gallon drums must necessarily only consider CH waste forms. Any calculation and assembly of surrogate materials is likely to be difficult because of the variability in the waste streams from different generator sites with different characteristic waste-generating processes. Within the wastes from any one generator, however, the waste stream is not always constant, and another source of variability is introduced. It is impossible to define "representative" surrogate samples. A better approach is to move away from the actual waste inventories toward a classification based more on the expected waste compressibility, which includes changes in porosity and permeability. This approach provides a means for extrapolation, and minimizes the number of tests in the program because the test results are less variable and the samples need not be selected by a statistical process (Butcher, 1989). Another positive aspect of this approach is that it is independent of changes to the waste inventory. The selected waste forms provide bounding conditions for the waste inventory. The sludge materials will represent the least compressible wastes. The most compressible wastes will be represented by the category of compressible materials (paper, rags, gloves). The metals are important because metal objects have the ability to penetrate the container sides, top, or bottom during compaction. Table 3 specifies the percentages of each waste classification to be used in the FY 99 tests. These percentages can be directly related to those used in Butcher *et al.*'s full-scale tests. In addition, results from evaluating full-scale tests of seven-pack and three-tiered seven-pack configurations can be linked to previously performed full-scale, single container tests.

Table 3. Planned Waste Form Compositions

Compressibles	Plastics 45%, fibers 37%; metals 9% and sorbents 9%
Rigid/Metals	Rigid/Metals 83%; plastics 10%, fibers 2%, and sorbents 5%
Sludge/Sorbents	Sludge 90%, plastics 3% and sorbents 7%
Total	100%

2.5 Material Handling and Storage

Raw materials and samples are required to be stored under conditions that will not affect the weight and composition of the materials or samples. Sample integrity must be maintained to keep the samples free from pests, insects, dust and dirt. Although there are no specific temperature requirements for materials or sample storage, samples must not be stored in temperature extremes causing brittleness, melting, or other conditions affecting integrity. Also, materials and samples must be stored in areas that are not open to the weather or where excessive humidity or moisture might affect the materials or samples or sample labeling.

A previously tested vertical sediment flume sample required dipping in wax to facilitate transfer from the compression chamber to the cuvette used for analysis. However, it is most efficient to compact the samples in a form that can be used directly for testing.

2.6 Sample Preparation and Labeling

Each container or sample will be labeled according to the general format specified in Table 4 below:

Table 4. Sample Labeling

Test Type	Test Number[A] and Alphanumeric (replicate)	Container Contents	Container Position[B]
¼ -	1, 1a, 1b, 2, 2a, 2b	S-(Sand)	Si-(Single)
	And so on	C-(Compressible)	1-7 (7-Pack Test)
		M-(/Rigid/Metallic)	1-21 (3-Tiered, 7-Pack Test)
		D-(Sludge)	
Full -	1, 1a, 1b, 2, 2a, 2b	S-(Sand)	Si-(Single)
	And so on	C-(Compressible)	1-7 (7-Pack Test)
		M-(Rigid/Metallic)	1-21 (3-Tiered, 7-Pack Test)
		D- (Sludge)	
VS (vertical sediment flume)-	1, 1a, 1b, 2, 2a, 2b	S-(Sand)	NA
	And so on	C-(Compressible)	NA
		M-(Rigid/Metallic)	NA

[A] If there is a need to reload the test, this will be indicated by using a decimal and a reload number. For example, if test a is reloaded, then the reload will be referred to as 1.1a.

[B] The container position within the 3-Tiered 7-Pack will be documented in the scientific notebook. The positional numbering scheme will begin with 1, 8, or 15 as the center number. The lower tier will be numbered 1-7, the middle tier will be numbered 8-14, and the upper tier will be 15-21. The second number assigned (2, 9, 16) will begin in the north direction and continue around in a clock wise direction until all numbers are assigned.

For example, the sample ID ¼-1a-S-Si refers to a container used in a quarter-scale single can test, the first replicate in the test series, and a container filled with sand. The sample ID, Full-3-C-18 refers to a container within a three-tiered seven-pack test that is filled with compressible materials. This is the 3rd test of this kind performed. Position #18 and the details of the third test will be described in the scientific notebook.

Actual container labels may be somewhat modified to provide test-specific information. All container labeling codes keys will be documented in the scientific notebook. Quarter-scale containers will be metal cans approaching the ideal specification described in Table 5.:

Table 5. Ideal Quarter-Scale Dimensions

Diameter	5.693 in
Height	8.70 In
Thickness side/top/bottom	0.015 in

Full-scale containers will be standard (UN 1A2/X423/S) 55-gallon drums specified for solid waste disposal. Each drum lid contains two bungholes. In actual use, one bunghole is closed and one is fitted with a HEPA filter. In full-scale testing, the HEPA filter will not be used, but the bungholes will be left open to allow air to escape during compression. In quarter-scale tests the containers are sealed when the lids are closed. In order to de-pressurize the containers, a small puncture should be made in each can lid. Stainless steel or other forms will be fabricated and used to prepare vertical sediment flume samples will be 15 cm x 15 cm.

2.7 Sample Storage and Control

Samples shall be identified and controlled in accordance with NP 13-1 (Sample Control) and SP 13-1 (Chain of Custody). The combined procedures specify approaches for labeling and identification, chain of custody, sample storage, environmental controls, and sample disposition. Specimens will be prepared in Albuquerque, NM. Sample preparation specifications will follow documented procedures and any additional details will be documented using a scientific notebook. Specimen preparation is expected to include assembly of surrogate waste components, compaction, and testing for erodibility and flow. Sample storage is previously addressed in Sections 2.2 and 2.5

2.8 References

Butcher, B.M., 1989. Waste Isolation Pilot Plant Simulated Waste Compositions and Mechanical Properties. Technical Report, SAND89-0372. Sandia National Laboratories, Albuquerque, NM.

Butcher, B.M. T.W. Thompson, R. G. VanBuskirk, and N.C. Patti. 1991. Mechanical Compaction of Waste Isolation Pilot Plant Simulated Waste. Technical Report, SAND90-1206. Sandia National Laboratories, Albuquerque, NM.

Parrish, Leon. 1989. Internal memorandum RS 6440/89/00001, January 1989, High-Speed Full-Scale Missle Input Tests: Final Report. Sandia National Laboratories. Albuquerque, NM.

Science Applications International Corporation (SAIC). 1989. Data Package for Material Compaction and Drum Collapse Testing: Phase II: Drum Collapse Data. Technical Procedure, Laboratory Safety, SAIC/RML-WIPP-TPSA, Rev. 0 Prepared by SAIC, Las Vegas, NV for Sandia National Laboratories, Albuquerque, NM 87185. (WPO# 26468)

2.9 Forms

This procedure has no associated forms other than those associated with mentioned NPs or SPs.

3.0 Records

Sample compaction activities will be documented using scientific notebooks. A Data Package documenting information such as the following will be created and submitted to the NWMP Records Center: sample requirements, composition, appearance (photographic documentation), preparation, sample labeling, subsampling, and sample storage, tracking, and disposition

4.0 Appendices

Appendix A: Reviewers and Required Signatures

Appendix A
Reviewers and Required Signatures

If the procedure is revised, the revision will be reviewed by either the original reviewers or by a reviewer with the same level of expertise. This Appendix is provided to document the list of original reviewers and to provide information to select the appropriate reviewers for subsequent revisions.

Author:	Deborah S. Coffey, 6832 Printed Name
QA Reviewer:	Norbert F. Tencza, 6811 Printed Name
Technical Reviewer:	Diane E. Albert, LANL Printed Name
Technical Reviewer:	Nancy S. Brodsky, 6117 Printed Name
ES&H Coordinator	Tanya McMullen, 6500 Printed Name
LANL Safety Representative	Dave Dixson, LANL Printed Name
MOC Manager of Industrial Safety[1]	NA Printed Name

[1] Work covered under this procedure will not be conducted at the WIPP site, and therefore, the MOC Manager's Signature is not needed.