Health and Safety Research Division

POLLUTANT ASSESSMENTS GROUP
PROCEDURES MANUAL
VOLUME I:
ADMINISTRATIVE AND SUPPORT PROCEDURES

prepared by
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Grand Junction, Colorado

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PREFACE

This manual describes procedures currently in use by the Pollutant Assessments Group. The manual is divided into two volumes: Volume 1 includes administrative and support procedures, and Volume 2 includes technical procedures. These procedures are revised in an ongoing process to incorporate new developments in hazardous waste assessment technology and changes in administrative policy. Format inconsistencies will be corrected in subsequent revisions of individual procedures.
TABLE OF CONTENTS

PREFACE

I. ADMINISTRATIVE PROCEDURES

<table>
<thead>
<tr>
<th>Number</th>
<th>Title</th>
<th>Revision</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>AD-010</td>
<td>Introduction</td>
<td>0</td>
<td>10/01/90</td>
</tr>
<tr>
<td>AD-020</td>
<td>Program Administration</td>
<td>0</td>
<td>10/01/90</td>
</tr>
<tr>
<td>AD-030</td>
<td>Project Management</td>
<td>0</td>
<td>10/01/90</td>
</tr>
<tr>
<td>AD-031</td>
<td>Remedial Investigation and Feasibility Study Budget and Schedule Forecasts</td>
<td>0</td>
<td>11/14/91</td>
</tr>
<tr>
<td>AD-040</td>
<td>Support Activities</td>
<td>0</td>
<td>10/01/90</td>
</tr>
<tr>
<td>AD-050</td>
<td>Quality Assurance</td>
<td>0</td>
<td>10/01/90</td>
</tr>
<tr>
<td>AD-051</td>
<td>Quality Assurance for Preexisting Custom Software</td>
<td>0</td>
<td>11/20/91</td>
</tr>
<tr>
<td>AD-060</td>
<td>Preparation, Control, and Distribution of Procedures</td>
<td>1</td>
<td>01/02/92</td>
</tr>
</tbody>
</table>

II. SUPPORT PROCEDURES

<table>
<thead>
<tr>
<th>Number</th>
<th>Title</th>
<th>Revision</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>SU-010</td>
<td>Control of Radioactive Sources</td>
<td>0</td>
<td>03/25/91</td>
</tr>
<tr>
<td>SU-020</td>
<td>Calibration of Portable Gamma Scintillation Detectors</td>
<td>0</td>
<td>10/01/90</td>
</tr>
<tr>
<td>SU-021</td>
<td>Calibration of Pressurized Ionization Chamber (PIC)</td>
<td>0</td>
<td>10/01/90</td>
</tr>
<tr>
<td>SU-022</td>
<td>Calibration of Soil Laboratory Gamma Spectrometry System</td>
<td>1</td>
<td>12/02/91</td>
</tr>
<tr>
<td>SU-025</td>
<td>Quality Control of Soil Analysis Laboratory Samples</td>
<td>1</td>
<td>02/03/92</td>
</tr>
<tr>
<td>SU-030</td>
<td>Computer Equipment Control, Maintenance, and Inventory</td>
<td>0</td>
<td>10/01/90</td>
</tr>
<tr>
<td>SU-040</td>
<td>Database Management</td>
<td>0</td>
<td>10/01/90</td>
</tr>
</tbody>
</table>
### SUPPORT PROCEDURES (continued)

<table>
<thead>
<tr>
<th>Number</th>
<th>Title</th>
<th>Revision</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>SU-061</td>
<td>Graphics for Inclusion Surveys of Vicinity Properties</td>
<td>0</td>
<td>102/03/92</td>
</tr>
<tr>
<td>SU-062</td>
<td>Graphics for Verification of Vicinity Properties</td>
<td>0</td>
<td>02/03/92</td>
</tr>
<tr>
<td>SU-070</td>
<td>Document Control</td>
<td>0</td>
<td>10/01/90</td>
</tr>
<tr>
<td>SU-080</td>
<td>Subcontract Planning and Administration</td>
<td>0</td>
<td>10/01/90</td>
</tr>
<tr>
<td>SU-085</td>
<td>Property Management</td>
<td>0</td>
<td>10/01/90</td>
</tr>
<tr>
<td>SU-090</td>
<td>Identification of Properties for Inclusion Surveys</td>
<td>0</td>
<td>10/01/90</td>
</tr>
<tr>
<td>SU-091</td>
<td>Consent for Access to Survey</td>
<td>0</td>
<td>10/01/90</td>
</tr>
</tbody>
</table>

#### III. TECHNICAL PROCEDURES

| TE-010 | Mobile Gamma Scanning Van                                               | 0        | 10/01/90   |
| TE-020 | Inclusion Survey Activities                                             | 1        | 02/03/92   |

1.0 Purpose

2.0 Applicability

3.0 Other Documents

4.0 Equipment and Materials

5.0 Responsibility

6.0 Definitions

7.0 Safety

8.0 Procedure

8.1 Property Sketch

8.2 Extent of Inclusion Survey

8.3 Gamma Screening

8.4 Deposit Definition

8.5 Point Sources

8.6 Soil Sample Collection

8.7 Measurements in Uncontaminated Areas

8.8 Data Recording

8.9 Inspection and Decontamination of Equipment and Personnel

| TE-021 | Gamma Scintillation Detector Operation                                | 0        | 03/25/91   |
| TE-022 | Pressurized Ionization Chamber (PIC) Operation                        | 0        | 03/25/91   |
### TECHNICAL PROCEDUREG (continued)

<table>
<thead>
<tr>
<th>Number</th>
<th>Title</th>
<th>Revision</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>TE-023</td>
<td>GR-410 Portable Gamma Spectrometer Operation</td>
<td>0</td>
<td>03/25/91</td>
</tr>
<tr>
<td>TE-024</td>
<td>Delta Counter Operation</td>
<td>0</td>
<td>03/25/91</td>
</tr>
<tr>
<td>TE-025</td>
<td>Alpha Radiation Measurement</td>
<td>1</td>
<td>02/03/92</td>
</tr>
<tr>
<td>TE-026</td>
<td>Beta-Gamma Radiation Measurement</td>
<td>1</td>
<td>02/03/92</td>
</tr>
<tr>
<td>TE-027</td>
<td>Determination of Removable Contamination</td>
<td>1</td>
<td>02/03/92</td>
</tr>
<tr>
<td>TE-028</td>
<td>Site Preparation for Radiological Surveying</td>
<td>0</td>
<td>10/01/90</td>
</tr>
<tr>
<td>TE-030</td>
<td>Inclusion Survey Report Completion</td>
<td>1</td>
<td>12/02/91</td>
</tr>
<tr>
<td></td>
<td><strong>1.0 Purpose</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>2.0 Applicability</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>3.0 Other Documents</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>4.0 Equipment and Materials</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>5.0 Responsibility</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>6.0 Definitions</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>7.0 Procedure</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>7.1 Team Leader Prereport Activities</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>7.2 Calculations</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>7.3 Report Skeleton</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>7.4 Letter of Recommendation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>7.5 Vicinity Property Summary Evaluation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>7.6 VPDMS Form</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>7.7 Condensed Exclusion Reports</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>7.8 Report Completion</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>7.9 Report Review</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>7.10 File Transmittal</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>7.11 Data Base Entry</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TE-031</td>
<td>Coring Drill Operation</td>
<td>0</td>
<td>02/03/92</td>
</tr>
<tr>
<td>TE-032</td>
<td>Alpha-Track Radon Detector Placement and Retrieval</td>
<td>0</td>
<td>02/03/92</td>
</tr>
<tr>
<td>TE-034</td>
<td>Chain of Sample Custody</td>
<td>0</td>
<td>07/01/91</td>
</tr>
<tr>
<td>TE-035</td>
<td>Soil Sample Preparation for Radionuclide Analysis</td>
<td>0</td>
<td>12/02/91</td>
</tr>
<tr>
<td>TE-036</td>
<td>Analysis of Radionuclides in Soils</td>
<td>0</td>
<td>12/02/91</td>
</tr>
<tr>
<td>Number</td>
<td>Title</td>
<td>Revision</td>
<td>Date</td>
</tr>
<tr>
<td>---------</td>
<td>--------------------------------------------------------------</td>
<td>----------</td>
<td>------------</td>
</tr>
<tr>
<td>TE-040</td>
<td>Verification Survey Activities</td>
<td>1</td>
<td>02/03/92</td>
</tr>
<tr>
<td></td>
<td>1.0 Purpose</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2.0 Other Documents</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3.0 Types of Verification</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4.0 Roles of Agencies</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5.0 Data Management</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>6.0 Verification Tracking</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>6.1 Logbook</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>6.2 Forms and Equipment</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>6.3 Database</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>7.0 Confirmatory Soil Analysis</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>7.1 Type I</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>7.2 Type II</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>7.3 Types I and II</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>8.0 Type I Verification Activities</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>8.1 Procedure</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>8.2 DOE Notification</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>8.3 Report Review Process</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>9.0 Type II Verification Activities</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>9.1 Equipment</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>9.2 Data Recording</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>9.3 Extent of Type II Verification Survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>9.4 Post-Verification Survey Activities</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>9.5 Soil Samples</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>9.6 Type II Verification Report</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>9.7 Verification Report Review</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>10.0 Type III Verification Activities</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>10.1 Equipment</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>10.2 Data Recording</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>10.3 Extent of Type III Verification Field Survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>11.0 Document Storage</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>11.1 Purpose</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>11.2 Applicability</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>11.3 Stages</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TE-046</td>
<td>Type B Field Verification Activities for Large Areas</td>
<td>0</td>
<td>08/19/91</td>
</tr>
<tr>
<td>TE-050</td>
<td>Monticello Vicinity Properties Project</td>
<td>1</td>
<td>02/03/92</td>
</tr>
<tr>
<td>TE-051</td>
<td>Ultrasonic Ranging and Data System (USRADS) Operation</td>
<td>0</td>
<td>02/03/92</td>
</tr>
<tr>
<td>Number</td>
<td>Title</td>
<td>Revision</td>
<td>Date</td>
</tr>
<tr>
<td>--------</td>
<td>----------------------------------------------------------------------</td>
<td>----------</td>
<td>------------</td>
</tr>
<tr>
<td>TE-055</td>
<td>Opposed Crystal System (OCS) Van Analysis</td>
<td>0</td>
<td>10/01/90</td>
</tr>
<tr>
<td>TE-060</td>
<td>Water Quality Parameters: pH, Specific Conductance, Dissolved Oxygen, and Alkalinity</td>
<td>0</td>
<td>10/01/90</td>
</tr>
<tr>
<td>TE-070</td>
<td>Soil Sampling with a Barrel Auger</td>
<td>0</td>
<td>10/01/90</td>
</tr>
<tr>
<td>TE-071</td>
<td>Sample Documentation</td>
<td>0</td>
<td>10/01/90</td>
</tr>
<tr>
<td>TE-072</td>
<td>Soil Sample Packaging and Preservation</td>
<td>0</td>
<td>10/01/90</td>
</tr>
<tr>
<td>TE-073</td>
<td>Equipment Decontamination</td>
<td>0</td>
<td>10/01/90</td>
</tr>
<tr>
<td>TE-074</td>
<td>Stream Sediment Sampling Using a Piston-Type Core Sampler</td>
<td>0</td>
<td>10/01/90</td>
</tr>
<tr>
<td>TE-075</td>
<td>Stream Sediment Sampling Using a Scooping Device</td>
<td>0</td>
<td>10/01/90</td>
</tr>
<tr>
<td>TE-076</td>
<td>Soil-Gas and Water Field Screening System</td>
<td>0</td>
<td>10/01/90</td>
</tr>
<tr>
<td>TE-077</td>
<td>Soil Augering Using a Little Beaver Mechanical Earth Drill</td>
<td>1</td>
<td>02/03/92</td>
</tr>
<tr>
<td>TE-078</td>
<td>Subsoil Sampling Probe</td>
<td>0</td>
<td>10/01/90</td>
</tr>
<tr>
<td>TE-079</td>
<td>Collecting Soil Samples Using Brass Sleeves</td>
<td>0</td>
<td>10/01/90</td>
</tr>
<tr>
<td>TE-080</td>
<td>Headspace Sampling with a Gas Chromatograph</td>
<td>0</td>
<td>10/01/90</td>
</tr>
<tr>
<td>TE-081</td>
<td>Surface and Groundwater Sampling for Inorganic, Radionuclide, and Physical Parameters</td>
<td>0</td>
<td>10/01/90</td>
</tr>
<tr>
<td>TE-082</td>
<td>Surface and Groundwater Sampling for Organic Parameters</td>
<td>1</td>
<td>02/03/92</td>
</tr>
<tr>
<td>TE-090</td>
<td>Measurement of Hydraulic Conductivity Using a Ball Test</td>
<td>0</td>
<td>10/01/90</td>
</tr>
<tr>
<td>TE-091</td>
<td>Field Determination of Gravimetric Moisture</td>
<td>0</td>
<td>10/01/90</td>
</tr>
<tr>
<td>TE-092</td>
<td>Determining Permeability Using a Packer Test</td>
<td>0</td>
<td>10/01/90</td>
</tr>
<tr>
<td>TE-093</td>
<td>Pumping Test in an Unconfined Aquifer</td>
<td>0</td>
<td>10/01/90</td>
</tr>
<tr>
<td>Number</td>
<td>Title</td>
<td>Revision</td>
<td>Date</td>
</tr>
<tr>
<td>--------</td>
<td>----------------------------------------------------------------------</td>
<td>----------</td>
<td>----------</td>
</tr>
<tr>
<td>TE-094</td>
<td>Water Level Measurement</td>
<td>1</td>
<td>02/03/92</td>
</tr>
<tr>
<td>TE-100</td>
<td>Drilling Log Preparation and Well Construction Documentation</td>
<td>0</td>
<td>10/01/90</td>
</tr>
<tr>
<td>TE-101</td>
<td>Subsurface Sampling Using a 5-ft. Continuous Sampler and a Split-barrel Sampler</td>
<td>0</td>
<td>10/01/90</td>
</tr>
<tr>
<td>TE-102</td>
<td>Subsurface Sampling Using a Shelby Thin-Wall Tube Sampler</td>
<td>0</td>
<td>10/01/90</td>
</tr>
<tr>
<td>TE-105</td>
<td>U2CRT Operation</td>
<td>0</td>
<td>05/01/91</td>
</tr>
<tr>
<td>TE-110</td>
<td>Monitoring Well Design</td>
<td>0</td>
<td>10/01/90</td>
</tr>
<tr>
<td>TE-111</td>
<td>Well Development</td>
<td>0</td>
<td>10/01/90</td>
</tr>
<tr>
<td>TE-112</td>
<td>Well Inspection and Maintenance</td>
<td>0</td>
<td>10/01/90</td>
</tr>
<tr>
<td>TE-120</td>
<td>Physical Survey</td>
<td>0</td>
<td>10/01/90</td>
</tr>
<tr>
<td>TE-130</td>
<td>Peristaltic Pump Operation</td>
<td>0</td>
<td>10/01/90</td>
</tr>
<tr>
<td>TE-131</td>
<td>Bladder Pump Operation</td>
<td>0</td>
<td>10/01/90</td>
</tr>
<tr>
<td>TE-132</td>
<td>Well Development Pump Operation</td>
<td>0</td>
<td>10/01/90</td>
</tr>
<tr>
<td><strong>INDEX</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>----------------</td>
<td>-------</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>10 CFR 20</strong></td>
<td>SU-010 p.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>40 CFR 192</strong></td>
<td>TE-040 p.3, 8, 30</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>ACAD</strong></td>
<td>SU-040 p.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SU-061 p.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>TE-030 p.3, 17</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Action Level</strong></td>
<td>TE-025 p.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>TE-026 p.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>ADC</strong></td>
<td>SU-022 p.2, 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>TE-036 p.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Air development</strong></td>
<td>TE-112 p.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Air Quality Monitoring Record</strong></td>
<td>TE-079 p.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Alkalinity test kit</strong></td>
<td>TE-060 p.18, 19</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Alpha radiation</strong></td>
<td>TE-020 p.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>TE-025 p.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>TE-046 p.1, 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Alpha scintillation probe</strong></td>
<td>TE-025 p.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Alpha track detector</strong></td>
<td>TE-040 p.2, 14, 15, 62</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>TE-032 p.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Archival</strong></td>
<td>AD-050 p.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>TE-036 p.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>TE-046 p.4, 24, 38</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>TE-046 p.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>TE-050 p.6, 13, 16</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Area Scan &amp; Radiation Level Survey form</strong></td>
<td>TE-026 p.1, 6</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>ARIX</strong></td>
<td>SU-090 p.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Asphalt coring</strong></td>
<td>TE-023 p.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>TE-031 p.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Audits</strong></td>
<td>AD-050 p.7-9</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Auger

- TE-040 p.1, 2, 11, 19, 22, 23, 35, 36
- TE-070 p.1-4
- TE-077 p.1-3
- TE-078 p.3
- TE-100 p.2
- TE-101 p.1, 2
- TE-102 p.2
- TE-105 p.1-4, 6-8, 11

Authorized limit

- TE-030 p.3, 28
- TE-050 p.14

Automatic can sealer

- TE-035 p.1, 8, 12

Background

- SU-010 p.4
- SU-020 p.2, 3
- SU-022 p.1, 4, 5
- SU-025 p.3, 4
- TE-010 p.1, 2, 6, 10, 13-16, 19, 22, 25, 28-31
- TE-020 p.9, 11, 12, 15, 18
- TE-021 p.3, 4
- TE-022 p.3, 4
- TE-023 p.4
- TE-025 p.2, 3, 5, 6, 8
- TE-026 p.2, 3, 5, 6, 9
- TE-027 p.3-5
- TE-030 p.1, 2, 7-10, 13, 27
- TE-040 p.13, 18, 23, 24, 27
- TE-050 p.2, 7, 13, 15
- TE-060 p.6

Bail tests

- TE-090 p.1

Bailing

- TE-082 p.3, 4
- TE-111 p.1

Barrel auger

- TE-070 p.1-4

Beta-Gamma probe

- SU-025 p.1, 3, 4
- TE-026 p.1, 2

Beta-Gamma radiation

- SU-025 p.1, 3
- TE-020 p.1
- TE-026 p.1
- TE-046 p.1

Biased samples

- TE-040 p.19, 24
- TE-046 p.3

Bladder pump

- TE-060 p.10, 14, 16, 20
- TE-081 p.8
- TE-082 p.2, 7
- TE-131 p.1
- TE-132 p.8
Blue ice
TE-072 p.2, 3
TE-081 p.9
TE-082 p.8

Brunton compass
TE-020 p.2, 6
TE-120 p.1

Budget and schedule
AD-031 p.1, 4

Buffer solutions
TE-060 p.4, 5, 7, 9

Calibration
AD-040 p.2
AD-050 p.7
AD-051 p.7
AD-060 p.2, 4
SU-010 p.1
SU-020 p.1-3
SU-021 p.1, 2
SU-022 p.1-4, 6, 8
SU-025 p.1
TE-010 p.1, 9, 10, 22-27
TE-022 p.1, 3
TE-023 p.3
TE-024 p.1, 3
TE-025 p.2
TE-026 p.2, 6, 7
TE-027 p.3
TE-035 p.2, 6
TE-036 p.1
TE-040 p.10, 15, 16
TE-051 p.3, 4
TE-055 p.3, 5
TE-060 p.2, 5-19
TE-080 p.4
TE-081 p.2, 7
TE-092 p.2
TE-120 p.2

CDH
SU-070 p.2
SU-091 p.4 6

CERCLA
AD-030 p.5
AD-031 p.1, 3

Chain of custody
TE-034 p.1-4, 7
TE-046 p.2
TE-050 p.4, 6, 13
TE-071 p.4

Chain of sample custody
SU-025 p.1, 3, 4, 10
TE-020 p.1, 2, 20, 25
TE-034 p.1-3, 5, 6
TE-035 p.1, 3, 9
TE-036 p.1, 3-5
<table>
<thead>
<tr>
<th>Section</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chain of sample custody (cont.)</td>
<td>TE-040 p.1, 6, 16, 20, 26, 34, 43</td>
</tr>
<tr>
<td></td>
<td>TE-046 p.1</td>
</tr>
<tr>
<td></td>
<td>TE-071 p.1, 4, 7</td>
</tr>
<tr>
<td></td>
<td>TE-081 p.2, 9</td>
</tr>
<tr>
<td></td>
<td>TE-082 p.2, 8, 14</td>
</tr>
<tr>
<td>Chain of Sample Custody form</td>
<td>TE-034 p.2, 3</td>
</tr>
<tr>
<td></td>
<td>TE-071 p.1, 4</td>
</tr>
<tr>
<td></td>
<td>TE-081 p.9</td>
</tr>
<tr>
<td></td>
<td>TE-082 p.8</td>
</tr>
<tr>
<td>Chain of Sample Custody/Soil Sample Analysis Form</td>
<td>SU-025 p.1, 3, 4, 10,</td>
</tr>
<tr>
<td></td>
<td>TE-020 p.2, 20, 25</td>
</tr>
<tr>
<td></td>
<td>TE-034 p.1</td>
</tr>
<tr>
<td></td>
<td>TE-035 p.1, 9</td>
</tr>
<tr>
<td></td>
<td>TE-036 p.1, 5</td>
</tr>
<tr>
<td></td>
<td>TE-040 p.1, 6, 16, 20, 26, 34, 43</td>
</tr>
<tr>
<td>Check source</td>
<td>SU-020 p.1, 2</td>
</tr>
<tr>
<td></td>
<td>SU-021 p.2</td>
</tr>
<tr>
<td></td>
<td>TE-021 p.3</td>
</tr>
<tr>
<td></td>
<td>TE-025 p.3</td>
</tr>
<tr>
<td></td>
<td>TE-026 p.3</td>
</tr>
<tr>
<td></td>
<td>TE-027 p.3</td>
</tr>
<tr>
<td></td>
<td>TE-051 p.1, 3</td>
</tr>
<tr>
<td></td>
<td>TE-055 p.1</td>
</tr>
<tr>
<td>Colorado Department of Health (CDH)</td>
<td>SU-070 p.2</td>
</tr>
<tr>
<td></td>
<td>SU-091 p.4, 6</td>
</tr>
<tr>
<td>Completion report</td>
<td>TE-040 p.1, 2, 4-9, 15, 25, 27, 29, 33, 38, 46</td>
</tr>
<tr>
<td></td>
<td>TE-050 p.4-6</td>
</tr>
<tr>
<td>Composite sample</td>
<td>TE-040 p.19, 23</td>
</tr>
<tr>
<td></td>
<td>TE-046 p.2</td>
</tr>
<tr>
<td></td>
<td>TE-074 p.2, 3</td>
</tr>
<tr>
<td></td>
<td>TE-075 p.2, 3</td>
</tr>
<tr>
<td>Computer equipment</td>
<td>AD-040 p.2</td>
</tr>
<tr>
<td></td>
<td>SU-030 p.1-3</td>
</tr>
<tr>
<td>Computer support</td>
<td>AD-040 p.1, 2</td>
</tr>
<tr>
<td></td>
<td>SU-061 p.2, 5</td>
</tr>
<tr>
<td></td>
<td>SU-062 p.2, 5</td>
</tr>
<tr>
<td></td>
<td>TE-036 p.6</td>
</tr>
<tr>
<td>Concrete coring</td>
<td>TE-020 p.17</td>
</tr>
<tr>
<td>Conductivity standards</td>
<td>TE-060 p.12, 14</td>
</tr>
<tr>
<td>Consent for Access</td>
<td>SU-091 p.4, 5</td>
</tr>
<tr>
<td></td>
<td>TE-050 p.9</td>
</tr>
<tr>
<td>Category</td>
<td>Pages</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>-------</td>
</tr>
<tr>
<td>Consent Form</td>
<td>AD-040 p.2, SU-090 p.4, SU-091 p.4, TE-020 p.7, 19, TE-030 p.6, 10, 12, 16, 18, TE-050 p.10</td>
</tr>
<tr>
<td>Contaminated mortar and brick</td>
<td>TE-020 p.12</td>
</tr>
<tr>
<td>Contamination Survey Summary form</td>
<td>TE-025 p.1, 3, 5, 6, 11, TE-026 p.1, 4, 6, 7, 12, TE-027 p.1, 4, 8</td>
</tr>
<tr>
<td>Conversion factor</td>
<td>TE-020 p.18, TE-022 p.4, 6, TE-025 p.4, TE-026 p.4, 7, TE-030 p.4, 5, 12</td>
</tr>
<tr>
<td>Conversion formulas</td>
<td>TE-020 p.2, 11, 27, TE-030 p.1, 5, 22</td>
</tr>
<tr>
<td>Corrective Action</td>
<td>AD-050 p.7, 9, 10, AD-051 p.10, SU-025 p.2, 6, SU-030 p.2</td>
</tr>
<tr>
<td>Cross-check samples</td>
<td>SU-025 p.2</td>
</tr>
<tr>
<td>Custom software</td>
<td>AD-051 p.1-3, 5</td>
</tr>
<tr>
<td>D&amp;D</td>
<td>AD-030 p.2, 4</td>
</tr>
</tbody>
</table>
Decontamination (cont.)

- TE-075 p.1
- TE-077 p.2
- TE-081 p.10
- TE-082 p.2, 8
- TE-094 p.1
- TE-101 p.1
- TE-102 p.1
- TE-112 p.1
- TE-132 p.1

Defense Decontamination

and Decommissioning

Program (D&D)

Delta counter

- SU-061 p.5
- TE-024 p.1-3
- TE-040 p.9-11, 16, 20, 22
- TE-046 p.1, 3

Department of Transportation (DOT) Hazardous

Materials Regulation,

49 CFR Part 172

Detector efficiency

- TE-025 p.4, 6
- TE-026 p.4-6
- TE-027 p.4

Dissolved oxygen

- TE-060 p.1, 3, 15, 24, 25
- TE-081 p.2, 15

Distance transducer

calibration

- TE-010 p.1, 27

Document control

- AD-010 p.1
- AD-040 p.1, 3
- SU-040 p.2
- SU-070 p.1, 3
- SU-091 p.5, 6
- TE-030 p.1, 3, 19

DOE Order 5480.11

- TE-020 p.1, 28

Dose rate

- TE-026 p.7

Dovetail properties

- SU-090 p.3

Drilling log

- TE-101 p.1
- TE-102 p.1

Electronic distance

measurement (EDM)

- TE-120 p.3
EM31 geophysical instrument

Environmental Restoration and Waste Management (EM)

Environmental Restoration Program (ER)

Extended measurements

Environmental Restoration Program (ER)

Extended measurements

Environmental Restoration Program (ER)

External audits

Field map

Field measurement of carbonate and bicarbonate (alkalinity)

Formerly Utilized Sites Remedial Action Program (FUSRAP)

Gamma Analysis Worksheet

Gamma exposure rate
<table>
<thead>
<tr>
<th>Equipment</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gamma scintillation detector</td>
<td>SU-020 p.1</td>
</tr>
<tr>
<td></td>
<td>TE-020 p.1, 3, 9, 27</td>
</tr>
<tr>
<td></td>
<td>TE-022 p.1, 4, 6</td>
</tr>
<tr>
<td></td>
<td>TE-032 p.2, 3</td>
</tr>
<tr>
<td></td>
<td>TE-040 p.9</td>
</tr>
<tr>
<td></td>
<td>TE-046 p.1</td>
</tr>
<tr>
<td></td>
<td>TE-051 p.1, 2, 4, 5</td>
</tr>
<tr>
<td>Gamma scintillator</td>
<td>TE-020 p.15, 16</td>
</tr>
<tr>
<td></td>
<td>TE-021 p.4</td>
</tr>
<tr>
<td></td>
<td>TE-022 p.3</td>
</tr>
<tr>
<td></td>
<td>TE-030 p.5, 10</td>
</tr>
<tr>
<td></td>
<td>TE-040 p.18</td>
</tr>
<tr>
<td></td>
<td>TE-046 p.1, 3</td>
</tr>
<tr>
<td></td>
<td>TE-050 p.13</td>
</tr>
<tr>
<td></td>
<td>TE-051 p.2</td>
</tr>
<tr>
<td>Gas chromatograph</td>
<td>TE-078 p.2, 4</td>
</tr>
<tr>
<td></td>
<td>TE-080 p.1, 3</td>
</tr>
<tr>
<td>GJRAP</td>
<td>SU-090 p.2, 3</td>
</tr>
<tr>
<td></td>
<td>TE-020 p.3, 6, 7</td>
</tr>
<tr>
<td>GM counters</td>
<td>TE-026 p.3</td>
</tr>
<tr>
<td>GR-410 portable gamma spectrometer</td>
<td>TE-020 p.1, 12</td>
</tr>
<tr>
<td></td>
<td>TE-023 p.2, 7</td>
</tr>
<tr>
<td>Graphics</td>
<td>AD-030 p.2</td>
</tr>
<tr>
<td></td>
<td>AD-040 p.1, 2</td>
</tr>
<tr>
<td></td>
<td>SU-061 p.1, 2</td>
</tr>
<tr>
<td></td>
<td>SU-062 p.1, 2</td>
</tr>
<tr>
<td></td>
<td>SJ-091 p.4</td>
</tr>
<tr>
<td></td>
<td>TE-020 p.1, 6</td>
</tr>
<tr>
<td></td>
<td>TE-030 p.1, 13</td>
</tr>
<tr>
<td>Grid block</td>
<td>TE-025 p.6</td>
</tr>
<tr>
<td></td>
<td>TE-026 p.67</td>
</tr>
<tr>
<td></td>
<td>TE-040 p.19</td>
</tr>
<tr>
<td></td>
<td>TE-046 p.4</td>
</tr>
<tr>
<td></td>
<td>TE-051 p.2-6</td>
</tr>
<tr>
<td>Grid system</td>
<td>TE-028 p.1-5</td>
</tr>
<tr>
<td>Groundwater</td>
<td>TE-060 p.2, 3, 10, 11, 14, 16, 20</td>
</tr>
<tr>
<td></td>
<td>TE-071 p.2, 3</td>
</tr>
<tr>
<td></td>
<td>TE-073 p.1</td>
</tr>
<tr>
<td></td>
<td>TE-081 p.1, 3, 5, 8</td>
</tr>
<tr>
<td></td>
<td>TE-082 p.1-3, 6</td>
</tr>
<tr>
<td></td>
<td>TE-090 p.1</td>
</tr>
<tr>
<td></td>
<td>TE-092 p.2</td>
</tr>
<tr>
<td></td>
<td>TE-093 p.1</td>
</tr>
<tr>
<td></td>
<td>TE-100 p.1, 3</td>
</tr>
</tbody>
</table>
**Groundwater (cont.)**

- TE-110 p.1, 2, 5, 8
- TE-111 p.1, 3

**HASRD**

- AD-010 p.1
- AD-030 p.4
- AD-050 p.2, 5, 7
- SU-010 p.1, 2

**Hatching**

- SU-061 p.3, 7
- SU-062 p.3, 5, 7

**Health and safety**

- AD-010 p.1
- AD-031 p.3
- AD-040 p.1-3
- AD-050 p.9
- SU-010 p.1
- TE-105 p.4

**HIG**

- SU-061 p.5
- TE-020 p.4
- TE-022 p.4
- TE-030 p.3, 5, 13, 16

**HNU**

- TE-079 p.2
- TE-080 p.2

**HOG**

- SU-061 p.5
- TE-020 p.4, 14, 15, 17
- TE-022 p.4
- TE-030 p.3, 5, 13, 16
- TE-040 p.19
- TE-046 p.2-4
- TE-050 p.7

**Horiba model U-7**

- TE-060 p.1, 2, 12, 16

**Hot spot**

- TE-020 p.4, 13
- TE-030 p.2, 9, 28
- TE-050 p.2, 13, 14, 18

**Hot spot guideline**

- TE-030 p.9
- TE-050 p.2, 13, 14

**Hot spot limits**

- TE-020 p.13
- TE-030 p.2, 9, 28
- TE-050 p.13, 14, 18

**Hydraulic conductivity**

- TE-090 p.1-3
- TE-093 p.3
- TE-110 p.4, 5
- TE-111 p.3, 4

**Inorganic analysis**

- TE-070 p.3
- TE-072 p.3
<table>
<thead>
<tr>
<th>Category</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Installation Restoration Project (IRP)</td>
<td>AD-030 p.5</td>
</tr>
<tr>
<td>Internal audits</td>
<td>AD-050 p.8, 9</td>
</tr>
<tr>
<td>Ionic strength</td>
<td>TE-060 p.3, 4</td>
</tr>
<tr>
<td>IRP</td>
<td>AD-030 p.5</td>
</tr>
<tr>
<td>ISC</td>
<td>SU-061 p.1, 7, 9, 11</td>
</tr>
<tr>
<td></td>
<td>SU-040 p.2</td>
</tr>
<tr>
<td></td>
<td>SU-070 p.1-3</td>
</tr>
<tr>
<td></td>
<td>SU-090 p.2-4</td>
</tr>
<tr>
<td></td>
<td>SU-091 p.4-6</td>
</tr>
<tr>
<td></td>
<td>TE-030 p.2, 3, 15, 16, 17, 79</td>
</tr>
<tr>
<td></td>
<td>TE-035 p.2-4</td>
</tr>
<tr>
<td></td>
<td>TE-040 p.4, 5, 12, 13, 17, 18, 23</td>
</tr>
<tr>
<td></td>
<td>TE-050 p.8-12, 15, 16</td>
</tr>
<tr>
<td>IVC</td>
<td>SU-062 p.1, 7, 8</td>
</tr>
<tr>
<td></td>
<td>TE-035 p.2, 4, 6</td>
</tr>
<tr>
<td></td>
<td>TE-040 p.2-4, 6-8, 14, 15, 17-19, 21, 23-28, 30, 31, 33-35, 38</td>
</tr>
<tr>
<td></td>
<td>TE-050 p.1, 3-8, 13, 15</td>
</tr>
<tr>
<td>Jaw crusher</td>
<td>TE-035 p.1, 6, 10</td>
</tr>
<tr>
<td></td>
<td>TE-040 p.26</td>
</tr>
<tr>
<td>JMC auger</td>
<td>TE-040 p.11, 19, 22, 23, 35, 36</td>
</tr>
<tr>
<td>KHAN</td>
<td>SU-040 p.1-3</td>
</tr>
<tr>
<td></td>
<td>TE-032 p.9-11</td>
</tr>
<tr>
<td></td>
<td>TE-036 p.2-4, 6, 9</td>
</tr>
<tr>
<td></td>
<td>TE-040 p.4</td>
</tr>
<tr>
<td></td>
<td>TE-050 p.15</td>
</tr>
<tr>
<td>KRTCOM</td>
<td>TE-036 p.2, 3, 6</td>
</tr>
<tr>
<td>Lower limit of detection</td>
<td>TE-025 p.4</td>
</tr>
<tr>
<td></td>
<td>TE-026 p.4</td>
</tr>
<tr>
<td>Micofiche</td>
<td>AD-040 p.3</td>
</tr>
<tr>
<td></td>
<td>SU-070 p.2</td>
</tr>
<tr>
<td>Mobile Gamma Scanning Van</td>
<td>TE-010 p.1, 3, 6</td>
</tr>
<tr>
<td>Mobile gamma survey</td>
<td>SU-090 p.1</td>
</tr>
<tr>
<td>Monticello database</td>
<td>TE-050 p.15</td>
</tr>
</tbody>
</table>
MVP

TE-020 p.1, 4, 8, 13-15, 17, 20
TE-030 p.1-3, 6, 9-11, 14, 15, 42, 61, 65, 73
TE-050 p.1-3, 7, 14

Net Estimated Area-Weighted Average (NEAWA)

TE-020 p.4, 11, 12
TE-030 p.3, 6-9, 11
TE-050 p.14

Occurrence reporting system (ORS)

AD-050 p.9

OCS van

TE-055 p.1

Operation of field GC

TE-080 p.2

Organic analysis

TE-070 p.3
TE-072 p.3
TE-082 p.2, 9, 10

Organizational chart

AD-020 p.1, 2

Owner request

TE-030 p.4

Packaging and preservation of samples for organic analyses

TE-072 p.2

Peristaltic pump

TE-081 p.3, 7
TE-111 p.2
TE-130 p.1

pH electrode

TE-060 p.1, 4-6

pH measurement

TE-060 p.3, 4, 10, 11

Photographs

AD-060 p.5
TE-010 p.6
TE-020 p.19, 20
TE-030 p.6
TE-046 p.3
TE-050 p.7
TE-074 p.4

PIC

SU-020 p.1, 3
SU-021 p.1
TE-020 p.1, 4, 11, 18
TE-022 p.1-4, 6, 7
TE-030 p.4, 5

Point source handling

TE-020 p.2, 28
<table>
<thead>
<tr>
<th>Category</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>Point sources</td>
<td>TE-020 p.5, 13, 14, 18, 28</td>
</tr>
<tr>
<td></td>
<td>TE-030 p.9, 10, 13</td>
</tr>
<tr>
<td></td>
<td>TE-040 p.12</td>
</tr>
<tr>
<td></td>
<td>TE-050 p.13</td>
</tr>
<tr>
<td>Portable Gamma Spectrometer</td>
<td>TE-020 p.1, 2, 12</td>
</tr>
<tr>
<td></td>
<td>TE-023 p.1, 7</td>
</tr>
<tr>
<td>Preventive maintenance</td>
<td>SU-030 p.2</td>
</tr>
<tr>
<td>Procedure Change Form</td>
<td>AD-060 p.5, 6</td>
</tr>
<tr>
<td>Procurement</td>
<td>AD-040 p.1, 2</td>
</tr>
<tr>
<td></td>
<td>AD-050 p.2, 4-6</td>
</tr>
<tr>
<td></td>
<td>AD-051 p.1, 2, 4</td>
</tr>
<tr>
<td></td>
<td>SU-030 p.3</td>
</tr>
<tr>
<td></td>
<td>SU-040 p.2, 3</td>
</tr>
<tr>
<td></td>
<td>SU-080 p.1-3, 5, 6</td>
</tr>
<tr>
<td>Proportional counter</td>
<td>TE-027 p.1, 3</td>
</tr>
<tr>
<td>PU5</td>
<td>TE-030 p.2, 4, 9, 14, 55, 63, 67</td>
</tr>
<tr>
<td>Pump-in borehole test</td>
<td>TE-092 p.1, 4</td>
</tr>
<tr>
<td>Pumping test</td>
<td>TE-093 p.1, 3-6</td>
</tr>
<tr>
<td></td>
<td>TE-110 p.1</td>
</tr>
<tr>
<td>FUOR</td>
<td>TE-030 p.2, 4, 9, 14, 53, 62, 66</td>
</tr>
<tr>
<td>Purchase requisition</td>
<td>SU-080 p.1, 3</td>
</tr>
<tr>
<td>Purchasing</td>
<td>AD-050 p.2, 5</td>
</tr>
<tr>
<td></td>
<td>SU-080 p.1, 4, 5</td>
</tr>
<tr>
<td>QA coordinator</td>
<td>AD-050 p.1, 3, 5-10</td>
</tr>
<tr>
<td>RAC</td>
<td>SU-070 p.2, 3</td>
</tr>
<tr>
<td></td>
<td>TE-030 p.3, 4, 6, 9, 27</td>
</tr>
<tr>
<td></td>
<td>TE-035 p.2, 4, 5</td>
</tr>
<tr>
<td></td>
<td>TE-040 p.1, 2-8, 11, 14-23, 25, 26, 28, 30, 31, 34, 35, 38</td>
</tr>
<tr>
<td></td>
<td>TE-046 p.2-4</td>
</tr>
<tr>
<td></td>
<td>TE-050 p.2-11, 13, 15, 16</td>
</tr>
<tr>
<td>Rad-Con</td>
<td>SU-022 p.4</td>
</tr>
<tr>
<td></td>
<td>TE-035 p.8</td>
</tr>
<tr>
<td>Radioactive sources</td>
<td>SU-010 p.1-5</td>
</tr>
<tr>
<td>Radiological Screening Summary form</td>
<td>TE-020 p.1, 19, 21, 23</td>
</tr>
<tr>
<td></td>
<td>TE-021 p.1, 4, 5</td>
</tr>
<tr>
<td></td>
<td>TE-022 p.1, 2, 5</td>
</tr>
<tr>
<td></td>
<td>TE-030 p.1, 5, 6, 10, 21</td>
</tr>
<tr>
<td>Category</td>
<td>Reference</td>
</tr>
<tr>
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<td>------------</td>
</tr>
<tr>
<td>Radon data base operations</td>
<td>TE-032 p.1, 4, 9</td>
</tr>
<tr>
<td>Radon Verification Check Sheet</td>
<td>TE-032 p.1-5, 7</td>
</tr>
<tr>
<td>RCRA</td>
<td>AD-030 p.5</td>
</tr>
<tr>
<td></td>
<td>AD-031 p.1, 3</td>
</tr>
<tr>
<td>RDC</td>
<td>SU-062 p.4</td>
</tr>
<tr>
<td></td>
<td>TE-030 p.4, 13, 16</td>
</tr>
<tr>
<td></td>
<td>TE-032 p.2, 8</td>
</tr>
<tr>
<td></td>
<td>TE-040 p.3, 8, 13, 15, 20, 21, 24, 27, 29, 37</td>
</tr>
<tr>
<td></td>
<td>TE-050 p.6</td>
</tr>
<tr>
<td>Recommendation basis</td>
<td>SU-070 p.2</td>
</tr>
<tr>
<td></td>
<td>TE-030 p.14, 19</td>
</tr>
<tr>
<td></td>
<td>TE-040 p.8, 30</td>
</tr>
<tr>
<td>Record of Final Decision</td>
<td>SU-091 p.1, 4, 6, 13</td>
</tr>
<tr>
<td>Removable contamination</td>
<td>TE-025 p.1, 6, 9</td>
</tr>
<tr>
<td></td>
<td>TE-026 p.1, 7, 10</td>
</tr>
<tr>
<td>Report skeleton</td>
<td>TE-030 p.2, 9, 12, 30, 42, 53, 55, 59, 61-63</td>
</tr>
<tr>
<td></td>
<td>TE-040 p.1, 2, 27, 28, 52, 67</td>
</tr>
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<td>RFI</td>
<td>AD-031 p.1</td>
</tr>
<tr>
<td>RI</td>
<td>AD-031 p.1</td>
</tr>
<tr>
<td></td>
<td>TE-071 p.2</td>
</tr>
<tr>
<td>ROI</td>
<td>TE-010 p.13, 16, 25</td>
</tr>
<tr>
<td></td>
<td>TE-055 p.3</td>
</tr>
<tr>
<td>Sample identification system</td>
<td>TE-071 p.1</td>
</tr>
<tr>
<td>Sample label</td>
<td>TE-035 p.5</td>
</tr>
<tr>
<td></td>
<td>TE-071 p.1, 5</td>
</tr>
<tr>
<td></td>
<td>TE-079 p.1</td>
</tr>
<tr>
<td></td>
<td>TE-081 p.1, 3, 12</td>
</tr>
<tr>
<td></td>
<td>TE-082 p.2, 6, 12</td>
</tr>
<tr>
<td></td>
<td>TE-101 p.2</td>
</tr>
<tr>
<td></td>
<td>TE-102 p.2</td>
</tr>
<tr>
<td>Sample preparation</td>
<td>TE-040 p.35</td>
</tr>
<tr>
<td>Sample preservation</td>
<td>TE-072 p.1</td>
</tr>
<tr>
<td></td>
<td>TE-081 p.1, 7, 13</td>
</tr>
<tr>
<td></td>
<td>TE-082 p.6</td>
</tr>
<tr>
<td>Topic</td>
<td>Reference</td>
</tr>
<tr>
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<td>-----------------</td>
</tr>
<tr>
<td>Scaler/ratemeter</td>
<td>TE-025 p.2, 4, 5 TE-026 p.2, 5, 6</td>
</tr>
<tr>
<td>Scan van</td>
<td>TE-010 p.7, 16</td>
</tr>
<tr>
<td>Scintillation detector</td>
<td>SU-020 p.1</td>
</tr>
<tr>
<td></td>
<td>TE-020 p.1, 3, 9, 27</td>
</tr>
<tr>
<td></td>
<td>TE-022 p.1, 4, 6</td>
</tr>
<tr>
<td></td>
<td>TE-032 p.2, 3</td>
</tr>
<tr>
<td></td>
<td>TE-040 p.9</td>
</tr>
<tr>
<td></td>
<td>TE-046 p.1</td>
</tr>
<tr>
<td></td>
<td>TE-051 p.1, 2, 4, 5</td>
</tr>
<tr>
<td>SFMP</td>
<td>AD-030 p.3, 4</td>
</tr>
<tr>
<td></td>
<td>AD-040 p.1</td>
</tr>
<tr>
<td></td>
<td>TE-050 p.1-5, 8-10, 13, 15, 16</td>
</tr>
<tr>
<td>Significant digits</td>
<td>TE-030 p.7, 9, 12, 13</td>
</tr>
<tr>
<td></td>
<td>TE-040 p.32</td>
</tr>
<tr>
<td></td>
<td>TE-060 p.14</td>
</tr>
<tr>
<td>Site location map</td>
<td>TE-040 p.30, 32</td>
</tr>
<tr>
<td>Site Survey Information</td>
<td>TE-040 p.5</td>
</tr>
<tr>
<td>Smear samples</td>
<td>TE-025 p.6</td>
</tr>
<tr>
<td></td>
<td>TE-026 p.7</td>
</tr>
<tr>
<td></td>
<td>TE-027 p.1</td>
</tr>
<tr>
<td>Software validation</td>
<td>AD-051 p.2</td>
</tr>
<tr>
<td>Software verification</td>
<td>AD-051 p.3</td>
</tr>
<tr>
<td>Soil Analysis Worksheet</td>
<td>TE-030 p.2, 6, 8, 9, 13, 17, 26</td>
</tr>
<tr>
<td></td>
<td>TE-040 p.2, 27, 65</td>
</tr>
<tr>
<td></td>
<td>TE-050 p.13, 14</td>
</tr>
<tr>
<td>Soil laboratory gamma spectrometry system</td>
<td>SU-022 p.1</td>
</tr>
<tr>
<td></td>
<td>TE-036 p.1</td>
</tr>
<tr>
<td>Soil sample collection</td>
<td>TE-020 p.15</td>
</tr>
<tr>
<td></td>
<td>TE-040 p.12, 19, 34</td>
</tr>
<tr>
<td>Soil Sample Data Field Form</td>
<td>TE-020 p.2, 17, 19, 24</td>
</tr>
<tr>
<td></td>
<td>TE-030 p.1, 5, 6, 18, 23</td>
</tr>
<tr>
<td>Soil sample preparation</td>
<td>TE-035 p.3</td>
</tr>
<tr>
<td></td>
<td>TE-040 p.26</td>
</tr>
<tr>
<td>Soil sample storage</td>
<td>TE-035 p.2</td>
</tr>
<tr>
<td></td>
<td>TE-036 p.2</td>
</tr>
<tr>
<td></td>
<td>TE-040 p.26</td>
</tr>
</tbody>
</table>
Soil samples

Su-025 p.2
Te-020 p.3, 11
Te-030 p.3, 9, 19
Te-036 p.1, 2, 4
Te-040 p.2-4, 6, 18-20, 24-26, 35, 36
Te-050 p.3, 13
Te-070 p.1
Te-071 p.3
Te-072 p.3
Te-080 p.1
Te-101 p.1
Te-105 p.3, 8

Soil sampling equipment

Te-020 p.15

Soil-gas and soil-liquid sampling

Te-076 p.2

Source custodian

Su-010 p.2-4

Specific conductance

Te-060 p.3, 4, 11-15, 22

Speedy Moisture Tester

Te-055 p.5

Spillover

Su-070 p.2
Su-090 p.2-4
Te-020 p.4, 7, 8, 11, 19
Te-030 p.5, 10, 19
Te-050 p.9, 10, 16

Split spoon

Te-079 p.1
Te-100 p.2
Te-105 p.1-3, 8, 9

Split-barrel sampler

Te-101 p.1, 2

Standard reference material

Su-022 p.1, 2

Statement of work

Ad-031 p.2
Su-080 p.5

Stationary receivers

Te-051 p.2, 3

Surface contamination guidelines

Te-025 p.1, 8
Te-026 p.1, 9

Surface Contamination Survey form

Te-025 p.1, 3, 5, 6, 10
Te-026 p.1, 4, 6, 7, 11
Te-027 p.1, 4, 9

Surge blocking

Te-112 p.3
<table>
<thead>
<tr>
<th>Term</th>
<th>Reference</th>
</tr>
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<tbody>
<tr>
<td>Surplus Facilities Management Project (SFMP)</td>
<td>AD-030 p.3</td>
</tr>
<tr>
<td>Survey site information form</td>
<td>TE-020 p.1, 19, 22</td>
</tr>
<tr>
<td></td>
<td>TE-030 p.6, 10, 12, 13</td>
</tr>
<tr>
<td>T-test</td>
<td>SU-025 p.2, 5, 6</td>
</tr>
<tr>
<td>TAC</td>
<td>SU-070 p.3</td>
</tr>
<tr>
<td></td>
<td>SU-090 p.1, 2</td>
</tr>
<tr>
<td></td>
<td>SU-091 p.10</td>
</tr>
<tr>
<td></td>
<td>TE-030 p.4, 6, 18</td>
</tr>
<tr>
<td>Teflon bailer</td>
<td>TE-081 p.8</td>
</tr>
<tr>
<td></td>
<td>TE-082 p.2, 7</td>
</tr>
<tr>
<td>Theodolite</td>
<td>TE-120 p.2, 3</td>
</tr>
<tr>
<td>Time-of-flight</td>
<td>TE-051 p.3, 4</td>
</tr>
<tr>
<td>TLD</td>
<td>SU-022 p.3</td>
</tr>
<tr>
<td></td>
<td>TE-035 p.3</td>
</tr>
<tr>
<td></td>
<td>TE-036 p.2</td>
</tr>
<tr>
<td>Tracking sheet</td>
<td>TE-040 p.4, 18, 33</td>
</tr>
<tr>
<td>Trailer house rule</td>
<td>TE-020 p.13</td>
</tr>
<tr>
<td>Transmittal letter</td>
<td>SU-091 p.1, 3, 7</td>
</tr>
<tr>
<td>Type I verification activities</td>
<td>TE-040 p.7</td>
</tr>
<tr>
<td>Type I verification flow of work</td>
<td>TE-040 p.1, 44</td>
</tr>
<tr>
<td>Type II verification activities</td>
<td>TE-040 p.9</td>
</tr>
<tr>
<td>Type II Verification flow of work</td>
<td>TE-040 p.2, 57</td>
</tr>
<tr>
<td>U2CRT</td>
<td>TE-105 p.1, 10, 11</td>
</tr>
<tr>
<td>Uranium Mill Tailings Remedial Action Project (UMTRAP)</td>
<td>AD-030 p.2</td>
</tr>
<tr>
<td>USGS bench mark</td>
<td>TE-120 p.3</td>
</tr>
<tr>
<td>USRADS</td>
<td>TE-051 p.1-3, 8</td>
</tr>
<tr>
<td>Topic</td>
<td>Pages</td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td>----------------</td>
</tr>
<tr>
<td>Vicinity Properties Management and</td>
<td>AD-030 p.3</td>
</tr>
<tr>
<td>Implementation Manual (VPMIM)</td>
<td></td>
</tr>
<tr>
<td>Victoreen</td>
<td>TE-021 p.1, 2</td>
</tr>
<tr>
<td>VOC analysis</td>
<td>TE-079 p.1</td>
</tr>
<tr>
<td>Volatile organics</td>
<td>TE-072 p.3, 4</td>
</tr>
<tr>
<td></td>
<td>TE-075 p.2, 3</td>
</tr>
<tr>
<td></td>
<td>TE-082 p.5, 8, 9</td>
</tr>
<tr>
<td></td>
<td>TE-101 p.2</td>
</tr>
<tr>
<td></td>
<td>TE-131 p.1</td>
</tr>
<tr>
<td>VPDMS (Vicinity Property Data Management System) Form</td>
<td>TE-030 p.2, 4, 15-18, 78</td>
</tr>
<tr>
<td>VPMIM</td>
<td>AD-030 p.3</td>
</tr>
<tr>
<td></td>
<td>TE-020 p.1, 5</td>
</tr>
<tr>
<td></td>
<td>TE-030 p.1, 7</td>
</tr>
<tr>
<td></td>
<td>TE-050 p.2</td>
</tr>
<tr>
<td>Well purging</td>
<td>TE-081 p.5</td>
</tr>
<tr>
<td></td>
<td>TE-082 p.3</td>
</tr>
<tr>
<td></td>
<td>TE-131 p.1</td>
</tr>
<tr>
<td></td>
<td>TE-132 p.1</td>
</tr>
<tr>
<td>Well screen</td>
<td>TE-081 p.5, 6, 8</td>
</tr>
<tr>
<td></td>
<td>TE-082 p.4, 7</td>
</tr>
<tr>
<td></td>
<td>TE-093 p.3, 4</td>
</tr>
<tr>
<td></td>
<td>TE-110 p.2-5</td>
</tr>
<tr>
<td></td>
<td>TE-111 p.3, 4</td>
</tr>
<tr>
<td></td>
<td>TE-112 p.3</td>
</tr>
<tr>
<td>&quot;Who-done-it&quot; map</td>
<td>TE-020 p.5, 7, 20</td>
</tr>
<tr>
<td>WLM method</td>
<td>TE-040 p.2, 14, 15, 63</td>
</tr>
</tbody>
</table>
1.0 PURPOSE

The purpose of the Pollutant Assessments Group Procedures Manual is to provide a standardized set of procedures documenting in an auditable manner the activities performed by the Pollutant Assessments Group (PAG) of the Health and Safety Research Division (HASRD) of the Environmental Measurements and Applications Section (EMAS) at Oak Ridge National Laboratory (ORNL).

The Procedures Manual ensures that the organizational, administrative, and technical activities of PAG conform properly to protocol outlined by funding organizations. This manual also ensures that the techniques and procedures used by PAG and other contractor personnel meet the requirements of applicable governmental, scientific, and industrial standards.

2.0 APPLICABILITY

The Procedures Manual describes the functions and procedures used by PAG. The manual's format and arrangement were selected to facilitate its use and to incorporate revisions as may be required. The manual is intended for use as a reference for all operations related to PAG and as a training manual. Copies of the Procedures Manual are provided to individuals having significant responsibilities in the implementation of the pertinent operations, as well as at all appropriate work stations.

3.0 SCOPE OF THE MANUAL

The Procedures Manual is sufficiently comprehensive for use by PAG and contractor personnel in the planning, performance, and reporting of project activities and measurements. The Procedures Manual provides procedures for conducting field measurements and includes program planning, equipment operation, and quality assurance elements.

Successive revisions of this manual will be archived in the PAG Document Control Department to facilitate tracking of the development of specific procedures.

Approved by:

[Signature] 9/20/90 (Date)  
[Signature] 9/20/90 (Date)
1.0 PURPOSE

This section describes the organizational structure developed to administer PAG projects and personnel.

2.0 APPLICABILITY

The program administration directs all project management activities and support functions of the PAG.

3.0 ADMINISTRATION

The group leader directs overall group activities and interfaces with ORNL section and division heads and outside agencies, with assistance from the program managers. The program managers coordinate project activities and funding.

The functional organizational chart is shown in Appendix 1.

4.0 DESCRIPTION

The following mission statement describes the goal of the PAG program:

The purpose of the ORNL Grand Junction Pollutant Assessments Group is to advance the state-of-the-art of hazardous and radiological waste site characterizations, performance assessment,, and regulatory compliance verification.
Appendix 1. Functional Organizational Chart
PROJECT MANAGEMENT

1.0 PURPOSE

This section describes project organization and provides guidelines for project management.

2.0 APPLICABILITY

These organizational structures apply to all PAG projects.

3.0 ADMINISTRATION

3.1 PROJECT MANAGERS

Project managers are responsible for management of specific projects, which includes the following responsibilities:

3.1.1 Review site-related historical records to estimate the size of the project and determine subcontractor, equipment, and personnel requirements.

3.1.2 Establish the project schedule and priorities, adhering to time constraints imposed by the funding agency. Include subcontractor schedules to coordinate subcontractor and field team activities.

3.1.3 Identify support function requirements and prepare necessary purchase orders and other documents.

3.1.4 Identify quality assurance requirements and prepare quality assurance plans.

3.1.5 Generate all plans and reports pertinent to the assigned project.

3.1.6 Plan and coordinate all field activities and task assignments for the project.

Approved by:

Craig Lithe 9/26/90
(Date)

C.A. Lithe
(Date)
3.1.7 Select project personnel based on project requirements, individual expertise, and the availability of PAG and subcontractor personnel.

3.1.8 Assure project personnel are fully trained to perform their respective duties.

3.2 TECHNICAL PERSONNEL

Technical personnel take direction from the project manager in completing field activities and preparing project reports and graphics. Technical personnel include geologists, hydrologists, engineers, team leaders, and technicians. They may be assigned to more than one project at a time.

4.0 DESCRIPTION

PAG projects are administered and funded by the Department of Energy (DOE), the Department of Defense (DOD), other government agencies, and independent organizations. Some of the projects governed by this manual are described below.

4.1 ENVIRONMENTAL RESTORATION AND WASTE MANAGEMENT (EM)

The Department of Energy (DOE) is fully committed to the assessment and cleanup over the next 30 years of inactive facilities and sites contaminated by wastes generated from past nuclear operations connected with the major DOE program areas of (1) defense programs, (2) nuclear energy, and (3) energy research. Environmental Restoration consists of two fundamental sets of activities: (1) remedial actions, involving potential releases from inactive waste sites, and (2) decontamination and decommissioning (D&D), involving surplus facilities.

4.1.1 Uranium Mill Tailings Remedial Action Project (UMTRAP)

From the early 1940s through 1970, uranium ore was processed at mills owned by private companies under contracts with the Manhattan Engineering District (MED) and the U.S. Atomic Energy Commission (AEC). As these uranium ore bodies were depleted and the demand for UO₂ decreased, many of the mills were deactivated. Large quantities processed residue (tailings) were left behind. Following conventional metallurgical industry practices, the tailings were deposited either in ponds or in stockpiles and were allowed to dry. Dried deposits were left unprotected, allowing the wind to broadcast tailings over the surrounding area. The public was allowed access to some deposits and, as a result, some tailings were utilized as a sand substitute or as backfill material in construction projects. These
properties include residences, schools, hotels, hospitals, open land, and commercial buildings, and are referred to as "vicinity properties".

In 1972, Congress passed Public Law 92-314 to provide funds for cleanup of vicinity properties in Grand Junction, Colorado. Also in 1972, the AEC, in cooperation with the U.S. Environmental Protection Agency (EPA), initiated a program to determine the preliminary radiological status and public health effects associated with the inactive uranium mill tailings sites and all associated vicinity properties. In 1978, Congress passed Public Law 95-604, the Uranium Mill Tailings Radiation Control Act (UMTRCA), which required the federal government to perform remedial actions on inactive uranium mill tailings sites that had been used by the federal government and on each site's associated vicinity properties.

The DOE was assigned the responsibility for conducting remedial action at 24 sites, which are located in one eastern and nine western states. The DOE's responsibilities are being met through its Uranium Mill Tailings Remedial Action Project Office (UMTRA-PO) in Albuquerque, New Mexico. The UMTRA-PO is responsible for: (1) identifying candidate vicinity properties, (2) determining the extent of contamination of these properties and their eligibility for remedial action, (3) implementing remedial actions, (4) certifying that the properties have been cleaned in conformance with EPA standards (40 CFR Part 192), and (5) coordinating its activities with appropriate agencies or representatives of the state, tribal, and local governments, the U.S. Nuclear Regulatory Commission (NRC), and the DOE Division of Remedial Action Projects. Details of the UMTRA project policies and guidelines for remedial action activities are given in the Vicinity Properties Management and Implementation Manual (VPMIM). The ORNL/PAG is the Inclusion Survey Contractor for all 24 sites and is the Independent Verification Contractor for the Grand Junction, Colorado site.

**4.1.2 Surplus Facilities Management Project (SFMP)**

The Surplus Facilities Management Project (SFMP) was established in 1978 and originally included both civilian and defense projects. Currently, the program administers remedial action for approximately 100 DOE sites which have been declared surplus to government needs. The objectives are to sufficiently decontaminate sites so that they may be used for other purposes and to eliminate any potential hazards to public health and the environment. Waste remediated under SFMP includes tailings, rubble, low-level waste (LLW), and transuranic waste (TRU). PAG currently performs inclusion surveys and site and property verification at Monticello, Utah. PAG has
conducted surveys at the reactor at Hallam, Nebraska, also a SFMP site.

4.1.3 Formerly Utilized Sites Remedial Action Project (FUSRAP)

Formerly Utilized Sites Remedial Action Project (FUSRAP) sites were used by MED of the Atomic Energy Commission's Manhattan Project to work with nuclear materials. These sites are to be remediated for unrestricted use as practicable. Sites range in character from an ore storage facility to laboratory buildings. Vicinity properties are sometimes associated with these sites. The project is mainly concerned with LLW in the form of soil contamination and contaminated building rubble.

Most of the sites are located in the states of Missouri, New York, and New Jersey. Several groups within HASRD have worked on the FUSRAP sites in Lodi, New Jersey, and Albany, New York.

4.1.4 Defense Decontamination and Decommissioning Program (D&D)

The EM Program includes the activities of the Defense Decontamination and Decommissioning (D & D) Program. The Defense D & D Program includes approximately 220 radioactively contaminated, DOE-owned facilities remaining in the inventory that have been declared surplus to government needs. These facilities are concentrated in seven locations throughout the United States. Defense D & D facilities include such installations as production reactors, fuel reprocessing plants, laboratories, storage tanks, stacks, pipelines, waste treatment systems, solid waste disposal facilities, ponds, cribs, ditches, and areas contaminated by uranium and thorium from mill tailings. The predominant wastes to be generated by cleanup of D & D facilities are low-level waste (LLW) and mill tailings, but some transuranic waste (TRU) may also be involved.

PAG is the independent verification contractor for the Grand Junction Project Office Remedial Action Project (GJPORAP). The GJPORAP follows SFMP protocol but is administered by the D & D program.

4.1.5 Environmental Restoration Program (ER)

The DOE Environmental Restoration (ER) Program was initiated in 1987 to manage the radioactive, hazardous, and mixed waste cleanup of inactive facilities at DOE/defense sites. This program was also established to ensure that DOE/defense site cleanup activities are in compliance with regulations of the Resource Conservation and
4.2 INSTALLATION RESTORATION PROJECT (IRP)

The U.S. armed forces, due to its primary mission of defense of the United States, has long engaged in a wide variety of operations dealing with toxic and hazardous materials. This problem has been recognized by the Department of Defense (DOD), and action has been taken to identify the locations and contents of past disposal sites and to eliminate the hazards to public health in an environmentally sound manner. The DOD program is called the Installation Restoration Program (IRP).

Current policy for the IRP is contained in Defense Environmental Quality Program Policy Memorandum (DEQPPM) 81-5, dated 11 December 1981. The IRP is defined in DEQPPM 81-5 as a four-phased program including problem identification (Phase I), confirmation (Phase II), technology development (Phase III), and planning and implementation of appropriate control measures (Phase IV).
1.0 PURPOSE

This procedure specifies the requirements for developing budget and schedule forecasts for performing remedial investigations (RI) and feasibility studies (FS) under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) or Resource Conservation and Recovery Act (RCRA) Facility Investigations (RFI) and Corrective Measure Studies (CMS) under RCRA.

2.0 APPLICABILITY

This procedure applies to all RI/FS and RFI/CMS projects conducted by the Pollutant Assessments Group (PAG).

3.0 OTHER DOCUMENTS

None

4.0 EQUIPMENT AND MATERIALS

4.1 Project file
4.2 Budget and scheduling software

5.0 RESPONSIBILITY

5.1 It is the responsibility of all PAG personnel planning long-term or full-scale RI/FS or RFI/CMS projects to document budget and schedule preparation in the manner described. This process is typically conducted by the PAG site project manager (SPM).

5.2 The chemical projects manager (CPM) or the radiological projects manager (RPM) and the PAG accounting supervisor are responsible for reviewing and approving budget and schedule documents and any changes to these documents.

Approved by:

[Signature] 2/4/92
(Date) C.A. Little 2/4/92
(Date)
6.0 PROCEDURE

6.1 Prepare or review the statement of work (SOW).

6.1.1 If the SOW is prepared by PAG, obtain written direction from the sponsor regarding the scope and content.

6.1.2 Review regulatory specifications in the SOW and related guidance documents to ensure that they are consistent.

6.2 After agreement with the SOW and notice to proceed are received in writing from the project sponsor, visit the site for scoping purposes.

6.2.1 Make certain the sponsor agrees with the size of the site-visit (scoping) team and the duration of the site visit.

   a. If the project location is unfamiliar and the project complex, the site visit team may require up to three members.

6.2.2 The following activities shall be included in the site visit:

   a. evaluation of space requirements, utilities, and impacts of applicable federal, state, and local regulatory requirements;

   b. development of a general plan to accomplish the objectives of the SOW;

   c. sketches and appropriate measurements for determining potential interferences due to terrain, weather, or site operations; and

   d. evaluation of those facility operational procedures which may have an impact on the project.

6.3 Develop a detailed preliminary field plan showing numbers of samples, sampling locations and types, and analytes to be determined.

6.3.1 Determine the level of support available from the on-site staff.

6.3.2 Call a meeting of the following people and present the preliminary field plan for their approval:

   a. the CPM or RPM;
   b. project hydrologist, if applicable;
   c. site geologist, if applicable;
d. health physicist, if applicable;
e. health and safety officer; and
f. at least one other SPM.

6.3.3 If the proposed plan is approved by the assembled group or is subject to minor changes only, document the review, the changes, and the approval of the preliminary plan.

6.3.4 If major revisions are required, repeat all of the appropriate steps above to develop and review a new plan.

6.4 Develop a schedule and budget for the preliminary plan.

6.4.1 Use budget and scheduling software to develop and document the process.

a. Obtain written direction from the sponsor concerning the format and software to be used.

6.4.2 Include the following parameters:

a. the purpose of the field investigation,
b. the estimated scope of work, and
c. any applicable milestones.

6.4.3 Establish a time frame, using applicable guidance from either RCRA or CERCLA, for field investigation and reporting requirements.

a. Some slack is built into the schedule based on the amount of time available to complete each individual task and the anticipated availability of resources during peak times (e.g., summer field work).

6.4.2 Assign resources on a task-by-task basis.

a. Include a detailed explanation for each subtask and each resource in the schedule and budget.

b. Use an existing resource table, taken from an approved project, as a guideline.

c. Each resource table should be project-specific, differing for each site based on drilling contracts, laboratory contracts, etc.
d. Any significant changes in the resource table after it has been established must be approved by the CPM or RPM and the PAG accounting supervisor.

6.5 Check the schedule to identify any resource or milestone conflicts and to ensure that the cost estimate is reasonable.

6.6 Submit the completed budget and schedule to the CPM or RPM and the PAG accounting supervisor for their written approval.

6.6.1 After approval, submit the budget and schedule to the sponsor.

6.7 Document all activities covered by this procedure and include this documentation in the project file.

6.7.1 Documentation for site visits includes trip reports and preliminary calculations.

6.7.2 Documentation also includes the following:

a. review meetings,

b. budget and schedule reviews, and

c. all approvals from the sponsor and PAG reviewers.
SUPPORT ACTIVITIES

1.0 PURPOSE

This section describes the support activities performed by PAG personnel.

2.0 APPLICABILITY

Support activities are carried out by PAG personnel for tasks requiring specialized skills or knowledge. These tasks fall under the following categories and are performed by one or more individuals within the specific support department:

- Public Relations
- Project Management Assistance
- Clerical
- Field Instrumentation
- Computer Support
- Health and Safety
- Procurement
- Document Control
- Graphics

Support activities procedures are described in Section II of this manual.

3.0 ADMINISTRATION

The group leader supervises the department head of each support department. The department head supervises other personnel within each support department and coordinates task assignments and schedules according to project requirements. The support staff may work on several projects at any given time and will communicate with project personnel as needed to complete support tasks. Support staff also perform ongoing overhead tasks.

4.0 DESCRIPTION

4.1 PUBLIC RELATIONS

The public relations department is the main contact between the public and the PAG especially on work for the UMTRA and SFMP projects. The public relations department handles advertising, press releases, homeowner...
mailings, community relations plans, consent form acquisitions, and database maintenance.

4.2 CLERICAL

Clerical staff are responsible for word-processing and reproduction of PAG documents, reports, and correspondence. Clerical staff also perform various overhead administrative tasks.

4.3 COMPUTER SUPPORT

The computer support department provides hardware and software support, user assistance, network maintenance, and computer documentation for all PAG computer equipment.

4.4 PROCUREMENT

The procurement coordinator completes all purchase requests sent to Energy Systems procurement, negotiates purchases from local vendors, coordinates work requests and purchase requisitions from Chem-Nuclear Geotech, and assists project managers in preparing statements of work for subcontracts. Procurement staff are the contact between PAG project personnel and Energy Systems procurement, outside vendors, and Chem-Nuclear Geotech procurement.

4.5 GRAPHICS

Graphics includes the generation of property base maps, cross-sections, trend graphs, and diagrams needed for report completion. Drawings may be completed by project personnel or a graphics technician designated by the project manager. The graphics coordinator assures consistency in graphics standards and procedures.

4.6 PROJECT MANAGEMENT ASSISTANCE

The project management assistant maintains spreadsheets for all PAG projects showing budgeted and actual costs for work scheduled and performed. Spreadsheets content varies according to the amount of detail required by the projects. The project management assistant tracks personnel hours charged to each project on a weekly and monthly basis.

4.7 FIELD INSTRUMENTATION

The field instrumentation coordinator maintains all check sources and electronic field measurement instruments. Maintenance includes inventory,
testing, calibration, and repair. Calibration and repair of instruments may be performed by the manufacturer or Chem-Nuclear Geotech.

4.8 HEALTH AND SAFETY

Health and safety personnel assure that correct safety procedures are followed in the field, that all personnel are adequately trained in health and safety procedures, and that necessary documentation is maintained. In addition to health and safety department staff, project personnel (geologists, technicians, etc.) may be assigned the role of site safety officer and be responsible for meeting all health and safety requirements at project sites.

4.9 DOCUMENT CONTROL

The document control department manages files and documents relevant to PAG projects including archive files, correspondence, and historical data on microfiche. The document control coordinator maintains a technical reference library for use by PAG personnel.
1.0 PURPOSE

This section describes the integration of Quality Assurance (QA) requirements into the planning and performance of PAG activities.

2.0 APPLICABILITY

This QA section applies to all activities conducted by the PAG.

3.0 ADMINISTRATION

3.1 GROUP LEADER

The group leader has overall responsibility for establishing QA policies, goals, and objectives, ensuring that the PAG projects are developed adequately and are properly implemented. The group leader is assisted in fulfilling this responsibility by the PAG QA coordinator.

3.2 PAG QA COORDINATOR

The PAG QA coordinator is responsible for reviewing and monitoring all plans and activities developed in accordance with procedures in this manual to ensure that QA aspects have been adequately and sufficiently considered, addressed, and are in conformance with accepted ORNL QA standards, policies, and practices. The PAG QA coordinator is responsible for conduct and surveillance of the QA program.

3.3 PROJECT MANAGERS

Project managers are responsible for incorporating the requirements of QA planning into all activities. The manager shall verify that input data and records used are the latest available sources of information.

Approved by:

Craig Litle 9/26/90 (Date)  
C.A. Litle 9/26/90 (Date)
4.0 POLICY STATEMENT

For PAG projects, it is the policy of Martin Marietta Energy Systems, Inc. to perform technical services in accordance with standard quality assurance practices.

5.0 COMMUNICATION POLICY

During planning of activities, the project managers shall ensure that all project personnel are fully informed of their responsibilities and limitations with respect to contacting and interfacing with outside organizations, subcontractors, and civilian and administrative personnel.

5.1 HASRD

Communication with the HASRD office is administrative in nature and shall be accomplished through the EMAS head, PAG leader, or program manager. Communication with the section office is not regulated for ordinary matters, i.e. time cards, work direction, procedures, etc.

6.0 PURCHASING

The PAG leader or the procurement coordinator has the responsibility of interfacing with ORNL procurement, Chem-Nuclear Geotech procurement, subcontractors, and outside vendors.

7.0 SUBCONTRACTS

Once contractual obligations are established, contact between the PAG project manager or other designated representative and the subcontractor will consist of scheduling, ensuring that services are performed as required by the contract, and ensuring final submittal of required data and reports from the subcontractor.

8.0 QUALIFICATIONS AND TRAINING

8.1 RESPONSIBILITIES

8.1.1 Program Managers

The program managers have the following responsibilities with respect to qualifications and training of personnel assigned to PAG projects:

a. Establish job descriptions,
b. Ensure that the employment procedures as defined in the Martin Marietta Energy Systems, Inc. Policy Procedures Manual are followed,

c. Maintain performance standards and measures of performance, and

d. Designate project managers based on experience and ability.

8.1.2 Project Managers

The project managers have the following responsibilities with respect to qualifications and training of personnel assigned to their projects:

a. Obtain information regarding the qualifications of individuals performing projects work, and identify the requirements for additional training.

b. Schedule workshops, meetings, or training sessions to ensure all pertinent project information is fully understood by all project personnel.

c. Ensure that technical personnel develop proficiency in necessary field techniques, including equipment operation, sampling techniques, monitoring methods, decontamination procedures, documentation procedures, and QA recordkeeping and conformance.

8.1.3 QA Coordinator

The PAG QA coordinator is responsible for documenting the training of all personnel. The QA coordinator shall document successful completion of training by approved forms in the personnel file.

8.1.4 Technical Personnel

Technical personnel should not perform any task unsupervised unless they have been fully trained for the task. Personnel are responsible for maintaining accurate and legible field data on the applicable forms and protecting the records against loss or damage while in the field.
9.0 RECORDS

This procedure describes control of issuance and revision of documents, such as instructions, procedures, and drawings, that describe activities affecting the PAG programs as well as the final issued documents to the DOE or other contracting agency. When possible, all records, data, maintenance manuals, and forms used or referenced in PAG activities shall be identifiable by revision date.

9.1 EQUIPMENT OPERATING AND MAINTENANCE MANUALS

Equipment operating and maintenance manuals shall accompany the associated equipment whenever possible. Where this is not practical, the appropriate operating and maintenance procedures shall be provided in the Procedures Manual. As a precaution, a copy of these manuals shall also be maintained in the corresponding records files kept by the field instrumentation coordinator or other responsible manager. Sufficient data shall be recorded to ensure the ability to reorder appropriate information in the event a manual is misplaced or lost.

When changes to operating parameters or maintenance procedures are made for a piece of equipment, changes to the corresponding equipment manuals shall be made. These changes must be identified by revision date.

9.2 DATA COLLECTION AND REPORTING FORMS

The use of current forms shall be controlled through periodic surveillances. The project manager or appropriate supervisor shall maintain a separate file of all forms used to report PAG activities and ensure that when forms are revised, all outdated copies are removed from use or destroyed. To aid in this control, the report forms shall have the current revision date and UCN number, preferably in the lower left hand corner.

9.3 ARCHIVAL OF FIELD DATA

All original field data shall be copied and maintained in a separate location by the team leader or project manager. The archive files shall be maintained until the project completion or until the contracting agency directs the disposal of the archival files.

10.0 PROCUREMENT CONTROL

This procedure applies to items and services required to implement activities associated with the PAG projects. Most items and services are purchased
through the purchasing department of Martin Marietta Energy Systems, Inc., and the ORNL standard practices and guidelines apply. Other items and services may be purchased by Chem-Nuclear Geotech procurement after a written request is initiated by ORNL/GJ. Some items are purchased through local vendors who invoice ORNL; a petty cash request is prepared by PAG to reimburse the vendor. This procedure describes the internal PAG controls to ensure that purchased items and services conform to procurement documents.

10.1 RESPONSIBILITY

10.1.1 Group Leader

The group leader or his designee is responsible for ensuring that all items and services are procured according to the guidelines and standards established in the reference section of this procedure. The group leader or designee is also responsible for approving requests for the procurement of all items and services.

10.1.2 QA Coordinator

The QA coordinator is responsible for reviewing nonconformance reports which document any nonconformance upon visual inspection by a responsible PAG staff member.

10.1.3 Procurement Coordinator

The procurement coordinator is responsible for identifying the requirements for purchased items and services, preparing requests for purchase, obtaining necessary approvals from the PAG project manager, and ensuring the acceptability of items and services received in accordance with procurement documents for PAG projects.

10.2 EVALUATION OF CONFORMANCE TO PROCUREMENT DOCUMENTS

The project manager, assisted by the QA coordinator and procurement coordinator, shall ensure that requirements for the control of purchased items and services are adequately incorporated into procurement activities associated with all projects. An overall review of purchase requests is the responsibility of the HASRD director, and is directly dependent upon established ORNL standard practices and guidelines for procurement.

Where project work requires purchased items and services, the project manager shall remain cognizant of the requirements established in procurement documents. Any deviation or departure from these requirements
shall be reported to the project manager for determination of further action in accordance with internal Martin Marietta Energy Systems guidelines. The QA coordinator may assist the project manager in this determination.

Upon arrival of any item at ORNL/Oak Ridge, procurement, identification and inspection shall be performed before shipment to the Grand Junction office. All items other than routine office supplies shall be visually inspected by the procurement coordinator. Any nonconformance shall be reported and documented.

11.0 IDENTIFICATION AND CONTROL OF MATERIAL AND EQUIPMENT

This procedure describes the requirements for ensuring the proper identification and control of materials and equipment used in the PAG projects.

11.1 EQUIPMENT INVENTORY

Accountability of high quality equipment assigned to the PAG projects shall be accomplished through the use of inventory records identifying the location of the equipment. These records shall be kept by the person responsible for the equipment.

11.2 USE OF UNAUTHORIZED EQUIPMENT

Improperly identified or unidentified equipment, instrumentation, and/or radioactive sources shall not be used during the performance of activities associated with PAG projects. Any deviation or departure from this requirement shall be reported to the project manager for determination of appropriate action.

11.3 INSPECTION, TEST AND OPERATING STATUS

The inspection, test, and operating status of all electronic measurement equipment is maintained by the field instrumentation coordinator. Non-conforming equipment records are maintained in a separate file, and the non-conforming equipment is physically relocated where it cannot be accessed for use. Conformance testing on equipment is conducted on a regular basis. Equipment shall have stickers in place indicating the inspection schedule. Portable instrumentation is checked each day prior to use.

11.4 DEFICIENCIES

A deficiency is defined as a nonconformance or departure of a characteristic from specified requirements. Deficiencies apply to equipment and
instrumentation that may be damaged, in need of modification, improperly identified, or past the due date for calibration such that the quality of associated tests, analyses, or measurements would be in question. Deficiencies also apply to processes or contracted services which are not performed in a timely or accurate manner.

11.5 CONTROL OF DEFICIENT ITEMS

This section describes the methods for identifying and segregating deficient items and obtaining corrective action. It applies to equipment and instrumentation improperly identified, in disrepair, or in need of calibration.

If it cannot immediately be determined that a deficiency shall cause the quality of associated tests, analyses, or measurements to be in question, the project manager may elect to allow the continued use of the equipment or instrumentation. After repair or calibration an evaluation shall be made to determine if any retesting must be performed.

11.5.1 Repair of Damaged Equipment

The field instrumentation coordinator shall determine the best and most appropriate method of repair. If repair of the item involves modification of the equipment or instrumentation, an evaluation shall be made to determine whether or not any changes to instructions contained in applicable procedures are necessary.

11.5.2 Lack of Identification

If equipment or instrumentation is not properly identified, the ORNL department responsible for its issuance shall be consulted to obtain the necessary information.

11.5.3 Corrective Action

Conditions adverse to quality shall be identified promptly and corrected as soon as practicable. The identification, cause, and corrective action for significant conditions adverse to quality shall be documented on the appropriate form and reported to responsible levels of management. The PAG QA coordinator shall take follow-up action to verify implementation of corrective actions.

12.0 SURVEILLANCES/AUDITS

Planned audits and surveillances shall be performed internally by the PAG QA coordinator, the HASRD QA coordinator, and externally by the DOE, contracting
agency, and the ORNL Quality Department, to verify compliance with all aspects of the QA program and to determine its effectiveness. Subcontractor performance shall also be audited.

12.1 RESPONSIBILITY

12.1.1 Project Managers

The PAG project managers are responsible for conveying to all project personnel the importance of continued surveillance and monitoring of all activities to ensure that applicable procedures are followed and requirements are met.

12.1.2 QA Coordinator

The QA coordinator shall be responsible for the following:

a. conducting internal audits of the PAG organization and subcontractors;

b. assisting the ORNL QA lead auditor in performing audits;

c. maintaining audit logs for the PAG organization; and

d. following up on corrective actions resulting from both internal and external audits.

12.2 ORNL INTERNAL AUDITS

The ORNL QA lead auditor performs regular QA audits of ORNL research and development divisions, service divisions supporting the research of ORNL projects and other service divisions that provide services for ORNL, in order to verify that the ORNL QA program is effective and to ensure compliance with the ORNL QA program and applicable procedures. Normally, one audit is conducted each month in a division, project, or facility selected by the ORNL QA director.

Audits are conducted in accordance with an announced audit plan and checklist by the ORNL QA lead auditor (chairperson) with a team composed of ORNL staff members. The audit team members are chosen by the lead auditor for their experience and knowledge of QA and/or of the activity being audited. Normally, a member of ORNL management is a member of the audit team.
Audit findings and recommendations of the audit team, as well as agreements and commitments for correction of any deficiencies, are documented by the audit team. The reports are distributed to ORNL and division management, as well as the PAG QA coordinator.

12.3 DIVISION INTERNAL AUDITS AND SURVEILLANCES

The division QA coordinator performs QA audits and surveillances of activities within the division or projects to verify for the division director that the QA project is effective and to assure that the staff is complying with appropriate aspects of the division’s QA procedures.

During audits, the following activities are normally documented: notification of audit, audit plan, audit checklist, audit findings, corrective action recommendations, and final summary report to division management.

Audits are normally conducted by an audit team chaired by the division or projects QA coordinator. The QA coordinator reports to the division and/or projects management and is independent of activities being audited.

Surveillances are conducted more frequently than audits. They are normally conducted by the QA coordinator on an individual basis with the responsible individuals in the group being audited.

Audits and surveillances are conducted when scheduled by the QA coordinator or when scheduled by responsible division management.

12.4 EXTERNAL AUDITS

The DOE project office or other contracting agency shall conduct audits periodically with the assistance of the DOE or contracting agency’s QA manager. The PAG QA coordinator shall assist in these audits and attend the post-audit meeting. The PAG QA coordinator shall also follow up on all corrective actions resulting from the audit.

13.0 OCCURRENCE REPORTING SYSTEM (ORS)

All personnel must report to PAG management all events, conditions, and problems which could: 1) affect the health and safety of the public; 2) seriously impact the intended purpose of DOE facilities; 3) have a noticeable adverse effect on the environment; or 4) endanger the health and safety of workers. To comply with DOE order 5000.3A, all unusual events, conditions, and problems as noted above are now reported on the Occurrence Reporting System (ORS) form. Copies of this form are located in the PAG QA coordinator’s office.
Personnel will complete and return the ORS form to their immediate supervisor, or if unavailable, the next higher level of management within 24 hours of emergency, unusual, and off-normal occurrences. Instructions for completing the ORS form and reporting the occurrence are contained in Martin Marietta Energy Systems General Policy Manual, Document GP-13, which is available in the PAG QA coordinator’s office.

14.0 RECORDS

Personnel should note on associated logs and records actions taken to correct deficiencies to clear any questions concerning the validity of tests, analyses, and measurements. Records shall be available for review by the QA coordinator to determine that deficiencies are properly identified and corrective action has been taken.
QUALITY ASSURANCE FOR PREEXISTING CUSTOM SOFTWARE

1.0 PURPOSE

This procedure defines the requirements and responsibilities for quality assurance (QA) and control of preexisting custom software which is unclassified and nonsensitive. It is intended to ensure that acquisition and maintenance of such software is done in a traceable, auditable, and fully documented manner throughout its life cycle in accordance with ASME NQA-2a QA requirements for nuclear facility applications (Reference 3.1.1). This procedure was developed specifically for preexisting custom software by adapting pertinent sections of the Martin Marietta Energy Systems, Inc., Automated Data Processing Systems Development Methodology (Reference 3.1.2) and of ASME NQA-2a.

2.0 APPLICABILITY

This procedure applies to preexisting software that is customized for a specific technical purpose rather than that which is mass produced for a wide variety of applications. It does not address classified or sensitive software or software development.

3.0 OTHER DOCUMENTS

3.1 REFERENCES


3.1.3 Procedure AD-050, Quality Assurance.

4.0 DEFINITIONS

4.1 Acquisition: procurement of software.
4.2 **Benchmarking**: verification of software by comparing software simulation results with results from previously verified software.

4.3 **Computer programming assistant**: assists the Computer Services Manager (CSM) in assignment and management of software.

4.4 **Computer security officer (CSO)**: oversees computer and software security, including passwords.

4.5 **Computer services manager (CSM)**: oversees procurement and assignment of computer hardware and software, works to ensure compatibility of existing and newly acquired products, and ensures that systems have adequate backup.

4.6 **Configuration control**: the process of identifying and defining the configuration items in a system, controlling the release and change of these items throughout the system life cycle, and recording and reporting the status of configuration items and change requests.

4.7 **Configuration control logbook**: a bound notebook for keeping records of configuration changes and dates, code revision number assignments, and verification test results.

4.8 **Custom software**: software developed to address a specific technical problem, as opposed to commercially available, wide-usage software such as word processors or data base managers.

4.9 **Principal investigator (PI)**: has overall technical responsibility for a project.

4.10 **Procedural logbook**: a bound notebook documenting chronological implementation of steps taken for each software acquisition to which this procedure applies.

4.11 **Procurement officer**: the material requisitioner for a project.

4.12 **Quality control notebook**: a binder for keeping sign-off and approval letters for information submitted during quality control review of the software.

4.13 **Software**: computer programs, procedures, associated procedure manuals, computer source codes, and program disks.

4.14 **Software validation**: the testing of specific software with respect to the accuracy of decisions or assumptions incorporated into the software.
4.15 Software verification: the testing of specific software with respect to the accuracy of numerical algorithms.

5.0 EQUIPMENT AND MATERIALS

5.1 Software
5.2 Procedural logbook
5.3 Configuration control logbook
5.4 Quality control notebook

6.0 RESPONSIBILITY

6.1 The principal investigator for the project for which software is acquired is responsible for:

6.1.1 Defining software needs and identifying software solutions;
6.1.2 Ensuring that installation, testing, operation, modification, and retirement procedures for the software are correctly implemented;
6.1.3 Overseeing quality control procedures; and
6.1.4 Documenting all tasks outlined within this procedure until the software is retired or responsibilities are transferred to another PI.

6.2 The computer services manager is responsible for:

6.2.1 Assisting the PI with identifying software needs and
6.2.2 Determining the custom software's compatibility with existing hardware, the operating system, the network system, and other software that it may have to interface with.

6.3 The computer security officer is responsible for defining and overseeing software protection measures.

7.0 PROCEDURE

7.1 Identify the need for software.

7.1.1 The PI examines in detail the problems or opportunities that necessitate software acquisition.

   a. Define the project's purpose, objectives, scope, and constraints in as much detail as possible.
7.1.2 The PI performs a feasibility study by gathering information about the problem to determine potential software solutions.

a. Identify alternative software.

b. Document the technical and operational feasibility and benefits and risks of the alternatives.

c. Assess any current system as an alternative.

d. If necessary, perform an economic analysis. See Reference 3.1.1.

7.1.3 The PI defines software requirements.

a. Identify all significant requirements pertinent to:
   1. input/output,
   2. solution techniques,
   3. calculations which must be performed, and
   4. documentation and testing of the software.

b. Define these requirements with consideration of the objectives and constraints previously identified.

7.2 Acquire software.

7.2.1 The PI issues a request stating the software name and version to the CSM.

7.2.2 The CSM formalizes the request through the Procurement Officer who implements appropriate procedures for acquisition.

7.2.3 The PI initiates the procedural logbook, preferably a bound notebook, which is used for documenting chronological steps taken for each software acquisition.

7.2.4 The procedural logbook includes the following:

a. assurance that the software is unclassified and nonsensitive;

b. documentation of project objectives, scope, and constraints;

c. identification of preliminary alternatives;

d. evaluation of technical and operational feasibility;

e. preliminary economic analysis or economic feasibility;

f. software requirements (code selection criteria);
7.3 Install software.

7.3.1 Upon arrival of the custom software, the CSO scans the custom software with a virus-detection program utility.

a. Record the results of this scan in the procedural logbook.

7.3.2 The computer programming assistant documents the software in the computer department records with the following information:

a. software name,
b. version,
c. serial number,
d. location of use, and
e. user (to whom it is assigned).

7.3.3 The CSO notifies the PI that the software is ready for installation.

7.3.4 The PI or designated person installs the software.

a. Make copies of the original software and use these for installation.

b. Install software according to the software installation guide.

7.3.5 Secure the original software by storing and protecting it from theft, loss, and environmental damage.

a. Store a copy of the original software on disk to be used as a backup for the installed copy.

b. Store the original software in a location remote from the user's computer in case of fire or other catastrophic event.

c. Control access to all copies of software to protect copyright agreements.

d. Use software in accordance with passwords assigned to personal computers, directories, and network areas.

7.3.6 Store user's manuals, software documentation, and source code listings in a location accessible to designated users of the software.
7.3.7 Establish a configuration control logbook that contains all information needed to manage the configuration of the software.

a. Record in the configuration control logbook documentation of the software installation by entering the date of installation, the version installed, and any installation notes.

b. This logbook should contain the name and telephone number of the PI responsible for this software and the name of the project for which it was purchased.

7.4 Test software to confirm that the selected software satisfies the objectives and requirements defined.

7.4.1 Verify that the software meets the requirements specified regarding input/output, solution techniques, and desired calculations.

a. Verify the software's capabilities by comparing analytical solutions of the desired simulation equations for a defined problem with software output to evaluate the accuracy of numerical algorithms.

1. In some cases, comparison of software simulation results with results from previously verified software, termed benchmarking, is acceptable.

2. Although analytical solutions may not exist for more complicated problems, choosing a wide range of simpler test cases will improve confidence in the capability of the software being tested.

b. Demonstrate that the software meets required input/output specifications.

7.4.2 Validate software.

a. Ultimately, the acceptability of the software will be judged by how well it meets stated objectives.

b. Test the accuracy of the decisions or assumptions incorporated into the software.
c. If possible, compare predictions made by the software with real data to assess validity, taking into account any inherent uncertainties in the real systems from which calibration and validation data is gathered.

1. Calibration data sets should not be the same as that to which the software output are compared.

d. When real data are not available, acceptability can be improved by analysis of output by acknowledged experts in the appropriate field of interest and by benchmarking the software with software that has gained high acceptability by such experts.

7.4.3 Document all test cases used for verification and validation.

a. Record the following in the procedural logbook:

1. test cases used for verification,
2. verification results,
3. validation or benchmarking test cases, and
4. validation or benchmarking results.

b. Post a summary of verification and validation results, including benchmarking, in the configuration control logbook.

1. This allows tracking of these results for each version of the software that exists.

c. Record problems in the testing phase, indicating software errors, in the procedural logbook and report these to the PI upon discovery.

7.4.4 Once the software has been tested, it is referred to as the baseline version.

7.5 Implement a configuration control process.

7.5.1 Define a configuration baseline for simulation codes, input data sets, simulation results, and hardware as the tested and approved configuration.

a. Label each of these items so that each item is uniquely identified and configurations resulting from revisions of each item are uniquely identified.
7.5.2 Document changes to configuration items, including software, input data and simulation results by using the following guidelines.

a. Software changes to a baseline version must be approved by the PI.

   1. Verify the software, with changes, as described above.

   2. Ensure that changes are properly reflected in software documentation and that the changed document is properly archived.

b. Changes to, or creation of new, data sets must be documented in a manner that uniquely identifies each set and corresponding simulation result set.

c. Simulation results will usually change with changes to the software or input data set; archive these results in a manner that clearly identifies which code version and input data set they are linked to.

d. Document any changes in hardware.

7.5.3 Record all information needed to manage a configuration in the configuration control logbook.

   a. Identify the approved configuration using a well-documented naming convention for software, data sets, and simulation results.

   b. This logbook should be easily decipherable with respect to reflecting modifications made to the various configurations.

7.6 Operate and maintain the baseline version of the software.

7.6.1 The PI trains personnel to operate the software in order to ensure suitable proficiency.

   a. This training is performed and documented in accordance with Procedure AD-050.

7.6.2 Maintain existing production versions of the software to correct errors or adapt to changes in requirements or operating environments.
a. All maintenance actions must be approved, documented, verified and validated or benchmarked, and controlled.

7.6.3 Document operation and maintenance activities.

a. Record any operational problems or incidents of concern in the procedural logbook.

b. The PI keeps any necessary written requests and approvals for maintenance actions in a specified location.

c. Record any resulting modifications in accordance with the configuration control process outlined above.

7.7 Retire software according to the developer's requirements and guidelines upon completion of life cycle.

7.7.1 Archive all documents as needed.

7.7.2 Ensure that the retired software is not available for unrestricted use so that future use is in accord with any applicable licensing agreements.

7.7.3 Document the steps taken to retire the software in the procedural logbook.

7.8 Periodically perform a quality control review to establish that a controlled and appropriate version is being used; that input data are correct; and that established, unique naming conventions are applied.

7.8.1 The PI reviews and verifies with the code user that:

a. a controlled and appropriate version of the code is being used as the production version;

b. all input data sets have been verified for accuracy and so documented in the quality control notebook; and

c. code versions, data sets, and simulation results are uniquely identified and recorded in the configuration control logbook.

7.8.2 Document quality control procedures.

a. Keep quality control documentation in the form of sign-off and approval letters in a separate quality control notebook.
7.9 Establish a formal software problem and corrective action reporting procedure.

7.9.1 Use this reporting system to promptly report problems and corrective actions in the form of letters to affected individuals and organizations.

7.9.2 Describe all problems and corrective actions in the procedural logbook.
PREPARATION, CONTROL, AND DISTRIBUTION OF PROCEDURES

1.0 PURPOSE

This procedure outlines the structure of the Procedures Manual and provides requirements for the format and standard practices to be used in preparing, revising, distributing, and controlling the procedures in the Procedures Manual.

2.0 APPLICABILITY

This procedure applies to the Pollutant Assessments Group Procedures Manual and to the preparation, revision, and distribution of all procedures contained therein.

3.0 ADMINISTRATION

All procedures contained in the Procedures Manual require signed approval by a program manager or an appropriate department supervisor and the PAG leader.

Reviewers and editors, designated by program managers or department supervisors, are responsible for reviewing the procedures for proper integration of administrative, QA, project operational activities, and compliance.

The procedures coordinator is responsible for:

3.1 Processing all procedure change forms and reviewing all changes in procedures;

3.2 Distribution and control of all procedures contained in the Procedures Manual;

3.3 Issuing new numbers for procedures; and

3.4 Maintaining a current master file of all procedures and an index of the current revisions.

Approved by:

C.A. Little 2/4/92
(Date)
4.0 DESCRIPTION

4.1 PROCEDURES MANUAL FORMAT AND CONTROL

4.1.1 Division of Manual

The Procedures Manual is divided into three sections:

a. Section I: Administrative Procedures

These procedures cover the administration of the Procedures Manual itself, Program Administration, Project Management, Quality Assurance, and the administration of support activities.

b. Section II: Support Procedures

These procedures cover activities such as AutoCAD and calibration of instrumentation that support the field activities described in Sect. III.

c. Section III: Technical Procedures

These procedures cover all the technical activities including field measurements, sampling, and laboratory analyses performed by the PAG.

4.1.2 Procedure Identification Numbers

Procedures are numbered in the following manner, where XXX signifies sequential numbering from 001 to 999:

a. Sect. I: AD-XXX

c. Sect. II: SU-XXX.

b. Sect. III: TE-XXX

4.1.3 Document and Manual Control

PAG Procedures Manuals are issued as copies of the Master PAG Procedures Manual to all program managers, project managers, team leaders, technicians, and other personnel with a demonstrated need. A listing of the location of each manual is kept by the procedures coordinator.
When new and/or revised procedures are issued to each manual, they are accompanied by instructions for updating the manual and also by a revised table of contents showing current procedure revisions and dates of revision. Each manual holder is responsible for maintaining a current, up-to-date manual.

4.2 PROCEDURE FORMAT

4.2.1 Administrative Procedures

The following format is used for all administrative sections:

1.0 PURPOSE: defines the objective of each section.

2.0 APPLICABILITY: defines the specific boundaries of each procedure and lists any exceptions.

3.0 ADMINISTRATION: specifies the individuals responsible for reviewing and implementing administrative sections.

4.0 DESCRIPTION: defines specific procedures and details related to administrative sections.

4.2.2 Technical Activities and Support Procedures

The following format is used for all technical activities and support procedures:

1.0 PURPOSE: defines the objective of each procedure.

2.0 APPLICABILITY: defines the specific boundaries of each procedure and lists any exceptions.

3.0 OTHER DOCUMENTS: lists, in the following format, documents that are referred to or used in the procedure:

3.1 REFERENCES

3.2 APPENDICES

3.3 EXHIBITS

4.0 EQUIPMENT AND MATERIALS: all equipment and materials that are used in performing the activity and that are referred to in the procedure are listed in the following way:
4.1 EQUIPMENT

4.2 MATERIALS

5.0 RESPONSIBILITY: those responsible for supervising and implementing the procedure are listed.

6.0 Section 6.0 may be any or all of the following as needed:

DEFINITIONS: any words or acronyms that need to be defined to add to the clarity of the procedure.

SAFETY: any safety considerations that need particular attention.

FREQUENCY: a recurring time period for which this procedure needs to be performed (e.g., an instrument calibration).

7.0 PROCEDURE: the last section of the document, whether this be Section 7, 8, 9, or 10 (see Section 6.0 above), outlines the actual steps to be followed in performing the activity.

4.2.3 Section Numbering

Section headings will be numbered, capitalized, and bold-faced according to the following scheme:

1.0 SECTION HEADING

1.1 SUBSECTION HEADING

1.1.1 Subsection Heading

a. Subsection Heading

1. Subsection Heading

4.2.4 Appendices

Appendices are numbered sequentially as they are references in the procedure. They include tables and forms that are pertinent to the procedure.
4.2.5 Exhibits

Exhibits are numbered sequentially as they are references in the procedure. They include photographs and miscellaneous drawings that are pertinent to the procedure.

4.2.6 Page Headers and Footers

The procedure number, revision number, revision date, and page number are entered in the heading on the first page of every procedure. Approval signatures are in the footer of page one of the procedure.

4.3 PROCEDURE PREPARATION

A new procedure is prepared as a draft using this procedure as a guideline. The originator ensures that all applicable requirements and correct standards and guidelines have been incorporated. The procedure is submitted to the procedures coordinator who distributes copies to all appropriate personnel for review as necessary.

4.4 REVISIONS

When a procedure is changed, the person responsible for supervising the activities covered by the procedure fills out a Procedure Change Form (see Appendix 1) and submits it to the procedures coordinator. This form is inserted into the Master procedures Manual in front of the affected procedure. This form remains in the Master Manual until the final draft of the revised procedure replaces the earlier version.

One historical copy of each previous revision is retained by the procedures coordinator for each procedure.
APPENDIX 1

PROCEDURE CHANGE FORM

DATE______________

PROCEDURE #_________________________ REV.______________

PROCEDURE SUBJECT_______________________________________

REVISION:
   (list by section and paragraph number; attach extra pages as needed)

REASON FOR CHANGE:

EFFECTIVE DATE:

APPROVAL:_________________________ DATE:_________ ______

Return to Procedures Coordinator UCN17180 (9/90)
CONTROL OF RADIOACTIVE SOURCES

1.0 PURPOSE

This procedure specifies the requirements for control of radioactive sources including handling, storage, and accountability.

2.0 APPLICABILITY

This procedure applies to the control of all radioactive sources used by PAG personnel for instrument calibration and field checking. These sources are subject to the federal regulations listed in Reference 3.1.1.

3.0 OTHER DOCUMENTS

3.1 REFERENCES


3.2 APPENDICES

3.2.1 Appendix 1: Quantities for Determining Exempt and Nonexempt Radioactive Sources

4.0 EQUIPMENT AND MATERIALS

None

5.0 RESPONSIBILITY

5.1 All persons using radioactive sources are responsible for the handling, storage, and accounting practices listed in this procedure.

5.1.1 It is the responsibility of all personnel to report any off-normal occurrence involving radioactive sources to their supervisor and the ORNL/PAG safety officer.

Approved by:

[Signatures and dates]
5.2 The ORNL source custodian issues sources, inventories sources and maintains an inventory list, arranges leak-tests for sources, and stores nonissued sources.

5.3 The field source custodian checks out a source from the ORNL source custodian and is responsible for the source until its return.

5.4 The ORNL/PAG safety officer reports any unusual or off-normal occurrence concerning radioactive sources to ORNL-HASRD and to the Geotech Environmental and Radiation Protection (E&RP) Radiation safety officer.

6.0 DEFINITIONS

6.1 Exempt sources: sources that have activity equal to or less than that specified in Appendix 1.

6.2 Nonexempt sources: sources that have activity greater than the levels listed in Appendix 1.

6.3 Radioactive source: radioactive material that is manufactured, using a man-made or enhanced radioactive isotope, for the purpose of calibrating or checking the operation of various electronic measuring devices. This does not include reference materials, samples, or reagents.

6.4 Sealed source: a discrete amount of radioactive material that is (a) bonded wholly within an inactive material, (b) sealed in an inactive container or capsule, or (c) plated on an inactive material in order to prevent dispersion of the radioactive material during routine use.

7.0 PROCEDURE

7.1 LABELING

7.1.1 All nonexempt radioactive sources have a unique identification number.

7.1.2 Radioactive sources (except depleted uranium sources used for field surveys) are labeled with the radiation symbol, isotope, and activity.

   a. The radiation symbol may be on the container in which the source is kept rather than on the source itself.

7.2 HANDLING

7.2.1 Do not eat, drink, smoke, or chew while handling radioactive sources.
7.3 STORAGE

7.3.1 Store all radioactive sources in the instrumentation office cabinet unless in use or permanently affixed to an instrument.

   a. The ORNL source custodian controls access to the storage cabinet.

7.3.2 Sources assigned to team leaders for field use are kept in a locked drawer in the field van.

7.3.3 Lock the system check sources for the Opposed Crystal System (OCS) van in the source pig (lead-lined container) of the van when not in use.

7.4 ACCOUNTABILITY

7.4.1 All sources must be controlled in such a way that they may be accounted for at all times.

7.4.2 Sources checked out from the ORNL source custodian are documented when removed from the storage cabinet and when returned.

   a. A source inventory data base is kept by the ORNL source custodian.

   b. Any person checking out a source from the ORNL source custodian becomes a field source custodian and is responsible for that source.

7.5 DISPOSAL

7.5.1 Dispose of radioactive sources according to the regulations outlined in Reference 3.1.1

7.6 LEAK TESTING

7.6.1 The ORNL source custodian delivers nonexempt sources to Chem-Nuclear Geotech at least once every 6 months for leak-testing.

7.7 RECORDS

7.7.1 The ORNL source custodian keeps an inventory record showing assigned location of each radioactive source, field source custodian, and date of last inventory.

7.7.2 An inventory of ORNL/PAG radiation sources is transferred to the Geotech source custodian upon request.
7.8 TRAINING

7.8.1 All employees who handle radioactive sources are trained on the job.

7.8.2 Employees using nonexempt sources are provided with source-handling training by the ORNL source custodian.
## Appendix 1. Quantities for Determining Exempt and Nonexempt Radioactive Sources

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Any alpha emitting radionuclide not listed here or mixtures of alpha emitters of unknown composition: 0.01 microcuries

Any radionuclide other than alpha emitting radionuclides not listed here or mixtures of beta emitters of unknown composition: 0.1 microcuries

Source: Title 10 CFR Part 20, Appendix 3
CALIBRATION OF PORTABLE GAMMA SCINTILLATION DETECTORS

1.0 PURPOSE

The purpose of this procedure is to provide a method for the laboratory calibration, field check, and on-site cross-calibration of portable gamma scintillation detectors.

2.0 EQUIPMENT AND MATERIALS

2.1 Portable Gamma Scintillation Detector (Victoreen Model 490 THYAC III) Ratemeter with 489-55 NaI(Tl) scintillation probe.

2.2 Pressurized Ionization Chamber (PIC)

2.3 Depleted uranium check source (approximately 21,000 gross cpm using portable gamma scintillation detector).

3.0 CALIBRATION FREQUENCY

Primary laboratory calibration will be performed every six months and immediately following any significant adjustment to or maintenance of the instrument. A field operation check is performed daily during use. On-site cross-calibration of instrument readings with PIC exposure rate measurement is performed as necessary.

4.0 APPLICABLE STANDARDS

4.1 ANSI N323-1978, Radiation Protection Instrumentation Test and Calibration (for guidance only).

5.0 PROCEDURE

5.1 LABORATORY CALIBRATION

5.1.1 The electronics technician shall collect the instrument and take it to the UNC Electronics Shop for calibration.

Approved by:

[Signatures and dates]
5.1.2 Following calibration and upon receipt of the instrument, the electronics technician will verify the instrument identification and probe numbers and that UNC has affixed a calibration tag to the instrument.

5.1.3 The electronics technician will enter into the instrument calibration logbook the location, status, date, date of calibration, and date of next calibration.

5.1.4 The electronics technician will also enter the above data into the Instrument Inventory and Calibration Control (IICC) computer program as documented in the IICC manual.

5.2 FIELD CHECK

5.2.1 Check battery condition by setting range switch to "BAT" position and observing THYAC III meter. Indicator should be in "Battery check" region or battery replacement is mandatory. (See Instruction Manual for Model 490, THYAC III).

5.2.2 Set Response switch to "MEDIUM" position and the Range switch to appropriate position (maximum upscale deflection without going off scale).

5.2.3 Determine background level and record background cpm in the field van logbook. This is usually done at a reference site for the area to be surveyed.

5.2.4 Place probe in contact with the depleted uranium check source and read gross cpm.

5.2.5 The net cpm reading must be within laboratory accepted limits (approximately ±20%) of the reading taken during the previous field check.

5.2.6 If the reading obtained is within the acceptable range, the instrument is now ready for use. If the reading is out of the acceptable range, change batteries and repeat steps 5.2.4 through 5.2.5. If the reading is still out of acceptable range, return the instrument to the PAG electronics technician for repair and recalibration.

5.2.7 Enter in the field van logbook the instrument number, source number, net cpm, date, location at which check was made, and initials of person making the check.
5.3 CROSS-CALIBRATION WITH PIC (SITES OUTSIDE GRAND JUNCTION)

5.3.1 Set up PIC at an outdoor location that should provide background radiation only.

5.3.2 Perform PIC field check according to Procedure SU-021, "Calibration of Pressurized Ionization Chamber".

5.3.3 Hold portable gamma scintillator at a height of six inches above the ground. Record gamma scintillator reading in cpm.

5.3.4 Place the PIC with the handle up directly on the spot measured with the scintillator, with #1 side position oriented to the north.

5.3.5 Record PIC reading in µR/h.

5.3.6 Record data in field van logbook.

5.3.7 Repeat the above steps for an indoor location, if necessary.

5.3.8 Calculate cross-calibration factor for each location.

5.4 LOGBOOK ENTRIES

All logbook entries should be made in the appropriate logbook in accordance with this procedure and Procedure SU-010, "Radiological Equipment, Inventory, Control, and Maintenance".

The Instrument Inventory and Calibration Control (IICC) computer program is used by the electronics technician to provide automated backup to the instrument calibration logbook. Its use is documented in the Instrument Inventory and Calibration Control Procedures manual located in the instrumentation office.

5.5 SYSTEM ADJUSTMENTS

5.5.1 High voltage may be adjusted only by the electronics technician.
1.0 PURPOSE
The purpose of this procedure is to provide a method for the laboratory calibration and field check of pressurized ionization chambers.

2.0 EQUIPMENT AND MATERIALS
2.1 A Reuter-Stokes RSS-111, Area Monitoring System (PIC).

3.0 CALIBRATION FREQUENCY
Primary laboratory calibration will be performed biannually by UNC. No field calibration is performed; field operational check is performed before each use.

4.0 APPLICABLE STANDARDS
4.1 ANSI N323-1978, Radiation Protection Instrumentation Test and Calibration (for guidance only).

5.0 PROCEDURE
5.1 LABORATORY CALIBRATION
5.1.1 The electronics technician shall notify the team leader to whom the instrument has been assigned that it is due for calibration.

5.1.2 The electronics technician shall take it to the UNC Electronics Shop for calibration.

5.1.3 Following calibration and upon receipt of the instrument, the electronics technician will verify the instrument identification and probe numbers and that the calibration facility has provided adequate calibration data on the instrument.

Approved by:

[Signatures and dates]
5.1.4 The electronics technician will enter into the instrument calibration logbook the location, status, date, date of calibration, and date of next calibration.

5.1.5 The electronics technician will also enter the above data into the Instrument Inventory and Calibration Control (IICC) computer program as documented in the IICC manual.

5.2 FIELD CHECK

5.2.1 This is a battery check only. Electronics technician responsible for periodic check source tests.

NOTE: Make sure all switches are in "OFF" position before connecting or disconnecting cable.

5.2.2 Test 300 V dry cell by turning on DISPLAY/RECORER switch, turn ELECTROMETER switch to zero, MODE switch to "BATT" position, and simultaneously press PUSH TO READ and 300 V push buttons. The percentage of charge status will appear on digital display. If the charge falls below 85%, return instrument to electronics technician.

5.2.3 Test -14, +14, and +12 batteries by depressing each of the three push buttons marked -14, +14, and +12 and noting the meter indication on one of the three meters immediately above the push button. If meter indicator is in or near the shaded area of the meter, recharge batteries according to paragraph 4.2 of Reuter Stokes Rss-111 Area Monitor System Operational Manual.

5.3 LOGBOOK ENTRIES

All logbook entries should be made in accordance with this procedure and Procedure SU-010, "Radiological Equipment, Inventory Control, and Maintenance."
CALIBRATION OF SOIL LABORATORY GAMMA SPECTROMETRY SYSTEM

1.0 PURPOSE

This procedure outlines the steps for calibration of the soil laboratory gamma spectroscopy system.

2.0 APPLICABILITY

This procedure applies to the ND-66 gamma spectroscopy system used in the PAG soils analysis laboratory for the analysis of radionuclides in soils.

3.0 OTHER DOCUMENTS

3.1 REFERENCES


3.1.2 Instrument Inventory and Calibration Control Instructions, unpublished.

3.2 APPENDICES

3.2.1 Quarterly Calibration

4.0 EQUIPMENT AND MATERIALS

4.1 EQUIPMENT

4.1.1 ND-66 NaI(Tl) well detector system

4.1.2 $^{226}$Ra standard reference materials:

a. $5.12 \pm 0.2 \ pCi/g$

b. $15.12 \pm 0.45 \ pCi/g$

c. $50.2 \pm 1.57 \ pCi/g$

Approved by:

(Dated) C.A. Little (Date)

12/16/91
4.1.5 $^{232}$Th standard reference material
4.1.6 Spectrum storage disk
4.1.7 Empty sample container for background determination
4.1.8 Soil analysis logbook
4.1.9 Instrument calibration logbook
4.1.10 IBM-PC computer

4.2 MATERIALS

4.2.1 Rad-Con™ or similar radioactive decontaminant spray
4.2.2 Paper towels

5.0 RESPONSIBILITY

5.1 The extended measurements coordinator is responsible for supervising all laboratory personnel and ensuring that all procedures are followed.

5.2 The soils laboratory technician is responsible for performing all calibrations and documenting the calibration data.

5.3 The electronics technician is responsible for overseeing total system calibration on both an emergency and quarterly basis. (See Appendix 1.)

6.0 DEFINITIONS

6.1 ADC: analog to digital converter; electronic equipment which sorts the pulses received from the amplifier.

6.2 Counting accuracy check: comparison of results calculated from counting a standard reference material to the known concentration of that standard.

6.3 Detector: sodium iodide (NaI) crystal used to detect photon emissions from unstable radioactive samples.

6.4 Efficiency calibration: adjustment of the ND-66 system to set the measured counts equivalent to the known concentration of a standard reference material.

6.5 Energy calibration: adjustment of the ND-66 system to ensure the correct channel number lies at the corresponding energy and that the energy to channel relationship is linear.
7.0 FREQUENCY

7.1 Perform an energy calibration:

7.1.1 at the start of a counting session,
7.1.2 when system operation is suspect, and
7.1.3 immediately following maintenance or adjustment of the instrument.

7.2 Perform an efficiency calibration once a week after the first energy calibration for that week.

7.3 Perform a counting accuracy check:

7.3.1 after the efficiency calibration,
7.3.2 after the energy calibration,
7.3.3 after every seventh cycle of samples through the three lead pig counting systems, and
7.3.4 whenever system operation is suspect.

7.4 Notify Geotech electronics laboratory personnel and/or the electronics technician that the system needs recalibration when operation is suspect.

8.0 SAFETY

8.1 Do not eat, drink, or smoke in the soils analysis laboratory.

8.2 Wear a thermoluminescent detector (TLD) at all times while working in the soils analysis laboratory.

9.0 PROCEDURE

9.1 Initialize the ND-66 system.

9.1.1 Enter the system password.

9.1.2 The main menu will appear. Enter the correct time and date.

9.1.3 Select option 1, "Soils Program."

9.1.4 After the acknowledgement header is displayed, press any key, and the next menu will appear.

9.1.5 Select option 1, "Initialize ND."
9.1.6 Press any key to advance the interface routine between the user's terminal and the ND-66.

9.1.7 Notice the ND-66 display. This subroutine enters the correct date, time, channels, regions of interest, and count time. If all data have been accepted, the program will return to the main menu.

9.1.8 If any piece of data is missing from the ND-66 display, select option 1, "Initialize ND" again. Repeat this step until all data is accepted.

9.2 Perform the energy calibration.

9.2.1 Clean the lead pigs with Rad-Con and a clean paper towel.

9.2.2 Place a $^{40}$K standard in pig 1.

9.2.3 Begin data acquisition using procedures described in "Keyboard Commands," Reference 3.1.1.

9.2.4 Set cursor at channel 243.

9.2.5 Observe gamma spectrum on the monitor.

9.2.6 Adjust the "fine gain" control on the front panel of the amplifier for ADC #1 so that the 1.460 MeV gamma peak is centered on the cursor (channel 243).

9.2.7 Remove the $^{40}$K standard from the pig and place a $^{137}$Cs standard in pig 1.

9.2.8 Set cursor at channel 111.

9.2.9 Observe gamma spectrum on the monitor.

9.2.10 Check to see that the 0.661 MeV gamma peak is at 111 $\pm$ 1 channel.

9.2.11 Adjust the fine gain control if needed.

9.2.12 If the peak is still not within the given channel ranges, notify the PAG electronics technician.
9.2.13 Repeat the above steps for pigs 2 and 3 and their corresponding amplifiers.

9.3 Perform the efficiency calibration.

9.3.1 Place the spectrum storage disk in the B: drive.

9.3.2 Place the empty sample container for background determination in pig 1.

9.3.3 Begin data acquisition by pressing the acquire and initialize keys on the ND-66 keyboard.

9.3.4 Choose option 2, "Background and Reference Menu."

9.3.5 Choose option 1, "Background."

9.3.6 When data acquisition has ceased, press 1 on the keyboard for pig 1. The spectral data is automatically stored on disk. The background and reference menu will appear.

9.3.7 Place the $^{226}$Ra 50.1 pCi/g standard in the detector.

9.3.8 Begin data acquisition by pressing the acquire and initialize keys on the ND-66 keyboard.

9.3.9 Choose option 2, "Radium reference."

9.3.10 When data acquisition has ceased, press 1 on the keyboard for pig 1. The $^{226}$Ra reference table will appear on the screen.

9.3.11 Input the following data:

a. Sample weight _____ g
b. $^{226}$Ra 50.1 pCi/g
c. $^{232}$Th 0.0 pCi/g
d. $^{40}$K 0.0 pCi/g

9.3.12 Proceed return to bring up the background and reference menu.

9.3.13 Place the $^{232}$Th standard in the detector.

9.3.14 Begin data acquisition by pressing the acquire and initialize keys on the ND-66 board.
9.3.15 Choose option 3, "Thorium reference."

9.3.16 When data acquisition has ceased, press 1 on the keyboard for pig 1. The $^{232}$Th reference table will appear on the screen.

9.3.17 Input the following data:

a. Sample weight ____ g
b. $^{226}$Ra 1.24 pCi/g
c. $^{232}$Th 71.2 pCi/g
d. $^{40}$K 1.87 pCi/g

9.3.18 Press return to bring up the background and reference menu.

9.3.19 Place the $^{40}$K standard in the detector.

9.3.20 Begin data acquisition by pressing the acquire and initialize keys on the ND-66 keyboard.

9.3.21 Choose option 4, "Potassium reference."

9.3.22 When data acquisition has ceased, press 1 for pig 1.

9.3.23 The $^{40}$K reference table will appear on the screen. Input the following data:

a. Sample weight ____ g
b. $^{226}$Ra 0.617 pCi/g
c. $^{232}$Th 0.368 pCi/g
d. $^{40}$K 104.6 pCi/g

9.3.24 Repeat the steps above for pigs 2 and 3.

a. When data acquisition is complete, enter 2 or 3 for the appropriate pig.

9.3.25 Upon completion of efficiency calibration, press any key to return to the main menu.

9.4 Perform a counting accuracy check for each detector.

9.4.1 Enter the sample analysis mode by selecting option 3 on the main menu. Upon entering this mode, the printer will print a sample header.
9.4.2 Place a $^{226}\text{Ra}$ 15 pCi/g standard in pig 1.

9.4.3 Begin data acquisition by pressing the acquire and initialize keys on the ND-66 keyboard.

9.4.4 When data acquisition has ceased, press 1 on the keyboard for pig 1. The spectral data will be printed on the screen and the data is automatically stored on disk.

9.4.5 The user is prompted for sample information. Notice that at the top of the screen the sequence number is displayed along with the current reference file number. Input all data requested, naming the sample Ra-15.

9.4.6 When asked whether the data are ok, type "Y" to continue execution of the program. Any other response will return the user to the first requested data input.

9.4.7 The sample concentration will appear on the screen. Record the result in the soil analysis logbook.

9.4.8 The $^{226}\text{Ra}$ 15 pCi/g concentration should lie within approximately ± 0.5 pCi/g.

9.4.9 Repeat the above steps for the $^{226}\text{Ra}$ 5 pCi/g standard. Name the sample Ra-5.

9.4.10 The $^{226}\text{Ra}$ 5 pCi/g concentration should lie within approximately ± 1.0 pCi/g.

9.4.11 Repeat the above steps for pigs 2 and 3.

9.4.12 If both standards fall within the guidelines, begin sample analysis.

9.4.13 If the value for either standard falls outside the guidelines repeat the energy and efficiency calibrations.
Appendix 1. Quarterly Calibration

1. Every 3 months the electronics technician notifies the Chem-Nuclear Geotech electronics laboratory that calibration is due.

2. Chem-Nuclear Geotech personnel perform zero intercept, high-voltage settings, initial amplifier settings, and other adjustments by using procedures described primarily in the ND-575 Operating Manual. Other maintenance is performed according to device-specific procedures.

3. The Chem-Nuclear Geotech electronics laboratory maintains an electronics maintenance logbook for the PAG soil counting system.

4. The electronics technician:
   a. checks the Chem-Nuclear Geotech data sheet for accuracy,
   b. files it in calibrated instrument file, and
   c. enters the status, date, date of maintenance, and date of next maintenance into the instrument calibration logbook.

5. The electronics technician enters the above data into the Instrument Inventory and Calibration Control (IICC) computer program as described in the IICC manual.
QUALITY CONTROL OF SOIL ANALYSIS LABORATORY SAMPLES

1.0 PURPOSE

The purpose of this procedure is to describe the quality control measures used by the PAG soil analysis laboratory.

2.0 APPLICABILITY

This procedure applies to the PAG soil analysis laboratory.

3.0 OTHER DOCUMENTS

3.1 REFERENCES

3.1.1 Procedure TE-026, Beta-Gamma Radiation Measurement.
3.1.2 Procedure SU-022, Calibration of Soil Laboratory Gamma Spectrometry System.

3.2 APPENDICES

3.2.1 Appendix 1: Soil Quality Check Form
3.2.2 Appendix 2: Request for Analytical Services
3.2.3 Appendix 3: Chain of Sample Custody/Soil Sample Analysis Form
3.2.4 Appendix 4: Contamination Survey Form

4.0 EQUIPMENT AND MATERIALS

4.1 EQUIPMENT

4.1.1 Soils laboratory computer system
4.1.2 Beta-gamma probe

4.2 MATERIALS

4.2.1 Soil analysis laboratory logbook
4.2.2 Soil quality control notebook

Approved by:

[Signature]
(Date)

C.A. Little
(Date)
5.0 RESPONSIBILITY

5.1 The extended measurements coordinator is responsible for:

5.1.1 Reviewing the monthly sample set results;
5.1.2 Directing corrective action for samples that fail the computer analysis of the cross-check results;
5.1.3 Informing project managers of suspect analysis results.

5.2 The soils laboratory technician is responsible for:

5.2.1 Selecting samples for cross-check analysis;
5.2.2 Preparing samples for analysis by the Chem-Nuclear Geotech environmental laboratory;
5.2.3 Entering the cross-check analysis results in the database;
5.2.4 Performing the computer analysis of the cross-check data, using the true-false test and the paired t-test.

6.0 DEFINITIONS

6.1 Cross-check: refers to having samples analyzed by two independent laboratories or methods to determine validity or accuracy of results.

7.0 FREQUENCY

7.1 Send a minimum of 5% of analyzed soil samples to the Chem-Nuclear Geotech environmental laboratory for cross-check analysis monthly.

8.0 PROCEDURE

8.1 Select cross-check samples.

8.1.1 Choose at least one sample from each well-crystal system used each day.
8.1.2 Select a representative sample from the low, medium, and high pCi/g ranges for each day.

8.1.3 Note the analyzed samples selected for cross-check in the comments column of the soil analysis laboratory logbook and on the Soil Quality Check Form. (See Appendix 1.)

8.2 Store in a container separate from other samples.

8.3 At the end of the month, prepare the samples for shipment to the Chem-Nuclear Geotech (hereafter called Geotech) environmental laboratory for cross-check analysis.

8.3.1 To provide a laboratory identification number, assign each sample a Geotech soil ticket number from the soil ticket booklet provided by Geotech.

8.3.2 Fill out a Geotech Request for Analytical Services (Appendix 2).

8.3.3 Fill out a Chain of Sample Custody/Soil Sample Analysis Form (Appendix 3).

8.3.4 Place the samples in a container for transmittal to Geotech.

8.3.5 Check container for contamination.

   a. Refer to Procedure TE-026, Beta-Gamma Radiation Measurement, for the operation and check instructions for the beta-gamma probe.

   b. Complete Part A of the Contamination Survey Form (Appendix 4).

   c. Wipe the outside of the container with rad wipes.

   d. Perform a 1-min count on the rad wipe using the beta-gamma probe.

   e. Record the gross count rate (cpm) on the Contamination Survey Form, Part B, Smear Survey.

   f. Subtract the background count (cpm) from the gross count to obtain the net count rate (cpm) and record.
g. If the net count rate is less than 30% above background, initial the form for approved release of the samples and container. Proceed to 8.4.

h. If the net count rate is greater than 30% above background, rewipe the box with a rad wipe and take a second net count rate as above.

i. If the net count rate is less than 30% above background, initial the form for approved release of the samples and container. Proceed to 8.4.

j. Perform a direct survey of the container by slowly moving the beta-gamma probe over all surfaces of the container.

k. Record data on the Contamination Survey Form, Part B, Direct Survey.

l. Using a radwipe, take a smear where the highest gross count was detected.

m. Count the radwipe for 1 min with the beta-gamma probe. If the smear exceeds the above criteria, obtain a different container and begin again the check for contamination.

8.4 Send the samples to the Geotech environmental laboratory.

8.4.1 Include the following paperwork:

a. Geotech Request for Analytical Services Form (Appendix 2).

b. Chain of Sample Custody/Soil Sample Analysis Form (Appendix 3), and

c. Contamination Survey Form (Appendix 4).

8.4.2 Obtain the signature of the Geotech employee receiving the samples on the Chain of Sample Custody/Soil Sample Analysis Form.

8.4.3 Retain a copy of the Chain of Sample Custody/Soil Sample Analysis Form for the file in the soil analysis laboratory, pending release of the samples from Geotech.
8.5 After receiving the cross-check sample results, enter the data into the soil quality control data base.

8.5.1 Transfer the results from the report received from the check laboratory to the Soil Quality Check Form (Appendix 1).

8.5.2 Turn on the computer, monitor, and printer.

8.5.3 Change directories to "QC."

8.5.4 At the C:\QC> prompt type "QC."

8.5.5 Hit the escape key to use a color monitor.

8.5.6 Enter the QC program password.

8.5.7 Select menu option FILE.

8.5.8 The program will default to path: C:\QC\ORIG. Return.

8.5.9 Select file SOILQC01.DBF.

8.5.10 Using the right arrow key, choose menu option RECORD.

8.5.11 Choose the option "Add New Record."

8.5.12 Enter the new sample ID.

8.5.13 Enter the sample data from the Soil Quality Check Form (Appendix 1).

8.5.14 Press the PgDn key to save the data.

8.5.15 Hit the escape key to return to the main menu.

8.6 Run the true-false test and t-test.

8.6.1 Using the right arrow key, choose menu option STATISTICS.

8.6.2 Choose the option, "Paired t-test, from database."

8.6.3 Enter the sample set (e.g., A37).

8.6.4 Hit any key to generate t-test values.
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<td>Page: 6 of 11</td>
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</table>

8.6.5 Press F2 to print the sample set data, including true/false and t-test data.

8.6.6 Choose menu option EXIT to exit program.

8.7 Place the printed report in the soil quality control notebook.

8.8 Take corrective action if the sample set fails the t-test according to the following priority:

8.8.1 Re-analyze the nonagreeng analysis pairs by both laboratories and compare the results.

8.8.2 If nonagreement still exists, schedule recalibration of the PAG NaI well-crystal. See Procedure SU-022.

8.8.3 Reanalyze all samples analyzed during the month that analytical results are in question.

8.9 Inform project managers immediately of any samples that are affected by re-analysis.
Appendix 1. Soil Quality Check Form

<table>
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<tr>
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ORNL JDO

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CHECK LAB

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Appendix 2. Request for Analytical Services

Request for Analytical Services

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| Requisition Number: |  |

| Project Number: | 6R0004-210 |

| Site Code (lab use only): |  |

| Final Report to: | G.A. Pierce, ORNL |

| Copy to: |  |

### Elemental Analyses (indicate by symbol):

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<td>Th³²²</td>
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### Isotope Analyses (indicate by symbol):

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<td>Th³²²</td>
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- [ ] EPTOX Metals
- [ ] Volatiles
- [ ] Semivolatiles
- [ ] Ignitability
- [ ] pH
- [ ] PCBs
- [ ] Herbicides
- [ ] Pesticides
- [ ] BETX
- [ ] Alkalinity
- [ ] Other:  

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| Other: |  |

### Special Instructions:

| A80 | March 1991 | QC sample set |

### Sample Disposition:

- [ ] Return
- [ ] Store
- [ ] Destroy

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**Chain of Sample Custody/Soil Sample Analysis Form**

1. Project No.: GR 0004-210
2. Project Name: ORNL March '91 QC

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<th>DATE BOTTLED</th>
<th>DATE ANALYZED</th>
<th>DISK NO.</th>
<th>SAMPLE WT. (g)</th>
<th>ZA6-Ra (pC/q)</th>
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<td>Dr. Davis</td>
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<td>ORNL</td>
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Distribution: Original accompanies samples, copies to relinquishers

UCN 17345 (9/91)
Contamination Survey

Date: 2/8/91  Site ID No: 6776  Health Physics Technician: S. Beik
Address: O7NH Sample Prep Trav

Part A. Beta-Gamma Radiation Survey Instrument Data

Luminescence: 121
Meter Model No: GMISS  Serial No: 73673  Detector Model No: 74-9  Serial No: 720727202
Calibration Factor: 5.2  Calibration Due Date: 6/17/91  Battery Check:  V  Alarm Check:  -
Radioactive Source ID: 2-929B  Isotope: Tc-99  Activity: ~ 0.25. y
Source Count Rate (cpm): 385.3  Background Count Rate (cpm): 6.5  Net Count Rate (cpm): 382.8
Acceptance Criteria: 3 Sigma of Net Average Source Activity

Lower Limit (cpm): 369.1  Upper Limit (cpm): 407.5  Observed Activity: 382.8

Part B. Survey Data

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<th>Smear Survey</th>
<th>Remarks</th>
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<td>Sample 6</td>
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*Net Count Rate = Gross Count Rate Minus Background Count Rate.*
1.0 PURPOSE

The purpose of this procedure is to provide a method to ensure that all new computer equipment meets its intended performance specifications prior to initial use in the PAG project and to provide a method for maintenance and inventory.

2.0 APPLICABILITY

This procedure applies to all new computers, and peripheral equipment to be utilized in the PAG project. The computers and peripherals include commercially available, custom made, and ORNL prototype devices.

3.0 PROCEDURE

3.1 NEW COMPUTER EQUIPMENT CHECK-IN AND SETUP

Check in procedure of new computer equipment falls into three general classes.

3.1.1 Check In and Tracking Number Assignment

Prior to use in the PAG project, all new computers and peripherals are assigned an ORNL tracking number and are appropriately marked by the computer technician or other designated individual. A preliminary check is made of the equipment to ensure conformance to design specifications and performance requirements. Maintenance records are established by use of the ORNL tracking number system. All of the pertinent information should be entered into the ORNL inventory data base (see sample data base entry, Appendix 1).

3.1.2 Setup, Electronic Checkout, Burn In, and installation

The computer or peripheral should be setup according to the needs of the end user. After all peripherals are attached to the computer,
3.2.1 The equipment is turned on, and all operating parameters are checked. If unit appears to be operating correctly, a five hour burn in is required before the equipment is ready to be installed. All operating parameters are checked again at the end of the burn-in time. If the equipment is operating correctly, it is ready for installation.

3.1.3 Disposition Options in Case of Nonconformance

In the event the computer or peripheral fails any required performance test or fails to meet design specifications, the device is returned to the vendor with a notation to that effect.

3.2 COMPUTER EQUIPMENT MAINTENANCE LOGS

3.2.1 The computer technician performing the maintenance function on PAG maintained computers and equipment is responsible for incorporating the maintenance entry into the log folder.

3.2.2 Maintenance logs for computer equipment include three categories.

a. Preventative Maintenance Inspection (PMI) Diagnostic Testing

All computer and peripheral preventive maintenance is entered into a log folder maintained by the computer technician. Each computer workstation has a unique log folder for the computer and associated peripherals. The computer technician has total responsibility for all entries which pertain to PMI routines and diagnostic testing. See PMI forms, Appendices 2, 3, 4 and 5.

b. Equipment Failure and Corrective Action Taken

All computer and peripheral failure and corrective action information shall be entered into the workstation log folder. This information shall include the following: date, parts repaired or replaced, diagnostic testing completed, and initials of the technician. If any equipment was sent to an outside vendor for repair, all pertinent information should be included in the log folder.

c. Upgrades and Field Modifications

All equipment upgrades and field modifications information shall be included in the log folder. This information shall include the following: date, parts required, diagnostic testing completed,
and initials of the technician. If the equipment is sent back to the manufacturer for upgrade, all pertinent information should be included in the log folder.

3.3 COMPUTER EQUIPMENT FOR FIELD USE

3.3.1 The computer technician performing the pre- and post-checkout function on PAG computers and equipment is responsible for incorporating the sign out and in procedure.

3.3.2 Computer equipment for field use shall include two categories:

a. Electronic Checkout, Pre- and Post-Field Work

All computers and peripherals shall be setup and all operating parameters checked out before they are signed out for field work. The PMI schedule should be checked to be sure that no PMI's will fall due while the equipment is in the field.

Upon return from the field, all computer equipment is to be checked for damage and setup to check operating parameters. After equipment is checked and needed repairs, if any, are made before it is returned to storage.

b. Computer Check Out

All travel computers and peripherals shall be checked out prior to being taken for field work. The checkout form (Appendix 6) should be filled out by the designated individual.

All equipment will be shipped in approved containers only.

3.4 COMPUTER SUPPLIES INVENTORY

The computer technician will make daily spot checks of the consumable supplies inventory. Any supplies that are below set levels (Appendix 7) will be ordered through normal procurement channels.
Appendix 1

Sample ORNL Inventory Data Base

Computer #NCR1 Model #0617
Serial #15-18566428 Doex #x183029
System board #017-0037169B

LOCATION:
Bldg #53B Room #7 User KMW

INSTALLED RAM:
System bd 000 kb Adapter bd 2048 kb

COMMENTS:
ACAD STATION 80387-16 MATH COPROCESSOR
MONITOR MODEL JG-1501VMA
THIS COMPUTER WAS UPGRADED FROM A 286 TO A 386-16.

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<td>Keyboard</td>
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<td>03</td>
<td>TECMA</td>
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</tr>
<tr>
<td>Check power supply voltages</td>
<td></td>
</tr>
<tr>
<td>General case cleaning</td>
<td></td>
</tr>
<tr>
<td>Clean floppy drive heads</td>
<td></td>
</tr>
<tr>
<td>Check for proper grounding</td>
<td></td>
</tr>
<tr>
<td>Run diagnostics</td>
<td></td>
</tr>
</tbody>
</table>

Date________  

Computer PMI
SN________

Initials________

UCN 17206 (6-89)
Appendix 3. TI Printer PMI Form.

## Maintenance activity

<table>
<thead>
<tr>
<th>Activity</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vacuum Dust</td>
<td></td>
</tr>
<tr>
<td>Clean ckt. board contacts</td>
<td></td>
</tr>
<tr>
<td>Clean carriage rod &amp; rollers</td>
<td></td>
</tr>
<tr>
<td>Clean print head</td>
<td></td>
</tr>
<tr>
<td>Adjust print head</td>
<td></td>
</tr>
<tr>
<td>Replace ribbon (if necessary)</td>
<td></td>
</tr>
<tr>
<td>Barberpole test &amp; check out</td>
<td></td>
</tr>
</tbody>
</table>

## T.I. Printer PMI

<table>
<thead>
<tr>
<th>SN</th>
<th>Date</th>
<th>Initials</th>
</tr>
</thead>
</table>

UCN 17205 (6-89)
Appendix 4. HP Laser Jet Printer PMI Form.

Date ______

**Laser Jet Printer PMI**

<table>
<thead>
<tr>
<th>S.N. ______</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Maintenance Activity</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vacuum dust &amp; print powder</td>
<td></td>
</tr>
<tr>
<td>Clean transfer guide</td>
<td></td>
</tr>
<tr>
<td>Clean primary corona wire</td>
<td></td>
</tr>
<tr>
<td>Clean transfer corona wire</td>
<td></td>
</tr>
<tr>
<td>Clean fusing roller</td>
<td></td>
</tr>
<tr>
<td>Check separation belt (replace if worn)</td>
<td></td>
</tr>
<tr>
<td>Check the E.P. cartridge</td>
<td></td>
</tr>
<tr>
<td>Clean outside case</td>
<td></td>
</tr>
<tr>
<td>Run check out</td>
<td></td>
</tr>
</tbody>
</table>

**Initials ______**

UCN 17207 (6-89)
Appendix 5. Miscellaneous Equipment PMI Form.

<table>
<thead>
<tr>
<th>Maintenance activity</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vacuum Dust</td>
<td></td>
</tr>
<tr>
<td>Clean ckt. board contacts</td>
<td></td>
</tr>
<tr>
<td>Check power supply voltages</td>
<td></td>
</tr>
<tr>
<td>General case cleaning</td>
<td></td>
</tr>
<tr>
<td>Check Misc. parameters</td>
<td></td>
</tr>
<tr>
<td>Check for proper grounding</td>
<td></td>
</tr>
<tr>
<td>Run diagnostics</td>
<td></td>
</tr>
</tbody>
</table>

Date_______  

Initials_______

UCN 17204 (6-89)

**ORNL**

*Computer check out form*

**Description of Computer and Peripherals**

<table>
<thead>
<tr>
<th>Name (noun)</th>
<th>ORNL Tracking #</th>
<th>Serial #</th>
<th>DOE X #</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Location where equipment will be used.

<p>| |</p>
<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

Approx. date of return.

<p>| |</p>
<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

**Checkout Date**

<p>| |</p>
<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

**Signature**

<p>| |</p>
<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>
Appendix 7. Computer Supplies Inventory Levels.

Exhibit 99.4-1. Computer supplies inventory levels

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity Required</th>
<th>Quantity On Hand</th>
<th>Supplies Needed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laser JetII Cartridges</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Laser Jet+ Cartridges</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>T.I. Printer Ribbons</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Toshiba Printer Ribbons</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Floppy Drive Cleaning Kits</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Antistatic fluid</td>
<td>1 Gal.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Antistatic Dispenser's</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QIC Tape Cleaner Kits</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>409 Cleaner</td>
<td>1 Gal.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vacuum cleaner bags</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Isopropyl Alcohol</td>
<td>1 pint</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cotton swabs</td>
<td>100</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
1.0 PURPOSE

The purpose of this procedure is to provide guidance in handling KMAN software and its applications. This procedure applies to the creation and maintenance of KMAN software and its database applications.

2.0 KMAN PAG/RADIOLOGICAL APPLICATIONS

Most PAG database management is accomplished with the commercial software package called KNOWLEDGEMAN (KMAN). These applications are designed, updated and stored by the computer department. All other commercial software programming is the responsibility of the individual programmer.

3.0 PROCEDURE

KMAN data base programming is done in order to input, store, update and output data. Application programming is done on an as-needed basis. It is up to the user to contact the programmer and request a job. The job is recorded in a data base and prioritized with all the other outstanding jobs. Time frames are negotiated between the user and the programmer. Jobs are re-evaluated and reprioritized at least weekly.

3.1 SECURITY

Security is implemented during the time when application programs are being written. KMAN software offers an internal type of security which allows the data files to be accessed by people with the matching codes. The PAG Local Area Network’s (LAN’s) security can limit access of specific users to specific areas. Network security is implemented with the physical location of the data. Access to specific parts of data bases is determined by general consensus of personnel involved.

3.2 TESTING
While in the development stage, programs are tested off-line as many ways as feasible. Program testing is done at the discretion of the programmer.

3.3 DOCUMENTATION

Programs are documented with the following:

1. Hardcopy output of programs are stored in a binder with all the related programs. This hardcopy contains the program title, programmer name, date written, date of the latest update, all associated files and variables used, a brief description of its function, and all prior revisions. The program also has status comments throughout the code.

2. Flowcharts are usually made showing program to program flow with all associated files. These flowcharts are drawn up in ACAD. They are stored in an off-line ASCII file and in hardcopy form.

3. Synopses are made which outline programs and their functions. One copy is sent to the computer manager, one copy is kept with the rest of the documentation and an ASCII file is kept off-line for future updates.

3.4 BACKUP

Application programs are backed-up, off-line on a computer hard drive in their ASCII state for easy access on future revisions. Also, the scrambled version is backed up on floppy for easy restoration in the event of LAN failure. The hardcopy printout serves as a programmer reference tool and backup in case the original backup is destroyed. All off-line programs are put on a tape for one to two month storage to protect them in the case of hard drive failure.

3.5 TRAINING

There are two types of training: 1. After applications are written and installed for one or more users, one-on-one training is used to show how the particular application works. 2. For the people who prefer to do their own KMAN programming, user assistance is provided for any aspect of the programming process. All maintenance, backup and documentation is the responsibility of the programmer.

3.6 MAINTENANCE

Program maintenance and ad-hoc queries are provided on the following application programs: UMTRA/ISC data bases, verification data base, document control data base, procurement data base, hardware data base,
QA data bases, soil data base, maintenance order data base, project cost accounting data base, and the time accounting data base. Refer to the appropriate Procedures Manual sections for more information on these data bases. Data bases can be added or dropped from existence according to the user’s needs and demands.

3.7 KMAN SOFTWARE HANDLING

The original commercial KMAN software is stored in a locked file cabinet in the computer room that is also locked during off hours. The original software is copied onto blank disks. This copy is used to install the software. Software versions should be upgraded if cost and time spent will benefit the data base systems. Upgrading includes configuring to the network and each specific personal computer. Software is ordered through procurement.
GRAPHICS FOR INCLUSION SURVEYS OF VICINITY PROPERTIES

1.0 PURPOSE

This procedure provides the methods and standards for ensuring that all maps and drawings produced by PAG personnel in support of inclusion surveys are correctly drawn and consistent throughout all reports and documents.

2.0 APPLICABILITY

This procedure applies to all graphics produced as part of the Uranium Mill Tailings Remedial Action (UMTRA) project or the Monticello Vicinity Properties project for reports and documents. Graphics are produced using AutoCAD (computer aided drafting) methods described in the AutoCAD manual, Reference 3.1.1.

3.0 OTHER DOCUMENTS

3.1 REFERENCES


3.2 APPENDICES

3.2.1 Appendix 1: ISC Layer Names

3.3 EXHIBITS

3.3.1 Exhibit 1: ISC Drawing with Detail
3.3.2 Exhibit 2: ISC Detail Drawing with Key Insert

4.0 EQUIPMENT AND MATERIALS

4.1 EQUIPMENT

4.1.1 Personal computer linked to the network
4.1.2 Digitizer tablet and mouse

Approved by: [Signature] 29 Jan 92 (Date)
4.1.3 Plotter or laser printer
4.1.4 AutoCAD software

4.2 MATERIALS

4.2.1 Plotter or printer paper
4.2.2 Plotter pens
4.2.3 Drafting tape

5.0 RESPONSIBILITY

5.1 It is the responsibility of the graphics coordinator to approve and implement changes in standards and procedures for all graphics drawings.

5.2 The graphics technician is responsible for creating base maps from field measurements or published maps and editing completed drawings for updated information and editorial changes.

5.3 Computer support personnel are responsible for archiving drawings by saving electronic and paper copies of certain drawings temporarily and then permanently.

6.0 PROCEDURE

INCLUSION SURVEY PROPERTY MAPS

6.1 Begin a new drawing on AutoCAD using ORNL20 or other appropriate default drawing with predefined limits.

6.1.1 Use the largest scale that will fit on an 8.5 x 11 in. sheet, leaving a 1-in. margin on the left side and 1/4-in. margins on all other sides.

6.1.2 Name the drawing using the property location number, for example, GJ12345.

6.2 Tape the field property sketch to the digitizer tablet and calibrate it by using two widely spaced points.

6.3 Reproduce the drawing using the layer names in Appendix 1 for drawing components.

6.3.1 Accuracy should be to the nearest foot.

6.4 Include a 7 x 10 in. border if possible.
6.4.1 The border can be eliminated or made slightly larger but should not be smaller.

6.5 Draw large properties using details and detail layers (see Appendix 1 for use of detail layers).

6.5.1 A property with detail may be drawn in three ways (see Exhibits 1 and 2):

a. Draw the property on one sheet, indicating the location of the detail, and the detail on another sheet.

b. Draw the property, showing the detail in one corner if there is room.

c. In the corner of the full-sheet detail drawing, include a small drawing of the entire property showing the detail location.

6.5.2 The scale of the detail drawing should be as large as possible and still fit on an 8.5 x 11 in. sheet.

6.6 Text height should be 0.1 x the scale of the drawing (2 for a 1 in. = 20-ft-scale drawing, 3 for a 1 in. = 30-ft-scale drawing, etc.)

6.6.1 Use the Standard style and Greek font for all text.

6.7 Indicate concrete using the MUDST hatching pattern rotated 45° to the object being hatched.

6.7.1 Use a scale of 5 to 10 for hatching a 20-scale drawing, 10 to 15 for 30-scale, etc.

6.8 Insert a north arrow and bar scale.

6.8.1 Blocks for north arrows and bar scales are inside the default drawing and can be recalled by using the INSERT command.

a. Block names are NORTH20, NORTH30, BAR20, BAR30, etc., corresponding to the scale of the drawing.

6.8.2 The north arrow should point up or to the left or may be rotated in the second quadrant to produce a better fit.

6.8.3 Place the north arrow and bar scale in the lower right-hand quadrant of the drawing outside the property boundaries.
6.9 Insert the location number and the complete address, including the city and state, beneath the bar scale.

6.10 Place a caption at the bottom of the drawing, indicating figure number and map name.

6.11 Edit the drawing, adding radiation contamination information on the layers indicated in Appendix 1.

6.12 Hatch radiation contamination using the hatch pattern DOTS.

6.12.1 Use a scale of 10 to 30 for a 20-scale drawing, varying according to the scale of the drawing, size of the deposit, and magnitude of contamination.

6.12.2 Deposits with higher concentrations of contamination are hatched more densely than less-contaminated areas.

6.13 Draw areas of contamination inside a structure (interior deposits) on a separate map.

6.13.1 Label this drawing Figure 1b.

a. Figure 1b is on the same computer drawing file but next to the exterior map and is plotted separately using the window option of the PLOT command.

6.13.2 Show only contaminated structures on Figure 1b, using a larger scale than the original drawing.

6.13.3 Figure 1b may be a duplicate of the original property map if the structure is large enough to accurately identify the contaminated region on the map.

6.13.4 When the only elevated reading in a structure is a point source, show this on the original property map; no interior map is necessary.

6.14 Show all radiation readings with appropriate units.
6.14.1 Show a HOG (high outdoor gamma) location on all exterior maps and a HIG (high indoor gamma) location on all interior maps.

6.14.2 Note the locations of PIC readings, delta counter measurements, samples, and boreholes.

6.15 Date and initial the drawing.

6.15.1 Place the date of sketching and initials of the sketcher and the date of completion and initials of the person creating the AutoCAD map drawing in the lower right-hand corner outside the border.

   a. If the initials are outside the printing area of the completed drawing, they may be placed inside the border.

   b. Use a scale of 0.5 x the text height.

6.16 Save the drawing to the TEAMS or RAD subdirectory on the network.

6.16.1 Use the DOS MAP command to determine the current subdirectory locations.

6.17 Plot the drawing on an 8.5 x 11 in. sheet using a plotter or laser printer.

6.17.1 Use a plotting scale of 1 in. = 20 ft or 1 in. = 30 ft, etc., as appropriate.

6.17.2 Turn off detail layers to print or plot an overall property drawing.

6.17.3 Turn off nondetail layers to plot the detail.

6.18 Archive the drawing by giving a paper copy of the base map to computer support personnel in charge of archiving ACAD drawings on tape.

6.18.1 Computer support archives the file by performing the following steps:

   a. Date and file the paper copy in a three-ring binder specific to the project.

   b. Copy the computer file from the subdirectory to the archive hard drive.

   c. Delete the file from all subdirectories.
d. After 30 to 60 days, archive the file to tape and delete from the network drive.
Appendix 1. ISC Layer Names

<table>
<thead>
<tr>
<th>Layer</th>
<th>Color</th>
<th>Entities</th>
<th>Linetype</th>
</tr>
</thead>
<tbody>
<tr>
<td>02TX</td>
<td>1</td>
<td>Notes</td>
<td>Continuous</td>
</tr>
<tr>
<td>OBLD</td>
<td>2</td>
<td>Buildings</td>
<td>Continuous</td>
</tr>
<tr>
<td>OBODR</td>
<td>2</td>
<td>Page border</td>
<td>Continuous</td>
</tr>
<tr>
<td>OBDRY</td>
<td>3</td>
<td>Property lines</td>
<td>Phantom</td>
</tr>
<tr>
<td>OLNA</td>
<td>4</td>
<td>Location no., address</td>
<td>Continuous</td>
</tr>
<tr>
<td>ONAB</td>
<td>4</td>
<td>North arrow &amp; bar scale</td>
<td>Continuous</td>
</tr>
<tr>
<td>OTEX</td>
<td>4</td>
<td>Text</td>
<td>Continuous</td>
</tr>
<tr>
<td>OCON</td>
<td>5</td>
<td>Concrete</td>
<td>Continuous</td>
</tr>
<tr>
<td>OCONH</td>
<td>5</td>
<td>Concrete hatching</td>
<td>Continuous</td>
</tr>
<tr>
<td>ODIT</td>
<td>5</td>
<td>Ditches, creeks</td>
<td>Divide</td>
</tr>
<tr>
<td>OFEN</td>
<td>6</td>
<td>Fences</td>
<td>Dashdot</td>
</tr>
<tr>
<td>OMISC</td>
<td>8</td>
<td>Misc. lines &amp; objects</td>
<td>Continuous</td>
</tr>
<tr>
<td>OWRK</td>
<td>8</td>
<td>Temporary working layer</td>
<td>Continuous</td>
</tr>
<tr>
<td>ORAD</td>
<td>6</td>
<td>Radiation contamination</td>
<td>Continuous</td>
</tr>
<tr>
<td>ORADH</td>
<td>6</td>
<td>Contamination hatching</td>
<td>Continuous</td>
</tr>
<tr>
<td>ORADTX</td>
<td>1</td>
<td>Contamination text</td>
<td>Continuous</td>
</tr>
</tbody>
</table>

Detail layers correspond to regular layer names with the addition of D's to create a name with seven letters. OTEX becomes OTEXDDD on a detail drawing, OCONH becomes OCONHDD, ORADTX becomes ORADTXD, etc.
Appendix 1 (continued)

(PROPERTY LINE
LAYER: OBDRY)

(SHED &
HOUSE
LAYER: OBDL)

11-14 uR/h

(LAYER: ORADTX
HEIGHT: 2)

pt sources
17-29 uR/h

1-STOREY
BRICK &
FRAME

FLAGSTONE &
CONCRETE

2-14 uR/h

(LAYER: ORADH
STYLE: DOTS)

(HATCHING
OUTLINE
L: ORAD)

point sources
20-49 uR/h

(ARCHITECTURAL
LAYER: OCON)

FLAGSTONE &
CONCRETE

20-25 uR/h

2 HOH

Dirt

pt source
173 uR/h

NANCY DRIVE

FENCE
LAYER: OPEN)

(CONCRETE HATCHING
LAYER: OCONH)

BSC

100'

(CONCRETE
LAYER: OCON)

ASPHALT,
DRIVE

(PAPER BORDER
LAYER: OBOOR)

THIS IS AN
EXAMPLE DRAWING

(NOTES, 2X THE
ORIGINAL TEXT
SCALE LAYER: 02TX)

(MY NOTES ARE ON LAYER: OWRK)

(ARCHITECTURAL
LAYER: ONAB)

(LANDMARKS
LAYER: GJO-3122

(GJO3122)

(Location &
ADDRESS
LAYER: OLNA)

257 NANCY DRIVE

JCM/YLF
Exhibit 1. ISC Drawing with Detail

Figure 1. Property Map (sheet 1 of 2)
Exhibit 1 (continued)

GJ04895
196.7 BROADWAY
GRAND JUNCTION, CO

DETAIL
Figure 1. Property Map
(sheet 2 of 2)
Exhibit 2. ISC Detail Drawing with Key Insert

Figure 1. Location GJ32595, 1284 58 Road, Collbran, Colorado.
1.0 PURPOSE

This procedure provides the methods and standards for ensuring that all maps and drawings produced by PAG personnel in support of inclusion verification tasks are correctly drawn and consistent throughout all reports and documents.

2.0 APPLICABILITY

This procedure applies to all graphics produced as part of the Uranium Mill Tailings Remedial Action (UMTRA) project and the Monticello Vicinity Properties project. Graphics are produced using AutoCAD (computer aided drafting) methods described in the AutoCAD manual, Reference 3.1.1.

3.0 OTHER DOCUMENTS

3.1 REFERENCES

3.1.2 Procedure SU-061, Graphics for Inclusion Survey Properties.

3.2 APPENDICES

3.2.1 Appendix 1: IVC Layer Names

3.3 EXHIBITS

3.3.1 Exhibit 1: IVC Drawing with Detail

4.0 EQUIPMENT AND MATERIALS

4.1 EQUIPMENT

4.1.1 Personal computer linked to the network
4.1.2 Digitizer tablet and mouse

Approved by:
29 Jan 92 (Date)
C.A. Little (Date)
4.1.3 Plotter or laser printer
4.1.4 AutoCAD software

4.2 MATERIALS
4.2.1 Plotter or printer paper
4.2.2 Plotter pens
4.2.3 Drafting tape

5.0 RESPONSIBILITY
5.1 It is the responsibility of the graphics coordinator to approve and implement changes in standards and procedures for all graphics drawings.
5.2 The graphics technician is responsible for creating base maps from field measurements or published maps and editing completed drawings for updated information and editorial changes.
5.3 Computer support personnel are responsible for archiving drawings by saving electronic and paper copies of certain drawings temporarily and then permanently.

6.0 PROCEDURE
6.1 If Chem-Nuclear Geotech is the remedial action contractor (RAC) for the remediated property, check out the property folio from Geotech’s Records Management department.
6.2 Locate the drawing file with the needed information from the diskette in the front of the folio.
6.2.1 The correct drawing file is usually labelled G#####.DWG, but it may be necessary to check the other drawings on the RAC diskette and possibly use one of them.
6.2.2 Some older folios may not contain drawings on AutoCAD; in this case, an AutoCAD drawing of the property is created by PAG personnel. See Procedure SU-061.
6.3 At the computer, go to W:\VERFRAD and copy the file to the VERFRAD subdirectory.
6.3.1 VERFRAD is the subdirectory where all verification drawings should be stored.
6.3.2 Change the file name to GJ####.dwg for ORNL drawings.

6.3.3 Return the floppy disc to the folio.

6.4 Call up AutoCAD and enter the name of the drawing without the extension, .dwg.

6.5 Convert RAC layers in the drawing to ORNL layers using the script file VUNC1.

6.5.1 If the program comes to a stop at any time during the conversion process, enter the command RESUME.

6.5.2 The following are the layers resulting from this conversion process. See Appendix 1 for further explanation.

<table>
<thead>
<tr>
<th>Layer</th>
<th>Description</th>
<th>Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>OBLD</td>
<td>buildings; yellow</td>
<td>(yellow)</td>
</tr>
<tr>
<td>OBDRY</td>
<td>boundary; green</td>
<td>(green)</td>
</tr>
<tr>
<td>OBODR</td>
<td>border; yellow</td>
<td>(yellow)</td>
</tr>
<tr>
<td>OCON</td>
<td>concrete; blue</td>
<td>(blue)</td>
</tr>
<tr>
<td>OMISC</td>
<td>misc.; grey</td>
<td>(grey)</td>
</tr>
<tr>
<td>ORADH</td>
<td>hatching; magenta</td>
<td>(magenta)</td>
</tr>
<tr>
<td>OTEX</td>
<td>text; cyan</td>
<td>(cyan)</td>
</tr>
<tr>
<td>OLNA</td>
<td>address; cyan</td>
<td>(cyan)</td>
</tr>
<tr>
<td>ONAB</td>
<td>bar and arrow; cyan</td>
<td>(cyan)</td>
</tr>
<tr>
<td>ODIT</td>
<td>ditch; blue</td>
<td>(blue)</td>
</tr>
<tr>
<td>ORAD</td>
<td>contamination; magenta</td>
<td>(magenta)</td>
</tr>
<tr>
<td>OFEN</td>
<td>fence; magenta</td>
<td>(magenta)</td>
</tr>
</tbody>
</table>

6.6 Purge the drawing of unused blocks and layers except for ORNL layers.

6.6.1 Since the PURGE command works only if it is the first command issued after entering the drawing editor, SAVE the drawing, QUIT the drawing editor, and then return to the drawing editor.

6.6.2 When the drawing comes up on the screen, purge the RAC layers with the very first command.

6.7 Properties too large to fit 40 scale on 8 x 11 in. paper should be completed with a detail map. See Procedure SU-061.

6.8 Insert a verification legend.

6.8.1 Vleg and wvleg are the two legend blocks that have already been created.

   a. Vleg is elongated on the X-axis and is used when there is insufficient space to insert the vertical legend.

   b. Wvleg is a vertical legend elongated in the Y-axis and should be appropriate in many drawings.
6.8.2 X and Y scales should be 2 for 20-scale drawings, 3 for 30-scale, etc.

6.9 When applicable, insert the radon symbol to indicate the location of the radon daughter concentration (RDC) measurement.

6.9.1 Copy the radon symbol from the legend to the part of the building where the detectors were located.

6.10 Insert the north arrow and bar scale.

6.10.1 Erase the RAC north arrow and bar scale.

6.10.2 Insert the appropriate ORNL bar scale, using block BAR20 for 20 scale, block BAR30 for 30 scale, etc.

6.10.3 Insert the ORNL north arrow at the same angle as the RAC arrow, using the block NORTH20 for 20 scale, NORTH30 for 30 scale, etc.

a. If it is necessary to rotate the north arrow, use the ROTATE command.

6.11 Digitize the field map to the tablet using TABLET command.

6.12 Add rad data to the drawing using the ORNL field map as the primary source.

6.12.1 Draw the boundaries of excavations in layer ORAD with a pline width of 0.4 to 0.6.

a. Both indoor and outdoor excavations are normally drawn on this map, although sometimes a separate indoor drawing may be appropriate.

b. Indoor drawings are almost always drawn to a 10 scale.

6.12.2 Use the OTEX layer to enter gamma exposure rate ranges.

a. Copy the V box and symbol (area identifier) from the legend and place it in each appropriate excavated area.

1. For multiple V areas, use the MULTIPLE option of the COPY command.
2. Pick the V box only, copy it to each excavated area, and add the appropriate area identifier using the TEXT or DTEXT command.

b. If an area excavation is too small, place a V box and symbol off to the side and draw a line to the excavation.

c. Make a column within the border of the drawing of all V boxes and their scan ranges.

6.13 Using layer ORADH, hatch excavations.

6.13.1 Pick both the border of the excavation and the border of the V box to avoid hatching through the V box.

6.14 Use the OTEX layer to add text for the address and GJ number.

6.14.1 Denote biased sample locations, marked on the map by solid circles, as B1, B2, etc.

6.14.2 Date and initial a completed drawing in the lower right-hand corner.

a. Text height should be half the regular text scale.

6.15 Save the drawing to subdirectory VERFRAD.

6.16 Print the completed drawing using a laser jet printer or a plotter.

6.16.1 Examine the printed drawing for errors and make any necessary changes.

6.17 Archive the drawing by giving a paper copy of the printed drawing to computer support personnel for backup archiving.

6.17.1 Computer support archives the file by performing the following steps:

a. Date and file the paper copy in a three-ring binder specific to the project.

b. Copy the computer file from the subdirectory to the archive hard drive.

c. Delete the file from all subdirectories.
d. After 30 to 60 days, archive the file to tape and delete from the network drive.
# Appendix 1. IVC Layer Names

<table>
<thead>
<tr>
<th>Layer</th>
<th>Color</th>
<th>Entities</th>
<th>Linetype</th>
</tr>
</thead>
<tbody>
<tr>
<td>02TX</td>
<td>1</td>
<td>Notes</td>
<td>Continuous</td>
</tr>
<tr>
<td>OBLD</td>
<td>2</td>
<td>Buildings</td>
<td>Continuous</td>
</tr>
<tr>
<td>OBODR</td>
<td>2</td>
<td>Page border</td>
<td>Continuous</td>
</tr>
<tr>
<td>OBDRY</td>
<td>3</td>
<td>Property lines</td>
<td>Phantom</td>
</tr>
<tr>
<td>OLNA</td>
<td>4</td>
<td>Location no., address</td>
<td>Continuous</td>
</tr>
<tr>
<td>ONAB</td>
<td>4</td>
<td>North arrow &amp; bar scale</td>
<td>Continuous</td>
</tr>
<tr>
<td>OTEX</td>
<td>4</td>
<td>Text</td>
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</tr>
<tr>
<td>OCON</td>
<td>5</td>
<td>Concrete</td>
<td>Continuous</td>
</tr>
<tr>
<td>OCONH</td>
<td>5</td>
<td>Concrete hatching</td>
<td>Continuous</td>
</tr>
<tr>
<td>ODIT</td>
<td>5</td>
<td>Ditches, creeks</td>
<td>Divide</td>
</tr>
<tr>
<td>OFEN</td>
<td>6</td>
<td>Fences</td>
<td>Dashdot</td>
</tr>
<tr>
<td>OMISC</td>
<td>8</td>
<td>Misc. lines &amp; objects</td>
<td>Continuous</td>
</tr>
<tr>
<td>OWRK</td>
<td>8</td>
<td>Temporary working layer</td>
<td>Continuous</td>
</tr>
<tr>
<td>ORAD</td>
<td>6</td>
<td>Radiation contamination</td>
<td>Continuous</td>
</tr>
<tr>
<td>ORADH</td>
<td>6</td>
<td>Contamination hatching</td>
<td>Continuous</td>
</tr>
<tr>
<td>ORADTX</td>
<td>1</td>
<td>Contamination text</td>
<td>Continuous</td>
</tr>
</tbody>
</table>
Exhibit 1. IVC Drawing with Detail

EXPLANATION

- CONCRETE
- EXCAVATED AREA
- REMAINING CONTAMINATION
- RDI MEASUREMENT AREA IDENTIFIER & COMPOSITE SAMPLE

V1: 12-20 μR/h
V2: 12-20 μR/h
V3: 14-24 μR/h
V4: 14-24 μR/h
V5: 14-20 μR/h
V6: 14-20 μR/h
V7: 14-20 μR/h
V8: 14-20 μR/h
V9: 11-15 μR/h
V10: 14-20 μR/h
V11: 14-17 μR/h

Figure 1. Property Map (sheet 2 of 2)
Figure 1. Property Map (sheet 1 of 2).
1.0 PURPOSE

The purpose of this procedure is to provide information relevant to management of the files and documents.

2.0 PROCEDURE

2.1 FILING

2.1.1 ISC Recommendation Reports - UMTRA Project.

After the inclusion/exclusion recommendation report is submitted to the DOE, a property file, containing documents leading to the recommendation, is retained by the ISC. This hard file is forwarded to the Public Relations Department where the date of recommendation is entered in the database and owner/property information is verified. The hard file is then forwarded to Document Control.

At Document Control, the property file is identified as a "current" file and is filed in the "current" section. The file becomes a "closed" file after the DOE reviews the ISC recommendation report and prepares an official inclusion or exclusion form memo with a copy to the ISC. Receipt of this memo "closes" the file and the folder is transferred to the "closed" category.

2.1.2 Filing of Current ISC Property Files

Current files are filed alphabetically by UMTRA site and numerically by location number for each site. They are retained in the "current" section.

2.1.3 Filing of Closed ISC Property Files

When the official DOE inclusion/exclusion letter is received, the date of the letter is entered in the computer database. Information

Approved by:

Sally Anne Right 9-24-90
(Date)  
C.A. Little 9/24/90
(Date)
contained in the inclusion/exclusion letter is verified with information in the data base as well as with information in the hard file. Any discrepancies are corrected and appropriate persons notified. The inclusion/exclusion letter is placed in the folder which is then moved to the "closed" category. These files are filed numerically by location number under the appropriate site.

2.1.4 Colorado Department of Health Files and Microfiche

Some properties have historical data from the Colorado Department of Health (CDH) radiological studies. These hard files were transferred to the ISC from CDH. The CDH file, when present, is combined with the ISC property file when it is initiated. Microfiche files of CDH data are also maintained and, occasionally, information is available on microfiche that is not available in the hard files.

CDH hard files and microfiche files are filed numerically by location number.

2.1.5 Property Drawings - RAC Land Survey Department

Original property drawings are loaned to the RAC Land Survey Department upon request so that the RAC does not have to duplicate land survey efforts.

Property drawings are removed from ISC report files and a color-coded card is placed in the file folder. A computer program has been established to track the following information: location number, borrower's name, and check-out and return dates. A printout of outstanding drawings is periodically sent to the RAC.

2.1.6 RAC Spillovers

When the RAC requests a spillover inclusion, the data base is checked to see whether or not the location number is in the system. The ISC then either creates a new file or retrieves the active file. If the ISC has to create a new file, the Public Relations Department is requested to enter a new record in the data base and initiate a file folder for the property. The words "UNC Spillover" are entered in the data base in the "Recommendation Basis" field. The spillover folder is then filed in a separate drawer and held until an official DOE inclusion letter is received, at which time it is filed in the "closed" category.
2.2 FILE CHECK-OUT SYSTEM

2.2.1 An out-card is filed in the drawer where the file has been removed. The card shows the location number, name of person, and date the folder was checked out. The out-card is removed when the file is returned.

2.2.2 Files that are removed from Document Control are also tracked on the computer. The computer record shows the location number, person's initials, date file removed, and date returned. Periodically, a printout is run and issued to each individual who has outstanding files. The printout is returned to Document Control with notations that the files are still in their possession or that they have been given to someone else. The computer data base is updated accordingly. When the file is returned to Document Control, the date of return is input into the computer which cancels the computer record.

2.3 PREPARATION OF FILES FOR MICROFILMING AND ARCHIVING

2.3.1 As part of the DOE UMTRA Project Office plan for archiving UMTRA documents, the ISC, as requested, prepares ISC files for transmittal to the RAC or TAC.

2.3.2 When the DOE requests files for a specific UMTRA site, the hard files are pulled from the drawers and information contained in each file is verified with information in the computer data base. Duplicates and all unnecessary papers are removed from the file folder, as are paper clips, staples, etc. Complete files relating to vicinity properties at all UMTRA sites except Grand Junction and Edgerton are forwarded to the TAC. In the case of Grand Junction and Edgmont, only those documents which the RAC does not have in their files will be forwarded with an index sheet listing the items being sent.
1.0 PURPOSE

The purpose of this procedure is to provide complete information and sources to enable procurement of services and equipment required to meet project objectives.

2.0 RESPONSIBILITY AND DIRECTION

The PAG leader or the PAG project managers shall prepare and integrate this procedure into the PAG projects. To successfully conduct the PAG projects, material and services are needed to assist in various capacities and at various times and sites. Either alone or together, the group leader and/or the project managers will determine when procurement services are required. When needed, they shall select from the following avenues of procurement, depending upon the type of material or service needed, cost of item, date needed, availability, and other project-related considerations.

1. In-house - Oak Ridge National Laboratory (ORNL) or United Nuclear Commission (UNC) Geotech,

2. Blanket Purchase Order (BPO) (Grand Junction and vicinity),

3. UCN-14715C, Purchase Requisition ORNL computerized form,

4. UNC-90, Purchase Requisition form through UNC Geotech Procurement,

5. UCN-1127, Request for Individual Consultant or Research and Development Subcontract, and

6. Purchasing while on business travel.

When the need for material or services is determined and avenue of procurement selected, the individual initiating the procurement becomes the requester. The responsibility of processing the request for any necessary material or services is a
joint effort of the requester and the procurement coordinator following procedures set forth below.

3.0 PROCEDURE

3.1 IN-HOUSE

Most office supplies and some laboratory or field supplies can be obtained from the UNC Geotech stores located on the compound. Material should be ordered from the UNC store whenever possible. Stores catalogs and order form supplies are maintained by the Procurement Coordinator.

3.1.1 Required item should be listed on the appropriate stores order form (UNC-1669) and described by catalog number, quantity desired, unit of issue, and description. The correct charge number should be supplied by the requester or appropriate project manager.

3.1.2 The form should be submitted to the procurement coordinator for processing. All forms will go through the procurement coordinator before they are sent on to UNC Geotech stores. An order normally takes five to seven days to be filled.

3.1.3 Some items such as forms, clothing, etc. are available only at the stores facility located at ORNL in Oak Ridge. These items are ordered by the procurement coordinator through Oak Ridge and are shipped to Grand Junction.

3.2 BLANKET PURCHASE ORDER

Office, field, drafting and computer supplies may be purchased through a local vendor (see list below naming a few). Prior approval must be obtained by the Grand Junction Office group leader or project manager. Nothing shall be purchased without prior approval.

1. Coast to Coast
2. Mountain West Office Products
3. Valley Office Supply
4. Plaza Engineering
5. Coakley Laundromat
6. L & K Surveying
7. Computerland
8. Connecting Points
9. Cognective Systems
10. Energy Equipment & Supply

3.3 UCN-14715C, PURCHASE REQUISITION

This form is to be used by the procurement coordinator in Grand Junction and Subcontracts Coordinator in Oak Ridge for initiating any necessary equipment and materials that needs to be procured through the Martin Marietta Energy Systems Procurement Division.

3.4 UNC-90, PURCHASE REQUISITION

This form is to be used by the procurement coordinator in Grand Junction for initiating any necessary equipment and materials that needs to be procured through the UNC Geotech Procurement Division.

3.4.1 Requester

a. Requests preparation of UCN-14715C form and provides required technical specifications, suggested vendors, and estimated cost;

b. Provides sole source or other justifications if necessary;

c. Serves as technical contact;

d. Informs procurement coordinator/OR if material or equipment is unacceptable for any reason after delivery.

3.4.2 Procurement coordinator/Grand Junction, Colorado and subcontracts coordinator/Oak Ridge, Tennessee

a. Prepares UCN-14715C form and associated paperwork;

b. Secures approvals;

c. Forwards forms to Subcontracts Coordinator/OR for additional approval routing, and submission to Procurement Division;

d. Tracks status on computer database;
e. Receives and inspects incoming shipments;

f. Notifies materials requisitioner/OR that orders are completed so he can issue a receiving report;

g. Sends all original invoices, shipping receipts and any other pertinent information to the appropriate office.

3.5 UCN-1127, REQUEST FOR INDIVIDUAL CONSULTANT OR RESEARCH AND DEVELOPMENT SUBCONTRACT

This form is required when a written agreement between Martin Marietta Energy Systems, Inc. and another company or individual is necessary to obtain consultant services, research and development services, and other professional and technical services. Typical subcontractor needs may include but are not limited to:

1. land surveying,
2. technical support,
3. aerial or ground surveys,
4. video taping support,
5. drilling,
6. analysis (soil, air, etc.), and
7. training courses.

3.5.1 Wage Scale Information

The PAG materials requisitioner is responsible for submitting, on a case-by-case basis, a request to Martin Marietta Energy Systems Purchasing Division to obtain the wage scales in parts of the country where field work is expected to be accomplished.

3.5.2 Responsibility

The initiation of these services is the responsibility of the requester and the materials requisitioner. The person who initiates a request for a subcontract shall refer to the ORNL standard procedures for purchasing and subcontracting. The requester and materials requisitioner are jointly responsible for the following duties:
a. Submit request for wage determination to Procurement Division,

b. Provide statement of work to reflect administrative and technical direction, deliverables, cost estimates, suggested vendors, and other information pertinent to contract negotiations and completion,

c. Provide sole-source justification if required,

d. Secure approvals,

e. Forward to subcontracts coordinator/OR and procurement division personnel for review and comments,

f. Interface with subcontracts coordinator/OR, section accounting clerk, division finance office, and procurement division personnel, and

g. Assist procurement division personnel in proposal evaluation, if required.

3.5.3 After subcontract is awarded

Subcontracts create a legally binding obligation of federal funds, and therefore, Federal Acquisition Regulations (FAR), Department of Energy Acquisition Regulations (DEAR), Martin Marietta Energy Systems purchasing policies and or UNC Technical Services purchasing policies must be followed. Designated approvals must be obtained.

After contract award the requester is responsible for administration and quality control functions as listed below:

1. Serve as the source of technical documents and direction for the subcontractor,

2. Initiate and provide technical support for a subcontract modification when required,

3. Prevent potential subcontractor from starting work in advance of official authorization from Martin Marietta Energy Systems Purchasing,

4. Direct the technical performance of the vendor in required task; ensure that performance of the tasks is properly completed and that quality assurance has been effected according to the subcontractor requirements.
5. Interface with the procurement coordinator/GJ, subcontracts coordinator/OR, and/or procurement division personnel if problems arise in administration of the contract,

6. Keep the PAG management and requisitioners informed of the status of the subcontracted job and follow any directives,

7. Review and approve the subcontractor's final report, daily log, invoice, etc.,

8. Provide confirmation of work completed to satisfaction according to specified deliverables of contract to ensure vendor payment, and

1.0 PURPOSE

The purpose of the following procedure is to provide guidelines for Property Coordinator for the Pollutant Assessments Group/Grand Junction Office (PAG).

2.0 APPLICABILITY

This procedure applies to all ORNL and UNC furniture assigned to the PAG and its associated location.

3.0 PROCEDURE

When furniture is moved from one location to another location, a written memo describing which furniture was moved from what location to new location and furniture I.D. number shall be generated and forwarded to the property coordinator.

The property coordinator is responsible for the overall coordination of all office furniture, and has the following responsibilities:

1. Receive furniture list from Oak Ridge National Laboratory Tennessee through UNC Geotech,

2. Enter all DOE/ORNL and UNC furniture into data base,

3. Assign a tracking number to all property,

4. Maintain a data base with the following parameters: building location, room number, employee name, furniture name and I.D. number,

5. Visit each office and generate from the data base a list of all furniture assigned to that office, and

6. Update the property data base on an as-needed basis and file a hard copy list in an appropriate storage file.

Approved by:

[Signatures]

(Date)

(Date)
IDENTIFICATION OF PROPERTIES FOR INCLUSION SURVEYS

1.0 PURPOSE

The purpose of this procedure is to describe the methods by which vicinity properties are identified as candidates for inclusion surveys in the UMTRA Project.

2.0 PROCEDURE

Many properties have been identified and designated for consideration by the UMTRA Project based on the results of earlier aerial radiological surveys and information obtained from earlier mobile and on-site surveys. Additional properties may be identified as candidates for inclusion based on:

1. detection of anomalous gamma radiation levels by the scanning van on properties not previously listed,

2. information from knowledgeable sources, and

3. requests from property owners or from the other project participants.

2.1 RADIOLOGICAL SCANNING VAN

When conducting or analyzing the results of any mobile gamma survey, the PAG staff will be alert to the possibility that some uranium mill tailings deposits may not have been found during earlier survey activities.

In the event that a previously unreported deposit is detected, the mobile scan team leader will report the location of the deposit and pertinent information to the project manager. The project manager will notify the UMTRA-PO and the TAC of the findings and will request that the property be added to the list of properties to be surveyed.

Approved by:__________________________

(Date)  9/19/90  C.A. Little (Date)  9/19/90
2.2 INFORMATION FROM KNOWLEDGEABLE SOURCES

Properties potentially contaminated with uranium mill tailings may be identified by various knowledgeable sources, including federal, state, or local officials, and citizens who can reliably recollect transport or placement of tailings on properties. The public relations coordinator, in cooperation with the TAC, will encourage such sources to come forward by making personal contact, holding public meetings, and advertising in the media. If properties are identified in this manner, the project manager or the TAC, as is appropriate, will request the UMTRA-PO to add these properties to the list to be surveyed.

2.3 OWNER REQUESTS

Property owners who suspect that their properties are contaminated with mill tailings are encouraged to request the DOE to survey their properties. Media advertising and public meetings also serve to alert these property owners.

2.4 TYPES OF PROPERTIES

There are basically three types of properties which the ISC will have occasion to survey and/or evaluate for inclusion into the UMTRA project:

1. properties which have qualified for possible remediation under the state managed Grand Junction Remedial Action Program (GJRAP),

2. properties which only qualify for the DOE sponsored UMTRA program and have thus been designated for ISC surveys,

3. properties adjacent to an UMTRA designated property, which upon ISC investigation are determined to contain a "spillover" of the tailings deposit located on the UMTRA designated property.

2.4.1 GJRAP Properties

The GJRAP was initiated before the UMTRA project and is managed by the State of Colorado. Remediation under GJRAP has been completed and the files closed out. The GJRAP differed significantly from the UMTRA project in that remediation was conducted on structures only - vacant lots were not eligible for cleanup. In addition, the standards upon which the properties were evaluated were different. The ISC has no jurisdiction over the interior of structures that were remediated under GJRAP, and will perform outdoor measurements only. GJRAP historical data are available and team
leaders are responsible for reviewing the data prior to an ISC survey.

2.4.2 Dovetail Properties

Dovetail properties are properties that were still "active" under GJRAP; "active" meaning that the GJRAP remediation on the structure(s) had not yet been closed out. For greater cost and time effectiveness as well as lessened inconvenience for the property owner, GJRAP and UMTRA attempted to "dovetail" their efforts and perform any indoor and outdoor remediation concurrently. Surveys on dovetails were conducted by both the ISC and ARIX, a local subcontractor. ARIX provided its survey results to the ISC and the ISC evaluated the data and submitted a summary report/recommendation to the DOE. All remediation under GJRAP has been completed.

2.4.3 UMTRA Properties

The UMTRA project was authorized six years after inception of GJRAP and is managed by the DOE. UMTRA cleans up all eligible vicinity properties, including open land. The criteria for inclusion are more stringent and remediation is performed on both the indoors and outdoors. These DOE designated properties have not been considered for cleanup under any other programs.

2.4.4 Spillover Properties

On occasion an outdoor gamma scan will reveal a deposit which extends from the currently surveyed property onto an adjacent property(ies). This "spillover" must be noted on the field map as such and investigated further. The team leader should attempt to acquire a consent for the spillover property. The address of the spillover property must be recorded and the public relations staff notified. The public relations staff will determine whether or not this adjacent property has already been designated and if not, will initiate proceedings to do so. A copy of all data and the field map of the surveyed property must be inserted into the newly created spillover property file.

a. Surveyed property deposit is includable.

If the surveyed property can be included on its own merit (does not depend on survey of adjacent property to deem the deposit includable), the report can be written immediately. The report
may also be initiated if it appears that a consent cannot be obtained for the spillover property within a reasonable time period. The adjacent property should be referenced by address and location number in the report.

b. Surveyed property deposit is not includable.

If the contamination on the surveyed property is insufficient to be included on its own merit, the file should be retained until a consent can be obtained on the spillover property. Once this subsequent survey is conducted, both reports can be written concurrently. Both reports should reference the other property by address and location number.

c. Spillover property has historical data.

If the spillover property has already been designated, the team leader should check to see if historical data is available. If previous outdoor radiological data indicates elevated gamma levels in the same area as the deposit on the surveyed property, the spillover property can be included without conducting an ISC walk-on survey. However, a consent form must still be obtained. This type of inclusion is a "spillover inclusion" and differs from a "standalone" or ISC survey-determined inclusion.
**CONSENT FOR ACCESS TO SURVEY**

1.0 PURPOSE

The purpose of this procedure is to describe the steps taken by the PAG/UMTRA to obtain signed consent-for-access agreements from property owners and tenants.

2.0 OTHER DOCUMENTS

2.1 APPENDICES

<table>
<thead>
<tr>
<th>Appendix</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>2.1.1</td>
<td>Appendix 1: Example of Consent-For-Access Transmittal Letter</td>
</tr>
<tr>
<td>2.1.2</td>
<td>Appendix 2: Example of Consent-For-Access Agreement</td>
</tr>
<tr>
<td>2.1.3</td>
<td>Appendix 3: Data Entered in the PAG/UMTRA Data Base</td>
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<tr>
<td>2.1.4</td>
<td>Appendix 4: Stage 1 Refusal Letter</td>
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<tr>
<td>2.1.5</td>
<td>Appendix 5: Record of Final Decision Enclosure</td>
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<td>2.1.6</td>
<td>Appendix 6: Cover Letter for Signed Refusal</td>
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<tr>
<td>2.1.7</td>
<td>Appendix 7: Signed Refusal</td>
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<td>2.1.8</td>
<td>Appendix 8: Cover Letter for Record of Final Contacts With Vicinity Property Owner(s)</td>
</tr>
<tr>
<td>2.1.9</td>
<td>Appendix 9: Record of Final Contacts With Vicinity Property Owner-GJ</td>
</tr>
</tbody>
</table>

3.0 RESPONSIBILITIES

The UMTRA Project is a cooperative program between the Federal Government and the affected states and Indian tribes. The responsibility for acquiring consent-for-access agreements, as well as the contents of the agreements, are
determined by the individual states and tribes in cooperation with the DOE. The following is a listing of the entities responsible for obtaining consent-for-access agreements for various property locations.

<table>
<thead>
<tr>
<th>Property Location</th>
<th>Responsible Entity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colorado</td>
<td>PAG/UMTRA</td>
</tr>
<tr>
<td>Idaho</td>
<td>PAG/UMTRA</td>
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<tr>
<td>Navajo Tribal Lands</td>
<td>The Navajo Nation</td>
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<td>PAG/UMTRA</td>
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<td>UNC and PAG/UMTRA</td>
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<td>PAG/UMTRA</td>
</tr>
<tr>
<td>Utah</td>
<td>State of Utah and PAG/UMTRA</td>
</tr>
<tr>
<td>Wyoming</td>
<td>PAG/UMTRA</td>
</tr>
</tbody>
</table>

The public relations staff is responsible for acquiring consent-for-access agreements that are to be obtained by PAG/UMTRA and is responsible for keeping records of all consents-for-access that have been obtained or have been refused.

4.0 PROCEDURE

The procedure used to acquire a consent-for-access agreement depends on the location of the property being considered. In general, seven steps are involved:

1. location of property and its owners and tenants,
2. preparation and mailing of a consent-for-access agreement package,
3. property file initiation,
4. processing returned consent-for-access agreements,
5. processing signed refusals for access and nonresponses,
6. processing partial-access properties, and
7. follow-up on consent-for-access agreements that are undeliverable.

4.1 LOCATION OF PROPERTY AND ITS OWNERS AND TENANTS
This procedure applies only to properties for which PAG/UMTRA has the responsibility to obtain consent-for-access agreements. For a property in Mesa County, CO, the public relations staff consults the Mesa County Tax Assessor’s files that are contained on the UNC computerized database. If the computer listing is outdated, the Mesa County Tax Assessor’s Office is contacted directly. If these two contacts fail to identify and locate the property owner, all historical data are thoroughly researched, and, if necessary, a member of the public relations staff will visit the property or will pursue any possible leads.

For properties outside Mesa County, their respective communities are visited. During this visit, the public relations staff obtains the necessary information from city or county records or from personal contacts with knowledgeable persons. This visit also allows the staff to resolve problems concerning the location and ownership of a property that is vaguely described on the designation listing. Consent-for-access agreements often are obtained in conjunction with these visits.

4.2 PREPARATION AND MAILING OF A CONSENT-FOR-ACCESS AGREEMENT

This procedure applies only to properties for which PAG/UMTRA has the responsibility to obtain consent-for-access agreements.

Once the necessary property location and ownership information is in hand, the public relations staff prepares the consent-for-access agreement package and mails it, certified. This package contains a transmittal letter; two copies of the agreement form; instructions for completing the agreement form; a stamped, self-addressed envelope; and an UMTRA brochure containing information on the cleanup of vicinity properties. The owner’s name and address are typed as the inside address on the transmittal letter. The location number, property address, and parcel number are typed on each copy of the agreement form. Example of the transmittal letter and consent-for-access agreement form are illustrated in Appendices 1 and 2.

4.3 PROPERTY FILE INITIATION

This procedure applies only to properties for which the PAG/UMTRA has the responsibility to obtain consent-for-access agreements.

Prior to mailing the consent-for-access agreement, the location number, which is used as the primary record control, is verified. All needed property data are entered into the PAG/UMTRA database (see Appendix 3). A folder is used to contain the property file and a label with the location number is made. When the consent-for-access agreement package is
mailed, the folder is then placed in the "consent form mailed" drawer of the location file cabinet.

4.4 PROCESSING RETURNED CONSENT FORMS

When the public relations staff receives a signed consent for access, it is date stamped. The date of receipt, any revised owner information, and the consent status are entered in the PAG/UMTRA data base. On properties with granted access, the property file is pulled and merged with the CDH file (when present). The file is then placed in the "ready for drawing assignment" drawer.

The property files are assigned for drawing by the public relations staff according to priorities. Files are pulled and the location number, date assigned, and person assigned to complete the drawing are entered in the data base and in a logbook. A copy of the consent is sent to the graphics staff, and the property file is placed in the "assigned for drawing" drawer.

When completed drawings are received from the graphics department, the date of completion is entered in the PAG/UMTRA data base. The property file is pulled, and the "property tracking form" is printed out from data in the data base and stapled inside the property folder. The folder is placed in the "ready to be surveyed" drawer.

Property files are pulled, assigned for survey, and distributed to appropriate team leaders. Assignment dates and team leaders' initials are entered in the data base and on the tracking sheets. Survey dates, provided by team leaders, are entered in the data base on a weekly basis by public relations staff.

4.5 PROCESSING SIGNED REFUSALS

This procedure applies only to properties for which the PAG/UMTRA has the responsibility to obtain consent-for-access agreements.

In cases where the owner signs a refusal for access, the ISC forwards property files to the Department of Energy. The DOE makes a final attempt to acquire consent by sending the Stage 1 Refusal Letter to the Owner. An enclosure to the letter is the "Record of Final Decision," an example of the Stage 1 Refusal Letter and enclosure is shown as Appendices 4 and 5.

The original signed refusal is forwarded to the DOE with a cover letter. These are placed in an official location folder with the CDH folder (when present) attached. Copies of the signed refusal and cover letter are
retained by the ISC in the property folder. The ISC property folder is filed in a drawer marked "Refusals Mailed to DOE." The location number is noted in a logbook when the folder is forwarded to DOE. The consent status, date of the signed refusal, and the date the file was forwarded to DOE are entered in the ISC data base. Examples of the cover letter and the signed refusal are shown as Appendices 6 and 7.

4.6 PROCESSING PARTIAL ACCESS PROPERTIES

Occasionally the ISC recommends exclusion of a property without having had access to all structures and the property is excluded from the UMTRA Project. If the DOE requires additional data on the property, the DOE acquires consent for access. The ISC is requested to return to the property to survey the previously inaccessible structure(s) and submit an addendum to the original report.

4.6.1 File Preparation

The DOE forwards the signed consent to the ISC. A file is initiated with a blue label and the words "Partial Access" stamped on the folder. The first recommendation report is pulled from the "closed" files in Document Control, copied, and placed in the newly initiated file folder. The original file folder which resides in the "closed" category is also stamped with the words "Partial Access." The newly created file folder with blue label is assigned to a team leader to acquire additional data. An addendum report is written and submitted to DOE. When the ISC receives the DOE decision memo which closes the file, the addendum report (in blue-labeled folder) is filed with the original recommendation report in the "closed" file category in document control. Appropriate information is entered in the data base.

4.7 FOLLOW-UP ON CONSENT-FOR-ACCESS AGREEMENTS NOT RETURNED

4.7.1 First Attempt

Consent-for-access packages that the postal service is unable to deliver are returned to the Public Relations department. A search of the most recent property files at the appropriate tax assessor's office then is initiated to locate and identify the current owner of the property. If this search fails to yield the required information, searches are made quarterly until the required information is obtained. Then a new consent-for-access package is mailed to the newly identified property owner.
4.7.2 Second Attempt

If no response to the original mailing is received within 60 days, a second package is sent.

4.7.3 Third Attempt

If no response to the second mailing is received within 60 days, an attempt is made to contact the property owner by telephone. If such contact cannot be made within 15 days, a personal visit is made to the property. This visit is intended to obtain information of the property owner from tenants, and if necessary, from neighbors. Any information obtained will be used to contact the property owner by mail or by telephone.

4.8 RECORD OF FINAL DECISION

If after at least three attempts by the ISC to acquire consent the owner does not respond, the ISC completes a "Record of Contacts" form. The dates on which the owner was contacted are documented on the form, and the form along with a cover letter are forwarded to DOE in an official file folder. Copies of the "Record of Contacts" and cover letter are retained by the ISC in the property folder. The ISC property folder is filed in a drawer marked "Nonresponders Referred to DOE." The location number is noted in a logbook when the folder is forwarded to DOE. The consent status and date the file was forwarded to DOE are entered in the ISC data base. Examples of the cover letter and "Record of Final Contacts" are shown as Appendices 8 and 9.

When the DOE receives a signed Record of Final Decision it is forwarded to the ISC in the official location folder. Documents contained in the official location folder are copied and placed in the ISC property folder. Both file folders are stamped with the words "Record of Final Decision." If the Record of Final Decision is a consent, the property file is placed in a drawer marked "Refusals Returned from DOE" and the ISC proceeds with the inclusion survey and recommendation. The inclusion survey report and recommendation are forwarded to the DOE in the official location folder along with the CDH folder (if present). If the Record of Final Decision is a signed refusal, the DOE writes a closeout memo. The memo and all documents in the official location folder are filed in the ISC property folder which is filed in the "closed" category in Document Control. The appropriate information is entered in the data base.
CONSENT FOR ACCESS TO SURVEY

Appendix 1 Example of Consent-For-Access Transmittal Letter.

Dear Property Owner:

This letter is to request access to your property by representatives of the U.S. Department of Energy (DOE) and the Colorado Department of Health, for purposes described below.

The Uranium Mill Tailings Radiation Control Act, Public Law 95-604, was passed by Congress in 1978. It authorized the Department of Energy (DOE) to carry out the Uranium Mill Tailings Remedial Actions (UMTRA) Project. On October 19, 1981, DOE and the State of Colorado entered into a cooperative agreement to implement the UMTRA Project and accomplish remedial action at the nine Colorado mill sites and their associated vicinity properties. The vicinity properties include any residential and commercial structures and open lands contaminated with mill tailings derived from the mill sites. The objective of the UMTRA Project is to remove or control uranium mill tailings and ensure that the standards published by the Environmental Protection Agency (EPA) for the protection of the public health, safety and the environment are met.

DOE is now evaluating properties to determine potential eligibility for inclusion in the UMTRA Project. Previous radiological surveys by State and Federal agencies suggest the possible presence of uranium mill residues on your property. Even though your property may have been surveyed in the past under the Grand Junction Remedial Action program, another survey may be required to ensure that the radiation levels do not exceed the standards established by the EPA for UMTRA.

Staff of the Oak Ridge National Laboratory, under contract to DOE, need to visit your property, located at:

[Address]

to take instrument readings and, possibly, air and soil samples to decide whether or not your property is eligible for remedial actions under the UMTRA Project.

Enclosed for your signature are two copies of a Consent form granting access to your property. Please note that a signature block is provided in the Consent form for your approval or disapproval of DOE's survey of your property. In either case, you should sign both copies of the Consent, retain one copy for your information, and return the second copy to DOE. A stamped, self-addressed envelope has been provided for your convenience.
Appendix 1 (continued)

If you consent to the DOE survey of your property, and upon our receipt of the signed Consent, you will be contacted by a survey team to schedule entry onto your property. You will be notified of the results of the tests and whether or not your property is eligible for remedial action. Any remedial action recommended, will be with your knowledge and consent, and at no cost to you.

If it is determined that your property is eligible for remedial action, DOE and the State of Colorado will transmit to you a remedial action agreement setting forth the terms and conditions for such remedial actions.

Please be advised that, in the event you do not consent to the DOE survey program, either by your signature in the appropriate space or by not returning the Consent form, DOE and the State might not contact you again regarding radiological survey of your property. Consequently, your property may not be included in the remedial action program.

If you have questions about the consent form and anything else mentioned in this letter, please feel free to contact Dr. Craig Little at 303/242-8621.

Sincerely,

Craig A. Little, Ph.D.
Oak Ridge National Laboratory

Albert J. Harle
Colorado Department of Health
Appendix 2 Example of Consent-For-Access Agreement.

CONSENT FOR ACCESS TO CONDUCT SURVEYS
AND ENGINEERING STUDIES

VICINITY PROPERTY NO.: 

PROPERTY ADDRESS: 

PROPERTY PARCEL NUMBER OR DESCRIPTION: 

I (We) acknowledge that I (We) own the property described above, and grant permission to employees, contractor and subcontractor personnel, and other representatives of the U.S. Department of Energy and the State of _______ to enter upon the property at a reasonable time or times during the next 36 months to conduct radiation surveys to determine the nature and extent of any radioactive material that might be present. In addition, permission is given to perform engineering assessments, if necessary, to evaluate the remedial measures that might be taken, as well as to evaluate the extent of the work required and the cost. 

I (We) understand that DOE's and the State's responsibility for any damage or disturbance to my (our) property caused by its activities shall be any backfilling, seeding, sodding, landscaping, rebuilding or repair of the property required to restore it to a condition comparable to its apparent physical condition immediately prior to entry upon the property. 

I (We) understand that the DOE and the State are not obligated to perform remedial action upon the property. I (We) understand that no remedial action shall be performed until the DOE, the State, and the property owner have entered into a separate written agreement setting forth terms, conditions, and plans for remedial action.

I (We) understand that the DOE and the State have the right to disclose to the public, in the form of technical data and reports, the results of its data-gathering on the above-described property.

( ) I grant access for the conduct of surveys and engineering studies as provided in this Consent-For-Access. 

Signature of Owner(s) ___________________________ Date __________ 

( ) I have decided not to participate in the UMTRA Project. 

Signature of Owner(s) ___________________________ Date __________ 

<table>
<thead>
<tr>
<th>OWNER DATA: (PLEASE PRINT CLEARLY)</th>
<th>TENANT DATA: (IF APPLICABLE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>NAME ____________________________</td>
<td>NAME ________________________</td>
</tr>
<tr>
<td>STREET __________________________</td>
<td>HOME PHONE (____) ____________</td>
</tr>
<tr>
<td>CITY ___________________________</td>
<td>BUS. PHONE (____) ____________</td>
</tr>
<tr>
<td>STATE ___________ ZIP ___________</td>
<td>COMMENTS ____________________</td>
</tr>
<tr>
<td>HOME PHONE (____) ____________</td>
<td></td>
</tr>
<tr>
<td>BUS. PHONE (____) ____________</td>
<td></td>
</tr>
</tbody>
</table>

(RV 06/96) SIGN AND RETURN WHITE COPY
APPENDIX 3

DATA ENTERED IN THE PAG/UMTRA DATA BASE

<table>
<thead>
<tr>
<th>Entry</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOCNO</td>
<td>TAC-assigned property location number</td>
</tr>
<tr>
<td>STREETNO</td>
<td>Number in property address</td>
</tr>
<tr>
<td>STREETNAME</td>
<td>Name of street in property address</td>
</tr>
<tr>
<td>CITYSTATE</td>
<td>City, State, and ZIP code in property address</td>
</tr>
<tr>
<td>TYPE</td>
<td>Type of property</td>
</tr>
<tr>
<td>OWNRLAST</td>
<td>Last name of property owner</td>
</tr>
<tr>
<td>OWNRFIRST</td>
<td>First and middle name or initials of property owner</td>
</tr>
<tr>
<td>OWNRSTREET</td>
<td>Street address of property owner</td>
</tr>
<tr>
<td>OWNRCITY</td>
<td>City in which owner lives</td>
</tr>
<tr>
<td>OWNRSTATE</td>
<td>State in which owner lives</td>
</tr>
<tr>
<td>TENANT</td>
<td>Name of tenant</td>
</tr>
<tr>
<td>DOEREQDATE</td>
<td>Date on which DOE designated the property or asked that survey be conducted</td>
</tr>
<tr>
<td>ACCLTRSEN</td>
<td>Date on which access agreement form was sent</td>
</tr>
<tr>
<td>NEXCONTACT</td>
<td>Date of next contact with property owner</td>
</tr>
<tr>
<td>FUPSEN</td>
<td>Date on which follow-up letter was sent</td>
</tr>
<tr>
<td>RESPONDATE</td>
<td>Date of owner's response</td>
</tr>
<tr>
<td>CONSTATUS</td>
<td>Owner's response (CONSENT or DENIAL)</td>
</tr>
<tr>
<td>SURVEYDATE</td>
<td>Date on which inclusion survey was conducted</td>
</tr>
<tr>
<td>RECMATION</td>
<td>PAG/UMTRA recommendation to DOE (INCL or EXCL)</td>
</tr>
<tr>
<td>RECBASIS</td>
<td>Type of information on which recommendation was based (walk-on, van, or historical)</td>
</tr>
<tr>
<td>LTRDOE</td>
<td>Date on which recommendation and survey report to DOE</td>
</tr>
<tr>
<td>INCLDATE</td>
<td>Date on which DOE decided to include the property</td>
</tr>
<tr>
<td>OTHRLOCNO</td>
<td>Other assigned property location numbers, if any</td>
</tr>
</tbody>
</table>
Appendix 4 Stage 1 Refusal Letter.

Department of Energy
Post Office Box 2567
Grand Junction, Colorado 81502-2567

June 6, 1988

Location No.: GJ00000
Address: 254 Remedial Road
Grand Junction, CO

Mr. John R. Citizen
254 Remedial Road
Grand Junction, CO 81502

Dear Mr. Citizen:

The U.S. Department of Energy (DOE), in cooperation with the State, is currently performing remedial actions at certain residences, open lands, and commercial structures in the Grand Junction, Colorado area that have been determined to contain uranium mill tailings derived from the inactive uranium mill site in Grand Junction. Remedial actions are those actions deemed necessary by DOE and the State to excavate and remove uranium mill tailings and otherwise clean up a property so that radiation levels do not exceed the standards promulgated by the U.S. Environmental Protection Agency (EPA), 40 CFR Part 192.

Previous aerial and mobile radiation measurements and historical records indicate that uranium mill tailings may be present on your property, and therefore, remedial action may be required. In order to make such a determination, the DOE has contracted Oak Ridge National Laboratory (ORNL) to take on-site radiation measurements. If the measurements confirm levels in excess of the standards set by the EPA, then the DOE will include your property as eligible for remedial action. Further, UNC Geotech, DOE's Remedial Action Contractor, will perform radiological and engineering surveys in order to define the remedial action required. Subsequently, the DOE will notify you and provide, for your execution, a Remedial Action Agreement identifying the nature and extent of tailings contamination and the remedial measures to be effected. However, should the measurements by ORNL indicate no tailings contamination in excess of the EPA standards, the DOE will notify you and no further action will be taken by the DOE with respect to your property.

As you can see, we have a pressing need for full access to your property. On Enclosure 1 you have indicated that you choose not to participate in the UMTRA Project. Inasmuch as this cleanup program is voluntary in nature, I feel it is incumbent on me to bring to your attention four items for reconsideration.

First, I have enclosed a copy of a brief analysis of the potential health effects of uranium mill tailings and the associated decay chain (Enclosure 2).

Second, it is our understanding that under a recent Colorado State case law, the owner/seller of a property may be held liable in tort if he or she fails to disclose to prospective purchasers a known latent defect, such as the presence of uranium mill tailings. While you may have no plans to sell your property, it is possible that any tailings contamination could have implications with respect to any future sale.
Third, any remedial action required on your property will be performed at no expense to you. We have initiated remedial action in the Grand Junction area and we would be glad to share information regarding the nature of those remedial actions.

Fourth and finally, in order to meet our schedule for a timely completion of our remedial action activities in Grand Junction, we need to initiate remedial action on all suspect properties, such as yours, immediately. Once our project is complete, responsibility for cleanup of mill tailings at properties which have not been cleaned up may rest with the owners of affected properties. At this time, we cannot predict whether license or management requirements will be imposed by the State or the Nuclear Regulatory Commission.

Please note that the State will be provided information concerning the radiological status of your property for action that they deem appropriate which may include the annotation of land records.

In light of these issues, I request that you reconsider participation in the UMTRA Project. I have enclosed for your signature a Record of Final Decision (Enclosure 3) which would authorize the DOE contractors to access your entire property as necessary to ensure compliance with the EPA standards. I would appreciate your prompt review and execution of the form and return of the same to my office in the enclosed postage-paid pre-addressed envelope.

If you have any questions or concerns regarding the UMTRA Project or your property, please call me at 303/242-8821, Ext. 220.

Sincerely,

[Signature]
R. Eldon Bray
Project Engineer

Enclosures (4):
Enclosure 1 - Record of Contacts
Enclosure 2 - Health Effects
Enclosure 3 - Record of Final Decision
Enclosure 4 - Self-addressed Envelope

cc: w/o enclosures:
C. Little - ORNL
G.A. Franz - CDU

ref: ltr/EB
ENVELOPE 3

RECORD OF FINAL DECISION

LOCATION NO.: GJ-12214
ADDRESS: 2040 Orchard Avenue
Grand Junction, CO

I, ______________________ (property owner), have reconsidered my
decision and choose to participate in the Uranium Mill Tailings Remedial
Action (UMTRA) Project.

DATED: ______________________

I, ______________________ (property owner), am in full
understanding of the UMTRA Project and do not wish to participate.

DATED: ______________________
Appendix 6  Cover Letter for Signed Refusal.

OAK RIDGE NATIONAL LABORATORY
OPERATED BY MARTIN MARIETTA ENERGY SYSTEMS, INC.

GRAND JUNCTION OFFICE
PO BOX 2567
GRAND JUNCTION, COLORADO 81502

Mr. Eldon Bray, Project Officer, CJPO
U.S. Department of Energy
Grand Junction Project Office
P.O. Box 2567
Grand Junction, CO 81502

Dear Mr. Bray:

Record of Contacts with Vicinity Owner - GJ

The Inclusion Survey Contractor has made at least three attempts to secure a signed consent from the owner of subject vicinity property. The owner either has refused to sign a consent approving or denying access, or has not responded to any letters or other attempts to secure a consent. In accordance with provisions set forth in the VPHM, a record of the contact is attached.

This information is being forwarded to the DOE who will make further attempts to secure a signed consent for access from the property owner. If the DOE is successful in obtaining an approved consent, please forward the original to ORNL and we will proceed with the radiological survey.

Sincerely,

Craig A. Little, Ph.D.
Pollutant Assessments Group Leader

Enclosure
Record of Contacts

CDR/eps
CONSENT FOR ACCESS TO CONDUCT SURVEYS AND ENGINEERING STUDIES

VICINITY PROPERTY NO.: GJ00000
PROPERTY ADDRESS: 254 Remedial Road, Grand Junction, CO

PROPERTY PARCEL NUMBER OR DESCRIPTION:

I (We) acknowledge that I (We) own the property described above, and grant permission to employees, contractor and subcontractor personnel, and other representatives of the U.S. Department of Energy and the State of Colorado to enter upon the property at a reasonable time or times during the next 36 months to conduct radiation surveys to determine the nature and extent of any radioactive material that might be present. In addition, permission is given to perform engineering assessments, if necessary, to evaluate the remedial measures that might be taken, as well as to evaluate the extent of the work required and the cost.

I (We) understand that DOE's and the State's responsibility for any damage or disturbance to my (our) property caused by its activities shall be any backfilling, seeding, sodding, landscaping, rebuilding or repair of the property required to restore it to a condition comparable to its apparent physical condition immediately prior to entry upon the property.

I (We) understand that the DOE and the State of Colorado are not obligated to perform remedial action upon the property. I (We) understand that no remedial action shall be performed until the DOE, the State, and the property owner have entered into a separate written agreement setting forth terms, conditions, and plans for remedial action.

I (We) understand that the DOE and the State have the right to disclose to the public, in the form of technical data and reports, the results of its data-gathering on the above-described property.

( ) I grant access for the conduct of surveys and engineering studies as provided in this Consent-for-Access.

Signature of Owner(s) ____________________________ Date ____________

I have decided not to participate in the UMTRA Project.

Signature of Owner(s) ____________________________ Date ____________

OWNER DATA: (PLEASE PRINT CLEARLY) TENANT DATA: (IF APPLICABLE)

NAME: John R. Citizen NAME ____________________________
STREET: 254 Remedial Road HOME PHONE (____) ____________
CITY: Grand Junction, CO BUS. PHONE (____) ____________
STATE:__________ ZIP: 81502
HOMES PHONE: (303) 900-0000 COMMENTS ____________________________
BUS. PHONE: (____) ____________

SIGN AND RETURN WHITE COPY
Appendix 8 Cover Letter for Record of Final Contacts
With Vicinity Property Owner(s).

Eldon Bray, Project Officer, GJPO
U.S. Department of Energy
Grand Junction Project Office
P.O. Box 2567
Grand Junction, CO 81502

Dear Mr. Bray:

Record of Contacts with Vicinity Property Owner - GJ-00683

The Inclusion Survey Contractor has made at least three attempts to secure a signed consent from the owner of subject vicinity property. The owner either has refused to sign a consent approving or denying access, or has not responded to any letters or other attempts to secure a consent. In accordance with provisions set forth in the VPMIP, a record of the contact is attached.

This information is being forwarded to the DOE who will make further attempts to secure a signed consent for access from the property owner. If the DOE is successful in obtaining an approved consent, please forward the original to ORNL and we will proceed with the radiological survey.

Sincerely,

Craig A. Little, Ph.D.
Pollutant Assessments Group Leader

Enclosure
Record of Contacts

CDR/cg
Appendix 9 Record of Final Contacts With Vicinity Property Owner - G.J.

RECORD OF CONTACTS WITH VICINITY PROPERTY OWNER(S)

IDENTIFICATION NO.: _______________________

ADDRESS: __________________________________________

OWNER NAME: _________________________________________

MAILING ADDRESS: ______________________________________

CONTACTS: 

DATE CONSENT MAILED: ________ CERTIFIED [ ] [ ]

DATE CONSENT MAILED: ________ CERTIFIED [ ] [ ]

DATE OF PERSONAL CONTACT: (PHONE)__________ (VISIT)___________

RESPONSE FROM PERSONAL CONTACT: ____________________

NEW OWNER INFORMATION: [ ] [ ]

OWNER NAME: _________________________________________

MAILING ADDRESS: ______________________________________

COMMENTS: ____________________________________________

ON-DUTY: YES [ ] NO [ ]
RESPONSE TO AD OR OWNER REQUEST: YES [ ] NO [ ]
OTHER: ________________________________________________
INTERNAL DISTRIBUTION (GRAND JUNCTION)

1. S. M. Berkoff
2-8. N. G. Conklin
9. T. A. Cronk
10. P. V. Egidi
11. D. B. Ertel
12. M. L. Espegren
13. F. O. Gardner
14. D. K. Halford
15. R. R. Knott
16. N. E. Korte
17. B. J. Krall
18. C. A. Little
19. D. A. Locke
20. D. C. Marty
21. C. A. Muhr
22. D. A. Pickering
23. J. A. Rice
24. S. M. Smuin
25. G. H. Stevens
26. J. E. Thate
27. M. J. Wilson
28. Brown van
29. Red van
30. OCS van
31. Dark-blue extended van
32. Baby-blue extended van
33. U2CRT
34. Blue Cherokee
35. Blue Pickup
36. Big red truck
37. Library Archive Library
38-42. PAG
43. PAG Soils Laboratory

INTERNAL DISTRIBUTION (OAK RIDGE)

44. B. A. Berven
45. L. S. Corrill
46. S. V. Kaye
47. D. C. Landguth
48. P. S. Rohwer
49. R. E. Swaja
50. P. F. Tiner
51. Central Research Library
52-53. Laboratory Records Department
54. Laboratory Records, ORNL-RC
55. ORNL Patent Section

EXTERNAL DISTRIBUTION

57. W. L. Beck, Oak Ridge Associated Universities, P.O. Box 117, Oak Ridge, TN 37831-0117
58. D. E. Brown, Senior Environmental Protection Specialist, Allied-Signal, Inc., 200 E. 95th St., Kansas City, MO 64131
59. T. J. Harvey, Office of Technical Services, H & R Technical Associates, 12800 Middlebrook Rd., Suite 207, Germantown, MD 20874
60. P. Keary, U. S. Department of Energy, Kansas City Area Office, 2000 E. 95th St., Kansas City, MO 64131
62. D. Robertson, HAZWRAP, P.O. Box 2003, Oak Ridge, TN 37831-7606
63. B. Stanley, HAZWRAP, P.O. Box 2003, Oak Ridge, TN 37831-7606
64. M. Wade, HAZWRAP, P.O. Box 2003, Oak Ridge, TN 37831-7606
65-66. Office of Scientific and Technical Information, P.O. Box 62, Oak Ridge, TN 37831