ENERGYSOLUTIONS

June 4, 2012 CD12-0131

Mr. Rusty Lundberg
Director
Utah Division of Radiation Control
195 North 1950 West
P.O. Box 144850
Salt Lake City, UT 84114-4850

Re: 11e.(2) Byproduct Material License Renewal Application #UT 2300478: Response to Completion Review

Dear Mr. Lundberg:

Please find enclosed three copies of an application to renewal Energy*Solutions*' 11e.(2) byproduct material license #UT 2300478, which has been revised to address issues raised in a Completion Review conducted by the Division on 22 May 2012. A summary of the changes made in response to the Completion Review is attached. Electronic copies of the renewal application will be transmitted to the Division via electronic mail separately.

If you have any questions regarding this submittal, please contact me at 801-649-2000.

Sincerely,

Sean McCandless
Director, Compliance and Permitting

enclosures

cc: John Hultquist, DRC (w/ encl.)
Ryan Johnson, DRC (w/ encl.)
Connie Rauen, DRC (w/ enc.)

**ATTACHMENT**

**COMPLETENESS REVIEW**

**RESPONSE SUMMARY**

## 1. LIST OF DOCUMENTS REQUIRED FOR TECHNICAL REVIEW

Copies of the most current versions of these documents (as of the date of this response) have been included in Exhibit A to this Response:

A. CL-AD-PR-021 (Rev. 0)
B. CL-AD-PR-030 (Rev. 3)
C. CL-AD-WI-002 (Rev. 8)
D. CL-BD-WI-001 (Rev. 0)
E. CL-CL-WI-001 (Rev. 2)
F. CL-CL-WI-002 (Rev. 2)
G. CL-CL-WI-003 (Rev. 0)
H. CL-CL-WI-004 (Rev. 0)
I. CL-CL-WI-013 (Rev. 1)
J. CL-CL-WI-015 (Rev. 1)
K. CL-CL-WI-016 (Rev. 0)
L. CL-CL-WI-017 (Rev. 0)
M. CL-EV-WI-001 (Rev. 1)
N. CL-EV-WI-002 (Rev. 0)
O. CL-EV-WI-003 (Rev. 0)
P. CL-IN-PR-001 (Rev. 0)
Q. CL-IN-PR-002 (Rev. 0)
R. CL-IN-PR-003 (Rev. 1)
S. CL-IN-PR-402 (Rev. 0)
T. CL-LC-WI-017 (Rev. 0)
U. CL-CL-WI-003 (Rev. 0)
V. CL-MT-PR-003 (Rev. 0)
W. CL-MT-PR-004 (Rev. 1)
X. CL-CL-WI-003 (Rev. 0)
Y. CL-MT-PR-103 (Rev. 0)
Z. CL-MT-PR-104 (Rev. 0)
AA. CL-MT-PR-105 (Rev. 0)
BB. CL-TS-WI-001 (Rev. 0)
CC. CL-SE-PR-010 (Rev. 5)
DD. CL-SE-PR-020 (Rev. 6)

These documents are copyrighted. Because Energy*Solutions* has not been given license to freely distribute these copyrighted documents, the internet location from where the Division can purchase them has been noted:

A. ASTM D 698 – "Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort)

www.astm.org/Standards/D698.htm

B. ANSI Z88.6-2006 – "Respiratory Protection – Respirator Use – Physical Qualifications for Personnel"

www.webstore.ansi.org/RecordDtail.aspx?sku=ANSI%2FAIHA+Z88.6-2006

The reference to the current organization chart cited on page 1-1 was clarified.

The reference, "DG-80030" has been revised to a more current document, "NRC Regulatory Guidance 8.25"

## 2. LIST OF DOCUMENTS CITED BUT NOT REFERENCED

Information contained in the discussions in Section 2.8.4 (i.e., Endangered and Threatened Species) has been revised and more current references have been used to replace the references noted below:

A. Benton, 1989 pg. 2-38
B. BLM, 2003 pg, 2-38
C. Johnston, 1989 pg 2-38

This citation has been added to the reference list.

A. DOE, 1992 pg. 7-7 – Reference added

This citation has been corrected.

A. MSI, 2012 (corrected from MSC 2012).

This reference is unnecessary and has been removed.

A. Ekins, 1989 pg 2-37 – Removed as unnecessary since site personnel have recorded observations of pronghorn.

## 3. CORRECTION OF SECTION 5.7.2

Section 5.7.2 has been re-titled and revised as directed.

## 4. REFERENCE CITED ON PAGE 3-3

In 1990, NRC published its Final Staff Technical Position (FSTP), "Design of Erosion Protection Covers for Stabilization of Uranium Mill Tailings Sites." This FSTP provided criteria for the design of soil and rock covers to be used at uranium mill tailings sites. Following several public comment periods and additional investigation, NRC updated its FSTP and provided design guidance based, "on the best technical approaches currently available for long-term stabilization for a period of 200 to 1,000 years," in NUREG-1623. The reference on page 3-3 has been changed to the more current NRC guidance (e.g., NUREG-1623).

**EXHIBIT A**

**REQUESTED PROCEDURES**

# PROCEDURE PREPARATION GUIDELINES

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## 1. GENERAL

### PAGE SETUP

**Margins** (File → Page Setup → Margins)

| | |
|---|---|
| Top | 1" |
| Bottom | 1" |
| Left | 1" |
| Right | 1" |
| Gutter | 0" |
| Gutter Position | Left |
| Apply to | Whole Document |

**Paper** (File → Page Setup → Paper)
As a general rule, keep this set for the default tray.

**Layout** (File → Page Setup → Layout)
Headers and footers:
Do not check either box (Neither *Different odd and even* nor *Different first page*)
Header .5"
Footer .25"

---

### FORMAT

**Alignment & Line Spacing** (Format → Paragraph → Indents and Spacing)
Alignment: Left alignment
Spacing: Single line spacing

**Tabs** (Format → Tabs)
Tabs: The default tab settings are: Tab Stops = 0.5"; Alignment = Left; Leader = None

**Font & Pitch** (Format → Font → )
Font: Times New Roman; Size: 12

**Note: The body of the text of the procedure is Times New Roman 12. Font sizes on the title page are set differently, as depicted on the form on the intraweb (Document number: Times New Roman 14-Bold; Title: Times New Roman 24-Bold; and Revision: Times New Roman 14-Bold).**

**Note: In attachments, the font size is at your discretion.**

---

## HEADERS & FOOTERS

The header and footer begin on the Table of Contents page run throughout the document (there is no Header/Footer on the Title Page).

### Header

The header includes the document number, title (which you may shorten or summarize in the header), and revision as displayed below:

**XX-XX-XX-###**

**Title** **Revision #**

Header Formatting:

1. Font - Times New Roman 12, Bold
2. 1st line - Document number is right aligned.
3. 2nd line - Title is left aligned and the revision uses a right alignment tab (set at 6.5").
4. 1 return after the title and revision
5. Solid line border (1½ pt) below the 2nd line of header (Place cursor on the 2nd line of header and click on Format → Borders & Shading → Borders → Setting: None → Style: single solid line → Color: Automatic → Width: 1½ pt → Preview: click on icon for bottom line → Apply to: Paragraph → OK)

### Footer

The footer begins on page two (Table of Contents) and includes the Page #, total number of pages, and Proprietary Information (if applicable), as displayed below:

Proprietary Information Page 2 of 18

Footer Formatting:

1. Right tab set at 6.5"
2. Font - Times New Roman 12, Regular
3. 3 pt space above the footer text
   (Format → Paragraph → Indents & Spacing → Before: 3 pt)
4. Solid line border (1½ pt) above
   (Format → Borders & Shading → Borders → Setting: None → Style: single solid line → Color: Automatic → Width: 1½ pt → Preview: click on icon for upper line → Apply to: Paragraph → OK)

**Note: Using section breaks between the title page, table of contents,.the body of the procedure, and the attachments allows you to manipulate the headers and footers: on the title page there are none; on subsequent pages there are.**

**Note: If you have problems with headers/footers not connecting to the previous, check your page setup (File → Page Setup → Layout → Headers and Footers → Neither choice should be checked).**

---

## PARAGRAPHS AND SUBPARAGRAPHS

| | |
|---|---|
| 1st Level Headings: | Upper case - Bold |
| 2nd Level Headings: | Title case - Bold |

Example:

1. **PURPOSE AND SCOPE**

   1.1 **Purpose**

---

## REFERENCES

The reference section should include the document identifier and title. For example:
ES-AD-PR-001, Document Preparation

---

## NOTES, CAUTIONS, AND WARNINGS

Align notes, cautions, and warnings with the text of the previous paragraph (not the section number). Bold type, sentence case, and use a hanging indent.

---

## MISCELLANEOUS TIPS

1. Do clean-up work before turning on the Track Changes feature.
   For example, changing the revision level on the title page and headers.
   Reason: All new keystrokes will be marked with a revision line when the Track Changes is turned on.

2. Do not use the tab or spacebar to indent lines of text;

3. Refrain from using automatic numbering.
   Reason: If only one person (who is skilled in auto numbering) will be working in a document there's no problem with automatic numbering. However, if multiple individuals have edited the document, it is likely to contain both auto numbering and hard numbering, which usually results in errors.

4. Do not using paragraph returns or page breaks to shift text to the next page. Instead, use "keep with next" (Format → Paragraph → Line and Page Breaks → Keep with next).

5. Always make sure that paragraphs and subparagraphs, references, notes and cautions, etc. are set up properly from the start:

## 2. COVER PAGE

### FORM

The Energy*Solutions* document approval page must be used. It is available on the Intraweb (Forms → ESHQA → Procedure Set-Up) for your convenience.

This cover page is in table format. The pitch for the different lines is already set. Just fill in the necessary information as you would on any table.

### DOCUMENT NUMBER

Upper Case – Bold – Times New Roman 14

### DOCUMENT TITLE

Title Case – Bold – Center – Times New Roman 24

Include the following proprietary statement (bold type) above the title, when applicable:

**Proprietary Information: This document contains proprietary information and is not to be released or copied without the permission of Energy*Solutions*.**

### REVISION LEVEL

Revision 0 or next sequential number for that document
Title Case – Bold – Right Alignment – Times New Roman 14

### SIGNATURE BLOCKS

Insert the author, reviewer, and approver name and title in the space provided.

### STATUS BLOCK

Mark the appropriate block
☐ New; ☐ Title Change; ☐ Revision; ☐ Rewrite; or ☐ Cancellation

### EFFECTIVE DATE

Insert the effective date of the procedure.

### CAUTIONARY NOTE

The following cautionary note must be imbedded on the bottom of the title page:
"Electronic documents, once printed, are uncontrolled and may become outdated. Refer to the intraweb or the Document Control authority for the correct revision."
Format: Times New Roman 9 - Sentence Case - Regular - Center

### END OF TITLE PAGE

Insert a section break: Insert → Break → Section break → Next page → OK
USE A SECTION BREAK, NOT A PAGE BREAK.

## 3. TABLE OF CONTENTS

### Table of Contents Text

The title (Table of Contents) should be centered – Bold Type - Title Case.

Headings (Section & Page): "Section" should be left aligned and "Page" should be right alignment tab (set at 6.5") – Bold type. See the example below:

**Table of Contents**

**Section** **Page**

**Note: Do not type the table of contents in manually. It will be generated/re-generated after inputting the text. The following page gives additional information/detailed directions on creating the table of contents.**

At the end of the table of contents information, insert a section break
(Insert → Break → Section break types → Next page)

**Additional Information – Table of Contents Directions**

There are 3 steps to making an automatic Table of Contents: (1) marking entries; (2) inserting the Table of Contents; and (3) updating the Table of Contents.

1. Marking Entries:

   To create a table of contents using table entry fields:

   Select the information that you want to appear in the table of contents.

   Press Alt-Shift-O (as in octopus).

   In the dialog box, Entry = what you want to appear in the table of contents;
   Table Identifier: C (table of contents); Level: level in the table of contents (Level 1 for 1.0, 2.0, etc.; Level 2 for 1.1, 1.2, 2.1, etc.).

   Click on Mark.

   Click on Close.

   Continue through the document marking headings for the Table of Contents until you reach the end.

2. Inserting the Table of Contents:

   Go to the Table of Contents page and position the insertion point on an empty line below the "Section" and "Page" line.

   Turn off "Track Changes" and turn off the show/hide icon (¶) on the toolbar.

   Click on the following: Insert → Reference → Index and Tables → Table of Contents

   Select the following:

   Show Page Numbers
   Right Align Page Numbers
   Tab Leader = ... (dot leader)
   Format = From Template
   Show Levels = 2

   Options: Select table entry fields (deselect styles) → OK

   Click on Modify (to set formatting of the Table of Contents entries)

   Select TOC 1 → Modify
   Format → Font
   Font: Times New Roman → Font Style: Regular; Size → 12 →
   Font Color: Automatic → Underline Style: None → Effects: All Caps → OK
   Format → Paragraph →Alignment: Left → Indentation: Left 0; Right 0 →
   Special: Hanging by 0.5" → Spacing: Before 6 pt; After 6 pt; → Line Spacing at: Single →
   Tabs → Tab Stop Position: 6.5"→ Alignment: Right → Leader: ... → Set → OK → OK

To modify the second level (TOC 2):

Select TOC2 → Modify

Format → Font

Font: Times New Roman → Font Style: Regular → Size: 12 → Font Color: Automatic → Underline Style: None → Effects: No selection needed

Format → Paragraph → Alignment: Left → Indentation: Left 0.5"; Right 0 → Special: Hanging by 0.5" → Spacing: Before 3 pt; After 3 pt → Line Spacing at: Single → Tabs → Tab Stop Position: 1" → Alignment: Left → Leader: None → Set → Tab Stop Position: 6.5" → Alignment: Right → Leader 2: ... → Set →OK → OK → OK → OK

The Table of Contents will be inserted after you click on the final OK to close out of the Index and Tables drop down box.

3. Updating the Table of Contents

After revising a document, you can update the table of contents:

Turn off "Track Changes"

Turn off the show/hide icon (¶) on the toolbar

Position the insertion point in the table of contents → Press F9 → Update Entire Table → OK

## 4. TYPICAL SECTIONS FOR DOCUMENTS

### Title Page – Cover Sheet

A title page shall be used as a cover sheet on documents. This page includes the following information:

Document identifier/number

Document title — A brief functional description of the procedure including (if applicable) the equipment or facility to which the document applies

Revision level

Signature block — Signatures of the author, reviewer, and approver (the names and titles are typed in the space provided below the signature line)

Status block — Denotes new, title change, revision, rewrite, or cancellation

Effective date

Cautionary Note — "Electronic documents, once printed, are uncontrolled and may become outdated. Refer to the intraweb or the Document Control authority for the correct revision."

All pages following the cover page shows the page numbering counting from the cover page (the Table of Contents page begins as Page 2 of __).

### Table of Contents

The table of contents contains titles of all sections, first level subsections, and attachments with page numbers where each starts.

### Purpose and Scope

This section states the function of the document in sufficient detail for anyone using it to understand its purpose and scope. Separate subsections may be used in this section to provide additional information or data.

### References

This section lists all drawings, technical manuals, standards, or other reference materials which are referenced in the text of the document (e.g. CFR, procedures, ANSI standards, etc.). All references will list the document number and complete title.

**General**

Discussion (Overview) — May be useful to convey reasons and objectives.

Definitions — Define uncommon terms.

Responsibilities — Define the levels of responsibility.

Precautions and Limitations — This section lists and references regulatory rules and procedures and precautions that apply to the document. Precautions and limits also appear at appropriate points in the detailed section.

Records — This section references documents required by the procedure (discusses the applicable distribution, routing for review after completion, and filing of those referenced documents). Any notification requirements with time limits shall be included in this section. Any document which requires the generation of quality assurance records shall either reference the applicable procedure to collect, retain, and maintain the record or note this information regarding quality assurance records.

**Procedure** (optional section titles are permitted)

This section prescribes the work activity. It is subdivided to best communicate the activity.

Prerequisites — This section lists those items that shall be accomplished prior to commencing the described operation.

General Requirements — Useful for "get-to-the-point" prescriptive operational and administrative documents.

Detailed Process of Steps — This section contains a concise description of actions required of personnel or other persons engaged by or for Duratek. Actions requiring several steps will be presented in a sequential or chronological order. When the document addresses the duties and responsibilities of more than one person, the text of this section will clearly delineate those of each person.

**Attachments and Forms**

Attachments are used when supplemental information or technical data is necessary. Forms, graphics, tables, checklists, logs, organization charts, process flow diagrams, drawings, etc. should be in an attachment (to ensure correct procedural interpretation, such figures may be included within the text as an option).

## 5. ATTACHMENTS

Identify each attachment with a number and title (i.e., Attachment 1, Energy*Solutions* Document Hierarchy). Use title case and bold type. For example:

**Attachment 1**
**Duratek Document Hierarchy - Guidance**

## 6. DOCUMENT REVISIONS: TRACKING CHANGES

Begin working with the current approved revision of the procedure (check with Document Control for the electronic file).

**Caution: All new keystrokes are marked with a revision line, so do as much clean up work as you can before turning on the revision lines.**

### Cover Sheet Revisions

Be sure to turn off the Mark Revisions While Editing before making changes to the cover sheet and header.

**Note: Revision marks should not appear on the cover sheet or in the header/footer area of the document.**

### Removing Previous Revision Marks

Revision lines used to note previous revisions should be removed before you begin making any changes. Delete revision lines: Tools→Track Changes→Accept All Changes in Document

**Note: Microsoft Word 2003 is different in that Tools→Track Changes opens the Reviewing toolbar for your options in tracking your changes.**

### Make Changes Showing Revision Lines

Revisions are noted with a vertical line in the right hand margin. To set up the revision lines, follow these steps...

Tools → Track Changes to access the toolbar

On the toolbar: Show/Options/ Markup/Changed lines - right border

Markup →Insertions - bold & blue

Deletions - strikethrough & red

Turn off "use balloons"

Turn on "Track Changes" on the toolbar

OK

**Turning Revision Lines Off**

The revision marks may be toggled off and on...the program remembers all revisions made and will not remove any markings until you accept or reject them.

**Note: Be sure to turn off the Track Changes when generating the final Table of Contents.**

## 7. FINALIZING THE DOCUMENT & TRANSMITTING IT TO DOCUMENT CONTROL

Before printing out the final copy for review/approval, be sure to hide strikethrough lines (Tools → Options → Track Changes → Markup → Insertions → select None → Color: Auto → Deletions → Mark: Hidden → Color: Auto → OK)

The final approved document is given to Document Control in electronic and paper format, along with the document summary form (from ES-AD-PR-001), for distribution. The form is available on the intraweb in Word format [Click on Forms → ESHQA → Document Summary Form (ES-AD-PR-001) ].

When issuance of a controlled paper copy is required, please include the proper mailing information (name & title, company, address, and phone number) for each individual. No controlled paper copies will be issued without this notification.

## 8. CHECKLIST FOR PROCEDURE FORMATTING

| | |
|---|---|
| Cover Page | Use standard form |
| Use Section Breaks | Rather than hard page breaks to separate title page, table of contents, body of text, and attachments |
| Page Set-Up | Top/Bottom, Left/Right Margins = 1"<br>Header = @ .5<br>Footer = @ .25 |
| Headers/Footers | 12 Times New Roman, bold<br>Borders: $1^1/_2$ width<br>Header 2nd line: After 3<br>Footer: Before 3 |
| Table of Contents | Generally use the standard contents:<br><br>1. PURPOSE AND SCOPE<br>1.1 Purpose<br>1.2 Scope<br>2. REFERENCES<br>3. GENERAL<br>3.1 Definitions<br>3.2 Responsibilities<br>3.3 Precautions and Limitations<br>3.4 Records<br>4. REQUIREMENTS AND GUIDANCE<br>5. ATTACHMENTS AND FORMS |
| Duratek | Use "search" to make sure all instances of "Duratek" have been changed to Energy*Solutions* |
| References | Check references to make sure any additions/deletions to text did not change numbering of references |
| General Formatting | Font - Times New Roman, 12 (not condensed)<br>Left justified<br>Standardize - numbering should be manual (auto numbering is good in theory but when more than one person works with a document this can cause problems). |
| Section 3 | Definition terms italicized<br>Definitions should be alphabetical order |
| Section Numbering | Check to see that it is sequential<br>Make sure there is not a mixture of auto and hard numbering<br>All subparagraph 1's should have a subparagraph 2 (1.1, 1.2, etc.) |

| | |
|---|---|
| Orphan Lines | Have widow/orphan turned on<br>Use "keep with next" rather than returns and hard page breaks<br>View in Print Preview to make sure you don't have lines splitting across pages that should be kept together. |
| Notes, Cautions | Bold, sentence case |
| Text Alignment | Left, not justified |
| Final Spell Check | |
| Update Table Of Contents | Turn off Show/Hide (¶). If you don't, it will not update the page numbers correctly. |
| Page Numbers | Sequential order (Page __ of __) |
| Document Summary Form | Use proper form & send along with the approved procedure and electronic procedure file to Document Control for processing. |

# QADEP for Technical Services

**Revision 0**

| | | |
|---|---|---|
| Authored By: | Signature on File<br>Veronica Pitts, Project Coordinator | 6/10/09<br>Date |
| Reviewed By: | Signature on File<br>Adam Jones, Technical Service Manager | 6/10/09<br>Date |
| Approved By: | Signature on File<br>Jeffery Ginsburg, Director of Technical Service | 6/10/09<br>Date |

☒ New
☐ Title Change
☐ Revision
☐ Rewrite

Effective Date: 6/12/09

Electronic documents, once printed, are uncontrolled and may become outdated.
Refer to the intraweb or the document control authority for the current revision.

## Table of Contents

**Section** **Page**

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**1.2. Scope....3**

**2. REFERENCES....3**

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# 1. PURPOSE AND SCOPE

## 1.1. Purpose

This QA Data Entry Plan (QADEP) details the fields in EWIS that Technical Services department will enter data and the document source which will be used.

## 1.2. Scope

To outline the EWIS data fields and documents used to enter data by the Technical Services Department.

# 2. REFERENCES

2.1 ES-QA-PR-005, Records

# 3. GENERAL

## 3.1. Definitions

3.1.1 Radioactive Waste Profile Record (EC-230), One or more completed waste profile forms and supporting documentation that are used to describe a waste stream.

3.1.2 Radioactive Waste Profile evaluation Forms, EC-0025 (Physical Evaluation), EC-325 (Non RCRA evaluation), EC-1575 (RCRA waste evaluation form), EC-0675 (Radiological Evaluation). Forms used by Energy*Solutions* Designated Corporate Authorities to document acceptability of the waste.

3.1.3 Notice to Transport (EC-1800), form used to notify generator that the waste profile has been approved and they are authorized to ship waste to the Energy*Solutions* Clive Disposal Facility.

## 3.2. Responsibilities

3.2.1 The Director will ensure that employees in the Technical Service Department will be trained and qualified to enter information into the EWIS data base. After the employee is trained the Director will sign into the APPS system and approve EWIS access.

3.2.2 Technical Service Manager will be authorized to enter and QA data into EWIS.

3.2.3 Project Coordinator will be authorized to enter and QA data into EWIS.

## 3.3. Precautions and Limitations

3.3.1 Generator information will be entered into the EWIS database based on the Waste Profile Record (WPR) and the Notice to Transport (NTT).

3.3.2 Data modifications will be entered in the waste profile fields as required by revisions submitted by the generator and approved by the Designated Corporate Authority.

3.3.3 All team members of the Technical Service Department will be trained and authorized to enter data into EWIS. This will allow data to be entered and

Quality Assurance to continue in the event one of the team members is out of the office for a number of consecutive days.

3.4. **Document Control and Records**

3.4.1 Records generated as a result of this instruction will be maintained in accordance with ES-QA-PR-005, Records.

## 4. REQUIREMENTS AND GUIDANCE

4.1 The Director of Technical Services, Technical Service Manager or Technical Service Project Coordinator enters or verifies the appropriate information into EWIS. If the Technical Service Manager or the Director of Technical Service enters data from the Waste Profile Record the profile is given to the Project Coordinator to QA the data input. If the Project Coordinator enters the information into EWIS the profile is given to the Technical Service Manager to QA the data entry. QA will be documented on the Profile Process spread sheet (Attachment 5.1) by initialing the form next to each data field verified.

4.2 On the WASTE STREAM TAB of EWIS, enter or verify entry of the following information,

- Enter the Waste Stream Number assigned by Business Development (BD)
- Enter the Waste Stream Description
  **Note: From the corresponding line on the waste profile record.**
- Enter the Primary Waste Type
  **Note: Select the type which fully describes the waste.**
- Enter the Secondary Waste Type
  **Note: Use this block to annotate if the material is DOE.**
- Enter the Disposal Cell
  - Class A for material which is not RCRA regulated and is not PCB remediation waste over 50 ppm;
  - MW for material which is, or has been RCRA regulated, contains certain PCB material or is a liquid waste;
  - 11e(2) for 11e(2) material.
- Enter Primary and Secondary Treatment types as indicated on the EC-0025 form or the EC-1575 form.
- Enter the Waste Kind
  **Note: Select the kind which fully describes the waste.**
- Enter the Waste Form
- Enter the State of Origin
- Enter the License
- Enter the Generator type

4.3 On the WS RADIOLOGICS TAB of EWIS enter or verify entry of the following information:

- Enter the isotopes and the associated concentration ranges for the isotope listed in the profile.
  **Note: Daughters as identified in the license do not need to be entered.**

- Click on the "Radionuclides" button.
- Select the nuclide and click on the "OK" button
- Enter a 0 for the low range.
- Enter the high range value, minimum of 10 pCi/gm

4.4 On the WS RECEIPT TAB of EWIS enter or verify entry of the EPA ID # from the waste profile record.

4.5 On the WS PROFILE TAB of EWIS enter or verify entry of the following information:

- Enter the Date the EC-230 was signed
- Enter the waste profile revision number
- Enter the approval date in the CORP RSO text box
- Enter the approval date in the CORP EE text box
- Enter the approval date in the Dir of Ops text box
- Enter comments form the approved Evaluation forms in the Waste Stream Profile Note txt box

**Note: When contractual issues and delivery orders are resolved the BD Representative will inform Technical Services that the Notice To Transport (NTT) can be issued.**

- If the waste is subject to Land Disposal Restrictions, check the LDR option

4.6 On the WS WASTECODES TAB of EWIS enter or verify entry of the following information:

- Click on the "Hazardous Waste Code" button
- Select the code and click on the "OK" button
- Enter the Underlying Hazardous Constituents
- Click on the "Underlying Hazardous Constituents" button
- Select the constituent and click on the "OK" button

**Note: If any problems are encountered while entering information into EWIS, such as isotopes above the license limits, this is noted on the review form and the problem reported to the Director of Health Physics (DHP). The DHP will send an email to IT Help desk to make the changes in EWIS. Once the changes have been made IT will send an email to DHP and Technical Service Project Coordinator and data input will continue.**

4.7 Technical Services will verify:

- Energy*Solutions* has a signed copy of the profile being accepted.
- All required reviews are completed.
- Business Development authorizes NTT
- EWIS data fields against the approved waste profile records and approval forms

4.8 On the WS PROFILE TAB OF EWIS:

- Enter date the NTT was signed and approved by either the Director of Technical Service or the Technical Service Manager in the NTT text box

4.9 The Project Coordinator will run a Notice to Transport issued report on a monthly basis listing all NTT's issued in the month. A random pick of 10% of the NTT's that were issued will be pulled for surveillance purposes.

ATTACHMENTS

5.1 Example Profile Process Form

5.1 **Example Profile Process Form**

# Profile Process

**Input Process:** ☐ **Data Base update** ☒ **EWIS update** ☐ **Issue NTT**

☐ **Scan** ☐ **EWIS verification** ☐ **On Base QA**

**Inspector:** **Inspection Date:**

**Generator/WS #:** **Revision #:**

*Prior to issuing the Notice to Transport, the Technical Service Manager shall initial each line in the "Waste Stream" section below to verify that the information in EWIS and on the Notice to Transport is accurate. The Project Coordinator shall ensure that this form is completed and included with the waste profile record.

| *Waste Streams | **Initial** | YES | NO | NA |
|---|---|---|---|---|
| | **Waste Stream ID** | ☐ | ☐ | ☐ |
| | **Waste Stream Description** | ☐ | ☐ | ☐ |
| | **Waste Type (Primary)** | ☐ | ☐ | ☐ |
| | **Waste Type (Secondary)** | ☐ | ☐ | ☐ |
| | **Disposal Cell** | ☐ | ☐ | ☐ |
| | **Treatment Type** | ☐ | ☐ | ☐ |
| | **Waste Kind** | ☐ | ☐ | ☐ |
| | **Waste Form (Verify liquid or non-liquid in EWIS, Notice to Transport, evaluation forms, and profile documentation)** ☐ **Liquid** ☐ **Solid** | ☐ | ☐ | ☐ |
| | **State Of Origin** | ☐ | ☐ | ☐ |
| | **Generator Type** | ☐ | ☐ | ☐ |
| | **License** | ☐ | ☐ | ☐ |
| | **Special Handling** | ☐ | ☐ | ☐ |
| WS Radiologics | **Isotopes match C.1 (last revision)** ☐ **See notes below** | ☐ | ☐ | ☐ |
| | **Isotope limit agrees with C.1 ( Last Revision)** ☐ **See notes below** | ☐ | ☐ | ☐ |
| WS Receipt | **EPA Id Number matches Waste Profile Record** | ☐ | ☐ | ☐ |

## 5.1 Example Profile Process Form (Continued)

| | | | | |
|---|---|---|---|---|
| WS Profile | **EC 230 date received (or date of revision)** | ☐ | ☐ | ☐ |
| | **WPREV #** | ☐ | ☐ | ☐ |
| | **Corp RSO ( date signed)** | ☐ | ☐ | ☐ |
| | **Corp EE (date signed)** | ☐ | ☐ | ☐ |
| | **Dir. Of Ops (date signed)** | ☐ | ☐ | ☐ |
| | ☐**LDR** ☐**Non LDR checked** | ☐ | ☐ | ☐ |
| | **Notice to Transport date matches the date NTT issued** | ☐ | ☐ | ☐ |
| | **Comments match comments on the evaluation sheets** | ☐ | ☐ | ☐ |
| WS Wastecodes | **Hazardous Waste Code matches what is listed on EC-230 or attachment** | ☐ | ☐ | ☐ |

**Note: Use this area to document any discrepancy found.**

**Comments:** _____

_____

_____

ENERGYSOLUTIONS

**CL-SE-PR-020**

# Issuing Badges to Visitors

**Revision 6**

| | | |
|---|---|---|
| Authored By: | Signature on File<br>Theron Taylor, Chief of Clive Security | 1/28/11<br>Date |
| Reviewed By: | Signature on File<br>Curtis Kirk, Quality Assurance Manager | 1/28/11<br>Date |
| Approved By | Signature on File<br>Richard A Chalk, Director Health Physics | 1/28/11<br>Date |
| Approved By | Signature on File<br>Jeff Gardner, Vice President of Clive | 1/28/11<br>Date |

- [ ] New
- [ ] Title Change
- [x] Revision
- [ ] Rewrite
- [ ] Cancellation

Effective Date 1/28/11

Electronic documents, once printed, are uncontrolled and may become outdated.
Refer to the intraweb or the document control authority for the current revision.

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**1.2. Scope....3**

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# 1. PURPOSE AND SCOPE

## 1.1. Purpose

This procedure defines the issuing of access badges to regulators, general visitors, truck drivers, contractors, and employees designated as escorts.

## 1.2. Scope

This procedure applies to all individuals requiring general access to the Clive Facility Controlled Area or limited access to the Restricted Area.

# 2. REFERENCES

2.1. ES-QA-PR-005, Records

2.2. Radioactive Material License, UT2300249

2.3. 11e(2) Materials License, UT2300478

2.4. CL-TN-PR-080, Trained Personnel Badging Procedure

2.5. CL-SE-PR-020-F1, Safety View for Visitors

2.6. CL-SE-PR-020-F2, Visitor Log

2.7. CL-SE-PR-020-F3, Authorization for Badge

2.8. CL-SE-PR-020-F4, Visitor/Truck Driver Escort Tracking

2.9. CL-RS-PR-120, Access Control

# 3. GENERAL

## 3.1. Definitions

3.1.1. *Employee ID Badge* - This is issued to employees and contractors to log entry to the Clive Site at the Administration Building and to access regulated buildings throughout the Clive Site.

3.1.2. *Controlled Areas* – For the purpose of this procedure the Controlled Area is all the Energy*Solutions* Property at the Clive Site that is outside a restricted area but inside the site boundary and to which Energy*Solutions* can limit access for any reason by use of badges, fences, gates and/or signs.

3.1.3. *Restricted Areas* – These are the areas within the Energy*Solutions* Controlled Area that requires control of access and occupancy for radiation protection purposes. The Restricted Area boundary is posted "Caution, Radioactive Material" and is bordered by a six (6) foot high fence as defined by Radioactive Materials License UT2300249 and UT2300478, except in buildings where a lockable door or other device to prevent unauthorized or inadvertent entry is present.

3.1.4. *Visitor* - For the purpose of this procedure, this is any individual whose restricted area activities are limited to communicating with personnel, observing and/or inspecting operations, facilities, and/or compliance at the

site and who has not been otherwise badged per reference 2.4 Trained Personnel Badging Procedure.

3.1.5. *Contractor* - For the purpose of this procedure, this is any non-employee who enters the Clive Site to perform work.

3.1.6. *Non USA Citizen* - This is any visitor or contractor that is not a citizen of the United States of America.

3.1.7. *Visitor Badges* -

**RED** - Any Non-USA Citizen – Limited Access. Escort required. Current employees refer to the note after 4.1

**YELLOW** - Regulator – Restricted Area access authorized w/o escort;

**TAN** - Unescorted Visitors and Unescorted Contractors – No Restricted Area access authorized;

**PURPLE** - General USA Citizen Visitor entering the Restricted Area. Escort required. Current employees refer to the note after 4.1;

**GRAY** - USA Citizen Truck Drivers delivering waste or picking up empty containers;

**LIGHT GREEN** - Escort (issued to an existing employee or contractor).

3.1.8. *Access Denial* - This could occur for one or more of the following reasons:

- Not able to produce a valid government issued photo ID;
- Violation of the Site Security Plan;
- Compliance violation.

3.1.9. *Escort* - This is any trained Energy*Solutions* or contractor employee designated to escort and directly observe the activities of Red, Purple, or Gray Badge wearers within the Restricted Area to prevent a violation of their level of access in accordance with reference 2.7.

3.1.10. *Escort Required Badges* - These are Restricted Area Access badges which involve NO classroom training:

**Purple** Badges (general visitor) are for individuals such as employees without Dosimetry or badges, or any other individual requiring an escort when inside the Restricted Area.

**Purple** Badges are designated for Escorted USA Citizen Visitors (trainees, observers, consultants, trainers, etc.) visiting within the Restricted Area.

**Purple** Badges are designated for Escorted USA Citizen Contractors working within the Restricted Area as **Temporary Rad Workers**.

**Red** Badges are for Non-USA Citizens.

**Note: Temporary Radiological Workers must be escorted, logged in on CL-RS-PR 120-F1 and comply with the visitor restrictions specified in CL-RS-PR-120 Access Control.**

3.1.11. *Non-Escorted, Non-Trained Badges* - This badge requires no classroom training but does require the same process for the initial badge issue as the Red badges:

**Regulator Yellow** Badge is for any employee or representative of a federal or state agency with regulatory power over the license and permits of Energy*Solutions*. These individuals are authorized to enter the Restricted Area for the purpose of observation only.

**Tan** Badge is designated for Unescorted USA Citizen Visitors (trainees, non-waste delivery personnel, etc.) and Unescorted USA Citizen Contractors not working within the Restricted Area.

**Gray** Badge is for Truck Drivers delivering Radioactive Waste or picking up waste containers.

3.1.12. *SO* - Energy*Solutions* Clive Utah Site qualified security guard.

3.1.13. *Safety View for Visitors* – A dynamic document that contains a site map and important information for the safety of visitors to the Clive Site. This document shall be revised as necessary and issued to first time visitors as needed.

## 3.2. Responsibilities

3.2.1. All Visitors and Contractors are responsible to comply with this procedure.

3.2.2. Contractor employees acting as escorts shall comply with Escort responsibilities.

3.2.3. Escort- The assigned escort is responsible for ensuring that all visitors comply with all security, safety and radiological requirements and are signed in accordance with CL-RS-PR-120, Access Control.

## 3.3. Precautions and Limitations

None

## 3.4. Permanent Records Protocol

3.4.1. SO's shall document all visitors on the CL-SE-PR-020-F2, Visitor Log, reference 2.6, and forward to the Security Supervisor at the end of each

shift for review and filing. These shall be transmitted to Document Control monthly for permanent records.

3.4.2. SO's shall document all first time visitors on the CL-SE-PR-020-F3, Authorization for Badge, reference 2.7, and forward to the Security Supervisor at the end of each shift for review and filing. These shall be transmitted to Document Control monthly for permanent records.

3.4.3. SO's shall issue to the escort for visitors and/or Temp Rad Workers, a CL-SE-PR-020-F4, Visitor/Truck Driver Escort Tracking, reference 2.8 Upon completion and return by the escort, it shall be forwarded to the Security Supervisor at the end of each shift for review and filing. These shall be transmitted to Document Control monthly for permanent records.

## 4. REQUIREMENTS AND GUIDANCE

### 4.1. General

4.1.1. The chart following identifies Controlled Area or Restricted Area access for which no Energy*Solutions* training is required.

| Job/Badge Class | Location | Requirements | Badge Color |
|---|---|---|---|
| Truck Driver/USA Citizen | SITE | Refer to Section 4.2 | Gray** |
| Non-USA Citizen | SITE | Refer to Section 4.2 | Red** |
| Regulator/Observer | SITE | Refer to Section 4.3 | Yellow |
| Unescorted USA Citizen Contractor/Visitor | SITE | Refer to Section 4.4 | Tan |
| USA Citizen Escorted Contractor/Visitor | SITE | Refer to Section 4.2 | Purple** |
| Escort | SITE | Refer to Section 4.2 | Light Green* |

**indicates that an escort is required before the individual is authorized to move around the facility.
* indicates this is the badge for the designated escort for the "**" badges.

**Note: No individual with a currently assigned Dosimetry device shall receive a Visitor Badge unless authorized by the Director of Health Physics.**

4.1.2. Documents shall be forwarded to Document Control in accordance with reference 2.1, Quality Assurance Records.

### 4.2. Escorted/Restricted Badges – Red, Purple and Gray

4.2.1. Security Personnel shall ensure that:

4.2.1.1 Visitors read the current revision of reference 2.5, Safety View for Visitors (first time);

4.2.1.2 Their signature on reference 2.6, Visitor Log, affirms their obligation to comply with all requirements;

4.2.1.3 Visitors sign reference 2.7, Authorization for Badge for Visitors, after receiving their badge (first time);

4.2.1.4 The Escort reads and signs reference 2.8, Visitor/Truck Driver Escort Tracking Form, after receiving a numbered Light Green Escort Badge;

4.2.1.5 Visitors (or Escort) shall return their badge and completed reference 2.8, Visitor/Truck Driver Escort Tracking Form, to the Security Office upon completion of the Restricted Area entry.

**Note: The Visitor/Truck Driver Escort Tracking form is kept by the escort and with escorted Visitors. Truck drivers entering the Non-Contaminated Restricted Area shall be escorted and under observation while in those areas. Another Employee may assume escort responsibility by signing the CL-SE-PR-020-F4 in the appropriate location.**

4.2.2. The Director of Health Physics or designee must authorize Restricted Area access.

**Note: The Director of Health Physics and the individual's Manager may waive the requirement that an assigned TLD or equivalent be worn to obtain record dose for the individual.**

4.3. **Non-Escorted Restricted Badges - Regulator Yellow Badge:**

4.3.1. Security Personnel shall ensure that:

4.3.1.1 As a state and federal licensee/permitted, Energy*Solutions* shall, as a courtesy:

4.3.1.1.1 Verify the identification of the individual;

4.3.1.1.2 Request that the individual acknowledge receipt, understanding and intent to comply with Safety View for Visitors by their signature on their first visit;

4.3.1.1.3 The individual shall then sign for receipt of the badge on the Authorization for Badge for Visitors (reference 2.7) on their first visit;

4.3.1.1.4 Security personnel shall issue the individual their Yellow Photo-ID badge upon signing in on the Visitor Log (Reference 2.6);

4.3.1.2 The individual receiving the badge shall return the badge to the Security office at the completion of the visit.

4.4. **Unescorted Visitors and Contractors -Tan Badges:**

4.4.1. Security Personnel shall ensure that:

4.4.1.1 Security personnel shall:

4.4.1.1.1 Verify the government issued identification of the individual;

4.4.1.1.2 Request that the individual acknowledge receipt, understanding and intent to comply with Safety View for Visitors (first time) by signing the form;

4.4.1.1.3 Require a signature on reference 2.7, Authorization for Badge, (first time);

4.4.1.1.4 Issue the individual the badge upon signing in on the Visitor Log (reference 2.6).

4.4.1.2 The individual receiving the badge shall return the badge to the Security office at the completion of the visit.

4.5. **Energy*Solutions* Clive Site Property outside the Controlled Areas:**

4.5.1. Visitors without escorts are allowed to visit areas outside the Controlled Areas, I.E. Warehouse, Maintenance Shop, and Administration Building.

4.6. **Protocol for instructing visitors prior to them *coming to the Clive site.***

4.6.1 Managers and employees that schedule visitors, deliveries, vendors, or contractors to come to the Clive site should advise the visitor/s that they are to check in with Security first, before attempting to make contact with personnel at the site.

4.6.2. Managers and employees should make the attached site map available to visitors prior to them coming to the site whenever possible.

## 5. ATTACHMENTS AND FORMS

5.1. Attachment 1, Safety View for Visitors Rev. 3 - Example

5.2. Attachment 2, Visitor Log - Example

5.3. Attachment 3, Authorization for Badge - Example

5.4. Attachment 4, Visitor/Truck Driver Escort Tracking – Example

**ATTACHMENT 5.1**
**Safety View for Visitors - Example**
CL-SE-PR-020-F1 Rev 3

ENERGYSOLUTIONS

**SAFETY VIEW FOR VISITORS** **Page 1 of 4**

The Clive, Utah, disposal site of Energy*Solutions* was licensed by the State of Utah in 1988 as a fully operational repository for naturally occurring radioactive waste. In March 1991, the license was amended to permit disposal of low level radioactive waste containing specific radionuclides and concentrations of radioactivity as well as radioactive waste that also contains hazardous materials (mixed waste).

The facility employs a construction staff including a Vice President of Clive, Director of Engineering, and a construction crew that handles the placement of the waste according to the necessary licensing requirements. Our technical staff includes professionals in Radiation Protection, Quality Assurance, Industrial Safety, Chemical Engineering, Civil Engineering, Security, Chemistry, and Environmental Safety.

As in any construction operation, there are possible hazards of concern. Energy*Solutions* primary concern is SAFETY. Most of the work performed includes the use of heavy machinery necessary to move and compact large quantities of material. To provide the utmost in preventative personal safety, site personnel are required to wear protective clothing and to conform strictly to proven, safe work practices.

Personal Protective Equipment (PPE) used by personnel entering the Restricted Area consists of coveralls, safety boots, hard hats, gloves, eye protection, and, where required, respiratory protection. The use of protective clothing reduces the risk of personal contamination and injury.

Because Energy*Solutions* handles radioactive material, precautionary actions are necessary to minimize radiation exposure. Safety measures taken to reduce potential exposures include: limited access into areas potentially contaminated with radioactive material, enforcement of proper exiting procedures, and the use of protective clothing, respiratory protection, and personal dosimetry.

All employees or visitors entering a Restricted Area must sign the appropriate Radiation Work Permit (RWP) at the Access Control desk and be issued dosimeters to monitor radiation exposures. Restricted Areas are identified by "CAUTION-RADIOACTIVE MATERIAL" signs. Personnel exiting areas that are potentially contaminated with radioactive material are screened by a Whole Body Monitor or portable "friskers" for the presence of any surface contamination.

Radiation exposures are monitored by the use of personal dosimetry. Visitors are issued dosimeters individually or as a group. The dosimeter may be an Electronic Pocket Dosimeter (EPD). Prior to exiting the restricted area, the dosimeters are returned, and the exposure is recorded. The wearing of dosimetry is used to determine the visitor's radiation exposure and to ensure that exposures are As Low As Reasonably Achievable (ALARA).

**SAFETY VIEW FOR VISITORS** 

**DOSE TO EMBRYO/FETUS -VISITOR**

All visitors to Restricted Areas at Energy*Solutions* Clive facility may be exposed to ionizing radiation. However, it is unlikely that any exposure by a visitor could be a measurable amount. Regulatory standards have been established for the protection of the embryo or fetus of a pregnant woman for excessive exposure to ionizing radiation.

Any Restricted Area visitor who is or may be pregnant and wants to ensure Energy*Solutions* maintains a record of embryo/fetus exposure must submit a request prior to entry using form CL-RS-PR-210-F4. The form CL-RS-PR-210-F4 is available from the Dosimetry Technician or the Director of Health Physics.

**HAZARD COMMUNICATION PROGRAM**

1. Energy*Solutions* uses products and materials (e.g., propane, gasoline and diesel fuel, laboratory chemicals, cleaning products, copier toner, etc.) subject to Hazard Communication regulations and the site Hazard Communication Plan (HCP). All warning labels and other Hazard Communications of such materials must be followed. Material Safety Data Sheets (MSDS's) for hazardous products used at Energy*Solutions* are available in the MSDS Binders and from the Safety and Health Manager.
2. Energy*Solutions* maintains some emergency response equipment such as fire extinguishers, safety showers, emergency eyewash, and first aid kits. Please orient yourself with the location of such equipment. If there are additional items of emergency equipment that you will need during your visit at Energy*Solutions*, please inquire as to its availability and/or location.
3. Should you bring products subject to the Hazard Communication regulations you shall provide copies of MSDS's to the Energy*Solutions* Safety and Health Manager.

**REGULATIONS-VISITORS**

The following is a list of Energy*Solutions* site regulations concerning visitors. Please note that some of the regulations have not been previously discussed. Please read and understand the following prior to entering a Restricted Area:

1. Access to Restricted Areas shall be permitted only with a current and correct Energy*Solutions* Access Identification Badge.
2. Visitors entering the facility **SHALL NOT** participate in waste management activities.
3. Visitors are not permitted to enter posted high radiation areas, or airborne contamination areas.
4. When entering a restricted area, visitors must enter their names on a Radiation Work Permit (RWP). At that time a dosimeter shall be issued to each person in the group or to one (1) person in the group.
5. Prior to exiting the Restricted Area all visitors shall follow proper exiting procedures as directed by the Health Physics Personnel.
6. All visitors shall wear protective clothing, as directed, upon entry to areas potentially contaminated with radioactive materials. Energy*Solutions* will provide hard hats, shoe covers, coveralls, gloves, and eye protection, if necessary.
7. No eating, drinking, or use of tobacco is allowed in restricted areas.
8. Follow all other site regulations provided in the briefing.
9. Visitors must be escorted by a badged employee or approved contractor.

**SAFETY VIEW FOR VISITORS** **Page 3 of 4**
**HAZARD COMMUNICATION PROGRAM**

***Medical Uses of Radioisotopes***
Many medical procedures may involve the use of radioactive materials in the course of treatment or diagnosis that could be detected by our site exit monitors and result in an alarm. If you know or believe that you may have had such procedures, please inform your escort or the Health Physics Technician at the Access Control Point.
Please be safe at all times while visiting our site. You can obtain additional safety information at the Administration Receptionist's desk or the Security Office. Should an emergency situation arise please notify your escort and follow his/her directions. Security personnel may also be contacted directly.
Emergency Contact Information:
Security Office Console – 801-649-2175
Administration Receptionist – 801-649-2010
We have Emergency Medical Technicians on site and an ambulance that can respond to serious injuries or illness.

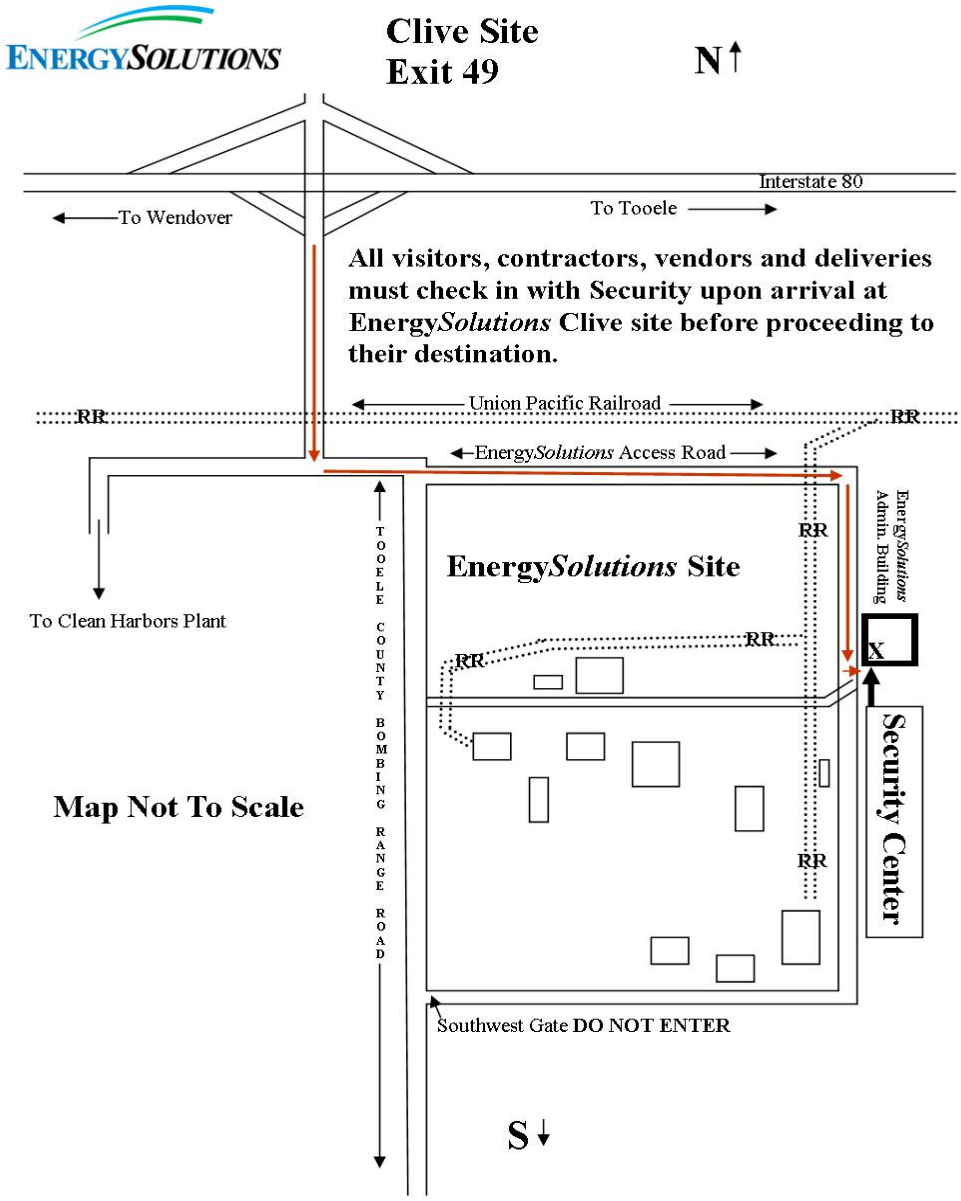
Report any observations of possible releases of hazardous materials to:

- The Security Department,
- Safety and Health Manager,
- Vice President of Clive,
- The Director of Health Physics or
- Any facility personnel.

RESTRICTED AREA FENCES: Throughout the facility there are fences installed to control access to areas where waste is located. These fences are posted with yellow caution signs for radioactive and asbestos material. When working within proximity to restricted area fences, visitors and contractors shall coordinate in advance with their EnergySolutions project manager or contact. If damage occurs to the fence or the fence is breached, immediately stop activities and contact Security @801-649-2175. Any equipment or personnel that pass through the fence shall remain as is until an EnergySolutions representative arrives on scene.

**SAFETY VIEW FOR VISITORS**
**VISITORS INFORMATION MAP**





# ATTACHMENT 5.2
## Visitor Log - Example

CL-SE-PR-020-F2
Rev. 0

ENERGYSOLUTIONS

## Visitors Log

Date_____ Page _____ of _____

| Name | Company | USA Citizen Yes or No | Site Contact (if known) | Trailer Number * | Time In | Time Out | Badge No. | Badge Type ** | Visitor Initials *** |
|---|---|---|---|---|---|---|---|---|---|
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* Trailer Number is only required for Truck Drivers.
** Badge types: CV=USA Citizen Visitor, —Purple, NCV=Non USA Citizen Visitor—Red, TD=Truck Driver—Gray, UC=Unescorted Contractor—Tan, UV=Unescorted Visitor—Tan, R=Regulator—Yellow.
*** Visitor's initials indicate visitor has received EC-98253 "Safety View for Visitors" and agrees to comply with the requirements found therein.

Chief of Security or Designee has reviewed form for accuracy, completeness, and legibility. _____ _____
Date Initials

# ATTACHMENT 5.3
# Authorization for Badge – Example

CL-SE-PR-020-F3
Rev. 0

ENERGYSOLUTIONS

## Authorization for Badge

Identification Badge Authorization for Visitors

**VISITOR FULL NAME:** _____ **DATE:**_____
**ADDRESS:** _____
**CITY & STATE:**_____ **ZIP:**_____
**EMPLOYER:**_____
*DATE OF BIRTH:_____ *Required only if entering Restricted Area

Have you ever been assigned a permanent Energy*Solutions* Badge or a TLD? ☐ **YES** ☐ **NO**

Please check if you have received or will be receiving one of the following badges:

☐ Orange, Blue or Green restricted area access badge

☐ Yellow Badge (Regulator)

☐ Magnetic Security Badge (with photograph)

Please read and sign the following safety affirmation:

**As a visitor to the Energy*Solutions* disposal site, I have read a copy of the Safety View for Visitors (CL-SE-PR-020 F1) document which contains the Site Regulations for Visitors, the Dose to Embryo/Fetus/Visitor, and the Hazard Communications Program. Having read these documents and having had ample opportunity to ask pertinent questions, I agree to comply with the statements in these documents and other regulations associated with the licensing and operation of the Energy*Solutions* Clive Site.**

**I hereby represent to Energy*Solutions* that I understand that not every potential danger or cause of injury was or could be covered in a short briefing such as this. I understand that it is my responsibility to conduct myself with caution and to anticipate possible hazards. I will avoid all hazardous conditions and unknown materials and ask any questions that may pose a concern. I also agree to follow the instructions of my authorized escort while I am inside of the Energy*Solutions* Restricted Area (if applicable).**

_____ _____
VISITOR SIGNATURE DATE

Visitor acknowledges that he/she has received a badge _____ _____
Initials Date

---

***TO BE FILLED OUT BY SECURITY PERSONNEL***

Badge Type**:** ☐ Non USA Citizen Visitor—Red ☐ USA Citizen Visitor—Purple ☐ Truck Driver—Gray
☐ Unescorted Contractor—Tan ☐ Unescorted Visitor—Tan

Badge Number: _____ Badge Expiration Date: _____

Security Personnel verified government issued identification: _____
Initials

Security Personnel acknowledges badge return: _____ _____
Initials Date

Chief of Security or Designee has reviewed form for accuracy, completeness, and legibility. _____ _____
Initials Date

# ATTACHMENT 5.4
## Visitor/Truck Driver Escort Tracking - Example

ENERGYSOLUTIONS

### Visitor Escort Tracking Form

CL-SE-PR-020-F4
Rev. 1

1. Escorts are responsible for the safety & compliance of any visitor placed in their care, especially during activation of the Emergency Response Plan.
2. Escorts will read and comply with the following information:
   a. Verify that visitor/s have obtained appropriate badge; Purple for USA Citizen, Red for Non-USA Citizen.
   b. Remain with the escorted individual(s).
   c. Make those you escort aware of any local hazards.
   d. Answer their questions to the best of your ability.
   e. Ensure the visitor(s) remain in the proper PPE while in the Restricted Area.
   f. Prevent the visitor(s) from entering any area(s) not authorized by their badge: (Visitors are restricted from handling waste or operating waste handling equipment.)
   g. Transfer the visitor(s) placed in your care to another escort if you must leave before they are finished or return them to Access Control at the end of their visit.
   h. Make certain that Non-USA Citizens do not come in contact with, or in sight of High Security Waste.
   i. This form must accompany the light green escort badge and then be returned by the escort, to Security when completed.

| PRINTED VISITOR NAME | TOUR AREA | BADGE # | ESCORT # |
|---|---|---|---|
| | | | |
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NOTE: Electronic Pocket Dosimeters (EPD) are required to be worn by visitors while in the Restricted Area.
[ ] Escorted individuals are Temp Rad Worker.

Escort has read, understands, and agrees to instructions outlined above:

_____ _____
1. ESCORT PRINTED NAME ESCORT SIGNATURE & DATE

_____ _____
2. ESCORT PRINTED NAME ESCORT SIGNATURE & DATE

_____ _____
3. ESCORT PRINTED NAME ESCORT SIGNATURE & DATE

_____ _____
4. ESCORT PRINTED NAME ESCORT SIGNATURE & DATE

Chief of Security or Designee has reviewed form for accuracy, completeness, and legibility. _____ _____
Initials Date

ENERGYSOLUTIONS

**CL-SE-PR-010**

# Security Operations Protocol

**Revision 5**

| | | |
|---|---|---|
| Authored By: | Signature on File<br>Theron Taylor, Chief of Clive Security | 1/5/12<br>Date |
| Reviewed By: | Signature on File<br>Curtis Kirk, Quality Assurance Manager | 1/5/12<br>Date |
| Approved By | Signature on File<br>Richard Chalk, Director of Health Physics | 1/5/12<br>Date |
| Approved By | Signature on File<br>Jeff Gardner, Vice President of Clive | 1/5/12<br>Date |

- [ ] New
- [ ] Title Change
- [x] Revision
- [ ] Rewrite
- [ ] Cancellation

Effective Date 1/5/12

Electronic documents, once printed, are uncontrolled and may become outdated.
Refer to the intraweb or the document control authority for the current revision.

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# 1. PURPOSE AND SCOPE

## 1.1. Purpose

To describe the methods used by Energy*Solutions*, Clive Site to ensure Site Security measures are implemented as required by the Site Radiological Security Plan (SRSP), for the protection of property and the safety of personnel.

## 1.2. Scope

This procedure applies to all personnel who access Energy*Solutions*, Clive Site facility. The specific controls detailed in this procedure are the responsibility of Energy*Solutions*, Clive Site Security Department.

# 2. REFERENCES

2.1. Site Radiological Security Plan, as amended

2.2. CL-SH-PR-500, Energy*Solutions* Emergency Response/Contingency Plan

2.3. CL-LD-PR-101, Management of High Security Waste Types

2.4. CL-SE-PR-010-F2, Security Patrol Log

2.5. CL-SE-PR-010-F1, Security Finding Report

2.6. CL-SE-PR-010-F3, Vehicle Search Log

2.7. CL-SE-PR-030, Quantities of Concern (Security 3.0) Sensitive Information

2.8. CL-RS-PR-120, Access Control

2.9. CL-SE-PR-010-F4, Restricted Area Gate Opening/Closing Log

2.10. CL-SE-PR-010-F5, Keys Issued for Restricted Area Locks

2.11. ES-AD-PR-008, Condition Reports

# 3. GENERAL

## 3.1. Definitions

3.1.1. *Security Department* - The official name for the Energy*Solutions*, Clive Site security group.

3.1.2. *Authorized Personnel* - Those personnel with Unescorted/Unrestricted Restricted Area access indicated by their Green or Orange Waste Worker badge.

3.1.3. *Central Security Control (CSC)* - The area designated as the offices of Energy*Solutions*, Clive Site Security Department.

3.1.4. *Facility (Site) Access Area (Controlled Area)* - Those areas at Energy*Solutions*, Clive Site, (the Controlled Area) which regulate access and exit by unlocking a locked gate, by an electronic gate key (Employee Badge) or by an electronic over-ride located in the CSC.

3.1.5. *Prohibited Articles* - The following items are not allowed within Clive Facility Access Areas (Clive Site):

- Firearms, Ammunition or Weapons in accordance to Utah State law;
- Alcoholic Beverages;
- Controlled Substances and Illegal Drugs;
- Explosives or Pyrotechnics;
- Still or video equipment may be authorized by the Vice President of Clive or designee.

3.1.6. *Reasonable Cause* - Any suspicious condition or activity that requires investigation by a Security Officer.

3.1.7. *Restricted Area Boundary* - As defined in the Radiation Safety program is the area within the Energy*Solutions*, Clive Site Controlled Area that requires control of access and occupancy for radiation protection purposes.

3.1.8. *Transfer Areas* - A designated and approved area established for relocation of cell construction material, fill material, and CLSM into the Restricted Area.

3.1.9. *Security Officer (SO)* - This is any individual who has completed all required training and the necessary Qualification Form(s) to perform or assist in the performance of Security Department Operations.

3.1.10. *High Security Waste* - Certain unclassified government information prohibited from unauthorized dissemination under section 148 of the Atomic Energy Act.

3.1.11. *Un-Containerized Waste* - This is waste that has been removed from a transportation container.

3.1.12. *Waste Access Area* - Areas where personnel may come in direct contact with un-containerized waste. These areas include the following:

- Railcar Rollover Facility;
- Intermodal Unloading Facility;

- Mixed Waste Treatment Facilities when they contain waste;
- Rail Digging Facility;
- Waste Disposal Cells;
- Shredder;
- Rotary Dump Facility

3.1.13. *Rover One* - The Security Officer on duty outside the Restricted Area.

3.1.14. *Rover Two* - The Security Officer on duty inside the Restricted Area.

3.1.15. *Security Finding* - A condition observed by an SO that warrants written information be communicated to the appropriate director or manager based on the discretion and judgment of the SO. This could include but not be limited to issues of; security, safety, compliance, maintenance or other.

3.1.16. *Security Supervisor* – The Chief of Security or his designee as determined by the Chief of Security. Typically, the senior S.O on duty.

3.2. **Responsibilities**

3.2.1. The Vice President of Clive (or equivalent position) has the ultimate responsibility and accountability for establishing and implementing Security controls for the Energy*Solutions*, Clive Site Facility.

3.2.2. The Chief of Clive Security (or equivalent position) is responsible for the management and supervision of all Security Department personnel, operations, communications, and surveillance activities.

3.2.3. The Security Supervisor (or equivalent position) is the Senior Security Officer (SO) on duty. He/she may assume the assigned duties of the Chief of Clive Security in order to carry out the normal operations required for Site Safety, Security and Surveillance, and is responsible for supervision of the site and authorized responsibilities relating to surveillance cameras, dispatch of SO's, use of the communications nets as directed by the Security management (Chief of Clive Security), or by established procedures and directives.

3.2.4. Each Security Officer (SO) (or equivalent position) is responsible to insure only Authorized Personnel are permitted entry to the designated areas of the Energy*Solutions*, Clive Site and to provide the security necessary to protect waste stream resources, facilities, materials, programs, personnel and assets from damage, loss or theft, and to detect, respond and report any and all conditions and/or circumstances contrary to safety, compliance, or security.

3.2.5. The SO performing Rover 1 duties is responsible for patrolling Energy*Solutions*, Clive Site property **outside** the Clive facility Restricted

and in the Controlled Areas in accordance with approved procedures and directives.

3.2.6. The SO performing Rover 2 duties is responsible for patrolling Energy*Solutions*, Clive Site property **inside** the Clive facility Restricted Area in accordance with approved procedures and directives.

### 3.3. Precautions and Limitations

3.3.1. All individuals in the Security Patrol Vehicle shall fasten their seat belts prior to movement.

3.3.2. While responding to emergencies SO's are authorized to use overhead lights and sirens but are not authorized to exceed a speed that puts anyone in danger.

3.3.3. Use of force is not allowed except in the defense of personal injury or death.

3.3.4. SO's have no arrest authority except citizen's arrest with assistance from a Utah State Peace Officer.

### 3.4. Document Control and Records

3.4.1. The following Security Forms shall be sent to the Security Supervisor for review and then forwarded monthly to Document Control via Transmittal Letter for scanning and storage:

- CL-SE-PR-010-F2, Security Patrol Log;
- CL-SE-PR-010-F3, Vehicle Search Log;
- CL-SE-PR-010-F1, Security Finding Report;
- CL-SE-PR-010-F4, Restricted Area Door and Gate Opening/Closing Log

## 4. REQUIREMENTS AND GUIDANCE

### 4.1. Authorization for Vehicle, Personnel and Building Searches

4.1.1. The Security Department is authorized to search any or all vehicles, personnel and buildings on Energy*Solutions*, Clive Site property within the parameters detailed in Section 4 of this procedure.

### 4.2. Waste Access Areas

4.2.1. The Vice President of Clive or equivalent shall be notified immediately if security seals are breached or any unauthorized individuals or equipment

are found in waste access areas in accordance with the Site Radiological Security Plan.

4.2.2. A master log will be maintained for all individuals who possess Restricted Area keys: Reference 2.10, Keys Issued for Restricted Area Locks.

4.2.3. A security log will be maintained for all Restricted Area gates and doors. A log entry will be made when RA gates and doors are unlocked or locked and secured: Reference 2.9, Restricted Area Gate Opening/Closing Log.

4.2.4. Upon termination, keys will be turned in to the Security Department.

4.2.5. Any breach of fence or boundary to the Restricted Area will be guarded and reported immediately to the Chief of Security and Director of Health Physics.

Note: A Condition Report will be implemented documenting the breach.

## 4.3. Restricted Area and Facility Security Patrol Protocol

4.3.1. The Rover One SO shall make no less than two (2) patrols around the Restricted Area perimeter each day and while patrolling place special emphasis on detecting, responding, investigating, logging and reporting problems or potential problems with:

- Restricted Area fence lines;
- Unauthorized entry or exit of the Site or Restricted Area;
- Evidence of compromised Security, such as suspected damage or tampering with fences, gates left unsecured or gates without chains and locks, unlocked or open doors or windows, etc;
- Lights that differ from their normal condition;
- Vehicles left unattended and/or running;
- Equipment or materials out of place, disguised or hidden;
- Railcars outside the Restricted Area;
- Boxes, barrels or containers outside the Restricted Area;
- Debris in containers pending unloading or un-containerized waste, staged for disposal;
- Restricted Area Transfer Points.
- Random searches of personnel and vehicles.

4.3.2. The Rover Two SO shall:

4.3.2.1 Ensure tools inside the Clive facility Restricted Area have the authorized and unique markings, security seals, security escorts or physical inventories that identify and distinguish them from waste material tools delivered to the site for disposal.

4.3.2.2 Conduct vehicle and personnel searches.

4.3.2.3 While patrolling, place special emphasis on detecting, responding, investigating, logging and reporting problems or potential problems with bulleted items listed in 4.3.1.

4.4. **Nightshift and Week-end Special Duties:**

4.4.1 The green (farm style) gates are to remain closed and locked during non-work hours to secure the Controlled Area.

4.4.2 Buildings shall be walked through and checked each shift.

4.4.3 Requests for special assistance from other departments shall be executed, i.e. doors unlocked, weather station attention, etc.

4.4.4 Doors shall be locked and unlocked according to present protocol.

4.4.5 Special alarms and lights shall be addressed according to the protocol.

4.5. **Vehicle Search Protocol**

4.5.1. The Security Supervisor may direct that individuals be selected for the daily search by any of the following: Specifically for cause, randomly by throw of a die, or on an alternating pattern. Vehicle Searches may be conducted anytime work is performed within the Clive Site Controlled Area in accordance with the following steps:

4.5.1.1 Vehicles may be searched randomly for prohibited articles or stolen items, or if in the opinion of the SO, there is reasonable cause or suspicious activity observed or suspected;

4.5.1.2 All searches shall be documented on the Vehicle Search Log, reference 2.6, listing the date, time, SO, operator, equipment number and equipment-type (if applicable), and pass or fail status of the search.

4.5.1.3 Central Security Control (CSC) and the Security Supervisor shall be notified immediately if unauthorized items are detected during the search and the Security Supervisor's response shall be documented in the comments section of the Vehicle Search Log.

4.5.2. Pulling a Vehicle Over for a Search:

4.5.2.1 Park the Security Patrol Vehicle in a safe, visible location;

4.5.2.2 Roll a die to determine the random sequence or use a predetermined sequence;

4.5.2.3 Use the Patrol Vehicle's flashing light bar, a portable vehicle barrier with flashers or, as a last resort, stand at the edge of the road and use the hand-held STOP sign.

4.5.2.4 Conduct yourselves in a professional and courteous manner at all times;

4.5.2.5 Identify yourself and inform the driver their vehicle has been selected for a search;

4.5.2.6 Ask the driver to pull off the road – if possible – or as far to the right as is safe;

4.5.2.7 Ask the occupant(s) to exit on the shoulder side of the vehicle;

4.5.2.8 Have the driver open the hood and trunk - if applicable.

4.5.3. If prohibited articles are discovered:

4.5.3.1 Immediately notify the Security Supervisor for instructions;

4.5.3.2 Confiscate contraband;

4.5.3.3 The Security Supervisor shall immediately notify the Vice President of Clive. At the end of the shift, forward any completed. Vehicle Search Log forms, reference 2.6, to the Security Supervisor for review, corrective *a*ction and filing.

4.6. **Personnel Search Protocol**

4.6.1. Personnel may be searched at anytime within the Clive Site Controlled Area in accordance with the following steps:

4.6.1.1 Security Supervisors shall determine the location and duration of the search;

4.6.1.2 Individuals may be searched at anytime while on site property, if in the opinion of the SO, there is reasonable cause or suspicious activity has been observed or suspected;

4.6.1.3 Rover 1 shall perform random searches on personnel outside the Restricted Area and within the Controlled Area;

4.6.1.4 Rover 2 shall perform random searches when personnel enter or exit the Restricted Areas.

4.6.2. The Security Supervisor may direct that individuals may be selected for the daily search by any of the following:

- Specifically for cause; or
- Randomly by throw of a die; or

- Use a predetermined sequence; or
- On an alternating pattern.

4.6.3. The date, time and results of all personnel searches shall be documented on the Security Patrol Log, reference 2.4, Security Patrol Log.

4.6.4. SO search protocol:

4.6.4.1 Conduct yourselves in a professional and courteous manner at all times;

4.6.4.2 Identify yourself and inform the individual(s) that they have been selected for a search;

4.6.4.3 Ask the individual selected to step to the side to prevent restrictions to traffic flow;

4.6.4.4 Ask the individual to empty their pockets on a counter or into a box for review and to facilitate the wand search;

4.6.4.5 Move the hand-held metal detector to scan the individual from front to back, beginning at the head and ending at the feet.

4.6.5. If metal is discovered ask the individual to remove it:

- If they comply: Continue the scan process until no metal is detected;
- If they refuse: Immediately notify the Security Supervisor for instructions.

4.6.6. If prohibited or stolen articles are discovered:

Detain the individual;

4.6.6.1 Immediately notify the Security Supervisor for instructions;

4.6.6.2 Prior to the end of the shift fill out a reference 2.5, Security Finding Report and forward it to the Security Supervisor for review, corrective action, and filing.

## 4.7. Building and Office Search Protocol

4.7.1. All buildings shall be searched during the night shift with **Rover 1** paying special attention to identifying, investigating, logging and reporting problems or potential problems :

4.7.1.1 All doors shall be physically checked to ensure they are locked and secured;

4.7.1.2 Doors found unsecured shall be opened, the office area searched for evidence of intrusion and/or theft, then locked;

4.7.1.3 If a door is unable to be locked contact the Security Supervisor for instructions;

4.7.1.4 Document unsecured buildings and offices by completing a Security Finding Report, reference 2.5, and make a notation on the Security Patrol Log, reference 2.4.

4.7.2. Prior to the end of the shift forward all Security Finding Report and Security Patrol Log forms to the Day Shift Security Supervisor for review, corrective action, and filing. A copy of the reference 2.6, Security Finding Report shall be forwarded to the appropriate managers.

## 4.8. Highway Shipment Security Protocol

4.8.1. Shipments arriving after normal business hours or on holidays shall be checked at least once every twenty four (24) hours to ensure:

- The load is secure; and
- The seals are intact.

4.8.2. Shipments arriving during normal business hours that cannot be accepted and unloaded until the next business day shall be checked at least four times in a twenty four (24) hour period to ensure:

- The load is secure; and
- The security seals are intact.

## 4.9. High Security Waste Disposal Protocol

4.9.1. High Security Waste shall be placed in accordance with reference 2.3, Management of High Security Waste Types.

## 4.10. Quantities of Concern (QoC)

4.10.1. QoC shipments shall be managed in accordance with reference 2.7, CL-SE-PR-030, Quantities of Concern (Sensitive Information).

## 4.11. Emergency or Contingency Protocol

4.11.1. When an unforeseen combination of circumstances such as fire, explosion, radiological release or other emergency calls for immediate action, immediately implement the Emergency Response Plan or Contingency Plan in accordance with reference 2.2, CL-SH-PR-500, Energy*Solutions*

Emergency Response/Contingency Plan and follow the instructions received from the Emergency Coordinator.

4.12. **Permanent Records Protocol**

4.12.1. SO's shall document and forward all incidents that result in a Security Finding on the reference 2.5, Security Finding Report, to the Security Supervisor at the end of each shift.

4.12.1.1 The SO shall check the appropriate box categorizing the Security Finding as related to: Security, Safety, Compliance, Maintenance or Other.

**Note: If the identified issue violates the Site Radiological Security Plan (Reference 2.1), a Condition Report will be implemented by the Chief of Security or designee in accordance with Reference 2.11.**

4.12.2. SO's shall document and forward the shift activities on the reference 2.4, Security Patrol Log, to the Security Supervisor at the end of each shift.

4.12.2.1 Each item listed on the Security Patrol Log shall be evaluated and adjudicated "Pass" or "Fail" and the appropriate entry made by the SO accordingly.

4.12.3. SO's shall document and forward the vehicle searches conducted on the reference 2.7, Security Vehicle Search Log, to the Security Supervisor at the end of each shift.

4.12.3.1 Each item listed on the Vehicle Search Log shall be evaluated and adjudicated "Pass" or "Fail" and the appropriate entry made by the SO accordingly.

4.12.4. Central Security Control (CSC) will maintain a log, reference 2.10, Restricted Area Gate Door and Opening/Closing Log for Restricted Area door and gate openings and closings as required in reference 2.9, CL-RS-PR-120, Access Control. The person opening the RA door or gate will notify CSC at the time the door or gate is opened and notify CSC again when the door or gate is closed and locked. If door or gate monitoring personnel changes during the time the door or gate is open, it will be logged as closed and re-opened.

## 5. ATTACHMENTS AND FORMS

5.1. Security Finding Report –Example

5.2. Security Patrol Log – Example

5.3. Security Vehicle Search Log – Example

5.4. Restricted Area Door and Gate Opening/Closing Log – Example

5.5. Keys Issued for Restricted Area Locks - Example

**ATTACHMENT 5.1**
**Security Finding Report – Example**

CL-SE-PR-010-F-1
Rev. 2

Category: Security [ ], Safety [ ], Compliance [ ], Maintenance [ ], Other [ ]

| | | | | |
|---|---|---|---|---|
| DATE: | | AREA: | | URGENCY |
| TIME: | | DEPARTMENT: | | (EXAMPLES: IMMEDIATE, ASAP, NON-URGENT) |

DESCRIBE SECURITY FINDING BELOW:

DESCRIBE CORRECTIVE ACTION TAKEN BELOW:

SECURITY OFFICER(S): _____ / _____

*THIS SECTION TO BE COMPLETE BY THE CHIEF OF CLIVE SECURITY OR HIS/HER DESIGNEE.*

Copy of this report delivered to the Department Manager/s? YES [ ] NO [ ]
Response from Manager Required? YES [ ] NO [ ]
Does this issue violate the Site Radiological Security Plan? YES [ ] NO [ ]
If yes, a Condition Report will be implemented by: _____

Name of Department Manager/s: _____ , _____

REVIEWED BY:

_____

SIGNATURE & DATE

**ATTACHMENT 5.2**
**Security Patrol Log – Example**

CL-SE-PR-010-F-2
Rev. 1

DATE: Page _____ of _____

| TIME | DESCRIPTION OF EVENTS, SEARCHES, ACTIVITIES, ETC. | PASS/FAIL (P/F) | S.O INITIAL. |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

_____
SECURITY GUARD SIGNATURE & DATE

REVIEWED BY:

_____
SIGNATURE & DATE

**ATTACHMENT 5.3**
**Vehicle Search Log – Example**

CL-SE-PR-010-F-3
Rev. 2

Date _____ Times _____ Guard _____

Check one: [ ] Inside Restricted Area [ ] Outside Restricted Area

| OPERATOR | EQUIP # | EQUIP TYPE | PASS/FAIL (P/F) | VEHICLE OWNER |
|---|---|---|---|---|
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KEY: RT = Rock Truck, WT = Water Truck, PU = Pickup, CT = Cement Truck, SUV = Sport Utility, HE = Heavy Equipment, POV = Personally Owned

Number of vehicles searched this session: _____

Comments _____

_____ _____

Security Guard Signature/Date Reviewer Signature/Date

ATTACHMENT 5.4
Restricted Area Door and Gate Opening/Closing Log – Example

## Restricted Area Door and Gate Opening/Closing Log

CL-SE-PR-010-F-4
Rev. 2

| Date | Gate No. (or door name) | Opened by: ( Name) | Time Opened | Estimated Time of Closing | Time Closed |
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**ATTACHMENT 5.5**
**Keys Issued for Restricted Area Locks – Example**

## Keys Issued for Restricted Area Locks

CL-SE-PR-010-F-5
Rev. 0

| Issued to: | Date | Issued by: | Returned (date) |
|---|---|---|---|
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# Macro Vault Operations

**Revision 0**

| | | |
|---|---|---|
| Authored By: | Signature on File<br>Craig Erickson, Mixed Waste Treatment Manager | 10/27/08<br>Date |
| Reviewed By: | Signature on File<br>Curtis Kirk, Quality Assurance Manager | 10/30/08<br>Date |
| Approved By: | Signature on File<br>Mark Ledoux, Corporate Radiation Safety Officer | 10/30/08<br>Date |
| Approved By: | Signature on File<br>Jesse Garcia, Director of Mixed Waste Operations | 10/30/08<br>Date |

☒ New
☐ Title Change
☐ Revision
☐ Rewrite

Effective Date: 11/4/08

Electronic documents, once printed, are uncontrolled and may become outdated.
Refer to the intraweb or the document control authority for the current revision.

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# 1. PURPOSE AND SCOPE

## 1.1. Purpose

To describe the procedure and inspection criteria for the preparations and casting the monolithic vault using the MACRO Vault technology.

## 1.2. Scope

This procedure applies to the operational/construction of MACRO Vault technology, at the Clive Mixed Waste Treatment Facility.

# 2. REFERENCES

2.1. State Issued Part B Permit, Attachment II-1-5, *Macroencapsulation Plan*

2.2. Proprietary Macro Mix Design Formulation, Revision 2, dated February 11, 2004; and Supplement dated April 12, 2004

2.3. CQA/QC Manual

2.4. CL-MT-PR-104, *Foam Filling Internal Voids*

# 3. GENERAL

## 3.1. Definitions

3.1.1. ***Macroencapsulation (MACRO)*** - Encapsulation with surface coating materials such as polymeric organics (e.g. resins and plastics) or with a jacket of inert inorganic materials to substantially reduce surface exposure to potential leaching media.

3.1.2. ***MACRO Vault*** - Hazardous debris, radioactive lead solids waste, or both that has been macroencapsulated by placing in an engineered vault, filling void spaces, and applying surface coating materials such as polymeric organics (e.g. resins and plastics) or with a jacket of inert inorganic materials to substantially reduce surface exposure to potential leaching media. MACRO Vaults may be constructed directly in the Mixed Waste Landfill Cell in accordance with the applicable requirements of Reference 2.1, Macroencapsulation Plan.

3.1.3. ***Primary Container*** - The outer container inside of a MACRO Vault. This container may hold open waste containers or loose waste.

3.1.4. ***Macro Mix*** - The fill material used in constructing the MACRO Vault to encapsulate the waste material, as defined in Reference 2.2.

3.1.5. ***Non-Structural Cracks*** **-** Small hairline cracks that would not cause loss of encapsulate material.

3.1.6. ***Structural Cracks*** **-** Cracks that would affect the encapsulates ability to remain in place in the vault (i.e. a crack with a width ≥ 1/8$^{th}$ inch).

3.1.7. ***Void Filling*** **-** The process of filling void spaces within the waste containers with Macro Mix, foam, or other flowable material.

3.2. **Responsibilities**

3.2.1. **Director of Mixed Waste Operations** has overall responsibility for this procedure.

3.2.2. **Treatment Manager** is responsible for the overall implementation and accuracy of this procedure and for ensuring that this procedure is being followed.

3.2.3. **Foreman** is responsible for directing the Facility Operators, performing batch ticket verification, and completing the forms attached to this procedure.

3.2.4. **Treatment Operator** is responsible for loading waste into primary containers to be macroencapsulated by a MACRO Vault. The operators are also responsible for forming up the MACRO Vault pour, operating equipment as needed, and filling voids as needed.

3.3. **Precautions and Limitations**

3.3.1. Caution shall be used around forklifts and other equipment used during operations.

3.3.2. Follow the RWP written to cover Macro Vault Operations.

3.3.3. All personnel shall attend a pre-operational briefing for each waste stream being encapsulated, prior to handling that waste. Multiple waste streams may be covered in the same briefing.

3.3.4. Caution shall be used when climbing on top of Macro Vaults. Soil shall be placed along vault edges to ensure the drop-off is less than six feet OR a spotter shall be employed to warn employees of fall hazards.

3.4. **Document Control and Records**

3.4.1. The Macro Vault Operations Record (Attachment 5.1), the Macro Vault Inspection Record (Attachment 5.2), and the Macro Corrective Action Log

(Attachment 5.3) shall be transmitted to Document Control within 90 days upon completion.

## 4. REQUIREMENTS AND GUIDANCE

### 4.1. General

4.1.1. MACRO Vault construction requirements

(1) The MACRO Vault shall be created to minimize interior voids or air pockets.

(2) Waste shall not protrude through the surface of the Macro Vault.

(3) A minimum of four inches of Macro Mix on all sides must be maintained to meet the vault requirements.

(4) The MACRO Vault shall be protected from precipitation contacting the waste until void filling is complete.

(5) Any precipitation that may accumulate in the Macro Vault shall be removed prior to waste or Macro Mix placement.

(6) Prior to accepting the load, the batch tickets shall be reviewed by the foreman or facility operator.

4.1.2. Each load of Macro Mix shall be physically tested by the foreman or facility operator to ensure the Macro Mix meets the required slump criteria. No Macro mix material will be loaded into the monolithic Macro Vault forms after its time is greater than 3 hours from adding water to the mixture.

(1) A slump test will be performed with a resulting minimum slump of 8-inches and a range up to 11 3/4-inches. If the resulting slump is less then 8-inches the pour may still resume by adding up to 10 oz of super plastisizer per yard of macro mix, not to exceed a total of 35 oz/cy, to the mix design to acquire an adequate slump. If the slump still cannot meet 8 inches or greater, or the slump exceeds 11 3/4 inches, the load will be rejected.

**NOTE: Personnel performing slump testing shall be trained and qualified.**

(2) A large object engineering review will be performed to determine the maximum weight of waste that may be placed in each specific Macro Vault geometry prior to pouring macro mix.

(3) Macro Vaults shall not exceed a footprint of 625 $ft^2$ (i.e. 25’ x 25’ or any dimension that is less than or equal to 625 $ft^2$).

(4) Multiple waste streams may be placed into a single Macro Vault so long as they are compatible with one another.

4.2. **Procedure**

4.2.1. Construction of Macro Vaults

(1) If the base surface is soil or cell floor, a minimum 20 mil plastic liner shall be placed under the vault to ensure flowablility between waste and the vault base. If the vault is being constructed on CLSM or Macro mix, no liner is required.

(2) Set four inch or greater risers within the vault area.

**NOTE: The floor of a vault may be poured separately, so long as a bonding agent is applied to all accessible areas of the floor surface prior to pouring the remainder of the vault.**

(3) Inspect the concrete risers to ensure they are free of any oil, gas, grease, paint, etc. Stir bonding agent before use.

(4) Apply bonding agent.

(5) Set the concrete forms to form the vault ensuring that a minimum of four inches on all sides is maintained when the waste is placed therein.

(6) Place the waste container on the risers, or pre-poured vault floor, by using a forklift or an alternative piece of equipment within the forms.

(7) Facility operators shall verify that all containers have been pre-poured (i.e. look for the label on the lid that indicates that the container has not been pre-poured). If the container requires void filling, remove or put holes in the lid to allow the Macro Mix to fill the voids. A minimum of 4 holes, measuring 2”x 4”, shall be punctured into the lid of the container.

(8) Collect any physical data if necessary, i.e., measurements, photographs, etc. prior to casting the monolithic vault.

4.2.2. Void filling shall be performed in accordance with Reference 2.4, Foam Filling Internal Voids, as needed.

**Note: Voids that were not previously filled shall be filled during the Macro Vault process using Macro Mix.**

4.2.3. Pouring the Macro Vault

**<u>Note</u>: The macro vault shall be completed within 24 hours of the first load of macro mix being added to the vault.**

(1) Prior to accepting the load, the batch tickets shall be reviewed by the foreman to determine:

(a) The mix design on the batch ticket is "MACRO MIX."

(b) The batch size is what was requested.

(c) The mix meets required tolerances (+/- 2% for aggregate and +/- 1% for all other ingredients as specified in Reference 2.2, Macro Vault Design Report). A manual calculation will be performed and written on the batch ticket for the first load in each vault to verify accuracy.

The reviewing foreman shall sign and date the actual batch ticket and the Macro Vault Operations Record (Attachment 5.1) to verify the review.

(2) The Cement Truck shall be allowed to pour 2 yards. During that time a sample of the mix shall collected and a slump test shall be performed before the Cement Truck discharges any more mix.

(3) If a Macro Vault is being poured with dimensions greater than 6 feet in height, the pour rate shall be control to prevent cold joints and outward pressure against the forms. The pour rate shall be at the Treatment Manager's discretion but no more than 6 vertical feet an hour.

**<u>Note</u>: Macro vaults cannot exceed 16 feet in height.**

(4) Continuously fill the vault around the primary container using Macro Mix.

**<u>Note</u>: The pour may be stopped temporarily as long as the pour resumes before the Macro Mix sets, or no longer than 3 hours from the load being added, so that no cold joints are made. In the event that the concrete cures without finishing the pour, concrete bonding agent shall be used on the cured area prior to adding new material to prevent cold jointing.**

(5) The vault shall be poured in a way that will allow for equal filling throughout the entire vault. It may be necessary to pour from the middle or filling the sides to help aid in equal filling.

(6) Overfill the Macro Vault to compensate for settling to maintain the 4 inch requirement.

(7) Following completion of the Macro Vault Pour, observe for at least 30-minutes ensuring that there isn't excessive settlement of the Macro Mix (consolidation of waste within the primary container).

(a) If settling does occur below the four inch requirement, additional Macro Mix shall be added to meet the minimum four inch requirement.

**Note: Use a shovel or other appropriate device to push down into the Macro mix to determine the thickness. Alternately, the depth may be marked on the concrete form.**

4.2.4. Documentation

(1) The following shall be documented on the Macro Vault Operations Record (Attachment 5.1):

(a) Generator and shipment number

(b) Weight of waste

(c) Large Object Engineering Review

(d) Identification of void filling material used

(e) Presence and dimensions of risers and spacers used

(f) Vault dimensions

(g) Vault location in the disposal cell

(h) Surface vault is to be poured on (i.e. plastic liner, CLSM, Macro Vault)

(i) Cleanout of concrete batch plant and delivery equipment (wash down) of CLSM residue before batching and transfer to Macro Mix

(j) Batch Ticket(s) for Macro Mix used

(k) Whether the Macro Mix is within established tolerances.

(l) Volume of Macro Mix poured in the vault

(m) The time the Macro Mix waste batched and start and end of the batch pour.

(n) The slump test time and result.

(2) The following will be documented on the Macro Vault Inspection Record (Attachment 5.2):

(a) Inspection results

- Daily inspection for special curing needs for the first three calendar days after the initial pour.

- Daily inspection, consists of exposed surfaces during normal hours, concerning curing and its physical condition. These conditions will include cracking, spalling, chipping, swelling, excessive heat generations, sweating after curing period, etc.

(3) Completed forms shall be forwarded to the Treatment Manager for review of accuracy, legibility and completion after completion and shall be transmitted in accordance with Section 3.4 of this procedure.

4.2.5. Stripping the forms

(1) Twelve hours after the completion of the Macro Vault, the forms may be removed from the vault. Caution should be used to ensure that the Macro Vault is not damaged during the form removal process.

(2) An initial inspection shall take place to evaluate the integrity of the Macro Vault. This will be documented on the Macro Vault Inspection Record (Attachment 5.2).

4.2.6. Curing of the MACRO Vault

(1) No special curing is required if the ambient air temperatures are above 40° F. or below 90° F. throughout the initial three day curing period. If during the three day curing period the temperature exceeds the specified ranges, then special curing methods need to be implemented.

(2) If the temperatures are below 40° F., protection from freezing shall be provided by blanketing the vault with an insulating cover and providing heat using torpedo heaters or other heating device to protect it from freezing.

**<u>Note</u>: The temperature on the heaters shall be kept at low setting to prevent potential cracking from over drying.**

(3) If the temperatures are above 90° F., the vault shall be wrapped and the vault shall be hydrated to ensure that proper curing takes place.

(4) When special curing is called for, (ambient air Temperatures below 40° F or above 90° F) a test cylinder for the Macro Vault being poured shall be collected. The test cylinders will be stored with or near the monolithic vault under the same curing conditions. If curing is required but does not take place for the entire three day requirement, these cylinders shall be sent to the lab for a compressive strength analysis to ensure that it meets the mix design requirements.

4.2.7. Inspection of the MACRO Vault

(1) The monolithic vault shall be inspected daily concerning maintenance of adequate heat or moisture during the curing period and maintaining the curing cover.

**Note: When temperatures are at or below 40°F, the daily inspection shall be performed at the beginning of the shift.**

(2) Daily inspection consists of exposed surfaces during normal hours, concerning curing and its physical condition. These conditions shall include cracking, spalling, chipping, swelling, excessive heat generations, sweating after curing period, etc.

(a) If surface fissures are identified in the inspection, they shall be documented on the Macro Vault Operations Record (Attachment 5.1) and watched for further deleterious effects.

(b) If a non-structural crack is identified, it shall be noted on the Macro Vault Inspection Record (Attachment 5.2) for the initial three days and the Macro Corrective Action Log (Attachment 5.3) thereafter, and be repaired immediately using a concrete sealing agent.

(c) If a structural crack is identified the Director of Mixed Waste Operations and Director of Engineering shall be notified for a corrective action.

4.2.8. Disposal

(1) The Quality Control Department (QC) will be notified when vaults are completed to initiate GPS mapping of each completed vault. Submit a copy of Attachment 5.1, Macro Vault Operations Record, to QC.

## 5. ATTACHMENTS AND FORMS

5.1. Macro Vault Operations Record, CL-MT-PR-105-F1 (EC98323) - Example

5.2. Macro Vault Inspection Record, CL-MT-PR-105-F2 (EC98324) - Example

5.3. Macro Corrective Action Log, CL-MT-PR-105-F3 (EC98226) - Example

# ATTACHMENT 5.1
## Macro Vault Operations Record - Example

ENERGYSOLUTIONS

Macro Vault Operations Record (EC-98323)
Form CL-MT-PR-105-F1 Rev. 0

**Macro Vault Operations Record**
Page 1 of 2

**Date**_____

**In Cell run # :**_____ **Vault Location** _____

_____ _____
**Vault Dimensions L x W x D** **Riser Dimensions LxWxD**

| | Check | | |
|---|---|---|---|
| **Risers Used** | ☐ | **Surface Under Vault**_____ | |
| **Risers Coated** | ☐ | **Material used to fill voids**_____ | |
| **Waste Compatible** | ☐ | **Vault Vol**_____ | |
| **4" Thick Min** | ☐ | **Waste Vol**_____ | |
| **Equipment Cleanout** | ☐ | **Estimated Macro Mix**_____ | |
| **Formula Spects Met** | ☐ | **Actual Poured**_____ | |
| **Batch Ticket Used** | ☐ | | |
| **Liner Used** | Y N | | |
| **Large Object Eng. Review** | Y N | | |

| Gen - W.S. - Bates # | Qty | Vol | Waste Weight |
|---|---|---|---|
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**For temperatures above 90°F, the Vault will be covered and sufficient water made available under the cover to continue the moist curing process.**
**For temperatures below 40°F, the cast vault requires protection from freezing and heat applied for three days.**

**Total Lbs**_____

**Notes :**

**Operator**_____

**Operator**_____

**Operator**_____

_____
**Reviewing Supervisor Signature & Date**

ENERGYSOLUTIONS

Macro Vault Operations Record (EC-98323)
Form CL-MT-PR-105-F1 Rev. 0

**Macro Vault Operations Record**

Page 2 of 2

**Date**_____

| | | | |
|---|---|---|---|
| **Load Ticket #**_____ | **Load Ticket #**_____ | **Load Ticket #**_____ | **Load Ticket #**_____ |
| Mix within required Tolerances. Y N | Mix within required Tolerances. Y N | Mix within required Tolerances. Y N | Mix within required Tolerances. Y N |
| Time Batch Mixed_____ | Time Batch Mixed_____ | Time Batch Mixed_____ | Time Batch Mixed_____ |
| Time Batch Pour Started_____ | Time Batch Pour Started_____ | Time Batch Pour Started_____ | Time Batch Pour Started_____ |
| Slump Test Time/Result:_____ | Slump Test Time/Result:_____ | Slump Test Time/Result:_____ | Slump Test Time/Result:_____ |
| Time Batch Pour Ended_____ | Time Batch Pour Ended_____ | Time Batch Pour Ended_____ | Time Batch Pour Ended_____ |
| **Load Ticket #**_____ | **Load Ticket #**_____ | **Load Ticket #**_____ | **Load Ticket #**_____ |
| Mix within required Tolerances. Y N | Mix within required Tolerances. Y N | Mix within required Tolerances. Y N | Mix within required Tolerances. Y N |
| Time Batch Mixed_____ | Time Batch Mixed_____ | Time Batch Mixed_____ | Time Batch Mixed_____ |
| Time Batch Pour Started_____ | Time Batch Pour Started_____ | Time Batch Pour Started_____ | Time Batch Pour Started_____ |
| Slump Test Time/Result:_____ | Slump Test Time/Result:_____ | Slump Test Time/Result:_____ | Slump Test Time/Result:_____ |
| Time Batch Pour Ended_____ | Time Batch Pour Ended_____ | Time Batch Pour Ended_____ | Time Batch Pour Ended_____ |
| **Load Ticket #**_____ | **Load Ticket #**_____ | **Load Ticket #**_____ | **Load Ticket #**_____ |
| Mix within required Tolerances. Y N | Mix within required Tolerances. Y N | Mix within required Tolerances. Y N | Mix within required Tolerances. Y N |
| Time Batch Mixed_____ | Time Batch Mixed_____ | Time Batch Mixed_____ | Time Batch Mixed_____ |
| Time Batch Pour Started_____ | Time Batch Pour Started_____ | Time Batch Pour Started_____ | Time Batch Pour Started_____ |
| Slump Test Time/Result:_____ | Slump Test Time/Result:_____ | Slump Test Time/Result:_____ | Slump Test Time/Result:_____ |
| Time Batch Pour Ended_____ | Time Batch Pour Ended_____ | Time Batch Pour Ended_____ | Time Batch Pour Ended_____ |
| **Load Ticket #**_____ | **Load Ticket #**_____ | **Load Ticket #**_____ | **Load Ticket #**_____ |
| Mix within required Tolerances. Y N | Mix within required Tolerances. Y N | Mix within required Tolerances. Y N | Mix within required Tolerances. Y N |
| Time Batch Mixed_____ | Time Batch Mixed_____ | Time Batch Mixed_____ | Time Batch Mixed_____ |
| Time Batch Pour Started_____ | Time Batch Pour Started_____ | Time Batch Pour Started_____ | Time Batch Pour Started_____ |
| Slump Test Time/Result:_____ | Slump Test Time/Result:_____ | Slump Test Time/Result:_____ | Slump Test Time/Result:_____ |
| Time Batch Pour Ended_____ | Time Batch Pour Ended_____ | Time Batch Pour Ended_____ | Time Batch Pour Ended_____ |

Foreman Signature/Date:_____

Manager Review Initial/Date:_____

# ATTACHMENT 5.2
## Macro Vault Inspection Record - Example

ENERGYSOLUTIONS

Macro Vault Operations Record (EC-98324)
Form CL-MT-PR-105-F2 Rev. 0

## Macro Vault Inspection Sheet

Cell#_____

Lift#_____

| | Date | Time Comp. | Inspector Printed Name And Signature | Containment integrity met Y / N | Curing time met Y / N | Low Temperature of day F | High Temperature for day F | Special Curing Needed Y / N | Waste Visible Y / N | Check For Cracks Y / N | Crack Type Structural / Non-Structural | Where Are The Cracks Located | Cracks Fixed Y / N | How Were The Cracks Fixed | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Day 1 | | | | | | | | | | | | | | | |
| Day 2 | | | | | | | | | | | | | | | |
| Day 3 | | | | | | | | | | | | | | | |

*Structural cracks are cracks that would affect the encapsulates ability to remain in place on the vault.
*Non-Structural cracking are small hairline cracks that would not cause loss of encapsulate material.
* If special curing is needed document the reason for the need and what actions were taken in the notes or comment section.

Notes : _____

_____
Manager Review / Date

## ATTACHMENT 5.3
## Macro Corrective Action Log - Example

ENERGYSOLUTIONS

Macro Corrective Action Log (EC-98226)
Form CL-MT-PR-105-F3 Rev. 0

### Macro Corrective Action Log

| GEN / WS / RUN | FORM # | DATE REMOVED FROM CELL | CORRECTIVE ACTION TAKEN | FINAL INSPECTION DATE / TIME | PASS/ FAIL | INSPECTORS SIGNATURE | Comments |
|---|---|---|---|---|---|---|---|
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# Foam Filling Internal Voids

**Revision 0**

| | | |
|---|---|---|
| Authored By: | Signature on File<br>Craig Erickson, Mixed Waste Treatment Manager | 4/14/08<br>Date |
| Reviewed By: | Signature on File<br>Curtis Kirk, Quality Assurance Manager | 4/17/08<br>Date |
| Approved By: | Signature on File<br>Mark Ledoux, Corporate Radiation Safety Officer | 4/17/08<br>Date |
| Approved By: | Signature on File<br>Jesse Garcia, Director of Mixed Waste Operations | 4/17/08<br>Date |

- ☒ New
- ☐ Title Change
- ☐ Revision
- ☐ Rewrite

Effective Date: 4/21/08

Electronic documents, once printed, are uncontrolled and may become outdated.
Refer to the intraweb or the document control authority for the current revision.

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# 1. PURPOSE AND SCOPE

## 1.1. Purpose

To provide instructions for the foaming of internal void space containing an elevated risk of dose and loss of contamination control due to particulates of concern that may consist of radioactive and/or hazardous chemicals.

## 1.2. Scope

This procedure applies to Autofroth® Systems foam insertion at the Clive Mixed Waste Facility.

# 2. REFERENCES

2.1. CL-TN-PR-010, *General Training Procedure*

2.2. Autofroth® Systems Training Manual

# 3. GENERAL

## 3.1. Definitions

3.1.1. *Containment Tent* - a temporary structure that isolates a work area that may have elevated levels of contamination from the surrounding areas in order to minimize the spread of contamination.

3.1.2. *Glove box* - a containment structure designed to allow individuals to perform manual labor in a highly contaminated environment while incurring a minimal risk.

3.1.3. *Foam Applicator* - the disposable 1-inch diameter tube used as the final conduit for foam insertion.

3.1.4. *Foam Nozzle* - the apparatus used to dispense the foam that connects to the foam applicator.

3.1.5. *Shot* - a controlled volume of foam that creates a maximum 24-inch lift of foam in the void being filled.

## 3.2. Responsibilities

3.2.1. **Director of Mixed Waste Operations** has the responsibility for providing personnel and resources necessary for the implementation of this procedure.

3.2.2. **Safety & Health Manager or designee** is responsible for identifying the appropriate safety precautions associated with wastes. In addition, for inspection of the containment tent for integrity and oversight of industrial hygiene protective measures.

3.2.3. **Director of Health Physics** is responsible for providing Health Physics personnel with the resources necessary for the implementation of this procedure.

3.2.4. **Treatment Manager** is responsible for overall control of operations in accordance with this procedure.

3.2.5. **Health Physics Technicians (HPT)** are responsible for monitoring radiological conditions and radiological controls as dictated by the procedure and RWP.

3.2.6. **Treatment Operators** are responsible for performance of the waste management activities in accordance with this procedure.

3.3. **Precautions and Limitations**

3.3.1. A job specific Radiation Work Permit (RWP) shall be written to control glove box foaming activities.

3.3.2. Respiratory protection and PPE shall be used as indicated in the Radiation Work Permit.

3.3.3. An evaluation of contamination levels of the internal void requiring foam filling will be performed by the manager and the HPT prior to beginning any foam filling operations. The HPT shall determine what if any radiological controls are necessary.

3.3.4. All workers shall participate in a pre-operational briefing that shall include a description of the conditions, precautions, and procedures outlined in the applicable RWP and procedures for this process.

3.3.5. Personnel involved in the foaming of highly contaminated internal voids shall participate in a realistic Mockup Training that includes training in the specific task(s) to be performed by the individual workers. Necessity for training will be determined by the HPT overseeing the void filling process. This training shall be documented in accordance with Reference 2.1, General Training Procedure.

3.3.6. All Autofroth® Systems foam operations shall be performed in accordance with the Autofroth® Systems Training Manual by individuals who have been formally trained to use the system. This training shall be documented in accordance with the Reference 2.1, General Training Procedure.

3.3.7. If applicable, a Containment Tent shall be constructed to isolate the void filling process from the surrounding area. The Containment Tent shall be inspected and accepted for use by the HPT prior to initial use and daily prior to use. This inspection and acceptance shall be prominently posted at the entrance to the Containment Tent.

a. HEPA ventilation of sufficient size and capacity shall be used to provide both 1) negative ventilation for the Containment Tent (greater than 10 air changes per hour) and 2) capture of displaced internal air and foam gases from the void being filled. HEPA ventilation shall be inspected and authorized for use by the HPT prior to initial use and daily prior to use. This inspection and acceptance shall be prominently posted at the entrance to the Containment Tent.

b. An access/service port to the internal void being filled shall be made for insertion of foam spray nozzles and for void exhaust ventilation (escaping air and foam gases). At no time will an unfiltered/unsealed air pathway be allowed to exist between the contaminated interior and the inside of the Containment Tent. .

3.3.8. Any item inserted inside internal void spaces and exposed to contamination (such as foam spray nozzles) shall not be removed from the void space once they are inserted.

3.3.9. Radiological surveys

a. Radiological surveys shall be performed in accordance with the RWP and applicable Radiation Safety procedures.

3.3.10. Monitoring requirements

a. Bioassay monitoring shall be performed in accordance with the RWP and applicable Radiation Safety procedures periodically.

b. Airborne particulate monitoring shall be performed in accordance with the RWP.

3.3.11. PPE requirements

a. Respiratory protection and PPE shall be used as indicated in the Radiation Work Permit.

### 3.4. Document Control and Records

3.4.1. Attachment 3, Internal Void Foam Filling Log Sheet, shall be transmitted to Document Control by the Mixed Waste Administrative Assistant within 90 days of completion.

## 4. REQUIREMENTS AND GUIDANCE

4.1. The Treatment Operator shall perform the Autofroth® Systems Daily Quality and Operational Check Protocol (Attachment 1).

4.2. The Treatment Operator shall determine specific foam shot times for void space filling by using the Autofroth® Systems Shot Time Table (Attachment 2), or by using the formula ($4*ft^3/60)*60$=Shot time in seconds.

4.3. The Treatment Operator shall perform the following steps:

**NOTE: At no time will an unfiltered/unsealed air pathway be allowed to exist between the contaminated interior and the inside of the Containment Tent.**

4.4. Establish and verify adequate exhaust ventilation.

**NOTE: The foam nozzle shall only contact the foam applicator, not the contaminated void. This will minimize the potential of contaminating the foam nozzle.**

4.5. Connect the foam applicator/nozzle assembly to the component being filled with foam.

4.6. As necessary, cut/remove plastic from view ports on the component to facilitate the visual observation of filling internals during the foam filling operation.

4.7. The Treatment Operator shall complete/dispense the pre-determined shot.

4.8. When the pre-determined shot has been dispensed, the Treatment Operator shall perform the following steps:

a. Disconnect the foam applicator from the foam nozzle and cover/seal the foam applicator.

b. Secure component exhaust ventilation.

4.9. The Treatment Operator shall allow the shot to cure for a minimum of 30 minutes.

4.10. The Treatment Operator shall observe/inspect the component to ensure that the void is as full as practical with cured foam.

4.11. Repeat steps 4.3 through 4.8 as necessary until the void is completely full of foam.

4.12. Once a component is full, the Treatment Operator shall document that the void is full on the Internal Void Foam Filling Log Sheet (Attachment 3).

4.13. The Treatment Operator shall ensure that no unfiltered/unsealed air pathway exists between the component interior and the environment and that any access ports/service ports to the component are sealed.

4.14. The manager of the person completing the documentation shall review the form for accuracy, completion and legibility, and then sign and date the form.

4.15. The reviewed documentation shall be forwarded to the Mixed Waste Administrative Assistant who shall transmit it to document control in accordance with Step 3.4 of this procedure.

## 5. ATTACHMENTS AND FORMS

5.1. Attachment 1, Autofroth® Systems Daily Quality and Operational Check Protocol

5.2. Attachment 2, Autofroth® Systems Shot Time Table

5.3. Attachment 3, Internal Void Foam Filling Log Sheet [CL-MT-PR-104-F1 (EC98306)] - Example

## ATTACHMENT 1
## Autofroth® Systems Daily Quality and Operational Check Protocol

1. Inspect connections for integrity both before and after pressurizing.
2. Record both the chemical and containment tent temperature; the acceptance criterion for the chemical is the range of 75-85° F.
3. Ratio the gun, remove the mixer and shut off the bleed air:
    a. Close both ball valves, purge gun head until empty.
    b. Open the MDI ‘A’ side ball valve and dispense 3 seconds of ‘A’ side into a pre-weighted plastic bag.
    c. Weigh the bag and record the net weight on the Daily Autofroth® Systems Log Sheet, Form GB-2.
    d. Close ‘A’ side ball valve.
    e. Repeat steps a. through d. for the resin ‘B’ side.
    f. Divide the MDI ‘A’ side weight by the resin ‘B’ side weight and multiply the quotient by one hundred.
    g. The acceptance criterion is the range of 86-96.

**ATTACHMENT 2**
**Autofroth® Systems Shot Time Table**

Shot Time (sec)

| Length of area to be foamed (ft) | 2 | 2.5 | 3 | 3.5 | 4 | 4.5 | 5 | 5.5 | 6 | 6.5 | 7 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 13 | | | | | | | | | | | |
| 12.5 | | | | | | | | | | | |
| 12 | | | | | | | | | | | |
| 11.5 | | | | | | | | | | | |
| 11 | | | | | | | | | | | |
| 10.5 | | | | | | | | | | | |
| 10 | | | | | | | | | | | |
| 9.5 | | | | | | | | | | | |
| 9 | | | | | | | | | | | |
| 8.5 | | | | | | | | | | | |
| 8 | | | | | | | | | | | |
| 7.5 | | | | | | | | | | | |
| 7 | 53 | 66 | 79 | 93 | | | | | | | |
| 6.5 | 49 | 61 | 74 | 86 | | | | | | | |
| 6 | 45 | 57 | 68 | 79 | 91 | | | | | | |
| 5.5 | 41 | 52 | 62 | 73 | 83 | 94 | | | | | |
| 5 | 38 | 47 | 57 | 66 | 76 | 85 | 95 | | | | |
| 4.5 | 34 | 42 | 51 | 59 | 68 | 76 | 85 | 94 | | | |
| 4 | 30 | 38 | 45 | 53 | 60 | 68 | 76 | 83 | 91 | | |
| 3.5 | 26 | 33 | 39 | 46 | 53 | 59 | 66 | 73 | 79 | 86 | 93 |
| 3 | 22 | 28 | 34 | 39 | 45 | 51 | 57 | 62 | 68 | 74 | 79 |
| 2.5 | 19 | 23 | 28 | 33 | 38 | 42 | 47 | 52 | 57 | 61 | 66 |
| 2 | 15 | 19 | 22 | 26 | 30 | 34 | 38 | 41 | 45 | 49 | 53 |

Width of area to be foamed (ft)

Note: The remainder of the matrix will be entered when the information is available.
Lifts shall not exceed 24 inches in thickness.

# ATTACHMENT 3
## Internal Void Foam Filing Log Sheet - Example

ENERGYSOLUTIONS

**Internal Void Foam Filling Log**
**Form CL-MT-PR-104-F1 Rev. 0**

Generator/WS: _____ Date: _____

### Internal Void Information

| | Bates # | Length | Width | Height | Shot Time | Component ID | Internal Void Completed | Ambient Temp | Temp MDI Tank A | Temp Resin Tank B | Bag A Shot MDI Weight | Bag B Shot Resin Weight | Ratio A/B Range 86-96 | Output (lbs/Min) | Initials | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | | | | | |
| 7 | | | | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | | |

Operator's Signature Date

Supervisor Review - Signature Date

Comments: _____

# Draining Battery Acid

**Revision 0**

| | | |
|---|---|---|
| Authored By: | Signature on File<br>Craig Erickson, Mixed Waste Treatment Manager | 4/14/08<br>Date |
| Reviewed By: | Signature on File<br>Curtis Kirk, Quality Assurance Manager | 4/18/08<br>Date |
| Approved By: | Signature on File<br>Mark Ledoux, Corporate Radiation Safety Officer | 4/18/08<br>Date |
| Approved By: | Signature on File<br>Jesse Garcia, Director of Mixed Waste Operations | 4/18/08<br>Date |

☒ New
☐ Title Change
☐ Revision
☐ Rewrite

Effective Date: 4/21/08

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# 1. PURPOSE AND SCOPE

## 1.1. Purpose

To provide a consistent method for draining acid from batteries prior to treatment of the batteries by macroencapsulation.

## 1.2. Scope

This procedure applies to Energy*Solutions* personnel who will be involved in draining and solidifying acid from batteries at the Clive Facility. This procedure covers batteries received at Energy*Solutions* from off-site generators as well as for expended batteries generated at the Clive Facility.

# 2. REFERENCES

2.1 CL-MD-PR-105, *90-Day and Satellite Accumulation Container Management*

# 3. GENERAL

## 3.1. Definitions

3.1.1. *Catch Basin* - A container filled approximately ½ full of an inert material (e.g. clay/sand, etc.) used to collect drained battery acid.

## 3.2. Responsibilities

3.2.1. **Director of Mixed Waste Operations** has responsibility for the overall implementation and accuracy of this procedure.

3.2.2. **Treatment Manager or Foreman** is responsible for conducting required pre-operationa1 briefings.

3.2.3. **Treatment Operator** is responsible for performing daily activities required for implementation of this procedure.

3.2.4. **Health Physics Technician** is responsible for briefing employees on the requirements of the applicable Radiation Work Permit prior to operations.

## 3.3. Precautions and Limitations

3.3.1. Operations shall be conducted in accordance with the appropriate Radiation Work Permit.

3.3.2. If batteries are found to be swollen or bulging contact the site Industrial Hygienist for review of PPE and work practices prior to draining.

3.3.3. An emergency shower/eyewash or other flushing agent shall be within the working area of the operation as a first-aid measure. If used, personnel

shall immediately flush the affected area and then alert medical personnel. Area shall be flushed for at least 15 minutes.

**NOTE: Acid may react with water. Care shall be taken when handling batteries not to mix water with acid.**

3.3.4. Additional PPE shall be worn by personnel directly handling batteries during draining. The following PPE shall be worn (at a minimum):

- Waterproof raingear
- Full-face respirator (or half-face with face shield)
- Heavy duty rubber gloves
- Rubber over-boots

### 3.4. Document Control and Records

None

## 4. REQUIREMENTS AND GUIDANCE

### 4.1. Compliance

4.1.1. The Treatment Manager shall provide and document a pre-operational briefing for all employees involved in the operation prior to performing the job.

4.1.2. Material from the catch basin shall be tested and meet LDR prior to disposal. Waste not meeting LDR shall be treated to applicable treatment standards prior to disposal.

### 4.2. Procedure

**NOTE: A Treatment Operator is responsible for performing steps 4.2.1 – 4.2.6.**

4.2.1. The catch basin shall be filled approximately ½ full with an inert, absorbent material.

4.2.2. A grate shall be placed over the opening of the catch basin, in a manner to let acid flow through into the absorbent material.

4.2.3. Each battery shall be placed on top of the grate then the maintenance ports covers shall be removed or openings made into sealed batteries. Maintenance port covers shall not be placed back on the batteries once empty.

4.2.4. Each battery shall be turned on its side, then upside down, to let the acid drain into the absorbent material.

4.2.5. Once the battery is completely drained, excluding residual moisture, it shall be replaced in its original storage container for macroencapsulation.

4.2.6. The catch basin shall be labeled and managed as part of the generator's waste stream (for batteries received from off-site sources) or as a 90-Day Container in accordance with Reference 2.1, 90-Day and Satellite Accumulation Container Management (for batteries generated at the Energy*Solutions* Clive facility). The original container which held the batteries shall maintain its same tracking number as before the batteries were drained.

## 5. ATTACHMENTS AND FORMS

None

# Stabilization Formula Development

**Revision 1**

| | | |
|---|---|---|
| Authored By: | Signature on File<br>Craig Erickson, Mixed Waste Treatment Manager | 4/30/10<br>Date |
| Reviewed By: | Signature on File<br>Curtis Kirk, Quality Assurance Manager | 5/5/10<br>Date |
| Approved By: | Signature on File<br>Rick Chalk, Director of Health Physics | 5/5/10<br>Date |
| Approved By: | Signature on File<br>Jesse Garcia, Director of Mixed Waste Operations | 5/6/10<br>Date |

☐ New
☐ Title Change
☒ Revision
☐ Rewrite

Effective Date: 5/10/10

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# 1. PURPOSE AND SCOPE

## 1.1. Purpose

To define a standardized procedure for performing bench scale treatability studies to create treatment formulas.

## 1.2. Scope

This procedure applies to the development of treatment formulas for chemical stabilization of mixed waste.

# 2. REFERENCES

2.1 CL-SH-PR-150, Laboratory Chemical Hygiene Plan

2.2 State Issued Part B Permit, Attachment II-1-2-1, Approved Treatment Reagents

2.3 State Issued Part B Permit, Attachment II-1-3, Waste Stabilization Plan

2.4 State Issued Part B Permit, Attachment II-1-1, Method EC-0700, Matrix pH.

2.5 State Issued Part B Permit, Attachment II-1-1, Method EC-0725, Paint Filter Liquids Test

2.6 CL-LB-PR-011, Sample Control – Chain of Custody

2.7 CL-LB-PR-010, Pre-Shipment of Waste Sample Acceptance

# 3. GENERAL

## 3.1. Definitions

3.1.1. *Stabilization* - The process of treating mixed wastes by chemical oxidation or reduction, neutralization, or deactivation to reduce the leachability of the hazardous constituents.

3.1.2. *pH* - A measure of a solution's acid strength; the negative common logarithm of the $H_3O^+$ concentration.

3.1.3. *pOH* - A measure of a solution's caustic strength.

3.1.4. *Molarity* - Concentration expressed as the number of moles of solute per liter of solution.

3.1.5. *Mole* - The amount of substance containing $6.02 \times 10^{23}$ units.

3.1.6. *Off Gassing* - The gas created by chemical reactions, which can take place during the addition of reagents and/or water to waste during stabilization.

### 3.2. Responsibilities

3.2.1. Director of Mixed Waste Operations has the overall responsibility for this procedure.

3.2.2. Treatment Manager is responsible for the overall implementation and accuracy of this procedure.

3.2.3. Treatment Foreman/Operator is responsible for performing this procedure to create treatment formulas.

3.2.4. Environmental Engineer is responsible for submitting treatment formulas to the Division of Solid and Hazardous Waste (DSHW).

### 3.3. Precautions and Limitations

3.3.1. Follow the PPE and other requirements posted on the appropriate RWP.

3.3.2. When working in the lab, follow the requirements in Reference 2.1, Laboratory Chemical Hygiene Plan.

3.3.3. The Treatment Foreman/Operator shall check for heat generation and off gassing when performing this procedure. If hazardous off-gassing is suspected or detected, notify the site Industrial Hygienist.

3.3.4. All waste samples received on site for treatability studies shall be treated and disposed or returned to the generator within one year of arrival.

### 3.4. Document Control and Records

3.4.1. Attachment 5.1, Formula Development & Summary Log, shall be maintained in the Mixed Waste operating record.

## 4. REQUIREMENTS AND GUIDANCE

### 4.1. General

4.1.1. The primary goal of treatment is to achieve the applicable treatment standards or objectives. The secondary goal is to achieve a final treatment residue, which may be most easily managed. The desired physical form or consistency of the treatment residue will be similar to that of a loose, compactable soil. However, some waste will have to be treated such that the treatment residue will have physical properties similar to concrete.

4.1.2. Conditions during the performance of this procedure shall be as to replicate the full-scale operation.

4.1.3. During treatment, water and reagents shall be added to the waste in order to meet the applicable treatment standards or objectives and to ensure a treated waste at a desired consistency.

4.1.4. If the sample requires size reduction in order to optimize treatment, use a grinder or other appropriate device to reduce particle size of the sample.

4.1.5. As a result of this procedure, information about the following treatment parameters shall be developed:

(1) The amount of water needed to make a slurry.

(2) Whether a pH adjustment is needed and how to adjust the pH.

(3) The composition and amount of treatment reagents to be used.

(4) The consistency of the post treatment material.

4.1.6. The treatment formula is to be developed using the information provided by the successful completion of this procedure, then utilized in accordance with Reference 2.3, Waste Stabilization Plan.

4.1.7. Practical application and field experience may also be used as part of the process for adjusting the formulas. Justifications for adjustments shall be documented in the remarks section of Attachment 5.1, Formula Development & Summary Log.

4.1.8. The treatability study shall be documented on Attachment 5.1, Formula Development & Summary Log.

4.1.9. Apparatus and Materials

- Laboratory balance, with at least +/- 0.1g readability.
- pH Meter or pH Paper.
- Beaker or container, glass or plastic calibrated for volume, 200ml minimum.
- Timing device (clock, watch, or timer).
- Rotary grinder.
- Mixer/blender, with slow speed (Pro Line model KSM5 or similar unit).
- Stirring device (glass rod, spatula, etc.).
- Volumetric measuring devices, glass or plastic (burets, pipettors, graduated cylinders, beakers, or flasks).
- Photo-ionization detector (PID).
- Temperature meter.
- Multi-gas meter.

- Drager tube.

4.1.10. Reagents

- Tap Water.
- Surfactants, various (i.e. detergents, wetting agents and emulsifiers).
- Treatment reagents from those listed in Reference 2.2, Approved Treatment Reagents.
- Technical grade acid and/or base to adjust pH.
- Materials to adjust the consistency of the treated waste which may include:
  - Perlite
  - Diatomaceous Earth
  - Natural clay
  - Sand
  - Gravel
  - Soil

4.2. **Process**

**Note: A treatment formula may involve introduction of the water, waste, pH adjustments as necessary and reagents in the order listed below or in an alternative order. Treatment formulas may also involve preparatory and follow-up steps with different reagents. The sequence of sections 4.2.1 through 4.2.9 of this procedure may be adjusted as necessary to account for these considerations so long as the amounts and orders of introduction to the treatment process (wastes, water, reagents, and pH adjusting materials, when necessary) are determined, performed, recorded and documented properly on Attachment 5.1, Formula Development & Summary Log.**

4.2.1. Weigh or establish a tare weight or mass of an empty beaker or container.

4.2.2. Place a minimum 100g waste sample into the container. Determine the mass of the sample. Record the mass in grams.

4.2.3. Determine the volume of the sample. Record the volume in mls.

4.2.4. Place the sample into a beaker or slow speed mixer/blender.

4.2.5. Using a volumetric measuring device, add water to the sample in small amounts and stir the sample-water solution until a fluid slurry is created which is easily mixed.

4.2.6. Determine the amount of water added. Record this amount in mls.

4.2.7. Check the pH of this slurry using a pH paper or meter. If the pH meter is used, a sample of the slurry may be taken and mixed with an equal amount of water before measuring the pH. Record the initial pH.

**Note: Soil pH can also be determined using Reference 2.4, Method EC-0700, Matrix pH.**

4.2.8. If the pH requires no adjustment, record and skip to 4.2.9. If the pH adjustment is necessary then follow these steps to determine pH adjustment.

(1) Determine the amount of acid or base to add to the slurry using the following procedure.

(a) If the pH>9, determine the pOH, otherwise skip to the next step. The pOH is calculated from the pH as follows:

- pOH = 14 – pH

(b) Using the pH or pOH as determined above, calculate the molarity (moles/liter) for $H^+$ or $OH^-$ of the solution by the applicable conversion equation:

- $H^+$ Molarity (moles/liter) = $10^{-[pH]}$
- $OH^-$ Molarity (moles/liter) = $10^{-[pOH]}$
- <u>Record</u> the $H^+$ or $OH^-$ molarity.

(c) Multiply the $H^+$ or $HO^-$ molarity by the volume (mls) of water added to the waste. Record this product in millimoles. This product is the number or millimoles of acid or base needed to adjust the pH.

(d) Calculate or determine the normality of the acid or base to be used to adjust the pH. Record the acid or base normality.

(e) Divide the number of millimoles needed for the adjustment by the normality (moles/liters) of the acid or base to be used to adjust the pH. Record the quotient in mls. This is the amount of the acid or base to add to the slurry for pH adjustment.

**Note: Safety precautions should always be taken when adding acids or bases.**

(2) Mix the calculated amount of acid or base into the slurry. Record the amount of acid or base added in mls.

(3) Repeat steps 4.2.7 and 4.2.8 until adjusted pH is achieved. Record the final pH.

(4) Record any observations or reactions between the slurry and the material added to adjust pH.

4.2.9. The types of treatment reagents and the slurry-reagents ratio are selected.

(1) Identify and record the composition of the treatment reagents used.

(2) Prepare the treatment reagent(s) to be used for addition to the waste or slurry. If more than one reagent is to be used, a mixture may be made by combining the appropriate amounts --OR-- the reagents may be obtained and made ready for appropriate addition to the slurry separately.

(3) Add the selected treatment reagents to the slurry and stir as needed until the slurry is solidified. Record any observations or reactions between the slurry and the treatment reagents. Record the technique for adding the materials.

(4) Determine the amount of treatment reagents added. Record the amount in grams.

(5) Determine the final volume of the treated material. Record the amount in mls.

4.2.10. Free liquids consistency check.

Visually inspect the sample for the presence of free liquids and run the Paint Filter Liquids Test (PFLT) on the treated waste in accordance with Reference 2.5, Method EC-0725, Paint Liquids Filter Test.

(1) If free liquids are present, go to step 4.2.9.3.

(2) If there are no free liquids, record.

4.2.11. Sample collection

(1) Place the sample in an approved sampling container. Label the sample with the following information:

(a) Contract number and formula designation

(b) Date and time of the sample collection

(c) Initials of the collector

(2) Fill out a chain of custody and maintain the sample in accordance with Reference 2.6, Sample Control - Chain of Custody procedure and deliver sample to Sample Control.

4.2.12. Analytical verification.

Analytical results showing the treatment standards or objectives are met using this procedure shall be obtained in order to establish a formula for use in treatment. Additional screening methods may be employed, but official analytical tests shall be performed by a Utah Certified Laboratory.

4.2.13. Consistency adjustments.

(1) If materials or other procedures are needed to adjust the consistency of the material for disposal, add the materials to the waste or carry out the procedures to adjust the consistency of the waste. Record what these adjustments are.

(2) Record any observations or reactions during consistency adjustments.

4.2.14. Quality control.

Once a formula has been developed, a duplicate must be completed as a comparison and precision check for the items below. These precision objectives require analysis of the treatment standards. The duplicate must fit within the following ranges:

- Mass of Sample: +/- 1%
- Volume of water added: +/- 1%
- Amount added to adjust pH: +/- 1%
- Mass of reagents added: +/- 1%
- Final volume of treated material: +/- 5%
- Final mass of treated material: +/- 5%

4.2.15. Sample management and disposal

(1) Treatability study samples shall be managed in accordance with Reference 2.7, Pre-Shipment of Waste Sample Acceptance.

**Note: Within one year of receipt, all samples shall be disposed or returned to the generator.**

4.2.16. The manager of the person completing Attachment 5.1, Formula Development & Summary Log, shall review it for accuracy, completion and legibility.

4.2.17. A copy of Attachment 5.1, Formula Development & Summary Log, shall be forwarded to the Environmental Engineer to be submitted to the DSHW as the selected proprietary treatment formula.

## 5. ATTACHMENTS AND FORMS

5.1. CL-MT-PR-004-F1, Formula Development & Summary Log - Example

# ATTACHMENT 5.1
## Formula Development & Summary Log - Example

ENERGYSOLUTIONS

CL-MT-PR-004-F1
Rev. 1

## Formula Development and Summary Log

Contract – Waste Stream: _____ Date: _____ Formula Designation: _____

Waste Name: _____ Generator: _____

Visual Description of Waste: _____

| | Initial Results | | Duplicate Results | |
|---|---|---|---|---|
| 1. Mass of sample (grams) | _____ | (g) | _____ | (g) |
| 2. Sample Volume (ml): | _____ | (ml) | _____ | (ml) |
| 3. Amount of Water Added (ml): | _____ | (ml) | _____ | (ml) |
| 4. pH Result (pH units): Paper ☐ Meter ☐ | _____ | (pH0 | _____ | (pH0 |
| 5. Is pH Adjustment necessary? | Yes ☐ (follow steps a-h) | | No ☐ (go to step 6) | |
| a. H+ or OH- Molarity : | _____ | (M) | _____ | (M) |
| b. Material for Adjustment: | _____ | | _____ | |
| c. H+ or OH- to Add (#5a * #3): | _____ | (mmoles) | _____ | (mmoles) |
| d. Acid/Base Normality (H+ or OH-): | _____ | (N) | _____ | (N) |
| e. Acid/Base to Add #5 / #5c): | _____ | (ml) | _____ | (ml) |
| f. Actual Volume of Acid/Base Added: | _____ | (ml) | _____ | (ml) |
| g. pH Result: | _____ | (pH) | _____ | (pH) |

h. Observations of Reactions: _____

6. Treatment Reagents and Technique Used: _____

| | | | | |
|---|---|---|---|---|
| 7. Amount of Treatment material Added: | _____ | (g) | _____ | (g) |
| 8. Final Volume of Treated Mixture: | _____ | (ml) | _____ | (ml) |
| 9. Visual and PFLT check for free liquids Result: | Pass ☐ Fail ☐ | | Pass ☐ Fail ☐ | |

10. (#1 + #3 = #7) / #1 = _____ If greater than 2, notify UDSHW

Remarks and description of final material: _____

Waste percent of operating capacity ([#2 / #8] * 0.75) _____ %

Water added to make slurry: _____ (ml)

Treatment Reagents: _____

pH adjustment needed: Yes ☐ No ☐

If yes material strength used: _____ (N)

pH adjustment ratio (#5 / #3): _____ Gal / gal-$H_2O$

Treatment materials per waste weight ratio (#7 / #1): _____ Lbs. Per lb.-waste

Analyst (print/sign): _____ Date: _____

# Decontamination Between Stabilization Waste Streams

**Revision 0**

| | | |
|---|---|---|
| Authored By: | Signature on File<br>Craig Erickson, Mixed Waste Treatment Manager | 3/3/08<br>Date |
| Reviewed By: | Signature on File<br>Curtis Kirk, Quality Assurance Manager | 3/4/08<br>Date |
| Approved By: | Signature on File<br>Mark Ledoux, Corporate Radiation Safety Officer | 3/5/08<br>Date |
| Approved By: | Signature on File<br>Jesse Garcia, Director of Mixed Waste Operations | 3/6/08<br>Date |

☒ New
☐ Title Change
☐ Revision
☐ Rewrite

Effective Date: 3/7/08

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# 1. PURPOSE AND SCOPE

## 1.1. Purpose

This procedure outlines the steps for decontaminating the stabilization areas and mixers between waste streams. In addition, decontamination between waste streams that require solidification only, if applicable.

## 1.2. Scope

This procedure applies to equipment decontamination between waste streams treated by stabilization and/or solidification at the Clive Mixed Waste Facility.

# 2. REFERENCES

2.1. CL-SH-PR-023**,** *Control of Hazardous Energy*

2.2. CL-SH-PR-003, *Confined Space Entry*

2.3. CL-MD-PR-002, *EnergySolutions Generated Waste*

2.4. CL-MT-PR-002-F1, *Waste Treatment Formula and Treatment Record (EC2475)*

2.5. CL-MD-PR-100-F1, *Decontamination Verification Document (EC0825)*

# 3. GENERAL

## 3.1. Definitions

3.1.1. *Stabilization* - The process of treating mixed waste by mixing it with reagents to reduce the leachability of the hazardous constituents.

3.1.2. *Pre-Op Briefing* - A meeting required prior to initiation of treatment for any waste stream and prior to re-starting treatment after interruption of treatment by a different waste stream. This briefing ensures that personnel have a general understanding treatment and operational parameters, health and safety concerns and radiological concerns.

3.1.3. *Treatment Run* - All residues of one waste stream which are treated during one calendar day of operation.

3.1.4. *Treatment Batch* - Any single mixer load of waste and reagents.

3.1.5. *Mixer Tank System* - The mix chamber, loading hoppers, and floor containment tank.

3.1.6. *Decontamination* - The process of cleaning all visible removable material from waste handling equipment, containers, and building.

3.1.7. *Triple Rinse* - Consists of rinsing three times using water or a solvent capable of removing contaminants or use of water dampened cloth or other absorbent material to clean surfaces that have been in contact with waste in a process of three successive "wipe-downs."

3.2. **Responsibilities**

3.2.1. **Director of Mixed Waste Operations** has overall responsibility for this procedure.

3.2.2. **Treatment Manager** is responsible for the overall implementation and accuracy of this procedure and conducting pre-operational briefings. The Treatment Manager shall ensure that qualified personnel implement this procedure.

3.2.3. **Foreman** is responsible for building inspections and ensuring that qualified personnel implement the procedure.

3.2.4. **Treatment Operator** is responsible for overseeing and performing daily activities required for implementation of this procedure, inspecting equipment, and ensuring that required samples are pulled.

3.2.5. **Health Physics Technician** is responsible for issuing applicable Radiation Work Permits and verifying that their requirements are correctly implemented.

3.3. **Precautions and Limitations**

3.3.1. Before performing decontamination on equipment (or any other activities, which involve contact with moving parts), initiate lock/out tag/out procedure in accordance with Reference 2.1, Control of Hazardous Energy.

3.3.2. All requirements of the Radiation Work Permit (RWP) prepared for treatment of a specific waste stream apply to decontamination activities related to that waste stream.

3.3.3. Operators and technicians shall wear Personal Protective Equipment (PPE) as defined in the RWP for the waste stream being processed during startup, operation, shutdown, and cleaning.

3.3.4. In accordance with Reference 2.2, Confined Space Entry, all requirements of the Confined Space entry program shall be followed when decontamination activities (such as mixer cleanout) require confined space entry.

### 3.4. Document Control and Records

None

## 4. REQUIREMENTS AND GUIDANCE

### 4.1. Compliance

4.1.1. Equipment decontamination shall be documented at the beginning of treatment of subsequent waste streams in accordance with Reference 2.4, Waste Treatment Formula and Treatment Record. Triple rinsing shall be documented in accordance with Reference 2.5, Decontamination Verification Document.

4.1.2. If the subsequent waste is incompatible with the previous waste as defined by the Reactive Group Number Chart, the Foreman shall ensure all waste handling equipment associated with that stabilization treatment process shall undergo a triple-rinse.

### 4.2. General

4.2.1. Waste or waste water generated during decontamination may be managed with the original treatment waste stream (i.e. treated in accordance with the treatment formula) or as Energy*Solutions* waste in accordance with Reference 2.3, Energy*Solutions* Generated Waste.

4.2.2. All workers performing decontamination activities shall be qualified as Treatment Operators in accordance with Clive Facility training guidelines.

### 4.3. Procedure

4.3.1. Decontamination of the Mixers

a. Perform appropriate lockout/tagout procedures *before* beginning decontamination as applicable.

b. Remove all visible waste from the surface and interior of the mixer and associated waste handling and/or sizing equipment and place it into containers for management.

c. If the next waste stream is incompatible with the previous, triple rinse the mixer, and associated waste handling and/or sizing equipment.

4.3.2. Decontamination of the Mixed Waste Operations Building

a. Collect visible, removable material from floor of the stabilization process area. Place the collected waste in containers for management.

b. If the next waste stream is incompatible with the previous, triple rinse the mixer, and associated waste handling and/or sizing equipment.

4.3.3. Decontamination of the Mixed Waste Treatment Building

a. Collect visible, removable material from the surface of the floors and sumps of the Treatment Building. Place the collected waste in containers for management.

b. If the next waste stream is incompatible with the previous, triple rinse the mixer, and associated waste handling and/or sizing equipment.

## 5. ATTACHMENTS AND FORMS

None

ENERGYSOLUTIONS

CL-LB-WI-017

# Acid Digestion of Aqueous Samples and Extracts for Total Metals

**Revision 0**

| | | |
|---|---|---|
| Authored By: | Signature on file | 9/13/11 |
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- [X] New
- [ ] Title Change
- [ ] Revision
- [ ] Rewrite
- [ ] Cancellation

Effective Date 9/16/11

Electronic documents, once printed, are uncontrolled and may become outdated.
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# 1 PURPOSE AND SCOPE

## 1.1 Purpose

TEST METHOD: This procedure is based on USEPA SW-846 Method 3010A, *Acid Digestion of Aqueous Samples and Extracts for Total Metals for Analysis by FLAA or ICP Spectroscopy*.

## 1.2 Scope

1.2.1 SCOPE OF MATRICES: This procedure is used for the preparation of aqueous samples, extracts and mobility extracts, and waste that contains suspended solids for analysis by flame atomic absorption and inductively coupled argon plasma emission spectroscopy.

1.2.2 DETECTION LIMITS: Concentration ranges and detection limits are determined according to the element of interest and by the instrumentation rather than the digestion technique; but are typically from micrograms per liter to milligrams per liter.

1.2.3 SCOPE AND APPLICATION:

1.2.3.1 Inductively coupled plasma-atomic emission spectrometry (ICP-AES) can determine concentrations of trace elements, including metals, in solution. This method provides a procedure for preparing aqueous samples and extracts to be analyzed for trace metals by ICP-AES. Techniques for analysis other than ICP-AES may be used if they are scientifically valid and the QC criteria of the method can be achieved.

1.2.3.2 This method is considered a total digestion for most samples. It is very strong acid digestion that will dissolve almost all elements that could become environmentally available. By design, elements bound in suspended silica structures are not normally dissolved by this procedure as they are not usually mobile in the environment.

1.2.3.3 This method may be employed to prepare samples for the analysis of any elements which the laboratory can demonstrate adequate detection limits and interference correction in conjunction with adequate digestion performance as illustrated through the use of certified or known controls and the recovery of known spikes.

1.2.3.4 This method is based on SW-846 Method 3010A but is modified to use an isothermal block digester with disposable vessels rather than a constant temperature hotplate with beakers. Volumes and waste generation are reduced by use of the block digester.

1.2.3.5 Although this procedure is based on SW-846 3010A, the options used to prepare samples for ICP Mass Spectrometry and Graphite Furnace Atomic Absorption are not included within this procedure.

## 2 REFERENCES

2.1 1985 Annual Book of ASTM Standards, Vol. 11.01; *Standard Specification for Reagent Water*; ASTM: Philadelphia, PA, 1985; D1193-77

2.2 CL-LB PR-002, Sample Management

2.3 CL-LC-WI-014, Preparation of Standards and Solutions for Trace Metals Analysis

2.4 CL-SH-PR-150, Laboratory Chemical Hygiene Plan

2.5 Rohrbough, W.G.; et al. *Reagent Chemicals, American Chemical Society Specifications*, 7th ed.; American Chemical Society: Washington, DC, 1986

2.6 Thermo Elemental *IRIS Intrepid II ICP Spectrometer Operator's Guide*, January 2003

2.7 USEPA SW-846 Test Methods for Evaluating Solid Waste, Update III, Revision 1, July, 1992, Method 3010A

2.8 USEPA SW-846 Test Methods for Evaluating Solid Waste, Update III, Revision 2, December, 1996, Method 6010B

## 3 GENERAL

### 3.1 Summary

3.1.1 A mixture of nitric acid and the material to be analyzed is refluxed in a covered digestion vessel. The reflux step is repeated with acid additions until the digestate color has stabilized or other indication that no further reaction will occur. After volume reduction and the addition of hydrochloric acid, the sample is again refluxed to solvate any remaining metals. The sample is then brought to volume, filtered, if necessary and analyzed.

3.1.2 Basic Principles:

3.1.2.1 Prior to analysis, samples must be put into solution or digested using appropriate sample preparation methods. For aqueous samples and extracts in general, the technique will be to reflux the sample in hot mineral acid followed by refluxing in aqua regia to complete the digestion.

3.1.2.2 In order to maintain data quality it is necessary that the sample prepared by this method is representative of the waste stream. Samples should be stirred or shaken to assure homogeneity.

3.1.2.3 If required, a separate aliquot shall be taken to determine the total percent suspended solids content but the sample aliquot should not be filtered.

### 3.2 Definitions

3.2.1 *Aliquot* – Within the scope of this procedure, an aliquot refers to the traditional laboratory term (meaning any sub-portion of a larger quantity) and should not be confused with a sampling aliquot as defined elsewhere.

3.2.2 *Cool* – Within the scope of this procedure, cool is defined as comfortable to handle without tools or additional protective equipment (i.*e.* – a vessel which was near boiling but can now be handled without discomfort will be said to have "cooled")

3.2.3 *Inductively Coupled Plasma (ICP)* – An emission or ionization source for spectroscopic analysis based on energy transferred to the sample from a plasma stream which has been formed by inductive heating of an inert gas.

3.2.4 *Laboratory Control Sample (LCS)* – A sample with a certified or known concentration of target analyte(s) or has been fortified with a known concentration of target analyte(s) before digestion.

3.2.5 *Method Blank* – An aliquot of reagent water which has been subjected to the entire sample preparation and analysis in a manner similar to that of an analytical sample. The method blank is used to determine laboratory contamination and is prepared according to the digestion method used.

3.2.6 *Method Detection Limit (MDL)* – The level at which there is 99% confidence that the element of interest can be detected in a prepared sample.

3.2.7 *Matrix Duplicate (D or Dup)* – An intra-laboratory split sample which is used to document precision for a given matrix.

3.2.8 *Matrix Spike (MS)* – An aliquot of a sample which has been spiked before digestion with a known concentration of target analyte(s). The matrix spike is used to document method bias for a given matrix.

3.2.9 *Matrix Spike Duplicate (MSD)* – A duplicate of the matrix spike. The matrix spike duplicate is used to document method bias and precision for a given matrix.

## 3.3 Responsibilities

3.3.1 The Laboratory Manager, or designee, is responsible for:

- The overall implementation of this procedure
- Reviews all documents associated with sample analysis
- Serves as the chemical hygiene officer per CL-SH-PR-150, *Laboratory Chemical Hygiene Plan.*

3.3.2 The Chemistry Laboratory Coordinator, or designee, is responsible for:

- Overseeing the daily operations of the onsite Chemistry Laboratory, ensuring personnel coverage and proper sample management and scheduling.

3.3.3 The Metals Analyst, or designee, is responsible for:

- Performing the routine operation of the IRIS ICP spectrometer with TEVA software interface, including analysis of samples prepped for Metals Analysis.
- Supervises the Metals Prep Technician in all metals prep performance.
- Provides technical knowledge and assistance for ongoing site operations.
  - Monitoring standards of performance and monitoring the validity of analysis and the data generated to assure reliable data.
  - This responsibility will include technical direction and support for the day to day performance of the laboratory operations described in this procedure.

3.3.4 The Metals Prep Technician is responsible for:

- Performs Acid Digestion of Aqueous Samples and Extracts for Total Metals Analysis, documenting thoroughly the process.

3.3.5 The Sample Control Office, or designee, is responsible for:

- Manages all waste samples brought into the on-site laboratory for required analysis
- Documents receipt of samples and tracks sample storage and disposal

3.3.6 The Risk Manager, or designee, is responsible for:

- Assisting the Laboratory Manger in assessing chemical risks associated with samples, chemicals and reagents.

## 3.4 Precautions and Limitations

3.4.1 Personnel performing metals digestions for trace metals analysis shall be properly trained on this procedure. Those individuals not qualified accordingly may perform tasks within this procedure provided they are operating under the direction of a qualified individual.

3.4.2 Safety

3.4.2.1 All laboratory personnel shall be familiar with Energy*Solutions*', Clive Facility, chemical hygiene plan and safety procedures.

3.4.2.2 All unknown samples shall be considered both hazardous and radioactive and shall be handled accordingly. Dry samples should only be handled in a fume hood. If there is any significant chance for inhalation risk, respirators shall be worn.

3.4.2.3 Concentrated acids as employed in this procedure present a significant risk if not stored and handled properly. All steps requiring the use of concentrated acids shall be conducted in a fume hood.

3.4.2.4 Normal laboratory Personal Protective Equipment (PPE) should be employed and will include at minimum non-permeable gloves, safety glasses and laboratory coats.

3.4.3 Sample Collection, Preservation and Handling

3.4.3.1 Sample collection and management for both on-site and off-site laboratories is addressed in other Energy*Solutions*, Clive Facility documents.

3.4.3.2 PRESERVATION AND STORAGE:

3.4.3.2.1 Samples and extracts shall be stored with refrigeration to 4°C ± 2°C. Aqueous samples and extracts must be acidified to a pH < 2 with $HNO_3$.

3.4.3.3 HOLDING TIME:

3.4.3.3.1 Holding times for metals other than mercury:

3.4.3.3.1.1 Total holding time must not exceed 360 days

3.4.3.3.1.2 Holding time will be 180 days from sample collection to sample preparation.

**Note: Holding time will be 14 days from sample collection to sample TCLP extraction. Then once extracted the 180 days starts for the preparation of the extract**

3.4.3.3.1.3 Holding time will be 180 days from sample preparation to sample analysis.

3.4.3.3.2 Holding times for mercury:

3.4.3.3.2.1 Total holding time must not exceed 56 days

3.4.3.3.2.2 Holding time will be 28 days from sample collection to sample preparation.

**Note: Holding time will be 14 days from sample collection to sample TCLP Extraction. Then once extracted, the 28 days starts for the preparation of the extract.**

3.4.3.3.2.3 Holding time will be 28 days from sample preparation to mercury analysis.

3.4.4 Interferences:

3.4.4.1 Waste streams may contain a wide variety of materials and compounds that can interfere with this digestion procedure. Performance with regard to the quality control requirements given in this procedure will determine the applicability for the sample(s) of interest.

3.4.4.2 Precipitation will cause a lowering of the silver concentration and therefore an inaccurate analysis.

3.4.4.3 There are no inherent interferences from this procedure beyond those discussed in the referring analytical methods.

3.4.5 Method Performance: The laboratory will maintain and make available, quality control record to evaluate accuracy and precision of this method.

3.4.6 Pollution Prevention

3.4.6.1 Solutions, standards and samples should be prepared in the smallest volumes appropriate to the procedure and consistent with the expected usage.

3.4.6.2 Waste disposal will be preceded by the segregation of hazardous and non-hazardous materials

3.4.7 Waste Management

3.4.7.1 Contact waste is accumulated in marked containers and periodically sent to the appropriate onsite disposal facility for processing and disposal.

3.4.7.2 Non-contact waste is accumulated and sent to the on-site waste disposal facility.

3.4.7.3 Liquid contact waste is neutralized to a pH 7 ± 2, accumulated in marked containers and periodically sent to the onsite mixed waste disposal facility for treatment and disposal

3.4.7.4 Sample handling and disposal shall be performed in accordance to reference 2.2.

## 3.5 Records

3.5.1 All Metals prep batches shall be noted within a prep log, to include sample identifications and volumes used in prep; lot numbers, expiration dates, concentrations and volumes of all reagents utilized; and final digestate volumes attained in the process outlined in this procedure.

3.5.2 Completed Metals Prep logbooks shall be reviewed for completeness and consistency and transmitted to document control for storage and maintenance.

# 4 REQUIREMENTS AND GUIDANCE

## 4.1 Equipment and Supplies

4.1.1 Digestion vessels – 68 mL disposable polyethylene digestion tubes or re-usable Teflon tubes or equivalent vessels. The digestion vessel must be certified for volume if the sample will be brought to volume in the vessel.

4.1.2 Vapor recovery devices (e.g. ribbed or non-ribbed watch glasses or equivalent refluxing devices)

4.1.3 Temperature measurement devices (e.g. thermometers, IR sensors, thermisters, etc.)

4.1.4 Filters – Whatman No. 41 paper or equivalent quantitative filter

4.1.5 Funnels or equivalent

4.1.6 Heating source – adjustable and capable of maintaining sample temperatures from 90 to 95°C (e.g. block digester, controlled microwave, etc.)

4.1.7 Volumetric flasks of suitable size and accuracy

4.1.8 Volumetric pipets of suitable size and accuracy

4.1.9 Volumetric cylinders, bottles and other vessels of suitable size and accuracy as needed for the preparation and storage of standards and solutions

4.1.10 Bottles and other vessels of suitable size and materials as needed for the storage of standards and solutions.

4.1.11 Bottle top re-pipet dispensers are recommended to reduce handling when dispensing concentrated acids.

4.1.12 Auto-pipets, calibrated as required

## 4.2 Reagents and Standards

4.2.1 Reagent or trace metals grade chemicals shall be used in all procedures. Unless otherwise indicated, it is intended that all reagents shall conform to the specifications of the Committee on Analytical Reagents of the American Chemical Society, where such specifications are available. Standards that are indicated as ‘Plasma grade’ will usually be certified to be of sufficient quality for these procedures. Other grades may be used, provided it is first ascertained that the reagent is of sufficiently high purity to permit its use without lessening the accuracy of the determination. If the purity of a reagent is in question it shall be analyzed and if the

concentration of the contamination is less than the MDL, then the reagent is acceptable.

4.2.2 The expiration date of commercially prepared solutions will be as stated by the vendor. If no expiration date is stated, the expiration date for solutions will be 1 year from the date of receipt and for solid materials it will be 3 years from the date of receipt. Solutions prepared by the laboratory will have an expiration date of 6 months unless otherwise stated in the preparation procedure. Any material deemed to be inadequately stable may be assigned a shorter expiration period. All neat and prepared materials will be stored at room temperature unless otherwise designated.

4.2.3 **Nitric Acid, Concentrated (67%-70% w/w) $HNO_3$**
Acids which are not certified for adequate purity should be analyzed to determine the level of impurities. If the method blank is < the MDL, the acid may be used.

4.2.4 **Hydrochloric Acid, Concentrated (34%-37% w/w) HCl**
Acids which are not certified for adequate purity should be analyzed to determine the level of impurities. If the method blank is < the MDL, the acid may be used.

4.2.5 **Hydrochloric Acid 1:1 – 1:1 by volume**
Concentrated HCl / reagent water. Prepare by slowly adding 500 mL of concentrated hydrochloric acid to approximately 400 mL of reagent water in a suitable volumetric container. Bring to a final volume of one (1) liter. Other volumes may be prepared by proportional adjustment of volumes.

4.2.6 **ICP Spike Solution**
A concentrated multi-element mix for addition to samples and/or blanks to determine the method performance. Their preparation is described in reference 2.3.

4.2.7 **Reagent Water**
Reagent water for ICP analysis shall be free of detectable interferences and shall meet or exceed ASTM Type II requirements.

4.3 **Calibration and Standardization -** does not apply to this procedure

4.4 **Procedure**

4.4.1 Transfer a 50 mL representative aliquot of the well mixed sample to a 68 mL block digestion vessel and add 1.5 mL of concentrated $HNO_3$. Cover the vessel with a ribbed watch glass or equivalent vapor recovery device.

4.4.2 Place the filled vessel in the block digester and begin heating to a temperature of 95°C ± 5°C. Heat until the volume is reduced to less than 3mL.

4.4.3 Do not allow any sample to boil at any time during this procedure and do not allow any sample to go to dryness.

4.4.4 Remove the sample from the heat source and allow to cool.

4.4.5 Add another 1.5 mL portion of concentrated $HNO_3$. Cover the vessel with a non-ribbed watch glass or equivalent. Return the sample to the heat source and if necessary, increase the heat until a gentle reflux action occurs.

4.4.6 Continue to heat, adding acid as necessary, until the digestion is complete. Completion of the digestion is normally indicated when the digestate has become light in color or when there is no further change in appearance with additional refluxing.

4.4.7 Uncover the vessel and evaporate the sample to a low volume (approximately 1.5 mL). Remove the sample from the heat source just prior to reaching this volume to prevent any portion of the vessel from going dry.

4.4.8 Allow to cool and add 5 mL of 1:1 hydrochloric acid.

4.4.9 Cover the vessel and return to the heat source. Reflux for 15 additional minutes to dissolve any precipitate or residue. Remove from heat and allow to cool.

4.4.10 Wash down the walls of the vessel and the reflux cover with reagent water and bring back to the original volume of 50 mL. If an internal standard spike such as scandium and/or yttrium is to be included with the digestate, it will be added before the sample is brought to volume.

4.4.11 If necessary, the sample may be filtered at this time to prevent suspended material from clogging the instrument's introduction system. The sample is now ready for analysis.

4.5 **Quality Control**:

4.5.1 All quality control data shall be maintained and available for easy reference or inspection. All quality control measures described in Chapter One of SW-846 should be followed.

4.5.2 A sample batch shall consist of a group of samples brought through the entire digestion process and subjected to the same reagents, labware, etc. at the same time. No more than 20 samples plus the necessary QC will be included in one batch.

4.5.3 Employ a minimum of one method blank per sample batch to determine if contamination or any memory effects are occurring. A method blank is a volume of reagent water carried through the same preparation process as a sample (refer to Chapter One of SW-846).

4.5.4 Employ a minimum of one laboratory control sample (LCS) per sample batch to determine the performance of the digestion procedure. An LCS is an aliquot of reagent water which has been fortified by the laboratory with a known amount of the elements of interest or a certified material which has a known concentration of the elements of interest. The LCS is brought through the entire digestion process as a sample (refer to Chapter One of SW-846).

4.5.5 Employ a minimum of one spiked sample per sample batch to determine method bias by the recovery of target analytes from the matrix.

4.5.6 Employ a minimum of one duplicate and/or one spike duplicate per sample batch to determine precision of the procedure in total.

4.5.7 Analyze matrix spiked duplicate samples as a frequency of one per matrix batch. A matrix duplicate sample is a sample brought through the entire sample preparation and analytical process in duplicate.

4.5.8 The spiked sample or spiked duplicate sample recovery is to be within ± 25% of the actual value or within the documented historical acceptance limits for each matrix.

4.5.9 The method of standard addition shall be used for the analysis of all EP extracts and delisting petitions. Although not required, use of the method of standard addition is recommended for any sample suspected of having interferences which are suppressing the recovery of elements of interest.

4.6 **Data Analysis and Calculations**:

4.6.1 The percent recovery between matrix spiked sample and matrix sample is to be calculated as follows:

$\%R = (D\ 2 – D\ 1) / D\ 1 \times 100$

Where:

%R = percent recovery

D1 = sample value

D2 = spiked sample value

4.6.2 The relative percent difference between matrix spiked duplicate or matrix duplicate determination is to be calculated as follows:

$RPD = (D\ 1 – D\ 2) / ((D\ 1 + D_2)/2) \times 100$

Where:

RPD = relative percent difference

D1 = first sample value

D2 = second sample value (duplicate)

**Note: A control limit of ± 20% RPD or within the documented historical acceptance limits for each matrix shall be used for**

**sample values greater than ten times the instrument detection limit.**

4.7 **Data Assessment and Acceptance for Quality Control**: No sample or QC data are generated or evaluated by this procedure

4.8 **Corrective Actions for Out-of-Control Data**:

4.8.1 If the sample(s) starts to boil, reduce the temperature of the block digester.

4.8.2 If the sample(s) goes dry, it is no longer analytically valid and shall be discarded. This will be noted in the logbook and the procedure is to be restarted with a fresh aliquot of that sample

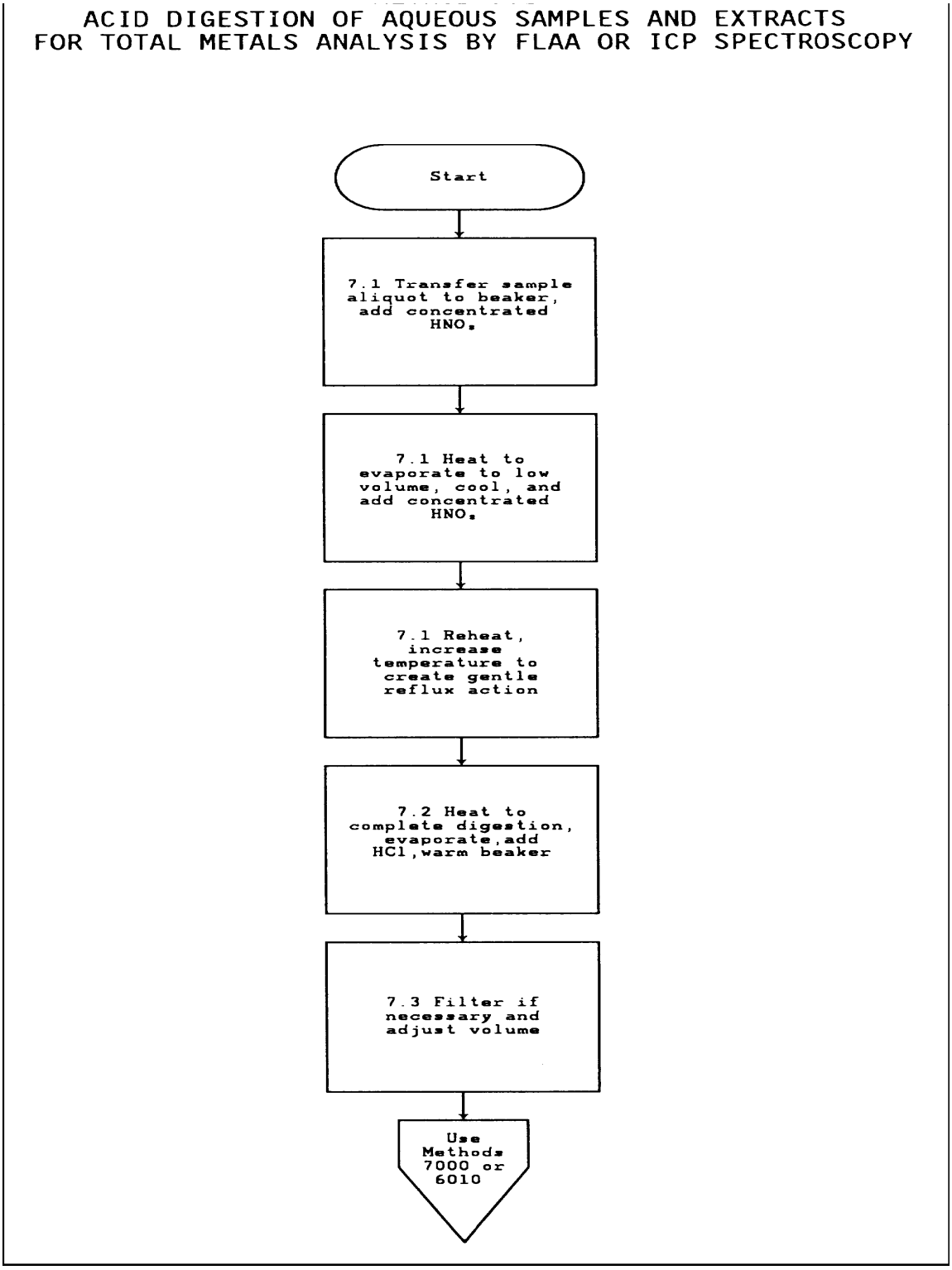
4.9 **Contingencies for Handling Out-of-Control or Unacceptable Data**: does not apply to this procedure

## 5 ATTACHMENTS AND FORMS

5.1 Flow diagram of 3010A from SW-846

**Note: Numbers in the diagram refer to the text sections of the referenced method.**

Attachment 5.1 - Flow diagram of Method 3010A from SW-846



ENERGYSOLUTIONS

CL-IN-PR-402

# Calibration and Operation of the Canberra Tennelec Series 5XLB

**Revision 0**

| | | |
|---|---|---|
| Authored By: | Signature on File<br>Dale Thorne, Health Physics Technician | 12/21/11<br>Date |
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☒ New
☐ Title Change
☐ Revision
☐ Rewrite

Effective Date: 12/21/11

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# 1. PURPOSE AND SCOPE

## 1.1. Purpose

This procedure provides instructions for the calibration and operation of the Tennelec Series 5XLB Automatic Low Background Counting System.

## 1.2. Scope

This procedure applies to the setup, calibration, and operation of the Tennelec Series 5XLB Automatic Low Background Counting System.

# 2. REFERENCES

2.1. S550 Eclipse LB User's Manual

# 3. GENERAL

## 3.1. Definitions

3.1.1. *Apparent Source Activity* – Source Activity, in dpm, equivalent to the 2π surface emission rate (in alphas or betas per minute) times a factor of 2. For example, if the source beta emission rate is 300 betas per minute, then the apparent source activity is 300 X 2 =600 dpm.

3.1.2. *Auto ROI (Region of Interest)* – Procedure that automatically adjusts alpha discriminators to minimize false readings of alphas counted as betas and betas counted as alphas in Simultaneous Count Mode.

3.1.3. *Blank Carrier* – Carriers used to fill in the space between sample changer columns.

3.1.4. *Calibrate* - To adjust or determine or both: (1) the response or reading of an instrument relative to a series of conventionally true value; or (2) the strength of a radiation source relative to a standard or conventionally true value.

3.1.5. *Calibration Carrier* - Carrier used to indicate to the instrument that calibration procedures are to be performed on the carriers that follow.

3.1.6. *Calibration Source* – A sample of radioactive material, usually with a long half-life, in which the number and type of radioactive atoms at a definite reference date and time is known. Calibration sources are used in the calibration of the Tennelec Series 5XLB Automatic Low Background Counting System.

3.1.7. *Carrier* – Plastic plates used to either carry samples for counting or to indicate to the instrument what process to perform. The following are the carriers used by the Tennelec Series 5XLB Automatic Low Background Counting System:

- Sample Carriers (numbered 1-100)
- End Plate
- Blank Carrier
- Group Carrier
- QC Carrier
- Calibration Carrier

3.1.8. *Check Source* - A radioactive source, not necessarily calibrated, which is used to confirm the continuing satisfactory operation of an instrument.

3.1.9. *Eclipse LB* – Software used in the set up, calibration, quality control, and operation of the Canberra Series 5 Counting Systems.

3.1.10. *Efficiency* - A ratio of the number of counts recorded relative to the number of nuclear transformations occurring.

3.1.11. *End Plate* – Carriers which indicate to the instrument that it has reached the end of the carriers.

3.1.12. *Group Carrier* – Carriers lettered A thru J, which indicate to the instrument what counting requirements are needed for the samples that follow.

3.1.13. *Guard Detector* - A detector used in anti-coincidence counting to reject events from cosmic rays. When an event occurs in both the sample and guard detector within an assigned time interval, the count is not added to the channel accumulating the data.

3.1.14. *Plateau* - As applied to radiation detector chambers, the level portion of the counting rate voltage curve where changes in operating voltage introduce minimum changes in the counting rate.

3.1.15. *Procedure* – A set of instructions that describe the conditions under which a sample will be counted plus additional instructions on how the results of that count will be analyzed and reported. Procedures which may be used by the instrument include the following:

3.1.15.1 Sample Counting Procedures

3.1.15.2 Calibration Procedures

- Plateau Procedures

- Background Procedure
- Efficiency Procedure
- Attentuation Procedure

3.1.16. *QC Carrier* – Carrier used to indicate to the instrument that quality control procedures are to be performed on the carriers that follow.

3.1.17. *Sample Changer* - Columns used for holding the carriers. The right column is for loading, and the left column is used for holding carriers as they are processed.

3.1.18. *Sample Detector* – A 2.25 inch diameter pancake style gas-flow proportional detector. The detector features twin anodes for excellent counting uniformity and an ultrathin 80 $\mu g/cm^2$ entrance window for high counting efficiency.

3.1.19. *Sequence* – A series of procedures set to run in a specific order. Sequences which may be used by the instrument include the following:

- Auto Cal sequence
- Auto QC sequence
- Super sequence

3.1.20. *Spillover* - The number of erroneous counts in a counting channel (alpha or beta) in systems capable of simultaneous counting. Alpha-into- beta crosstalk occurs when the higher energy alpha particle creates a smaller charge within the detector because of a nonuniform detector response. Beta-into-alpha crosstalk occurs when the beta particle backscatters into the sensitive volume, creating a larger charge.

## 3.2. Responsibilities

3.2.1. Director of Health Physics (DHP) or designee is responsible for the overall radiation protection and compliance with state and federal regulations.

3.2.2. Assistant Site Radiological Safety Officer (ASRSO) or designee is responsible for the overall operation of the Tennelec Series 5XLB Automatic Low Background Counting System.

3.2.3. Health Physics Technicians (HPT's) or Instrument Operators are responsible for the routine implementation of this procedure.

3.2.4. Health Physics Administrative Assistant (HPAA) is responsible for processing radiological documentation and forwarding it to Document Control.

### 3.3. Precautions and Limitations

3.3.1. Calibration must be performed semi-annually.

3.3.2. QC checks must be performed daily or prior to each intermittent use.

3.3.3. The DHP or designee shall approve the sources used for calibration and QC checks.

3.3.4. The same depth carrier insert must be used for sample counts as was used for a current calibration.

3.3.5. Planchets and samples must be loaded correctly to prevent jamming of the carriers and damage to the sample detector window.

3.3.6. Only P-10 gas is to be used with this instrument.

3.3.7. If there is a change to the Automatic Gas Flow regulation then re-calibration of the instrument may be necessary.

3.3.8. This instrument contains moving parts. Keep hands and clothing clear of the moving parts.

### 3.4. Document Control and Records

3.4.1. Documents generated pursuant to this procedure shall be maintained in accordance with CL-QA-PR-005 Quality Assurance Records.

3.4.2. All documents generated pursuant to this procedure shall be transmitted to Document Control by the HPAA within 30 days of receipt.

## 4. REQUIREMENTS AND GUIDANCE

### 4.1. Initial Set Up

4.1.1. **ATTACH** gas line to instrument and P-10 bottle.

4.1.2. **SET** gas pressure at bottle to 10 psi.

4.1.3. **ALLOW** gas line and detector to purge.

4.1.4. **ENSURE** that instrument is connected to AC power via a unit with surge suppression capability.

4.1.5. **TURN ON** instrument.

4.1.6. **INSTALL** and then **OPEN** Eclipse software.

4.1.7. **CREATE** user names and passwords with appropriate security rights for authorized users as needed and as instructed in user's manual.

4.1.8. **ENTER** calibration source information as instructed in user's manual.

**Note: The Apparent Source Activities must be used when entering the activity levels for these sources.**

4.1.9. **CREATE** Plateau, Auto ROI, Background, and Efficiency procedures as instructed in user's manual.

4.1.10. **CREATE** As Found sequence which includes Background and Efficiency procedures as instructed in user's manual.

4.1.11. **CREATE** Auto Cal sequence as instructed in user's manual.

4.1.12. **CREATE** sample counting procedures as needed and as instructed in user's manual.

4.1.13. **INSTALL** carrier plates in between sample changers in the following order going from left to right:

4.1.13.1. End Plate

4.1.13.2. Blank Carrier

4.1.13.3. Blank Carrier

4.2. **Calibration**

4.2.1. **VERIFY** that instrument is hooked up to P-10 gas and that pressure is set to 10 psi.

4.2.2. **OPEN** Eclipse software.

4.2.3. **ENTER** username and password.

**Note: The user must have been granted sufficient security rights to perform calibration.**

4.2.4. **OBTAIN** calibration sources and **VERIFY** that source serial numbers, isotopes, and apparent source activities match information entered in Eclipse software.

4.2.5. **OBTAIN** CL-IN-PR-402-F2, Canberra Tennelec S5-AB Calibration Certificate (Attachment 5.2.).

4.2.6. **ENTER** the following information on CL-IN-PR-402-F2, Canberra Tennelec S5-AB Calibration Certificate (Attachment 5.2.).

- Instrument Serial Number
- Calibration Source Information

- Environmental Conditions

4.2.7. **OBTAIN** previous calibration certificate and **ENTER** Previous Efficiencies on CL-IN-PR-402-F2, Canberra Tennelec S5-AB Calibration Certificate (Attachment 5.2.).

4.2.8. **INSTALL** group and carrier plates in right sample changer in the following order going from bottom to top:

**Note: Carrier inserts must be the same as listed on previous calibration certificate under Geometry Selection.**

4.2.8.1. Calibration Carrier

4.2.8.2. Carrier #1 – Alpha Calibration Source

4.2.8.3. Carrier #2 – Beta Calibration Source

4.2.8.4. Carrier #3 – Blank Planchet for background check

4.2.8.5. End Plate

4.2.9. **CLICK** on Go button of toolbar.

4.2.10. **SELECT** and **OPEN** As Found sequence associated with calibration sources and geometry that you are using.

**Note: This sequence will update the background and perform and print As Found efficiencies.**

4.2.11. **ALLOW** sequence to finish.

4.2.12. **OBTAIN** printed reports.

4.2.13. **ENTER** As Found Efficiencies and Spillover on CL-IN-PR-402-F2, Canberra Tennelec S5-AB Calibration Certificate (Attachment 5.2.).

4.2.14. **WRITE** "As Found" on top of Alpha and Beta Efficiency Reports.

4.2.15. **VERIFY** that As Found efficiencies are within +/- 10% of previous calibration efficiencies.

4.2.16. **IF** As Found efficiencies are not with +/- 10% of previous calibration efficiencies, **NOTIFY** ASRSO or designee.

4.2.17. **CORRECT** page numbering so that reports reflect the following numbering sequence:

- Page 6 of 12 – As Found Alpha Efficiency Report
- Page 7 of 12 – As Found Beta Efficiency Report

4.2.18. **CLOSE** background and efficiency windows.

4.2.19. **IF** calibration is for a different geometry than required for As Found measurement, **CHANGE** carrier inserts to desired depth **OTHERWISE** proceed to 4.2.20.

4.2.20. **CLICK** on Go button of toolbar.

4.2.21. **SELECT** and **OPEN** Plateau sequence associated with geometry that you are using.

**Note: This sequence will perform and print plateaus.**

4.2.22. **ALLOW** sequence to finish.

4.2.23. **CLICK** plateau tab in alpha plateau window and then **CLICK** Use Auto Selected.

4.2.24. **REPEAT** 4.2.23. for beta plateau.

4.2.25. **OBTAIN** printed reports.

4.2.26. **ENTER** page numbering so that reports reflect the following numbering sequence:

- Page 8 of 12 – Alpha Plateau Report
- Page 9 of 12 – Alpha Plateau Report

4.2.27. **ENTER** carrier insert information in Geometry Selection on CL-IN-PR-402-F2, Canberra Tennelec S5-AB Calibration Certificate (Attachment 5.2.).

4.2.28. **CLOSE** plateau windows.

4.2.29. **CLICK** on Go button of toolbar.

4.2.30. **SELECT** and **OPEN** Calibration sequence associated with calibration sources and geometry that you are using.

**Note: This sequence will perform Auto ROI, update background, and perform and print efficiencies.**

4.2.31. **ALLOW** sequence to finish.

4.2.32. **COPY** Auto ROI window and **PASTE** in a Word document.

4.2.33. **ADJUST** size and orientation of Auto ROI to fit page in Word document and **PRINT.**

4.2.34. **OBTAIN** printed reports.

4.2.35. **VERIFY** that average alpha spillover is between 20 to 25 percent and average beta spillover is less than 1 percent on efficiency reports.

4.2.36. **WRITE** "Auto ROI" on top of Auto ROI Word document.

4.2.37. **ENTER/CORRECT** page numbering so that reports reflect the following numbering sequence:

- Page 10 of 12 – Auto ROI
- Page 11 of 12 – Alpha Efficiency Report
- Page 12 of 12 – Beta Efficiency Report

4.2.38. **ENTER** As Left Efficiencies and Spillover on CL-IN-PR-402-F2, Canberra Tennelec S5-AB Calibration Certificate (Attachment 5.2.).

4.2.39. **CLOSE** Auto ROI, background, and efficiency windows

4.2.40. **REMOVE** group and carrier plates.

4.2.41. **OBTAIN** Check Sources and **ENTER** source information on CL-IN-PR-402-F2, Canberra Tennelec S5-AB Calibration Certificate (Attachment 5.2.).

4.2.42. **INSTALL** group and carrier plates in right sample changer in the following order going from bottom to top:

**Note: Carrier inserts must be the same as used for plateaus, Auto ROI, and efficiencies**

4.2.42.1. Group A

4.2.42.2. Carrier #1 – Alpha Check Source

4.2.42.3. Group B

4.2.42.4. Carrier #2 – Beta Check Source

4.2.42.5. End Plate

4.2.43. **CLICK** on Go button of toolbar.

4.2.44. **SELECT** and **OPEN** Reference Reading sequence.

**Note: This sequence will perform 21 one minute counts of the alpha and beta check sources. The data from these counts will be used for the Chi Squared Test and to set the Reference Readings for the check sources.**

4.2.45. **ALLOW** sequence to finish.

4.2.46. **CLOSE** reference reading windows.

4.2.47. **CLOSE** Eclipse software.

4.2.48. **REFRESH** data on CL-IN-PR-402-F2, Canberra Tennelec S5-AB Calibration Certificate (Attachment 5.2.).

4.2.49. **VERIFY** that imported data in alpha and beta worksheets is for the current day.

4.2.50. **VERIFY** that Chi Squared results are within both .95/.05 and .90/.10 ranges for both sources. The spreadsheet will indicate Pass or Fail for .95/.10 range. and Yes or No for .90/.10 range. If Pass and Yes are indicated for both sources then **PROCEED** to 4.2.53.

4.2.51. **IF** results are within .95/.05 range but not within .90/.10 range then Chi Squared Test results are considered acceptable, but you will need to **INVESTIGATE** the cause of the instrument's performance.

4.2.52. **IF** instrument falls out of both ranges, instrument is considered "Out of Service". **NOTIFY** ASRSO or designee.

4.2.53. **ENTER** Calibration Date, Calibration Due Date, and any Comments on CL-IN-PR-402-F2, Canberra Tennelec S5-AB Calibration Certificate (Attachment 5.2.).

4.2.54. **PRINT, SIGN,** and **DATE** the following:

- CL-IN-PR-402-F2, Canberra Tennelec S5-AB Calibration Certificate (Attachment 5.2. – Page 1 of 12.)
- Canberra Tennelec S5-AB MDA Chart - Smear Efficiency (Attachment 5.3. – Page 2 of 12)
- Canberra Tennelec S5-AB MDA Chart - Filter Efficiency (Attachment 5.4. – Page 3 of 12)
- Alpha Control Chart (Attachment 5.5. – Page 4 of 12)
- Beta Control Chart (Attachment 5.6. – Page 5 of 12)

4.2.55. **SIGN,** and **DATE** the following:

- As Found Alpha Efficiency Report (Page 6 of 12)
- As Found Beta Efficiency Report (Page 7 of 12)
- Alpha Efficiency Report (Page 11 of 12)
- Beta Efficiency Report (Page 12 of 12)

**Note: A complete calibration package consists of all of the above mentioned items as well as the following:**

- Alpha Plateau Report (Page 8 of 12)
- Alpha Plateau Report (Page 9 of 12)
- Auto ROI (Page 10 of 12)

4.2.56. **COMPLETE** a calibration sticker for instrument. As a minimum, **INCLUDE** the following additional information on sticker:

- Instrument Serial Number
- Calibration Date
- Calibration Due Date
- Calibration Technician's Initials

4.2.57. **SUBMIT** calibration package to ASRSO or designee for review.

4.2.58. **FORWARD** calibration package to HPAA.

4.2.59. HPPA shall **TRANSMIT** reviewed calibration package to Document Control within 30 days of receipt.

4.2.60. **UPDATE** current CL-IN-PR-402-F1, Canberra Tennelec S5-AB Constancy Check Sheet (Attachment 5.1.) with new information (i.e. Calibration Date, Calibration Due, Calibrated By, Reference Readings, Calibration Geometry, etc.).

## 4.3. Operation

### 4.3.1. Background

**Note: A background count is required daily prior to constancy check when instrument is in use. Additional background counts should be made if there is reason to believe that the background has changed significantly since the background count.**

4.3.1.1. **VERIFY** that P-10 gas pressure is set to 10 psi and that sufficient gas remains for operation period.

4.3.1.2. **OPEN** Eclipse software.

4.3.1.3. **ENTER** username and password.

**Note: The user must have been granted sufficient security rights to perform this operation.**

4.3.1.4. **INSTALL** group and carrier plates in right sample changer in the following order going from bottom to top:

**Note: Carrier inserts must be the same as listed on a current CL-IN-PR-402-F1, Canberra Tennelec S5-AB Constancy Check Sheet (Attachment 5.1.).**

4.3.1.4.1. Group A

4.3.1.4.2. Carrier #3 (With clean empty planchet in it)

4.3.1.4.3. End Plate

4.3.1.5. **CLICK** on Go button of toolbar.

4.3.1.6. **SELECT** and **OPEN** AB Bkgd procedure.

**Note: The background procedure is set for 100 minutes.**

4.3.1.7. **ALLOW** procedure to finish.

4.3.1.8. **VERIFY** that backgrounds are normal and acceptable.

4.3.1.9. **CLOSE** AB Bkgd window.

4.3.1.10. As needed **CLOSE** Eclipse software.

4.3.2. **Constancy Check**

4.3.2.1. As needed **OPEN** Eclipse software.

4.3.2.2. As needed **ENTER** username and password.

**Note: The user must have been granted sufficient security rights to perform this operation.**

4.3.2.3. **OBTAIN** check sources.

**Note: The check sources need to be the same as those listed on a current CL-IN-PR-402-F2, Canberra Tennelec S5-AB Calibration Certificate (Attachment 5.2.).**

4.3.2.4. **INSTALL** group and carrier plates in right sample changer in the following order going from bottom to top:

**Note: Carrier inserts must be the same as listed on a current CL-IN-PR-402-F1, Canberra Tennelec S5-AB Constancy Check Sheet (Attachment 5.1.).**

4.3.2.4.1. Group A

4.3.2.4.2. Carrier #1 (Alpha Check Source)

4.3.2.4.3. Group B

4.3.2.4.4. Carrier #2 (Beta Check Source)

4.3.2.4.5. End Plate

4.3.2.5. **CLICK** on Go button of toolbar.

4.3.2.6. **SELECT** and **OPEN** Constancy Check sequence.

4.3.2.7. **ALLOW** sequence to finish.

4.3.2.8. **CLOSE** Constancy Check windows.

4.3.2.9. **CLOSE** Eclipse software.

4.3.2.10. **OBTAIN** and **OPEN** current CL-IN-PR-402-F1, Canberra Tennelec S5-AB Constancy Check Sheet (Attachment 5.1.).

4.3.2.11. **VERIFY** that information on current CL-IN-PR-402-F1, Canberra Tennelec S5-AB Constancy Check Sheet (Attachment 5.1.) is accurate.

4.3.2.12. **REFRESH** data on current CL-IN-PR-402-F1, Canberra Tennelec S5-AB Constancy Check Sheet (Attachment 5.1.).

4.3.2.13. **VERIFY** that background, alpha constancy check, and beta constancy check data for current day have updated in current CL-IN-PR-402-F1, Canberra Tennelec S5-AB Constancy Check Sheet (Attachment 5.1.).

4.3.2.14. **IF** alpha and beta constancy check data is within +/- 2 sigma range then **PROCEED** to 4.3.2.18.

**Note: Readings should statistically fall within the +/- 2 sigma range 19 out of 20 times.**

4.3.2.15. **IF** alpha and or beta constancy check data fall outside of +/- 2 sigma range but are within 3 sigma range then **REPEAT** constancy check for source or sources.

4.3.2.16. **IF** alpha and or beta constancy check data fall outside of +/- 2 sigma range again **INVESTIGATE** the cause of the readings and as necessary **NOTIFY** ASRSO or designee.

4.3.2.17. **IF** alpha and or beta constancy check data fall outside of +/- 3 sigma range, then **TAG** instrument Out of Service, **INVESTIGATE** cause of readings, and **NOTIFY** ASRSO or designee.

**Note: The constancy check must fall within the +/- 2 sigma range before the instrument can be placed back into service.**

4.3.2.18. **PRINT** current CL-IN-PR-402-F1, Canberra Tennelec S5-AB Constancy Check Sheet (Attachment 5.1.).

4.3.2.19. **INTIAL** and **DATE** current CL-IN-PR-402-F1, Canberra Tennelec S5-AB Constancy Check Sheet (Attachment 5.1.) and **ADD** comments as necessary.

4.3.2.20. **SAVE** current CL-IN-PR-402-F1, Canberra Tennelec S5-AB Constancy Check Sheet (Attachment 5.1.) using the current date as the file name.

4.3.2.21. **IF** instrument passed constancy check **INITIAL** constancy verification sticker for current day.

4.3.2.22. **REMOVE** check sources.

4.3.2.23. **FORWARD** completed CL-IN-PR-402-F1, Canberra Tennelec S5-AB Constancy Check Sheets to HPAA at the end of each quarter.

4.3.2.24. HPPA shall **TRANSMIT** completed CL-IN-PR-402-F1, Canberra Tennelec S5-AB Constancy Check Sheets to Document Control within 30 days of receipt.

4.3.3. **Sample Counting**

**Note: A variety of different procedures and sequences may be created for specific counting needs. Each procedure may have a different configuration (i.e. count time, activity units, associated form, geometry, etc.). The following are general instructions for using counting procedures and sequences and may not provide sufficient instruction for all applications. Please refer to the S550 Eclipse LB User's Manual for additional instruction on the creation and use of procedures and sequences.**

4.3.3.1. **ENSURE** that constancy check label has been initialed for current day.

4.3.3.2. **REVIEW** Canberra Tennelec S5-AB MDA Charts (See Attachments 5.3. and 5.4.) to ensure that procedure(s) will meet any sample MDA requirements.

4.3.3.3. **LOAD** planchets in numbered carrier with samples for counting.

**Note: When loading samples care should be taken to ensure that the sample is situated such that it will remain below the top edge of the planchet. Disk smears should be firmly affixed to the bottom of the planchets so that they will not rise up during counting and potentially damage or contaminate the detector.**

4.3.3.4. **STACK** carriers with first sample to be counted on bottom and last to be counted on top.

4.3.3.5. **INSTALL** group and carrier plates in right sample changer in the following order going from bottom to top:

**Note: Carrier inserts must be the same as listed on a current applicable Constancy Check Sheet, Calibration Certificate, and the procedure that is to be used.**

4.3.3.5.1. Group plate designated by procedure or sequence

4.3.3.5.2. Sample Carrier plates

4.3.3.5.3. Additional Group and Sample Carrier plates if a sequence is being run

4.3.3.5.4. End plate

4.3.3.6. **OPEN** Eclipse software.

4.3.3.7. **ENTER** username and password.

**Note: The user must have been granted sufficient security rights to perform this operation.**

4.3.3.8. **CLICK** on Go button of toolbar.

4.3.3.9. **SELECT** and **OPEN** counting procedure or sequence.

4.3.3.10. **ALLOW** procedure or sequence to finish.

4.3.3.11. As necessary **REVIEW** and or **DOCUMENT** count data.

**Note: The data may be reviewed and or documented in the following ways.**

- **The procedure may be configured to automatically print a sample report with data in a variety of different activity units.**
- **Additional sample information may be added to sample batch by using Sample Manager. (See Sample Manager chapter in user's manual). The batch may then be printed.**
- **The data may be imported from the Eclipse data base file into a spreadsheet.**

4.3.3.12. **REMOVE** carriers and group plates.

4.3.3.13. **CLOSE** counting procedure window.

4.3.3.14. **CLOSE** Eclipse software.

## 5. ATTACHMENTS AND FORMS

5.1. CL-IN-PR-402-F1, Canberra Tennelec S5-AB Constancy Check Sheet (Example)

5.2. CL-IN-PR-402-F2, Canberra Tennelec S5-AB Calibration Certificate (Example)

5.3. Canberra Tennelec S5-AB MDA Chart - Smear Efficiency (Example)

5.4. Canberra Tennelec S5-AB MDA Chart - Filter Efficiency (Example)

5.5. Alpha Control Chart (Example)

5.6. Beta Control Chart (Example)

5.1. **CL-IN-PR-402-F1, Canberra Tennelec S5-AB Constancy Check Sheet (Example)**

ENERGYSOLUTIONS

Canberra Tennelec S5-AB
Constancy Check Sheet

CL-IN-PR-402-F1
Rev. 0

Selected Geometry: 1/8" Stainless Steel Insert | Technician's Initials: JD | Date: 11/9/2011

Detector Serial #: 719486 | Alpha Check Source: Th-230 / # F6-074 | Beta Check Source: Sr90/Y90 / # F6-075

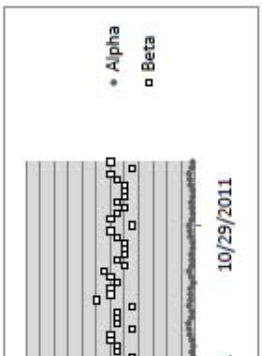
Calibration Date: 7/1/2011 | Reference Reading: 4965 CPM | Reference Reading: 5861 CPM

Calibration Due: 1/1/2012 | +/- 2 Sigma: 4824 <> 5107 CPM | +/- 2 Sigma: 5715 <> 6008 CPM

Calibrated By: John Doe | +/- 3 Sigma: 4754 <> 5177 CPM | +/- 3 Sigma: 5642 <> 6081 CPM

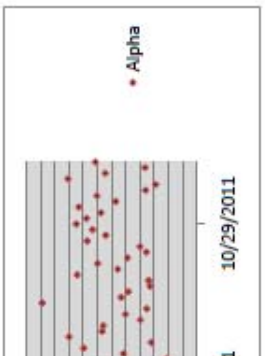
Background

| α CPM | β CPM | Date |
|---|---|---|
| 0.03 | 1.10 | 10/31/2011 |
| 0.04 | 1.00 | 11/1/2011 |
| 0.05 | 1.10 | 11/2/2011 |
| 0.03 | 1.00 | 11/3/2011 |
| 0.03 | 1.00 | 11/4/2011 |
| 0.06 | 1.00 | 11/5/2011 |
| 0.07 | 1.10 | 11/6/2011 |
| 0.08 | 1.20 | 11/7/2011 |
| 0.04 | 0.90 | 11/8/2011 |
| 0.03 | 1.20 | 11/9/2011 |



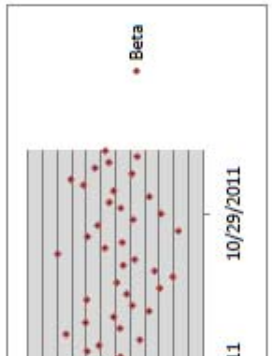

Alpha Check Source

| α CPM | β CPM | Date |
|---|---|---|
| 4992 | 1080 | 10/31/2011 |
| 5047 | 1094 | 11/1/2011 |
| 4955 | 1052 | 11/2/2011 |
| 5002 | 986 | 11/3/2011 |
| 4881 | 1044 | 11/4/2011 |
| 4856 | 1000 | 11/5/2011 |
| 5074 | 894 | 11/6/2011 |
| 4981 | 1088 | 11/7/2011 |
| 4882 | 1090 | 11/8/2011 |
| 5006 | 1075 | 11/9/2011 |




Beta Check Source

| α CPM | β CPM | Date |
|---|---|---|
| 5877 | 1.02 | 10/31/2011 |
| 5776 | 4.02 | 11/1/2011 |
| 5866 | 0.00 | 11/2/2011 |
| 5942 | 0.00 | 11/3/2011 |
| 5974 | 1.02 | 11/4/2011 |
| 5820 | 0.00 | 11/5/2011 |
| 5913 | 1.98 | 11/6/2011 |
| 5878 | 1.98 | 11/7/2011 |
| 5807 | 1.02 | 11/8/2011 |
| 5887 | 0.00 | 11/9/2011 |




Comments:

## 5.2. CL-IN-PR-402-F2, Canberra Tennelec S5-AB Calibration Certificate (Example)

ENERGYSOLUTIONS

CL-IN-PR-402-F2
Revision 0

### Canberra Tennelec S5-AB Calibration Certificate

Instrument Serial Number 0719486

| Calibration Sources | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Alpha Source | Th-230 | S/N | C7-604 | Cal Due | 11/1/2012 | Ap. Activity | 18860 | dpm |
| Beta Source | Cl-36 | S/N | C7-605 | Cal Due | 11/1/2012 | Ap. Activity | 23520 | dpm |

Calibration sources used are traceable to the National Institute of Standards and Technology (NIST).

| Environmental Conditions | | | | | | | |
|---|---|---|---|---|---|---|---|
| Temperature | 73.4 | ° F | Pressure | 25.87 | in.Hg | Relative Humidity | 26 % |

| As Found Results | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Previous Efficiencies | | | | Efficiencies | | | | Spillover | | | |
| α | 38.97 % | β | 41.02 % | α | 38.76 % | β | 40.54 % | α | 21.02 % | β | 0.05 % |

| As Left Results | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Efficiencies | | | | Filter Efficiencies (α x 0.85) | | | | Spillover | | | |
| α | 39.35 % | β | 40.32 % | α | 33.45 % | β | 40.32 % | α | 20.69 % | β | 0.07 % |

| Geometry | |
|---|---|
| Geometry Selection: | 1/8" Stainless Steel Insert |

| Check Sources | | | | | | | |
|---|---|---|---|---|---|---|---|
| Alpha Source: | Th-230 | S/N: | F6-074 | Beta Source: | Sr-90/Y-90 | S/N: | F6-075 |

Chi Squared Test

| (n) | α(x) | α(x-x̄)² | β(x) | β(x-x̄)² | (n) | α(x) | α(x-x̄)² | β(x) | β(x-x̄)² |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 5066 | 562 | 5752 | 5075 | 12 | 5107 | 4188 | 5733 | 8143 |
| 2 | 4978 | 4133 | 5871 | 2281 | 13 | 4977 | 4262 | 5824 | 1 |
| 3 | 5071 | 825 | 5882 | 3453 | 14 | 5050 | 60 | 5727 | 9262 |
| 4 | 5129 | 7519 | 5785 | 1462 | 15 | 5045 | 7 | 5916 | 8605 |
| 5 | 5134 | 8412 | 5765 | 3392 | 16 | 4984 | 3397 | 5756 | 4521 |
| 6 | 5107 | 4188 | 5793 | 914 | 17 | 5058 | 247 | 5880 | 3222 |
| 7 | 5061 | 350 | 5804 | 370 | 18 | 5102 | 3566 | 5898 | 5589 |
| 8 | 4960 | 6771 | 5807 | 264 | 19 | 5035 | 53 | 5734 | 7963 |
| 9 | 5112 | 4860 | 5826 | 8 | 20 | 4902 | 19680 | 5848 | 613 |
| 10 | 5063 | 429 | 5834 | 116 | 21 | 5002 | 1623 | 5814 | 85 |
| 11 | 4945 | 9465 | 6039 | 46553 | α(x̄) | 5042 | | β(x̄) | 5823 |
| Legend | | Acceptance Ranges | | $x^2$ | ∑α(x-x̄)² | 84596 | | ∑β(x-x̄)² | 111892 |
| | | .95/.05 Acceptance Range | | α $x^2$ | α Wiithin .90/.10 Range | | | α Wiithin .95/.05 Range | |
| $x^2 = \frac{\sum(x-\bar{x})^2}{\bar{x}}$ | | 11.6 to 32.6 | | 16.78 | Yes | | | Pass | |
| | | .90/.10 Acceptance Range | | β $x^2$ | β Wiithin .90/.10 Range | | | β Wiithin .95/.05 Range | |
| | | 13.24 to 29.62 | | 19.21 | Yes | | | Pass | |

| Reference Readings & High and Low Ranges | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| α Reference: | 5042 | cpm | 2σ | 4912 | cpm | to | 5172 | cpm | 3σ | 4847 | cpm | to | 5237 cpm |
| β Reference: | 5823 | cpm | 2σ | 5674 | cpm | to | 5973 | cpm | 3σ | 5599 | cpm | to | 6048 cpm |

Comments

NA

Date Calibrated 9/2/2011 Calibration Due Date 3/2/2012

Calibrated By _____ Reviewed By _____
Print/Sign/Date Print/Sign/Date

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## 5.3. Canberra Tennelec S5-AB MDA Chart - Smear Efficiency (Example)

Canberra Tennelec S5-AB MDA Chart
Smear Efficiency

Serial Number: 0719486
Calibration Date: 9/2/2011
Calibration Due: 3/2/2012

Alpha Efficiency: 0.3935
Beta Efficiency: 0.4032
Background Count Time: 100 Minutes

ALPHA

| Ct. Time → | 0.5 | 1 | 2 | 5 | 10 | Ct. Time → | 0.5 | 1 | 2 | 5 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Bkgd(cpm) ↓ | MDA | MDA | MDA | MDA | MDA | Bkgd(cpm) ↓ | MDA | MDA | MDA | MDA | MDA |
| 0.00 | 14 | 7 | 3 | 1 | 1 | 0.52 | 22 | 13 | 8 | 4 | 3 |
| 0.02 | 15 | 8 | 4 | 2 | 1 | 0.54 | 22 | 13 | 8 | 4 | 3 |
| 0.04 | 16 | 9 | 5 | 2 | 1 | 0.56 | 23 | 13 | 8 | 4 | 3 |
| 0.06 | 17 | 9 | 5 | 2 | 1 | 0.58 | 23 | 13 | 8 | 4 | 3 |
| 0.08 | 17 | 9 | 5 | 2 | 1 | 0.60 | 23 | 13 | 8 | 4 | 3 |
| 0.10 | 18 | 10 | 5 | 3 | 2 | 0.62 | 23 | 14 | 8 | 4 | 3 |
| 0.12 | 18 | 10 | 6 | 3 | 2 | 0.64 | 23 | 14 | 8 | 4 | 3 |
| 0.14 | 18 | 10 | 6 | 3 | 2 | 0.66 | 23 | 14 | 8 | 4 | 3 |
| 0.16 | 19 | 10 | 6 | 3 | 2 | 0.68 | 24 | 14 | 8 | 5 | 3 |
| 0.18 | 19 | 10 | 6 | 3 | 2 | 0.70 | 24 | 14 | 8 | 5 | 3 |
| 0.20 | 19 | 11 | 6 | 3 | 2 | 0.72 | 24 | 14 | 9 | 5 | 3 |
| 0.22 | 19 | 11 | 6 | 3 | 2 | 0.74 | 24 | 14 | 9 | 5 | 3 |
| 0.24 | 20 | 11 | 6 | 3 | 2 | 0.76 | 24 | 14 | 9 | 5 | 3 |
| 0.26 | 20 | 11 | 6 | 3 | 2 | 0.78 | 24 | 14 | 9 | 5 | 3 |
| 0.28 | 20 | 11 | 7 | 3 | 2 | 0.80 | 24 | 14 | 9 | 5 | 3 |
| 0.30 | 20 | 11 | 7 | 3 | 2 | 0.82 | 25 | 14 | 9 | 5 | 3 |
| 0.32 | 20 | 12 | 7 | 4 | 2 | 0.84 | 25 | 15 | 9 | 5 | 3 |
| 0.34 | 21 | 12 | 7 | 4 | 2 | 0.86 | 25 | 15 | 9 | 5 | 3 |
| 0.36 | 21 | 12 | 7 | 4 | 2 | 0.88 | 25 | 15 | 9 | 5 | 3 |
| 0.38 | 21 | 12 | 7 | 4 | 2 | 0.90 | 25 | 15 | 9 | 5 | 3 |
| 0.40 | 21 | 12 | 7 | 4 | 2 | 0.92 | 25 | 15 | 9 | 5 | 3 |
| 0.42 | 21 | 12 | 7 | 4 | 2 | 0.94 | 25 | 15 | 9 | 5 | 3 |
| 0.44 | 22 | 12 | 7 | 4 | 3 | 0.96 | 25 | 15 | 9 | 5 | 3 |
| 0.46 | 22 | 13 | 7 | 4 | 3 | 0.98 | 26 | 15 | 9 | 5 | 3 |
| 0.48 | 22 | 13 | 8 | 4 | 3 | 1.00 | 26 | 15 | 9 | 5 | 3 |
| 0.50 | 22 | 13 | 8 | 4 | 3 | 1.02 | 26 | 15 | 9 | 5 | 3 |

BETA

| Ct. Time → | 0.5 | 1 | 2 | 5 | 10 | Ct. Time → | 0.5 | 1 | 2 | 5 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Bkgd(cpm) ↓ | MDA | MDA | MDA | MDA | MDA | Bkgd(cpm) ↓ | MDA | MDA | MDA | MDA | MDA |
| 0.0 | 13 | 7 | 3 | 1 | 1 | 2.6 | 32 | 20 | 13 | 7 | 5 |
| 0.1 | 17 | 9 | 5 | 3 | 2 | 2.7 | 32 | 20 | 13 | 7 | 5 |
| 0.2 | 19 | 10 | 6 | 3 | 2 | 2.8 | 33 | 20 | 13 | 8 | 5 |
| 0.3 | 20 | 11 | 7 | 3 | 2 | 2.9 | 33 | 21 | 13 | 8 | 5 |
| 0.4 | 21 | 12 | 7 | 4 | 2 | 3.0 | 33 | 21 | 13 | 8 | 5 |
| 0.5 | 22 | 13 | 7 | 4 | 3 | 3.1 | 34 | 21 | 14 | 8 | 5 |
| 0.6 | 22 | 13 | 8 | 4 | 3 | 3.2 | 34 | 21 | 14 | 8 | 6 |
| 0.7 | 23 | 14 | 8 | 4 | 3 | 3.3 | 34 | 22 | 14 | 8 | 6 |
| 0.8 | 24 | 14 | 9 | 5 | 3 | 3.4 | 35 | 22 | 14 | 8 | 6 |
| 0.9 | 24 | 15 | 9 | 5 | 3 | 3.5 | 35 | 22 | 14 | 8 | 6 |
| 1.0 | 25 | 15 | 9 | 5 | 3 | 3.6 | 35 | 22 | 14 | 8 | 6 |
| 1.1 | 26 | 15 | 9 | 5 | 4 | 3.7 | 36 | 22 | 15 | 9 | 6 |
| 1.2 | 26 | 16 | 10 | 5 | 4 | 3.8 | 36 | 23 | 15 | 9 | 6 |
| 1.3 | 27 | 16 | 10 | 6 | 4 | 3.9 | 36 | 23 | 15 | 9 | 6 |
| 1.4 | 27 | 16 | 10 | 6 | 4 | 4.0 | 37 | 23 | 15 | 9 | 6 |
| 1.5 | 28 | 17 | 10 | 6 | 4 | 4.1 | 37 | 23 | 15 | 9 | 6 |
| 1.6 | 28 | 17 | 11 | 6 | 4 | 4.2 | 37 | 24 | 15 | 9 | 6 |
| 1.7 | 29 | 17 | 11 | 6 | 4 | 4.3 | 37 | 24 | 15 | 9 | 6 |
| 1.8 | 29 | 18 | 11 | 6 | 4 | 4.4 | 38 | 24 | 16 | 9 | 6 |
| 1.9 | 29 | 18 | 11 | 6 | 4 | 4.5 | 38 | 24 | 16 | 9 | 6 |
| 2.0 | 30 | 18 | 12 | 7 | 4 | 4.6 | 38 | 24 | 16 | 9 | 6 |
| 2.1 | 30 | 19 | 12 | 7 | 5 | 4.7 | 39 | 24 | 16 | 9 | 7 |
| 2.2 | 31 | 19 | 12 | 7 | 5 | 4.8 | 39 | 25 | 16 | 10 | 7 |
| 2.3 | 31 | 19 | 12 | 7 | 5 | 4.9 | 39 | 25 | 16 | 10 | 7 |
| 2.4 | 31 | 19 | 12 | 7 | 5 | 5.0 | 39 | 25 | 16 | 10 | 7 |

Calibrated By_____
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Reviewed By_____
Print/Sign/Date

## 5.4. Canberra Tennelec S5-AB MDA Chart - Filter Efficiency (Example)

**Canberra Tennelec S5-AB MDA Chart**
**Filter Efficiency**

Serial Number: 0719486
Calibration Date: 9/2/2011
Calibration Due: 3/2/2012

Alpha Efficiency: 0.33448
Beta Efficiency: 0.4032
Background Count Time: 100 Minutes

**ALPHA**

| Ct. Time → | 0.5 | 1 | 2 | 5 | 10 |
|---|---|---|---|---|---|
| Bkgd(cpm) ↓ | MDA | MDA | MDA | MDA | MDA |
| 0.00 | 16 | 8 | 4 | 2 | 1 |
| 0.02 | 18 | 10 | 5 | 2 | 1 |
| 0.04 | 19 | 10 | 5 | 3 | 1 |
| 0.06 | 20 | 11 | 6 | 3 | 2 |
| 0.08 | 20 | 11 | 6 | 3 | 2 |
| 0.10 | 21 | 11 | 6 | 3 | 2 |
| 0.12 | 21 | 12 | 6 | 3 | 2 |
| 0.14 | 21 | 12 | 7 | 3 | 2 |
| 0.16 | 22 | 12 | 7 | 3 | 2 |
| 0.18 | 22 | 12 | 7 | 4 | 2 |
| 0.20 | 22 | 13 | 7 | 4 | 2 |
| 0.22 | 23 | 13 | 7 | 4 | 2 |
| 0.24 | 23 | 13 | 7 | 4 | 2 |
| 0.26 | 23 | 13 | 8 | 4 | 2 |
| 0.28 | 24 | 13 | 8 | 4 | 3 |
| 0.30 | 24 | 14 | 8 | 4 | 3 |
| 0.32 | 24 | 14 | 8 | 4 | 3 |
| 0.34 | 24 | 14 | 8 | 4 | 3 |
| 0.36 | 25 | 14 | 8 | 4 | 3 |
| 0.38 | 25 | 14 | 8 | 4 | 3 |
| 0.40 | 25 | 14 | 8 | 4 | 3 |
| 0.42 | 25 | 15 | 9 | 5 | 3 |
| 0.44 | 25 | 15 | 9 | 5 | 3 |
| 0.46 | 26 | 15 | 9 | 5 | 3 |
| 0.48 | 26 | 15 | 9 | 5 | 3 |
| 0.50 | 26 | 15 | 9 | 5 | 3 |

| Ct. Time → | 0.5 | 1 | 2 | 5 | 10 |
|---|---|---|---|---|---|
| Bkgd(cpm) ↓ | MDA | MDA | MDA | MDA | MDA |
| 0.52 | 26 | 15 | 9 | 5 | 3 |
| 0.54 | 26 | 15 | 9 | 5 | 3 |
| 0.56 | 27 | 15 | 9 | 5 | 3 |
| 0.58 | 27 | 16 | 9 | 5 | 3 |
| 0.60 | 27 | 16 | 9 | 5 | 3 |
| 0.62 | 27 | 16 | 10 | 5 | 3 |
| 0.64 | 27 | 16 | 10 | 5 | 3 |
| 0.66 | 28 | 16 | 10 | 5 | 3 |
| 0.68 | 28 | 16 | 10 | 5 | 4 |
| 0.70 | 28 | 16 | 10 | 5 | 4 |
| 0.72 | 28 | 16 | 10 | 5 | 4 |
| 0.74 | 28 | 17 | 10 | 5 | 4 |
| 0.76 | 28 | 17 | 10 | 6 | 4 |
| 0.78 | 29 | 17 | 10 | 6 | 4 |
| 0.80 | 29 | 17 | 10 | 6 | 4 |
| 0.82 | 29 | 17 | 10 | 6 | 4 |
| 0.84 | 29 | 17 | 10 | 6 | 4 |
| 0.86 | 29 | 17 | 11 | 6 | 4 |
| 0.88 | 29 | 17 | 11 | 6 | 4 |
| 0.90 | 29 | 17 | 11 | 6 | 4 |
| 0.92 | 30 | 18 | 11 | 6 | 4 |
| 0.94 | 30 | 18 | 11 | 6 | 4 |
| 0.96 | 30 | 18 | 11 | 6 | 4 |
| 0.98 | 30 | 18 | 11 | 6 | 4 |
| 1.00 | 30 | 18 | 11 | 6 | 4 |
| 1.02 | 30 | 18 | 11 | 6 | 4 |

**BETA**

| Ct. Time → | 0.5 | 1 | 2 | 5 | 10 |
|---|---|---|---|---|---|
| Bkgd(cpm) ↓ | MDA | MDA | MDA | MDA | MDA |
| 0.0 | 13 | 7 | 3 | 1 | 1 |
| 0.1 | 17 | 9 | 5 | 3 | 2 |
| 0.2 | 19 | 10 | 6 | 3 | 2 |
| 0.3 | 20 | 11 | 7 | 3 | 2 |
| 0.4 | 21 | 12 | 7 | 4 | 2 |
| 0.5 | 22 | 13 | 7 | 4 | 3 |
| 0.6 | 22 | 13 | 8 | 4 | 3 |
| 0.7 | 23 | 14 | 8 | 4 | 3 |
| 0.8 | 24 | 14 | 9 | 5 | 3 |
| 0.9 | 24 | 15 | 9 | 5 | 3 |
| 1.0 | 25 | 15 | 9 | 5 | 3 |
| 1.1 | 26 | 15 | 9 | 5 | 4 |
| 1.2 | 26 | 16 | 10 | 5 | 4 |
| 1.3 | 27 | 16 | 10 | 6 | 4 |
| 1.4 | 27 | 16 | 10 | 6 | 4 |
| 1.5 | 28 | 17 | 10 | 6 | 4 |
| 1.6 | 28 | 17 | 11 | 6 | 4 |
| 1.7 | 29 | 17 | 11 | 6 | 4 |
| 1.8 | 29 | 18 | 11 | 6 | 4 |
| 1.9 | 29 | 18 | 11 | 6 | 4 |
| 2.0 | 30 | 18 | 12 | 7 | 4 |
| 2.1 | 30 | 19 | 12 | 7 | 5 |
| 2.2 | 31 | 19 | 12 | 7 | 5 |
| 2.3 | 31 | 19 | 12 | 7 | 5 |
| 2.4 | 31 | 19 | 12 | 7 | 5 |

| Ct. Time → | 0.5 | 1 | 2 | 5 | 10 |
|---|---|---|---|---|---|
| Bkgd(cpm) ↓ | MDA | MDA | MDA | MDA | MDA |
| 2.6 | 32 | 20 | 13 | 7 | 5 |
| 2.7 | 32 | 20 | 13 | 7 | 5 |
| 2.8 | 33 | 20 | 13 | 8 | 5 |
| 2.9 | 33 | 21 | 13 | 8 | 5 |
| 3.0 | 33 | 21 | 13 | 8 | 5 |
| 3.1 | 34 | 21 | 14 | 8 | 5 |
| 3.2 | 34 | 21 | 14 | 8 | 6 |
| 3.3 | 34 | 22 | 14 | 8 | 6 |
| 3.4 | 35 | 22 | 14 | 8 | 6 |
| 3.5 | 35 | 22 | 14 | 8 | 6 |
| 3.6 | 35 | 22 | 14 | 8 | 6 |
| 3.7 | 36 | 22 | 15 | 9 | 6 |
| 3.8 | 36 | 23 | 15 | 9 | 6 |
| 3.9 | 36 | 23 | 15 | 9 | 6 |
| 4.0 | 37 | 23 | 15 | 9 | 6 |
| 4.1 | 37 | 23 | 15 | 9 | 6 |
| 4.2 | 37 | 24 | 15 | 9 | 6 |
| 4.3 | 37 | 24 | 15 | 9 | 6 |
| 4.4 | 38 | 24 | 16 | 9 | 6 |
| 4.5 | 38 | 24 | 16 | 9 | 6 |
| 4.6 | 38 | 24 | 16 | 9 | 6 |
| 4.7 | 39 | 24 | 16 | 9 | 7 |
| 4.8 | 39 | 25 | 16 | 10 | 7 |
| 4.9 | 39 | 25 | 16 | 10 | 7 |
| 5.0 | 39 | 25 | 16 | 10 | 7 |

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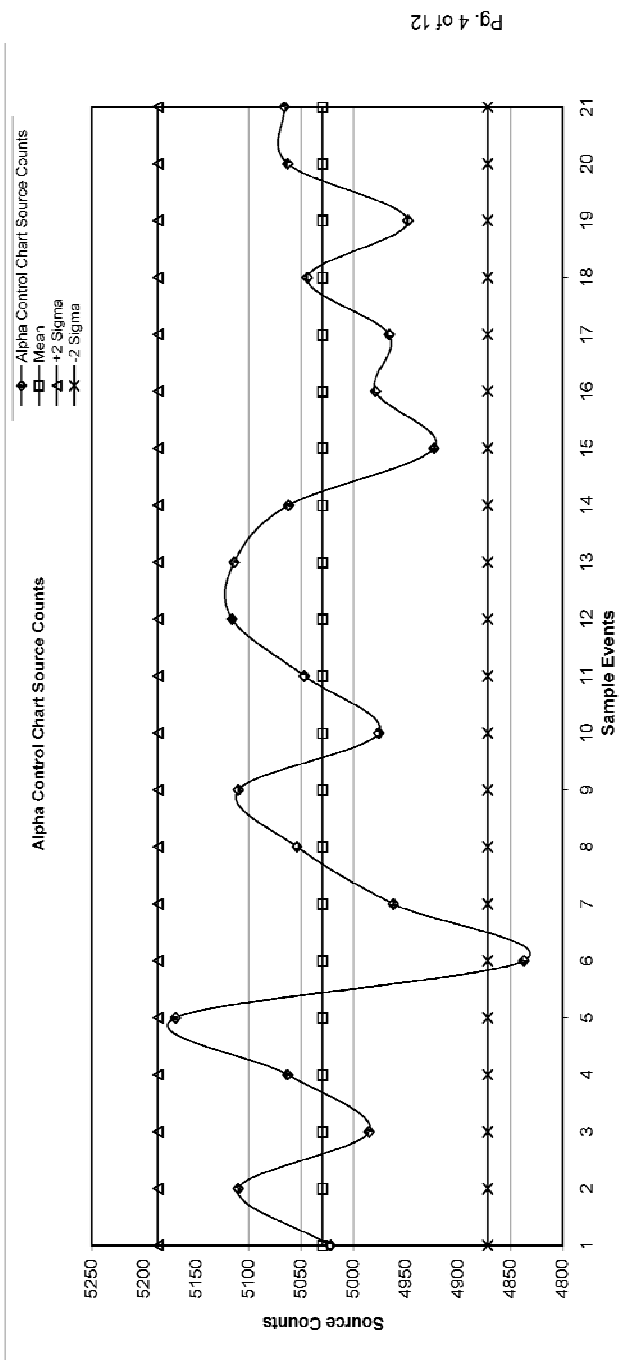
Reviewed By_____
Print/Sign/Date

## 5.5. Alpha Control Chart (Example)

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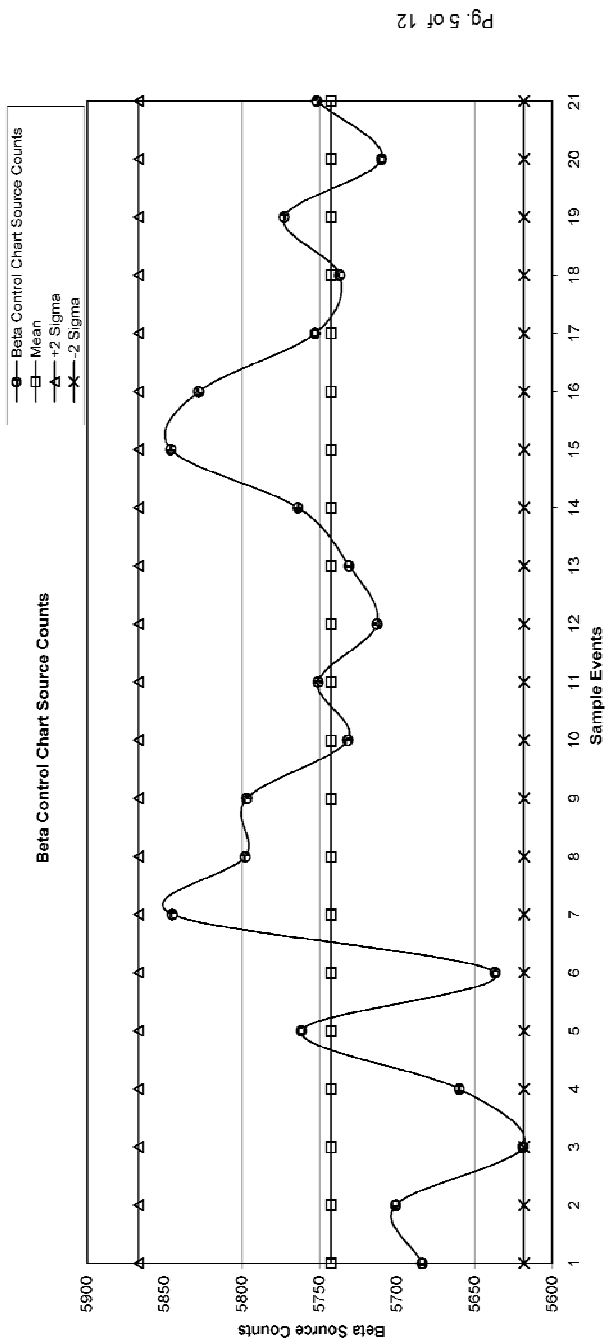
Instrument Model Tennelec S5-AB
Instrument Serial Number 719486
Source Serial Number C7-604
Isotope Th-230

Calibrated By _____ Print/Sign/Date _____

Reviewed By _____ Print/Sign/Date _____

## 5.6. Beta Control Chart (Example)




Instrument Model Tennelec S5-AB
Instrument Serial Number 719486
Source Serial Number C7-605
Isotope Cl-36

Calibrated By _____ Print/Sign/Date

Reviewed By _____ Print/Sign/Date

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# PCB Shredding – Air Sample Collection

**Revision 1**

| | | |
|---|---|---|
| Authored By: | Signature on File<br>Tim Orton, Environmental Engineer | 2/15/08<br>Date |
| Reviewed By: | Signature on File<br>Curtis Kirk, Quality Assurance Manager | 2/20/08<br>Date |
| Approved By: | Signature on File<br>Dan Shrum, Vice President, Environmental Compliance and Permitting | 2/25/08<br>Date |
| Approved By: | Signature on File<br>Mark LeDoux, Corporate Radiation Safety Officer | 2/25/08<br>Date |

- ☐ New
- ☐ Title Change
- ☒ Revision
- ☐ Rewrite

Effective Date: 2/27/08

Electronic documents, once printed, are uncontrolled and may become outdated.
Refer to the intraweb or the document control authority for the current revision.

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# 1. PURPOSE AND SCOPE

## 1.1. Purpose

The purpose of this procedure is to define the method used for collecting PCB air samples using High Volume Polyurethane Foam (PUF) Sampling in accordance with EPA Method TO-4A during PCB shredding operations.

## 1.2. Scope

This procedure applies to all personnel who will participate in PUF sampling with respect to PCB Shredding operations. This procedure does not apply in emergency situations where health and safety concerns supersede the need for environmental PCB monitoring.

# 2. REFERENCES

2.1 Compendium Method TO-4A – *Determination of Pesticides and Polychlorinated Biphenyls in Ambient Air Using High Volume Polyurethane Foam (PUF) Sampling Followed by Gas Chromatographic/Multi-Detector Detection (GC/MD)*

2.2 LAB-1.1, *Sample Control – Chain of Custody*

2.3 CL-RS-PR-140, *Radiation Work Permit*

2.4 CL-RS-PR-120, *Access Control Points*

2.5 CL-RS-PR-210, *Personnel External Radiation Monitoring*

2.6 CL-SH-PR-041, *Incoming Shipment Acceptance procedure*

2.7 CL-IN-PR-001, *PCB Air Sampler - Single Point Flow Check*

2.8 CL-IN-PR-002, *PCB Air Sampler - Calibration*

2.9 EPA Approval for the Shredder Operation to Process PCB Wastes (EPA Approval), as amended.

# 3. GENERAL

## 3.1. Definitions

3.1.1. *Calibrated Orifice Flow Rate Transfer Standard* — The standard used to calibrate the High Volume Air Sampler.

3.1.2. *Cartridge* — The filter head assembly on the Sampler that contains the media used to capture the sample.

3.1.3. *Controlled Environment* — An environment that is free of radiological and chemical contamination.

3.1.4. *High Volume Air Sampler (Sampler)* — The sampling station, components and sample collection media used to obtain an air sample.

3.1.5. *Magnehelic Gauge* – Gauge used to read differential pressure within the sample collection line. The flow rate through the sampler is calculated from this differential pressure and ambient conditions.

3.1.6. *Personal Protective Equipment (PPE)* — Garments or accessories used by an individual to reduce exposure to hazardous materials.

3.1.7. *PUF Module* — A glass cartridge containing the PUF media that the sample is collected upon.

3.1.8. *Restricted Area (RA)* — The area within the controlled area that requires control of access and occupancy for radiation protection purposes. The RA boundary is posted "Caution, Radioactive Material" and is bordered by a 6-foot high fence except in buildings where a lockable door or other device to prevent unauthorized or inadvertent entry is present. A security badge and dosimetry is required for entrance into the RA.

3.1.9. *Sampling Campaign* — A fixed volume of PCB waste for processing through the shredder.

3.2. **Responsibilities**

3.2.1 *Environmental Engineer* is responsible for the implementation of this procedure and compliance with state and federal regulations.

3.2.2 *Director of Health Physics (DHP)* is responsible to ensure that air sampling is monitored every six hours and that filter samples are taken by Health Physics personnel at the conclusion of PCB shredding campaigns.

3.2.3 *Corporate Radiation Safety Officer* is responsible for overall radiation safety, contamination control, and compliance with state and federal regulations.

3.2.4 *Health Physics Technicians (HPTs)* are responsible for obtaining PCB air samples in accordance with this procedure.

3.2.5 *Utah Certified Commercial Laboratory* will be responsible for preparation of the sampling media as well as shipment to the facility. The Utah Certified Commercial Laboratory will also be responsible for sample extraction, analysis, and reporting.

3.3. **Precautions and Limitations**

3.3.1. The toxicity or carcinogenicity of each reagent used in this method has not been precisely defined; however, each chemical compound should be treated as a potential health hazard. From this viewpoint, exposure to these chemicals must be reduced to the lowest possible level through the use of personal protective equipment.

3.3.2. The Shredder Area can be dangerous. All signs, postings, and procedures should be followed.

3.3.3.. PCBs have been classified as a known or suspected, human or mammalian carcinogen. Care must be exercised when working in an environment potentially contaminated with this substance.

3.3.4. Aluminum foil wraps or containers that sampling media are shipped in shall be retained in order to ship spent filters and samples to the Utah Certified Commercial Laboratory.

## 4. REQUIREMENTS AND GUIDANCE

### 4.1. General Requirements

4.1.1. Personnel performing PCB air sample collection activities shall perform work in accordance with procedure CL-RS-PR-140, *Radiation Work Permits (RWP).*

4.1.2. Only qualified Health Physics Technicians trained on this procedure, the Environmental Engineer and/or a trained designee shall be allowed to perform this procedure.

4.1.3. All personnel and items entering the contaminated portion of Energy*Solutions*' RA shall comply with procedure CL-RS-PR-120, *Access Control Points.*

4.1.4. All contact with radiologically or chemically contaminated media shall be minimized. Appropriate PPE shall be used whenever personnel handle chemically or radiologically contaminated objects.

4.1.5. All personnel issued a dosimeter to perform work within the scope of this procedure shall use it in accordance with procedure CL-RS-PR-210, *Personnel External Radiation Monitoring*, to monitor exposure to RAM. This requirement applies both inside and outside the RA.

4.1.6. All Radiological Controls are implemented in order to keep exposures as low as reasonably achievable (ALARA).

4.1.7. The exhaust hose of the sampler should be stretched out in the downwind direction to prevent recycling of air into the sample head.

4.1.8. All cleaning and sample module loading and unloading should be conducted in a controlled environment to minimize potential contamination.

### 4.2. Preparing Cartridge for Sampling

4.2.1. Cartridge preparation shall be conducted in a clean, controlled environment.

4.2.2. While wearing nitrile gloves, remove a clean glass PUF module from its shipping container. Remove the Teflon end caps, if present. Retain all shipping material to be reused after the sample has been collected.

4.2.3. Unscrew the lower chamber of the cartridge, insert the glass PUF module into the lower chamber, and tightly re-attach the lower chamber to the cartridge.

4.2.4. Carefully place a clean conditioned fiber filter atop the filter holder and secure it in place by clamping the filter holder ring over the filter. Place the aluminum protective cover on top of the cartridge head. Tighten the three-screw clamps. Ensure that all cartridge connections are tightly assembled. Place a small piece of aluminum foil on the ball-joint of the sample cartridge to protect from back-diffusion of semi-volatile contaminants into the cartridge during transport to the sampler.

**Note: Failure to ensure that module connections are tightly assembled could result in air flow leaks at poorly sealed locations which could affect sample representativeness.**

4.2.5. Place the assembled sampling cartridge in a carrying bag to take to the sampler.

4.3. **Collection**

4.3.1. Prior to sampling, perform a single-point calibration check in accordance with procedure CL-IN-PR-001, *PCB Air Sampler - Single Point Flow Check.*

4.3.2. With the sample cartridge removed from the sampler and the flow control valve fully open, turn the pump on and allow it to warm-up for approximately five minutes.

4.3.3. Attach a "dummy" sampling cartridge loaded with the same type of fiber filter and PUF media to be used for sample collection.

4.3.4. Note the ambient temperature ($T_a$) in °C and barometric pressure ($P_a$) in mmHg.

4.3.5. The desired sampler flow rate is eight (8) standard cubic feet per minute (0.2265 cubic meters per minute). The Magnehelic reading (MR) corresponding to this flow rate can be calculated by observing the ambient temperature ($T_a$), in °C, and barometric pressure ($P_a$), in mmHg, and calculating using the slope (M2) and intercept (B2) found during calibration of the sampler as discussed in procedure CL-IN-PR-002, *PCB Air Sampler - Calibration*. The calculation for MR is as follows:

$$MR = \left[M2(0.2265) + B2\right]^2 \left[\left(\frac{P_a}{760}\right)\left(\frac{\mathbf{298}}{(T_a + \mathbf{273})}\right)\right]$$

4.3.6. Turn the sampler on and adjust the voltage variator so that the Magnehelic reading corresponds to the calculated reading, MR. Turn the sampler off and remove the "dummy" module. The sampler is now ready for field use.

**Note: Once the flow is adjusted, take extreme care not to inadvertently alter its setting.**

4.3.7. Check the zero reading of the sampler Magnehelic. Record the sampler ID, filter number, PUF module ID number, and elapsed time meter setting on the Field Test Data Sheet (Attachment 5.1). Also record the environmental conditions present (e.g., rain, snow, wind, etc.). Attach the assembled sampler cartridge to the sampler.

4.3.8. Turn on the power switch of the sampler. Adjust the flow (Magnehelic setting), if necessary using the flow control valve.

4.3.9. At the beginning of sampling, every six (6) hours during sampling, and at the end of the sampling period, record the date and time, ambient temperature ($T_a$, °C), barometric pressure ($P_a$, mmHg), and Magnehelic reading (MR1). Calculate the associated flow rate (X2) in standard cubic meters per minute (scmm) and in standard cubic feet per minute (scfm) using this data along with the calibration slope (M2) and intercept (B2) for the sampler (refer to procedure CL-IN-PR-002, *PCB Air Sampler - Calibration*) using the following equations:

$$Y5 = \left[ MR1 \left( \frac{P_a}{760} \right) \left( \frac{\mathbf{298}}{(T_a + \mathbf{273})} \right) \right]^{1/2} \quad \text{and,}$$

$$X2 = \frac{Y5 - B2}{M2}$$

4.4. **Sample Recovery**

4.4.1. At the end of the desired sampling period, turn the power off. Carefully remove the sampling cartridge containing the filter and adsorbent cartridge. Place the protective plate over the filter to protect the cartridge during transport to a clean recovery area. Also, place a piece of aluminum foil around the bottom of the adsorbent sampler head.

4.4.2. Perform a final sampler audit single-point flow check in accordance with procedure CL-IN-PR-001, *PCB Air Sampler - Single Point Flow Check*. If the manometer calculated flow deviates by more than 10% from the Magnehelic reading, mark the flow data for that sample as suspect and inspect and/or remove from service. Record results on the Field Test Data Sheet (Attachment 5.1).

**Note: If the single-point flow check deviates by more than 10%, a recalibration of the sampler (in accordance with procedure CL-IN-PR-002, *PCB Air Sampler - Calibration*), should be completed prior to additional sample collection from that sampler.**

4.4.3. Transport the sampling cartridge to a controlled environment.

4.4.4. While wearing nitrile gloves remove the PUF module from the lower chamber of the sampling cartridge and lay it on the retained aluminum foil in which the sample was originally wrapped. Fresh aluminum foil may also be used.

4.4.5. Carefully remove the glass fiber filter from the upper chamber.

4.4.6. Fold the filter in half twice (sample-side inward) and place it in the glass cartridge atop the PUF media.

4.4.7. Wrap the combined samples in aluminum foil, attach Teflon end caps (if provided) and place them in their original shipping container or another

approved shipping container. Complete a sample label and affix it to the shipping container.

4.4.8. Chain of custody should be maintained for all samples in accordance with Lab-1.1, *Sample Control – Chain of Custody*. Store the containers in a 4 °C environment and protect from UV light to prevent possible photo-decomposition of collected analytes. If the time span between sample collection and laboratory analysis is to exceed 24 hours, refrigerate samples at 4 $^{o}$C.

4.4.9. For each sampling campaign, return at least one field filter/PUF blank to the laboratory. Treat a field blank exactly as the sample except that no air is drawn through the filter/adsorbent cartridge assembly.

4.4.10. Ship and store field samples chilled (< 4 $^{o}$C) until receipt at the analytical laboratory, after which they should be refrigerated at less than or equal to 4$^{o}$C. Extraction must be performed within 7 days of sampling and analysis within 40 days of extraction.

4.4.11. Sample extraction will be performed by a Utah Certified Commercial Laboratory.

### 4.5. Document Management

4.5.1 The completed Field Test Data Sheet (Attachment 5.1) shall be placed in the PCB Air Sampling Log Book (three-ring binder) located in the controlled environment where the sampling equipment is stored.

4.5.2 The forms will be reviewed for completeness and accuracy by the Environmental Engineer, or designee, on a weekly basis.

4.5.3 The completed and reviewed forms will be forwarded to document control on a monthly basis.

## 5. ATTACHMENTS AND FORMS

5.1 Example Field Test Data Sheet

## 5.1. Example Field Test Data Sheet

**CL-IN-PR-003 F1**

**PCB Shredding – Air Sample Collection**

**FIELD TEST DATA SHEET**

Sampler ID: _____ Operator(s): _____
_____
_____

Environmental Conditions: _____

Filter Number: _____ PUF ID No.: _____

Elapsed Time Meter: Start _____
Stop _____ Magnehelic Zero Check? Y N
Diff. _____

Orifice Slope (M1): _____ Orifice Intercept (B1): _____
Calibrated Slope (M2): _____ Calibrated Intercept (B2): _____

| Date & Time | Ambient Temperature ($T_a$ - °C) | Barometric Pressure ($P_a$ - mmHg) | Magnehelic Reading (MR1) | Calculated Flow Rate (scmm)* | Calculated Flow Rate (scfm)* | Operator Initials |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | | | |
| Average | | | | | | |

*scmm = standard cubic meters per minute; scfm = standard cubic feet per minute

Pre-Sampling Single Point Flow Check:

Manometer Reading (Y1): _____ Calibrated Flow Rate (X1): _____
Magnehelic Reading (MR1): _____ Measured Flow Rate (X2): _____
Percent Difference: _____ Percent difference within 10%? YES NO

Post-Sampling Single Point Flow Check:

Manometer Reading (Y1): _____ Calibrated Flow Rate (X1): _____
Magnehelic Reading (MR1): _____ Measured Flow Rate (X2): _____
Percent Difference: _____ Percent difference within 10%? YES NO

Comments:
_____
_____
_____
_____

# PCB Air Sampler - Calibration

**Revision 0**

| | | |
|---|---|---|
| Authored By: | Signature on File<br>Michael LeBaron, Permitting Engineer | 12/20/07<br>Date |
| Reviewed By: | Signature on File<br>Tim Orton, Environmental Engineer | 12/27/07<br>Date |
| Reviewed By: | Signature on File<br>Curtis Kirk, Quality Assurance Manager | 1/3/08<br>Date |
| Approved By: | Signature on File<br>Dan Shrum, Vice President, Environmental Compliance and Permitting | 1/4/08<br>Date |
| Approved By: | Signature on File<br>Mark LeDoux, Corporate Radiation Safety Officer | 1/3/08<br>Date |

☒ New
☐ Title Change
☐ Revision
☐ Rewrite

Effective Date: 1/8/08

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# 1. PURPOSE AND SCOPE

## 1.1. Purpose

The purpose of this procedure is to clarify the method used to calibrate the High Volume Polyurethane Foam (PUF) Sampling System (Sampler) using a Calibrated Orifice Flow Rate Transfer Standard. The sampler being calibrated is used to take PCB Air Samples during PCB shredding operations. High volume sample calibration procedures that apply solely to radiological monitoring **do not** apply to this procedure.

## 1.2. Scope

This procedure applies to all personnel who will participate in PUF sampling with respect to PCB Shredding operations. This procedure does not apply in emergency situations where health and safety concerns supersede the need for environmental PCB monitoring.

# 2. REFERENCES

2.1 Compendium Method TO-4A – *Determination of Pesticides and Polychlorinated Biphenyls in Ambient Air Using High Volume Polyurethane Foam (PUF) Sampling Followed by Gas Chromatographic/Multi-Detector Detection (GC/MD).*

2.2 EPA *High Volume Sampling Method, 40 CVR 50, Appendix B*

2.3 Lab-1.1, *Sample Control – Chain of Custody*

2.4 CL-RS-PR-140, *Radiation Work Permit*

2.5 CL-RS-PR-120, *Access Control Points*

2.6 CL-RS-PR-210, *Personnel External Radiation Monitoring*

2.7 CL-SH-PR-041, *Incoming Shipment Acceptance procedure*

2.8 CL-IN-PR-003, *PCB Shredding – Air Sampling Collection*

2.9 Compendium Method TO-4A – *Determination of Pesticides and Polychlorinated Biphenyls in Ambient Air Using High Volume Polyurethane Foam (PUF) Sampling Followed by Gas Chromatographic/Multi-Detector Detection (GC/MD)*

2.10 EPA Approval for the Shredder Operation to Process PCB Wastes (EPA Approval), as amended.

# 3. GENERAL

## 3.1. Definitions

3.1.1. *Calibrated Orifice Flow Rate Transfer Standard* — The standard used to calibrate the High Volume Air Sampler.

3.1.2. *Cartridge* — The filter head assembly on the Sampler that contains the media used to capture the sample.

3.1.3. *Controlled Environment* — An environment that is free of radiological and chemical contamination.

3.1.4. *High Volume Air Sampler (Sampler)* — The sampling station, components and sample collection media used to obtain an air sample.

3.1.5. *Magnehelic Gauge* – Gauge used to read differential pressure within the sample collection line. The flow rate through the sampler is calculated from this differential pressure and ambient conditions.

3.1.6. *Personal Protective Equipment (PPE)* — Garments or accessories used by an individual to reduce exposure to hazardous materials.

3.1.7. *PUF Module* — A glass cartridge containing the PUF media that the sample is collected upon.

3.1.8. *Restricted Area (RA)* — The area within the controlled area that requires control of access and occupancy for radiation protection purposes. The RA boundary is posted "Caution, Radioactive Material" and is bordered by a 6-foot high fence except in buildings where a lockable door or other device to prevent unauthorized or inadvertent entry is present. A security badge and dosimetry is required for entrance into the RA.

### 3.2. Responsibilities

3.2.1 *Environmental Engineer* is responsible for the implementation of this procedure and compliance with state and federal regulations.

3.2.2 *Director of Health Physics (DHP)* is responsible to ensure that air sampling is monitored every six hours and that filter samples are taken by Health Physics personnel at the conclusion of PCB shredding campaigns.

3.2.3 *Corporate Radiation Safety Officer* is responsible for overall radiation safety, contamination control, and compliance with state and federal regulations.

3.2.4 *Health Physics Technicians (HPTs)* are responsible for obtaining PCB air samples in accordance with this procedure.

### 3.3. Precautions and Limitations

3.3.1 The toxicity or carcinogenicity of each reagent used in this method has not been precisely defined; however, each chemical compound should be treated as a potential health hazard. From this viewpoint, exposure to these chemicals must be reduced to the lowest possible level through the use of personal protective equipment.

3.3.2 The Shredder Area can be dangerous. For your safety: follow all signs, postings, and procedures.

## 4. REQUIREMENTS AND GUIDANCE

### 4.1. General Requirements

4.1.1. There are two High-Volume samplers associated with this procedure – one at Air Monitoring Station A-36, and near the concrete support on the southeast corner of the shredder structure. Both samplers are distinguishable from other air samplers by their silver, metal birdcage compartment.

4.1.2. Personnel performing PCB air sample collection activities shall perform work in accordance with CL-RS-PR-140, *Radiation Work Permits (RWP).*

4.1.3. Only qualified Health Physics Technicians trained on this procedure, the Environmental Engineer and/or a trained designee shall be allowed to perform this procedure.

4.1.3. All personnel and items that enter the contaminated portion of Energy*Solutions*' RA shall comply with procedure CL-RS-PR-120, *Access Control Points.*

4.1.4. All contact with radiological or chemically contaminated media shall be minimized. Appropriate PPE shall be used whenever personnel handle chemically or radiologically contaminated objects.

4.1.5. All personnel issued a dosimeter to perform work within the scope of this procedure shall use it in accordance with procedure CL-RS-PR-210, *Personnel External Radiation Monitoring*, to monitor exposure to RAM. This requirement applies both inside and outside the RA.

4.1.6. All Radiological Controls are implemented in order to keep exposures as low as reasonably achievable (ALARA).

4.1.7. The Calibrated Orifice Flow Rate Transfer Standard shall be sent to the manufacturer for recertification on an annual basis or more frequently if deemed necessary by the Environmental Engineer.

## 4.2. Calibration Procedure

4.2.1. The calibration system set-up is illustrated in *Figure 8* of Compendium Method TO-4A – *Determination of Pesticides and Polychlorinated Biphenyls in Ambient Air Using High Volume Polyurethane Foam (PUF) Sampling Followed by Gas Chromatographic/Multi-Detector Detection (GC/MD)* (Method TO-4A).

4.2.2. Calibration is performed without the fiber filter or a PUF module installed in the sampling cartridge. However, an empty glass PUF module must remain in the sampling cartridge in order to insure a good seal.

4.2.3. Record the ambient temperature ($T_a$), in °C, and barometric pressure ($P_a$), in mmHg.

4.2.4. Attach the sampling cartridge with no sampling media (but with an empty glass PUF module) to the sampler. Fully open the flow control valve and adjust the voltage variator so that the sample flow rate corresponding to approximately nine (9) cubic feet per minute (~0.255 cubic meters per minute) is indicated on the Magnehelic gauge (See Section 4.3.5 of procedure CL-IN-PR-003, *PCB*

*Shredding – Air Sample Collection*, for this calculation). Allow the motor to warm up for ten minutes, then turn off the sampler.

4.2.5. Place the Calibrated Orifice Flow Rate Transfer Standard on top of the sampling cartridge.

4.2.6. Properly align the retaining rings with the filter holder and secure by tightening the three screw clamps.

4.2.7. Leak test the Calibrated Orifice Flow Rate Transfer Standard by blocking the hole on the top of the standard and the tap on the side of the standard, and turning on the sampler motor. Gently rock the standard and listen for a whistling sound that would indicate a leak in the system. Eliminate all leaks before proceeding with the calibration. When the sampler is determined to be leak-free, turn off the sampler and unblock the holes in the standard.

**Note: Avoid running the sampler for too long a time with the orifice blocked. This precaution will reduce the chance that the motor will be overheated due to lack of cooling air. Such overheating can shorten the life of the motor.**

4.2.8. Open both ports of the manometer and connect tubing from one of the manometer ports to the pressure tap on the side of the Calibrated Orifice Flow Rate Transfer Standard. Leave the opposite side of the manometer open to the atmosphere. Gently shake or tap the manometer to remove air bubbles and/or liquid remaining on tubing connectors. Ensure a level reading is provided on the manometer and adjust the resulting meniscus to zero on the scale.

4.2.9. On the PCB Air Sampler Field Calibration Data Sheet (Attachment 5.1), record the calibration date and time, sampler ID, calibration orifice ID, ambient temperature and barometric pressure, and operator's signature(s).

4.2.10. Turn the flow control valve to the fully open position and turn the sampler on. Adjust the flow control using the voltage variator until a Magnehelic reading of approximately 70 inches is obtained. Allow the Magnehelic and manometer readings to stabilize and record these values on the PCB Air Sampler Field Calibration Data Sheet (Attachment 5.1). Record the manometer reading in the Y1 column and the Magnehelic reading in the Y2 column.

4.2.11. Repeat step 4.2.10 for Magnehelic readings of 60, 50, 40, 30, 20, and 10 inches.

4.2.12. Turn the voltage variator to maximum power and confirm a Magnehelic reading of at least 100 inches.

4.2.13. Turn off the sampler and confirm a Magnehelic reading of zero.

**Note: If readings of 100 and 0 inches are not achieved during steps 4.2.12 and 4.2.13, the Environmental Engineer, or qualified designee, shall**

**examine the sampler, determine a root cause for the problem, and implement corrective actions prior to use.**

4.2.14. Remove the transfer standard and the sampling cartridge.

4.2.15. Obtain the manufacturer's calibration values of slope (M1) and intercept (B1) for the Calibrated Orifice Flow Rate Transfer Standard. Record these values on the PCB Air Sampler Field Calibration Data Sheet (Attachment 5.1).

4.2.16. Using the recorded ambient temperature ($T_a$), in °C, and barometric pressure ($P_a$), in mmHg, calculate the orifice manometer Y3 value and the monitor Magnehelic Y4 value using the following equations:

$$Y3 = \left[Y1\left(P_a / 760\right)\left(298 / \{T_a + 273\}\right)\right]^{1/2}$$

$$Y4 = \left[Y2\left(P_a / 760\right)\left(298 / \{T_a + 273\}\right)\right]^{1/2}$$

4.2.17. Calculate the orifice flow rate in standard cubic meters per minute using the following equation:

$$X1 = \frac{Y3 - B1}{M1}$$

4.2.18. Record the calculated values for Y3, Y4, and X1 on the PCB Air Sampler Field Calibration Data Sheet (Attachment 5.1).

4.2.19. Perform a linear regression of the values in column X1 and the values in Column Y4. Record the slope (M2), intercept (B2), and correlation (CC2). If the correlation is less than 0.990, the calibration is unsuccessful and needs to be repeated. Record these values on the PCB Air Sampler Field Calibration Data Sheet (Attachment 5.1).

## 5. ATTACHMENTS AND FORMS

5.1 PCB Air Sampler Field Calibration Data Sheet

### 5.1 PCB Air Sampler Field Calibration Data Sheet

**PCB Air Sampler**

## FIELD CALIBRATION DATA SHEET

Date: _____ Time: _____

Sampler ID: _____ Operator(s): _____
_____

Calibration Orifice ID: _____ _____

Ambient Temperature ($T_a$, °C): _____

Barometric Pressure ($P_a$, mmHg): _____

Orifice Slope (M1): _____ Orifice Intercept (B1): _____

| Actual Values | | Calibrated Values | | | |
|---|---|---|---|---|---|
| Manometer Reading, inches (Y1) | Magnehelic Reading, inches (Y2) | Manometer (Y3) | Magnehelic (Y4) | Orifice Flow Rate scmm* (X1) | Orifice Flow Rate scfm* (X1) |
| | 70 | | | | |
| | 60 | | | | |
| | 50 | | | | |
| | 40 | | | | |
| | 30 | | | | |
| | 20 | | | | |
| | 10 | | | | |

*scmm = standard cubic meters per minute; scfm = standard cubic feet per minute

**Calibrated Data:**

Slope (M2): _____
Intercept (B2): _____
Correlation (CC2): _____ (must be > 0.990)

Comments:
_____
_____
_____

# DOCUMENT SUMMARY FORM

Please provide the following information for new/revised documents.
Forward the completed form, approved document, and electronic file, to Document Control.

| | | | |
|---|---|---|---|
| Document No.: | **CL-IN-PR-002** | Revision No.: | **0** |
| Title: | **Calibration of High Volume Sampling System Utilizing a Calibrated Orifice Transfer Standard** | | |

If this is a revision, summarize the reason(s) for the revision.
**Not a revision. New procedure.**

| | |
|---|---|
| ☐ Yes ☒ No | This document requires evaluation per the requirements of a license. If yes, attach evaluation results. |
| ☐ Yes ☒ No | This document requires regulatory agency approval before implementation. If yes, contact Document Control. |

Type of revision: ☐ Contains technical changes ☐ Contains only administrative changes

Distribution for new document or changes to distribution for revised document.

**Mark LeDoux, Curtis Kirk, Zeke Wilmot, Kelly Lewis, Rick Chalk, Treesa Parker, Sean McCandless, Tim Orton, Mike LeBaron, Dan Shrum, Brian Kirkwood, Dave Squires, Jeff Gardner, Marci Wicks, Jesse Garcia, Walt Goins**

# PCB Air Sampler - Single Point Flow Check

**Revision 0**

| | | |
|---|---|---|
| Authored By: | Signature on File<br>Michael LeBaron, Permitting Engineer | 12/20/07<br>Date |
| Reviewed By: | Signature on File<br>Tim Orton, Environmental Engineer | 12/27/07<br>Date |
| Reviewed By: | Signature on File<br>Curtis Kirk, Quality Assurance Manager | 1/3/08<br>Date |
| Approved By: | Signature on File<br>Dan Shrum, Vice President, Environmental Compliance and Permitting | 1/4/08<br>Date |
| Approved By: | Signature on File<br>Mark LeDoux, Corporate Radiation Safety Officer | 1/3/08<br>Date |

☒ New
☐ Title Change
☐ Revision
☐ Rewrite

Effective Date: 1/8/08

Electronic documents, once printed, are uncontrolled and may become outdated.
Refer to the intraweb or the document control authority for the current revision.

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# 1. PURPOSE AND SCOPE

## 1.1. Purpose

The purpose of this procedure is to track the High-Volume Polyurethane Foam (PUF) Air Sampler's calibration stability. The High-Volume PUF Air Sampler being calibrated is used to take PCB Air Samples in conjunction with the management of PCB-contaminated waste in the Shredder facility.

## 1.2. Scope

This procedure applies to all personnel who will participate in PUF sampling with respect to PCB Shredding operations. This procedure does not apply in emergency situations where health and safety concerns supersede the need for environmental PCB monitoring.

# 2. REFERENCES

2.1 Compendium Method TO-4A – *Determination of Pesticides and Polychlorinated Biphenyls in Ambient Air Using High Volume Polyurethane Foam (PUF) Sampling Followed by Gas Chromatographic/Multi-Detector Detection (GC/MD).*

2.2 Lab-1.1, *Sample Control – Chain of Custody*

2.3 CL-RS-PR-140, *Radiation Work Permit*

2.4 CL-RS-PR-120, *Access Control Points*

2.5 CL-RS-PR-210, *Personnel External Radiation Monitoring*

2.6 CL-IN-PR-002, *PCB Air Sampling - Calibration*

2.7 CL-IN-PR-003, *PCB Shredding - Air Sampling Collection*

2.8 EPA Approval for the Shredder Operation to Process PCB Wastes (EPA Approval), as Amended.

# 3. GENERAL

## 3.1. Definitions

3.1.1. *Calibrated Orifice Flow Rate Transfer Standard* — The standard used to calibrate the High Volume Air Sampler.

3.1.2. *Cartridge* — The filter head assembly on the Sampler that contains the media used to capture the sample.

3.1.3. *Controlled Environment* — An environment that is free of radiological and chemical contamination.

3.1.4. *High Volume Air Sampler (Sampler)* — The sampling station, components and sample collection media used to obtain an air sample.

3.1.5. *Magnehelic Gauge* – Gauge used to read differential pressure within the sample collection line. The flow rate through the sampler is calculated from this differential pressure and ambient conditions.

3.1.6. *Personal Protective Equipment (PPE)* — Garments or accessories used by an individual to reduce exposure to hazardous materials.

3.1.7. *PUF Module* — A glass cartridge containing the PUF media that the sample is collected upon.

3.1.8. *Restricted Area (RA)* — The area within the controlled area that requires control of access and occupancy for radiation protection purposes. The RA boundary is posted "Caution, Radioactive Material" and is bordered by a 6-foot high fence except in buildings where a lockable door or other device to prevent unauthorized or inadvertent entry is present. A security badge and dosimetry is required for entrance into the RA.

3.1.9. *Single Point Calibration Check* – The calibration check for operational flow rate that is performed before each sampling event, or as often as is deemed necessary by the Environmental Engineer or his qualified designee.

### 3.2. Responsibilities

3.2.1 *Environmental Engineer* is responsible for the implementation of this procedure and compliance with state and federal regulations.

3.2.2 *Director of Health Physics (DHP)* is responsible to ensure that air sampling is monitored every six hours and that filter samples are taken by Health Physics personnel at the conclusion of PCB shredding campaigns.

3.2.3 *Corporate Radiation Safety Officer* is responsible for overall radiation safety, contamination control, and compliance with state and federal regulations.

3.2.4 *Health Physics Technicians (HPTs)* are responsible for obtaining PCB air samples in accordance with this procedure.

### 3.3. Precautions and Limitations

3.3.1 The toxicity or carcinogenicity of each reagent used in this method has not been precisely defined; however, each chemical compound should be treated as a potential health hazard. From this viewpoint, exposure to these chemicals must be reduced to the lowest possible level through the use of personal protective equipment.

3.3.2 The Shredder Area can be dangerous. For your safety: follow all signs, postings, and procedures.

## 4. REQUIREMENTS AND GUIDANCE

### 4.1. General Requirements

4.1.1. Personnel performing PCB air sample collection activities shall perform work in accordance with CL-RS-PR-140, *Radiation Work Permits (RWP).*

4.1.2. Only qualified Health Physics Technicians trained on this procedure, the Environmental Engineer and/or a trained designee shall be allowed to perform this procedure.

4.1.3. All personnel and items that enter the contaminated portion of Energy*Solutions*' RA shall comply with procedure CL-RS-PR-120, *Access Control Points.*

4.1.4. All contact with radiological or chemically contaminated media shall be minimized. Appropriate PPE shall be used whenever personnel handle chemically or radiologically contaminated objects.

4.1.5. All personnel issued a dosimeter to perform work within the scope of this procedure shall use it in accordance with the CL-RS-PR-210, *Personnel External Radiation Monitoring*, to monitor exposure to RAM. This requirement applies both inside and outside the RA.

4.1.6. All Radiological Controls are implemented in order to keep exposures as low as reasonably achievable (ALARA).

4.1.7. The Calibrated Orifice Flow Rate Transfer Standard shall be sent to the manufacturer for recertification on an annual basis or more frequently if deemed necessary by the Environmental Engineer.

4.1.8. Single Point Calibration checks are required as follows:

- Prior to the start of each test period.
- After each test period.
- Prior to sampling after a sampler is moved.

4.1.9. For tracking the performance of the sampler, a control chart presenting the percentage difference between the Magnehelic measurement calculated flow rates and the calibrated orifice/manometer reading calculated flow rates will be maintained.

## 4.2. Calibration Procedure

4.2.1 Prior to the Single Point Calibration Check, attach a sampling cartridge that does not contain any sampling media, but does contain an empty glass PUF Module, to the sampler and activate the sampling motor.

4.2.2 Record the ambient temperature ($T_a$), in °C, and barometric pressure ($P_a$), in mmHg.

4.2.3 Fully open the flow control valve and adjust the voltage variator so that a sample flow rate corresponding to approximately nine (9) cubic feet per minute (~0.255 cubic meters per minute) is indicated on the Magnehelic gauge (calculate the desired Magnehelic reading using the calculation in Section 4.3.5 of CL-IN-PR-003, *PCB Shredding – Air Sample Collection*).

4.2.4 Allow the motor to warm up for ten minutes and then adjust the flow control valve to a flow rate of eight (8) cubic feet per minute (see calculation in Section 4.3.5 of CL-IN-PR-003, *PCB Shredding – Air Sample Collection*).

4.2.5 Place the Calibrated Orifice Flow Rate Transfer Standard on top of the sampling cartridge.

4.2.6 Properly align the retaining rings with the filter holder and secure by tightening the three screw clamps.

4.2.7 Leak test the Calibrated Orifice Flow Rate Transfer Standard by blocking the hole on the top of the standard and the tap on the side of the standard and turning on the sampler motor. Gently rock the standard and listen for a whistling sound that would indicate a leak in the system. Eliminate all leaks before proceeding with the calibration. When the sampler is determined to be leak-free, turn off the sampler and unblock the holes in the standard.

**Note: Avoid running the sampler for too long a time with the orifice blocked. This precaution will reduce the chance that the motor will be overheated due to lack of cooling air. Such overheating can shorten the life of the motor.**

4.2.9 Open both ports of the manometer and connect tubing from one of the manometer ports to the pressure tap on the side of the Calibrated Orifice Flow Rate Transfer Standard. Leave the opposite side of the manometer open to the atmosphere. Gently shake or tap the manometer to remove air bubbles and/or liquid remaining on tubing connectors. Ensure a level reading is provided on the manometer and adjust the resulting meniscus to zero on the scale.

4.2.10 Turn on the sampler motor and let run for five (5) minutes.

4.2.11 Record the manometer pressure differential indicated, Y1, in inches of water.

**Note: Be sure that a stable Y1 has been established prior to recording the value.**

4.2.12 Record the observed Magnehelic gauge reading, MR1, in inches of water.

**Note: Be sure that a stable MR1 has been established prior to recording the value.**

4.2.13 Using the Orifice Transfer Standard curve from the latest manufacturers calibration, calculate the calibrated flow rate (X1) using the calculations in Sections 4.2.16 and 4.2.17 of Procedure CL-IN-PR-002, *PCB Air Sampler – Calibration*).

4.2.14 Calculate the Magnehelic measurement flow rate (X2) using the procedure in Section 4.3.9 of CL-IN-PR-003, *PCB Shredding – Air Sample Collection.*

4.2.15 If the difference between the value calculated in 4.2.13 and the value calculated in 4.2.14 is greater than 10%, the sampler will require a full calibration in accordance with CL-IN-PR-002, *PCB Air Sampler - Calibration*, prior to sample collection using that sampler.

4.2.16 Remove the Flow Rate Transfer Standard and the sampling cartridge.

## 5. ATTACHMENTS AND FORMS

None

# DOCUMENT SUMMARY FORM

Please provide the following information for new/revised documents.
Forward the completed form, approved document, and electronic file, to Document Control.

Document No.: **CL-IN-PR-001** Revision No.: **0**

Title: **Single Point Calibration Check**

If this is a revision, summarize the reason(s) for the revision.
**Not a revision. New procedure.**

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|---|---|
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Type of revision: ☐ Contains technical changes ☐ Contains only administrative changes

Distribution for new document or changes to distribution for revised document.

**Mark LeDoux, Curtis Kirk, Zeke Wilmot, Kelly Lewis, Rick Chalk, Treesa Parker, Sean McCandless, Tim Orton, Mike LeBaron, Dan Shrum, Brian Kirkwood, Dave Squires, Jeff Gardner, Marci Wicks, Jesse Garcia, Walt Goins**

ENERGYSOLUTIONS

CL-EV-WI-003

# Groundwater Monitoring Well Installation and Abandonment

**Revision 0**

| | | |
|---|---|---|
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- [X] New
- [ ] Title Change
- [ ] Revision
- [ ] Rewrite
- [ ] Cancellation

Effective Date 11/17/11

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# 1. PURPOSE AND SCOPE

## 1.1 Purpose

To provide guidelines for Energy*Solutions'* Compliance and Permitting Department staff for the installation and abandonment of groundwater monitoring wells at the Clive facility. This procedure ensures that Compliance and Permitting Department staff members have coordinated with regulatory agencies, Clive Operations, Safety and Health (S&H), Health Physics, Engineering, and Security regarding the planning and execution of groundwater monitoring well installation and/or abandonment**.** This work instruction also ensures compliance with requirements applicable to well installation and/or abandonment.

## 1.2 Scope

The scope of this work instruction includes the scoping, planning, and completion of groundwater monitoring well installation and abandonment activities. Step-by-step procedures for well installation and abandonment are outside of the scope.

# 2. REFERENCES

2.1 CL-TN-PR-060, Training Documentation and Storage.

2.2 ES-SH-PR-101, Job Hazard Analysis.

2.3 CL-SH-PR-050, Equipment Operations.

2.4 Attachment 6.2, *Excavation Permit (Example)*, ES-SH-PR-109, *Excavation and Trenching.*

2.5 Utah Administrative Code (UAC) R655-4-4.2, *Start Cards.*

2.6 Revised Hydrogeologic Report. August 2004. Version 2.0 (or more recent version if available).

2.7 Groundwater Quality Discharge Permit (GWQDP) No. UGW450005, as amended.

2.8 RCRA Ground-Water Monitoring Technical Enforcement Guidance Document (TEGD), U.S. EPA Office of Solid Waste and Emergency Response, September 1986.

2.9 State-issued Part B Permit, EPA ID No. UTD982598808, *Module VI* and attachments.

2.10 RCRA Ground-Water Monitoring Draft Technical Guidance, U.S. EPA Office of Solid Waste, November 1992.

2.11 ASTM D2488-09a, *Standard Practice for Description and Identification of Soils (Visual-Manual Procedure).*

2.12 UAC R655-4-14, *Abandonment of Wells.*

## 3. GENERAL

### 3.1 Definitions

3.1.1 *Clive Operations* – In general, refers to personnel involved in the operation and maintenance of the Clive facility. Where this work instruction directs coordination/consultation with "*Clive Operations*," it refers specifically to the Director of LLRW Operations for work outside of the Mixed Waste facility and the Director of Mixed Waste Operations for work within the Mixed Waste facility.

3.1.2 *Demobilization* – Activities occurring from the time the work scope is completed until the contractor is off the Clive facility (last day of field work).

3.1.3 *Job Hazard Analysis* (JHA) – A documented review of a specific operation, task, or activity that involves carefully studying and recording each step of a job, identifying existing or potential job hazards (both safety and health hazards), and determining the best way to perform the job to reduce or eliminate these hazards.

3.1.4 *Mobilization* – Activities occurring during the time from initial arrival of the contractor at the Clive facility (first day of field work) until arrival at the first well location.

3.1.5 *Site Set-Up* – Activities occurring after arrival at the first location and before drilling or well abandonment begins. Also includes on-facility movement between subsequent locations.

### 3.2 Responsibilities

3.2.1 The Director of Compliance and Permitting (DCP) or designee shall be responsible for the overall implementation of this instruction.

3.2.2 The Groundwater Manager (GM) is responsible for scoping and planning of monitoring well installation and abandonment events, well installation and abandonment field operations, reporting, and the implementation and maintenance of this work instruction.

3.2.3 The GM and Staff Hydrogeologist (SH) are responsible for following this instruction.

3.2.4 Groundwater Sampling Technicians are responsible for providing logistical support during well installation and/or abandonment field operations at the Clive facility.

### 3.3 Records

3.3.1 Well installation and abandonment activities will generate records for individual monitoring wells. These records will be completed in the field and retained by the GM or SH. Electronic copies will be maintained in *On-Base* by inclusion in reports submitted to the Division of Radiation Control (DRC) and Division of Solid and Hazardous Waste (DSHW) (as applicable). Records generated in accordance with this instruction are discussed further in applicable sections of this work instruction.

### 3.4 Training

3.4.1 All personnel who are directly involved with the installation and abandonment of groundwater monitoring wells at the Clive facility will receive training on this instruction.

3.4.2 Training will be documented according to CL-TN-PR-060 (Reference 2.1).

## 4. REQUIREMENTS AND GUIDANCE

### 4.1 Pre-Award Scoping

4.1.1 The GM or SH will develop a scope of work for inclusion in a bid package.

**Note: Where applicable, the subsections below are relevant to surveying and slug testing contractors as well as the drilling contractor.**

4.1.1.1 Bid packages will be developed for:

- Well installation and/or well abandonment
- Surveying (well installation only)
- Slug testing (well installation only)

Due to permit-imposed time constraints on as-built reporting, surveying and slug testing contractor procurement will proceed prior to well installation.

4.1.1.2 A Job Hazard Analysis (JHA) (Reference 2.2) will be performed and provided to a Clive S&H representative for review and comment. The JHA review at this step in the

process will ensure that S&H requirements potentially affecting the bid price and suitability of contractors are included in the bid package.

4.1.1.3 The Clive S&H representative will be consulted regarding training requirements for contractor personnel. These requirements will be included in the bid package.

4.1.1.4 Procedure CL-SH-PR-050, Equipment Operations, (Reference 2.3) and the Vehicle Inspection ("Tag-Out Items") form will be included in applicable bid packages along with a statement that equipment (e.g., drill rig) will be inspected and must comply prior to use on the Clive facility.

4.1.1.5 Only Utah-licensed well drillers will be considered for well installation and abandonment work. Only Utah-licensed surveyors will be considered for survey work.

4.1.1.6 For abandonment, it will be decided during pre-award scoping which entity or entities (i.e., drilling contractor or Clive Operations) will remove and dispose of surface completions (refer to Section 4.6.4 for additional information).

## 4.2 Planning

4.2.1 Well Installation – The GM or SH will perform the following planning activities.

4.2.1.1 Develop a preliminary schedule approximately 60 calendar days before the start of field work. Consult with Clive Operations, Health Physics, S&H, and Engineering concerning schedule, locations, and site support. In addition to the above, communicate the preliminary schedule to the DRC and DSHW (as applicable).

4.2.1.2 Submit an Excavation Permit (Attachment 6.2, Reference 2.4) to Engineering. Where necessary, arrange for an Engineering representative to mark underground utilities. Well locations cannot be finalized until the Excavation Permit is approved by the Director of Engineering or designee.

4.2.1.3 Arrange with the Engineering Department to mark well locations with survey stakes. The GM or SH will review the locations in the field to confirm they are sited correctly and to identify any logistical issues (e.g., accessibility, underground or overhead

utilities, etc). If a location is not accessible due to presence of equipment or material or due to ground conditions (e.g., steep grade), coordinate with Operations to improve access prior to mobilization.

4.2.1.4 Obtain Authorization to Drill (Start Cards) for each well from the Utah Division of Water Rights (DWR) (Reference 2.5). Wells drilled to a depth of 30 feet or greater must have authorization from DWR prior to drilling.

4.2.1.5 Approximately 30 calendar days before the start of field work, select a start date and develop a firm schedule for well installation. Confirm start date and schedule with drilling contractor, Operations, Health Physics, and S&H. Provide schedule to Security, the DRC, and DSHW (as applicable). Provided estimated start date to surveyor and slug-testing contractor for their services.

4.2.1.6 Confirm that drilling contractor's staff and equipment will meet the training and inspection requirements, respectively, provided in the bid package.

4.2.1.7 Review Monitoring Well Completion Logs for existing wells in the vicinity of the new well locations. Information on the hydrogeology and stratigraphy of the Clive facility is available in the Revised Hydrogeologic Report (Reference 2.6).

4.2.2 Well Abandonment – The GM or SH will perform the following planning activities.

4.2.2.1 Develop a preliminary schedule approximately 60 calendar days before the start of field work. Consult with Operations, Health Physics, S&H, and Engineering concerning schedule, locations, and site support. In addition to the above, communicate preliminary schedule to the DRC and DSHW (as applicable).

4.2.2.2 Provide drilling contractor with well information from the DWR water rights database available online at: http://www.waterrights.utah.gov/wellInfo/wellInfo.asp. At a minimum, provide the well identification number, well name, and location. This information may be provided as part of bid package. Check with drilling contractor to ensure the driller has provided the information to DWR and has received Well Abandonment Reports (one per well) from DWR.

4.2.2.3 Approximately 30 calendar days before the start of field work, select a start date and develop a firm schedule for well abandonment. Confirm start date and schedule with drilling contractor, Operations, Health Physics, and S&H. Provide the schedule to Security, the DRC, and DSHW (as applicable).

4.2.2.4 Confirm that drilling contractor's staff and equipment will meet the training and inspection requirements, respectively, provided in the bid package.

4.2.2.5 Review the Monitoring Well Completion Logs for the wells to be abandoned. Estimate the quantities of grout and cement required for each well.

4.3 **Mobilization** – The GM or SH will perform the following activities. Note: based on availability of facility personnel, the order of the items below may be modified.

4.3.1 Check in with Clive Security and obtain badges for contractor personnel.

4.3.2 Escort contractor personnel to S&H and confirm requirements and training. If work will take place inside the Restricted Area, contractors will be required to complete temporary radiation worker training and obtain badges.

4.3.3 Coordinate with Health Physics regarding radiological requirements. If work will take place inside the Restricted Area:

- Arrange a baseline radiological survey of equipment and drilling rig.
- The drilling contractor will provide a tool inventory to Health Physics.
- Note that tools, supplies, and equipment that will not be used in the Restricted Area should be removed from the drill rig and staged at a pre-arranged location prior to the radiological survey and tool inventory.

4.3.4 Coordinate with S&H and Maintenance personnel to complete vehicle inspection.

4.3.5 Perform safety review with drilling contractor personnel. Discuss JHA requirements and schedule. Discuss Clive facility emergency procedures and provide Clive Security phone number. Provide the location of the drill rig emergency shutoff switch (kill switch) to all field personnel.

## 4.4 Site Set-Up

4.4.1 Drill rigs will move between locations with the mast in the fully lowered position, and equipment and materials will be properly secured. For off-road locations, a spotter and/or the operator should walk the route of travel and inspect it for gullies, ruts, and other obstacles. Slopes should be avoided, but if side-slope travel is required, the operator should take care to evaluate the ability of the rig to remain upright. A spotter will be used to direct the rig operator in areas where there is congestion, restrictive maneuvering is required, or adequate visibility cannot be maintained.

4.4.2 The GM or SH will review the Excavation Permit (Section 4.2.1.2) to confirm that the location is clear of underground and overhead utilities. This is initially performed during the Planning stage (Section 4.2.1.3), but, due to its importance, will be repeated during site set-up.

4.4.3 Set up sample tables, work areas, and position Energy*Solutions* vehicles at a minimum distance from the rig of the height of the fully extended mast plus 5 feet.

4.4.4 Energy*Solutions* personnel will limit their assistance to drillers with equipment and supplies, and Energy*Solutions* personnel will not operate the drill rig controls except to activate the emergency shutoff, if needed.

4.4.5 Water used for decontamination procedures and the mixing of grout and cement will be fresh, clean water. Water trucked to the facility from Grantsville or similar is acceptable.

## 4.5 Well Installation

4.5.1 The GM or SH will conduct and document a safety meeting at the beginning of each field day. The meeting will address job hazards and controls, and will reiterate facility emergency procedures including the Clive Security phone number.

4.5.2 The following are requirements for well construction:

- GWQDP No. UGW450005 Requirements – Part I.F.1.e "Well Construction Criteria" (Reference 2.7). Wells will be constructed in accordance with guidelines found in the EPA RCRA Groundwater Monitoring Technical Enforcement Guidance Document (TEGD) (Reference 2.8). This applies to all wells except for those in the Mixed Waste facility.

- Part B Permit, EPA ID No. UTD982598808 Requirements – Condition VI.E.2.a (Reference 2.9). All monitoring wells will be

constructed in accordance with the techniques described in the TEGD (Reference 2.8) and the 1992 TEGD Addendum or latest version (Reference 2.10). This applies to wells in the Mixed Waste facility.

4.5.3 The GM or SH will complete a Boring Log (CL-EV-WI-003-F1) in the field for each installed well. An industry standard method (such as ASTM D2488-09a, Reference 2.11) will be used to log the soil. For consistency, nomenclature and format established during previous well installations should be followed as appropriate.

4.5.4 The GM or SH will determine the total depth of the boring and well construction details (e.g., depth and length of screened interval, height of riser, etc). Only unopened bags of materials will be used in well construction. The GM or SH will complete a Monitoring Well Construction Form (CL-EV-WI-003-F2) in the field for each installed well.

4.5.5 Although monitoring well locations are typically uncontaminated, decontamination of equipment will be performed. Auger flights and drill rods will be pressure washed between well locations (or between drill holes if multiple holes are drilled at a single location). Split-spoon samplers will be decontaminated between sample intervals. Typically, sampler decontamination will consist of scrubbing with a solution of fresh water and laboratory detergent (e.g., Alconox or Liquinox), two fresh water rinses, and a final deionized water rinse. Water from decontamination will be containerized and disposed at the Mixed Waste decontamination facility or other suitable facility, as directed by Operations and/or Health Physics.

4.5.6 The drillers will level the area around the surface completion and will place forms around the riser in preparation for pouring the concrete pad. The GM or SH will coordinate with Operations to have concrete poured at each well location. The drillers will finish the pads and place a brass survey marker or similar into the concrete pad surface.

## 4.6 Well Development

4.6.1 Wells are developed in two stages: initial and final development. The initial stage may be performed by the drilling contractor and is included in the scope of this work instruction. Final development is performed subsequent to installation of a dedicated pump in each well by Energy*Solutions* Groundwater Program personnel. Note: Wells without dedicated pumps (e.g., deep monitoring wells and extraction wells) may not require final development.

4.6.2 Initial well development will be performed by bailing, air lifting, or other suitable method. The method must be capable of flushing sediment from the sand (filter) pack and removing sediment from the well.

4.6.3 The volume of water removed from each well and the visual appearance of the development water will be documented in the field by the GM or SH.

4.6.4 Equipment used in development will be decontaminated between wells by pressure washing or by the procedure given in Section 4.5.5.

## 4.7 Well Abandonment

4.7.1 The GM or SH will conduct and document a safety meeting at the beginning of each field day. The meeting will address job hazards and controls, and will reiterate facility emergency procedures including the Clive Security phone number.

4.7.2 The following are requirements for well abandonment:

- Wells outside of the Mixed Waste facility – Wells will be abandoned in accordance with the requirements of UAC R655-4-14 (Reference 2.12).

- Mixed Waste facility wells – Wells will be abandoned in accordance with Attachment VI-3 of the State-issued Part B Permit, EPA ID No. UTD982598808 (Reference 2.9).

**Note: The well abandonment requirements of UAC R655-4-12 and Attachment VI-3 of the Part B Permit are essentially identical.**

4.7.3 The GM or SH will complete a Monitoring Well Abandonment Form (CL-EV-WI-003-F3) in the field for each well abandoned.

4.7.4 The method for removal and disposal of well surface completions will be decided during pre-award scoping (Section 4.1), since it affects the driller's scope of work and planning activities. Depending on the number of wells abandoned, the driller or Clive Operations will pull the surface completions out of the ground, break up the concrete pads, and dispose of the casing and concrete. In general, if the number of wells abandoned is small (less than five), the driller may pull and dispose of the casing and concrete. If the number of wells abandoned exceeds five or if the completions cannot be efficiently and safely removed by the driller, the GM or SH should coordinate with Operations for removal and disposal.

- If the driller removes surface completions, the pad and casing will be broken into pieces that can safely be manually loaded into and out of a vehicle used to transport the materials to the disposal location. Under no circumstances will the drill rig be used to mechanically load debris into or out of a vehicle. Caution will be taken to not overload vehicles used to transport completion debris.

4.8 **Demobilization**

4.8.1 The GM or SH will perform the following activities before releasing the drilling contractor from the facility:

4.8.1.1 Ensure that the scope of work has been met.

4.8.1.2 If working in Restricted Area, coordinate release of the drill rig with Health Physics.

4.8.1.3 Inspect the location used by the contractor for staging materials and equipment. Check that contractor has loaded all materials and equipment and has properly disposed of trash or unwanted materials.

4.8.1.4 Check contractors out at Clive Security and receive all contractor badges, as applicable.

4.8.2 The GM or SH will notify the DCP, Clive Operations, and Security that field work has been completed and the drilling contractor is off-site.

4.9 **Surveying and Slug Testing** – At the conclusion of well installation, the location and elevation of each new well will be determined by a Utah-licensed surveyor. Slug testing will be performed at each new well to estimate hydraulic conductivity.

4.9.1 The GM or SH will perform the following activities:

4.9.1.1 Confirm start date and schedule with contractor, Operations, Health Physics, and S&H. Provide the schedule to Security.

4.9.1.2 Arrange an escort (e.g., Groundwater or Environmental Technician) for contractor, if the GM or SH is not going to be present for surveying and/or slug testing field work.

4.9.1.3 Check in with Clive Security and obtain badges for contractor personnel.

4.9.1.4 Escort contractor personnel to S&H and confirm requirements and training. If work will take place inside the Restricted Area,

contractors will be required to complete temporary radiation worker training and obtain badges.

4.9.1.5 Perform a safety review with contractor personnel. Discuss Clive facility emergency procedures and provide Clive Security phone number.

4.9.1.6 When field work has been completed, ensure that the scope of work has been met.

4.9.1.7 If working in the Restricted Area and if applicable, coordinate release of the contractor's equipment with Health Physics.

4.9.1.8 Check contractors out at Clive Security and receive all contractor badges, as applicable.

4.9.1.9 Notify the DCP, Clive Operations, and Security that field work has been completed and the contractors are off-site.

## 4.10 Reporting

### 4.10.1 Well Installation

4.10.1.1 The following are reporting requirements for installation:

- GWQDP No. UGW450005 Requirements – Part II.L "Monitoring Well As-Built Reports" (Reference 2.7). Will be submitted to DRC within 60 calendar days of well construction. Will include survey coordinates and elevations and slug test results.

- Part B Permit, EPA ID No. UTD982598808 Requirements – Condition VI.E.2.e (Reference 2.9). Monitoring well completion reports will be submitted to DSHW within 45 calendar days of installation. This applies to wells in the Mixed Waste facility.

4.10.1.2 The GM or SH will arrange with contractors to obtain the following information/reports in a timely manner to meet the schedule requirements listed above:

- DWR Well Driller's Report – from drilling contractor
- Well coordinate and elevation survey data
- Slug testing report

4.10.2 Well Abandonment

4.10.2.1 The following are reporting requirements for abandonment:

- GWQDP No. UGW450005 Requirements – Part II.M "Plugging and Abandonment Reports" (Reference 2.7). Will be submitted to DRC within 30 calendar days of completion of well abandonment.

- Part B Permit, EPA ID No. UTD982598808 Requirements – Condition VI.E.2.h (Reference 2.9). A Report of Abandonment will be submitted to DSHW within 30 calendar days of abandonment. Minimum requirements for reported information are listed in Attachment VI-3 of the Part B Permit. This applies to wells in the Mixed Waste facility.

4.10.2.2 The GM or SH will arrange with drilling contractor to obtain completed DWR Well Abandonment Reports in a timely manner to meet the schedule requirements listed above.

## 5. ATTACHMENTS AND FORMS

5.1 CL-EV-WI-003-F1, Boring Log (Rev. 0)

5.2 CL-EV-WI-003-F2, Monitoring Well Construction Form (Rev. 0)

5.3 CL-EV-WI-003-F3, Monitoring Well Abandonment Form (Rev. 0)

## 5.1 CL-EV-WI-003-F1, Boring Log (Rev. 0) (Page 1 of 2)

BORING LOCATION

Project:
Date Drilled: _____ Date Completed: _____
Logged By: _____

Boring No.: _____
Northing: _____ Easting: _____

Water Elevation (ft.): _____
Date Measured: _____

Ground Surface Elevation (ft.): _____
Measuring Point (MP) Elevation (ft.): _____
MP is Ground Surface Datum: NGVD (1929)

Total Depth (ft.): _____
Diameter (in.): _____

Drilling Contractor: _____
Drilling Method: _____

Well Screen: Diameter _____ Depth _____ Slot Size _____
Casing: Diameter _____ Length _____ Type _____
Sand _____ Bentonite Seal _____ Cement Grout Seal _____

| DEPTH (FEET) | GRAIN SIZE % GRAVEL | % SAND | % FINES | MAX. PID READING (ppm) | BLOWS (6 IN.) | SAMPLE TYPE* | SAMPLE RECOVERY | USCS CLASSIFICATION | LITHOLOGIC DESCRIPTION (USCS name; color; size and angularity of each component or plasticity; density; moisture content; additional facts) | ELEVATION (FEET) |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | | | | | | | |
| 1 | | | | | | | | | | |
| 2 | | | | | | | | | | |
| 3 | | | | | | | | | | |
| 4 | | | | | | | | | | |
| 5 | | | | | | | | | | |
| 6 | | | | | | | | | | |
| 7 | | | | | | | | | | |
| 8 | | | | | | | | | | |
| 9 | | | | | | | | | | |

* C California Split Spoon Sampler (2.5" I.D.)
S Standard penetration test sampler
c Cuttings
▼ Elevation of ground water

BORING LOG

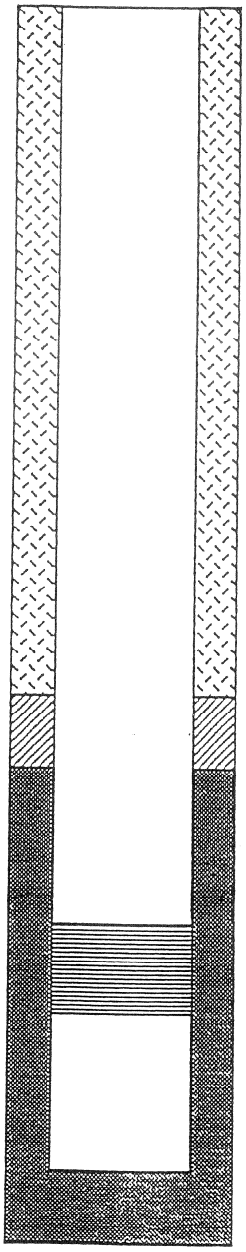
PAGE 1 OF ____

## 5.1 CL-EV-WI-003-F1, Boring Log (Rev. 0) (Page 2 of 2)

| DEPTH (FEET) | GRAIN SIZE % GRAVEL | % SAND | % FINES | MAX. PID READING (ppm) | BLOWS (6 IN.) | SAMPLE TYPE* | SAMPLE RECOVERY | USCS CLASSIFICAT. | Project: Boring No.:_____ LITHOLOGIC DESCRIPTION (USCS name; color; size and angularity of each component or plasticity; density; moisture content; additional facts) | ELEVATION (FEET) |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | | | | | | | |
| 1 | | | | | | | | | | |
| 2 | | | | | | | | | | |
| 3 | | | | | | | | | | |
| 4 | | | | | | | | | | |
| 5 | | | | | | | | | | |
| 6 | | | | | | | | | | |
| 7 | | | | | | | | | | |
| 8 | | | | | | | | | | |
| 9 | | | | | | | | | | |
| 0 | | | | | | | | | | |
| 1 | | | | | | | | | | |
| 2 | | | | | | | | | | |
| 3 | | | | | | | | | | |
| 4 | | | | | | | | | | |
| 5 | | | | | | | | | | |
| 6 | | | | | | | | | | |
| 7 | | | | | | | | | | |
| 8 | | | | | | | | | | |
| 9 | | | | | | | | | | |
| 0 | | | | | | | | | | |

PAGE OF BORING LOG

## 5.2 CL-EV-WI-003-F2, Monitoring Well Construction Form (Rev. 0)



(NOT TO SCALE)

WELL NUMBER _____
GEOLOGIST _____
DATE CONSTRUCTION STARTED _____
DATE CONSTRUCTION COMPLETED _____

RELEVANT INFORMATION (Problems, corrective actions)

_____
_____
_____
_____

CASING SCHEDULE:

RISER TYPE _____
RISER DIAMETER _____
RISER LENGTH _____
SCREEN TYPE _____
SCREEN LENGTH _____
SCREEN DIAMETER _____
PROTECTIVE CASING TYPE , LENGTH, DIAMETER _____

_____ CEMENT GROUT INTERVAL

_____ TOP OF BENTONITE SEAL

BENTONITE TYPE _____

_____ TOP OF SAND PACK

SAND SIZE _____

_____ SCREENED INTERVAL
(Beginning and ending depth below ground surface)

SLOT SIZE _____

_____ USCS CLASSIFICATION OF FORMATION MATERIAL IN SCREENED INTERVAL

_____ DEPTH OF CASING
(Below ground surface)

_____ BOREHOLE DEPTH

ANNULAR VOLUME:

$V = \pi H (R_1^2 - R_2^2)$

WHERE:

V = Annular Volume ($ft^3$)
$\pi$ = 3.142
H = Length of Interval (ft)
$R_1$ = Borehole Radius (ft)
$R_2$ = Well Casing Radius (ft)

CALCULATIONS:

MONITORING WELL
CONSTRUCTION FORM

## 5.3 CL-EV-WI-003-F3, Monitoring Well Abandonment Form (Rev. 0)

WELL NUMBER _____

LOCATION _____

PERSONNEL _____

DATE ABANDONED _____

DRILLING CONTRACTOR _____

TOTAL DEPTH FROM WELL CONSTRUCTION DIAGRAM _____ FT BGS / BTOC

TOTAL DEPTH MEASURED PRIOR TO ABANDONMENT (TD) _____ FT BGS / BTOC

LENGTH OF SCREEN (LOS) _____ FT

CALCULATE VOLUME OF GROUT/CEMENT (VOL) _____ GALLONS

CALCULATION: VOL = (TD x UNIT $VOL_{casing}$) + (LOS x UNIT $VOL_{filter\ pack}$)

| UNIT $VOL_{casing}$: | UNIT $VOL_{filter\ pack}$: |
|---|---|
| 0.16 GALLONS PER FOOT FOR 2-INCH WELLS | 0.78 GALLONS PER FOOT FOR 2-INCH WELLS^ |
| 0.65 GALLONS PER FOOT FOR 4-INCH WELLS | 1.1 GALLONS PER FOOT FOR 4-INCH WELLS^ |

^ ASSUMES 30% POROSITY IN FILTER PACK

ACTUAL VOLUME OF GROUT/CEMENT USED* _____ GALLONS

* AS MIXED

TYPE OF CEMENT/GROUT USED 1 _____ QUANTITY _____ GALS/BAGS

TYPE OF CEMENT/GROUT USED 2 _____ QUANTITY _____ GALS/BAGS

DEPTH OF CASING TERMINATION** _____ FT BGS

** MINIMUM OF 2 FT BGS

COMPACTED NATIVE FILL PLACED ABOVE ABANDONED WELL? _____ YES / NO CIRCLE ONE

DISPOSITION OF WELL PAD _____

DISPOSITION OF PROTECTIVE CASING _____

FORM COMPLETED BY _____

ENERGYSOLUTIONS

**MONITORING WELL ABANDONMENT FORM**

# Southwest Corner Pond and Well Nest: Custodial Responsibilities

**Revision 0**

| | | |
|---|---|---|
| Authored By: | Signature on File | 12/30/09 |
| | Michael LeBaron, Permitting Engineer | Date |
| Reviewed By: | Signature on File | 12/30/09 |
| | Robert Sobocinski, Groundwater Manager | Date |
| Reviewed By: | Signature on File | 12/30/09 |
| | Jeff Low, Staff Hydrogeologist | Date |
| Approved By: | Signature on File | 12/30/09 |
| | Sean McCandless, Director of Compliance and Permitting | Date |

☒ New
☐ Title Change
☐ Revision
☐ Rewrite

Effective Date:

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# 1. PURPOSE AND SCOPE

## 1.1. Purpose

The purpose of this work instruction is to help Environmental and Groundwater Monitoring personnel effectively and regularly monitor the physical conditions of facilities located at the southwest corner of the Clive, Utah site.

## 1.2. Scope

This work instruction applies to inspection and management activities that will occur at the Southwest Corner Pond, PZ-1, GW-19a, GW-19b, and a recently installed extraction well, EW-901.

# 2. REFERENCES

2.1 CL-EV-PR-004, Groundwater Monitoring

2.2 Groundwater Quality Discharge Permit No. UGW450005

2.3 CL-TN-PR-060, Training Documentation and Storage Procedure

# 3. GENERAL

## 3.1. Definitions

3.1.1 The *Environmental Monitoring Team* for this work instruction consists of the following individuals:

- The Director of Compliance and Permitting;
- The Groundwater Manager;
- The Staff Hydrogeologist;
- The Permitting Engineer;
- Environmental Monitoring Technicians;
- Groundwater Monitoring Technicians; and,
- Any other individuals familiar with and trained to perform the tasks delineated in Section 2 of this work instruction.

3.1.2 *Freeboard* is defined as the amount of distance between the lip of the pond and the water level in the pond.

## 3.2. Responsibilities

3.2.1 The Director of Compliance and Permitting (DCP) is responsible for providing random QA/QC checks of documentation generated by this Work Instruction.

3.2.2 The Groundwater Manager is responsible for ensuring pond and well conditions are not presenting conditions adverse to compliance with the Groundwater Quality Discharge Permit (GWQDP) by reporting significant trends and conditions to the DCP and Staff Hydrogeologist. The

Groundwater Manager may implement or direct additional activities associated with this Instruction as needed.

3.2.3 The Staff Hydrogeologist is responsible for ensuring pond and well conditions are not presenting conditions adverse to compliance with the GWQDP by reporting significant trends and conditions to the DCP and Groundwater Manager. The Staff Hydrogeologist may implement or direct additional activities associated with this Instruction as needed.

3.2.4 The Permitting Engineer is responsible for the management of the Environmental and Groundwater Monitoring Technicians as well as the scheduled operations associated with this Instruction. The Permitting Engineer will ensure that the Environmental Monitoring Team has the necessary equipment and resources to remain in compliance.

3.2.5 The Environmental and Groundwater Monitoring Technicians (technicians) are responsible for executing the schedules and requirements established in the Instruction.

### 3.3. Precautions and Limitations

3.3.1. Technicians performing the inspections associated with this Instruction alone shall ensure that they have either a radio or PTT with them at all times. They shall also ensure that at least one other individual is notified of where they are going and how long the inspection should take.

3.3.2. When performing inspections in this area, be aware of the presence of any wildlife, insects, parasites and/or snakes. **DO NOT** attempt to pet, touch or collect any biota encountered.

3.3.3. Should any detritus be found floating in the pond, alert Facility Management or Operations to assist in removal. **DO NOT** attempt to remove garbage from the pond on your own.

**Note: Do not implement any of the inspections or routines established by this Instruction during a lightning storm. Wait for the storm to pass prior to performing work in this area.**

## 4. REQUIREMENTS AND GUIDANCE

### 4.1. General Requirements

4.1.1. All personnel associated with the Environmental Monitoring Team shall receive training on this work instruction.

4.1.2. Members of the Environmental Monitoring Team shall be trained on and comply with permits and procedures referenced in this work instruction (See Section 2).

4.1.3. Members of the Environmental Monitoring Team are expected to follow ALL safety guidelines specified at the Clive facility ALL of the time. This includes maintaining safe distances from large vehicles and rail spurs, obeying site safety signs and speed limits, being cognizant of heat

stress levels as well as observing the conditions specified in applicable Radioactive Work Permits (RWPs).

4.1.4. Any training performed with respect to this Instruction shall be documented in accordance with CL-TN-PR-060, Training Documentation and Storage Procedure.

4.2. **Southwest Corner Pond and Well Nest Inspection**

4.2.1. Form CL-EV-WI-002 F1, Southwest Corner Pond Inspection Sheet, an example of which has been provided as attachment 5.1 to this work instruction, shall be used to document the pond inspection. Form CL-EV-WI-002 F2, Depth to Water Measurements, an example of which has been provided as attachment 5.2 to this work instruction, shall be used to document water levels obtained at GW-19A and PZ-1.

4.2.2. An inspection of the pond and well nest shall occur once a month when empty, and twice a month (every other week) any time the entire bottom of the pond is completely submerged.

**Note: The inspection schedule for the pond remains once a month in the event that isolated pockets that do NOT submerge the entire bottom of the pond are observed.**

4.2.2.1. Obtain and record a water level measurement at GW-19A and PZ-1 in accordance with CL-EV-PR-004, *Groundwater Monitoring*, during inspections that occur when the pond contains runoff water. Record the measurement on CL-EV-WI-002 F2, *Depth to Water Measurements*.

4.2.2.2. Send the depth to water values to the Groundwater Manager via electronic mail the same day that the inspection occurs.

4.2.2.3. When CL-EV-WI-002 F2 has been completely filled, scan the form and send the scanned copy to the Groundwater Manager for record keeping purposes.

4.2.3. Record weather and general conditions of the inspection site on CL-EV-WI-002 F1. General inspection items include:

- A check to ensure the gate to the pond is secured;
- A check to ensure the wells are secure and free of damage;
- Evidence of vandalism or the presence of wildlife around the pond or wells;
- A check of the inlet box for water that may be coming into the pond;
- Recording the flow and leak detection meter values;
- A visual inspection of exposed liner for damage;
- A rough estimate of freeboard;

- Inspection time; and,
- Recorded observations of any unusual circumstances.

4.2.4. When the general inspection has been completed, perform a trash walk of the fenced area around the pond; and of the area around the groundwater wells.

### 4.3. Record Keeping

4.3.1. Documents generated during pond and well nest inspection activities that are required by this work instruction are not required by Energy*Solutions*' Quality Assurance program. As such, these documents will be maintained internally by the Groundwater Manager or qualified designee.

4.3.2. Annually, the Staff Hydrogeologist, or qualified designee, will review the forms associated with this work instruction then have them scanned into electronic format. After they have been scanned, the originals will be discarded. Electronic copies of the documents will be stored on a secure server that is fault-tolerant.

### 4.4. Data Management

4.4.1. The Groundwater Manager and Staff Hydrogeologist will use data obtained by this work instruction to:

- Identify and mitigate potential mounding activity associated with pond leakage in a timely manner;
- Monitor well security; and,
- Ensure good housekeeping practices are observed in this area.

## 5. ATTACHMENTS AND FORMS

5.1 CL-EV-WI-002 F1, Southwest Corner Pond Inspection Sheet

5.2 CL-EV-WI-002 F2, Depth to Water Measurements

## 5.1. CL-EV-WI-002 F1, Southwest Corner Pond Inspection Sheet

ENERGYSOLUTIONS

**Southwest Corner Pond Inspection Sheet**
**Rev. 0, December 30, 2009**
**CL-EV-WI-002 F1**

**Inspect the Southwest Corner Pond for leaks, tears, usage and water amounts. General notes can be catalogued in the 'Summary of Findings' section below. Inspection of the Southwest Corner Pond is required once a month when no water is present and twice a month (every other week) when being used for water storage. There is no requirement to check this pond during weekends or holidays.**

Inspector_____ _____ _____
Print Sign Date

Summary of findings (include adverse weather, and/or general environmental conditions)

| |
|---|
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| |
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| |
| |

## General Inspection Items

| Inspection Item | Input | | Action Required |
|---|---|---|---|
| Check to ensure the gate is secure upon arrival | Yes | ¨ | If no, look for evidence of vandalism or the presence of wildlife in the pond |
| | No | ¨ | |
| Check the pond for water storage amounts | 1/2 to full | ¨ | If empty, check 'NA' in the box below. If holding enough water to completely cover the bottom of the pond, obtain a water level at GW-19A and PZ-1. |
| | ≤ 1/2 | ¨ | |
| | Empty | ¨ | |
| Check the inlet box for water that may be coming into the pond. | Yes | ¨ | If none, check 'No'. If runoff water is flowing, check 'Yes'. |
| | No | ¨ | |
| Check to ensure wells (GW-19A, GW-19B, PZ-1 and production well) are securly locked. | Locked | ¨ | If wells are not locked, immediately inform the Staff Hydrogeologist and/or Groundwater Manager. |
| | Open | ¨ | |
| GW-19A - Depth to Water Measurement obtained: | Yes | ¨ | If 'Yes' is checked, ensure depth to water measurements are recorded on CL-EV-WI-002 F2. Checking 'No' assumes measurement was not taken even though runoff was in the pond. Record reason for not obtaining depth to water if 'No' is checked. Check 'NA' when pond is dry. |
| | No | ¨ | |
| | NA | ¨ | |
| PZ-1 - Depth to Water Measurement obtained: | Yes | ¨ | If 'Yes' is checked, ensure depth to water measurements are recorded on CL-EV-WI-002 F2. Checking 'No' assumes measurement was not taken even though runoff was in the pond. Record reason for not obtaining depth to water if 'No' is checked. Check 'NA' when pond is dry. |
| | No | ¨ | |
| | NA | ¨ | |
| Observe and record the value of the flow meter and leak detection meter | Flow lvl: | Pre | If meter reading is >1.0, turn the pump to 'manual' and allow it to run until the water stops flowing and you can hear the pump surging. At this point, turn pump back to 'Automatic' and record the new values from the meters. |
| | Leak lvl: | | |
| | Flow lvl: | Post | |
| | Leak lvl: | | |

| | | | |
|---|---|---|---|
| Visually inspect pond liner. Is there visible damage to the liner? | Yes | ¨ | If yes, notify Groundwater Manager and/or Staff Hydrogeologist and indicate date, time, and name of notification in the box below. |
| | No | ¨ | |
| | | | |

Reviewed by: _____ _____ _____
Name Signature Date

## Southwest Corner Pond

| Meters and Fluid Head | | |
|---|---|---|
| **Inspection Item** | **SWC Pond** | **Notes** |
| Inspection Time | | |
| Leak Detection Meter Reading | | |
| Previous Reading | | |
| Difference | | |
| Process Controller Display Value | | |
| If the fluid head reading is greater than 1.0, notify the Director of Compliance and Permitting | | Notification made (Date, Time, Name) |
| | | |

| Freeboard | | |
|---|---|---|
| **Inspection Item** | **SWC Pond** | **Notes** |
| Rough estimate of freeboard | | |
| Is pond overflowing? | Yes ¨ | |
| | No ¨ | |
| | | |
| | | |
| Observations | | |
| | | |
| | | |

## 5.2. CL-EV-WI-002 F2, Depth to Water Measurements

**Depth to Water Measurements: GW-19A and PZ-1**
**Rev. 0, December 30, 2009**
**CL-EV-WI-002 F2**

| GW-19A Depth to Water | | | | |
|---|---|---|---|---|
| Date | Depth to Water | Tech Initials | Instrument ID number | Comments |
| | | | | |

| PZ-1 Depth to Water | | | | |
|---|---|---|---|---|
| Date | Depth to Water | Tech Initials | Instrument ID number | Comments |
| | | | | |

ENERGYSOLUTIONS

**CL-EV-WI-001**

# Environmental Compliance Tracking

**Revision 1**

| | | |
|---|---|---|
| Authored By: | Signature on File | 6/9/09 |
| | Michael LeBaron, Permitting Engineer | Date |
| Reviewed By: | Signature on File | 6/9/09 |
| | Wayne Johns, Environmental Manager | Date |
| Approved By: | Signature on File | 6/9/09 |
| 6 | Sean McCandless, Director of Compliance and Permitting | Date |

☐ New
☐ Title Change
☒ Revision
☐ Rewrite

Effective Date: 6/10/09

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# 1. PURPOSE AND SCOPE

## 1.1. Purpose

The purpose of this work instruction is to provide the guidelines for Energy*Solutions'* Compliance & Permitting Department to effectively manage the environmental monitoring program for the Clive facility. This instruction is to provide a structured framework in which environmental samples shall be collected and reported as per Energy*Solutions'* permit and license requirements.

## 1.2. Scope

This work instruction applies to the collection, analysis, management, validation, and reporting of all routine environmental data for Energy*Solutions'* Clive facility. It **does not** apply in emergency situations where the health and safety of other individuals supersedes the need for immediate monitoring of radiological conditions.

# 2. REFERENCES

2.1 11e.(2) License No. UT2300478 Application, *Section 7*

2.2 LLRW Radioactive Material License No. UT2300249 Application, Condition 26 Environmental Monitoring Plan

2.3 State-Issued Part B Permit, EPA ID Number UTD 982598898, Attachment II-1-10 and Attachment II-1-10.1

2.4 CL-CL-WI-015, Reports Due Compliance Tracking

2.5 CL-EV-PR-330, Environmental Soil monitoring

2.6 CL-RS-PR-310, Rad Elec E-PERM Monitoring System Operations

2.7 CL-EV-PR-320, Airborne Particulate Monitoring

2.8 CL-RS-PR-113, VTD Radiological Monitoring

2.9 CL-IN-PR-420, Protean Counter Model WPC-9559: Calibration and Operating instructions

2.10 CL-TN-PR-060, Training Documentation and Storage

2.11 CL-EV-PR-005, Cover Test Cell Monitoring

# 3. GENERAL

## 3.1. Definitions

3.1.1 The *Environmental Monitoring Team* consists of the following individuals:

- The Senior Vice President, Regulatory Compliance;
- The Director of Compliance and Permitting;
- The Environmental Manager;

- The Environmental Engineer;
- The Permitting Engineer;
- Environmental Monitoring Technicians; and,
- Any other individuals trained to perform one or all of the tasks delineated in Section 2 of this work instruction.

3.2. **Responsibilities**

3.2.1 The Senior Vice President, Regulatory Compliance is designated as the Environmental Compliance Officer and is responsible for the Environmental Monitoring Program and the overall implementation of this instruction.

3.2.2 The Director of Compliance and Permitting (DCP) is responsible for providing a QA/QC check to ensure that schedules are met and also for reviewing final reports. The DCP will be contacted within 24 hours on environmental sample exceedances or other instances of program noncompliance, and ensure that regulatory agencies have been notified.

3.2.3 The Environmental Manager is responsible for verifying that the environmental program is in compliance with applicable regulations and licenses; providing a timely review of records; reporting significant conditions and trends to the DCP; compiling and reporting environmental monitoring results; verifying analytical requests; and providing a quality control check of laboratory data. The Environmental Manager is the point-of-contact with regulatory agencies and is responsible for ensuring that they are notified in the event of an exceedance. The Environmental Manager may direct additional sampling in excess of the requirements of this work instruction.

3.2.4 The Permitting Engineer is responsible for the management of the Environmental Monitoring Technicians as well as the daily operations of the environmental monitoring program. The Permitting Engineer will also ensure that the environmental monitoring team has the necessary equipment and resources to remain in compliance.

3.2.5 The Environmental Engineer is responsible for reviewing PCB data forwarded by the Environmental Monitoring Technicians. The Environmental Engineer may direct additional samples in excess of the requirements of this instruction.

3.2.6 The Environmental Monitoring Technicians (technicians) are responsible for keeping accurate environmental records and following this instruction. They will also be responsible for:

3.2.6.1 The timely acquisition, processing, analysis and shipping of samples;

3.2.6.2 Notifying the Permitting Engineer and Environmental Manager of observed conditions, trends, or sample

exeedances related to compliance with the Environmental Monitoring Program;

3.2.6.3 Making completed records available for management review;

3.2.6.4 Preparing and submitting records for archiving;

3.2.6.5 Performing equipment calibration and ensuring equipment is calibrated prior to use;

3.2.6.6 Ordering supplies and equipment needed to perform responsibilities;

3.2.6.7 Entering sample data and analytical results into a spreadsheet or database, as required;

3.2.6.8 Supporting the Director of Health Physics as required (abnormal conditions related to Health Physics are reported to the Director of Health Physics);

3.2.6.9 Performing instrumentation background and constancy checks;

3.2.6.10 Preparing analytical requests; and,

3.2.6.11 Notifying the Permitting Engineer and Environmental Manager when analytical results are available for review.

### 3.3. Precautions and Limitations

3.3.1. The Environmental Monitoring Plan requires that Energy*Solutions* provide continuous air monitoring around the perimeter of the fence line. It is important to inspect the air monitoring stations at the conclusion of adverse weather conditions (any storm event that produces winds in excess of 30 miles per hour, lightning, precipitation, or any combination of the previously listed weather conditions) to ensure that a power outage has not occurred and the air monitoring stations continue to operate.

3.3.2. Systems associated with the Cover Test Cell are prone to failure when subjected to close proximity static bursts. As such, it is important to run the datalogger on the Cover Test Cell at the conclusion of storm events where lightning is reported or suspected to evaluate the condition of the Cover Test Cell.

**Note: Do not attempt to check the condition of the Cover Test Cell *during* a lightning storm. Doing so could create a situation adverse to employee safety.**

## 4. REQUIREMENTS AND GUIDANCE

### 4.1. General Requirements

4.1.1. All personnel associated with Energy*Solutions*' Environmental Monitoring Team shall receive training on this work instruction.

4.1.2. Personnel working in the environmental monitoring department shall be trained on and comply with permits and procedures that support this work instruction (See Section 2, References).

4.1.3. Personnel working in the environmental monitoring department are expected to follow ALL safety guidelines specified at the Clive facility ALL of the time. This includes maintaining safe distances from large vehicles and rail spurs, obeying site safety signs and speed limits, being cognizant of heat stress levels as well as observing the conditions specified in applicable Radioactive Work Permits (RWPs).

4.1.4. Refresher training is an integral part of ensuring compliance with the Environmental Monitoring Program. Environmental Monitoring Technicians shall alternately train each other weekly on topics related to the procedures they work from as well as the guiding documents from which the procedures are generated. Either the Permitting Engineer or the Environmental Manager will sit in on the training on a monthly basis and will also give the training as needed. Training will be documented in accordance with CL-TN-PR-060, Training Documentation and Storage Procedure.

4.2. **Procedure**

4.2.1. The purpose of this section is two fold:

- First, it will provide general instruction as to how the environmental program is to be managed. Specific instructions are provided in other documents referenced in Section 2 of this work instruction.
- Second, this work instruction will ensure that sampling and data management are conducted so that reporting deadlines required by the permits and licenses are met, samples are not missed and compliance is maintained.

4.2.2. An essential tool for managing Energy*Solutions'* environmental monitoring program is the preparation of a **Sampling and Reporting Schedule.** This schedule shall be prepared on an annual basis and will include start and finish dates for pre-sampling activities, sampling events, data management, and reporting. The Permitting Engineer shall be required to prepare and update the schedule. An example is shown as Attachment 5.1. The schedule need not be prepared using computer software, but it is advisable. The Environmental Manager will review and approve the sampling schedule on an annual basis.

4.2.3. The DCP will prepare a report production-tracking schedule in accordance with the guidelines specified in CL-CL-WI-015, Reports Due Compliance Tracking. This schedule is part of Energy*Solutions'* Compliance and Permitting internal review process. The DCP will report due dates and

any problems or concerns to the Senior Vice President, Regulatory Compliance.

4.2.4. Some sampling activities require that pre-sample preparations be made. They are as follows:

- PCB Soil Sampling: The Permitting Engineer shall notify the Lab Manager and Environmental Engineer one week prior to the sampling event. The Permitting Engineer will also notify the Environmental Engineer when samples are shipped. The offsite laboratory performing the analysis shall perform the analysis within timeframes specified by the Environmental Engineer.
- Quarterly and 11e.(2) Radial Soil Sampling: The Permitting Engineer shall notify Energy*Solutions*' Lab Manager that quarterly and/or 11e.(2) radial soil sampling will commence two weeks prior to the sampling event. This will allow the Lab to arrange their schedule such that effective and timely analysis of the samples will occur.
- E-PERM Counting: A constancy check shall be performed on the SPER reader by the technicians prior to reading electrets with the SPER reader as well as when counting is complete.
- Tritium Columns: The technicians will ensure that they have a column on site at least two weeks prior to starting data acquisition. Columns will be calibrated and assembled prior to changing them out.
- VTD Sampling: In accordance with CL-RS-PR-113, VTD Radiological Monitoring, the Assistant Site Radiation Safety Officer (ASRSO), under the direction of the Director of Health Physics, reviews waste manifest information to ensure that the proper type of effluent sampling is occurring during VTD processes. The ASRSO then works with Environmental staff to ensure that the proper type of sampling occurs (i.e. Iodine, Krypton and other permit required isotopes are measured when found in the manifests).

4.2.5. Some activities need to be regularly monitored to ensure that environmental staff are prepared to perform all required tasks within the required timeframes. Those tasks are as follows:

- A Daily Data Checklist, an example of which is provided as Attachment 5.2, shall be generated as logs and data are generated to ensure that all data are initially reviewed in a timely manner. The technician who generates the data will generate the checklist. A different technician, either inside the department or outside the department where applicable, will then be responsible for reviewing the data and checking the 'reviewed' box. This checklist shall also be used to capture instrumentation-related

software or program changes and reviews associated with any of the instrumentation used to perform environmental monitoring. The Permitting Engineer may also perform this review. Checklists will be saved for reference until the data germane to the checklists have been reviewed by the State, at which point, they may be discarded.

- Annually, at the beginning of the 3rd quarter, the Environmental Manager and Environmental Engineer shall ensure that a contract exists between Energy*Solutions* and the Laboratories used to analyze environmental data. If contract maintenance is required, it shall be completed by the end of the year. They shall confirm with their respective Laboratories that hold times can be met for all analytical procedures. They shall also review with the Laboratory the analytical request for their data reporting needs and confirm delivery deadlines and reporting requirements.
- Technicians are required to ensure that the following equipment is functioning and within calibration:
    - Venturi – Calibrate the venturi annually and prior to usage if the calibration expiration has expired.
    - Low-Volume Air Flow Pumps – Calibrate low-volume air flow pumps every six months and prior to the expiration of the last calibration. Pumps shall be removed from the field and re-calibrated one month prior to the calibration expiration date.
    - SPER Readers – Ensure that SPER readers and constancy sources are sent off annually (and not used if expired until a new constancy check can be performed) to be inspected and re-certified. There are two SPER readers; ensure that their calibration dates remain staggered so that there is one counter available at all times.
    - Protean Counter Model No. WPC-9559 – Technicians will work with Energy*Solutions*' Lab staff to ensure that the Protean is calibrated within six months of its last calibration.
    - Inside and Outside Vehicles – Technicians shall ensure that environmental vehicles are safe, functional and current with preventative maintenance. Technicians shall ensure that there is enough gas in the vehicles to safely perform their tasks prior to performing quarterly/11e.(2)/weekly soil sampling, E-PERM checks, and Lo-Vol runs.
    - At the beginning of each quarter, Technicians shall inventory the following environmental monitoring material. The purpose of the inventory is to ensure that there is

enough material in stock to complete the sampling events scheduled for that quarter within the required timeframes:

- Cal-kits, electrets, alphatracks, soil sample bottles, venturies, ziplock bags, desiccant, paper towels, water bottles, marking pens, drying tins, nitrile gloves, envelopes, filters, custody seals, mylar bags, tyvek bags, tritium columns, log forms.

4.3. **Sampling Activities**

Sampling Activities shall be performed in accordance with the procedures listed in Sections 2.1 through 2.8 of this work instruction. Environmental Compliance Flow Charts have been produced to provide a quick reference for the actions required to remain in compliance (see Attachment 5.3). At no time does the flow chart supersede the requirements of the specific sampling procedures.

4.3.1. Mid-quarter, the Environmental Monitoring Team shall meet and go over the Quarterly Checklist (an example of which has been provided as Attachment 5.4) of items that are due each quarter. Progress made on each item and target finish dates for each item will be reviewed at that time.

4.4. **Post Sampling Activities**

4.4.1. The Environmental Manager will ensure that data have been received by external laboratories via e-mail correspondence. The Environmental Manager will request a courtesy notification via e-mail when samples are received by the lab. The Environmental Manager will also ask the lab to detail any abnormal conditions the lab may note with respect to the samples. Said details can be communicated to the Environmental Manager in the confirmatory e-mail, but can be communicated via phone, fax or in person as well.

4.4.2. The technicians shall review the following logs and paperwork within one week of task completion:

- Quarterly Soils Field Log, chain-of-custody and analytical results;
- 11e.(2) Radial soil field logs, chain-of-custody, and analytical results;
- Lo-Vol Field Log, Protean data, and analytical results;
- PCB soil field log and chain-of-custody;
- Pump Calibration field sheets;
- Weekly E-PERM logs;
- VTD Sampling Documentation (when VTD is being performed);
- Tritium Logs (when done);

- Spike Test, Blind Gamma and Blind Radon Log (when performed);
- Area Release Logs (as needed).

**Note: Technicians shall review their peer's logs; not their own.**

4.4.3. The Permitting Engineer, or a qualified designee, will perform a periodic spot check on random samples of completed field logs and paperwork generated via sample collection.

**Note: A 'completed' field log constitutes a log that has been filled out completely with respect to the task required. Examples:**

- **A soil log is not complete until the sample has been obtained, processed, canned, weighed and chained to the laboratory.**

4.5. **Analytical Data Entry**

4.5.1 The Environmental Manager shall enter or download electronic data deliveries (EDD's) within 7 calendar days of receipt. Should the Environmental Manager be out of the office or otherwise unavailable when data become available for entry, the Environmental Manager will have 7 calendar days from the returned-to-work date to enter or download the EDD. Data requiring hand-entry shall be entered in the database within 7 calendar days of receipt. Receipt, in this case, constitutes the point in time the field log containing data is received.

**Note: The Environmental Manager may delegate data entry to any other member of the environmental monitoring staff PROVIDED the Environmental Manager reviews the log against the entered data within 48-hours of completion. This will require the individual entering the data to immediately notify the Environmental Manager upon completion of data entry.**

4.5.2 After entering the data, the Environmental Manager shall compare License-driven action levels with analytical results. Should exceedances occur, the Environmental Manager shall confirm with the lab that data are acceptable (ensure that analytical values make sense) and direct additional sampling or remediation as required in the License. In addition, the Environmental Manager or a qualified designee, shall direct the necessary verbal and written notification to all regulatory agencies. If no exceedances occur, the Environmental Manager shall input the data into a format preparatory for reporting.

4.5.3 After the data are entered and validated, the Environmental Manager shall update and review plots, graphs and figures associated with the Quarterly Report further checking for outlier data.

4.5.4 After the plots, graphs and figures are complete, the Environmental Manager, or Designee, will begin report preparation using a previous report as a template.

4.5.5 After the report has been prepared, the DCP shall review the report to check for consistency and quality.

4.5.6 After the review is complete, a final version, with copies, shall be prepared by the Environmental Manager.

4.5.7 The reports will then be submitted to regulatory agencies for review and comment.

4.5.8 A copy of the report shall be maintained by the Environmental Manager as well as the Technicians.

## 5. ATTACHMENTS AND FORMS

5.1 Environmental Monitoring Schedule

5.2 Daily Data Checklist

5.3 Environmental Compliance Flow Charts

5.4 Quarterly Check List

## 5.1. Environmental Monitoring Schedule

Page intentionally left blank. Attachment is a large calendar in possession of Environmental Monitoring staff.

## 5.2. Daily Data Checklist

MONTH_____

WEEK START_____ WEEK END_____

| | Mon | Tues | Wed | Thur | Fri |
|---|---|---|---|---|---|
| DATE | | | | | |
| INITIAL | | | | | |
| **Lo-Vol Data** | | | | | |
| *Log* | | | | | |
| *Protean* | | | | | |
| *Retrieve Filters* | | | | | |
| *Envelopes* | | | | | |
| *Pump Replacement* * | | | | | |
| *7-14 Day Count* | | | | | |
| **VTD** | | | | | |
| *Protean* | | | | | |
| *Spreadsheet* | | | | | |
| *Count Days* | | | | | |
| **Instrumentation Projects (Initial the box)**** | | | | | |
| *Routine Changes* | | | | | |
| *Quick Calculations* | | | | | |
| *Reviewer (initial)* | | | | | |
| *Calibrations* | | | | | |
| **Weekly E-Perms** | | | | | |
| *Obtain EPERMs* | | | | | |
| *Equilibrate* | | | | | |
| *Record data* | | | | | |
| *Send Data to HPs* | | | | | |
| **Special Soils** | | | | | |
| *COC* | | | | | |

Other/Notes: _____

* List locations where pumps were replaced in the "Other/Notes" section.

** The reviewer shall be a different individual from the person who made the routine changes, or performed the calculations.

## 5.3. Environmental Compliance Flow Charts

Page intentionally left blank. Attachments are 11x17-inch process flow diagrams in possession of Environmental Monitoring staff.

## 5.4. Quarterly Check List

| Activity | Status | | Completion Date | Tech Initials |
|---|---|---|---|---|
| | Complete | Incomplete | | |
| 11e.(2) Radials (Annual) (5.4.3) | | | | |
| Collected | | | | |
| Canned | | | | |
| Gamma Spec'ed | | | | |
| PCB Soils (Bi-annual) (5.4.4) | | | | |
| Collected | | | | |
| Shipped | | | | |
| Quarterly Soils (5.4.2) | | | | |
| Collected | | | | |
| Collection Log delivered to Wayne | | | | |
| Canned | | | | |
| Gamma Spec'ed | | | | |
| Datapacks delivered to Wayne | | | | |
| 14-day and MDA Verification Complete | | | | |
| Shipped | | | | |
| Quarterly Restricted Area Exit Gate Soil Samples (5.4.5) | | | | |
| Collected | | | | |
| Collection Log delivered to Wayne | | | | |
| Canned | | | | |
| Gamma Spec'ed | | | | |
| Datapacks delivered to Wayne | | | | |
| 14-day and MDA Verification Complete | | | | |
| Shipped | | | | |
| Bowser Morner Gamma Test (6.3) | | | | |
| Sent off | | | | |
| Receipt Confirmed at Landauer | | | | |
| RadTraks Read | | | | |
| Receipt Confirmed at Clive | | | | |
| EPERMs Read | | | | |
| Certification received | | | | |
| U of U Blind Gamma's (6.4) | | | | |
| Test Performed | | | | |
| Devices Returned | | | | |
| TLDs returned to HP | | | | |
| EPERMs Read | | | | |
| EPERM results delivered to Wayne | | | | |
| Airborne Particulate Quarterly Composite - Gamma Analysis (5.1.2) | | | | |
| Gamma Spec'ed | | | | |
| Shipped | | | | |
| Returned | | | | |
| Tritium Column Analysis (5.1.4) | | | | |
| Shipped | | | | |
| Returned | | | | |
| Quarterly Composite VTD Airborne Particulate Samples - Gamma Analysis (5.2) | | | | |
| Composited for Quarter | | | | |
| Shipped. | | | | |
| Four Quarterly Split Soil Samples (6.5) | | | | |
| Four Quarterly Duplicate Samples (6.5) | | | | |
| Quarterly Radtraks (5.1.3) | | | | |
| Deployed | | | | |
| Shipped | | | | |
| One additional gamma monitor placed at three air monitoring locations (6.4) | | | | |
| Ordered | | | | |
| Deployed | | | | |
| Wayne notified of deployment (time and place confirmed). | | | | |
| Shipped | | | | |
| One additional radon monitor placed at three air monitoring locations (6.3) | | | | |
| Deployed | | | | |
| Shipped | | | | |
| OSL Order for next quarter | | | | |
| Radtrak order for next quarter | | | | |

# WITS Container Movement

**Revision 0**

| | | |
|---|---|---|
| Authored By: | Signature on File<br>Brian D. Kirkwood, LLRW Operations Manager | 11/13/09<br>Date |
| Approved By: | Signature on File<br>Dave Squires, Director of LLRW Operations | 11/13/09<br>Date |
| Approved By: | Signature on File<br>Jesse Garcia, Director of MW Operations | 11/13/09<br>Date |

☒ New
☐ Title Change
☐ Revision
☐ Rewrite

Effective Date: 11/16/09

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Refer to the intraweb or the document control authority for the current revision.

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# 1. PURPOSE AND SCOPE

## 1.1. Purpose

The purpose of this work instruction is to provide a reference to personnel who are responsible for tracking waste shipments in WITS, an electronic waste tracking system used at the Clive disposal facility.

## 1.2. Scope

This work instruction is provided as a guidance document for personnel to use as a reference while accepting and moving shipments and containers throughout the LLRW Restricted Area.

# 2. REFERENCES

2.1. N/A

# 3. GENERAL

## 3.1. Definitions

3.1.1. *WITS* – Waste Information Tracking System designed as a "Bolt On" tool for user supplied status updates to EWIS.

3.1.2. *MUID* – Moveable Unit ID or a custom grouping of containers or shipments for the purpose of updating waste locations for more than one container at a time. More useful for large, bulk movements designated for the same location.

3.1.3. *Bulk Waste Item* – Waste created from a container after specific criteria have been met, usually verified by completion of a checklist.

3.1.4. *Checklist* – A series of questions or compliance items used in WITS movements and are required before a shipment or container can be physically advanced to the next sequential step of the disposal or container release process; depending the location specific functionality, affirmative completion of a checklist will change a shipment status to the next phase in the process (e.g. Unloaded, Washed, etc).

3.1.5. *WITS User's Guide* - WITS is a dynamic system designed to be flexible based on production demands. Location names, container status changes, and automatic functionality built into the system may be changed at any time as inefficiencies are identified and improvements are made. The WITS User's Guide is provided as a quick reference document for each user to reference as location inventories are managed.

## 3.2. Responsibilities

3.2.1. All Users are responsible for verifying container and shipment status prior to advancing to the next phase of the waste management process; for following the guidelines established in the WITS User's Guide; and for identifying and suggestion areas for improvement.

3.2.2. WITS Administrator is responsible for making changes within WITS that will ensure continued accuracy, process flow, and functionality of waste and container movement throughout the disposal and release process. Some changes will include: New locations, shipment status changes, location functionality changes, and location constraint adjustments.

3.2.3. Shipping and Receiving Personnel are responsible for following their procedural guidelines that will ensure accepted shipments are automatically moved to one of the following three locations:

(1) All Outside Full Gondola Rail

(2) All Outside Full Intermodal Rail

(3) All Outside Full Truck Containers

### 3.3. Precautions and Limitations

3.3.1. All transactions are monitored in WITS. If a mistake is made, please contact a WITS Administrator to make a correction.

3.3.2. Do not share login information with other users. If personnel are required to track waste with the WITS tool, access can be obtained by permission from a manager.

3.3.3. WITS is a tool that works best if all responsible users stay up to date with their applicable locations. If, for any reason, a location can not be maintained, the LLRW Waste Tracker should be notified to ensure inventory accuracy.

### 3.4. Document Control and Records

3.4.1. None

## 4. REQUIREMENTS AND GUIDANCE

### 4.1. Login Access

4.1.1. Once a user has obtained access in accordance with established procedures, WITS can be accessed by logging on to: ***http://ecorcap.envirocareutah.com:7778/wits/ec_start***, or by typing "WITS" in the address bar of any computer logged into the Clive facility network.

4.2. **Performing Container Movement through WITS**

**Standard Use**

4.2.1. In most cases, if all users are performing their duties as required, each user can open the WITS location for which they are responsible and begin managing inventory in accordance with container management processes.

4.2.2. To access any desired location from the Splash Page (WITS Start Screen):

(1) Click on the "Find Locations" link at the left of the screen

(2) Use one of the two methods provided on the Find Locations screen

(a) Find by (partial) Name – use a % sign in addition to a partial work you may know for the facility name (e.g. "% Box Wash" will provide "HP-LL Post-Decon Box Wash" and "LL Decon – Box Wash"

(b) Find from List – a drop down list is provided with all locations listed alphabetically

(3) Click on the desired location

(4) Begin normal work in accordance with the WITS User's Guide, Attachment 5.1

**Container Search**

4.2.3. When a container or shipment is encountered and is not available in the location screen personnel can look for the container to begin movements:

(1) Click the "Find Container" link at the left of the screen

(2) Search for the container by one of the three methods provided (there is a fourth method for Mixed Waste users):

(a) Gen Item # - is the generator container number

(b) Bates Number – enter the bates number if it is known

(c) Search number – enter the Generator, waste stream, and shipment number, if it is known

(3) When the shipment is found, begin normal movements in accordance with the WITS User's Guide.

**MUIDS**

4.2.4. MUIDS are useful for mass moving containers or shipments to the same location.

4.2.5. To build a MUID:

(1) From the location screen select the "Build MUID" link near the top left of the screen.

(2) Select desired shipments to be included in the MUID by clicking the checkbox at the left of each container.

(3) Click "Build MUID" again. All shipments selected will be given a common MUID number.

**Hint: If you are building a MUID based on a determined volume select the desired shipments and click the "sum net vol" button to see a display of the cubic foot value based on the shipment manifest.**

4.2.6. Once a shipment is in a MUID, each attempt to move the shipment will result in an attempt to move the entire MUID. When a shipment is part of a MUID, WITS will ask the user if all items should be moved, or just the checked items. Instructions are available at the top of the screen for this step.

**Moving Shipments**

4.2.7. From a location with inventory, select "Move" next the desired shipment.

4.2.8. A new screen will appear. From that screen, the user has the option to move the shipment to a scanned location (must type in location name exactly), from a location in a drop down menu, or from a selection of the last ten locations where the user moved a shipment.

4.2.9. Follow the screen locations and appropriately answer checklists if they appear.

**Receiving Shipments**

4.2.10. From a location with inventory, select "Receive" next the desired shipment (if applicable).

4.2.11. Follow the screen locations and appropriately answer checklists if they appear.

**Moving Bulk Shipment**

4.2.12. Moving bulk shipments requires an understanding of haul truck volume, lift volume, or other calculations as necessary.

4.2.13. In most cases, volume information can be obtained by tallying manifested volumes, counting containers, or counting loads required to haul the material from one location to the next. Use the table below for common volumes used per conveyance/container type:

(1) Truck load volume:

(a) Determine truck load volume for each waste type (debris, soil, mix, etc)

(b) Add combined loads to one location.

(c) Move appropriate amount of bulk waste to desired location by using the MUID tally button.

(2) Lift Volume:

(a) Determine lift capacity from Q.C. specifications.

(3) Move appropriate amount of bulk waste to the desired location by using the MUID tally button, counting container volumes (using table below, or referring to loads on driver's load sheets.

| Conveyance | Debris | Full/Soil | 50/50 |
|---|---|---|---|
| Super Gondola | 7392 | 9856 | N/A |
| Gondola | 1500 | 2000 | N/A |
| **Haul Truck** | **305** | **405** | **350** |
| Intermodal | 506.25 | 675 | N/A |
| CVAN | 960 | 1280 | N/A |
| B25 | 72 | 96 | N/A |
| Drum | 7.5 | 9 | N/A |

**Note: The volumes listed on this table are guidelines to be used as a reference. In most cases, using the haul truck volume is the most consistent since that is the only factor in our control. In all cases, final lift volumes are verified by a visual debris inspection performed by Quality Control Personnel.**

**Moving Empty Containers or Railcars Through a Decon Facility**

4.2.14. In most cases, when personnel are accurately tracking inventories at locations for which they are responsible, container movements can be made through the applicable Work Center.

4.2.15. From a Work Center with empty container inventory, select “Move” next the desired container number.

4.2.16. A new screen will appear. From that screen, the user has the option to move the container to a scanned location (must type in location name exactly), from a location in a drop down menu, or from a selection of the last ten locations where the user moved a shipment.

4.2.17. Follow the screen locations and appropriately answer checklists if they appear.

4.2.18. Follow location specific instructions found in Attachment 5.1, WITS User’s Guide.

4.2.19. If a container cannot be found at the Work Center location, follow guidelines in section 4.2.3 of this document.

## 5. ATTACHMENTS AND FORMS

5.1. Example of WITS User’s Guide

5.2. Example of Typical WITS Container Movements

5.3. Example of WITS Location Responsibilities

## 5.1 Example of WITS User's Guide

ENERGYSOLUTIONS

**Attachment 5.1 WITS USER GUIDE**

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Refer to the intraweb or the document control authority for the current revision.

## 5.1 Example of WITS User's Guide (cont)



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## 5.1 Example of WITS User's Guide (cont)



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## 5.1 Example of WITS User's Guide (cont)

**Location and Zone List – WITS USER GUIDE Rev. 0**

Zones and Locations are used to manage container and waste tracking throughout the Clive facility. The following Zones and Locations are established in the Restricted – Low Level Area of WITS and represent container and waste movements throughout the Clive, Low Level Facility.

### 1. Embankment – class a

**Purpose**

This Zone is established to track the final disposition of waste designated as "Class A" and disposed in a location within the Class A Embankment.

**Functionality**

Shipments in this zone can be containerized or bulk depending on container release criteria established prior to disposal.

When shipments enter this zone the shipment status is automatically updated to a status of "Disposed"

**Locations**

1.1. **Active Lifts**

1.1.1. Active Lift Locations continually change as the embankment progresses. Similar to the grid on a map, active Lifts are identifiable by the embankment name and the corresponding grid address within the embankment section (e.g. AW-C12).

1.1.2. If an Active Lift location is not found, contact a WITS user with Administrative rights to create a new WITS location.

*Responsibility*

1.1.3. The LLRW Waste Tracker is responsible for obtaining waste movement information from applicable personnel and updating locations within this zone. Information can be obtained from driver worksheets, operator logs, verbal inquiries, or location status changes within WITS.

*Checklists*

1.1.4. There are no checklists associated with waste movements to Active Lifts

*Constraints*

1.1.5. There are no constraints associated with waste movements to Active Lifts

*Functionality*

## 5.1 Example of WITS User's Guide (cont)



1.1.6. Shipments are manually moved to Active Lifts from any waste management facility or stockpile.

1.1.7. WITS is set up to automatically receive shipments sent to Active Lifts

1.2. **Lift ID's**

1.2.1. Lift ID's represent completed, approved waste lifts within the corresponding embankment. Lift ID Locations within WITS are continually added as each active lift is changed to a completed lift after Q.C. testing and approval. Each lift ID is identified by the corresponding embankment and grid address, year, month, day and type (e.g. AWC12091017MM).

**Note: MM indicates that the waste has a mobile isotope; FF indicates flowable fill; SS indicates that the lift is placed on a side slope DU indicates disposal of Depleted Uranium within the lift; etc. Type indicators are assigned by Q.C. personnel.**

1.2.2. If a Lift ID location is not found, contact a WITS user with Administrative rights to create a new WITS location.

*Responsibility*

1.2.3. The LLRW Waste Tracker is responsible for obtaining waste movement information from applicable personnel and updating locations within this zone. Information can be obtained from driver worksheets, operator logs, verbal inquiries, or location status changes within WITS.

1.2.4. Lift ID's shall match the ID on the Lift Approval Form provided by Quality Control personnel after a lift has been tested and approved.

*Checklists*

1.2.5. There are no checklists associated with waste movements to Lift ID's

*Constraints*

1.2.6. There are no constraints associated with waste movements to Lift ID's

*Functionality*

1.2.7. Shipments are manually moved to Lift ID's from Active Lifts.

1.2.8. WITS is set up to automatically receive shipment sent to Lift ID's

1.3. **Stockpile Locations**

1.3.1. Stockpile locations are designated for waste shipments stored on an area of the embankment that cannot be managed on an active lift.

## 5.1 Example of WITS User's Guide (cont)



1.3.2. Shipments can be moved to stockpile locations when storage is made necessary as a result of delays associated with acceptance, characterization, disposal capabilities, or problem resolution. Although not required, shipments placed in stockpile are usually bulk, or larger containers not feasible for storage at a Containerized Waste Storage facility.

1.3.3. Stockpile locations for the Class A Embankment include:

- AWSP-01 (not designated)
- AWSP-02 (not designated)
- AWSP-03 (waste soils)
- AWSP-04 (waste debris)
- AWSP-05 (oversized debris)
- AWSP-06 (Ion Exchange Resins)
- AWSP-07 (not designated)
- AWSP-08 (not designated)
- AWSP-09 (not designated)
- AWSP-10 (not designated)

*Responsibility*

1.3.4. The LLRW Waste Tracker is responsible for obtaining waste movement information from applicable personnel and updating locations within this zone. Information can be obtained from driver worksheets, operator logs, verbal inquiries, or location status changes within WITS.

*Checklists*

1.3.5. There are no checklists associated with waste movements to Stockpile Locations.

*Constraints*

1.3.6. There are no constraints associated with waste movements to Stockpile Locations

*Functionality*

1.3.7. Shipments are manually moved to Stockpile Locations from any waste management facility or stockpile.

## 5.1 Example of WITS User's Guide (cont)



1.3.8. Shipments stored here monitored by several reports for financial surety, volume, and revenue purposes.

1.3.9. WITS is set up to automatically receive shipments sent to Stockpile Locations.

## 2. EMBANKMENT – CLASS A NORTH

**Purpose**

This Zone is established to track the final disposition of waste designated as "Class A" and disposed in a location within the Class A North Embankment.

**Functionality**

Shipments in this zone can be containerized or bulk depending on container release criteria established prior to disposal.

When shipments enter this zone the shipment status is automatically updated to a status of "Disposed"

**Locations**

### 2.1. Active Lifts

2.1.1. Active Lift Locations continually change as the embankment progresses. Active Lifts are identifiable by the embankment name and the corresponding grid address within the embankment section (e.g. NW-G08).

2.1.2. If an Active Lift location is not found, contact a WITS user with Administrative rights to create a new WITS location.

*Responsibility*

2.1.3. The LLRW Waste Tracker is responsible for obtaining waste movement information from applicable personnel and updating locations within this zone. Information can be obtained from driver worksheets, operator logs, verbal inquiries, or location status changes within WITS.

*Checklists*

2.1.4. There are no checklists associated with waste movements to Active Lifts

*Constraints*

2.1.5. There are no constraints associated with waste movements to Active Lifts

*Functionality*

## 5.1 Example of WITS User's Guide (cont)



2.1.6. Shipments are manually moved to Active Lifts from any waste management facility or stockpile.

2.1.7. WITS is set up to automatically receive shipments sent to Active Lifts

2.2. **Lift ID's**

2.2.1. Lift ID's represent completed, approved waste lifts within the corresponding embankment. Lift ID Locations within WITS are continually added as each active lift is changed to a completed lift after Q.C. testing and approval. Each lift ID is identified by the corresponding embankment and grid address, year, month, day and type (e.g. NWG08091017MM).

**Note: MM indicates that the waste has a mobile isotope; FF indicates flowable fill; SS indicates that the lift is placed on a side slope DU indicates disposal of Depleted Uranium within the lift; etc. Type indicators are assigned by Q.C. personnel.**

2.2.2. If a Lift ID location is not found, contact a WITS user with Administrative rights to create a new WITS location.

*Responsibility*

2.2.3. The LLRW Waste Tracker is responsible for obtaining waste movement information from applicable personnel and updating locations within this zone. Information can be obtained from driver worksheets, operator logs, verbal inquiries, or location status changes within WITS.

2.2.4. Lift ID's shall match the ID on the Lift Approval Form provided by Quality Control personnel after a lift has been tested and approved.

*Checklists*

2.2.5. There are no checklists associated with waste movements to Lift ID's

*Constraints*

2.2.6. There are no constraints associated with waste movements to Lift ID's

*Functionality*

2.2.7. Shipments are manually moved to Lift ID's from Active Lifts.

2.2.8. WITS is set up to automatically receive shipment sent to Lift ID's

2.3. **Stockpile Locations**

2.3.1. Stockpile locations are designated for waste shipments stored on an area of the embankment that cannot be managed on an active lift.

## 5.1 Example of WITS User's Guide (cont)



2.3.2. Shipments can be moved to stockpile locations when storage is made necessary as a result of delays associated with acceptance, characterization, disposal capabilities, or problem resolution. Although not required, shipments placed in stockpile are usually bulk, or larger containers not feasible for storage at a Containerized Waste Storage facility.

2.3.3. Currently, there are no Stockpile Locations established for the Class A North Embankment:

*Responsibility*

2.3.4. The LLRW Waste Tracker is responsible for obtaining waste movement information from applicable personnel and updating locations within this zone. Information can be obtained from driver worksheets, operator logs, verbal inquiries, or location status changes within WITS.

*Checklists*

2.3.5. There are no checklists associated with waste movements to Stockpile Locations.

*Constraints*

2.3.6. There are no constraints associated with waste movements to Stockpile Locations.

*Functionality*

2.3.7. Shipments are manually moved to Stockpile Locations from any waste management facility or stockpile.

2.3.8. Shipments stored here monitored by several reports for financial surety, volume, and revenue purposes.

2.3.9. WITS is set up to automatically receive shipments sent to Stockpile Locations.

### 3. EMBANKMENT – 11e.(2)

**Purpose**

This Zone is established to track the final disposition of waste designated as "11e.(2)" and disposed at a location within the 11e.(2) Embankment.

**Functionality**

Although a typical 11e.(2) shipment arrives by rail, shipments in this zone can be containerized or bulk depending on container release criteria established prior to disposal.

## 5.1 Example of WITS User's Guide (cont)



When shipments enter this zone the shipment status is automatically updated to a status of "Disposed"

**Locations**

3.1. **Active Lifts**

3.1.1. Active Lift Locations continually change as the embankment progresses. Active Lifts are identifiable by the embankment name and the corresponding grid address within the embankment section (e.g. EW-H17).

3.1.2. If an Active Lift location is not found, contact a WITS user with Administrative rights to create a new WITS location.

*Responsibility*

3.1.3. The LLRW Waste Tracker is responsible for obtaining waste movement information from applicable personnel and updating locations within this zone. Information can be obtained from driver worksheets, operator logs, verbal inquiries, or location status changes within WITS.

*Checklists*

3.1.4. There are no checklists associated with waste movements to Active Lifts

*Constraints*

3.1.5. There are no constraints associated with waste movements to Active Lifts

*Functionality*

3.1.6. Shipments are manually moved to Active Lifts from any waste management facility or stockpile.

3.1.7. WITS is set up to automatically receive shipments sent to Active Lifts

3.2. **Lift ID's**

3.2.1. Lift ID's represent completed, approved waste lifts within the corresponding embankment. Lift ID Locations within WITS are continually added as each active lift is changed to a completed lift after Q.C. testing and approval. Each lift ID is identified by the corresponding embankment and grid address, year, month, day and type (e.g. EWH17091017SS).

**Note: FF indicates flowable fill; SS indicates that the lift is placed on a side slope; etc DU indicates disposal of Depleted Uranium within the lift. Type indicators are assigned by Q.C. personnel. There should be no "MM" indicators for the 11e.(2) Embankment.**

## 5.1 Example of WITS User's Guide (cont)



3.2.2. If a Lift ID location is not found, contact a WITS user with Administrative rights to create a new WITS location.

*Responsibility*

3.2.3. The LLRW Waste Tracker is responsible for obtaining waste movement information from applicable personnel and updating locations within this zone. Information can be obtained from driver worksheets, operator logs, verbal inquiries, or location status changes within WITS.

3.2.4. Lift ID's shall match the ID on the Lift Approval Form provided by Quality Control personnel after a lift has been tested and approved.

*Checklists*

3.2.5. There are no checklists associated with waste movements to Lift ID's

*Constraints*

3.2.6. There are no constraints associated with waste movements to Lift ID's

*Functionality*

3.2.7. Shipments are manually moved to Lift ID's from Active Lifts.

3.2.8. WITS is set up to automatically receive shipment sent to Lift ID's

3.3. **Stockpile Locations**

3.3.1. Stockpile locations are designated for waste shipments stored on an area of the embankment that cannot be managed on an active lift.

3.3.2. Shipments can be moved to stockpile locations when storage is made necessary as a result of delays associated with acceptance, characterization, disposal capabilities, or problem resolution. Although not required, shipments placed in stockpile are usually bulk, or larger containers not feasible for storage at a Containerized Waste Storage facility.

3.3.3. Stockpile locations for the 11e.(2) Embankment include:

- EWSP-01
- EWSP-02
- EWSP-03

*Responsibility*

## 5.1 Example of WITS User's Guide (cont)



3.3.4. The LLRW Waste Tracker is responsible for obtaining waste movement information from applicable personnel and updating locations within this zone. Information can be obtained from driver worksheets, operator logs, verbal inquiries, or location status changes within WITS.

*Checklists*

3.3.5. There are no checklists associated with waste movements to Stockpile Locations.

*Constraints*

3.3.6. There are no constraints associated with waste movements to Stockpile Locations.

*Functionality*

3.3.7. Shipments are manually moved to Stockpile Locations from any waste management facility or stockpile.

3.3.8. Shipments stored here monitored by several reports for financial surety, volume, and revenue purposes.

3.3.9. WITS is set up to automatically receive shipments sent to Stockpile Locations.

## 4. LL CSP

**Purpose**

This zone is established to track containers physically stored on the Containerized Waste Storage Pad.

Containers can be moved to this zone when storage is made necessary as a result of delays associated with acceptance, characterization, disposal capabilities, or problem resolution.

**Functionality**

Containers stored here are monitored by several reports for financial surety, volume, and revenue purposes.

**Locations**

### 4.1. LL CSP East

*Responsibility*

4.1.1. The container handling foreman is responsible for ensuring movements to this location are either manually moved to this location within this program or tracked on a log and given to the LLRW Waste Tracker for movement.

## 5.1 Example of WITS User's Guide (cont)



4.1.2. The LLRW Waste Tracker is responsible for monitoring this location to ensure inventories are up do date and accurate.

*Checklist*

4.1.3. A checklist is established for this location to ensure containers moved here meet the applicable compliance criteria. This checklist is for verification purposes only; shipment status changes do not occur when the checklist is complete.

*Constraints*

4.1.4. This location automatically verifies container type and waste type prior to allowing shipment storage.

4.1.5. This location is approved to manage any containerized shipment inside a metal or plastic box or on pallets. Cardboard, wood, and plastic liner bags are not allowed.

**Note: If an approved container is rejected, contact the LLRW Waste Tracker to review the container type and compare it with the constraints table within the program**

4.1.6. This location is set up to allow any LLRW or Class A waste type by default. 11e.(2) waste storage is permitted provided that there is not other waste type on the pad.

**Note: If 11e.(2) waste storage is required; first, remove all other waste types then contact the LLRW Waste Tracker to update the constraints table.**

*Functionality*

4.1.7. This location is set up to receive containerized waste shipments once a checklist has been complete.

**Note: If 11e.(2) waste storage is required; first, remove all other waste types then contact the LLRW Waste Tracker to update the constraints table.**

4.2. **LL CSP High Rad Area**

*Responsibility*

4.2.1. The container handling foreman is responsible for ensuring movements to this location are either manually moved to this location within this program or tracked on a log and given to the LLRW Waste Tracker for movement.

4.2.2. The LLRW Waste Tracker is responsible for monitoring this location to ensure inventories are up do date and accurate.

## 5.1 Example of WITS User's Guide (cont)



*Checklist*

4.2.3. A checklist is established for this location to ensure containers moved here meet the applicable compliance criteria. This checklist is for verification purposes only; shipment status changes do not occur when the checklist is complete.

*Constraints*

4.2.4. This location automatically verifies container type and waste type prior to allowing shipment storage.

4.2.5. This location is approved to manage any containerized shipment inside a metal or plastic box or on pallets. Cardboard, wood, and plastic liner bags are not allowed.

**Note: If an approved container is rejected, contact the LLRW Waste Tracker to review the container type and compare it with the constraints table within the program**

4.2.6. This location is set up to allow any LLRW or Class A waste type by default. 11e.(2) waste storage is permitted provided that there is not other waste type on the pad.

**Note: If 11e.(2) waste storage is required; first, remove all other waste types then contact the LLRW Waste Tracker to update the constraints table.**

*Functionality*

4.2.7. This location is set up to receive containerized waste shipments once a checklist has been complete.

**Note: If 11e.(2) waste storage is required; first, remove all other waste types then contact the LLRW Waste Tracker to update the constraints table**

4.3. **LL CSP West**

*Responsibility*

4.3.1. The container handling foreman is responsible for ensuring movements to this location are either manually moved to this location within this program or tracked on a log and given to the LLRW Waste Tracker who will for movement.

4.3.2. The LLRW Waste Tracker is responsible for monitoring this location to ensure inventories are up do date and accurate.

*Checklist*

## 5.1 Example of WITS User's Guide (cont)



4.3.3. A checklist is established for this location to ensure containers moved here meet the applicable compliance criteria. This checklist is for verification purposes only; shipment status changes do not occur when the checklist is complete.

*Constraints*

4.3.4. This location automatically verifies container type and waste type prior to allowing shipment storage.

4.3.5. This location is approved to manage any containerized shipment inside a metal or plastic box or on pallets. Cardboard, wood, and plastic liner bags are not allowed and the constraint verification tool will reject items that do not match established criteria.

**Note: Occasionally, container types are entered that the system does not recognize. If an approved container is rejected, contact the LLRW Waste Tracker to review the container type and compare it with the constraints table within the program.**

4.3.6. This location is set up to allow any LLRW or Class A waste type by default. 11e.(2) waste storage is permitted provided that there is no other waste type on the pad.

**Note: If 11e.(2) waste storage is required; first, remove all other waste types then contact the LLRW Waste Tracker to update the constraints table.**

*Functionality*

4.3.7. This location is set up to receive containerized waste shipments once a checklist has been complete.

## 5. LL DECON

**Purpose**

This zone is established to monitor container decontamination and release after the waste has been removed.

**Functionality**

Container status changes as each item progressively moves through locations within this zone. Status updates include: "Unloaded" to "Washed" then to "Released", depending on the functionality of each location.

**Locations**

### 5.1. HP-LL Post Decon Box Wash

## 5.1 Example of WITS User's Guide (cont)

**Location and Zone List – WITS USER GUIDE Rev. 0**

*Responsibility*

5.1.1. Facility Operators are responsible for sending containers to this location when they require a survey for release. Health Physics personnel are responsible for maintaining the inventory of containers at this Work Center location and sending them to appropriate container release locations when release surveys are complete.

*Checklist*

5.1.2. There are no active Checklists associated with this location.

*Constraints*

5.1.3. This location verifies container type and status prior to accepting inventory. Container types listed as Intermodal, CVAN, B-25, End Dump, and other metal boxes with a status of Washed or Released are accepted into this location.

*Functionality*

5.1.4. After containers have been washed at the Box Wash or Intermodal Container Wash facility and are ready to survey for release, facility personnel manually move the applicable container to this location.

5.1.5. This location is set up to automatically receive containers when they are sent here.

5.1.6. Once released, Health Physics Personnel move the container out of this location and into an appropriate outside storage location or to a returned location when the container is sent off-site. Example locations for released containers include: LL Container Release, DOT Yard, RTS Yard, Unrestricted Yard, and LL IM Rail.

### 5.2. HP-LL Post Decon New Rail

*Responsibility*

5.2.1. Health Physics personnel are responsible for maintaining the inventory of containers at this Work Center location.

*Checklist*

5.2.2. There are no active Checklists associated with this location.

*Constraints*

***This location verifies container type and status prior to accepting inventory. Container types listed as Railcars, Intermodal, CVAN, B-25, End Dump,***

## 5.1 Example of WITS User's Guide (cont)



5.2.3. and/or other metal boxes with a status of Washed or Released are accepted into this location.

*Functionality*

5.2.4. After containers have been washed at the New Rail Decontamination Facility and are ready to survey for release, facility personnel manually move the applicable container to this location.

5.2.5. This location is set up to automatically receive containers when they are sent here.

5.2.6. Once released, Health Physics Personnel move the container out of this location and into an appropriate outside storage location or to a returned location when the container is sent off-site Example locations for released containers include: Rail Release (primary), LL Container Release, DOT Yard, RTS Yard, Unrestricted Yard, and LL IM Rail.

### 5.3. LL Container Release

*Responsibility*

5.3.1. Health Physics personnel are responsible for maintaining the inventory of this location.

*Checklist*

5.3.2. A checklist has been established to verify specific criteria are completed prior to moving the container to its appropriate release location (e.g. DOT Yard, RTS Yard, Unrestricted Yard, LL IM Rail):

a. Have all labels been removed or added as needed for this container?

b. Is the container lid properly seated?

c. Is the rear door properly sealed?

d. Have you assigned at least one security seal?

*Constraints*

5.3.3. This location is set up to verify container type, shipment status, release type, and waste type. Containers will be rejected if they do not meet pre-determined criteria.

**Note: If an approved container is rejected, contact the LLRW Waste Tracker to review the container type and compare it with the constraints table within the program.**



5.1 Example of WITS User's Guide (cont)

*Functionality*

5.3.4. When facility personnel move shipments to this location and answer the checklist affirmative, the container status automatically updates to "Released".

5.4. **LL Decon – Box Wash**

5.4.1. This location is established to provide a location for Decon personnel to review inventory of containers requiring decontamination after they are unloaded.

*Responsibility*

5.4.2. Facility operators are responsible for moving containers to this location after they have been unloaded at a container handling facility.

5.4.3. Facility Operators are responsible for washing containers and moving them to HP Post Decon Box Wash when they are ready for survey and release.

*Checklist*

5.4.4. A checklist has been established to verify applicable criteria and update container status when questions are answered affirmative.

a. Is the container free of any damage?

b. Has the container been properly washed to meet the requested release standard?

*Constraints*

5.4.5. This location automatically verifies shipment status prior to being accepted. Shipments with a status of "Unloaded" and "Washed" are accepted. All others are rejected.

*Functionality*

5.4.6. When checklist items are answered affirmative the container status changes to "Washed".

5.5. **LL Decon – New Rail**

5.5.1. This location is established to provide a location for Decon personnel to review inventory of railcars requiring decontamination after they are unloaded.

*Responsibility*

## 5.1 Example of WITS User's Guide (cont)



5.5.2. Facility operators are responsible for moving gondolas to this location after the cars have been unloaded at the Rollover Facility or the Railcar Digging Facility.

5.5.3. Health Physics personnel are responsible for releasing gondolas and moving them to EC Released when acceptable survey results are obtained.

*Checklist*

5.5.4. There are no checklists associated with this location.

*Constraints*

5.5.5. There are currently no constraints associated with this location.

*Functionality*

5.5.6. This location is set up to automatically receive gondolas as they are sent.

## 6. LL IUF

**Purpose**

This zone is established to track bulk and containerized storage of shipments managed at the Intermodal Unloading Facility.

Shipments can be moved to locations within this zone when storage is made necessary as a result of delays associated with acceptance, characterization, disposal capabilities, or problem resolution. In some cases, it can also be more efficient to unload containers in the IUF depending on generator specific criteria.

**Functionality**

Shipments stored here, whether in containers or bulk, are monitored by several reports for financial surety, volume, and revenue purposes.

**Locations**

### 6.1. Aprons

6.1.1. The concrete surfaces above each bay are an approved location for containerized waste storage.

6.1.2. Apron Locations in the LL IUF zone include:

- Apron 1
- Apron 2
- Apron 3

## 5.1 Example of WITS User's Guide (cont)



- Apron 4

*Responsibility*

6.1.3. The container handling foreman is responsible for ensuring movements to these locations are either manually moved to locations within this program or tracked on a log and given to the LLRW Waste Tracker for movement.

*Checklist*

6.1.4. There are no checklists established for these locations.

*Constraints*

6.1.5. These locations automatically verify shipment status, container type and waste type prior to allowing shipment storage.

6.1.6. These locations are approved to manage any containerized shipment inside a metal or plastic box or on pallets. Cardboard, wood, and plastic liner bags are rejected.

**Note: If an approved container is rejected, contact the LLRW Waste Tracker to review the container type and compare it with the constraints table within the program.**

6.1.7. These locations are set up to allow any LLRW or Class A waste type by default. 11e.(2) waste storage is permitted provided that there is no other waste type stored at the facility.

**Note: If 11e.(2) waste storage is required; first, remove all other waste types; then, contact the LLRW Waste Tracker to update the constraints table.**

*Functionality*

6.1.8. These locations are set up to automatically receive shipments as they are sent by WITS users.

6.1.9. No checklists are currently established at these locations.

6.2. **Intermodal Bays (IM Bays)**

6.2.1. The concrete bays are approved locations for containerized and bulk waste storage.

6.2.2. IM Bay Locations in the LL IUF zone include:

- IM Bay 1
- IM Bay 2

## 5.1 Example of WITS User's Guide (cont)



- IM Bay 3
- IM Bay 4

*Responsibility*

6.2.3. The container handling foreman is responsible for ensuring movements to these locations are either manually moved to locations within this program or tracked on a log and given to the LLRW Waste Tracker for movement.

*Checklist*

6.2.4. Two questions are asked when a container is moved to any of the four IM Bay locations. These questions have no functionality but are established to serve as a reminder and to verify that certain compliance requirements are being met:

a. If the container is smaller than a Metal Melt, and is empty, is it labeled with an "Unloaded" label?

b. Is the bay properly labeled?

*Constraints*

6.2.5. These locations automatically verify shipment status, container type and waste type prior to allowing shipment storage.

6.2.6. These locations are approved to manage any bulk or containerized waste shipment including bags, liners, wood, and cardboard containers.

**Note: If an approved container is rejected, contact the LLRW Waste Tracker to review the container type and compare it with the constraints table within the program.**

6.2.7. These locations are set up to allow any LLRW or Class A waste type by default. 11e.(2) waste storage is permitted provided that there is no other waste type stored at the facility.

**Note: If 11e.(2) waste storage is required; first, remove all other waste types; then, contact the LLRW Waste Tracker to update the constraints table.**

*Functionality*

6.2.8. These locations are set up to automatically receive shipments as they are sent by WITS users.

6.2.9. Bulk shipments should be split from the shipping container at the appropriate container handling location (i.e. Rail Intermodal Unloading, Truck Intermodal Unlading, etc.) prior to being moved to the IM Bays.



## 5.1 Example of WITS User's Guide (cont)

# 7. LL SAMPLE COLLECTION

**Purpose**

In some cases, especially with portable devices used for WITS management, it is difficult for users to identify shipments that require sampling. This zone keeps shipments that have been flagged for sampling out of established Work Zones to eliminate confusion related to approval for management. Use of this zone is optional.

**Functionality**

Shipments moved to any of these locations are withheld from an approval status until a sample can be obtained. Once a sample is obtained, the shipment status changes to “Sampled” and is usually approved for management. Once approved, the shipment should be moved to its physical location. Shipments placed on hold may remain in “LL Sample Hold” until approval for management is given. It is preferred that all shipments will actually be tracked to their physical locations and personnel refer to the status of each container prior to unloading them.

Containers stored here are monitored by several reports for financial surety, volume, and revenue purposes.

**Responsibility**

It is the LLRW Waste Tracker’s responsibility to monitor this location for inventory that may be left here over time.

**Locations**

## 7.1. LL Sample Collection

*Responsibility*

7.1.1. Chemistry Lab personnel are responsible for identifying shipments requiring sample collection and, if determined necessary, are responsible for moving them here to ensure the shipment is segregated from those not requiring analysis.

7.1.2. Once a shipment is moved here, it is automatically accepted (after affirmative selection from checklist) and then automatically moved to LL Sampled.

*Checklist*

7.1.3. A verification checklist is provided to ask the user who is moving the shipment if the containers are required to be sampled.

7.1.4. The checklist serves no functionality

## 5.1 Example of WITS User's Guide (cont)



*Constraints*

7.1.5. This location verifies container status and accepts shipments that have been accepted or received.

*Functionality*

7.1.6. This location is only established as an administrative control to prevent inadvertent disposal of shipments before they are sampled.

7.2. **LL Sample Hold**

*Responsibility*

7.2.1. Chemistry Lab personnel are responsible for identifying shipments that require analysis prior to disposal and moving them to this location as needed.

7.2.2. Once a shipment is approved for management, chemistry lab personnel are responsible for moving the waste item to the "LL Sampled" WITS location.

*Checklist*

7.2.3. There are no checklists established for this location.

*Constraints*

7.2.4. There are no constraints established for this location.

*Functionality*

7.2.5. This location is used to hold a shipment from an operational view to prevent inadvertent disposal out of a Work Center.

7.2.6. Shipments sent to this location are automatically received.

7.3. **LL Sampled**

*Responsibility*

7.3.1. Chemistry Lab personnel are responsible for ensuring sampled waste shipments are moved to this location from either "LL Sample Hold" or "LL Sample Collection"

7.3.2. When a shipment is sampled, the Container Handling Foreman or the LLRW Waste Tracker is responsible for moving the shipment out of this location and into its physical location.

***Checklist***

## 5.1 Example of WITS User's Guide (cont)



7.3.3. There are no checklists established for this location.

*Constraints*

7.3.4. There are no constraints established for this location.

*Functionality*

7.3.5. Shipments sent here require a WITS user to manually accept the shipment into this location.

7.3.6. Shipments moved here by Chemistry Lab personnel are approved for management and should have an automatic status update of "Sampled"

## 8. LL UNLOAD PLANNING

**Purpose**

This zone is established to provide a work center to equipment and facility operators who manage waste containers inside the LLRW Restricted Area. Locations within this zone are set up to track applicable container types in accordance with specific work processes. Processes for unloading intermodals by rail differ from those for unloading intermodals by truck. Likewise, processes for managing drums, B-25's, and other containers also vary in the way they are tracked through this system. Specific WITS locations have been established for each container unloading process to ensure accurate process flow.

**Functionality**

Each location listed below is set up to track waste containers at their physical location as they progress through the restricted area to disposal. When specific checklists are answered affirmative, status changes occur that allow for separate tracking of bulk waste to disposal and its shipping container to release.

Containers and waste managed at these locations are monitored by several reports for financial surety, volume, revenue, and demurrage tracking purposes.

**Locations**

### 8.1. LL Intermodal Railcar

8.1.1. This location is established to provide a tracking mechanism for conveyance vehicles entering the LLRW Restricted area that carry multiple shipping containers. Intermodal and CVAN containers are most commonly found on an Intermodal Railcar Conveyance.

*Responsibility*

8.1.2. The Rail Gate Guard is responsible for ensuring Intermodal Railcars are tracked to this location when each of its containers has been offloaded.

## 5.1 Example of WITS User's Guide (cont)



8.1.3. Once the conveyance has been offloaded, a Facility Operator is responsible for ensuring the conveyance is moved to Rail Release for release tracking purposes.

**Note: Conveyances moved to Rail Release are not automatically accepted. The Rail Gate Guard is responsible for accepting conveyances at Rail Release when they are ready to leave the Clive facility.**

*Checklist*

8.1.4. A checklist is established to verify that the conveyance has been unloaded. Once answered affirmative, the status of the conveyance automatically changes to "Unloaded".

*Constraints*

8.1.5. This location automatically verifies container type prior to accepting a conveyance.

8.1.6. This location only accepts container type "Intermodal Railcar"

**Note: If an approved container is rejected, contact the LLRW Waste Tracker to review the container type and compare it with the constraints table. Modifications can be made if required.**

*Functionality*

8.1.7. This location is set up to receive conveyances once the checklist has been completed.

8.2. **LL Intermodal Unloading (Rail)**

8.2.1. This location is provided as an interim location to assist with inventory tracking and waste management purposes. This is not a Work Center from which containers are manually moved.

*Responsibility*

8.2.2. The Rail Gate Guard is responsible for moving Intermodal Railcars to this location from All Outside Full Intermodal Rail as shipments are accepted and pushed into the Restricted Area.

*Checklist*

8.2.3. There are no checklists associated with this location.

*Constraints*

## 5.1 Example of WITS User's Guide (cont)



8.2.4. This location automatically verifies container status and rejects any shipment which has not been received or approved.

*Functionality*

8.2.5. This location automatically accepts shipments and then automatically moves them to Rail Intermodal Unloading.

8.2.6. The automatic accept and move process removes shipments from their previous location and then tracks them to this physical location for easier identification on applicable inventory reports.

**Note: When shipments are moved from one location to the next, inventory reports do not identify the movement until the shipment has been accepted at the new location.**

8.3. **LL Intermodal Unloading (Truck)**

8.3.1. This location is provided as an interim location to assist with inventory tracking and waste management purposes. This is not a Work Center from which containers are manually moved.

*Responsibility*

8.3.2. Facility and Equipment operators are responsible for moving Intermodal truck shipments to this location from All Outside LL Full Truck Containers or from any other storage location as shipments are accepted and approved for management.

*Checklist*

8.3.3. There are no checklists associated with this location.

*Constraints*

8.3.4. This location automatically verifies container status and rejects any shipment which has not been received or approved.

*Functionality*

8.3.5. This location automatically accepts shipments and then automatically moves them to Truck Intermodal Unloading where they are managed for disposal.

8.3.6. The automatic accept and move process removes shipments from their previous location and then tracks them to this physical location for easier identification on applicable inventory reports.

## 5.1 Example of WITS User's Guide (cont)



**Note: When shipments are moved from one location to the next, inventory reports do not identify the movement until the shipment has been accepted at the new location.**

8.4. **MW Holding Pad B**

8.4.1. This location has been established as a tracking mechanism to identify LLRW shipments unloaded at the Mixed Waste Facility.

*Responsibility*

8.4.2. When LLRW shipments are unloaded at the Mixed Waste Facility, applicable container handling personnel are responsible for identifying waste movement to and from this location on a log and transmitting the information to the LLRW Waste Tracker.

8.4.3. The LLRW Waste Tracker is responsible for updating WITS inventory locations as containers are moved to and from this location.

*Checklist*

8.4.4. There are no checklists associated with this location.

*Constraints*

8.4.5. There are no constraints associated with this location.

*Functionality*

8.4.6. Shipments moved to this location are automatically accepted.

8.5. **Rail Intermodal Unloading**

8.5.1. This is a Work Center location from which equipment and facility operators manage containers when they are ready to be unloaded.

*Responsibility*

8.5.2. The facility foreman is responsible for ensuring intermodal or CVAN shipments are tracked on a paper log or manually moved through this location for accurate inventory reporting.

8.5.3. If a shipment is tracked on a paper log, the facility foreman is responsible for ensuring the information is transmitted to the LLRW Waste Tracker who is then responsible for logging the container movement in WITS.

8.5.4. The LLRW Waste Tracker is responsible for monitoring this location to ensure waste movement is occurring as required.

*Checklist*

## 5.1 Example of WITS User's Guide (cont)



8.5.5. When a shipment is manually received at this location, several questions are asked for verification purposes:

a. Is the container completely empty?

b. Contact Operations to make notification of where bulk waste is being unloaded.

c. If the container is being dumped in a bay, is the bay properly labeled?

*Constraints*

8.5.6. This location automatically verifies shipment status prior to being accepted. Any shipment that has not been approved for management will be rejected.

*Functionality*

8.5.7. Once the questions on the checklist have been answered correctly, the shipment status is changed to "Unloaded" and the system automatically creates a bulk record for tracking to the disposal embankment and then pushes the container to LL Decon Box Wash to begin the container release process.

8.5.8. The bulk record remains as part of the inventory for this location until it is manually moved to the proper location.

8.6. **Truck Dock**

8.6.1. This location has been established to track containers physically stored at the Truck Dock.

8.6.2. Containers can be moved to this location when storage is made necessary as a result of delays associated with acceptance, characterization, disposal capabilities, or problem resolution.

*Responsibility*

8.6.3. The container handling foreman is responsible for ensuring movements to this location are either manually moved within this program or tracked on a log and given to the LLRW Waste Tracker for movement.

*Checklist*

8.6.4. There are no checklists associated with this location.

*Constraints*

8.6.5. There are no constraints established for this location.

*Functionality*

## 5.1 Example of WITS User's Guide (cont)



8.6.6. Shipments sent to this location are automatically received.

8.7. **Truck Intermodal Unloading**

8.7.1. This is a Work Center location from which equipment and facility operators manage containers when they are ready to be unloaded.

*Responsibility*

8.7.2. The facility foreman is responsible for ensuring intermodal or CVAN shipments are tracked on a paper log or manually moved through this location for accurate inventory reporting.

8.7.3. If a shipment is tracked on a paper log, the facility foreman is responsible for ensuring the information is transmitted to the LLRW Waste Tracker who is then responsible for logging the container movement in WITS.

8.7.4. The LLRW Waste Tracker is responsible for monitoring this location to ensure waste movement is occurring as required.

*Checklist*

8.7.5. When a shipment is manually received at this location, several questions are asked for verification purposes:

a. Is the container completely empty?

b. Contact Operations to make notification of where bulk waste is being unloaded.

c. If the container is being dumped in a bay, is the bay properly labeled?

*Constraints*

8.7.6. This location automatically verifies shipment status prior to being accepted. Any shipment that has not been approved for management will be rejected.

*Functionality*

8.7.7. Once the questions on the checklist have been answered correctly, the shipment status is changed to "Unloaded" and the system automatically creates a bulk record for tracking to the disposal embankment and then pushes the container to LL Decon Box Wash to begin the container release process.

8.7.8. The bulk record remains as part of the inventory for this location until it is manually moved to the proper location.

## 9. LL UNLOADING RAIL

## 5.1 Example of WITS User's Guide (cont)

**Location and Zone List – WITS USER GUIDE Rev. 0**

**Purpose**

This zone is established to provide a work center to facility operators who unload gondola rail shipments at either of the two railcar rollover facilities or the railcar digging facility.

**Functionality**

Each location listed below is set up to track waste gondolas at their physical location as they progress through the restricted area to disposal. When specific checklists are answered affirmative, status changes occur that allow for separate tracking of bulk waste to disposal and its railcar to release.

Gondolas and waste managed at these locations are monitored by several reports for financial, surety, volume, revenue, and demurrage tracking purposes

**Locations**

9.1. **Inside Full Gondola East Rail**

9.1.1. This location is provided as an interim location to assist with inventory tracking and waste management purposes for Gondola shipments planned for unloading at the Rollover Facility. This is not a Work Center from which gondolas are manually moved.

*Responsibility*

9.1.2. The Rail Gate Guard is responsible for moving Gondola Railcars to this location from All Outside Full Gondola Rail as shipments are accepted and pushed into the Restricted Area through the east gate.

*Checklist*

9.1.3. There are no checklists associated with this location.

*Constraints*

9.1.4. There are no constraints associated with this location.

*Functionality*

9.1.5. This location automatically accepts shipments and then automatically moves them to the Rollover.

9.1.6. The automatic accept and move process removes shipments from their previous location and then tracks them to this physical location for easier identification on applicable inventory reports.

## 5.1 Example of WITS User's Guide (cont)



**Note: When shipments are moved from one location to the next, inventory reports do not identify the movement until the shipment has been accepted at the new location.**

9.2. **Inside Full Gondola West Rail**

9.2.1. This location is provided as an interim location to assist with inventory tracking and waste management purposes for Gondola shipments planned for unloading at the Rotary Dump Facility. This is not a Work Center from which gondolas are manually moved.

*Responsibility*

9.2.2. The Rail Gate Guard is responsible for moving Gondola Railcars to this location from All Outside Full Gondola Rail as shipments are accepted and pushed into the Restricted Area through the west gate.

*Checklist*

9.2.3. There are no checklists associated with this location.

*Constraints*

9.2.4. There are no constraints associated with this location.

*Functionality*

9.2.5. This location automatically accepts shipments and then automatically moves them to the Rotary Dump Facility.

9.2.6. The automatic accept and move process removes shipments from their previous location and then tracks them to this physical location for easier identification on applicable inventory reports.

**Note: When shipments are moved from one location to the next, inventory reports do not identify the movement until the shipment has been accepted at the new location**

9.3. **Rail Digging Facility**

*Responsibility*

9.3.1. The Rail Gate Guard is responsible for moving gondola shipments planned for digging to the Rail Digging Facility.

9.3.2. Once a Gondola is emptied, the Rail Facility Foreman is responsible for moving the gondola shipment through the rollover facility for automatic bulk creation and automatic movement to the Track 4 Decon Facility

## 5.1 Example of WITS User's Guide (cont)



*Checklist*

9.3.3. There are no checklists associated with this location.

*Constraints*

9.3.4. There are no constraints associated with this location.

*Functionality*

9.3.5. This location is set up to automatically accept gondolas set by WITS users.

9.3.6. This location is not currently set up to automatically create a bulk shipment when unloaded.

9.4. **Rollover**

9.4.1. This is a Work Center location from which facility operators manage Gondolas when they are ready to be unloaded.

*Responsibility*

9.4.2. The facility foreman is responsible for ensuring Gondola shipments are tracked on a paper log or manually moved through this location for accurate inventory reporting.

9.4.3. If a shipment is tracked on a paper log, the facility foreman is responsible for ensuring the information is transmitted to the LLRW Waste Tracker who is then responsible for logging the container movement in WITS.

9.4.4. The LLRW Waste Tracker is responsible for monitoring this location to ensure waste movement is occurring as required and for moving bulk shipments to the appropriate location as determined by operator logs and worksheets.

*Checklist*

9.4.5. When a shipment is unloaded at this location, several questions are asked for verification purposes:

a. If required, has the car been sampled?

b. Change status to unloaded?

*Constraints*

9.4.6. This location automatically verifies shipment status prior to being accepted. Any shipment that has not been approved for management will be rejected.

*Functionality*

## 5.1 Example of WITS User's Guide (cont)



9.4.7. The facility operator must manually accept shipments as they enter the facility to be rolled. Once accepted, the facility operator shall check the container status. Any shipment that does not have a status of "Sampled" shall be sampled prior to unloading.

9.4.8. When a shipment is rolled, the facility operator shall select "Move" to move the Gondola to the Track 4 Decon Facility.

9.4.9. When the checklist associated with the container move is answered affirmative, the system creates a bulk shipment, updates the shipment status to "Unloaded" and sends the gondola to the Track 4 Decon Facility while leaving the bulk as part of the facility inventory.

9.4.10. The bulk record remains as part of the inventory for this location until it is manually moved to the proper location.

9.5. **Rotary Dump Facility**

9.5.1. This is a Work Center location from which facility operators manage Gondolas when they are ready to be unloaded.

*Responsibility*

9.5.2. The facility foreman is responsible for ensuring Gondola shipments are tracked on a paper log or manually moved through this location for accurate inventory reporting.

9.5.3. If a shipment is tracked on a paper log, the facility foreman is responsible for ensuring the information is transmitted to the LLRW Waste Tracker who is then responsible for logging the container movement in WITS.

9.5.4. The LLRW Waste Tracker is responsible for monitoring this location to ensure waste movement is occurring as required and for moving bulk shipments to the appropriate location as determined by operator logs and worksheets.

*Checklist*

9.5.5. When a shipment is unloaded at this location, several questions are asked for verification purposes:

a. If required, has the car been sampled?

b. Change status to unloaded?

*Constraints*

9.5.6. This location automatically verifies shipment status prior to being accepted. Any shipment that has not been approved for management will be rejected.

## 5.1 Example of WITS User's Guide (cont)



*Functionality*

9.5.7. The facility operator must manually accept shipments as they enter the facility to be rolled. Once accepted, the facility operator shall check the container status. Any shipment that does not have a status of "Sampled" shall be sampled prior to unloading.

9.5.8. When a shipment is rolled, the facility operator shall select "Move" to move the Gondola to the Rotary Wash Facility.

9.5.9. When the checklist associated with the container move is answered affirmative, the system creates a bulk shipment, updates the shipment status to "Unloaded" and sends the gondola to the Rotary Wash Facility while leaving the bulk as part of the facility inventory.

9.5.10. The bulk record remains as part of the inventory for this location until it is manually moved to the proper location.

9.6. **Rotary Wash Facility**

9.6.1. This location is established to provide a location for Health Physics personnel to review inventory of railcars requiring release after decontamination.

*Responsibility*

9.6.2. Facility operators are responsible for moving gondolas to this location after the cars have been emptied.

9.6.3. Health Physics personnel are responsible for releasing gondolas and moving them to EC Released when acceptable survey results are obtained.

*Checklist*

9.6.4. There are no checklists associated with this location.

*Constraints*

9.6.5. There are currently no constraints associated with this location.

*Functionality*

9.6.6. This location is set up to automatically receive gondolas as they are sent.

## 10. SHREDDER

**Purpose**

This zone is established to track bulk and containerized storage of shipments stored in preparation to be shredded.

## 5.1 Example of WITS User's Guide (cont)



Shipments can also be moved to this zones when storage is made necessary as a result of delays associated with acceptance, characterization, disposal capabilities, or problem resolution. In some cases, it can also be more efficient to unload containers at the Shredder Facility depending on generator specific criteria.

**Functionality**

Shipments stored here, whether in containers or bulk, are monitored by several reports for financial, surety, volume, and revenue purposes.

**Locations**

10.1. **Shredder In-Feed**

*Responsibility*

10.1.1. The container handling foreman is responsible for ensuring movements to this location are either manually moved or tracked on a log and given to the LLRW Waste Tracker for movement.

10.1.2. The LLRW Waste Tracker is responsible for reviewing operator logs to determine where shredded material is moved for disposal and for updating the location inventory as shipments are physically moved to and from the location.

10.1.3. The LLRW Waste Tracker is responsible for monitoring this location to ensure accuracy in inventory reporting.

*Checklist*

10.1.4. There are no checklists associated with this location.

*Constraints*

10.1.5. There are currently no constraints associated with this location.

*Functionality*

10.1.6. This location is set up to automatically receive shipments as they are moved here. Shipments moving out of this facility require manual movement.

## 11. UNUSED ZONES

The following embankments are listed in the Restricted-Low Level Area in the WITS program but are not used for operational purposes. They are maintained in the database to allow for historical referencing and reporting as needed. Waste item records should not be changed in these areas unless approved by a site director.

11.1. **Embankment – LARW**

## 5.1 Example of WITS User's Guide (cont)



11.2. **Embankment – NORM**

11.3. **Legacy Embankment – 11e.(2)**

11.4. **Legacy Embankment – Class A**

11.5. **Legacy Embankment – LARW**

11.6. **Legacy Embankment – NORM**

## 5.2 Example of Typical WITS Container Movements

| | | | Possible Movements | |
|---|---|---|---|---|
| Zones | Location | Type | Container | Waste |
| Embankments | Active Lifts | WC | N/A | Lift ID's |
| | Lift ID's | WC | N/A | N/A |
| | Stockpile Locations | WC | N/A | Active Lifts |
| LL CSP | LL CSP East | WC | N/A | IUF, Stockpile, Active Lifts |
| | LL CSP High Rad Area | WC | N/A | IUF, Stockpile, Active Lifts |
| | LL CSP West | WC | N/A | IUF, Stockpile, Active Lifts |
| LL Decon | HP-LL Post Decon Box Wash | WC | LL Container Release | N/A |
| | HP-LL Post Decon New Rail | WC | LL Container Release | N/A |
| | LL Decon – Box Wash | WC | HP-LL Post Decon Box Wash | N/A |
| | LL Container Release | WC | DOT Yard, RTS Yard, Unrestricted Yard, LL IM Rail | N/A |
| | LL Decon – New Rail | WC | HP-LL Post Decon New Rail | N/A |
| LL IUF | Aprons | WC | N/A | IM Bays, Stockpile, Active Lifts |
| | IM Bays | WC | LL Decon – Box Wash | Stockpile, Active Lifts |
| LL Sample Collection | LL Sample Collection | AL | LL Sampled, LL Sample Hold | N/A |
| | LL Sample Hold | AL | LL Sampled, LL Sample Hold | N/A |
| | LL Sampled | AL | Container Storage, Active Lift, Stockpile | N/A |
| Truck Intermodal Unloading | LL Intermodal Railcar | VT | Container Release | N/A |
| | LL Intermodal Unloading (Rail) | AL | Rail Intermodal Unloading | N/A |
| | LL Intermodal Unloading (Truck) | AL | Truck Intermodal Unloading | N/A |
| | Rail Intermodal Unloading | WC | LL Decon – Box Wash | IUF, Stockpile, Active Lifts |
| | Truck Dock | WC | IUF, Stockpile, Active Lift | N/A |
| | Truck Intermodal Unloading | WC | LL Decon – Box Wash | IUF, Stockpile, Active Lifts |
| LL Unloading Rail | Inside Full Gondola East Rail | AL | Rollover | N/A |
| | Inside Full Gondola West Rail | AL | Rotary Wash Facility | N/A |
| | Rail Digging Facility | WC | Rollover | N/A |
| | Rollover | WC | LL Decon - New Rail | Stockpile, Active Lifts |
| | Rotary Dump Facility | WC | Rotary Wash Facility | Stockpile, Active Lifts |
| | Rotary Wash Facility | WC | EC Released | N/A |
| Shredder | Shredder In-Feed | WC | N/A | Stockpile, Active Lifts |

WC Work Center
AL Administrative Locatin
VT Vehicle Tracking

## 5.3 Example of WITS Location Responsibilities

| | | | Responsibility | | | |
|---|---|---|---|---|---|---|
| Zones | Location | Type | Primary | Move To | Move From | Monitor |
| Embankments | Active Lifts | WC | LLRW Waste Tracker | Container Handler | N/A | LLRW Waste Tracker |
| | Lift ID's | WC | LLRW Waste Tracker | LLRW Waste Tracker | N/A | LLRW Waste Tracker |
| | Stockpile Locations | WC | LLRW Waste Tracker | LLRW Waste Tracker | N/A | LLRW Waste Tracker |
| LL CSP | LL CSP East | WC | Container Foreman | Container Foreman | Container Foreman | LLRW Waste Tracker |
| | LL CSP High Rad Area | WC | Container Foreman | Container Foreman | Container Foreman | LLRW Waste Tracker |
| | LL CSP West | WC | Container Foreman | Container Foreman | Container Foreman | LLRW Waste Tracker |
| LL Decon | HP-LL Post Decon Box Wash | WC | Health Physics | Decon Personnel | Health Physics | Health Physics |
| | HP-LL Post Decon New Rail | WC | Health Physics | Decon Personnel | Health Physics | Health Physics |
| | LL Decon – Box Wash | WC | Decon Personnel | Container Foreman | Decon Personnel | Health Physics |
| | LL Container Release | WC | Health Physics | Health Physics | Health Physics | Health Physics |
| | LL Decon – New Rail | WC | Decon Personnel | Rail Foreman | Decon Personnel | Decon Personnel |
| LL IUF | Aprons | WC | Container Foreman | Container Foreman | Container Foreman | LLRW Waste Tracker |
| | IM Bays | WC | Container Foreman | Container Foreman | Container Foreman | LLRW Waste Tracker |
| LL Sample Collection | LL Sample Collection | AL | Chem Lab Personnel | Rail Gate Guard | Chem Lab Personnel | LLRW Waste Tracker |
| | LL Sample Hold | AL | Chem Lab Personnel | Chem Lab Personnel | Chem Lab Personnel | LLRW Waste Tracker |
| | LL Sampled | AL | Chem Lab Personnel | Chem Lab Personnel | Container Foreman | LLRW Waste Tracker |
| Truck Intermodal Unloading | LL Intermodal Railcar | VT | Container Foreman | Container Foreman | Container Foreman | Container Foreman |
| | LL Intermodal Unloading (Rail) | AL | Container Foreman | Rail Gate Guard | Auto | LLRW Waste Tracker |
| | LL Intermodal Unloading (Truck) | AL | Container Foreman | Container Foreman | Auto | LLRW Waste Tracker |
| | Rail Intermodal Unloading | WC | Container Foreman | Auto | Container Handler | LLRW Waste Tracker |
| | Truck Dock | WC | Container Foreman | Container Foreman | Container Handler | LLRW Waste Tracker |
| | Truck Intermodal Unloading | WC | Container Foreman | Auto | Container Handler | LLRW Waste Tracker |
| LL Unloading Rail | Inside Full Gondola East Rail | AL | Rail Foreman | Rail Gate Guard | Auto | LLRW Waste Tracker |
| | Inside Full Gondola West Rail | AL | Rail Foreman | Rail Gate Guard | Auto | LLRW Waste Tracker |
| | Rail Digging Facility | WC | Container Foreman | Rail Gate Guard | Rail Foreman | LLRW Waste Tracker |
| | Rollover | WC | Rail Foreman | Auto | Rotary Operator | LLRW Waste Tracker |
| | Rotary Dump Facility | WC | Rail Foreman | Auto | Rotary Operator | LLRW Waste Tracker |
| | Rotary Wash Facility | WC | Rail Foreman | Rotary Operator | Health Physics | Health Physics |
| Shredder | Shredder In-Feed | WC | LLRW Waste Tracker | Container Foreman | LLRW Waste Tracker | LLRW Waste Tracker |

WC Work Center
AL Administrative Locatin
VT Vehicle Tracking

# Biennial Review of Licenses and Permits

**Revision 0**

| | | |
|---|---|---|
| Authored By: | Signature on File<br>Treesa Parker, Compliance/Regulatory Specialist | 7/8/09<br>Date |
| Reviewed By: | Signature on File<br>Tim Orton, Environmental Engineer | 7/8/09<br>Date |
| Approved By | Signature on File<br>Sean McCandless, Director of Compliance and Permitting | 7/9/09<br>Date |

- [X] New
- [ ] Title Change
- [ ] Revision
- [ ] Rewrite
- [ ] Cancellation

Effective Date 7/13/09

Electronic documents, once printed, are uncontrolled and may become outdated.
Refer to the Intraweb or the Document Control authority for the correct revision.

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# 1. PURPOSE AND SCOPE

## 1.1 Purpose

The purpose of this work instruction is to provide guidance for effectively managing, tracking, and documenting the biennial review of Clive facility permits and licenses.

## 1.2 Scope

This instruction applies to the completion of biennial reviews of licenses and permits issued to the Energy*Solutions*' Clive Facility.

# 2. REFERENCES

2.1 LLRW Radioactive Material License No. UT2300249, as amended.

2.2 11e.(2) Radioactive Material License UT2300478, as amended.

2.3 State-issued Part B Permit EPA Identification No. UTD982598898, as modified.

2.4 Ground Water Quality Discharge Permit No. UGW450005, as modified.

2.5 USDA Compliance Agreement No. 06-22-01, as amended.

2.6 Air Approval Order, DAQE-AN0717016-06, as amended.

2.7 HSWA Permit, UTD982598898, as amended.

2.8 Operating Permit, Administration Building Water System #23085, as amended.

2.9 TSCA Coordinated Approval dated August 12, 2004, as amended.

2.10 TSCA Shredder Approval dated January 29, 2008, as amended.

# 3. GENERAL

## 3.1 Definitions

3.1.1 For purposes of this procedure, **Biennial review** means the review of an item within two years unless exempted

3.1.2 **Exempted item** means any licensed or permitted document that has been modified, amended, or is under timely renewal within the last year. For documents with multiple sub-parts that have separate approval dates, such as the State-issued Part B Permit, exemption applies to each sub-part individually.

3.1.3 **Permit/License.** Provides the name of the specific permit, manual, or license involved. This includes each of the references listed above and the associated modules, attachments, and appendices.

3.2 **Responsibilities**

3.2.1 The **Director of Compliance and Permitting** or designee is responsible for ensuring all licenses and permits are reviewed a minimum of once every two years and for the documentation of such reviews. The Director of Compliance and Permitting or designee is also responsible to ensure the completion of all modifications required based on the reviews.

3.2.2 **Compliance Personnel** are responsible for the review of licenses and permits as assigned and the documentation of such reviews.

3.3 **Precautions and Limitations**

3.3.1 This instruction is considered an internal tool to track the performance of a biennial review of Clive facility licenses and permits. It is not required in any permit or license but is valuable to ensure consistency among facility permits and licenses.

3.4 **Records**

3.4.1 Completed Biennial Review Documentation Forms will be kept within the Compliance and Permitting Department for a period of three years.

## 4. REQUIREMENTS AND GUIDANCE

4.1 The Director of Compliance and Permitting or designee will initiate the biennial review as follows:

4.1.1 The Director of Compliance and Permitting or designee will review Attachment 5.1, *Biennial Review Table* and determine if review requirements have been met, assign necessary reviews, or amend the list for additions or subtractions.

4.1.1.1 Each module, attachment, or appendix will be listed as a separate item.

4.1.2 The Director of Compliance and Permitting or designee will delegate individual Compliance Personnel to perform a detailed review of each item within Attachment 5.1, *Biennial Review Table*.

4.1.3 Assigned Compliance Personnel will perform a detailed review of each item listed on Attachment 5.1, *Biennial Review Table*. The review shall include at a minimum the following:

4.1.3.1 A review of references listed to ensure correct version or cross reference;

4.1.3.2 A review to ensure consistency of organizational titles listed within the document with the currently approved version of Appendix I approved in License Condition 32.A of Radioactive Material License No. UT2300249; and

4.1.3.3 A review of contents to determine continuing applicability since the last approval date.

4.1.4 Findings of each review will be detailed on Attachment 5.2, *Biennial Review Documentation Form and provided to the Director of Compliance and Permitting.*

4.1.5 The Director of Compliance and Permitting will review the findings and issue assignments to applicable individuals to correct them, and track completion.

## 5. ATTACHMENTS AND FORMS

5.1 Biennial Review Table, example

5.2 Biennial Review Documentation Form, example

# Attachment 5.1
# Biennial Review Table
# (Example)

## Biennial Review Table

| License/Permit | Title | Revision Date | Reviewed On | Due | Owner | Notes |
|---|---|---|---|---|---|---|
| UT2300249 | LLRW Radioactive Material License | February 23, 2009 | | February 23, 2011 | Sean McCandless | |
| UT2300249 | Waste Characterization Plan | March 10, 2008 | | March 10, 2010 | Sean McCandless | |
| UT2300249 | Organization | February 9, 2009 | | February 9, 2011 | Sean McCandless | |
| UT2300249 | Site Radiological Security Plan | November 24, 2008 | | November 24, 2010 | Sean McCandless | |
| UT2300249 | Environmental Monitoring Plan | November 24, 2008 | | November 24, 2010 | Wayne Johns | |
| | | | | | | |
| UT2300478 | 11e.(2) Radioactive Materials License | February 23, 2009 | | February 23, 2011 | Sean McCandless | Under Timely Renewal |
| | | | | | | |
| UGW450005 | Groundwater Quality Discharge Permit (GWDP) | June 9, 2008 | | June 9, 2010 | Sean McCandless | Currently in process of modification |
| GWDP Appendix A | Exceedances of Ground Water Protection Levels | June 30, 1999 | | June 30, 2001 | Bob Sobocinski | |
| GWDP Appendix B | Water Monitoring Quality Assurance Plan | February 14, 2005 | | February 14, 2007 | Bob Sobocinski | |
| GWDP Appendix C | CQA for Collection Lysimeter Construction and Operation, Maintenance, and Closure Plans for Collection Lysimeters and Related Approvals | January 9, 2004 | | January 9, 2006 | Bob Sobocinski | |
| GWDP Appendix D | Construction QA/QC Plan for 11e.(2) Facility | February 26, 2004 | N/A | N/A | Sean McCandless | Will be deleted with next Permit Modification |
| GWDP Appendix E | Post-Closure Monitoring Plan for LARW and 11e.(2) Disposal Cells | January 18, 2000 | | January 18, 2002 | Sean McCandless | |
| GWDP Appendix F | Post-Closure Monitoring Plan | January 5, 2000 | | January 5, 2002 | Sean McCandless | |
| GWDP Appendix G | Weather Station Monitoring | October 30, 2008 | | October 30, 2010 | Mike LeBaron | |
| GWDP Appendix J | BAT Performance Monitoring Plan | April 7, 2009 | | April 7, 2011 | Treesa Parker | |
| GWDP Appendix K | BAT Contingency Plan | April 7, 2009 | | April 8, 2011 | Treesa Parker | |
| | | | | | | |
| State-issued Part B | | | | | | |
| Module I | Standard Conditions | January 28, 2009 | | January 28, 2011 | Sean McCandless | |
| Attachment I-1 | Regulations Incorporated by Reference | June 7, 2006 | | June 7, 2008 | Sean McCandless | |
| Module II | General Facility Conditions | April 9, 2007 | | April 9, 2009 | Sean McCandless | |
| Attachment II-1 | Waste Analysis Plan | June 7, 2006 | | June 7, 2008 | Sean McCandless | |

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Biennial Review Table

**Biennial Review Table**

| License/Permit | Title | Revision Date | Reviewed On | Due | Owner | Notes |
|---|---|---|---|---|---|---|
| Attachment II-1-1 | Incoming-Shipment Parameter Analysis Methods | June 7, 2006 | | June 7, 2008 | Sean McCandless | |
| Attachment II-1-2 | Waste Analysis Plan for Treatment Wastes | April 4, 2003 | | April 4, 2005 | Sean McCandless | |
| Attachment II-1-2-1 | Approved Treatment Reagents | May 31, 2006 | | May 31, 2008 | Sean McCandless | |
| Attachment II-1-3 | Waste Stabilization Plan | April 9, 2007 | | April 9, 2009 | Sean McCandless | |
| Attachment II-1-4 | Liquid Waste Management Plan | October 16, 2003 | | October 16, 2005 | Sean McCandless | |
| Attachment II-1-4-1 | Analytical Procedures for Formula Development Liquid Waste Solidification Method EC-2301 | May 31, 2006 | | May 31, 2008 | Sean McCandless | |
| Attachment II-1-5 | Macroencapsulation Plan | October 9, 2008 | | October 9, 2010 | Sean McCandless | |
| Attachment II-1-6 | Leachate, Evaporation, and Decontamination Waste Management Plan | April 4, 2003 | | April 4, 2005 | Sean McCandless | |
| Attachment II-1-7 | Spray Washing Plan | April 4, 2003 | | April 4, 2005 | Sean McCandless | |
| Attachment II-1-9 | Mixed Waste Operations Building Operating Plan | December 5, 2003 | | December 5, 2005 | Sean McCandless | |
| Attachment II-1-10 | Management of Wastes Containing Polychlorinated Biphenyls (PCBs) | January 28, 2009 | | January 28, 2009 | Sean McCandless | |
| Attachment II-1-10.1 | Plan for the Management of Waste Containing Polychlorinated Biphenyls (PCBs) at the LLRW Facility | January 28, 2009 | | January 28, 2009 | Sean McCandless | |
| Attachment II-1-11 | Mixed Waste Treatment Building Operating Plan | December 5, 2003 | | December 5, 2005 | Sean McCandless | |
| Attachment II-1-12 | Thermal Desorption Separation Plan | December 5, 2003 | | December 5, 2005 | Sean McCandless | |
| Attachment II-1-12-1 | Thermal Desorption Shakedown Operations and Waste Family Demonstration Testing | December 5, 2003 | | December 5, 2005 | Sean McCandless | |
| Attachment II-1-12-2 | Pre-Demonstration Plan for Volatile and Semi-Volatile Organic Compounds | December 5, 2003 | | December 5, 2005 | Sean McCandless | |
| Attachment II-1-12-3 | CMBST-Coded Waste Pre-Demonstration Plan | April 23, 2008 | | April 23, 2010 | Sean McCandless | |
| Attachment II-1-12-4 | Volatile Metals Pre-Demonstration Plan | August 19, 2008 | | August 19, 2010 | Sean McCandless | |

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Biennial Review Table

**Biennial Review Table**

| License/Permit | Title | Revision Date | Reviewed On | Due | Owner | Notes |
|---|---|---|---|---|---|---|
| Attachment II-1-13 | Mixed Waste Storage Building Operating Plan | December 5, 2003 | | December 5, 2005 | Sean McCandless | |
| Attachment II-1-14 | Plan for Management of Waste codes F020-F023 and F026-F027 | September 23, 2005 | | September 23, 2007 | Sean McCandless | |
| Attachment II-2 | Site Security Plan | September 14, 2007 | | September 14, 2009 | Sean McCandless | |
| Attachment II-3 | Site Inspection Plan | November 26, 2004 | | November 26, 2004 | Sean McCandless | |
| Attachment II-4 | Personnel Training Plan | March 1, 2004 | | March 1, 2004 | Sean McCandless | |
| Attachment II-5 | Preparedness and Prevention Plan | April 4, 2003 | | April 4, 2005 | Sean McCandless | |
| Attachment II-6 | Contingency Plan | June 9, 2008 | | June 9, 2010 | Sean McCandless | |
| Attachment II-6 | Emergency Coordinator List | June 9, 2008 | | June 9, 2010 | Sean McCandless | |
| Attachment II-7 | Closure Plan | January 22, 2009 | | December 31, 2009 | Treesa Parker | Annual Requirement |
| Attachment II-7-1 | Closure Cost Estimate Calculations | January 22, 2009 | | December 31, 2009 | Treesa Parker | Annual Requirement |
| Attachment II_7-1.1 | Closure Cost Estimate Cost Sheets | January 22, 2009 | | December 31, 2009 | Treesa Parker | Annual Requirement |
| Attachment II-7-2 | Irrevocable Letter of Credit | April 9, 2007 | | April 9, 2009 | Treesa Parker | |
| Attachment II-7-2.1 | Closure and Post-Closure Trust Agreement | April 9, 2007 | | April 9, 2009 | Treesa Parker | |
| Attachment II-8 | Post Closure Plan | April 4, 2003 | | April 4, 2005 | Sean McCandless | |
| Attachment II-9 | Construction QA/QC Manual | April 17, 2006 | | | Sean McCandless | |
| Attachment II-10 | Plan for Controlling Wind Dispersal | April 4, 2003 | | April 4, 2005 | Sean McCandless | |
| Attachment II-11 | Facility Drawings | February 25, 2009 | | March 1, 2010 | Sean McCandless | Annual Requirement |
| Module III | Storage In Containers | October 19, 2006 | | October 19, 2008 | Sean McCandless | |
| Attachment III-1 | Container Management Plan | October 16 2003 | | October 19, 2008 | Sean McCandless | |
| Attachment III-2 | Waste Identification and Tracking Plan | April 4, 2003 | | April 4, 2005 | Sean McCandless | |
| Module IV | Storage and Treatment in Tanks | December 5, 2003 | | December 5, 2005 | Sean McCandless | |
| Attachment IV-1 | Tank Management Plan | December 5, 2003 | | December 5, 2005 | Sean McCandless | |
| Attachment IV-2 | Mixer Effectiveness Plan | June 14, 2005 | | June 14, 2007 | Sean McCandless | |
| Attachment IV-3 | Fire Protection Plan | December 5, 2003 | | December 5, 2005 | Sean McCandless | |
| Module V | Disposal in Landfills | July 2, 2007 | | July 2, 2009 | Sean McCandless | |
| Attachment V-1 | Plan for the Design and Maintenance of Run-On/Run-Off Control Berms | April 4, 2003 | | April 4, 2005 | Sean McCandless | |
| Module VI | Groundwater Monitoring | August 13, 2008 | | August 13, 2010 | | |
| Attachment VI-1 | Groundwater Field Sampling Plan | September 23, 2005 | | September 23, 2007 | | |

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Biennial Review Table

**Biennial Review Table**

| License/Permit | Title | Revision Date | Reviewed On | Due | Owner | Notes |
|---|---|---|---|---|---|---|
| Attachment VI-2 | Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities | September 23, 2005 | | September 23, 2007 | | |
| Attachment VI-3 | Permanent Closure of Monitoring Wells | August 13, 2008 | | August 13, 2010 | | |
| Module VII | Corrective Action Program | April 4, 2003 | | April 4, 2005 | | |
| | | | | | | |
| USDA Compliance Agreement No. 06-22-01, as amended. | Soil Permit | February 13, 2006 | | February 13, 2008 | Tim Orton | In process of Amendment |
| | | | | | | |
| DAQE-AN0717016-06 | Air Approval Order | September 8, 2006 | | September 8, 2008 | Tim Orton | |
| | | | | | | |
| 8P-HW | HSWA Permit | June 8, 2000 | | June 8, 2002 | Sean McCandless | |
| | | | | | | |
| TSCA 08/12/2004 | TSCA Coordinated Approval dated August 12, 2004, as amended | August 12, 2004 | | August 12, 2006 | Tim Orton | |
| | | | | | | |
| TSCA 01/29/2008 | TSCA Shredder Approval dated January 29, 2008, as amended | January 29, 2008 | | January 29, 2010 | Tim Orton | |
| | | | | | | |
| 23085 | Operating Permit, Administration Building Water System #23085, as amended. | January 10, 2007 | | January 10, 2009 | Jeff Low | |
| CUP 2700-87 | Tooele County Conditional Use Permit | August 1, 2006 | | August 1, 2008 | Sean McCandless | |

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Biennial Review Table

## Attachment 5.2
## Biennial Review Documentation Form (Example)

**Biennial Review Documentation Form**

Date: _____

**List of Items Reviewed:**

| Item | Findings Yes/No (If yes, provide details in comment section below) | Reviewer Signature/Date |
|---|---|---|
| 1. | | |
| 2. | | |
| 3. | | |
| 4. | | |
| 5. | | |
| 6. | | |
| 7. | | |
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| 9. | | |
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| 14. | | |
| 15. | | |
| 16. | | |
| 17. | | |
| 18. | | |
| 19. | | |
| 20. | | |

Finding/Comments (if more room is necessary attach separate sheet and document below): _____

_____ _____
Director of Compliance or Permitting/Designee Date

# Reports Due Compliance Tracking

**Revision 1**

| | | |
|---|---|---|
| Authored By: | Signature on File<br>Treesa Parker, Compliance/Regulatory Specialist | 5/25/11<br>Date |
| Reviewed By: | Signature on File<br>Tim Orton, Environmental Engineer | 5/25/11<br>Date |
| Approved By | Signature on File<br>Sean McCandless, Director of Compliance and Permitting | 5/26/11<br>Date |

- [ ] New
- [ ] Title Change
- [x] Revision
- [ ] Rewrite
- [ ] Cancellation

Effective Date 6/3/11

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2.3 State-issued Part B Permit EPA Identification No. UTD982598898, as modified .3
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## 1. PURPOSE AND SCOPE

### 1.1 Purpose

To provide guidelines to effectively manage, track, and submit progress on the reports, inspections, and requirements of Energy*Solutions* Clive facility regulatory Permits and Licenses.

### 1.2 Scope

The "Reports Due" database (calendar) provides a reminder as well as a deadline safety net for reports required by Energy*Solutions* Clive facility permits and licenses. Additionally, it provides accountability for personnel who are responsible for a report or inspection.

## 2. REFERENCES

2.1 LLRW Radioactive Material License No. UT2300249, as amended

2.2 11e.(2) Radioactive Material License UT2300478, as amended

2.3 State-issued Part B Permit EPA Identification No. UTD982598898, as modified

2.4 Ground Water Quality Discharge Permit No. UGW450005, as modified

## 3. GENERAL

### 3.1 Definitions

None

### 3.2 Responsibilities

3.2.1 The Director of Compliance and Permitting or designee is responsible for ensuring all reports required by the permits and licenses are in the database with correct dates; assigning Compliance and Permitting Staff as lead for each report; and for reviewing the database periodically for omissions or outdated material.

3.2.2 Compliance and Permitting Staff are responsible for reviewing the database on a monthly basis; as well as providing notification to the Director of Compliance and Permitting when their assigned item has been completed or if the specified deadline cannot be met.

### 3.3 Precautions and Limitations

3.3.1 This instruction is considered an internal tool to track progress of each item listed within the database. It is not required in any permit or license, but is valuable when used to deliver reports, etc. to the applicable regulatory agency in accordance with compliance deadlines.

3.3.2 The Reports Due database is primarily intended to assist in tracking recurring regulatory reports. One-time reporting or compliance deadlines

may also be tracked in the database, at the discretion of the Director of Compliance and Permitting.

3.4 **Records**

None

## 4. REQUIREMENTS AND GUIDANCE

4.1 Each entry into the database will include the following information, as applicable (see Attachment 5.1):

4.1.1 **Permit/License.** Provides the name of the specific permit, manual, or license involved. This includes each of the References above; and may include other permits, regulatory requirements, or compliance commitments made via correspondence.

4.1.2 **Permit/License Condition.** Provides the section in the permit/license where a specific report and requirements are found.

4.1.3 **Item Description.** Provides the name of the report or document as given in the permit/license as well as a brief description as necessary.

4.1.4 **Due Date.** Provides the absolute final date the report is due to the regulatory agency or other internal department.

4.1.5 **Responsible Staff.** Identifies the individual within the Compliance and Permitting department responsible for ensuring the report is submitted on or before the due date.

4.2 The Director of Compliance and Permitting or designee will enter each item into the database as an internal aid for tracking.

4.3 The Director of Compliance and Permitting or designee will enter any new item initiated by an amended permit, license, or through commitment made to a regulatory agency.

4.4 The Director of Compliance and Permitting will assign Responsible Staff for each report, with staff input and concurrence.

4.5 At least annually, the Director of Compliance and Permitting will review and update the entire database.

4.6 Compliance and Permitting Staff will review the database on a monthly basis to ensure that upcoming reports assigned to them are on track for timely submittal; and to update the database for reports that have been submitted.

4.7 The Compliance/Regulatory Specialist or designee will send reminders to responsible individuals or department managers for status updates regarding the completion of items.

4.8 The Compliance/Regulatory Specialist or designee will notify the Director of Compliance and Permitting if a quarterly, semi-annual, or annual report has not been completed within one week prior to its due date.

4.9 Whenever possible, objective evidence that a report has been completed shall be used as the basis for updating the database; as opposed to informal communication (i.e., email claiming an item is complete). Objective evidence consists of reviewing the actual report.

## 5. ATTACHMENTS AND FORMS

5.1 Reports Due Database, example

## Attachment 5.1
## Reports Due Database (Example)

| Subject | Due Date | Categories |
|---|---|---|
| Follow up letter due for 1997 pond BAT Failure 051911 | Wed 5/25/2011 | Treesa Parker |
| Quarterly Open Cell Area Report -- RML Condition 11 / LLRW and Class A S... | Thu 5/26/2011 | Sean McCandless |
| Annual Surety Review -- 11e.(2) 9.12 | Tue 5/31/2011 | Vern Rogers |
| Quarterly status report P3-95SWC remediation | Wed 6/1/2011 | Bob Sobocinski |
| DU Performance Assessment | Wed 6/1/2011 | Sean McCandless |
| Quarterly Drinking Water System Coliform Sampling | Wed 6/15/2011 | Jeff Low |
| Monthly PCB Manifests/Acceptance Documents -- GWQDP App. I / RCRA II.... | Mon 6/20/2011 | Karen Kirkwood |
| Annual Intermodal Unloading Facility Inspection -- GWQDP App. J | Thu 6/30/2011 | Treesa Parker |
| Quarterly Environmental Monitoring Results -- RML 29.A | Thu 6/30/2011 | Wayne Johns |
| Annual Shredder Facility Inspection -- GWQDP I.F.20 | Thu 6/30/2011 | Treesa Parker |
| Annual Raptor Nest Monitoring Update -- Tooele County CUP | Thu 6/30/2011 | Mike LeBaron |
| Annual PCB Report -- RCRA Att. II-1-10 11.b | Fri 7/15/2011 | Tim Orton |
| Quarterly Radiological Survey of Rail From North Gate to Main Line -- RML ... | Mon 7/18/2011 | Karen Kirkwood |
| Quarterly Leachate Collection/Removal Volumes to DSHW and EPA -- RCRA ... | Wed 7/20/2011 | Treesa Parker |
| TSCA approval (mega-shredder) revision submitted to EPA | Fri 7/29/2011 | Tim Orton |
| Quarterly Disposal Report to DRC -- RML 29.B | Sat 7/30/2011 | Wayne Johns |
| Annual GW Report (Jan - Jun) -- RCRA VI.G.2 | Mon 8/1/2011 | Jeff Low |
| Quarterly MW groundwater sample results | Mon 8/1/2011 | Jeff Low |
| Semi-Annual PCB Groundwater and Leachate Data to EPA | Mon 8/8/2011 | Jeff Low |
| Semi-Annual BAT Report -- GWQDP I.H.20 | Thu 9/1/2011 | Treesa Parker |
| Annual Pressure Testing of East Side Drainage System - GWQDP Apd J, Sect... | Fri 9/30/2011 | Treesa Parker |
| Annual insurance documentation -- RCRA II.Q.2 | Sat 10/1/2011 | Treesa Parker |
| Annual Back Flow Inspection for New Ops Building | Wed 10/12/2011 | Jeff Low |
| Annual Drinking Water System Lead & Copper | Tue 10/18/2011 | Jeff Low |
| Right of Way Renewal for Production Wells -- BLM Right of Way | Tue 11/1/2011 | Sean McCandless |
| Gravel resource evaluation -- RML 73.G | Thu 12/1/2011 | Vern Rogers |
| Annual As-built Reports for LLRW and 11e.(2) -- GWQDP I.H.6 / 11e.(2) 9.16 | Thu 12/1/2011 | Vern Rogers |
| Annual Site Drawing Update -- RCRA II.11 | Thu 12/1/2011 | Treesa Parker |
| Annual Surety Review -- RML 73 | Thu 12/1/2011 | Treesa Parker |
| Annual As-built Report for MW Facility -- GWQDP V.F.10 / RCRA V.F.13 | Thu 12/1/2011 | Vern Rogers |
| Annual As-built Reports for LLRW and 11e.(2) -- GWQDP I.H.6 / 11e.(2) 9.16 | Thu 12/1/2011 | Vern Rogers |
| Annual Closure Cost Estimate -- RCRA II.O.2 | Sat 12/31/2011 | Vern Rogers |
| Annual Closure Cost Estimate TSCA Coordinated Approval January 29, 2008 ... | Sat 2/25/2012 | Vern Rogers |
| Annual Landfill Solid Waste Report | Tue 2/28/2012 | Tim Orton |
| Annual Tank Inspections (independent P.E.) -- RCRA II.F.4 | Wed 2/29/2012 | Karen Kirkwood |
| Annual Tier II Report -- EPCRA | Wed 2/29/2012 | Mike LeBaron |
| Biennial Hazardous Waste Report -- RCRA I.f.23 | Wed 2/29/2012 | Tim Orton |
| Annual Update GW Sampling Schedule for the year -- GWQDP CLI002 6.1 | Thu 3/1/2012 | Mike LeBaron |
| Annual Groundwater Monitoring Report -- GWQDP I.H.1 | Thu 3/1/2012 | Jeff Low |
| Annual Groundwater Usage Report -- GWDP I.H.13 | Thu 3/1/2012 | Jeff Low |
| Annual Meteorological Report - GWQDP I.H.10 | Thu 3/1/2012 | Mike LeBaron |
| Annual Report of Treatability Studies -- 40 CFR 261.4(f)(9) | Wed 3/14/2012 | Tim Orton |
| Annual Waste Minimization Plan -- RCRA II.M.4 | Fri 3/30/2012 | Tim Orton |
| Annual Waste Analysis and Acceptance Summary -- RCRA II.D.14 | Fri 3/30/2012 | Tim Orton |
| Annual Independent Audit of CQA/QC Program -- RCRA V.C.23 | Fri 3/30/2012 | Vern Rogers |
| Annual report of semi-annual PCB Soil Monitoring -- RCRA Att. II-1-10 11.d | Fri 3/30/2012 | Tim Orton |
| Annual Report of Cumulative Void space Disposed in the CWF for Previous Y... | Fri 3/30/2012 | Sean McCandless |
| Annual Independent audit of CQA/QC -- LLRW | Sat 3/31/2012 | Vern Rogers |
| Annual financial report -- RML 75 | Sat 3/31/2012 | Treesa Parker |
| Annual 11e.(2) Report -- 11e.(2) 12.6 | Sun 4/29/2012 | Wayne Johns |
| Annual Dose Report (Form 5) -- 10 CFR 20.2206 subpart C | Sun 4/29/2012 | Karen Kirkwood |

Sean McCandless 1 5/24/2011 3:47 PM

# Shipment Report

**Revision 1**

| | | |
|---|---|---|
| Authored By: | Signature on File<br>Treesa Parker, Compliance/Regulatory Specialist | 4/4/11<br>Date |
| Reviewed By: | Signature on File<br>Tim Orton, Environmental Engineer | 4/4/11<br>Date |
| Approved By | Signature on File<br>Sean McCandless, Director of Compliance and Permitting | 4/4/11<br>Date |

- [ ] New
- [ ] Title Change
- [x] Revision
- [ ] Rewrite
- [ ] Cancellation

Effective Date 4/11/11

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1. PURPOSE AND SCOPE

1.1 **Purpose**

To establish a comprehensive administrative method for the preparation of the Shipment Report required by the State-issued Part B Permit.

1.2 **Scope**

This instruction applies to the shipment report that is required by Conditions II.L.3 and II.M.2 of the State-issued Part B Permit. This report applies to all mixed waste shipments and all shipments containing Polychlorinated Biphenyls (PCBs) received at the Clive facility; and all hazardous waste shipments originating at the Clive facility shipped with the Clive facility listed as the generator on the Uniform Hazardous Waste Manifest.

2. **REFERENCES**

2.1 State-issued Part B Permit EPA Identification No. UTD982598898, as modified

2.2 CL-MD-PR-001, *Unloading and Handling Highway Shipments*

2.3 Code of Regulations (CFR) Title 40, *Protection of Environment*

3. **GENERAL**

3.1 **Definitions**

3.1.1 *Radioactive Waste Manifest (Form 540/541)* – Uniform Low-Level Radioactive Waste Manifest required with each shipment of waste material arriving at the South Clive Facility.

3.1.2 *Uniform Hazardous Waste Manifest* – Uniform Hazardous Waste Manifest EPA form 8700-22, and if necessary, EPA form 8700-22A, originated and signed by the generator in accordance with the instructions included in the appendix to 40 CFR 262.

3.1.3 *Incoming - Shipment Acceptance Procedure and Checklist (Form EC-0525)* – Form used as a checklist for the acceptance or rejection of an incoming waste shipment. This form is completed at the Mixed Waste facility for “M”, “PM”, and “PR” shipments. Procedures for completing the form are described in CL-MD-PR-001.

3.1.4 *Land Disposal Notification and Certification Form* – Form included with hazardous waste shipments identifying how the waste must be managed. The form lists waste treatment requirements or certifies, in accordance with 40 CFR 268.7, that the waste meets Land Disposal Restriction

treatment standards listed in 40 CFR 268.40 and 40 CFR 268.48. The Land Disposal Notification and Certification Form accompanies manifests with a Bates No. beginning with an "M" or "PM".

3.1.5 *PCB Waste Certification Form (Form EC-98729)* – Form completed by the generator certifying the PCB waste classification as listed in 40 CFR 761.

3.1.6 *Notice to Transport (NTT)* – Form completed for waste stream providing Energy*Solutions'* approval to transport waste to the Clive facility.

3.1.7 *Fingerprint Analysis* – Analytical methods used by the on-site Chemistry Laboratory for screening incoming shipment waste samples for general chemistry parameters to assist with characterizing waste samples for waste handling purposes.

3.1.8 *Shipment Report* – Report due to the Executive Secretary of the Solid and Hazardous Waste Control Board by the 20th day of each month, in accordance with Permit conditions II.L.3 and II.M.2.

3.1.9 *Generator Number* – A unique number identifying the waste that generally consists of a four-digit generator contract number followed by a dash ("-") and a specific waste stream number. (sometimes this number is three and four digits long). The generator contract number may occasionally include letters as well as numbers; i.e., 0421F.

## 3.2 Responsibilities

3.2.1 The **Shipping and Receiving Manager** or designee will provide the manifests and required forms to Document Control for transfer to the Electronic Document Control System (OnBase).

3.2.2 The **Document Control Administrator** or designee is responsible for transfer of the required documents into the Electronic Document Control System (OnBase).

3.2.3 The **Director of Mixed Waste Operations** or designee is responsible for the completion of all required incoming shipment acceptance forms and transfer of completed forms to Document Control.

3.2.4 The **Director of Compliance and Permitting** or designee is responsible for document retrieval, review, compilation and subsequent submittal of the Shipment Report to the Executive Secretary of the Utah Solid and Hazardous Waste Control Board.

## 3.3 Precautions and Limitations

None

3.4 **Records**

3.4.1 Copies of the electronic files submitted as part of the Shipment Report will be kept within the Compliance and Permitting Department.

3.4.2 Any corrections to original documents in support of the Shipment Report will be made and scanned into OnBase prior to submittal of the report.

## 4. REQUIREMENTS AND GUIDANCE

4.1 The Shipment Report will be submitted to the Executive Secretary of the Utah Solid and Hazardous Waste Control Board on or before the 20th of the month.

4.1.1 The Shipment Report will include the following for each shipment, as applicable:

4.1.1.1 Radioactive Waste Manifest (Form 540/541) and supplementary materials;

4.1.1.2 Uniform Hazardous Waste Manifest;

4.1.1.3 Incoming - Shipment Acceptance Procedure and Checklist (Forms EC-0525 and EC-0525A);

4.1.1.4 Land Disposal Notification and Certification Form;

4.1.1.5 Special Nuclear Material Exemption Certification Form (EC-0230-SNM);

4.1.1.6 PCB Waste Generator Certification Form;

4.1.1.7 Fingerprint Analysis Results; and

4.1.1.8 Notice to Transport.

4.1.2 The Shipment Report will include all shipments originating from the Clive facility that require a Uniform Hazardous Waste Manifest and that have the Clive facility listed as the generator.

4.1.2.1 Only the Uniform Hazardous Waste Manifest(s) associated with the shipments described in 4.1.2 is required to be included in the Shipment Report.

4.1.2.2 If no hazardous waste shipments met the criteria of 4.1.2 during the previous month, the Shipment Report will include a statement to this effect.

4.2 The Director of Compliance and Permitting or designee will retrieve the information for the Shipment Report from the Electronic Document Control Database (OnBase) System.

4.3 The Shipment Report documents will be saved as image files within the common directory for transfer to electronic media for submittal. The items will be saved as follows:

4.3.1 The Form 540/541 documents will be saved per Bates No.

4.3.2 Shipment Acceptance Forms (EC-0525) will be saved per Bates No.

4.3.3 The Fingerprint Analysis Results will be combined, scanned and saved as one image file containing information for all M shipments in the report.

4.3.4 The PCB Waste Certification Forms will be combined, scanned and saved as one image file for all included PM and PR waste streams.

4.3.5 The Notice to Transports will be combined, scanned and saved as one image file for all included waste streams.

4.3.6 The Uniform Hazardous Waste Manifests for shipments originating from the Clive Facility will be combined, scanned and saved as one image file, as assigned by the Shipping and Receiving Department.

4.4 A Table of Contents with hyperlinks to the Manifest Forms and the Shipment Acceptance Forms, Fingerprint Analysis Results, PCB Waste Certification Form, Notice to Transport, and Uniform Hazardous Waste Manifests, if applicable, of each manifest will be prepared.

4.4.1 Bates Nos. will be entered into separate columns designated by the waste type “M”, “PM”, “PR” and/or “XM” as applicable.

4.4.2 A monthly list of generator numbers will be kept for retrieval of fingerprint analysis, PCB Certification, and Notice to Transport results. One column will be made for “M” Bates No.’s and additional columns for the “PM”, “PR”, and “XM” bates numbers, the generator numbers will be written under the appropriate column.

4.4.3 A PDF file of the NTT’s will be created as follows:

4.4.3.1 NTT’s may be found in OnBase by selecting the “Generator Packets” Document Type Group and the “EC-1800, Notice to

Transport" Document Type and entering the generator number (Generator-WS #).

4.4.3.2 Print out all NTT's for the generator numbers from that month.

4.4.3.3 Scan the printouts into a single PDF file and save.

4.4.4 A PDF file of the PCB Waste Certification Forms for all "PM" and "PR" Bates No.'s will be created as follows:

4.4.4.1 PCB Waste Certification Forms may be accessed in OnBase by selecting the "Generator Packets" Document Type Group and the "WPR Attachments "or" EC-98279, PCB Waste Certification" Document Type and entering the generator number for each "PM" and "PR" Bates No.

4.4.4.2 Search the "WPR Attachments" Document Type list to find the PCB Waste Certification Form page(s).

4.4.4.2.1 It may be necessary to right click on the document and search "revisions / renditions" to find the PCB Waste Certification Form.

4.4.4.2.2 If the PCB Waste Certification Form cannot be located, check with Technical Services.

4.4.4.3 Print only the PCB Waste Certification Form page(s).

4.4.4.4 Scan the printouts of the PCB Waste Certification Forms into a single PDF file and save.

4.4.5 A PDF file of the Fingerprint Analysis Form will be created as follows:

4.4.5.1 Open the BI Publisher program.

4.4.5.2 Navigate through the WasteX folder to the Mixed Waste folder and then to the "Pre-Shipment MW Profile Evaluation" report.

4.4.5.3 Fill in the start date and the end date for the fingerprint data desired. (It may be beneficial to enter "today's date" as the end date to capture fingerprint data entered after month end. If end date is changed, delete generators that are not applicable).

4.4.5.4 Click on the "View" button.

4.4.5.5 A PDF file of all Fingerprint Analysis Forms between the dates chosen will be created. Save this file. (See 4.4.5.3 above)

4.4.6 The NTT's, PCB Waste Certification Forms, Fingerprint Analysis Forms, and the HWM Forms will be hyperlinked to the Table of Contents.

4.4.7 If previous unresolved problems have been resolved, their Bates No.'s will be noted on the Table of Contents and hyperlinked. To complete this, save the previous problems to the current month to enable them to appear when hyperlinked.

4.5 The documents will be reviewed and corrected to meet the following, as required (Refer to "Checklist for Review of Manifests", Attachment 5.1):

4.5.1 Form EC-0525 information is complete and correct;

4.5.2 All pages are accounted for as noted on the Shipment Manifest Form 540, Block 7;

4.5.3 Addresses and contact information on Form 540 (block 5), the Uniform Hazardous Waste Manifest (block 5), and Form EC-0525 match;

**Note Form 540 (block 5) is the contact information for the shipper and the Uniform Hazardous Waste Manifest (block 5) is the contact information for the generator. If the shipper is not the same as the generator, these will not match. In this case, other information on the forms should be examined to ensure that all three documents are related to the same shipment.**

4.5.4 Number of containers is consistent on all forms (Forms 540 block 3, 542 block 1, and EC-0525 "Container Count"):

4.5.5 Weights listed for PCB Wastes (PM and PR shipments) are provided in kilograms on the Uniform Hazardous Waste Manifest (Block 12);

4.5.6 Weight measured upon arrival, as documented on Form EC-0525 "Total Measured Weight," is within 10% of the weight listed on the Uniform Hazardous Waste Manifest, and the inspector check in item #10 of Form EC-0525 is marked correctly;

4.5.7 SNM Exemption Form is included;

**Note: Must be included for shipments containing U-233, U-235, Pu-236, Pu-238, Pu-239, Pu-240, Pu-241, Pu-242, Pu-243, and Pu-244, (Check 541: Manifest Totals) unless otherwise designated by the Shipping and Receiving Manager.**

4.5.8 Land Disposal Restriction Form is included, unless otherwise designated by the Environmental Engineer;

4.5.9 PCB Waste Certification Form is included;

4.5.10 Notice to Transport is included; and

4.5.11 Fingerprint results are complete and included.

4.6 Upon completion of the material review, the Director of Compliance and Permitting or designee will prepare files and transfer them to electronic media.

4.7 The Director of Compliance and Permitting or designee will prepare a letter for report submittal in accordance with the State-issued Part B Permit.

4.7.1 A suggested Letter Template is provided in Attachment 5.2.

## 5. ATTACHMENTS AND FORMS

5.1 Checklist for Review of Manifests

**Note The use of this checklist is optional as long as all permit requirements for the report are met.**

5.2 Letter Template

**ATTACHMENT 5.1**
**CHECKLIST FOR REVIEW OF MANIFESTS**

**FORM EC-0525** (Incoming Shipment Acceptance Procedure and Checklist)

1. Match the "Bates" No. to the Bates No. written on Form 540.

2. Compare the "Arrived Date" to the signature date on Form 540 block 9. These two dates must be within 10 days of each other.

3. Compare the "Shipment No." to the Manifest Number on Form 540 block 8 or Block 5.

4. Compare the "Container Count" to Form 540 block 3 and Form 541 block 1.

5. Check to see that either "Accepted" or "Rejected" is circled.

6. Item #7 needs to be circled "Treated" or "Disposed".

7. Check that the "Manifest Weight" is listed in the upper right area.

8. Check that the "Difference" and "Percentage Difference" are written in the upper right area. If the "Percentage Difference" is less than 10%, then "Y" should be circled in item #10.

   **Note: For "M" Bates No.'s, if item #10 shows "N/A" and "containerized" is written at the end of the line, then a percentage weight is not needed. See note 29 below for "PM" Bates No.'s.**

9. Check to see that all numbered items are completed by circling either "Y" or "N" or "NA".

10. If any of the numbered items have the "N" circled, there needs to be an explanation noted at the bottom of the form.

11. Compare the "Generator Name" to the Shipper Name on Form 540 block 5. These may be different, but are okay if other information matches between the forms.

12. Compare the "Manifest No." to the EPA Manifest Number on Form 540 block 4.

    **Note: The numbers do not need to match exactly, but enough similarity needs to exist to ensure the same documents are being referenced.**

    **Note "YES" or "NO" should be checked on Form 540 block 4. If "YES" is checked, then the EPA Manifest Number should match that on Form EC-**

**0525. If it is checked "NO", then the Hazardous Waste Manifest is not needed and will not be included in the shipping papers.**

13. Check that Form EC-0525 has been signed by the inspector and the Site Manager, if necessary. The Site Manager must sign if items #16 or #17 are circled "N". The signed date on Form EC-0525 should be within 10 days of the signature date on Form 540 block 9.

**FORM 540** (Uniform Low-Level Radioactive Waste Manifest)

14. Check that contact information is provided in blocks 5 and 6.

15. Count pages and check that they are equivalent to that listed in block 7.

16. Compare the address in block 5 to the address in block 5 of the Uniform Hazardous Waste Manifest – If these addresses do not match, refer to item 27 below.

17. Check for signatures and dates in blocks 9 **AND** 10.

18. Check to see that the date of receipt in block 9 is within 10 days of the arrival date noted in block 20 of the Uniform Hazardous Waste Manifest.

**UNIFORM HAZARDOUS WASTE MANIFEST**

19. Compare "Manifest Tracking Number" (block 4) to Form 540 block 4.

20. Compare the "Generator Name" in block 5 to Form 540 block 5 – If these names do not match, refer to item 27 below.

21. Compare the "Transport Company" in block 6 to Form 540 block 6.

22. Check block 12, weight needs to be in "K" for "PM" and "PR" shipments.

23. Check block 13, at least one waste code should be listed on "M" and "PM" shipments.

24. Check for signature and date in block 20.

**UNIFORM LOW-LEVEL RADIOACTIVE WASTE MANIFEST ISOTOPES REPORT**

25. If the report contains U-233, U-235, Pu-236, Pu-238, Pu-239, Pu-240, Pu-241, Pu-242, Pu-243, or Pu-244, (Check 541: Manifest Totals) the SNM forms needs to be included with the shipping papers, unless otherwise designated by the Shipping and Receiving Manager.

## LAND DISPOSAL NOTIFICATION AND CERTIFICATION FORM

26. Check that a Land Disposal Notification and Certification form is present for all "M", "PM", and "XM" shipments, unless otherwise designated by the Environmental Engineer.

**Note: If any of the above information needed is missing or requires correction, notify the Shipping and Receiving Manager or the Director of Mixed Waste Operations. If a problem is not resolved by the time the report needs to go out, make a note on the cover letter and highlight the Bates No. in green on the Table of Contents.**

## MISCELLANEOUS NOTES

27. Form 540 (block 5) is the contact information for the shipper and the Uniform Hazardous Waste Manifest (block 5) is the contact information for the generator. If the shipper is not the same as the generator, these will not match. In this case, other information on the forms should be examined to ensure that all three documents are related to the same shipment.

28. Shipments with "PR" Bates No.'s are Low-Level Radioactive Wastes that are also regulated for PCBs. These shipments do not require a Form EC-0525, a Uniform Hazardous Waste Manifest, or a Land Disposal Notification and Certification form. Block #4 on Form 540 will designate whether a Uniform Hazardous Waste Manifest is included with the shipping paperwork

29. Shipments with "PM" Bates No.'s are regulated for both PCBs and hazardous waste (Mixed Waste). Shipments with "PM" Bates No.'s must have a Land Disposal Notification and Certification form. The weight "Percentage Difference" of these shipments must be within 10% whether they are bulk or containerized shipments (the note in item 8 above is not applicable). The weight of these shipments must be expressed in kilograms (to convert kilograms to pounds, multiply kilograms by 2.2).

30. The percentage difference is calculated by subtracting the weight difference between the measured weight and the manifested weight, dividing this number by the measured weight and multiplying by 100.

31. The 10% weight difference is only applicable for those shipments that have a Uniform Hazardous Waste Manifest.

32. Generators may line out block 20 on Form 540; however, the Certification in Block 10 must be signed.

33. The generator is required to provide a letter of update to the profile for an annual renewal of the NTT. PCB Shipments do not require a new PCB Waste Certification Form unless the PCB type is changed.

**ATTACHMENT 5.2**
**LETTER TEMPLATE**

Prepare the monthly letter for signature as follows, with {xxxxxxxxxxxxxxxxxxxx}replaced by text discussing whether hazardous shipments were sent from the Clive facility or not:

(TRANSMITTAL #) CD11-XXXX

DATE

Scott T. Anderson
Executive Secretary
Utah Solid and Hazardous Waste Control Board
P.O. Box 144880
Salt Lake City, Utah 84114-4880

Subject: EPA ID No. 982598898 – _____(Month)_____ Manifests and Other Documentation as Required by State-issued Part B Permit.

Dear Mr. Anderson:

Energy*Solutions*, LLC, hereby submits manifests and associated documents for Mixed Waste received at the South Clive facility during ____(Month)_____ as required by State-issued Part B Permit, Module II.L.3, and Module II.M.2. {xxxxxxxxxxxxxxxxxxxx} A CD is enclosed with electronic manifest files and a Table of Contents with hot links to each file.

Manifests with issues yet to be resolved are as follows:
(Delete this if there are no problems)

Manifest issues resolved:
(Delete this if there are no problems)

Should there be any questions regarding this letter, please contact me at (801) 649-2000.

Sincerely,

{name}Director of Compliance and Permitting

Enclosures

cc: Rusty Lundberg, DRC (w/o enclosures)

# Surety Review Instruction

**Revision 0**

| | | |
|---|---|---|
| Authored By: | Signature on File<br>Treesa Parker, Compliance/Regulatory Specialist | 4/13/09<br>Date |
| Reviewed By: | Signature on File<br>David F. Booth, Director of Engineering | 4/14/09<br>Date |
| Approved By | Signature on File<br>Sean McCandless, Director of Compliance and Permitting | 4/13/09<br>Date |

- [X] New
- [ ] Title Change
- [ ] Revision
- [ ] Rewrite
- [ ] Cancellation

Effective Date 4/16/09

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# 1. PURPOSE AND SCOPE

## 1.1 Purpose

To establish a comprehensive administrative method for reviewing existing surety calculations for the Clive facility.

## 1.2 Scope

This instruction applies to the surety documents for facilities as approved by applicable regulatory agencies

# 2. REFERENCES

2.1 LLRW Radioactive Material License No. UT2300249, Condition 73, as amended

2.2 11e.(2) Radioactive Material License UT2300478, Condition 9.12, as amended

2.3 State-issued Part B Permit EPA Identification No. UTD982598898, Attachment II-7, as modified

2.4 11e.(2) Radioactive Material License Application, as revised

2.5 Most recent inflationary factors from the Bureau of Labor Statistics or Bureau of Economic Anlysis

2.6 CL-CL-WI-001, *Regulatory Submittal Control*

# 3. GENERAL

## 3.1 Definitions

3.1.1 Unit Cost – The unit cost is the monetary amount for one unit calculated such as a cubic yard, or square foot, etc.

3.1.2 Unit of Measure – Unit of measure is defined as how an individual line item is measured such as a cubic yard, each, linear foot, etc.

3.1.3 Extended Cost – The extended cost is the cost per line item calculated from the unit cost multiplied by the number of individual units.

3.1.4 Inflationary Factor – The inflationary factor is obtained from the Bureau of Economic Analysis or Bureau of Labor Statistics.

## 3.2 Responsibilities

3.2.1 The **Compliance/Regulatory Specialist** shall review existing surety calculations and coordinate efforts to review, fund, and prepare revisions for final submittal.

3.2.2 The **Director of Compliance and Permitting** or designee shall review revised surety documents and request changes to the financial mechanism.

3.2.3 The **Director of Engineering** or designee is responsible for providing information regarding any structural change made that would affect closure cost calculations. The Director of Engineering or designee is responsible for preparing required analyses of reserve capacity, closure snapshots, etc., and for providing an engineering review of drafted documents for submittal.

3.2.4 The **Vice President of Clive** or designee is responsible for providing updates to the current list of equipment, quantities of empty boxes, and waste in storage inventories as requested and for the review of all proposed calculations prior to submittal.

3.2.5 The **Treasurer** or designee is responsible for preparing revisions to the surety instrument as required and for performing a review of submittals.

3.2.6 The **Document Control Manager** or designee is responsible for maintaining surety document files and for the distribution of approved documents.

3.3 **Precautions and Limitations**

3.3.1 Each annual surety review for the 11e.(2) facility and LLRW facility shall be prepared under the direct supervision of and certified by a Professional Engineer or Professional Geologist currently licensed in the State of Utah with at least 5 years of construction cost estimation experience.

3.4 **Records**

3.4.1 A copy of all supporting documentation, estimates, government publications, etc. will be kept on file within the Compliance and Permitting Department.

## 4. REQUIREMENTS AND GUIDANCE

4.1 The Compliance/Regulatory Specialist will obtain the most recent publication of the R.S. Means Heavy Construction Cost Data Book.

The Compliance/Regulatory Specialist will obtain the most recent publication of inflationary factors from the Bureau of Economic Analysis from the U.S.

Department of Commerce. The implicit price deflator listed for gross domestic product within Table 4 will be used as the inflationary factor.

4.2 The inflationary factor will be entered into the surety spreadsheet to update the unit cost for line items subject to an annual inflationary increase.

4.3 For line items using R.S. Means as the cost basis, the unit cost will be compared to the most recent R.S. Means unit cost. The costs will be recorded.

4.4 The Compliance/Regulatory Specialist will review all estimated costs and obtain revised estimates for those older than five years. This may be accomplished by obtaining new third party estimates, calculating current operating costs, etc.

4.5 The Compliance/Regulatory Specialist will request the following engineering evaluations/demonstrations from the Director of Engineering:

4.5.1 Analysis of reserve capacity available for placement of decommissioning materials and quantities of stored wastes

4.5.2 Analysis of required re-vegetation

4.5.3 Analysis of potential material sources for embankment cover construction

4.6 The Compliance/Regulatory Specialist will review calculations and estimates against current costs and activities. The review will include but not be limited to the following:

4.6.1 Lengths of roads

4.6.2 Construction of Cover

4.6.3 Upgraded facilities and/or new construction not previously added

4.6.4 Decommissioned facilities for which funding is no longer needed

4.6.5 Analytical cost estimates, and other previous estimates, etc.

4.6.6 Equipment Inventory

4.6.7 Length of rail

4.7 The Compliance/Regulatory Specialist will input the revised unit costs and changes to calculated volumes into the spreadsheet.

4.8 The Compliance/Regulatory Specialist will perform an entire review of the spreadsheet calculations.

4.9 Once the annual update is drafted, it will be routed for internal review in accordance with CL-CL-WI-001, *Regulatory Submittal Control.*

4.10 The Compliance/Regulatory Specialist shall submit the annual surety review or closure cost estimates in accordance with the following schedule:

4.10.1 LLRW: December 1st; submitted to the Executive Secretary of the Utah Radiation Control Board.

4.10.2 Mixed Waste: December 31st; submitted to the Executive Secretary of the Utah Solid and Hazardous Waste Control Board.

4.10.3 11e.(2): May 31st; submitted to the Executive Secretary of the Utah Radiation Control Board.

4.11 Scheduling of any required amendment to the financial instrument shall be arranged with the Chief Financial Officer or designee prior to submittal to any regulatory agency.

## 5. ATTACHMENTS AND FORMS

5.1 None

ENERGYSOLUTIONS

CL-CL-WI-003

# Annual Compliance Facility Assessment

**Revision 0**

| | | |
|---|---|---|
| Authored By: | Signature on File<br>Tim Orton, Environmental Engineer | 10/19/11<br>Date |
| Reviewed By | Signature on File<br>Mike LeBaron, Permitting Engineer | 10/19/11<br>Date |
| Approved By | Signature on File<br>Sean McCandless, Director of Compliance & Permitting | 10/19/11<br>Date |

- [X] New
- [ ] Title Change
- [ ] Revision
- [ ] Rewrite
- [ ] Cancellation

Effective Date 10/24/11

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# 1. PURPOSE AND SCOPE

## 1.1 Purpose

To define a compliance walk-through assessment of the Clive facility that focuses on areas that may require additional permitting in order to remain in compliance.

## 1.2 Scope

This instruction applies to the assessment of all operations at the Clive facility, including operations performed outside of the restricted area in Sections 5, 29, 32, and 33.

# 2. REFERENCES

2.1 State-issued Part B Permit, EPA ID No. UTD982598898

2.2 Current Division of Air Quality Approval Order

2.3 Radioactive Material License No. UT 2300249

2.4 Ground Water Quality Discharge Permit No. UGW450005

2.5 11e.(2) Radioactive Material License No. UT 2300478

2.6 ES-AD-PR-008, Condition Reports

2.7 CL-CL-WI-015, Reports Due Compliance Tracking

# 3. GENERAL

## 3.1 Definitions

3.1.1 *Facilities* – Any stationary fixed object at the site, including buildings, pollution control devices, waste handling structures, etc.

3.1.2 *Unregulated Items* – Items, facilities, or processes which are currently not described in appropriate regulatory Permits, Licenses, or Approvals.

## 3.2 Responsibilities

3.2.1 The Director of Compliance and Permitting is responsible for the overall implementation of this instruction. If regulatory revisions are necessary, the Director of Compliance and Permitting will coordinate to ensure the revision is completed.

3.2.2 Compliance personnel are responsible to perform the necessary assessments and report results to the Director of Compliance and Permitting.

3.3 **Precautions and Limitations**

3.3.1 Personnel will follow the requirements of the applicable Radiation Work Permit and Job Hazard Analysis (JHA), if applicable, while performing assessments inside the Restricted Area.

3.3.2 Proper Personal Protective Equipment (PPE) to include steel-toed shoes, hard hats, and safety glasses, will be donned by assessment personnel when inspecting outside of vehicles in areas outside of the Restricted Area.

3.3.3 When inspecting from inside of a vehicle, personnel will observe all road signs around Energy*Solutions* property. Furthermore, the vehicle will be stopped and pulled to the side of the road before examining/observing an area.

3.4 **Document Control and Records**

None

## 4. REQUIREMENTS AND GUIDANCE

4.1 Compliance assessments will be conducted in the fourth quarter of each calendar year.

4.2 Assessments may be performed either walking or within vehicles.

4.3 Assessments may be completed in one day or over several days, so long as all of the areas owned by Energy*Solutions* at Clive are assessed each year.

4.4 Assessment personnel will examine and note all facilities at the site.

4.4.1 Unusual items and activities will also be noted.

4.5 Notes from the assessment will be compared with Permits, Licenses and Approvals (References 2.1 through 2.5) as well as consultation with the Director of Compliance and Permitting, and/or others within the Compliance department. Any facilities, items, or activities that are not captured within the appropriate Permit, License, or Approval will be noted as an unregulated item and reported to the Director of Compliance and Permitting.

4.5.1 A Condition Report will be written in accordance with Reference 2.6 for the unregulated item.

4.5.2 The Director of Compliance and Permitting will assign necessary compliance personnel to revise the appropriate regulatory document to include the unregulated item.

**Note: The Director of Compliance and Permitting may employ other personnel (operations, engineering, etc.) as necessary to complete the revision.**

4.5.3 If it is determined that the absence of documentation for the unregulated item is a regulatory violation, a self-identified non-compliance letter will be drafted and submitted to the appropriate agency.

4.6 Assessments will be tracked and documented in accordance with Reference 2.7.

## 5. ATTACHMENTS AND FORMS

None

ENERGYSOLUTIONS CL-CL-WI-002

# Groundwater Compliance Tracking

**Revision 2**

| | | |
|---|---|---|
| Authored By: | Signature on File<br>Jeff Low, Staff Hydrogeologist | 1/31/12<br>Date |
| Reviewed By: | Signature on File<br>Robert Sobocinski, Groundwater Manager | 1/31/12<br>Date |
| Reviewed By: | Signature on File<br>Mike Lebaron, Permitting Engineer | 1/31/12<br>Date |
| Approved By | Signature on File<br>Sean McCandless, Director of Compliance and Permitting | 1/31/12<br>Date |

- [ ] New
- [ ] Title Change
- [x] Revision
- [ ] Rewrite
- [ ] Cancellation

Effective Date 2/8/12

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# 1. PURPOSE AND SCOPE

## 1.1 Purpose

To provide the guidelines for *EnergySolutions*' Compliance and Permitting Department to effectively manage the groundwater program at the South Clive facility. This procedure ensures that the sampling and data management are conducted so that reporting deadlines required by permits and licenses are met**.**

## 1.2 Scope

The scope of the procedure is limited to planning of sampling events, notifications, reporting, and other activities ancillary to monitoring well sample collection and data reporting.

# 2. REFERENCES

2.1 Groundwater Quality Discharge Permit No. UGW450005, as amended

2.2 Groundwater Quality Discharge Permit No. UGW450005, Appendix B, *Water Monitoring Quality Assurance Plan*, as amended

2.3 CL-EV-PR-004, Groundwater Monitoring Procedure

2.4 State-issued Part B Permit, EPA ID No. UTD982598808, *Module VI*

2.5 CL-CL-WI-015, Reports Due Compliance Tracking

2.6 CL-TN-PR-060, Training Documentation and Storage

2.7 Coordinated Approval Mixed Waste Landfill Cell, U.S. EPA, Ref: 8P-P3T

# 3. GENERAL

## 3.1 Definitions

3.1.1 *Ground Water Quality Standard* – Numerical contaminant concentration levels adopted by the Utah Water Quality Board in or under Utah Code R317-6-2 for the protection of the subsurface waters of Utah.

3.1.2 *Ground Water Protection Levels* - Either the GWQS or the Background Concentration, whichever is greater, as listed in Tables 1A to 1F of Part I.C of the Ground Water Quality Discharge Permit (GWQDP).

3.1.3 *Background Concentration* – Is the concentration of a pollutant in ground water upgradient or lateral hydraulically equivalent point from a facility, practice or activity which has not been affected by that facility, practice or activity. Background concentration is also the mean concentration plus the second standard deviation for any contaminant in any individual well according to the GWQDP, Table 1B, note 1.

3.1.4 *Probable-out-of-compliance* – According to Part I.G.1.a of the GWQDP, any one sample in excess of a ground water protection level (GWPL).

3.1.5 *Out-of-compliance* - Two (2) consecutive samples in excess of the protection level in Tables 1A, 1B, 1C, 1D, 1E, or 1F of this Permit for any parameter from the same compliance monitoring well (refer Part I.G.1.b).

3.1.6 *Concentration Limits* – Concentrations listed in Tables VI-1 and VI-2 of the Mixed Waste Storage, Treatment, and Disposal Permit (Part B Permit). Groundwater concentration data for Class 1 and Class 2 monitoring parameters from Mixed Waste Facility sampling locations are compared to concentration limits.

**Note: Groundwater concentration data for radiological parameters from Mixed Waste Facility sampling locations are compared to GWPLs provided in Table 1E and 1F of the GWQDP.**

3.1.7 *Maximum Contaminant Levels* - The highest level of a contaminant that is allowed in drinking water. This is an U.S. Environmental Protection Agency (EPA) listing that is referred to in the Coordinated Approval regarding chlorinated organics in leachate and monitoring wells (refer Condition 4).

3.1.8 *Annual Clive Groundwater Schedule* – A schedule that makes use of the Intraweb application with the link designated "Groundwater Monitoring" and includes start and finish dates for pre-sampling activities, sampling events, data management, and reporting. The schedule can be accessed using the following url:
https://sharepoint.energysolutions.com/sites/intranet/Lists/GMCalendar/MyItems.aspx

## 3.2 Responsibilities

3.2.1 The Director of Compliance and Permitting (DCP) or designee shall be responsible for the Environmental Monitoring Program, record control, and the overall implementation of this instruction.

3.2.2 The Permitting Engineer is responsible for the daily operations of the groundwater program and will be responsible for implementing this instruction.

3.2.3 The Groundwater Manager and Staff Hydrogeologist are responsible for following this instruction. The Groundwater Manager and Staff Hydrogeologist are also responsible for: data evaluation, exceedance tracking and reporting and the production of site groundwater surface maps.

3.2.4 Groundwater Sampling Technicians are responsible for following this instruction in regards to sampling event performance.

3.3 **Precautions and Limitations**

3.3.1 All personnel who are involved with the Clive groundwater program shall receive training on this instruction.

3.4 **Records**

3.4.1 Individual monitoring well data and field sampling sheets shall be maintained for each well by the Staff Hydrogeologist, or designee in 3-ring binders in the Clive Groundwater Office. The management of documents generated in accordance with this instruction is specified in applicable sections.

3.5 **GWQDP, Part B Permit, and Coordinated Approval Training**

3.5.1 Monthly training will be performed for this instruction at the Clive facility by any person trained in this instruction and will be documented according to CL-TN-PR-060. Training topics will center on individual sections of this instruction.

## 4. REQUIREMENTS AND GUIDANCE

4.1 Sampling and Reporting Schedule

4.1.1 By March 1 of each year the Groundwater Manager or Staff Hydrogeologist shall prepare the Annual Clive Groundwater Schedule (Schedule).

4.1.2 The DCP shall review the Schedule on a yearly basis.

4.2 Pre-Sampling Activities

4.2.1 Approximately 4 weeks prior to sampling, the Staff Hydrogeologist and/or Groundwater Sampling Technicians will notify the contracted laboratory

of the sampling dates, analyses required, and number of samples. The Staff Hydrogeologist should provide/discuss the following information with the laboratory:

- Confirm the lab can meet holding times for all analytical procedures.
- Order bottles for on-site delivery including QC samples and spare sets.
- Provide analytical laboratories a list of parameters with methods and detection limits.

4.2.2 GWQDP and Part B Permit Groundwater Monitoring Notifications

4.2.2.1 In accordance with Part I.F.1.i of the GWQDP, at least 30 calendar days prior to the annual Groundwater Monitoring event required under Part I.H.1, the Groundwater Manager or Staff Hydrogeologist will submit a written notice and schedule, with approximate dates the wells will be sampled to the Executive Secretary, to allow the DRC the opportunity to collect split groundwater samples from the same wells at the same time as the Energy*Solutions* sampling team for independent laboratory analysis.

4.2.2.2 At least 14 calendar days prior to quarterly, semi-annual, or annual sampling at the Mixed Waste Facility the Groundwater Manager or Staff Hydrogeologist will notify the Utah Division of Solid and Hazardous Waste (DSHW) in writing in accordance with reference condition VI.E.1.f of the State-Issued Part B Permit.

4.2.3 Approximately 1 week prior to the scheduled sampling, groundwater sampling technicians perform the following**:**

- All field instruments will be calibrated to verify proper operation. Document the calibration using form CL-EV-PR-004-F2, Groundwater Monitoring Field Instrument Calibration Sheet as required by CL-EV-PR-004.
- Field vehicles for both inside and outside the restricted area shall be scheduled (the vehicles shall be fueled the day prior to the sampling event).
- Both sets of controllers/compressors shall be tested and repaired/maintained as required (the compressors shall be fueled the day prior to the sampling event).

- The depth to water meters shall be checked for proper function.
- Expendable supplies such as gloves, tyvek, Ziploc bags, chain-of-custody forms, tape, pens, paper towels, plastic sheeting, etc., shall be gathered for the sampling field kit.
- Sampling bottles received from the laboratory shall be placed in the field kits for each well to ensure that sufficient sets of bottles have been received including spares.

4.3 Groundwater Manager and Staff Hydrogeologist Post Sampling Activities:

4.3.1 Within 3 days of sample shipment or delivery, confirm laboratory receipt of samples by facsimile or email receipt of the chain-of custody.

4.3.2 Within 30 days of a sampling event enter field data (sample date, pH, specific conductivity, temperature, dissolved oxygen, and depth to water) into the electronic database.

4.3.3 Within two days of receipt, enter laboratory data into groundwater monitoring well analytical data spreadsheets and compare data to GWPLs of the GWQDP, concentration limits of the Part B Permit or Maximum Contaminant Levels (MCLs) as required by the Coordinated Approval. Follow exceedance reporting requirements for probable-out-of-compliance/out-of-compliance (Part I.G of the GWQDP), Class 1 and Class 2 Concentration limit exceedances (Parts VI.L.1. and VI.L.2 of the Part B Permit) as applicable and MCL exceedances referred to in the Coordinated Approval as follows:

4.3.3.1 GWPL Probable-out-of-compliance (POOC) (Parts I.G.1 and I.G.2, GWQDP)

4.3.3.1.1 Defined as any one sample exceeding GWPLs.

4.3.3.1.2 Notify the DCP immediately of any exceedances.

4.3.3.1.3 Notify Water Quality Board executive secretary by email and cc to OnBase within 30 days of detection.

4.3.3.1.4 Immediately implement quarterly sampling for the wells and parameters of concern.

4.3.3.1.5 Submit written report for wells and parameters in POOC on a semi-annual basis. 1st and 2nd quarter sampling event results will be reported by September 1. 3rd and 4th quarter sampling results will be submitted with annual reports by March 1.

4.3.3.2 GWPL Out-of-compliance (Parts I.G.1 and I.G.3, GWQDP)

4.3.3.2.1 Defined as GWPL exceedance(s) from two consecutive samples

4.3.3.2.2 Notify the DCP immediately of OOC status.

4.3.3.2.3 Following notification of the DCP, notify Water Quality Board Co-Executive Secretary of OOC status within 24 hours by email and cc to Onbase. Provide written notice within 5 days of detection.

4.3.3.2.4 Immediately implement monthly sampling for wells and parameters of concern. Monthly sampling will continue until a sampling frequency relaxation request has been approved by the Executive Secretary.

4.3.3.2.5 Results of monthly sampling will be submitted semi-annually. Data for samples collected January through June will be reported by September 1. Data for samples collected July through December will be submitted with the annual report by March 1.

4.3.3.2.6 Within 30 days of the verbal notice to the Executive Secretary (Section 4.3.3.2.3 above), submit an assessment study plan and compliance schedule to the Executive Secretary in accordance with Part I.G.3.b of the GWQDP.

4.3.3.2.7 In the event that Out-of-Compliance status is determined as per Part I.G.1(a) or (b), and upon written notification from the Executive Secretary, the DCP or designee will immediately implement the Contingency Plan in Appendix A of the GWQDP (refer Part I.G.3.c)

4.3.3.3 Part B Permit Class 1 and Class 2 concentration limit exceedance of Part VI.L.1. and/or Part VI.L.2. (except for TSS or TDS analysis).

4.3.3.3.1 Notify the DCP immediately of any exceedances.

4.3.3.3.2 Following notification of DCP notify the Executive Secretary of the Solid and Hazardous Waste Control

Board in writing within 7 calendar days of discovery of initial exceedance (Part VI.I.1).

4.3.3.3.3 Notify the Executive Secretary at least seven days prior to any re-sampling. Copies of initial data and re-sampling (2nd sample) data shall be submitted to the Executive Secretary. Within 30 calendar days following data submission, determine whether there is a statistically significant evidence of contamination (Parts VI.I.3 and VI.G.3).

4.3.3.3.4 "If the analysis for the resampled well or wells indicates exceedance of the groundwater concentration limit, the Permittee [sampling team] shall resample again not more than three months following the original annual sampling event. The Permittee [Groundwater Manager or Staff Hydrogeologist] shall provide the results within 60 calendar days of sampling to the Executive Secretary." (Part VI.I.5 Part B Permit).

4.3.3.3.5 If the analysis of the third consecutive sample exceeds the groundwater concentration limits, the Groundwater Manager and/or the Staff Hydrogeologist will perform the requirements found in Part VI.I.6 of the Part B Permit:

4.3.3.3.5.1 If it is decided that the concentration limit was exceeded due to sources other than the regulated unit or due to errors in sampling, analysis, or evaluation, then notify the Executive Secretary within 7 calendar days of receiving data from the 3rd sample that a demonstration will be made (Part VI.I.6.a).

Within 90 calendar days of the notification of demonstration under Part VI.I.6.a, submit a report to the Executive Secretary documenting the demonstration.

Continue compliance monitoring in accordance with Part VI.J until written notification to resume

detection monitoring is received from the Executive Secretary.

4.3.3.3.5.2 If constituents causing exceedance are from the regulated unit, institute a Compliance Monitoring Program in accordance with Part VI.J and a Corrective Action Program in accordance with Part VI.K.

4.3.3.3.5.3 If constituents causing exceedance are not from the regulated unit, continue quarterly compliance monitoring until the source is determined (VI.I.8).

4.3.3.4 Coordinated Approval Conditions 2 and 4

4.3.3.4.1 EnergySolutions shall annually submit groundwater and leachate monitoring data to EPA.

4.3.3.4.1.1 The detection limits and report schedule shall be the same as the Part B Permit requires.

4.3.3.4.1.2 The reports shall include, at a minimum, groundwater elevations for monitoring wells, analyses for PCBs, pH, specific conductance and chlorinated organics and volumes of leachate collected from the sumps.

4.3.3.4.1.3 The reports shall be submitted to EPA within 60 calendar days from the last day of the sampling event. The data may be submitted in an Excel and/or PDF format.

4.3.3.4.2 Energy*Solutions* shall notify EPA in writing within 7 days after the discovery of total PCBs at a concentration of 1 part per billion (ppb) or above, or if other chlorinated organics are detected at concentrations equal to or above MCLs at any leachate sump or monitoring well. If the detection at a monitoring well is verified with a follow-up sample and analysis, Energy*Solutions* shall submit a

proposed corrective action plan as outlined in Part VI.K of the Part B Permit to EPA for approval.

4.3.4 Calculate groundwater gradients for inclusion in the GWQDP groundwater annual report.

4.3.4.1 Data and contour maps shall be organized according to month (i.e., August 1999) electronically.

4.3.4.2 Results from monthly depth to groundwater and annual specific gravity measurements shall be entered into the developed spreadsheet to generate saline and freshwater-equivalent groundwater elevation tables and gradients for monthly water levels.

4.3.4.3 These same results are used for importing data for contouring.

4.3.5 Within 30 days of sampling the Mixed Waste Facility, calculate groundwater gradients for inclusion in the annual report.

4.3.6 Prepare annual reports for both the GWQDP Permit and the Part B Permit as follows:

4.3.6.1 Update the tables to include the following:

- Analytical results
- Depth to groundwater and specific gravity measurements
- Groundwater elevation conversions
- Data validation results (data qualifiers if any)
- Protection level data exceedences, as necessary

4.3.6.2 Update the figures to include the following*:*

- Site location map
- Monthly potentiometric surface maps (GWQDP report only)
- Flow net using water levels measured at the time of sampling (Part B Permit report only).

4.3.6.3 Update the text to include the following*:*

- Recent observations
- Trend changes
- Data validation results
- Report Summary

4.3.6.4 Provide an EDD that includes, at a minimum, searchable laboratory data pack files

4.3.7 Analytical results from quarterly sampling of Mixed Waste wells shall be submitted by May 1, August 1, November 1, and February 1, respectively (Part I.G.2).

4.3.8 The Groundwater Manager and/or Staff Hydrogeologist shall arrange and have completed under their direction a quality control check of report tables and figures.

4.3.9 The Groundwater Manager or Staff Hydrogeologist shall provide reports to the DCP for a consistency and quality review.

4.3.10 Upon completion of the review, the Groundwater Manager or Staff Hydrogeologist shall finalize the report and arrange for re-production.

4.3.11 Hard copy data sets are kept at the South Clive facility and are in the control of the Staff Hydrogeologist or designee. These hard copy data sets are provided by the analytical laboratories as original hard copies of data packs.

## 5. ATTACHMENTS AND FORMS

None

# Regulatory Submittal Control

**Revision 2**

| | | |
|---|---|---|
| Authored By: | Signature on File<br>Treesa Parker, Compliance/Regulatory Specialist | 5/25/11<br>Date |
| Reviewed By: | Signature on File<br>Tim Orton, Environmental Engineer | 5/25/11<br>Date |
| Approved By | Signature on File<br>Sean McCandless, Director of Compliance and Permitting | 5/26/11<br>Date |

- [ ] New
- [ ] Title Change
- [x] Revision
- [ ] Rewrite
- [ ] Cancellation

Effective Date 6/3/11

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# 1. PURPOSE AND SCOPE

## 1.1 Purpose

To define review and approval requirements for regulatory submittals.

## 1.2 Scope

This instruction applies to formal letters, reports, and other submittals to regulatory agencies prepared by the Compliance and Permitting Department for the Clive Facility. This instruction does not apply to email correspondence, nor to informal responses to information requests made during the course of an inspection.

# 2. REFERENCES

2.1 LLRW Radioactive Material License No. UT2300249

2.2 11e.(2) Radioactive Material License No. UT2300478

2.3 State-issued Part B Permit

2.4 Groundwater Quality Discharge Permit No. UGW450005

2.5 Authorized Signatures list, as revised

2.6 ES-AD-PR-008, Condition Reports

2.7 ES-QA-PR-002, Quality Assurance Surveillances

2.8 CL-CL-WI-015, Reports Due Compliance Tracking

# 3. GENERAL

## 3.1 Definitions

3.1.1 *Regulatory Submittal* – Any correspondence to environmental regulatory agencies relating to the Clive facility and:

- requesting an amendment or modification to any referenced permit or license;
- addressing actual or alleged noncompliance in Clive facility operations;
- submitting required reports, including environmental, as-built, and monthly shipping; or
- providing other regulatory information, response to information requests, etc.

3.1.2 *Authorized Signature* – An individual who has been authorized by a corporate officer to sign regulatory submittals on behalf of the company.

3.1.3 *Author* – The author of any document subject to this work instruction may be any Energy*Solutions* employee assigned to the task by management.

3.2 **Responsibilities**

3.2.1 The Senior Vice President, Regulatory Compliance is responsible for reviewing regulatory submittals relating to actual and alleged noncompliance.

3.2.2 The Vice President of Clive is responsible for reviewing regulatory submittals relating to actual and alleged noncompliance.

3.2.3 The Director of Compliance and Permitting is responsible for the overall implementation of this instruction. The Director of Compliance and Permitting or designee shall review and approve any regulatory submittal.

3.2.4 The Director of Health Physics, or designee**,** is responsible to review and approve any regulatory submittal that requests an amendment or modification to any radioactive material license or license-referenced document.

3.2.5 The Compliance/Regulatory Specialist, or designee, is responsible for archiving regulatory submittal approval forms and performing peer review of regulatory submittals as necessary.

3.2.6 The Quality Assurance Manager, or designee, is responsible for considering whether a surveillance is appropriate for assessing implementation of new and amended regulatory requirements, and for providing resources to support surveillances when requested.

3.2.7 The Peer Reviewer (i.e., Environmental Engineer, Director of Engineering, Quality Assurance Manager, etc.) is responsible for reviewing regulatory submittals upon request.

3.3 **Precautions and Limitations**

3.3.1 The Director of Compliance and Permitting, or designee, shall provide training on this work instruction to employees who prepare regulatory submittals.

3.3.2 In accordance with UAC R315-3-2.2 and Condition IV.I of the GWQDP, submittals regarding the State-issued Part B permit and Ground Water Quality Discharge Permit shall bear a certification statement and an authorized signature.

3.3.3 Submittals regarding the Radioactive Material Licenses shall bear an authorized signature.

3.3.4 Although email correspondence is not within the scope of this procedure, it should be peer-reviewed prior to submittal. Email correspondence, particularly relating to initial (24-hour) required notifications, should be evaluated by the author for inclusion to OnBase.

3.4 **Records**

3.4.1 Reviews may be informal; including email, verbal, or redline/strikeout markup of documents.

3.4.2 Documentation of review and approval is accomplished by having an authorized signature on the letter or cover letter for each regulatory submittal.

3.4.3 Forms associated with this work instruction are not quality assurance records. Once complete, these forms shall be scanned into OnBase and retained for at least 3 years.

**Note: Once scanned, hard copy forms may be destroyed.**

## 4. REQUIREMENTS AND GUIDANCE

### 4.1 Amendment and Modification Requests

4.1.1 Each amendment or modification request shall be reviewed by at least:

4.1.1.1 One peer in the Compliance and Permitting group;

4.1.1.2 The Director of Health Physics; and

4.1.1.3 The Director(s) or Manager(s) of activities directly affected by the proposed change.

4.1.2 Reviewers will evaluate the proposed changes for compliance with other rules and requirements; radiation and occupational safety; operational efficiency; and other concerns as appropriate.

4.1.3 Approval to submit is documented by the primary author on form CL-CL-WI-001-F1, Regulatory Submittal Approval.

**Note: Approval may be documented via telecom or email; a signature is not required. If the form is not signed, note the name of the reviewer indicating approval as well as the date of verbal or email approval and initial.**

4.1.4 Revisions to the original submittal are subject to the same level of review as the initial submittal.

4.1.5 Upon regulatory approval, the primary author is responsible to ensure new and revised requirements are communicated to affected Clive personnel as follows. Use form CL-CL-WI-001-F2, Regulatory Approval Implementation Checklist, to document.

4.1.5.1 Forward regulatory approval letter and clean copies of controlled documents to the Document Control department for internal transmittal and posting to OnBase.

4.1.5.2 Notify Clive management of approval via "Clive Managers" email list. Summarize affected documents and new or revised requirements in this email.

4.1.5.3 Perform a preliminary review for operating procedures and work instructions that need to be revised, and the likely person responsible for completing these revisions.

4.1.5.4 Provide training and/or training materials to affected work groups. This training should explicitly consider which operating procedures, work instructions, and other lower-tier documents are affected by the new or revised requirements.

4.1.5.5 Finalize the list of operating procedures, work instructions, and other lower-tier documents to be revised, with assigned responsible personnel, on form CL-CL-WI-001-F2.

4.1.5.6 Review the regulatory approval for new or revised reporting requirements and due dates. Update the "reports due" database accordingly in accordance with CL-CL-WI-015, *Reports Due Compliance Tracking*.

4.1.5.7 These actions shall be completed within 10 calendar days of regulatory approval. The Director of Compliance and Permitting may approve extensions to this time frame.

**Note: Operating procedure and work instruction revisions do not need to be completed within 10 days; however, the documents to be revised and person responsible for completing the revision do need to be identified.**

**Note: Applicable operating procedures and work instructions shall be revised before the implementation of any regulatory approval.**

4.1.5.8 Perform a followup review of implementation within 90 days of regulatory approval. At this time, all lower-tier document revisions should be complete or be tracked via a Condition Report issued in accordance with ES-AD-PR-008, *Condition Reports*. Document this review on form CL-CL-WI-001-F2.

4.1.5.9 Complex regulatory approvals may warrant further implementation review via a surveillance performed in accordance with ES-QA-PR-002, Quality Assurance Surveillances. Discuss appropriateness and surveillance scheduling with the Quality Assurance Manager. Document decision reached on form CL-CL-WI-001-F2.

4.2 **Alleged or Actual Noncompliance**

4.2.1 Each regulatory submittal addressing alleged or actual noncompliance shall be reviewed by at least:

4.2.1.1 One peer in the Compliance and Permitting group;

4.2.1.2 Director of Compliance and Permitting;

4.2.1.3 The Vice President of Clive;

4.2.1.4 The Senior Vice President, Regulatory Compliance; and

4.2.1.5 The Director(s) or Manager(s) of activities directly affected by the issue at hand.

4.2.2 Reviewers will evaluate the correspondence for factual accuracy and effectiveness of any proposed corrective actions.

4.2.3 Approval to submit is documented by having the correspondence signed by the Director of Compliance and Permitting, the Senior Vice President, Regulatory Compliance, or the Director of Health Physics.

4.3 **Regulatory Reports**

4.3.1 Each report for regulatory submittal shall be reviewed by at least one qualified peer.

4.3.2 In order to allow time for adequate review, the report author shall provide an initial draft of the report as early as possible.

4.3.3 The peer shall review the report for content, accuracy, and to ensure that all regulatory requirements are met.

4.3.4 The following reports shall be documented with a cover sheet that indicates the author and the reviewer.

4.3.4.1 Environmental Monitoring

4.3.4.2 Groundwater Monitoring

4.3.4.3 Area Release

4.3.4.4 BAT Monitoring

**Note: Engineering reports such as the annual as-built report and surety reviews have authorship and review documented by the Professional Engineer's stamp and certification. No further compliance documentation is needed.**

4.3.5 Once peer review is complete, the report shall be forwarded to the appropriate regulatory agency or agencies under a cover letter signed by an individual that has signatory authority.

4.4 **Other Regulatory Correspondence**

4.4.1 Other regulatory correspondence (i.e., notifications, submittals, etc.) shall be reviewed by at least one qualified peer.

4.4.2 Once peer review is complete, present item to the Director of Compliance and Permitting or individual that has signatory authority.

4.4.3 The Director of Compliance and Permitting or individual with signatory authority shall perform a final review and sign the transmittal letter.

5. ATTACHMENTS AND FORMS

5.1 CL-CL-WI-001-F1, Regulatory Submittal Approval, Example

5.2 CL-CL-WI-001-F2**,** Regulatory Approval Implementation Checklist, Example

## 5.1 CL-CL-WI-001-F1, Regulatory Submittal Review Form

ENERGYSOLUTIONS

**REGULATORY SUBMITTAL REVIEW FORM**
**March 18, 2010 (CL-CL-WI-001-F1)**

Document: _____

CD#: _____

Author: _____ _____ _____
Print Sign Date

Peer Reviewer: _____ _____ _____
Print Sign Date

Radiation Safety review:

Reviewed by: _____ _____ _____
Print Sign Date

Interdepartmental Review (as necessary or mark N/A):

Reviewed by: _____ _____ _____
Print Sign Date

Director of Compliance and Permitting or authorized signatory:

Reviewed by: _____ _____ _____
Print Sign Date

## 5.2 CL-CL-WI-001-F2, Regulatory Approval Implementation Checklist

ENERGYSOLUTIONS

**REGULATORY APPROVAL IMPMENTATION CHECKLIST**
**June 3, 2011 (CL-CL-WI-001-F2)**

Document(s): _____

Approval letter and clean electronic files forwarded to Document Control. Date: _____

Email notification and summary of approval forwarded to "Clive Managers" email list. Date: _____

Training – list work groups to be trained and date of training session:

1.
2.
3.
4.

Procedures – list procedures to be revised and person responsible for completing revision:

1.
2.
3.
4.

Reports due database updated. Date: _____

Author: _____ _____ _____
Print Sign Date

90-day followup review notes:

QA Surveillance requested (Yes/No)?

Author: _____ _____ _____
Print Sign Date

# Business Development QADEP for EWIS

**Revision 0**

| | | |
|---|---|---|
| Authored By: | Signature on File<br>Dax Lawrence, Project Coordinator | 7/31/09<br>Date |
| Reviewed By: | Signature on File<br>Jose Jerez, Account Executive | 7/31/09<br>Date |
| Approved By: | Signature on File<br>Paul Larsen, Senior Vice President | 7/31/09<br>Date |

☒ New
☐ Title Change
☐ Revision
☐ Rewrite

Effective Date: 8/5/09

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# 1. PURPOSE AND SCOPE

## 1.1. Purpose

To establish a process for the verification of data entered into the Electronic Waste Information System (EWIS).

## 1.2. Scope

This instruction applies to all data that is entered into the EWIS by Business Development personnel.

# 2. REFERENCES

2.1 ES-QA-PR-005, Records

2.2 CL-AD-PR-060, EWIS/WITS Administrative Procedure

2.3 ES-QA-PR-002, Quality Assurance Surveillances

2.4 ES-AD-PR-008, Condition Reports

# 3. GENERAL

## 3.1. Definitions

3.1.1 **Electronic Waste Information System (EWIS)**
EWIS is a centralized location of data that provides information on Energy*Solutions*' customers, their waste streams, and the waste material sent for management and disposal. The data can also be used as an indicator for tracking waste through its various operational activities.

3.1.2 **Authorized User**
An individual who, at the request of their department manager/supervisor, is granted access to the EWIS program.. The proposed Authorized User shall be trained and qualified in accordance with CL-AD-PR-060, EWIS/WITS Administrative Procedure.

3.1.3 **EWIS Reports**
A set of database queries that allow users to compile EWIS data into pre-formatted reports.

3.1.4 **QA Data Entry Plan (QADEP)**
A plan for the verification of data entered into the EWIS database. This plan shall identify each type of data entered in the database, the quality assurance document source, the frequency of verification, and a description of the verification method.

3.1.5 **Radioactive Waste Profile Record (EC-0230)**
One or more completed forms and documentation that are used to describe a waste stream.

### 3.2. Responsibilities

3.2.1 Each **Department Manager/Supervisor** shall be responsible for the verification of data input by their department. Each manager/supervisor shall provide the EDA with a request for Authorized Users within their department. This list shall include the name of the Authorized User and the type of access each user shall require

3.2.2 **Authorized Users** are responsible for entering accurate and factual information into the EWIS database.

3.2.3 Each **Project Manager** is responsible for ensuring the verification process is performed and documented in accordance with this procedure. Each Project Manager shall also be an Authorized User. The Project Manager is responsible for ensuring the verification of data entered by the BDAA.

3.2.4 The **Business Development Administrative Assistant (or designee)** shall be responsible for entering data into the EWIS and for performing the verification of data entered by each Project Manager. The BDAA shall be an Authorized User.

### 3.3. Precautions and Limitations

3.3.1 Only Authorized Users shall view, enter, or modify data in the EWIS Database.

3.3.2 The raw data that is entered into the EWIS is obtained from hard copy quality records, logbooks, contracts, Radioactive Waste Profile Records, shipment manifests, licenses, and other documents.

3.3.3 Department managers/supervisors shall provide training to their employees that use the EWIS. The training shall include, but is not limited to, the basic use of the EWIS, the specific job guidelines for their job, an overview of how the department uses the EWIS, and an overview of data entered into EWIS by other departments (as appropriate).

### 3.4. Document Control and Records

3.4.1 Records generated as a result of this instruction will be maintained in accordance with ES-QA-PR-005, Records.

## 4. REQUIREMENTS AND GUIDANCE

4.1 Project Managers shall establish guidelines for data entry. The guidelines shall be a step-by-step instruction of each authorized user's job duties as they pertain to EWIS. Managers shall ensure the user is trained for each function they perform in EWIS

4.2 The Business Development Administrative Assistant (or designee) shall review for accuracy at least 10 % of the data entered by the BD team on a monthly basis. This shall be performed and documented in accordance with ES-QA-PR-002, Quality Assurance Surveillances.

4.3 If a discrepancy is found, an additional 10% of the data entered shall be reviewed for each discrepancy identified. Upon discovery, the BD Administrative Assistant shall notify the Project Manager who shall ensure the discrepancy is fixed. The BD

Administrative Assistant shall note on the surveillance that the discrepancy was fixed. If the discrepancy can not be fixed during the course of the surveillance, it shall be documented in accordance with ES-AD-PR-008, Condition Reports.

## 5. ATTACHMENTS

None

CL-AD-WI-002

# Document Control

**Revision 8**

| | | |
|---|---|---|
| Authored By: | Signature on File | 11/1/11 |
| | Treesa Parker, Compliance Regulatory Specialist | Date |
| Reviewed By: | Signature on File | 11/3/11 |
| | Dave Moir, Document Control Administrator | Date |
| Approved By | Signature on File | 11/4/11 |
| | Sean McCandless, Director of Compliance and Permitting | Date |

- [ ] New
- [ ] Title Change
- [x] Revision
- [ ] Rewrite
- [ ] Cancellation

Effective Date 11/8/11

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# 1. PURPOSE AND SCOPE

## 1.1. Purpose

This Work Instruction implements additional requirements for document control, in accordance with ES-AD-PR-002, Document Control, at the Energy*Solutions* Clive facility.

## 1.2. Scope

This work instruction applies to additional requirements specifically related to the original submissions of and revisions to license(s), permit(s), procedure(s) and/or instruction(s) at the Energy*Solutions* Clive Facility.

# 2. REFERENCES

2.1. ES-AD-PR-002, Document Control

2.2. ES-AD-PR-001, Document Preparation

2.3. CL-AD-WI-001, Document Preparation

2.4. CL-QA-PR-005, Quality Assurance Records

2.5. CL-AD-PR-020, Operating Work Permit

# 3. GENERAL

## 3.1. Definitions

3.1.1 *Controlled Document Holder* - The individual designated by the department manager/supervisor that shall be responsible for receiving, maintaining, and controlling access to hard copies of controlled document manuals. This individual shall be either the manager/supervisor or the Department Records Custodian identified in CL-QA-PR-005, Quality Assurance Records.

3.1.2 *Review Cycle* – The review process, which covers transmitting procedures or work instructions to identified personnel for review and comment, the resolution of comments and the time frame in which all reviews must be completed and all comments resolved.

3.13 *Electronic Document Imaging System (OnBase)* - A client / server based PC application for storing and retrieving a wide range of information.

## 3.2. Responsibilities

3.2.1. Management at the Energy*Solutions* Clive Facility is responsible for dissemination of information regarding any new release of or

change to licenses, permits, work instructions, procedures and other documents which may affect operations or activities under their responsibility.

3.2.2. Each recipient of a controlled document shall retain only the latest revision of the controlled document and verify that the controlled document revision is current as described in ES-AD-PR-002, Document Control.

### 3.3. Precautions and Limitations

3.3.1 All personnel designated to prepare, review, control, or distribute quality documents shall be trained as appropriate to this instruction and ES-AS-PR-001, Document Preparation and CL-AD-WI-001, Document Preparation, for the task assigned.

### 3.4. Document Control and Records

3.4.1 Document Review and Comment Forms shall be submitted along with the final hard copy of the procedure/document submitted for approval. These shall be kept for the period of one (1) year.

3.4.2 Distribution Record Log is completed each time a distribution of a controlled document is made. This is to be maintained for the lifetime of the Clive Site.

3.4.3 Read Receipt Records are generated when a person opens and reads an e – mail that has been sent to them. These will be generated in connection with the distribution of controlled documents and shall be kept for the period of one (1) year.

## 4. REQUIREMENTS AND GUIDANCE

### 4.1. Review Cycle

4.1.1 The author shall forward the procedure/document, with the Document Summary Form and Document Approval Page, to Document Control, who shall then forward the procedure for review and comment to those individuals identified in Section 4.1.3.

**Note: The author may request an expedited review for proposed revisions that are administrative in nature. The author must provide a summary of the administrative revisions on the Document Summary**

**Form. The Document Control Administrator will distribute the proposed revisions with the expedited request.**

4.1.2 Unless otherwise specified, the word procedure(s)/document(s) will also refer to work instruction(s) and policies throughout this instruction.

4.1.3 Document Control shall, at a minimum distribute procedures to the responsible manager, Quality Assurance Manager, Director of Compliance & Permitting, Director of Health Physics, and Safety & Health Manager for review and comment. Document Control should also include the Safety & Health Manager in the review cycle.

**Note: The above listed may use designees to review.**

4.1.4 Document Control may, at their discretion, include other personnel in the review cycle, as deemed necessary. Management personnel may request to be included in the review cycle. Any person performing review may assign a designee for this purpose.

4.1.5 Reviewers shall review for completeness, adequacy, and correctness of the procedure/document as far as their particular areas of expertise allow. If there are comments, they should be documented on a Document Review Comment Form, CL-AD-WI-002-F1 (Attachment 5.1) and returned to the author, with a cc to Document Control, within 5 working days.

**Note: Reviewers may use e – mail to make their comments.**

**Note: Reviewers shall endeavor to the best of their ability, during their review, to ensure that language in the procedure/document required by a Condition Report or by regulatory requirements is not changed.**

**Note: Documents distributed with proposed changes that are administrative in nature, shall be reviewed for those administrative changes only.**

4.1.6 The author shall resolve the comments and document the resolution taken, either on the Document Review Comment Form, CL-AD-WI-002-F1 (Attachment 5.1) or via e – mail. The originator of the comments shall sign-off on the Document Review

Comment Form, CL-AD-WI-002-F1 (Attachment 5.1) indicating satisfactory comment resolution, or verify satisfactory comment resolution via e – mail. Any comments that cannot be resolved will be taken to the next level of Management for resolution.

**Note: The author shall incorporate any changes made as a result of comments received into the procedure/document. Additionally, the author shall include sufficient information as to changes made in the Document Summary so that training conducted on the procedure/document can adequately address the changes that have been made**

**Note: Any major comments accepted may require a redistribution of the procedure/document for review when the scope or context of the procedure is affected.**

4.1.7 After comments are resolved, the author shall route a final copy of the procedure/document for required approvals to the appropriate individuals, per ES-AD-PR-001, Document Preparation. The final copy submitted for approval shall include a copy of all signed-off Document Review Comment Forms, CL-AD-WI-002-F1 (Attachment 5.1), or e – mails that have been used to verify comment resolution. The Quality Assurance Manager shall sign the reviewed by line on the Document Approval Page, for all who have reviewed the procedure/document.

**Note: Reviewers may use an e – mail for notification that they have accepted resolutions to their comments.**

4.1.8 Those who will be signing on the Document Approval Page shall sign, date and return the final approved copy, along with the Document Review Comment Forms, CL-AD-WI-002-F1 (Attachment 5.1) to the Document Control Administrator (or designee), within five (5) working days. The Document Control Administrator (or designee), after ensuring that an effective date has been assigned and is attached to the Document Approval Page, shall distribute the procedure/document.

4.1.8.1 A hard copy of the procedure/document with the approval signatures shall be kept on file.

4.1.8.2 In addition to the latest revision of the procedure/document being available on the Intraweb, read only (image) copies

will also be made available on the Electronic Document Imaging System. Previous revisions/renditions to procedures/documents shall be available there.

**Note: Procedures will not be distributed until a hard AND final electronic copy has been submitted to the Document Control Administrator (or designee) along with final electronic copy of any forms that are attached to the procedure. The responsible manager of the author of the procedure/document shall be responsible for seeing that Document Control receives the final electronic copies of any forms that are attached to the procedure/document, along with the final electronic copy of the procedure/document.**

4.1.8.3 Program Documents, such as ALARA, Radiation Protection Program, policy documents, etc, do not go through the review cycle as they are reviewed internally by those responsible for their generation. Document Control is not required to collect training documentation when Program Documents are distributed. However, Document Control shall collect training documents for policies.

4.2 **Control of Revisions**

4.2.1 In accordance with ES-AD-PR-002, Document Control, revisions to procedures/documents shall be reviewed and approved by the same organizations/positions that performed the original review and approval.

4.2.2 Revisions to procedures/documents shall be controlled and distributed in accordance with this instruction.

4.2.3 The author of a revision(s) to a procedure/document shall obtain an electronic copy of the procedure/document that is going to be revised from Document Control.

4.2.4 Per ES-AD-PR-002, Document Control, the author shall include a completed Document Summary Form, which shall summarize the changes being made to the procedure/document, along with a redline/strikeout copy of the procedure/document, to Document Control.

**Note: A revision to a procedure/document will take the next highest revision number, i.e., Rev 0, Rev 1, Rev 2, etc.**

**Revision numbers shall not be skipped, the revision will always be the next highest number.**

4.2.5 Cancellations of procedures/documents shall be handled in accordance with ES-AD-PR-001, Document Preparation.

4.2.6 Immediate changes to procedures/documents shall be handled per ES-AD-PR-001, Document Preparation. Additionally, immediate changes shall be sent to the Director of Compliance & Permitting, or designee and Director of Health Physics, or designee for review. If regulatory approval is required, then an immediate change cannot be made.

## 4.3 Identification of Forms

4.3.1 Document Control is responsible for providing numbers for forms/quality assurance/compliance documents generated by the Clive Site (as defined in CL-QA-PR-005). No form affecting quality/compliance shall be distributed unless it has been submitted to Document Control to receive a number. Additionally, no form affecting quality/compliance shall be distributed until an electronic copy has been submitted to Document Control. No form shall be distributed unless it is attached to a procedure, license, or permit.

**Note: A form may be attached to an instruction or Operating Work Permit (see CL-AD-PR-020).**

4.3.2 Forms shall be numbered using the procedure or instruction number, followed by F1 for the first form in the procedure/instruction, F2 for the second form, F3 for the third form, etc. (I.e., CL-AD-WI-002 F1, CL-AD-WI-002 F1, CL-AD-WI-002 F3, etc.)

**Note: Variations to this numbering system shall be approved by Document Control and the Quality Assurance Manager on a case – by – case basis.**

4.3.3 Forms shall be attached only to the procedure in which they were originally referenced. Other procedures needing to use the same form shall reference it in the procedure, i.e., activities shall be document on form X, located in procedure Y.

4.3.4 Headers on forms generated at the Clive Facility, for use at the Clive Facility, should contain the following:

- Energy*Solutions* logo in left margin
- Form number in Times New Roman 12, in right margin, flush with revision number underneath
- Form name in center, in Times New Roman 14
- The footer should have page ___ of ___

Example:

ENERGYSOLUTIONS

Form Number (CL-# #-#-#)
Revision #

FORM NAME/TITLE

Page __ of __

4.3.5 In accordance with ES-AD-PR-001, Document Preparation, while an exact duplicate of the form is preferred, it is not required. Only an example of the form need be attached. As long as the example has all information required by the approved form, it does constitute an example. The example should look similar to the approved form & should also contain the form number, but it need not be an exact duplicate.

4.3.6 A revision to a form shall only take place if a change is made to a form. Forms do not become revised if the procedure/document to which they are attached becomes revised. I.e., a procedure is revised from Rev 0 to Rev 1 and has three forms attached, all forms are on Rev 0. While the procedure will now be on Rev 1, the forms remain on Rev 0 unless a change is made to the form. Only then will the form be considered revised. If a form is revised, it shall take the next highest revision number. Revision numbers shall not be skipped.

4.3.7 If a form is revised, the procedure to which it is attached shall also be revised and the instructions for revising the procedure shall apply.

## 4.4 Instructions

4.4.1 Instructions shall require review and approval; with the exception that the writing, reviewing and approval of an instruction shall be confined to the department the instruction will affect (i.e. the instruction shall be authored by personnel within the department, reviewed by personnel within the department with expertise in the matters being addressed by the instructions and shall be approved by the responsible manager for the department).

4.4.2 An instruction will not require any other review and approval beyond the affected department.

4.4.3 Instructions may be sent to the Director of Health Physics for review, if deemed appropriate. The Director of Health Physics however, does not need to approve instructions.

**Note: The same revision rules that apply to procedures shall also apply to instructions should an instruction become revised. Also, the same revision rules that apply to attached forms shall apply to forms that are attached to an instruction.**

## 4.5 Document Distribution

4.5.1 Document distribution shall be done in accordance with ES-AD-PR-002, Document Control.

4.5.2 In conjunction with ES-AD-PR-002, Document Control, those who receive hard copy distributions shall be considered to be controlled document holders. Each set of controlled documents shall be assigned unique control numbers. This control number shall be assigned to the controlled document holder and a set of controlled document manuals will then be issued.

4.5.3 The Document Control Administrator, or designee, shall maintain records of the distribution of controlled documents. This record shall contain the following:

- A list of control numbers that have been assigned to the document holder. This list shall include the control number and the name of the individual assigned that number.

- This list shall include the title(s) of all controlled document manuals assigned to the holder.
- A list of documents that have been distributed to the holder.

4.5.4 Per ES-AD-PR-002, Document Control, a letter of transmittal shall accompany distribution of all controlled documents. The Document Control Administrator (or designee), shall assign all distribution numbers. These numbers shall be assigned sequentially, i.e. 233, 234, 235, etc.; and logged on the Distribution Record Log (Attachment 5.2). The master copy of each distribution shall be scanned. Once the distribution is scanned, it shall be sent as an attachment to an e – mail, to those controlled document holders who are intended to receive it.

**Note: See instructions on how to complete distribution log.**

4.6 **Notification of Document Updates**

4.6.1 Responsible managers at the Energy*Solutions* Clive facility shall be notified by e-mail as new or updated documents, forms, procedures or work instructions are posted on the Intraweb.

- Along with notification of the new or updated documents, forms, procedures or work instructions, the responsible manager shall be notified of the requirement to train personnel or contractors who are impacted by the documents, forms, procedures or work instructions.
- The e-mail notification shall include a requirement that the manager complete the training and return a completed training roster within five (5) business days.
- Notifications of new or modified documents shall be sent as “read receipt”. Document Control shall keep a record of read receipts for the period of one (1) year.

## 5. ATTACHMENTS AND FORMS

5.1 Example, Document Review Comment Form

5.2 Example, Distribution Log

5.3 Instructions, How to Complete Distribution Record Log

5.4 Example, Read Receipt

## 5.1 Document Review Comment Form - Example

ENERGYSOLUTIONS

CL-AD-WI-002-F1
Revision 0

**DOCUMENT REVIEW COMMENT FORM**

Document Title and Identifying Number: Revision # : Date:

**Reviewer's Name:**

| Item Number | Page or Section No. | Comment | Comment Resolution |
|---|---|---|---|
| | | | |

Page _____ of _____

Comment Resolution Accepted By: Date:

## 5.2 Distribution Record Log – Example CL-AD-WI-002 F2

| Number | License | Permit | Manual | Instruction | Other | Document | Date Transmitted | CC # |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

## 5.3 INSTRUCTIONS FOR COMPLETION OF DISTRIBUTION RECORD LOG

1) Distribution Record Log can be found in computer records. The path to the log is O:/CLUT/Document Control/Dist Log/tblEC2810Rev2A(a)/tlbCLADWI002F2R2R1

2) In the "Number" column, type in the number of the distribution. These numbers are sequential, i.e., 2010, 2011, etc. The exception to the rule would be when distributing an Operational Work Permit. In This Case, You would enter the OWP number, i.e., 03-005, etc.

3) The next columns are listed "License, Permit, Manual, Instruction and Other".

   -If the transmittal concerns a license, click on the cell in the license column to bring up the dropdown list and choose the appropriate license from the list.
   - If the transmittal concerns a permit, click on the cell in the permit column to bring up the dropdown list and choose the appropriate permit from the list.
   - If the transmittal concerns a manual, click on the cell in the manual column to bring up the dropdown list and choose the appropriate manual from the list.
   - If the transmittal concerns an instruction, click on the cell in the instruction column to bring up the dropdown list and choose the appropriate instruction from the list.
   - If the transmittal concerns an item other than a license, permit, manual or instruction, it must be listed in the other column. Click on the cell in the other column. The dropdown list gives you two choices, "OWP" and "Other." If it is an OWP, click on "OWP." If it is another document, click on "Other."

4) The next column is listed as "Documents." In this column, list the documents you are transmitting, then put in parenthesis the revision number, then list the name of the procedure, then list the effective date. If you are transmitting more than one document, separate the documents listed with a semi colon. I.e., Table of Contents; CL-AD-WI-001 (Rev 2) Document Control, Both Dated (enter effective date). If the distribution is for an OWP, you will list it this way: OWP/xx-xxx, then in parenthesis the revision number ,then the name of the OWP, then the effective date. I.e., OWP/02-015 (Rev 0) Special Nuclear Materials , Dated 9/13/02.

5) In the "Date Transmitted" column, key in the date the document was transmitted in the x/x/xx format (note, the database will automatically format it to the x/x/xxxx format).

6) In the CC # column, list all controlled procedure numbers receiving a copy of the distribution. For example, a copy of the procedure is going to controlled document numbers 7, 10 and 58 you would list in the column, 7, 10, 58.

## 5.4 Read Receipt Notification - Example

Read: Message Title
Name of E-Mail Addressee
**To:** Name of entity sending the original e-mail notification
**Sent:** Date and time the original notification was sent

---

Your message

| | |
|---|---|
| To: | Name or title of the Gatekeeper |
| Subject: | Subject of the original e-mail notification |
| Sent: | Date and time the original notification was sent |

was read on (Date and time the original notification was read by the addressee).

# LLRW Export Approval

**Revision 3**

| | | |
|---|---|---|
| Authored By: | Signature on File<br>Wayne Johns, Environmental Manager | 12/6/11<br>Date |
| Reviewed By: | Signature on File<br>Curtis Kirk, Quality Assurance Manager | 12/6/11<br>Date |
| Reviewed By: | Signature on File<br>Allan Erichsen, Director of Waste Acceptance | 12/20/11<br>Date |
| Reviewed By: | Signature on File<br>Rick Chalk, Director of Health Physics | 12/6/11<br>Date |
| Reviewed By: | Signature on File<br>Jeff Ginsburg, Vice President of Waste Management | 12/6/11<br>Date |
| Approved By: | Signature on File<br>Sean McCandless, Director of Compliance and Permitting | 12/6/11<br>Date |

- [ ] New
- [ ] Title Change
- [x] Revision
- [ ] Rewrite
- [ ] Cancellation

Effective Date 12/20/11

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# 1. PURPOSE AND SCOPE

## 1.1 Purpose

To describe operational requirements used to ensure that only waste having Compact/State approval, as required by RML Condition 9.A., is accepted for disposal.

## 1.2 Scope

Each waste generator is responsible for compliance with their respective compact/state radioactive waste disposal requirements. This procedure identifies Approval to Export document requirements used to comply with RML Condition 9.A.

# 2. REFERENCES

2.1 CL-CW-PR-202, Generator Certification

2.2 CL-QA-PR-005, Quality Assurance Records

2.3 CL-SR-PR-041, Incoming Radioactive Waste Shipment Acceptance

2.4 CL-WM-PR-001, Waste Profile Acceptance Process

2.5 Northwest Interstate Compact on Low-Level Radioactive Waste Management, Third Amended Resolution and Order, May 2006, Olympia, Washington.

2.6 Low-Level Radioactive Waste Policy Amendments Act of 1985 (Public Law 99-240)

2.7 Utah Division of Radiation Control, Radioactive Material License, UT 2300249 (RML)

# 3. GENERAL

## 3.1 Definitions

3.1.1 *11e.(2)Waste* - Tailings or wastes produced by the extraction or concentration of uranium or thorium from ore processed primarily for its source material content.

3.1.2 *Approval to Export (ATE)* - A written document, commonly identified as a “permit” or “petition”, issued by a Compact or State authorizing the disposal of low-level radioactive waste at Energy*Solutions*’ Clive facility.

3.1.3 *Blanket Approval* - A Compact or Unaffiliated State policy that does not require a generator to acquire a specific ATE document to ship radioactive waste to Energy*Solutions*' Clive facility for disposal.

3.1.4 *Case-by-Case* - A Compact or Unaffiliated State that requires a specific ATE document to dispose of radioactive waste at Clive's disposal facility does not have a blanket approval allowing shipment for disposal of LLRW to Energy*Solutions*.

3.1.5 *Compact* - Interstate agreement designed to establish and administer a common radioactive waste disposal policy for radioactive waste generated within the member States.

3.1.6 *DOE Wastes* - LLRW wastes produced by the U.S. Department of Energy.

3.1.7 *Low-level Radioactive Waste (LLRW)* - Radioactive waste that is not;

- Classified as high-level radioactive waste, transuranic waste, or spent nuclear fuel.
- 11e.(2) wastes.
- Discrete surface wastes resulting from uranium solution extraction processes.
- Underground ore bodies depleted by the extraction or concentration of uranium or thorium.
- NARM wastes.

3.1.8 *Mixed Waste* - Waste containing both radioactive and chemically hazardous waste.

3.1.9 *Naturally Occuring and Accelerator-Produced Radioactive Materials (NARM)* -

- Any discrete source of radium-226 that is produced, extracted, or converted for use for a commercial, medical, or research activity.
- Any material that has been made radioactive by use of a particle accelerator; for use for a commercial, medical, or research activity.
- Any discrete source of naturally occurring radioactive material used in a commercial, medical, or research activity, other than source material, that the U.S. Nuclear Regulatory Commission determines would pose a threat similar to the threat posed by a discrete source of radium-226 to the public health and safety or the common defense and security
- Accelerator-produced radioactive waste produced during the operation of atomic particle accelerators.

3.1.10 *Processor Waste* - Waste generated (or is otherwise owned) by an entity not named in the contract used by Energy*Solutions* to accept the waste.

3.1.11 *Unaffiliated State* - A State that is not committed to a Compact agreement.

3.1.12 *Waste Generator* - An organization or entity that is ultimately responsible for a waste.

## 3.2 Responsibilities

3.2.1 The Shipping Receiving Coordinator (or designee) is responsible for confirming Compact/State approval prior to accepting each waste shipment.

3.2.2 The Business Development Account Executive (or designee) is responsible for ensuring that generators submit ATE documentation, as required by the Generator's compact/state, prior to any contract agreement.

3.2.3 The Director of Health Physics (or designee) is responsible for verifying the generator has ATE documentation.

3.2.4 The Director of Compliance and Permitting (or designee) is responsible for:

- Identifying Compact/State approval requirements.
- Notifying the Compact/State when there is an approval discrepancy.
- Maintaining this procedure.

## 3.3 Precautions

Do not use the Generator's address recorded on Manifest Form 542, block 5 to determine the State where the waste was generated.

## 3.4 Limitations

3.4.1 Each Waste Generator or shipper is responsible for demonstrating State/Compact approval. Each Waste Generator or shipper requiring an ATE documents approval shall attach the applicable ATE to each profile submittal and shipping manifest. Only ATE documents specifically submitted for each profile request and shipment, by the shipper or waste generator, shall be used for ATE document validation.

3.4.2 Waste Generators or shippers do not need to provide ATE documentations for when waste does not require Case-by-Case ATE.

## 3.5 Records

3.5.1 The ATE documents submitted by Waste Generators and shippers shall be archived with the associated profile and manifest documents in OnBase.

3.5.2 Compact/State correspondence, related to RML condition 9.A., shall be archived in OnBase.

## 4. REQUIREMENTS AND GUIDANCE

### 4.1 Determination of ATE Documentation Requirement

4.1.1 Identify the State where the waste was generated.

**Note: The State where the waste was generated is recorded on:**

- **the Radioactive Waste Profile Record, Form EC-0230, Section A.1 for non-processor waste.**
- **the shipment manifest, Form 540, Block 5, when shipment is not Processor Waste.**
- **the shipment manifest Form 541 block 5 or Form 542 block 10 when shipment is Processor Waste.**

4.1.2 Identify the low-level waste compact affiliation for the State where the waste was generated using Table 1 or Table 2.

4.1.3 Select the waste type from the "Waste Types" listed in Table 3.

**Note: The waste type is recorded on:**

- **the Radioactive Waste Profile Record, Form EC-0230, Section A.2.**
- **The Uniform Hazardous Waste Manifest.**

4.1.4 Using the waste type and the Compact/State determine if Case-by-Case ATE is required for the waste, using Table 3.

### 4.2 ATE Document Validation.

**Note: Only ATE documents submitted with each shipment and profile, by the shipper or waste generator, shall be used for ATE document validation.**

4.2.1 Verify the name on the ATE document matches the Generator name recorded on the profile or manifest.

4.2.2 Verify the State listed on the profile or manifest corresponds to the Compact/State issuing the ATE document.

4.2.3 Verify the shipment "Arrived Date" is between the ATE issue date (or period start date) and the disposal by date (or period end date).

4.2.4 When required, verify the shipment does not cause the total waste volume received to exceed the permitted ATE waste volume.

**Note: Compacts/States that limit export approval to the ATE listed volume are identified in Table 3.**

4.2.5 Attach the ATE and applicable notification documents used to demonstrate compliance with RML Condition 9.A. to the profile or shipment manifest paperwork.

4.3 **Procedure Maintenance**

4.3.1 When informed that a Compact/State ATE requirement has been changed, the Director of Compliance and Permitting, or designee, shall review the change and update procedures as necessary to consistent with the new requirement.

4.3.2 At least once every 24 months the Director of Compliance and Permitting, or designee shall submit a questionnaire, similar to form CL-AD-030-F1, toeach Compact and Unaffiliated State to ensure Energy*Solutions*' practices are consistent with the Compact/State expectations.

**Note: This requirement does not require that the last request or compact/state response be less than two years old. It only requires that a bi-annual routine be established to request the information from the Compact/States.**

## 5. ATTACHMENTS AND FORMS

5.1 Table 1, Compact Members, Ordered by States

5.2 Table 2, Compact Members, Ordered by Compact

5.3 Table3, Approval by Waste Type

5.4 Table 4, Compact Contact Information

5.5 Form CL-AD-PR-030-F1, Revision 1

## 5.1 - Table1, Compact Members, Ordered by States

| ABBRS | COMPACT | ATE | STATE | ABBRS | COMPACT | ATE | STATE |
|---|---|---|---|---|---|---|---|
| AK | Northwest Compact | C | Alaska | MT | Northwest Compact | C | Montana |
| AL | Southeast Compact | | Alabama | NC | Unaffiliated States | | North Carolina |
| AR | Central Compact | C | Arkansas | ND | Southwestern Compact | C | North Dakota |
| AZ | Southwestern Compact | C | Arizona | NE | Unaffiliated States | | Nebraska |
| CA | Southwestern Compact | C | California | NH | Unaffiliated States | | New Hampshire |
| CO | Rocky Mountain Compact | C | Colorado | NJ | Atlantic Compact | | New Jersey |
| CT | Atlantic Compact | | Connecticut | NM | Rocky Mountain Compact | C | New Mexico |
| DC | Unaffiliated States | | Columbia | NV | Rocky Mountain Compact | C | Nevada |
| DE | Appalachian Compact | | Delaware | NY | Unaffiliated States | | New York |
| FL | Southeast Compact | | Florida | OH | Midwest Compact | | Ohio |
| GA | Southeast Compact | | Georgia | OK | Central Compact | C | Oklahoma |
| HI | Northwest Compact | C | Hawaii | OR | Northwest Compact | C | Oregon |
| IA | Midwest Compact | | Iowa | PA | Appalachian Compact | | Pennsylvania |
| ID | Northwest Compact | C | Idaho | PR | Unaffiliated States | | Puerto Rico |
| IL | Central Midwest Compact | | Illinois | RI | Unaffiliated States | | Rhode Island |
| IN | Midwest Compact | | Indiana | SC | Atlantic Compact | | South Carolina |
| KS | Central Compact | C | Kansas | SD | Southwestern Compact | C | South Dakota |
| KY | Central Midwest Compact | | Kentucky | TN | Southeast Compact | | Tennessee |
| LA | Central Compact | C | Louisiana | TX | Texas Compact | C | Texas |
| MA | Unaffiliated States | | Massachusetts | UT | Northwest Compact | C | Utah |
| MD | Appalachian Compact | | Maryland | VA | Southeast Compact | | Virginia |
| ME | Unaffiliated States | | Maine | VT | Texas Compact | C | Vermont |
| MI | Unaffiliated States | | Michigan | WA | Northwest Compact | C | Washington |
| MN | Midwest Compact | | Minnesota | WI | Midwest Compact | | Wisconsin |
| MO | Midwest Compact | | Missouri | WV | Appalachian Compact | | West Virginia |
| MS | Southeast Compact | | Mississippi | WY | Northwest Compact | C | Wyoming |

C- Compact/state issues Case-by-Case ATE.

## 5.2 - Table2, Compact Members, Ordered by Compact

| ABBRS | COMPACT | ATE | STATE | ABBRS | COMPACT | ATE | STATE |
|---|---|---|---|---|---|---|---|
| DE | Appalachian Compact | | Delaware | WY | Northwest Compact | C | Wyoming |
| MD | Appalachian Compact | | Maryland | CO | Rocky Mountain Compact | C | Colorado |
| PA | Appalachian Compact | | Pennsylvania | NM | Rocky Mountain Compact | C | New Mexico |
| WV | Appalachian Compact | | West Virginia | NV | Rocky Mountain Compact | C | Nevada |
| CT | Atlantic Compact | | Connecticut | AL | Southeast Compact | | Alabama |
| NJ | Atlantic Compact | | New Jersey | FL | Southeast Compact | | Florida |
| SC | Atlantic Compact | | South Carolina | GA | Southeast Compact | | Georgia |
| AR | Central Compact | C | Arkansas | MS | Southeast Compact | | Mississippi |
| KS | Central Compact | C | Kansas | TN | Southeast Compact | | Tennessee |
| LA | Central Compact | C | Louisiana | VA | Southeast Compact | | Virginia |
| OK | Central Compact | C | Oklahoma | AZ | Southwestern Compact | C | Arizona |
| IL | Central Midwest Compact | | Illinois | CA | Southwestern Compact | C | California |
| KY | Central Midwest Compact | | Kentucky | ND | Southwestern Compact | C | North Dakota |
| IA | Midwest Compact | | Iowa | SD | Southwestern Compact | C | South Dakota |
| IN | Midwest Compact | | Indiana | TX | Texas Compact | C | Texas |
| MN | Midwest Compact | | Minnesota | VT | Texas Compact | C | Vermont |
| MO | Midwest Compact | | Missouri | DC | Unaffiliated States | | Columbia |
| OH | Midwest Compact | | Ohio | MA | Unaffiliated States | | Massachusetts |
| WI | Midwest Compact | | Wisconsin | ME | Unaffiliated States | | Maine |
| AK | Northwest Compact | C | Alaska | MI | Unaffiliated States | | Michigan |
| HI | Northwest Compact | C | Hawaii | NC | Unaffiliated States | | North Carolina |
| ID | Northwest Compact | C | Idaho | NE | Unaffiliated States | | Nebraska |
| MT | Northwest Compact | C | Montana | NH | Unaffiliated States | | New Hampshire |
| OR | Northwest Compact | C | Oregon | NY | Unaffiliated States | | New York |
| UT | Northwest Compact | C | Utah | PR | Unaffiliated States | | Puerto Rico |
| WA | Northwest Compact | C | Washington | RI | Unaffiliated States | | Rhode Island |

C- Compact/state issues Case-by-Case ATE.

## 5.3 – Table 3, Approval by Waste Type

| Waste Type | Appalachian | Atlantic | Central | Central Midwest | Midwest | Northwest | Rocky Mountain[1] | Southeast | Southwestern | Texas | District of Columbia | Massachusetts | Maine | Michigan | North Carolina | Nebraska | New Hampshire | New York | Puerto Rico | Rhode Island |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LLRW generated within a State and not listed in waste type a. b. or c. | B | B | C | B | B | C | C | B | C | C | B | B | B | B | B | B | B | B | B | B |
| a. LLRW generated within a State, owned or generated by the DOE | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B |
| b. LLRW generated within a State, owned or generated by the US Navy, resulting from decommissioning vessel | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B |
| c. LLRW generated within a State, owned or generated resulting from research, development, testing, or production of atomic weapons. | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B |
| Compact authorization limits for section 3(a)(1)(B)(i-iii) Waste | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Low-Level Radioactive Waste (LLRW) | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 11e.(2) Waste | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B |
| NORM | B | B | B | B | B | B | C | B | B | B | B | B | B | B | B | B | B | B | B | B |
| Mixed Waste | B | B | B | B | B | B | C | B | B | N | B | B | B | B | B | B | B | B | B | B |

Notes

1. The RockyMountain Compact does not approve exceeding the gross waste volume limits listed on the approval to export document.

B. Blanket Approval

C. Case-by-Case Approval Required

N. Generator required to notify Compact of radioactive waste shipment.


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## 5.4 - Table 4, Compact Contact Information

| COMPACT | COMPACT APPROVAL ON WEB | WEB ADDRESS | CONTACT NAME | CONTACT PHONE |
|---|---|---|---|---|
| Appalachian | | http://www.dep.state.pa.us/brp/Nuclear_Safety_Division/RadWasteEmergencyRespSection/appalach.htm | James Barnhart | 717-782-0178 |
| Atlantic | | http://www.atlanticcompact.org/ | Max Batavia | 803-737-1879 |
| Central | x | http://www.cillrwcc.org/ | Rita Houskie | 402-476-8247 |
| Central Midwest | | http://www.cmcompact.org/ | Marcia Marr | 217-785-9982 |
| Midwest | | http://www.midwestcompact.org/about.htm | Stanley York | 608-267-4793 |
| Northwest | | http://www.ecy.wa.gov/nwic/index.asp | Mike Garner | 360-407-7102 |
| Rocky Mountain | | http://www.rmllwb.us/ | Leonard Slosky | 303-825-1912 |
| Southeast | | http://secompact.org/ | Ted Buckner | 919-821-0500 |
| Southwestern | | http://www.swllrwcc.org/ | Kathy Davis | 916-448-2390 |
| Texas | x | http://www.tllrwdcc.org/information.html | Margaret Henderson | 512-820-2930 |
| District of Columbia | | http://hrla.doh.dc.gov/hrla/cwp/view,A,1384,Q,573744,hrlaNav,%7C33257%7C.asp | Greg Talley | 202-724-8800 |
| Massachusetts | | http://www.mass.gov/dph/rcp | William Sellers | 617-242-3457 |
| Maine | | http://www.maine.gov/dhhs/eng/rad/ | Tom Hillman | 207-287-5676 |
| Michigan | | http://www.michigan.gov/deq | Robert Skowronek | 517-241-1253 |
| North Carolina | | http://www.ncradiation.net/ | Wendy Tingle | 919-571-4141 x 209 |
| Nebraska | | http://www.dhhs.ne.gov/rad/ | Julia Schmitt | 402-471-0528 |
| New Hampshire | | http://des.nh.gov/ard_intro.htm | Dennis O'Dowd | 603-271-4585 |
| New York | | http://www.nyserda.org/energy_information/radwaste.asp | Alyse Peterson | 518-862-1090 x 3274 |
| Puerto Rico | | -- | Raul Hernandez | 787-724-7815 |
| Rhode Island | | http://www.health.state.ri.us/hsr/facilities/radiological/ | Terry Tehan | 401-789-9391 |


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## 5.5 Form CL-AD-PR-030-F1, Revision 1

# Export Approval Requirement Questionnaire

| *Compact/Unnafiliated State* | Date |
|---|---|
| | |

Purpose
1) Identify waste types requiring specific export approval for disposal at the Energy*Solutions*, Clive Utah facility. 2) Identify the waste types you would like to see reported in the "Report" column.

| | | Yes | No | Report |
|---|---|---|---|---|
| 1. | Low-Level Radioactive Waste (LLRW); source, special nuclear, or byproduct material (not defined in paragraphs (2), (3), and (4) of the definition of *Byproduct material* set forth in 10CFR20.1003) generated within a State and not listed in waste type a. b. or c. | ☐ | ☐ | ☐ |
| a. | LLRW generated within a State, owned or generated by the U.S. Department of Energy. | ☐ | ☐ | ☐ |
| b. | LLRW generated within a State, owned or generated by the U.S. Navy, resulting from decommissioning vessel | ☐ | ☐ | ☐ |
| c. | LLRW generated within a State, owned or generated resulting from research, development, testing, or production of atomic weapons. | ☐ | ☐ | ☐ |
| 2. | Byproduct material paragraph (2): The tailings or wastes produced by the extraction or concentration of uranium or thorium from ore processed primarily for its source material content, including discrete surface wastes resulting from uranium solution extraction processes. (11e.(2)) | ☐ | ☐ | ☐ |
| 3. | Byproduct material paragraph (3)(i): Any discrete source of radium-226 for use for a commercial, medical, or research activity | ☐ | ☐ | ☐ |
| 4. | Byproduct material paragraph (3)(ii):. Any material that has been made radioactive by use in a particle accelerator for use for a commercial, medical, or research activity. | ☐ | ☐ | ☐ |
| 5. | Byproduct material paragraph (4): Any discrete source of naturally occurring radioactive material for use in a commercial, medical, or research activity | ☐ | ☐ | ☐ |
| 6. | Mixed Waste: LLRW that is also regulated as a Hazardous Waste. | ☐ | ☐ | ☐ |

When export permits are required, Energy*Solutions* verifies an export permit was issued by the compact or unaffiliated state prior to receipt of the first shipment by the waste generator. Please describe any additional export permit controls you would like EnergySolutions to perform.

Each month Energy*Solutions* reports the Compact, State, Generator number, Generator Name, Processor, Bates number, cubic feet, and average radioactive concentration. Do you require any additional information?

Name _____ Title _____