

Idaho National Laboratory

RETRIEVAL OF MATERIAL FROM 16-IN., 24-IN., AND 26-IN. LINERS	Identifier: RSWF-OI-002	Page: 1 of 54
	Revision: 17	
	Effective Date: 10/14/13	

Materials and Fuels Complex	Laboratory Instruction	USE TYPE 2	eCR Numbers: 610299, 615787
Manual: MFC RSWF Operating Instructions (OI)			

TSR RELATED PERMIT RELATED

PROCEDURE REVIEW REQUIREMENTS PER SP-20.1.4					
DISCIPLINE	REVISION	CHANGE	DISCIPLINE	REVISION	CHANGE
NUC OPS MAINTENANCE	N/A	N/A	F&SS	N/A	N/A
MFC FACILITY ENGINEERING	N/A	N/A	FCF OPERATIONS	N/A	N/A
TRAINING	N/A	N/A	HFEF OPERATIONS	N/A	N/A
NUCLEAR SAFETY REVIEW	*	*	EML	N/A	N/A
PROJECTS	N/A	N/A	FASB	N/A	N/A
SSPSF OPERATIONS	N/A	N/A	RCL	N/A	N/A
TREAT OPERATIONS	N/A	N/A	FMF OPERATIONS	N/A	N/A
TREAT WAREHOUSE OPERATIONS	N/A	N/A	ZPPR OPERATIONS	N/A	N/A
HOISTING AND RIGGING	*	*	NRAD OPERATIONS	N/A	N/A
QUALITY	*	*	ANALYTICAL LAB	N/A	N/A
TSD FACILITIES OPERATIONS (CESB and RSWF)	*	*	RADIOLOGICAL CONTROLS	*	*
ENVIRONMENTAL	N/A	N/A	INDUSTRIAL SAFETY	*	*
INTER-FACILITY TRANSFERS	N/A	N/A	INDUSTRIAL HYGIENE	*	*
OUTSIDE REVIEW	N/A	N/A	FIRE PROTECTION	*	*
CUI REVIEW	N/A	N/A	SAFEGUARDS AND SECURITY	N/A	N/A
WASTE GENERATOR SERVICES	N/A	N/A	PACKAGING & TRANS.	N/A	N/A
* QUALIFIED REVIEWER SHALL DETERMINE THE NEED FOR THESE REVIEWS BASED UPON THE SCOPE OF THE CHANGE					

Idaho National Laboratory

RETRIEVAL OF MATERIAL FROM 16-IN., 24-IN., AND 26-IN. LINERS	Identifier: RSWF-OI-002 Revision: 17 Effective Date: 10/14/13 Page: 2 of 54
---	--

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Idaho National Laboratory

RETRIEVAL OF MATERIAL FROM 16-IN., 24-IN., AND 26-IN. LINERS	Identifier: RSWF-OI-002	Page: 3 of 54
	Revision: 17	
	Effective Date: 10/14/13	

REVISION LOG

Rev.	Date	Affected Pages	Revision Description
0	01/29/02	All	New issue.
0a	02/19/02	2, 4, 7, 12, 15, and 17	Change.
0b	05/13/02	3–8, 10, 12, and 17	Change.
0c	07/09/02	1–5, 7–11, and 17	Change.
0d	08/27/02	1–17	Change.
1	10/30/02	1–11, 14–15, and 17	Revision including periodic review.
1a	06/25/03	3, 5, 6, 11–14, and 16	Change.
1b	09/19/03	1, 3–5, 7, 10, and 16	Change.
1c	10/27/03	4, 5, 9–11, and 21	Change.
1d	11/20/03	1, 5–13, 15, 17, and 21	Change.
1e	01/30/04	2, 3, 7, 8, and 10–15	Change including periodic review.
2	07/09/04	1–20 and 24	Change including periodic review.
2a	11/17/04	8, 12, 14, and 18–20	Change.
2b	07/01/05	3, 4, 10, 11, 17, and 19	Change.
3	12/13/05	1–4, 6–22 and 29	Revision.
4	08/21/06	4, 9, 12, and 18	See DAR 506940. Revision.
5	11/21/06	1–4, 6, 9–16, 18, and 19	See DAR 509721. Revision; includes periodic review.
6	08/30/07	All	See eCRs 550533 and 550648. Revision and conversion to LI.
7	12/13/07	5, 7, 14, 15, 17, 18, 20, 23, and 25-27	See eCR 556494.
8	08/19/08	10, 18, 22, 30, 36 and 37	See eCR 561091. PFC.
9	06/11/09	All	See eCRs 569432 and 563138. PFC and revision.
10	06/30/09	All	See eCR 570665. Revision.
11	07/13/09	1-2, 16-21	See eCRs 570966 and 571081. PFCs.

Idaho National Laboratory

RETRIEVAL OF MATERIAL FROM 16-IN., 24-IN., AND 26-IN. LINERS	Identifier: RSWF-OI-002 Revision: 17 Effective Date: 10/14/13	Page: 4 of 54
---	---	----------------------

Rev.	Date	Affected Pages	Revision Description
12	08/11/09	All	See eCRs 571378, 571572, 571688, and 571968. PFCs.
13	06/25/10	All	See eCRs 573799, 578422, and 579215. PFCs.
14	11/16/10	All	See eCR 585921. PFC.
15	08/23/12	All	See eCR 605946. SAR-407 upgrade and periodic review.
16	10/24/12	All	See eCRs 607349, 607512, 607651, and 607596. PFCs.
17	10/14/13	All	See eCRs 610299 and 615787. PFC and revision.

RETRIEVAL OF MATERIAL FROM 16-IN., 24-IN., AND 26-IN. LINERS	Identifier:	RSWF-OI-002	
	Revision:	17	
	Effective Date:	10/14/13	Page: 5 of 54

CONTENTS

- 1. PURPOSE/SCOPE/APPLICABILITY.....7
- 2. RISK AND CONTROLS.....8
 - 2.1.1 All Personnel13
 - 2.1.2 Material Services (MS) (as applicable to task performed).....13
 - 2.1.3 Health Physics Technicians.....13
 - 2.1.4 OPS Personnel.....14
 - 2.1.5 Shift Supervisor.....14
 - 2.2 Precautions and Limitations.....14
 - 2.3 TSR Requirements17
- 3. PREREQUISITES18
 - 3.1 General.....18
 - 3.2 Planning and Coordination18
 - 3.3 Special Tools and Equipment; Parts and Supplies.....19
 - 3.4 Field Preparations20
- 4. FACILITY CONDITIONS.....20
- 5. INSTRUCTIONS.....21
 - 5.1 Remote Drill System Setup.....21
 - 5.2 Sampling the Liner Atmosphere25
 - 5.3 Preparatory Procedures30
 - 5.4 Removing Original Shield Plug.....31
 - 5.5 Removing Material from Liner.....35
 - 5.6 Transfer of Material to a New Liner (if applicable)39
 - 5.7 Wire-Rope Sling Replacement (if applicable).....39
 - 5.7.10 Splicing the Cable Ends Together40
 - 5.7.11 Proof Test40

RETRIEVAL OF MATERIAL FROM 16-IN., 24-IN., AND 26-IN. LINERS	Identifier:	RSWF-OI-002	
	Revision:	17	
	Effective Date:	10/14/13	Page: 6 of 54

- 6. POST-PERFORMANCE ACTIVITIES41
 - 6.1 Job Completion41
 - 6.2 Data Review41
- 7. ABNORMAL OPERATIONS42
 - 7.2 High Radiation While Handling Containers42
 - 7.3 Dropped Container During Handling Operations43
 - 7.3.1 Immediate Actions43
 - 7.3.2 Subsequent Action43
- 8. RECORDS43
- 9. REFERENCES44
- 10. APPENDIXES45
 - Appendix A Figures47
 - Appendix B Resealing the Liner53

RETRIEVAL OF MATERIAL FROM 16-IN., 24-IN., AND 26-IN. LINERS	Identifier:	RSWF-OI-002	
	Revision:	17	
	Effective Date:	10/14/13	Page: 7 of 54

1. PURPOSE/SCOPE/APPLICABILITY

To provide instructions for opening of liners in preparation for retrieval and transfer operations per RWSF-OI-007, "Remote Handled (RH) Waste Transfer," and for retrieving material (stored in multiple layers of containment) from 16-in. liners or from 26-in. liners and transporting the material to a new, cathodically-protected, 16-in. or 26-in. liner within RSWF, an HFEF-5 cask, an Interim Storage Container (ISC), a Facility Transfer Container (FTC), or to FCF, HFEF, or another facility for processing.

Retrievals involving mixed waste must be performed in compliance with the Resource Conservation and Recovery Act (RCRA) Permit (PER-116, "HWMA RCRA Partial Permit Materials and Fuels Complex").

Each working copy of this procedure can only be used to perform one retrieval and transfer.

The activities directed by this procedure have been designated Quality Level 2 per Quality Level Determination MFC-000249.

This procedure implements requirements as identified in SAR-407, "Safety Analysis Report for the Radioactive Scrap and Waste Facility (MFC 771)" and TSR-407, "Technical Safety Requirements for the Radioactive Scrap and Waste Facility (MFC 771)."

Idaho National Laboratory

**RETRIEVAL OF MATERIAL FROM 16-IN.,
24-IN., AND 26-IN. LINERS**

Identifier: RSWF-OI-002

Revision: 17

Effective Date: 10/14/13

Page: 8 of 54

2. RISK AND CONTROLS

Sequence of Basic Activities	Potential Hazard	Hazard Control
1. Retrieval of storage can.	1. Radiation/ contamination	1. 1) Radiological work permit (RWP). 2) Temporary/ALARA shielding when necessary. 3) Extended boom to minimize exposure to crane operator.
2. Liner gas sampling.	2a. Radiation/ contamination	2a. 1) RWP is required to perform sampling operations. 2) Personal protective equipment (PPE) as specified on the RWP.
	2b. Hydrogen fire/explosion	2b. Keep potential ignition sources at least 6 ft from the liner when venting and sampling the gas in the liner.
	2c. Pinch/rotation hazard sharp edges	2c. 1) Maintain situational awareness during remote drill system attachment/setup. 2) Stand at least >50 ft from the liner during drilling operations.
3. Liner opening.	3a. Explosive hydrogen	3a. Sample/purge the liner prior to opening.
	3b. Radiation/ contamination	3b. 1) RWP required for opening of liner. 2) PPE as specified on the RWP.
4. Heavy equipment operation/cask operation.	4a. Damage to equipment	4a. Equipment operations must be performed by Material Services (MS) personnel.
	4b. Transfer path disturbed or unstable	4b. 1) If disturbed, test drive a forklift with empty cask over the path. 2) Loads must be closer to the ground during movement.

Idaho National Laboratory

**RETRIEVAL OF MATERIAL FROM 16-IN.,
24-IN., AND 26-IN. LINERS**

Identifier: RSWF-OI-002

Revision: 17

Effective Date: 10/14/13

Page: 9 of 54

Sequence of Basic Activities	Potential Hazard	Hazard Control
	4c. Personnel injury	4c. 1) Restrict the field work area to authorized personnel and identify proper PPE to enter the work area. 2) Where overhead obstructions exist, hard hats are to be used to protect workers. 3) Ensure high visibility garments are worn by persons in proximity to operating equipment. 4) Safety shoes must be worn by personnel..
5. Hoisting and rigging.	5. Personnel injury and equipment damage	5. 1) Rigging tackle inspected for defects by a qualified rigger prior to use. 2) Rigging and hoisting equipment annual inspection certification verified prior to use. 3) Personnel must wear safety shoes and protective gloves and keep hands clear of pinch points. 4) Make sure the load is attached securely and that the correct lifting equipment is used. 5) Never travel suspended loads over personnel. 6) A load indication device shall be used to prevent inadvertent equipment overload. 7) The load indication device shall be in current calibration. 8) At least one person assigned to the lift will be the designated leader (DL).
6. Container shield plug removal/installation.	6. Personnel burns and eye damage	6. 1) Wear required PPE per designated Hot Work Permit. 2) Welding operation performed per designated Hot Work Permit.

Idaho National Laboratory

**RETRIEVAL OF MATERIAL FROM 16-IN.,
24-IN., AND 26-IN. LINERS**

Identifier: RSWF-OI-002

Revision: 17

Effective Date: 10/14/13

Page: 10 of 54

Sequence of Basic Activities	Potential Hazard	Hazard Control
7. Use of gas cylinders.	7. Missile hazard	7. 1) Ensure cylinder caps are installed prior to transporting cylinders. 2) Ensure cylinders are stored in the upright position and properly restrained. 3) Safety shoes and leather gloves must be worn by personnel handling compressed gas cylinders.
8. Elevated work/ladders.	8. Slips and falls	8. 1) Ensure handrail is installed on the cask adapter for personnel access. Ensure the safety line is fastened between handrails. 2) Use extra caution when working on transfer casks and using heavy equipment. 3) Tie off ladder or ensure ladder hooks are secure at the top prior to work. 4) Tools will not be carried in hand while ascending or descending the ladder (i.e. carry tools in belt-fastened pouches or raise/ lower by hand line.). 5) Tools carried in belt-fastened pouches or raised/ lowered by hand line. 6) Maintain three points-of-contact while ascending/descending.

Idaho National Laboratory

**RETRIEVAL OF MATERIAL FROM 16-IN.,
24-IN., AND 26-IN. LINERS**

Identifier: RSWF-OI-002

Revision: 17

Effective Date: 10/14/13

Page: 11 of 54

Sequence of Basic Activities	Potential Hazard	Hazard Control
9. Working near open liner.	9. Falls	9. Cover open liners when left unattended, with a temporary cover or protect the open hole with standard removable railing.
10. Hazardous/uneven walkways.	10. Falls, slips, and trips	10. 1) Watch for uneven ground, above ground liners, and concrete rows. 2) Observe and be aware of potential tripping hazards presented by positioning devices, liners, retrieval cables, concrete rows, and heavy equipment. 3) Remove excess snow in work area and wear proper footwear for slick surfaces.
11. Weather conditions.	11. Personnel injury, slips, and falls	11. 1) Use extra caution when working on transfer casks and using heavy equipment. 2) Discontinue work and seek shelter per LWP-16108 or at the direction of the Shift Supervisor (SS). 3) Crane operations must be suspended when sustained winds are >25 mph. 4) Supervisor shall establish heat/cold stress stay times per LWP-14606.

Idaho National Laboratory

**RETRIEVAL OF MATERIAL FROM 16-IN.,
24-IN., AND 26-IN. LINERS**

Identifier: RSWF-OI-002

Revision: 17

Effective Date: 10/14/13

Page: 12 of 54

Sequence of Basic Activities	Potential Hazard	Hazard Control
12. Working in RSWF.	12. Snake/insect bites or stings	12. 1) Visually inspect area for snakes/stinging insects prior to work. 2) Contact the TSD Facilities Manager to have any snakes/biting insects found removed from the work area. 3) If bitten or stung, notify supervisor and seek immediate medical attention. 4) There is a potential for snakes to take shelter under material lying on the ground; use caution when moving material lying on the ground undisturbed. Do not reach under material until you know there are no snakes under it.

RETRIEVAL OF MATERIAL FROM 16-IN., 24-IN., AND 26-IN. LINERS	Identifier: RSWF-OI-002	Page: 13 of 54
	Revision: 17	
	Effective Date: 10/14/13	

2.1.1 All Personnel

- 00INL288, Personal Protective Equipment
OR
QLHAZ24T, 24-HR TSD WKR (OSHA HAZWOPER)

NOTE: *Personnel without Rad Worker training may be allowed entry onto the RWP under escort with approval of the facility RadCon Manager.*

- QN00RAD1, INL Radworker I
OR
QN00RAD2, INL Radworker 2, for unescorted access (with exception of Health Physics Technician [HPT])
- 0TRN1041, Compressed Gas Safety Training
- 00TRN606, Heat Stress
- SMTT0010, Cold Stress
- 0INL1140, INL Ladder and Roof Safety
- QNFPARWK, INL At-Risk Worker Fall Protection
- TSD Support Personnel Qualification, except escorted personnel.

2.1.2 Material Services (MS) (as applicable to task performed)

- QNHSWING, Swing Cab Tel Boom Crane Operator
- QNRIGGER, Rigger
- QNFKL002, Forklift Operator
- QNTSDFEO, EO TSDF Support Personnel
- QNMFHEEO, Heavy Equipment Operator.

2.1.3 Health Physics Technicians

- QNMFCHPT, Health Physics Qualification.

RETRIEVAL OF MATERIAL FROM 16-IN., 24-IN., AND 26-IN. LINERS	Identifier: RSWF-OI-002	
	Revision: 17	
	Effective Date: 10/14/13	Page: 14 of 54

2.1.4 OPS Personnel

- QNTSD1OP, TSD Nuclear Facility Operator
- QLHAZ24T, 24-HR TSD WKR (OSHA HAZWOPER).

2.1.5 Shift Supervisor

- QLHAZ24T, 24-HR TSD WKR (OSHA HAZWOPER).

2.2 Precautions and Limitations

NOTE: *Specific container designs have changed over the years and the generic description of "HFEF-5 container" has been generically applied to containers stored in 16-in liners. For purposes of this procedure, the description of HFEF-5 container covers all containers stored in 16 in. liners including cans that originated from Argonne National Laboratory-East (ANL-E).*

2.2.1 OPS/MS: IF radiological conditions exceed the limiting conditions that void the RWP at any point in this procedure, THEN stop work, place work area in a safe condition, and notify TSD Facilities Manager and HP Supervisor.

2.2.2 Heavy equipment operations must be per LWP-14104, "Heavy Industrial Equipment."

2.2.3 Heavy equipment exceeding 12,000 pounds, which has not been evaluated for load effects on the storage liners at RSWF per ECAR-1827, "RSWF Equipment Loading Adjacent to Liners," must be restricted to the maintained roadway that runs inside the perimeter fence of RSWF.

TSR-407 AC 5.407.1

2.2.4 Container HANDLING is limited to a single container at any one time.

RETRIEVAL OF MATERIAL FROM 16-IN., 24-IN., AND 26-IN. LINERS	Identifier:	RSWF-OI-002	
	Revision:	17	
	Effective Date:	10/14/13	Page: 15 of 54

- 2.2.5 Wire-rope slings are attached directly to the lids of the storage containers that are contained in the liners and are located between 2 and 6.5 feet below ground surface. These containers contain remote-handled material (very high radiation readings). Because of the hostile environment, the wire-rope slings cannot be load tested or inspected annually and may not be marked with the rated capacity and inspection date. SD-38.1.2, "Treatment, Storage, and Disposal Facilities (TSDF) Hostile Environment Plan," documents any special operating and maintenance requirements for this equipment. Prior to removing a waste container from a liner, the wire-rope sling must be visually inspected by a certified inspector for size and condition. If a wire-rope sling is <1/4 in. in diameter or determined to be unsatisfactory, the wire-rope sling must be replaced prior to retrieval. If a wire-rope sling is 1/4 in., 5/16 in., or 1/2 in. in diameter and it is in satisfactory condition, the container may be removed.
- 2.2.6 During crane operations, avoid "shock loading" when lowering a container into a storage liner or the HFEF-5 cask.
- 2.2.7 As a Best Management Practice, the crane operator should rotate his boom away from personnel working below, as much as practical.
- 2.2.8 Acceptable communication methods, during retrieval operations, include verbal communications, cell phones, and mutually-agreed-upon hand signals.

TSR-413 AC 5.413.1.2

- 2.2.9 For transfers to MFC Facilities, container transfers involving Hazard Category 3 or greater quantities of radioactive material using non-DOT-compliant packages at MFC shall be conducted per the configurations and parameters detailed in LST-337, "Approved Container/Payload List for Inter-Facility Transfer Operations at MFC."

TSR-413 AC 5.413.1.2

- 2.2.10 For transfers to MFC Facilities, compliance with the details of LST-337 is executed within the interfacing facility for payload configurations and contents, and transfer configurations and parameters (with the exception of transfer speed, transfer height and ambient operating temperature). If the container/packaging is not identified in LST-337, the transfer cannot be made.

RETRIEVAL OF MATERIAL FROM 16-IN., 24-IN., AND 26-IN. LINERS	Identifier:	RSWF-OI-002	
	Revision:	17	
	Effective Date:	10/14/13	Page: 16 of 54

TSR-413 AC 5.413.1.2

- 2.2.11 For transfers to MFC Facilities, verification that payload configurations and contents, and transfer configurations and parameters, meet the LST-337 requirements must, at a minimum, be documented on FRM-790, "MFC Transfer of HC-3 or Greater Quantity of Hazardous Material in Non-DOT-Certified Packaging" (reference TSM-OI-003, "Transfer of Hazardous Material in Non-DOT-Certified Packaging between MFC Nuclear Facilities").

TSR-407 AC 5.407.4

- 2.2.12 At least one qualified operator or SS shall be present during liner loading and unloading operations involving a shielded transfer cask.
- 2.2.13 All RSWF transfers must be approved by the TSD Facilities Manager.
- 2.2.14 The RSWF has limited access and is controlled per the RSWF Security Plan, which is available through the TSD Facilities Manager.
- 2.2.15 The transfer of any accountable nuclear material to or from RSWF must be accompanied by appropriate Safeguards documentation (reference RSWF-OI-005, "Nuclear Material Control Plan").
- 2.2.16 Welding associated with this procedure is on A-36 carbon steel (no certificates required). Weld per INL Welding Manual, specifications number C3.5 and Figure 1, RSWF shield-plug lifting ring, and Figure 2, Lifting lug/support tab weld.
- 2.2.17 If a problem is encountered that will prevent completion of this procedure all work must be stopped, the TSD Facilities Manager notified, and the actions necessary to place the facility/liners in a safe configuration determined as follows:
- If the retrieval cannot be completed by the end of the day, the TSD Facilities Manager, with written concurrence of the INL Safeguards Manager, may authorize a delay in welding shut or emptying a liner containing scrap (such as, accountable material or spent nuclear fuel). The actions to be performed to resolve the problem must be documented in an appropriate form (e.g., work order, nonroutine procedure), commensurate with the complexity of the evolution.
 - All actions must comply with applicable facility regulations (RCRA permit, Safety Analysis Report [SAR-407]/Technical Safety Requirements [TSR-407] and RSWF-OI-005)

RETRIEVAL OF MATERIAL FROM 16-IN., 24-IN., AND 26-IN. LINERS	Identifier: RSWF-OI-002	Page: 17 of 54
	Revision: 17	
	Effective Date: 10/14/13	

- If a liner has been opened that contains material requiring containment (e.g., RCRA-regulated material or fuel), the instructions must also include directions on how to meet this requirement (such as rewelding the shield plug in place)
- The instructions must be reviewed as determined by the TSD Facilities Manager and must include, as a minimum, the SS and Operations Support personnel, and approval by the TSD Facilities Manager.

SAR-407 Safety Analysis Commitment

2.2.18 Remote liner drilling capabilities are required to comply with a safety analysis commitment derived in the SAR. The remote liner drilling commitment reduces the consequence of a radioactive material release to the facility worker by removing the facility worker from the potential hazard during initial opening (drilling) of a closed liner. The remote liner drilling activity involves the use of a drilling apparatus designed to be operated away from the liner. The remote liner drilling commitment applies to those liners that have welded closure covers.

2.2.19 Keep heavy equipment 6 ft away from 48 in. and 60 in. liners.

2.3 TSR Requirements

2.3.1 The following TSR-407 Limiting Conditions for Operation (LCOs) and Administrative Controls (ACs) are applicable to the work scope addressed in this procedure.

TSR	
LCO/SAC 3.407.1	Container Position
LCO/SAC 3.407.2	Supplemental Radiological Control
AC 5.407.1	Container Handling Limit
AC 5.407.2	RSWF In-facility Movements
AC 5.407.3	Cask Seating Requirement
AC 5.407.4	Staffing Requirement
SAR-413	Safety Analysis Report for Inter-Facility Transfers to MFC

Idaho National Laboratory

RETRIEVAL OF MATERIAL FROM 16-IN., 24-IN., AND 26-IN. LINERS	Identifier:	RSWF-OI-002	Page: 18 of 54
	Revision:	17	
	Effective Date:	10/14/13	

3. PREREQUISITES**3.1 General****SAR-413**

- 3.1.1 SS: For transfers to MFC Facilities, verify transfer configurations greater than Haz Cat 3 have been approved by the shipping and receiving facility Nuclear Facility Managers and is documented on FRM-790, "Transfer of HC-3 or Greater Quantity of Hazardous Material in NON-DOT-Certified Packaging." Include a copy of FRM-790 with the container retrieval data package.
- 3.1.2 RSWF MBA Custodian/Safeguards Representative/SS: Verify proper liner identification number and mark the liner for retrieval operation. Record the liner number below:

Liner No.:	
------------	--

RSWF MBA Custodian/ Safeguards Representative/S#:		Date:	
RSWF SS/S#:		Date:	

TSR-407 AC 5.407.4

- 3.1.3 Verify that at least one QUALIFIED operator or SS is present.

SAR-407 Safety Analysis Commitment

- 3.1.4 Heavy equipment that has not been evaluated for load effects on the storage liners at RSWF per ECAR-1827, "RSWF Equipment Loading Adjacent to Liners," must be restricted to the maintained roadway that runs inside the perimeter fence of RWSF.

3.2 Planning and Coordination

- 3.2.1 Ensure a RWP has been initiated.
- 3.2.2 Attach a copy of a completed Form 429.01, "Idaho National Laboratory — Weld Data Sheet," to the working copy of this procedure.

RETRIEVAL OF MATERIAL FROM 16-IN., 24-IN., AND 26-IN. LINERS	Identifier: RSWF-OI-002	
	Revision: 17	
	Effective Date: 10/14/13	Page: 19 of 54

3.3 Special Tools and Equipment; Parts and Supplies

3.3.1 Material Services Handling: Ensure the following are available (as applicable):

- Mobile crane
- Forklift (25 ton minimum)
- Cask adapter with safety rails (for mounting the cask on the forklift)
- HFEF-5 cask (as required)
- Positioning device
- Lifting tackle to attach to the retrieval cable
- Two nylon slings with a working load limit (WLL) of at least 5,600 lb
- 5/8 in. shackle with a WLL of at least 5,600 lb
- Cable handling tool
- Temporary/ALARA shielding (if required)
- Load indicating device with current calibration sticker
- 14 ft replacement cable 1/4 in., crimps, go-no-go gauge.

Idaho National Laboratory

RETRIEVAL OF MATERIAL FROM 16-IN., 24-IN., AND 26-IN. LINERS	Identifier: RSWF-OI-002	Page: 20 of 54
	Revision: 17	
	Effective Date: 10/14/13	

NOTE: *Independent Verification (IV) is required for the item obtained in Step 3.3.2. If a different meter is used on different days, document the performance of Step 3.3.2 on the new meter on a copy of this page.*

3.3.2 Obtain a H2SCAN portable hydrogen detector; record the calibration data in the following table. (The H2SCAN detector will have a Vendor Calibration Sticker rather than a Standards and Calibration Lab information.)

Manufacturer	Model Number	S&CL Number	Calibration Due Date

It has been verified that the above specified M&TE is available and calibrated.			
Signature/S #:		Date:	
IV Signature/S #:		Date:	

3.4 Field Preparations

3.4.1 SS: Inspect the row where the retrieval will occur for obstacles (e.g., liners, lift fixtures) and low areas that might interfere with the movement of the heavy equipment.

4. FACILITY CONDITIONS

4.1 SS: Verify the retrieval operation to be performed has been approved and approval is documented on an RSWF-Transfer Evaluation Checksheet (reference RSWF-OI-004, Appendix A) by the TSD Facilities Manager.

TSR-407, AC 5.407.2

4.2 SS: Verify the weather conditions (e.g., wind, snow, rain) are safe for performing the transfer. (Temperature must be >-40°F, sustained winds are not >25 mph, and no severe weather warnings are in effect.)

4.3 SS: Verify the approved hot work permit for RSWF has not expired.

Idaho National Laboratory

RETRIEVAL OF MATERIAL FROM 16-IN., 24-IN., AND 26-IN. LINERS	Identifier:	RSWF-OI-002	Page: 21 of 54
	Revision:	17	
	Effective Date:	10/14/13	

TSR-407, AC 5.407.1

4.4 Ensure no other container handling activities are in progress.

Facility conditions have been met.			
Shift Supervisor/S#:		Date:	

5. INSTRUCTIONS

NOTE 1: *The subsections within Section 5 may be performed independently of each other or marked "N/A" at the discretion of the SS.*

NOTE 2: *The RSWF Representative may document step completion (in lieu of the person completing the step) during the performance of steps that must be performed sequentially without interruption.*

NOTE 3: *SS may pre-direct the performance of multiple steps of this procedure.*

NOTE 4: *Movement and staging heavy equipment may be performed as per SS direction, in any order.*

5.1 Remote Drill System Setup

5.1.1 OPS: Obtain the following (as required):

- One each, 6 in. long, 1/8 in. or 1/4 in. twist drill. Multiple bits may be required during the drilling operation
- Ductmate flange-gasket putty or equivalent
- Remote drill system with control box and remote control unit (see Figure 3, Remote drill system, and Figure 4, Remote drill system control schematic)
- Two charged 12-Vdc batteries
- Wire brush (to clean rust from liner prior to installing remote drilling system)
- Vacuum grease
- Gauge tool appropriate to the thickness of the liner wall

RETRIEVAL OF MATERIAL FROM 16-IN., 24-IN., AND 26-IN. LINERS	Identifier: RSWF-OI-002	
	Revision: 17	
	Effective Date: 10/14/13	Page: 22 of 54

- Bottle cart to transport and hold argon gas cylinder
 - Liner purge system including: purge block with calibrated pressure gauge and relief valve, argon gas cylinder with regulator (for liner purge), vent block, vent line with HEPA filter and valve).
- 5.1.2 Obtain an H2SCAN portable hydrogen detector and a calibration gas cylinder (2% hydrogen) with certification paper and expiration date.
- NOTE:** *The following steps may be performed as needed to ensure that the hydrogen detector is operable.*
- 5.1.3 Perform portable hydrogen detector operability test daily prior to use as follows:
- 5.1.3.1 Verify hydrogen detector is within calibration by checking the date on the calibration label.
 - 5.1.3.2 Connect regulator to gas bottle cylinder.
 - 5.1.3.3 Ensure tubing is connected to regulator.
 - 5.1.3.4 Ensure the H2Scan calibration cup is connected to the end of the tubing.
 - 5.1.3.5 While in a non-hydrogen environment, power the detector on.
 - 5.1.3.6 Allow the detector to perform its warm up period, and then sit in normal atmosphere for at least two additional minutes.
 - 5.1.3.7 Power detector off.
 - 5.1.3.8 Power detector on.
 - 5.1.3.9 Allow the detector to perform its warm up period, and then sit in normal atmosphere for at least one additional minute.
 - 5.1.3.10 Connect the calibration cup to detector sensor.
 - 5.1.3.11 Open regulator valve to obtain flow of hydrogen gas through hose to the detector sensor.
 - 5.1.3.12 Expose the detector sensor to 2% hydrogen for three minutes, with the calibration cup assembly installed.

RETRIEVAL OF MATERIAL FROM 16-IN., 24-IN., AND 26-IN. LINERS	Identifier: RSWF-OI-002	
	Revision: 17	
	Effective Date: 10/14/13	Page: 23 of 54

- 5.1.3.13 Shut regulator valve to stop flow from the regulator, and remove the calibration cup from the detector sensor.
- 5.1.3.14 Allow the detector reading to return to an indication of 0%.
- 5.1.3.15 Power detector off.
- 5.1.3.16 Power detector on and allow it to perform its warm up period.
- 5.1.3.17 Reconnect the calibration cup to detector sensor.
- 5.1.3.18 Open regulator valve to obtain flow of hydrogen gas through hose to the detector sensor.
- 5.1.3.19 Expose the detector sensor to 2% hydrogen for three to five minutes, with the calibration cup assembly installed.
- 5.1.3.20 Read detector display, verifying readout is between 1.6% and 2.4% hydrogen, which is within the factory tolerance.
- 5.1.3.21 IF the detector is out of tolerance, THEN the operability test may be performed again by repeating Substeps 5.1.3.7 through 5.1.3.22, OTHERWISE the detector is ready for operation.
- 5.1.3.22 Secure gas bottle and regulator.
- NOTE 1:** *Ensure that the battery is removed from the charger or that the ON/OFF switch is in the OFF position prior to connecting or disconnecting charger power.*
- NOTE 2:** *Multiple drill bits may be required for the operation and they can be changed out under the direction of the SS.*
- NOTE 3:** *Radiological Buffer Area (RBA) specified in Steps 5.1.15 may be established at any time, prior to Step 5.1.15 per the direction of the SS.*
- 5.1.4 Screw the spring-adjusting knob (HW-2) to collapse the spring as far as possible.
- 5.1.5 As necessary, insert a 1/8 or 1/4 in. × 6 in. long drill bit through the grommet in the connection fitting. (Tighten the compression fitting until the drill bit is hard to turn by hand.)

Idaho National Laboratory

RETRIEVAL OF MATERIAL FROM 16-IN., 24-IN., AND 26-IN. LINERS	Identifier: RSWF-OI-002	
	Revision: 17	
	Effective Date: 10/14/13	Page: 24 of 54

- 5.1.6 Set and pin the liner size block on the remote drill system for the size of the liner to be drilled.
- 5.1.7 Prepare the area around the liner to be drilled; remove soil as necessary to allow placement of the remote drill rig on the liner.
- 5.1.8 Clean the area on the liner where the drill rig seals to the liner (scrape or use a wire brush).
- 5.1.9 Apply a small amount of vacuum grease to the rubber seal on the remote drill system and/or liner area for the seal surface.
- 5.1.10 Place the remote drill system on the liner; using HW-1, center and tighten the remote drill system to the liner.
- 5.1.11 Adjust the drill bit to contact liner as necessary to provide more spring pressure and tighten the drill bit in the drill chuck.
- 5.1.12 Undo the spring-adjusting knob (HW-2) until the drill bit contacts the liner and then back off HW-2 approximately 1/2 in.

NOTE 1: *Liner wall thickness is noted on Dwg. 747635, "RSWF Liner Configuration."*

NOTE 2: *RSWF 16 in. O.D./10 ft liner walls are all 1/2 in. thick and the 16 in. O.D./12 ft 4 in. liner walls are all 1/4 in. thick.*

- 5.1.13 Determine the thickness of the liner wall to be sampled. Record the liner-wall thickness below:

Liner wall thickness (in.):	
-----------------------------	--

- 5.1.14 Using the appropriate limit-switch area of the gauge tool, set the limit-switch gap by adjusting the bolt in/out as appropriate and finger tighten the hex lock nut.
- 5.1.15 HPT: Establish a (RBA).

RETRIEVAL OF MATERIAL FROM 16-IN., 24-IN., AND 26-IN. LINERS	Identifier:	RSWF-OI-002	Page: 25 of 54
	Revision:	17	
	Effective Date:	10/14/13	

5.2 Sampling the Liner Atmosphere

NOTE 1: *Sampling of a liner atmosphere should only be performed if the retrieval operation is planned to occur within 30 days of the sampling date. Should the retrieval plans change (e.g., due to program change after venting is initiated) such that the package won't be retrieved within 30 days after the atmosphere is acceptable for retrieval, the vent hole must be sealed to prevent outside sources of contamination from entering the liner.*

NOTE 2: *Subsection 5.2 may be performed in part or as a whole as needed to verify liner hydrogen levels are acceptable.*

5.2.1 **SS:** Verify the liner number on the identified liner matches the number listed in Step 3.1.2. Record the number of the liner to be sampled and the date in the following data table:

Liner number:	
Date:	

WARNING

Explosive hydrogen may be present in the liner; therefore, the liner must be drilled and sampled for hydrogen prior to opening the liner.

5.2.2 Drill a hole through the liner as follows:

- 5.2.2.1 Ensure the DC POWER switch on the control box is in the OFF position.
- 5.2.2.2 Connect the control box to the remote drill system and ensure the battery is installed.
- 5.2.2.3 Place the DC POWER switch on the control box to the ON position.
- 5.2.2.4 Move >50 ft away from the liner.

RETRIEVAL OF MATERIAL FROM 16-IN., 24-IN., AND 26-IN. LINERS	Identifier:	RSWF-OI-002	
	Revision:	17	
	Effective Date:	10/14/13	Page: 26 of 54

5.2.2.5 Press the start button on the remote control. (The green and red lights on top of the control box should illuminate and the drill will start.)

NOTE: *Typically it takes approximately 1 minute to drill a hole in a liner. If it appears that it is taking too long to drill a hole, the drill may be stopped and the problem investigated and corrected. The drill bit may need to be replaced. Corrective action will be as directed by the SS.*

5.2.2.6 Observe the control box and note when the red light turns off. (This indicates that the hole has been drilled successfully through the liner. At this point, the drill motor is turned off automatically by the limit switch.)

5.2.2.7 Place the DC POWER switch on the control box in the OFF position.

5.2.2.8 Screw the spring-adjusting knob (HW-2) to collapse the spring as far as possible.

NOTE: *Positive or negative pressure is determined by testing the air flow via the vent line assembly. If negative pressure is present, the assembly will exhibit suction properties.*

5.2.3 Attach the vent line assembly to the remote drill system sample port via the quick disconnect.

5.2.4 Open the vent line valve, determine if the liner is pressurized, and then shut the vent line valve.

5.2.5 Based on whether or not the liner is pressurized, perform either Step 5.2.6 or 5.2.7, as directed by the SS.

NOTE: *Steps 5.2.6 and 5.2.7 can only be performed if the portable hydrogen detector is available.*

5.2.6 If the liner is pressurized, perform the following:

5.2.6.1 Attach the vent line with HEPA filter and valve to the remote-drill system sample port.

RETRIEVAL OF MATERIAL FROM 16-IN., 24-IN., AND 26-IN. LINERS	Identifier: RSWF-OI-002	
	Revision: 17	
	Effective Date: 10/14/13	Page: 27 of 54

CAUTION

Care must be taken to prevent sealing the probe of the hydrogen detector against the sample line. The detector could be damaged if it becomes pressurized.

- 5.2.6.2 Open the vent line valve and commence taking samples with the portable hydrogen detector approximately every minute until hydrogen level is <0.8% or until the liner is depressurized.
- 5.2.6.3 IF hydrogen levels have decreased to <0.8%, THEN, perform the following:
- 5.2.6.3.1 Remove the remote drilling system.
- 5.2.6.3.2 HPT: Perform a verification radiological survey on the liner purge HEPA filter and remote drilling system.
- NOTE:** *If this procedure will be performed multiple times within the same shift, the RBA postings and controls may remain in effect, as directed by the Shift Supervisor.*
- 5.2.6.3.3 IF the survey indicates no contamination, THEN remove the RBA postings and controls or mark N/A, as applicable.
- 5.2.6.4 IF the liner depressurizes and the hydrogen level is still >0.8%, THEN perform Step 5.2.7, IF NOT GO TO Step 5.2.8.
- 5.2.7 If the liner is NOT pressurized, perform the following:
- 5.2.7.1 HPT: Perform a verification radiological survey on the liner purge HEPA filter and remote drilling system.
- 5.2.7.2 Rotate the remote drill system 180 degrees and drill a second hole.
- 5.2.7.3 Remove the remote drill system.

RETRIEVAL OF MATERIAL FROM 16-IN., 24-IN., AND 26-IN. LINERS	Identifier:	RSWF-OI-002	
	Revision:	17	
	Effective Date:	10/14/13	Page: 28 of 54

- 5.2.7.4 HPT: Perform a verification radiological survey on the remote drilling system.
- 5.2.7.5 Install the liner purge system (see Figure 5).
- 5.2.7.6 Ensure the vent valve is closed.
- 5.2.7.7 Open the argon purge cylinder.
- 5.2.7.8 Establish a flow rate that does not exceed 5 psi on the purge system. (PI-001)
- 5.2.7.9 Pressurize liner to approximately 4.5 psi.
- 5.2.7.10 Stop pressurization by closing the flow valve.
- 5.2.7.11 Let stand approximately 5 minutes.
- NOTE:** *In the following steps, hydrogen level may fluctuate based on the pressurization. It is essential to wait until pressure has decreased to less than 1 psi to obtain an accurate hydrogen level reading.*
- 5.2.7.12 Perform the following steps:
- 5.2.7.12.1 Open the vent valve to begin depressurization. Monitor the hydrogen level during the depressurization.
- 5.2.7.12.2 Take a hydrogen reading when pressure has decreased to <1 psi. If the hydrogen level is <0.8, then **GO TO** Step 5.2.7.14.
- 5.2.7.13 IF hydrogen reading is >0.8, THEN repeat Steps 5.2.7.6 through 5.2.7.12.2 until hydrogen levels are <0.8%.
- 5.2.7.14 Secure the purge and remove the liner purge system.
- 5.2.7.15 HPT: Perform a verification radiological survey on the liner purge HEPA filter and liner purge system.

Idaho National Laboratory

RETRIEVAL OF MATERIAL FROM 16-IN., 24-IN., AND 26-IN. LINERS	Identifier:	RSWF-OI-002	
	Revision:	17	
	Effective Date:	10/14/13	Page: 29 of 54

NOTE: *If this procedure will be performed multiple times within the same shift, the Radiological Buffer Area postings and controls may be left in place, as directed by the Shift Supervisor.*

5.2.7.16 IF the survey indicates no contamination, THEN remove the Radiological Buffer Area postings and controls or mark N/A, as applicable.

5.2.8 Place a painted dust cover over the liner to identify it as the liner to be opened.

5.2.9 IF the shield plug/cover plate is required to be removed, THEN continue with this procedure to Step 5.3.

5.2.10 IF the shield plug/cover plate does not require removal, THEN discontinue this procedure and go to RSWF-OI-010, "Retrieval of Loaded Liners," or RSWF-OI-012, "Excavation of Loaded Liners."

RETRIEVAL OF MATERIAL FROM 16-IN., 24-IN., AND 26-IN. LINERS	Identifier:	RSWF-OI-002	Page: 30 of 54
	Revision:	17	
	Effective Date:	10/14/13	

5.3 Preparatory Procedures

CAUTION

To prevent damage to equipment and the liners, close observation is required to ensure the heavy equipment does not contact the liners when entering the area.

NOTE 1: *The RSWF Representative may document step completion (in lieu of the person completing the step) during the performance of steps that must be performed sequentially without interruption.*

NOTE 2: *If this procedure is being used to prepare a liner for RSWF-OI-007 operations, steps not required will be marked N/A, as directed by the SS.*

NOTE 3: *SS may pre-direct the performance of multiple steps of this procedure.*

5.3.1 SS: Record the following below:

Date of retrieval:	
Transfer/retrieval number:	
Material transferred from liner No.:	
Material transferred to liner No.: (only applicable to liner-to-liner transfers)	
Container Identification No.:	

5.3.2 SS: Notify the FCF Representative to make arrangements with HFEF to transfer the load received from RSWF (if necessary).

5.3.3 SS: Notify the RSWF Material Balance Area (MBA) Custodian that material will be retrieved from an RSWF liner.

Idaho National Laboratory

RETRIEVAL OF MATERIAL FROM 16-IN., 24-IN., AND 26-IN. LINERS	Identifier: RSWF-OI-002	Page: 31 of 54
	Revision: 17	
	Effective Date: 10/14/13	

- 5.3.4 RSWF MBA Custodian: Verify proper liner identification number and contents and provide a transfer document to RSWF personnel (if necessary).

I have been notified of the transfer. Proper liner identification number and contents have been verified and (if necessary) a transfer document provided to RSWF personnel.			
RSWF MBA Custodian/ Safeguards Representative:		Date:	

- 5.3.5 SS: Record the transfer document tracking number (if necessary):

Transfer Document Tracking No.:	
---------------------------------	--

- 5.3.6 SS: Verify that the atmosphere of the liner to be opened (listed in Step 5.2.1) has been sampled and is <0.8% as indicated by the portable hydrogen monitor.

The atmosphere of the liner to be opened is <0.8% as indicated by the portable hydrogen monitor.			
Shift Supervisor:		Date:	

5.4 Removing Original Shield Plug

- 5.4.1 Welder: Verify the liner number on the identified liner matches the number listed in Step 5.2.1. Record the liner number below:

Liner No.	
-----------	--

- 5.4.2 Welder: If the existing lifting fixture must be replaced on the shield plug (not of the design of Figure 1), remove the existing lifting fixture from the shield plug and replace it with a new lifting fixture per the INL Welding Manual, Specification Number C3.5 or C6.13 and Figure 1.
- 5.4.3 Using a cutting torch, remove all except approximately one in. of the weld from the shield plug.
- 5.4.4 Attach three support tabs (retainer plates) to the shield plug in accordance with the INL Welding Manual, Section C3.5 (refer to Figure 2, Detail 1).

RETRIEVAL OF MATERIAL FROM 16-IN., 24-IN., AND 26-IN. LINERS	Identifier: RSWF-OI-002	Page: 32 of 54
	Revision: 17	
	Effective Date: 10/14/13	

5.4.5 Visual Weld Inspector: Perform a visual inspection of the support tab welds for no cracks, thorough fusion, and undersized welds. Perform a visual inspection of the new lifting lug (if installed) welds for items 1 through 8 of Section 1.1 (statically loaded) in Appendix D of TPR-13442. Initial this step if the visual inspection meets the applicable inspection requirements.

5.4.6 Welder: Using a cutting torch, remove the rest of the weld from the shield plug.

5.4.7 Remove excess slag and anything that could interfere with the positioning device.

NOTE: *IV is required for the item obtained in Step 5.4.8.*

5.4.8 MS Handling: Ensure the load-indicating device has a current calibration sticker; record the calibration data in the following table:

Manufacturer	Model Number	S&CL Number	Calibration Due Date

It has been verified that the above specified M&TE is available and calibrated.			
Signature/S No.:		Date:	
IV Signature/S No.:		Date:	

5.4.9 MS: Stage the appropriate equipment (mobile crane, applicable tackle, positioning device, etc.) as necessary to perform work activities directed by this procedure.

5.4.10 MS: Prior to use, inspect all rigging tackle to be used to ensure it is free from defects and is within the periodicity for required inspection per LWP-6500.

NOTE: *The purpose of the test drive is to ensure that the ground is stable, there are no obstructions in the transfer path, and the forklift and cask will have unhindered progress to the liner.*

5.4.11 MS Handling: If necessary, perform a test drive by driving the forklift (loaded with an empty cask) over the transfer path. As necessary, stabilize the transfer path and/or remove obstructions from the transfer path so the forklift can make unhindered progress.

RETRIEVAL OF MATERIAL FROM 16-IN., 24-IN., AND 26-IN. LINERS	Identifier:	RSWF-OI-002	Page: 33 of 54
	Revision:	17	
	Effective Date:	10/14/13	

5.4.12 MS Crane Operator/SS: Guide the Heavy Equipment Operator/Equipment Operator driving the 25-ton forklift (if needed) and mobile crane to the location of the liner that will be opened.

5.4.13 MS Rigger/SS: Attach a shackle (5/8-in. minimum), nylon sling, and load-indicating device to the shield plug lifting fixture.

NOTE: *If the shield plug cannot be easily removed, the welder may have to remove more of the weld.*

5.4.13.1 Ensuring the lift force does not exceed 3,200 lb (as indicated on the load indicating device), verify shield plug can be easily removed from the liner.

5.4.13.2 IF performing operations in preparation for RSWF-OI-007 or RSWF-OI-011 (not using a cask), THEN reinstall the shield plug and discontinue this procedure.

NOTE: *Steps 5.4.14 and 5.4.15 may be performed concurrently.*

5.4.14 HPT: Establish a RBA around the liner.

5.4.14.1 HPT: Establish a Contamination Area (CA) barrier around the liner and install a pigpen.

5.4.15 IF High Radiation Area (HRA) threshold limits are met, THEN establish a High Radiation Area-Access Controls Required (HRA-ACR) area.

NOTE: *If contamination is detected above RWP limits, the shield plug must be lowered back into the liner.*

5.4.16 MS Crane Operator: Remove the shield plug from the liner, ensuring the lifting force does not exceed 3,200 lb (as indicated on the load-indicating device).

5.4.17 HPT: As the shield plug is being removed, perform a radiological survey on the exposed plug.

5.4.18 Perform radiation level survey over and around the open liner.

RETRIEVAL OF MATERIAL FROM 16-IN., 24-IN., AND 26-IN. LINERS	Identifier: RSWF-OI-002	Page: 34 of 54
	Revision: 17	
	Effective Date: 10/14/13	

WARNING

To reduce radiation exposure to the HPT the long-handled tool must be long enough that the HPT is not required to kneel over the open liner to reach the inside of the liner or the waste can.

- 5.4.19 HPT: Use a long-handled tool to perform a radiological survey inside the liner and on outside of the storage container or 16-in. liner, as applicable.
- 5.4.20 IF survey (on the plug, inside of the liner, retrieval cable, or on the outside of the waste can or 16-in. liner) indicates no contamination, THEN continue with Step 5.4.21; if contamination was found, implement Appendix B, Resealing the Liner.

NOTE: *If this procedure will be performed multiple times within the same shift, the RBA postings and controls may remain in effect, as directed by SS.*

- 5.4.21 If the survey indicates no contamination, perform the following:
 - 5.4.21.1 HPT: Remove the CA postings and controls.
 - 5.4.21.2 MS Rigger: Rotate the shield plug away from the open liner as far as the retrieval cable allows (approximately 6 ft if attached).

WARNING

Care must be taken to minimize radiation exposure while verifying the outer can identification number.

- 5.4.21.3 SS: Verify and record the outer can/liner identification number.

Outer Can/Liner No.:	
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- 5.4.21.4 IF the container ID No. does not agree with the transfer documentation, THEN notify the TSD Facilities Manager.

RETRIEVAL OF MATERIAL FROM 16-IN., 24-IN., AND 26-IN. LINERS	Identifier:	RSWF-OI-002	Page: 35 of 54
	Revision:	17	
	Effective Date:	10/14/13	

- 5.4.21.5 IF performing operations in preparation for RSWF-OI-008, THEN lower the shield plug to the ground and disconnect from the crane then discontinue this procedure.
- 5.4.21.6 MS Rigger: Inspect the wire-rope sling to the extent possible (using artificial light, camera, and a mirror if necessary).
- 5.4.21.7 IF the wire-rope sling is <1/4 in. in diameter or is not satisfactory, THEN complete Step 5.4.22 and replace the retrieval cable per Section 5.7, OR Implement Appendix B to reseal the liner, as directed by the SS.
- 5.4.22 Disconnect the retrieval cable from the shield plug and set the shield plug on the ground.

5.5 Removing Material from Liner

- 5.5.1 MS: Perform the following:
- 5.5.1.1 Attach the crane to the positioning device and move the positioning device to the open liner.
- 5.5.1.2 Insert the retrieval cable through the positioning device while placing the positioning device on the open liner.
- TSR-407 AC 5.407.2**
- 5.5.1.3 Position the forklift with the cask above the liner from which the material will be removed, with the bottom of the cask approximately 3 ft above the ground.
- 5.5.1.4 Removing the cask doors retaining bolts using the actuators, move the cask doors into the open position.
- 5.5.2 HPT: Perform verification radiological surveys on the bottom cask door.
- 5.5.3 If necessary, direct the decon of the cask door.
- 5.5.3.1 Remove RBA postings.

RETRIEVAL OF MATERIAL FROM 16-IN., 24-IN., AND 26-IN. LINERS	Identifier:	RSWF-OI-002	
	Revision:	17	
	Effective Date:	10/14/13	Page: 36 of 54

5.5.4 MS: Perform the following:

5.5.4.1 Lower a cable through the cask bore to pull up the retrieval cable so it can be attached to the crane hook.

TSR-407 AC 5.407.3

5.5.4.2 Park the HFEF-5 cask on the positioning device, ensuring cask is fully seated.

LCO/SAC 3.407.2

5.5.4.3 Install temporary shielding around the positioning device on the side facing the crane and operator, or establish other mitigative measures, to maintain the direct radiation exposure rate below 5 R/hr at the location of the closest facility worker.

5.5.4.4 Position a mobile crane as far away as practical, such that the crane hook, with the load-indicating device attached, can be centered above the cask.

5.5.4.5 Attach the retrieval cable to the load-indicating device.

5.5.5 HPT/SS: Have personnel not necessary for retrieval operations move to a safe and reasonable distance from the open liner while the retrieval operation is in process.

5.5.6 HPT: Monitor radiation exposure in the vicinity of the closest facility worker(s) continuously.

5.5.6.1 IF RWP limits are exceeded,
THEN place container in a safe condition and notify TSD Facilities Manager and HP Supervisor.

5.5.6.2 IF the container **CANNOT** be placed in a safe position,
THEN immediately suspend liner loading/unloading operations,
AND immediately establish and maintain a safe distance relative to the cask/liner and notify TSD Facilities Manager and HP Supervisor.

RETRIEVAL OF MATERIAL FROM 16-IN., 24-IN., AND 26-IN. LINERS	Identifier:	RSWF-OI-002	Page: 37 of 54
	Revision:	17	
	Effective Date:	10/14/13	

WARNING 1

High radiation levels may exist at the sides and top of the cask. Personnel must stand clear of the cask to reduce radiation exposure.

WARNING 2

To prevent excessive radiation from the top of the open waste cask, the waste can must not be raised too far above the bottom shield door.

CAUTION

To prevent damage to the wire-rope sling, the lifting force cannot exceed 1,000 lb for 1/4-in.-diameter wire rope or 2,000 lb for 5/16- and 1/2-in.-diameter wire rope.

NOTE: *To help guide the waste can into the cask, the operator may need to use the cable handling tool to help guide the container into the cask bore.*

LCO/SAC 3.407.1

5.5.7 Ensure the container is not lifted beyond the top of the shielded transfer cask during liner loading or unloading.

5.5.8 Begin lifting the waste can from the liner as follows:

5.5.8.1 Put the height-indicating device around the cable.

5.5.8.2 MS Crane Operator: Observe the weight of the material and ensure the lifting force does not exceed the applicable limit (as indicated on the load-indicating device).

5.5.8.3 Raise the container approximately 6 in. off the bottom of the liner and record its weight:

Container weight:	
-------------------	--

TSR-407 AC 5.407.2

5.5.8.4 Verify the container weight is less than 1,500 pounds.

Idaho National Laboratory

RETRIEVAL OF MATERIAL FROM 16-IN., 24-IN., AND 26-IN. LINERS	Identifier: RSWF-OI-002	
	Revision: 17	
	Effective Date: 10/14/13	Page: 38 of 54

- 5.5.8.5 MS Rigger: Align the top of the can with the bottom of the cask.
- 5.5.8.6 MS Crane Operator: Raise the waste can until the top of the waste can lifts the height-indicating device into view.
- 5.5.8.7 MS Rigger: Close the bottom shield door using the actuator and install the retaining bolts.
- 5.5.8.8 MS Crane Operator: Slowly lower the waste can until it rests on the closed bottom cask shield door.
- 5.5.8.9 MS Rigger: Taking care not to drop the retrieval cable into the cask, remove the retrieval cable from the load indicator and drape it over the side of the cask for lifting-assembly removal and attachment of a 1/8-in. cable to the retrieval cable.
- 5.5.8.10 Attach the 1/8-in. temporary cable (or equipment) to the retrieval cable.

TSR-407 AC 5.407.2

- 5.5.8.11 Close the top shield door and secure the 1/8 in. cable with the shield door.

NOTE: *Any transfer of accountable nuclear material from RSWF must be performed per RSWF-OI-005, "Nuclear Material Control Plan," and must be accompanied by appropriate Safeguards documentation.*

- 5.5.9 SS: IF the material in the cask is fuel to be sent to FCF, HFEF or another facility, THEN notify the receiving SS of the impending transfer and the outer container identification number.
- 5.5.10 OPS: IF the material in the cask is mixed waste, THEN inspect cask integrity to ensure no leaks, AND Label the cask with a hazardous waste label.
- 5.5.11 HPT: Monitor contact and 1-meter radiation levels on the cask exterior after the waste can is pulled into the cask. Record radiation levels on the FRM-790. Remove temporary shielding, if necessary.

Radiation level on cask exterior:	
Radiation level at 1 meter:	

RETRIEVAL OF MATERIAL FROM 16-IN., 24-IN., AND 26-IN. LINERS	Identifier: RSWF-OI-002	Page: 39 of 54
	Revision: 17	
	Effective Date: 10/14/13	

TSR-407 AC 5.407.2

5.5.12 Verify the direct radiation dose rate is ≤ 200 mrem/h at any point on the external surface of the closed, loaded cask or per PLN-260, "INL Radiation Protection Program," 4 requirements, specifically following LRD-15001, "Radiological Control Manual," 5 per the Radiological Health and Safety Policy.

5.5.13 SS: IF transferring the cask out of RSWF, THEN give the Safeguards Transfer Documents to the (MS) Driver to deliver to the receiving SS (HFEF or FCF).

5.6 Transfer of Material to a New Liner (if applicable)

5.6.1 SS: Transfer container to new location using RSWF-OI-001, "Storage Operations," to place material into a new liner and exit this procedure.

5.7 Wire-Rope Sling Replacement (if applicable)

NOTE: *Steps may be repeated as necessary per the direction of the SS.*

5.7.1 HPT: Monitor the workers' general area radiation level while performing this operation.

NOTE: *Due to various lifting fixture configurations, it may be necessary to install new cable prior to the removal of the existing cable. Steps 5.7.2 and 5.7.3 may be performed in reverse order as directed by the SS.*

5.7.2 Cut cable with the remote cable-cutting tool.

5.7.3 Use the remote re-cabing tool to thread the new 1/4 in. wire rope.

5.7.4 Extend 4-6 in. of one end of the wire rope beyond the re-cabing tool and secure it in place.

5.7.5 Using the re-cabing tool, thread the end of the cable through the container lifting fixture.

5.7.6 Release the end of the cable.

5.7.7 Reattach the re-cabing tool to the loose end of the wire rope that was threaded through the lifting fixture and secure it in place.

RETRIEVAL OF MATERIAL FROM 16-IN., 24-IN., AND 26-IN. LINERS	Identifier:	RSWF-OI-002	
	Revision:	17	
	Effective Date:	10/14/13	Page: 40 of 54

- 5.7.8 Using the re-cabbling tool, pull the wire rope through the lifting fixture, until both ends of the wire rope are above ground surface.
- 5.7.9 Back away from the open liner as much as possible (to reduce exposure from shine) to splice the ends together.

NOTE: *The following step must be performed by a Qualified Rigger using materials and equipment (1/4 in. cable and sleeves, compression tool, and go/no-go gauge) specifically purchased for this unique application.*

5.7.10 Splicing the Cable Ends Together

- 5.7.10.1 Connect the ends of the wire rope with two compression sleeves. Leave a small amount, approximately the length equal to the rope diameter, protruding past the end sleeve and leave a space the width of a sleeve between the two sleeves.
- 5.7.10.2 Use the compression tool to crimp the sleeve four times.
- 5.7.10.3 Check compressed fittings with the 1/4-in. setting on the go/no-go gauge. Fittings **MUST** pass gauge test before being proof tested.

5.7.11 Proof Test

- 5.7.11.1 Hook the cable to the crane.
- 5.7.11.2 Lift the can approximately 6 in. and suspend it for at least 1 minute.
- 5.7.11.3 Examine the cable and sleeve to ensure the suspended weight did not affect their assembled geometry.
- 5.7.11.4 IF cable integrity is determined to be satisfactory, THEN lower container to bottom of the liner, AND skip Step 5.7.11.5.
- 5.7.11.5 IF cable integrity is determined to be unsatisfactory, THEN lower the container to the bottom of the liner AND replace the cable by performing Steps 5.7.3 through 5.7.11.3.
- 5.7.11.6 Unhook the cable from the crane.
- 5.7.11.7 Return to Section 5.5.

RETRIEVAL OF MATERIAL FROM 16-IN., 24-IN., AND 26-IN. LINERS	Identifier: RSWF-OI-002
	Revision: 17
	Effective Date: 10/14/13 Page: 41 of 54

6. POST-PERFORMANCE ACTIVITIES

6.1 Job Completion

- 6.1.1 MS: Prepare the HFEF-5 cask for transfer back to the MFC fenced area.
- 6.1.2 SS: Perform a post-transfer facility walkdown to ensure the integrity of the liners and cathodic protection system. Document facility walkdown and results in the TSD Facilities SS Logbook.
- 6.1.3 OPS: Contact Waste Generator Services (WGS) for disposition of any waste generated.

A post-transfer facility walkdown to ensure the integrity of the liners and cathodic protection system has been completed and documented in the TSD Facilities SS logbook.			
Shift Supervisor:		Date:	

6.2 Data Review

- 6.2.1 SS: Review the data recorded during performance of this procedure to ensure data is complete.

Data recorded during performance of this procedure has been reviewed; the transfer has been satisfactorily completed.			
Shift Supervisor:		Date:	

- 6.2.2 SS: If the transfer involved a relocation, give a copy of this completed procedure to the RSWF MBA Custodian.

A copy of the data sheet has been received.			
RSWF MBA Custodian:		Date:	

- 6.2.3 TSD Facilities Manager: Review the data recorded during performance of this procedure to ensure the transfer has been satisfactorily completed.

Data recorded during performance of this procedure has been reviewed; the transfer has been satisfactorily completed.			
TSD Facilities Manager:		Date:	

Idaho National Laboratory

RETRIEVAL OF MATERIAL FROM 16-IN., 24-IN., AND 26-IN. LINERS	Identifier:	RSWF-OI-002	
	Revision:	17	
	Effective Date:	10/14/13	Page: 42 of 54

6.2.4 SS: File a copy of the completed procedure and FRM-790 in the RSWF files.

6.2.5 Staff Specialist: Update RSWF inventory database and IWTS (as applicable).

7. ABNORMAL OPERATIONS

LCO/SAC 3.407.1

7.1 The container is lifted beyond the top of the shielded transfer cask during liner loading or unloading.

7.1.1 IF the package is lifted beyond the top of the shielded transfer cask during liner loading or unloading,
THEN immediately lower the package back into the shielded cask/storage device.

7.1.2 IF the container CANNOT immediately be returned to a position within the shielded cask/storage device
THEN immediately establish and maintain a safe distance relative to the unshielded container.

LCO/SAC 3.407.2

7.2 High Radiation While Handling Containers

7.2.1 IF the dose rate exceeds 5R/hr at the location of the closest facility worker,
THEN immediately place the container in a safe position by returning it to the shielded cask/storage device.

7.2.2 IF the container CANNOT be safely placed back into the shielded cask/storage device,
THEN immediately suspend container handling operations and immediately establish and maintain a safe distance relative to the container.

Idaho National Laboratory

RETRIEVAL OF MATERIAL FROM 16-IN., 24-IN., AND 26-IN. LINERS	Identifier:	RSWF-OI-002	
	Revision:	17	
	Effective Date:	10/14/13	Page: 43 of 54

7.3 Dropped Container During Handling Operations**7.3.1 Immediate Actions**

- 7.3.1.1 IF a loaded container is dropped during handling operations, THEN immediately evacuate the facility.
- 7.3.1.2 All non-contaminated personnel not involved in the emergency response assemble at the TREAT Office Building.
- 7.3.1.3 All contaminated or potentially contaminated personnel assemble as directed by the HPT.
- 7.3.1.4 SS/Building Emergency Director (BED): Notify the Emergency Action Manager (EAM).

7.3.2 Subsequent Action

- 7.3.2.1 Notify RadCon and Facility Manager if any abnormal conditions have occurred.
- 7.3.2.2 Perform required actions as directed by TSD-EAR-001, "TSD Emergency Response Procedure."

8. RECORDS

Executed copies of the following:

Form 429.01, "Idaho National Laboratory — Weld Data Sheet"

FRM-790, "MFC Transfer of HC-3 or Greater Quantity of Hazardous Material in Non-DOT-Certified Packaging"

RSWF-OI-002, "Retrieval of Material from 16-in., 24-in., and 26-in. Liners"

RSWF-OI-004, "Administrative Requirements/Process for Material Transfers," Appendix A

NOTE: *LWP-1202, "Records Management," the INL Records Schedule Matrix, and associated record types list(s) provide current information on the retention, quality assurance, and/or destruction moratorium requirements for these records. Contact a Records Coordinator for assistance if needed.*

Idaho National Laboratory

RETRIEVAL OF MATERIAL FROM 16-IN., 24-IN., AND 26-IN. LINERS	Identifier:	RSWF-OI-002	
	Revision:	17	
	Effective Date:	10/14/13	Page: 44 of 54

9. REFERENCES

ECAR-1213, "RSWF Hoisting and Rigging Plans"

ECAR-1827, "RSWF Equipment Loading Adjacent to Liners"

DOE Standard 1090, "Hoisting and Rigging"

Dwg. 747635, "RSWF Liner Configuration"

FRM-790, "MFC Transfer of HC-3 or Greater Quantity of Hazardous Material in Non-DOT-Certified Packaging"

Form 429.01, "Idaho National Laboratory — Weld Data Sheet"

INL Welding Manual, Section C3.5

LRD-15001, "Radiological Control Manual"

LST-337, "Approved Container/Payload List for Inter-Facility Transfer Operations at MFC"

LWP-1202, "Records Management"

LWP-6200, "Maintenance Integrated Work Control Process"

LWP-6500, "Hoisting and Rigging at the INL"

LWP-14104, "Heavy Industrial Equipment"

LWP-14606, "Heat and Cold Stress"

LWP-16108, "Response to Severe Weather Conditions"

PER-116, "HWMA RCRA Partial Permit Materials and Fuels Complex"

PLN-260, "INL Radiation Protection Program"

RSWF-OI-001, "Storage Operations"

RSWF-OI-005, "Nuclear Material Control Plan"

RSWF-OI-007, "Remote-Handled Transuranic (RH-TRU) Waste Transfer"

RSWF-OI-008, "Preparing a 16-in. Liner Stored in a 24-in. Liner for RH-TRU Waste Retrieval Activities"

RSWF-OI-010, "Retrieval of Loaded Liners"

Idaho National Laboratory

RETRIEVAL OF MATERIAL FROM 16-IN., 24-IN., AND 26-IN. LINERS	Identifier: RSWF-OI-002	
	Revision: 17	
	Effective Date: 10/14/13	Page: 45 of 54

RSWF-OI-011, "Retrieval of an SLSF Canister from a 26-in. RSWF Liner"

RSWF-OI-012, "Excavation of Loaded Liners"

SAR-407, "Safety Analysis Report for the Radioactive Scrap and Waste Facility (MFC 771)"

SD-38.1.2, "Treatment, Storage, and Disposal Facilities (TSDF) Hostile Environment Plan"

TPR-13440, "Magnetic Particle Examination"

TSD-EAR-001, "TSD Emergency Response Procedure"

TSR-407, "Technical Safety Requirements for the Radioactive Scrap and Waste Facility (MFC 771)"

W7500-0688-ES, "MFC Transportation Safety Document"

10. APPENDIXES

Appendix A, Figures

Appendix B, Resealing the Liner

Idaho National Laboratory

RETRIEVAL OF MATERIAL FROM 16-IN., 24-IN., AND 26-IN. LINERS	Identifier: RSWF-OI-002 Revision: 17 Effective Date: 10/14/13 Page: 46 of 54
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RETRIEVAL OF MATERIAL FROM 16-IN., 24-IN., AND 26-IN. LINERS	Identifier:	RSWF-OI-002	Page: 47 of 54
	Revision:	17	
	Effective Date:	10/14/13	

Appendix A

Figures

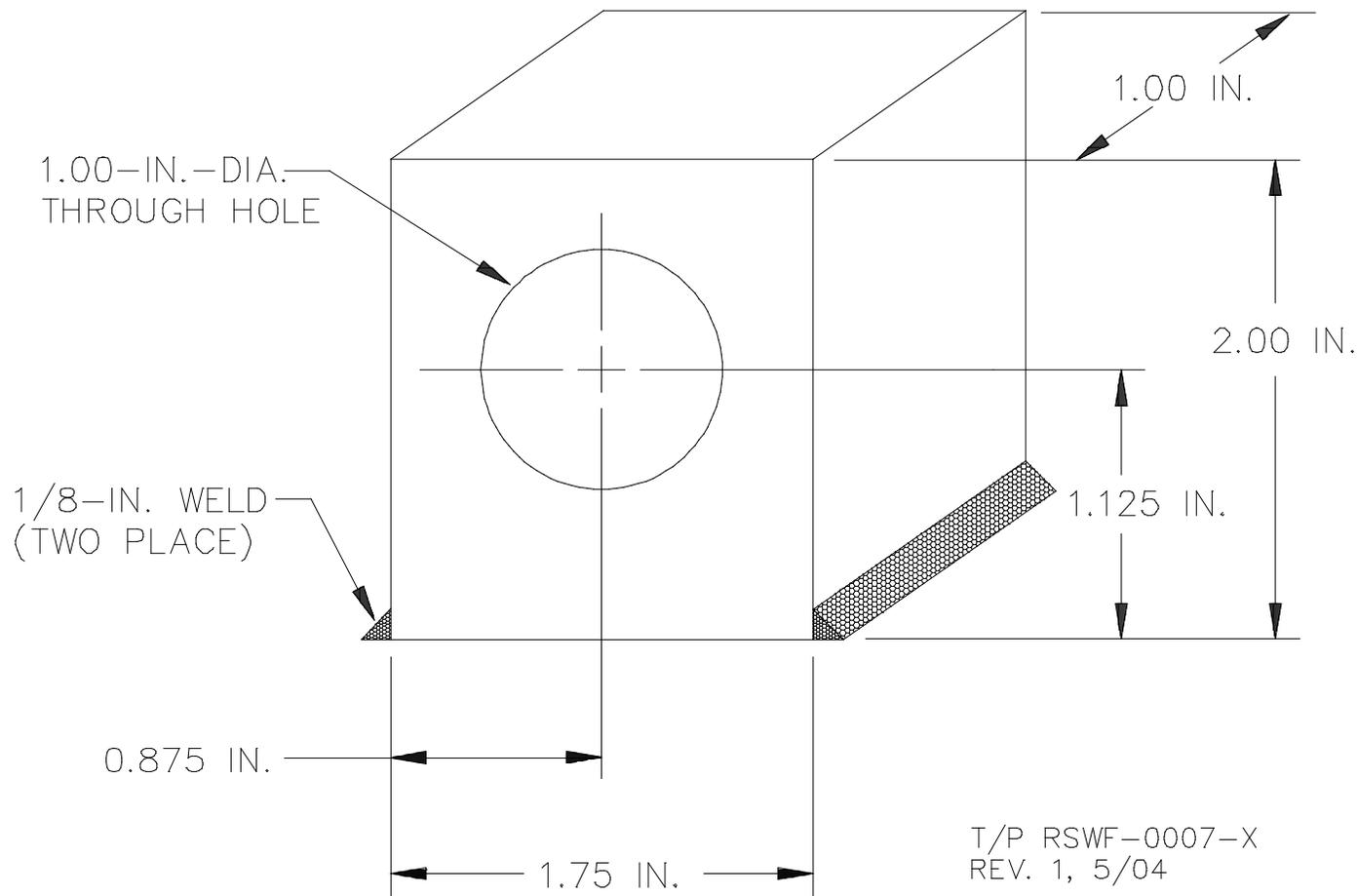


Figure 1. RSWF shield-plug lifting ring.

RETRIEVAL OF MATERIAL FROM 16-IN., 24-IN., AND 26-IN. LINERS	Identifier: RSWF-OI-002	Page: 48 of 54
	Revision: 17	
	Effective Date: 10/14/13	

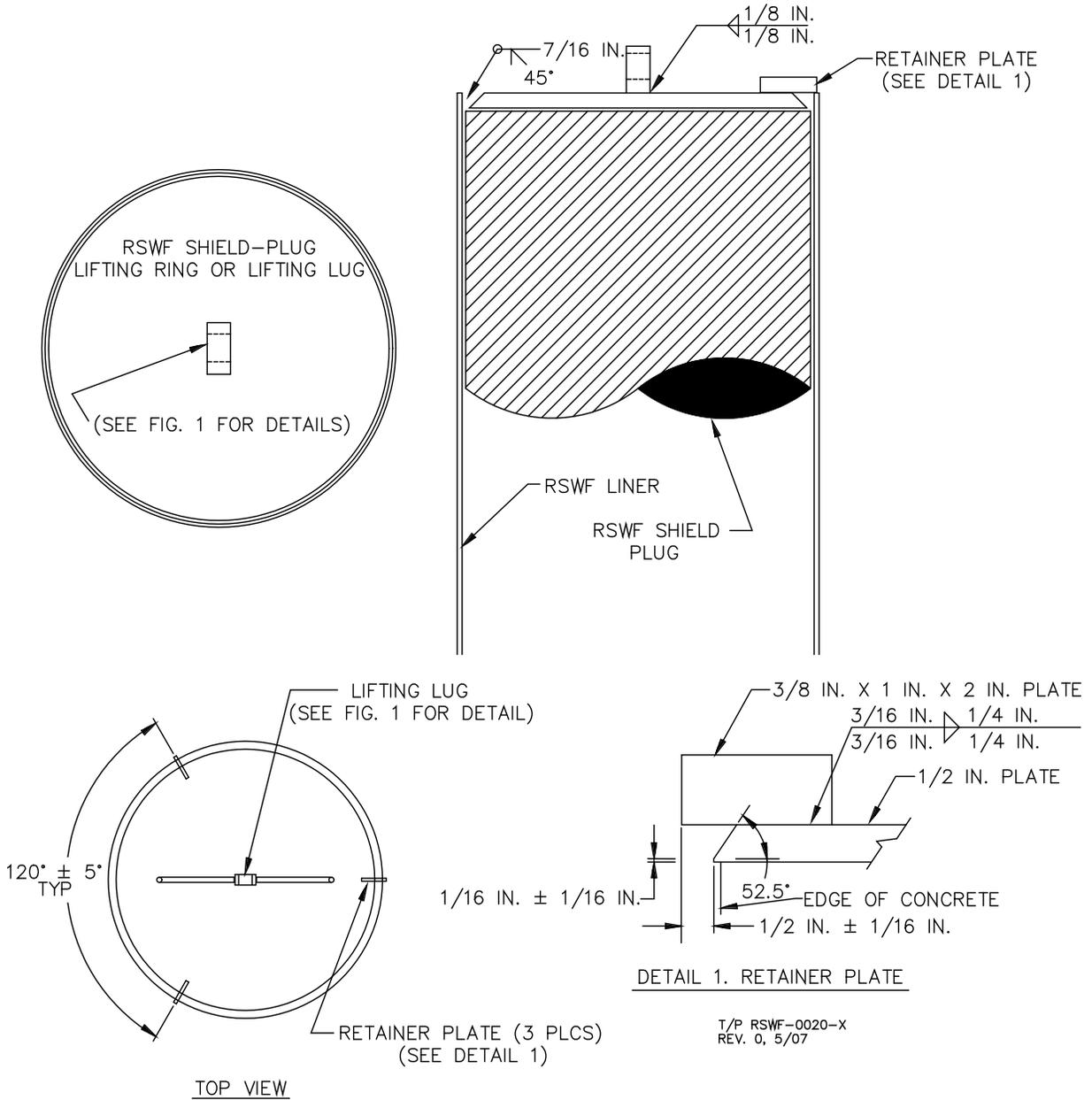
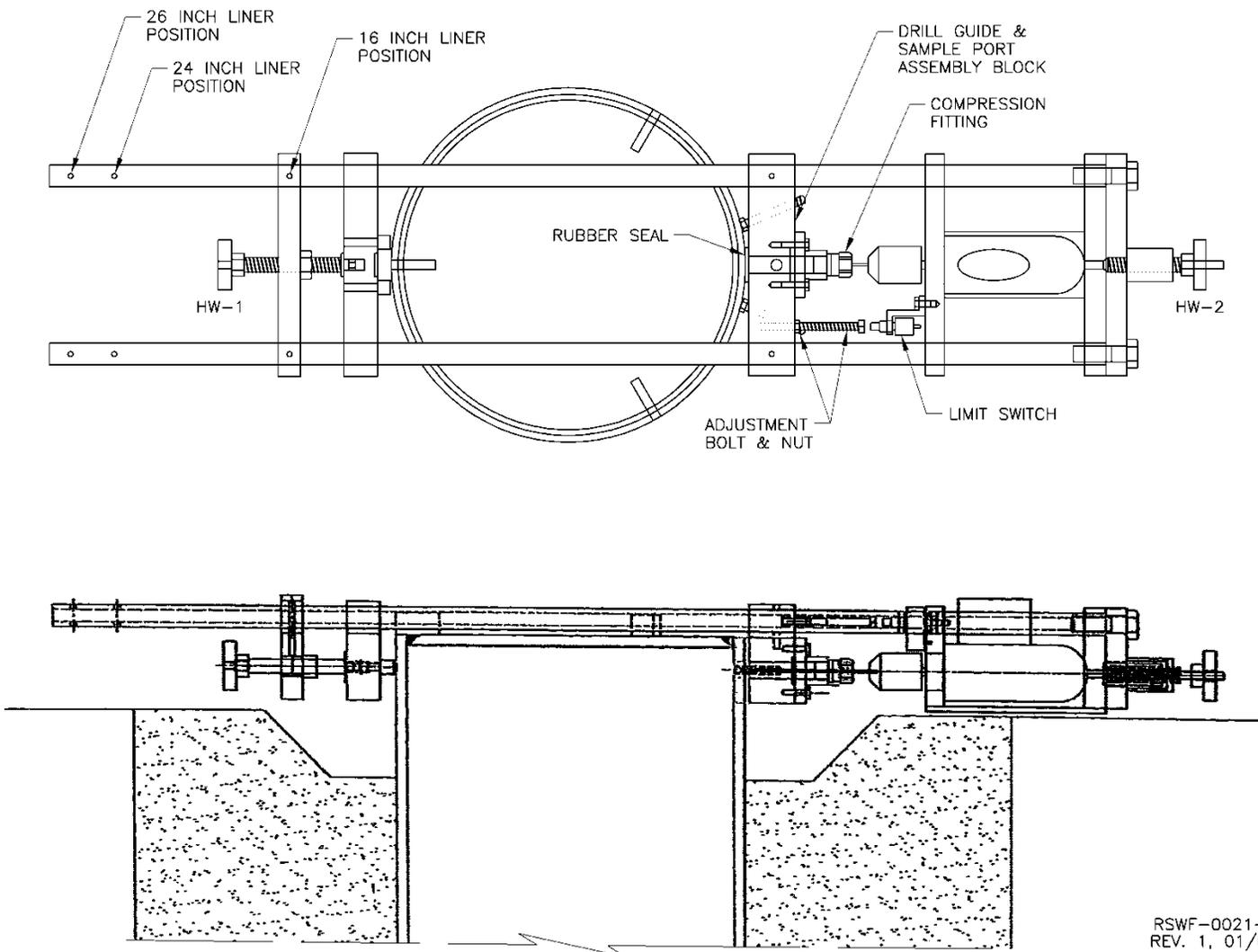


Figure 2. Lifting lug/support tab weld.

RETRIEVAL OF MATERIAL FROM 16-IN., 24-IN., AND 26-IN. LINERS	Identifier:	RSWF-OI-002	Page: 49 of 54
	Revision:	17	
	Effective Date:	10/14/13	



RSWF-0021-1
REV. 1, 01/09

Figure 3. Remote drill system.

RETRIEVAL OF MATERIAL FROM 16-IN., 24-IN., AND 26-IN. LINERS	Identifier: RSWF-OI-002 Revision: 17 Effective Date: 10/14/13	Page: 50 of 54
---	---	----------------

DRILLING INSTRUCTIONS

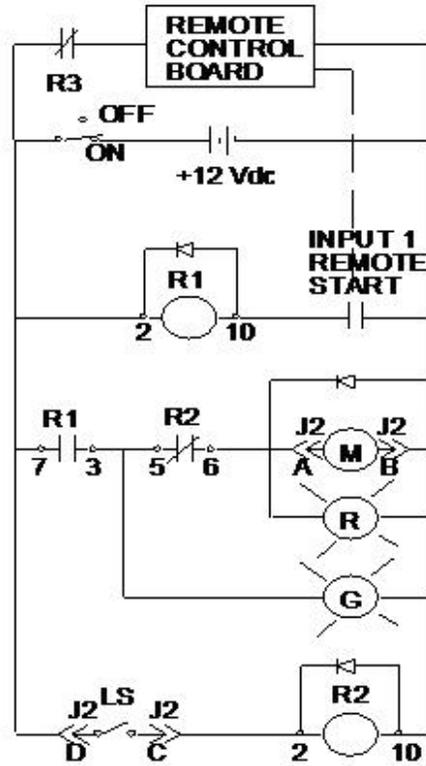
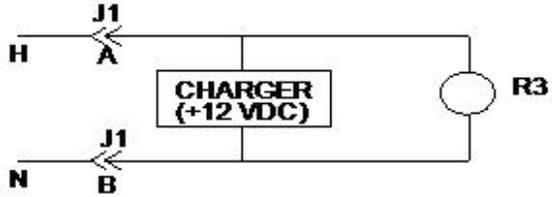
INITIALLY THE REMOTE START IS OFF. WHEN THE REMOTE BUTTON IS PUSHED, THE REMOTE START IS TOGGLED ON ENERGIZING RELAY R1. THIS CAUSES THE DRILL MOTOR, THE RED AND THE GREEN LIGHTS TO COME ON. WHEN THE LINER IS PENETRATED, THE LIMIT SWITCH LS IS PICKED UP AND RELAY R2 IS ENERGIZED TURNING OFF THE DRILL MOTOR AND THE RED LIGHT. THE GREEN LIGHT IS TURNED OFF BY AGAIN PRESSING THE REMOTE BUTTON.

BATTERY CHARGING INSTRUCTIONS

RELAY R3 HAS BEEN INSTALLED TO DE-ENERGIZE THE RECEIVER WHENEVER THE CHARGER IS CONNECTED TO AC POWER. THIS PREVENTS DAMAGE TO THE RECEIVER WHEN THE BATTERY IS CHARGING.

NOTE

ENSURE THAT THE BATTERY IS REMOVED FROM THE CHARGER OR THAT THE ON/OFF SWITCH IS IN THE OFF POSITION PRIOR TO CONNECTING OR DISCONNECTING CHARGER POWER.

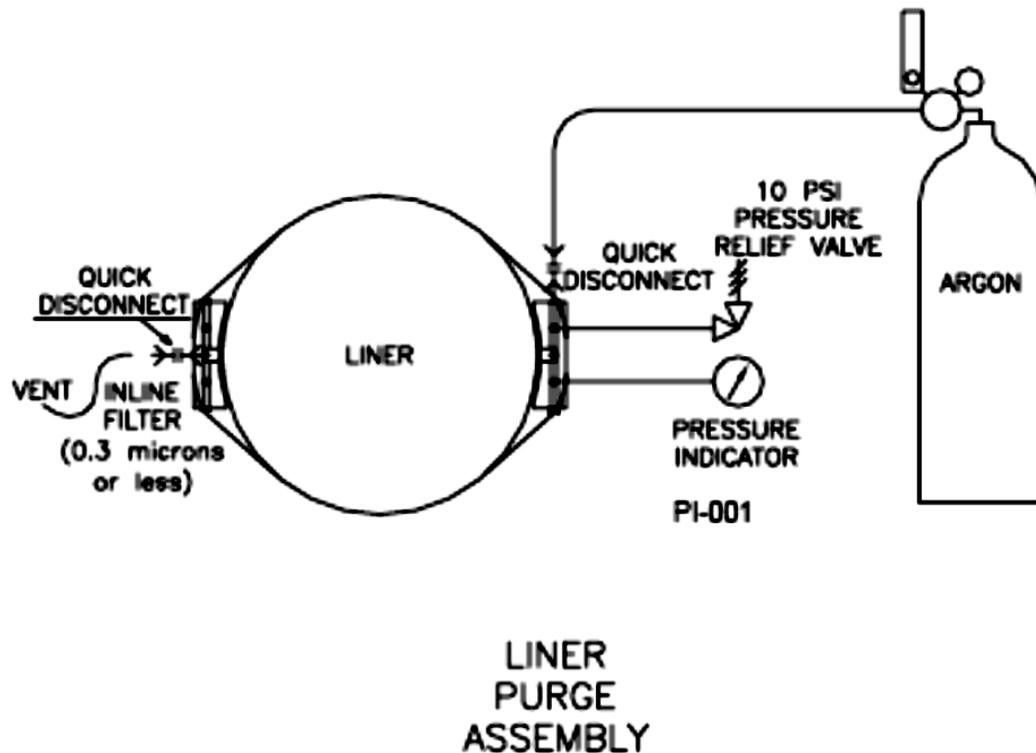


REMOTE START/STOP CIRCUIT

ETA NO. EN-2004-003		MEAL SYSTEM NO. RSWF-001		TITLE Remote Drilling System for RSWF Liners Electrical Schematic			
DRAWN BY N. Messick	DATE	QA LEVEL 3					
CHECKED		TSK MANAGER	DATE				
RESP. ENG. N. Messick		APPR'D RELEASED					
TOLERANCE N/A	MATERIAL Noted			SCALE N/A	SHEET 1 of 1	DWG NO. ETA-EN-2004-003-10	REV. 0

Figure 4. Remote drill system control schematic.

RETRIEVAL OF MATERIAL FROM 16-IN., 24-IN., AND 26-IN. LINERS	Identifier:	RSWF-OI-002	Page: 51 of 54
	Revision:	17	
	Effective Date:	10/14/13	



5/19/2009
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Figure 5. Liner purge assembly.

Idaho National Laboratory

RETRIEVAL OF MATERIAL FROM 16-IN., 24-IN., AND 26-IN. LINERS	Identifier: RSWF-OI-002 Revision: 17 Effective Date: 10/14/13 Page: 52 of 54
---	---

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RETRIEVAL OF MATERIAL FROM 16-IN., 24-IN., AND 26-IN. LINERS	Identifier:	RSWF-OI-002	Page: 53 of 54
	Revision:	17	
	Effective Date:	10/14/13	

Appendix B

Resealing the Liner

- _____ 1. MS Crane Operator: Set the shield plug back in the liner.
- _____ 2. HPT: Evaluate the radiological conditions to determine if additional radiological controls are necessary.
- _____ 3. OPS: Notify the TSD Facilities Manager that contamination has been detected and obtain approval to perform Steps 4 through 14.
- _____ 4. Welder: Remove the support tabs from the shield plug.
- _____ 5. MS Crane Operator: Lower the shield plug approximately two in. into the liner to provide radiation shielding to the welder.

CAUTION

Care must be taken to prevent cutting or burning the nylon sling during performance of Step 6.

- _____ 6. Welder: Using a grinder, prepare the top of the liner for welding to the shield plug.
- _____ 7. MS Crane Operator: Raise the shield plug above the top of the liner.
- _____ 8. Welder: Attach three support tabs (retainer plates) to the shield plug per the INL Welding Manual, Section C3.5 refer to Appendix A, Figure 2, Detail 1).
- _____ 9. Visual Weld Inspector: Perform a visual inspection of the support tab welds for no cracks, thorough fusion, and undersized welds. Initial this step if the visual inspection meets the applicable inspection requirements.
- _____ 10. MS Crane Operator: Lower the shield plug to the top of the liner.
- _____ 11. MS Rigger: Disconnect the rigging from the shield plug.
- _____ 12. Welder: Reweld the shield plug (removing the three support tabs as the shield plug is being rewelded to the liner) and vent-plug hole per INL Welding Manual, Specification Number C3.0; and Appendix A, Figure 2.

Idaho National Laboratory

RETRIEVAL OF MATERIAL FROM 16-IN., 24-IN., AND 26-IN. LINERS	Identifier:	RSWF-OI-002
	Revision:	17
	Effective Date:	10/14/13

Page: 54 of 54

- _____ 13. Visual Weld Inspector: Perform a visual inspection of the shield plug and vent-plug hole weld. Visually inspect final passes for no cracks, thorough fusion, and undersized welds. Initial this step if the visual inspection meets the inspection requirements.
14. MS/OPS: Perform Post-performance Activities identified in Section 6.