

HWMA/RCRA PART B PERMIT
FOR THE
IDAHO NATIONAL LABORATORY

BOOK 1 OF 1

PER-140 – MATERIALS AND FUELS COMPLEX
SODIUM PROCESS FACILITY AND
SECONDARY SODIUM SYSTEM

ATTACHMENT 6

SECTIONS F-3 THROUGH F-5 – PROCEDURES TO PREVENT HAZARDS

MODIFICATION DATE: December 5, 2012

CONTENTS

F-3	Prevention and Preparedness.....	1
	F-3(a)(1) Equipment Requirements.....	1
	F-3(a)(2) Internal.....	1
	F-3(a)(3) External Communications.....	1
	F-3(a)(4) Emergency Equipment.....	1
	F-3(a)(5) Water for Fire Control.....	1
	F-3(a)(6) Aisle Space Requirements.....	2
F-4	Preventive Procedures, Structures, and Equipment.....	2
	F-4(a) Loading and Unloading Operations.....	2
	F-4(b) Run-On and Run-Off.....	3
	F-4(c) Water Supplies.....	3
	F-4(d) Equipment and Power Failure.....	3
	F-4(e) Personal Protective Equipment.....	4
F-5	Ignitable, Reactive, and Incompatible Wastes.....	4
	F-5(a) Prevent Ignition or Reaction of Ignitable or Reactive Waste.....	5
	F-5(b) General Precautions for Handling Ignitable or Reactive Waste and Mixing of Incompatible Waste.....	5
	F-5(c) Management of Ignitable or Reactive Waste in Containers.....	7
	F-5(d) Management of Incompatible Waste in Containers.....	7
	F-5(e) Management of Ignitable or Reactive Waste in Tank Systems.....	7
	F-5(f) Management of Incompatible Waste in Tank Systems.....	8

1 **F-3 Prevention and Preparedness [IDAPA 58.01.05.008; 40 CFR 264 Subpart C]**

2 **F-3(a)(1) Equipment Requirements [IDAPA 58.01.05.008; 40 CFR 264.32]**

3 This subsection documents compliance with the preparedness and prevention
4 equipment requirements. The required equipment includes internal and external
5 communication equipment, emergency equipment, and water for fire control.

6 **F-3(a)(2) Internal Communications [IDAPA 58.01.05.008; 40 CFR 264.32(a)]**

7 MFC uses a site-wide emergency signal and paging system to alert facility
8 personnel of emergencies (ref. Permit Attachment 7, Section G, Contingency Plan).
9 Attachment 7 shows the signals used and, for each signal, the type of emergency
10 and required action. All personnel are trained to respond appropriately to these
11 signals. The siren signals are Site-wide while radiation alarms are facility specific.
12 Emergency messages are sent over the MFC paging system.

13 **F-3(a)(3) External Communications [IDAPA 58.01.05.008; 40 CFR 264.32(b)]**

14 The means of communication between HWMA unit and emergency-response
15 personnel includes the dial 777 telephone system and fire-alarm pullboxes. The dial
16 777 emergency telephone system enables an individual to dial the numbers 777 on
17 any business telephone who will contact emergency-response personnel. Fire-alarm
18 pullboxes connect with the MFC site-wide alarm system to enunciators at INL Fire
19 Department Station No. 2 (located on the MFC site). Firefighting personnel are
20 automatically notified of the pullbox location.

21 **F-3(a)(4) Emergency Equipment [IDAPA 58.01.05.008; 40 CFR 264.32(c)]**

22 The MFC HWMA units have facility-specific emergency equipment available (for
23 their use in the unit) and it is regularly inspected and maintained (ref.
24 Attachment F-2). This equipment, and its quantities, locations, and capabilities, are
25 identified in this Permit in Attachment 4, Section F, and Attachment 7, Section G
26 (ref. Attachment F-3 and Table G-1). Emergency access routes to
27 emergency-response equipment for use at the HWMA units are shown in
28 Attachment 7, Section G, Contingency Plan, Exhibit G-1.

29 **F-3(a)(5) Water for Fire Control [IDAPA 58.01.05.008; 40 CFR 264.32(d)]**

30 Water for fire control of non-reactive HW/MW fires is available throughout the
31 MFC site for use in each HWMA unit as identified in this Permit, Attachment 7,

1 Section G, Contingency Plan. If a HWMA unit manages water reactive HW/MW,
2 then water is not normally used for control of fires involving these types of
3 HW/MW. The use of water to fight reactive metal fires would only accelerate the
4 fire. Instead, Class D extinguishing media (which is formulated for reactive metal
5 fires) will be used to fight these fires. Water will be used for fire control only if the
6 reactive HW/MW is not involved in the fire or if the fire department or facility
7 manager determines it is appropriate for the situation.

8 **F-3(a)(6) Aisle Space Requirements [IDAPA 58.01.05.008; 40 CFR 264.35]**

9 In accordance with National Fire Protection Association (NFPA) 101, *The Life*
10 *Safety Code (LSC) for Industrial Occupancies (National Fire Protection*
11 *Association) and Occupational Safety and Health Standards (OSHA)*, a minimum of
12 3 ft of aisle space is/will be maintained for any means of ingress or egress into the
13 HWMA units. Placement of containers and process equipment within the HWMA
14 unit in accordance with this minimum aisle spacing requirement ensures
15 unobstructed movement of emergency response personnel, fire protection
16 equipment, spill control equipment and decontamination equipment to any area of
17 the facility operation in an emergency.

18 **F-4 Preventive Procedures, Structures, and Equipment**

19 **F-4 (a) Loading and Unloading Operations [IDAPA 58.01.05.012; 40 CFR**
20 **270.14(b)(8)(I)]**

21 HWMA unit container loading and unloading operations include (as applicable to
22 the specific unit) the following:

- 23 • Unloading containers of HW/MW from trucks or trailers and casks using
24 forklifts, mobile cranes, or facility cranes
- 25 • Moving containers from HWMA storage areas to the HWMA unit process
26 areas and/or to another HWMA unit storage or treatment facility
- 27 • Daily inspection following transfer operations.

28 Loading and unloading operations is/will be performed by qualified personnel.
29 Hazards in HW/MW loading and unloading operations at the HWMA units are
30 minimized through following the provisions described in this Permit in
31 Attachment 1, Section D, Process Description.

1 **F-4 (b) Run-On and Run-Off [IDAPA 58.01.05.012; 40 CFR 270.14(b)(8)(ii)]**

2 **F-4 (b)(1) Indoor HWMA Units**

3 Containers of HW/MW are elevated off the floor during storage (e.g., stored on
4 secondary containment pallets or skids or by container design) ensuring that the
5 containers do not come in contact with runoff from HW/MW handling operations or
6 run-on from precipitation). Note: During processing, containers may be staged on
7 the floor as required by the process. The permitted tank systems are also located
8 within buildings to prevent contact with liquids (run-on precipitation, liquid in
9 secondary containment).

10 **F-4(c) Water Supplies [IDAPA 58.01.05.012; 40 CFR 270.14(b)(8)(iii)]**

11 Contamination of water supplies due to HWMA unit operations is highly unlikely
12 because:

- 13 • HW/MW is stored in sealed containers; HW/MW with free liquids are stored
14 in containers/tanks with secondary containment.
- 15 • HWMA units are >50 ft from the nearest site production/drinking water
16 well.
- 17 • The MFC site is maintained with the necessary grading and ditches to
18 channel run-off to the Industrial Waste Pond.
- 19 • MFC is more than 10 miles removed from the nearest surface water (the Big
20 Lost River) protected by the Clean Water Act.
- 21 • The water table of the Snake River Plain Aquifer is > 600 ft below grade.

22 **F-4(d) Equipment and Power Failure [IDAPA 58.01.05.012; 40 CFR 270.14(b)(8)(iv)]**

23 Equipment failures are minimized and prevented by thorough preventative
24 maintenance and servicing programs. Possible equipment failure during HW/MW
25 handling activities is primarily limited to crane or hoist breakdowns in the HWMA
26 units. Crane breakdown could encompass motor, mechanical, and structural failure.
27 Failures of the cranes or hoists are minimized through routine maintenance.

28 Forklift failure could encompass motor, hydraulic, mechanical, and structural
29 failure; rigging tackle failure could encompass breakage or deformation of slings,
30 wire ropes, shackles, hooks, or other lifting devices. Forklift failure is minimized by

1 routine maintenance and pre-use equipment checks. Delays in unloading and storage
2 of waste containers as a result of forklift failure are also minimized because other
3 forklifts are available if one is out of service.

4 To mitigate effects during electrical power failures:

- 5 • Ongoing operations (such as movement of HW/MW containers and
6 treatment systems in operation) will be secured and placed in a safe
7 condition
- 8 • Open containers of HW/MW will be closed and secured
- 9 • Automatic valves and controls in HW/MW treatment systems will fail in
10 safe positions (as they are designed to do in case of power failures).

11 HWMA unit operations personnel complete facility shutdown as necessary to place
12 operations and waste in a safe standby configuration.

13 **F-4(e) Personal Protective Equipment [IDAPA 58.01.05.012; 40 CFR 270.14(b)(8)(v)]**

14 HW/MW is received at HWMA units in closed containers. HW/MW containers are
15 only to be opened for the removal or transfer of the HW/MW at the time of waste
16 verification, repackaging, and/or treatment. HW/MW within tank systems is isolated
17 from personnel. Personal protective equipment (PPE) and fire/spill control
18 equipment is available for use in the HWMA unit, if deemed necessary, when
19 HW/MW may be exposed to the atmosphere during repackaging, cutting of piping
20 to facilitate access to the waste, and/or treatment.

21 **F-5 Ignitable, Reactive, and Incompatible Wastes [IDAPA 58.01.05.012; 40 CFR**
22 **270.14(b)(9)]**

23 Since the HWMA units may handle ignitable and reactive HW/MW, units managing
24 this waste are designed, constructed, and operated to prevent accidental ignition or
25 the reaction of the HW/MW with water or other incompatible material.

1 **F-5(a) Prevent Ignition or Reaction of Ignitable or Reactive Waste [IDAPA**
2 **58.01.05.012 and 58.01.05.008; 40 CFR 270.14(b)(9) and 264.17(a)]**

3 Engineering and administrative controls are in place at the HWMA units that
4 manage ignitable or reactive HW/MW to prevent the accidental reaction or ignition
5 of ignitable and reactive HW/MW and include the following:

- 6 • Protecting HW/MW containers from physical damage by minimizing
7 handling
- 8 • Not storing incompatible materials together such as water (other than the
9 industrial service water), corrosives, oxidizers, or halogenated solvents in
10 the area in container or tanks systems
- 11 • Prohibiting sources of heat or ignition in the storage areas where ignitable or
12 reactive HW/MW are managed
- 13 • Restricting access to HW/MW areas to trained personnel
- 14 • Keeping doors to HWMA units closed (when not in use) to prevent
15 precipitation from accumulating in the storage area
- 16 • Using only properly trained personnel to place or remove HW/MW from the
17 areas.
- 18 • Work control documents.

19 **F-5(b) General Precautions for Handling Ignitable or Reactive Waste and Mixing of**
20 **Incompatible Waste [IDAPA 58.01.05.012 and 58.01.05.008; 40 CFR**
21 **270.14(b)(9) and 264.17(b)]**

22 The design and operating practices at the HWMA units that manage ignitable or
23 reactive HW/MW prevent reactions that:

- 24 • Generate uncontrolled extreme heat or pressure, fire, explosions, or violent
25 reactions
- 26 • Produce uncontrolled toxic mists, fumes, dusts, or gases in sufficient
27 quantities to pose a risk of fire or explosion or to threaten human health or
28 the environment
- 29 • Damage the structural integrity of containers, tanks systems or secondary
30 containment systems.

1 These practices and design features are intended to separate and protect waste from
2 sources of ignition, reaction, or spontaneous ignition, as follows:

- 3 • Incompatible waste is segregated as described in Subsection 4(d).
- 4 • When containers are required to be opened for the purpose of HW/MW
5 waste verification, repackaging, and/or treatment, only the containers in
6 process will be opened.
- 7 • The atmosphere in the area where containers are opened is controlled to
8 keep HW/MW confined. If necessary, containers will be opened in
9 atmospheres that have appropriate ventilation or atmospheric controls with
10 respect to areas where unopened containers or personnel are located.
- 11 • All equipment and wiring complies with applicable NFPA codes. Portable
12 electric tools used are double-insulated or have ground fault interruption
13 (GFI) circuit protection.
- 14 • Open-flame cutting, welding, or other similar spark or ignition sources will
15 not be allowed inside the HWMA unit unless repair is required on a piece of
16 equipment, in which case the equipment and the open flame or spark source
17 will be isolated to the extent feasible from the HW/MW. To the extent
18 necessary, the HW/MW will be transferred to one of the HWMA unit
19 storage/treatment areas where potential ignition sources do not exist.

20 Additionally, the following steps/precautions will be taken when removing
21 and handling sodium/NaK filled piping segments/components. The
22 appropriate PPE (portable eyewash station) and fire response equipment
23 (metal X fire extinguisher) will be staged near the work area. Unnecessary
24 combustibles and any moisture on the floor will be removed. A clean and
25 dry metal catch pan will be staged under the area where cutting will occur.
26 Whenever possible cuts will be made from the high points of the system
27 down, with a visual inspection completed prior to cutting. Cutting will be
28 completed via mechanical means (e.g., porta-band saw or wheeled cutter).
29 The cutting will be stopped when the cut temperature approaches 200° F to
30 allow the equipment to cool and ensure the sodium does not melt. The ends
31 of piping or removed sections will be bagged to minimize exposure to air.
32 Work areas will be inspected for signs of alkali metals outside of an
33 acceptable storage container at the end of each shift and the areas cleaned up
34 as needed.

- 35 • Routine inspections of HWMA unit container storage/process areas provide
36 regular assessment of storage conditions and early identification of
37 potentially hazardous situations.

1 **F-5(c) Management of Ignitable or Reactive Waste in Containers [IDAPA**
2 **58.01.05.012 and 58.01.05.00 8; 40 CFR 270.15C and 264.176]**

3 MFC is located approximately 4 miles from the nearest INL facility property line. A
4 buffer zone surrounding the MFC, and including the HWMA units, is greater than
5 50 ft from the property line, in compliance with IDAPA 58.01.05.008 and 40 CFR
6 264.176.

7 **F-5(d) Management of Incompatible Waste in Containers [IDAPA 58.01.05.012 and**
8 **58.01.05.008; 40 CFR 270.15(d) and 264.177]**

9 Prior to HW/MW shipment to a HWMA unit, the generator provides information to
10 the HWMA unit manager (or designee). The HWMA unit manager or designee
11 reviews this information for conformance with this permit. This provides a check as
12 to whether or not the generator is placing incompatible HW/MW together in a single
13 container or in a single shipment (both of which are prohibited). All HW/MW
14 received at a HWMA unit is packaged by the generator. Information regarding the
15 review of generator-supplied information for compatibility is addressed in this
16 Permit in Attachment 2, Section C, Waste Analysis Plan.

17 If noncompliant conditions are discovered by HWMA unit operations personnel
18 during the course of storage, repackaging, and/or treatment, the generator is
19 contacted and the situation evaluated and documented on a case-by-case basis. To
20 the extent possible, the noncompliant condition is remedied at least to the point
21 where the HW/MW can be safely returned to the generator.

22 HW/MW generated at a HWMA unit as a result of repackaging, and/or treatment, is
23 packaged in compatible containers and with compatible HW/MW if consolidated.
24 No HW/MW generated at a HWMA unit is placed in containers with HW/MW or
25 HW/MW residue, which could be potentially incompatible.

26 If a container of HW/MW received at a HWMA unit is incompatible with any
27 HW/MW or materials stored nearby, it will be separated from the other HW/MW or
28 materials or isolated from them by means of a wall or other device or procedure.

29 **F-5(e) Management of Ignitable or Reactive Waste in Tank Systems [IDAPA**
30 **58.01.05.012 and 58.01.05.00 8; 40 CFR 270.16(j) and 264.198]**

31 Ignitable and reactive HW/MW that is placed in the tank system used to deactivate
32 the HW/MW is managed to ensure that the waste will not react or ignite outside of

1 the designed treatment process. The headspaces of tanks holding Na/NaK are
2 typically filled with inert gas, nitrogen for example, to minimize the potential for an
3 air to waste reaction. The controlled reaction of ignitable and reactive HW/MW in
4 tank systems meet the requirements of IDAPA 58.01.05.008 and 40 CFR 264.198
5 and 264.17(b).

6 **F-5(f) Management of Incompatible Waste in Tank Systems [IDAPA 58.01.05.012**
7 **and 58.01.05.008; 40 CFR 270.16(j) and 264.199]**

8 Incompatible HW/MW will not be placed together in storage tanks or tank systems.
9 As identified above tank systems are designed specifically to react ignitable and
10 reactive HW/MW with water only under controlled conditions.