

PROCEDURE TO ABSORB OIL WITH HI DRI FOR SHIPMENT
TO RICHLAND, WASHINGTON, BURIAL SITE

1.0 GENERAL

This procedure defines the method to be used to absorb oil for shipment to the burial site at Richland, Washington.

2.0 DEFINITIONS

2.1 Waste Oil Drum

Drums in which waste oil is stored prior to absorption. They are normally identified with an "NR---" number. These drums are not used for shipping.

2.2 Shipping Drum

Drums into which oil and Hi Dri are layered. These drums should not have been used for anything else previously. When full, they will be shipped to the burial site.

2.3 Separation Drum

Drums used to hold water pumped out of a waste oil drum. These drums are used to provide extra time to get complete water and oil separation prior to pumping water to a control side floor drain.

3.0 REFERENCES

- 3.1 "Absorbents Approved for Use in Packaging Radioactive Wastes", undated memorandum from E. Lee Gronemeyer, In-Charge Transportation and Waste Management, Department of Social and Health Services, State of Washington.
- 3.2 49 CFR Parts 100 to 178.
- 3.3 10 CFR Part 71.
- 3.4 U.S. Ecology, Inc. State of Washington Radioactive Materials License WN-1019-2.
- 3.5 Waste Oil Shipping Drum Contents, form CHP-76.

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4.0 MATERIALS NEEDED

- 4.1 Hi Dri in 40 pound bags
- 4.2 Two and one-half gallon bucket
- 4.3 New 55-gallon drums
- 4.4 Four mil (or greater) thick plastic bags large enough to line a 55-gallon drum
- 4.5 Adhesive tape to seal plastic bag
- 4.6 Hand pump and hoses to fit
- 4.7 Bottom probe for pump
- 4.8 Protective clothing for handling contaminated liquids
- 4.9 "Radioactive" markings

5.0 PRECAUTIONS

Handle oil carefully. It is a contaminated liquid. Also, avoid spilling Hi Dri.

6.0 FILLING THE DRUMS

- 6.1 Obtain a waste permit number from the Duty Shift Supervisor.
- 6.2 Each drum of oil should be checked for the presence of water which may have settled below the oil at the bottom of the drum.
 - 6.2.1 Let the drum set for at least one hour after it has been moved. This will allow the drum contents to settle.
 - 6.2.2 Place the probe of the transfer pump into the very bottom of the drum.
 - 6.2.3 Pump any water that may have accumulated in the bottom of the drum into a bucket.
 - 6.2.4 Cease pumping when oil comes out of the pump.
 - 6.2.5 Allow the oil water mixture in the bucket to separate.
 - 6.2.6 Pour the oil off of the top and back into the waste oil drum. The water should be solidified according to RDW 3.2 or OP-9B.

- 6.3 Line a 55-gallon drum with a plastic bag. This will be the shipping drum. The bag must be at least four mils thick. Thickness should be checked by referring to manufacturer's data or with a micrometer.
- 6.4 Pour one bag of Hi Dri into the shipping drum.
- 6.5 Pour one two and one-half gallon pail of oil into the shipping drum.
- 6.6 Repeat Steps 6.4 and 6.5 three more times. There will then be four bags of Hi Dri and 10 gallons of oil in the shipping drum.
- 6.7 Add one more bag of Hi Dri.
- 6.8 Twist bag shut and seal tightly with tape.
- 6.9 Place a "Radioactive" marking on the top of the bag.
- 6.10 See Figure 1 which illustrates the distribution of Hi Dri and oil.
- 6.11 Place lid on drum and tighten.
- 6.12 Put two "Radioactive Material" labels 180° degrees apart on the drum.

NOTE: THESE LABELS WILL NOT BE NECESSARY IF THE DRUM IS TO BE IMMEDIATELY SURVEYED AND PROPERLY MARKED OR LABELED FOR SHIPMENT.

- 6.13 Fill out a drum processing tag, form OPS-14 and attach it to the shipping drum. Some information such as total activity may not be known at the time of drum processing and may be added at a later time.
- 6.14 In order to keep track of the activity in each shipping drum, record the following data on form CHP-76.
 - 6.14.1 Waste permit number.
 - 6.14.2 Waste oil drum number.
 - 6.14.3 Number of gallons from a waste oil drum put in the shipping drum. If oil is taken from more than one waste oil drum, record the gallons taken from each.

NOTE: THE TOTAL NUMBER OF GALLONS OF OIL PUT IN A DRUM MUST NEVER EXCEED 10 GALLONS.

- 6.15 Survey the drum and place it in the drum staging area. Post the area as necessary.

7.0 PREPARING DRUMS FOR SHIPMENT

- 7.1 Contact the Nuclear Plant Specialist or Engineer assigned to radwaste to establish the hazardous material classification of the shipment. This will determine which radioactive handling materials procedure will be used for processing.
- 7.2 After the shipping drums have been prepared for shipment, place them in an appropriate storage area.
- 7.3 Send completed form CHP-76 to the Nuclear Plant Specialist or Engineer assigned to radwaste.

ATTACHMENT 1CALCULATION OF AMOUNTS OF OIL AND HI DRI
TO BE PUT IN A 55-GALLON DRUM1. Oil/Hi Dri Ratio to be Used for Shipping Purposes

Testing at Point Beach Nuclear Plant shows that Hi Dri will absorb 77% of its weight in oil.

However, regulations require that a container must be filled with enough Hi Dri to absorb twice the amount of oil present. The oil/Hi Dri ratio used is only half of the actual absorption ability of the Hi Dri.

$$\frac{\text{Weight Oil}}{\text{Weight Hi Dri}} = 0.385$$

The ratio shown above is used for shipping purposes.

2. Weight of Hi Dri per Drum

A little over five forty-pound bags of Hi Dri will fill a 55-gallon drum.

Weight Hi Dri per Drum = 200 pounds.

3. Weight Oil Allowed in 200 Pounds of Hi Dri

$$200 \text{ pounds Hi Dri} \times \frac{0.385 \text{ lb. oil}}{\text{lb. Hi Dri}} = 77 \text{ lbs. oil}$$

4. Gallons of Oil Allowed in 200 Pounds of Hi Dri

This assumes a specific gravity of 0.9 for oil. This is higher than actual, but allows a safety margin.

$$\frac{77 \text{ lbs. oil}}{\text{drum}} \times \frac{1}{0.9 \times 8.33 \text{ lbs./gal.}} = 10.27 \text{ gallon/drum}$$

5. Amounts of Hi Dri And Oil to be Put in a 55-Gallon Drum

The amounts will be stated in terms of bags and pail fulls for convenience. A bag of Hi Dri is 40 pounds. A pail of oil is 2.5 gallons.

Hi Dri to be placed in drum = 5 bags

Oil to be placed in drum = 4 pails

Note that this allows only 10 gallons of oil in the drum, less than the allowable. This provides another safety margin.

FIGURE 1

