



# Moderate Risk Waste Fixed Facility Guidelines

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Publication No. 92-13  
March 1992  
(Revised May 1993 and December 1995)

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Prepared by:

Washington State Department of Ecology  
Solid Waste and Financial Assistance Program

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## DOCUMENT HISTORY AND ACKNOWLEDGMENTS

The development of this Ecology document has included a synthesis of ideas, experience, and comments from many sources. Base material was developed principally by Sally Toteff for use in a handful of unique Moderate Risk Waste (MRW) Fixed Facility pilot project grant agreements. Using this foundation, Wayne Turnberg and Tony Warfield developed a single draft document that was widely distributed in Washington to nearly 200 officials at the city, county, and state levels of government. Many of these interested reviewers submitted written comments. Nearly all of the comments were used in the creation of the original 1992 version of this guidance document. The 1992 document was written by David Nightingale, except for the figure titled "Potentially Incompatible MRW Categories," which was developed by William Green. The 1993 and 1995 revisions were made by David Nightingale.

In addition to the successive Ecology authors mentioned above, other key individuals deserve credit. Mari Eichner and Donna Voss from the Department of Community Development provided valuable input on the application and interrelation of the various building and fire codes. Linda Anyan from the Department of Labor and Industries was a great help in evaluating and editing the WISHA and Electrical Code sections of the text. Keying and formatting the document text and tables was performed promptly and accurately by Sue Smith and Sonya Kirkendall, Ecology Word Processing Specialists.

This 1995 version of the MRW Fixed Facilities Guidelines is a significant update from the March 1992 and the May 1993 versions. This reflects the increasing body of knowledge regarding the design and operation of MRW Fixed Facilities. In 1992, when the original guidelines were printed, there were approximately 12 Fixed Facilities in Washington. Now there are approximately 36 operating facilities in Washington as of this writing. The development experiences of the 24 new facilities as well as the operating experiences of all 36 facilities now operating have provided much of the updated and additional material contained in this document.

Consequently, final thanks are due to the many local and state reviewers as well as Ecology staff from around the state who provided the ideas, experiences in siting and facility design, operational tips and history, suggestions, questions, and critiques leading up to this guidance document. This valuable input has certainly resulted in a more comprehensive and usable guidance document.

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## I. INTRODUCTION

Moderate Risk Waste (MRW) is a category of solid waste which is Household Hazardous Waste (HHW) or Conditionally Exempt Small Quantity Generator (CESQG) waste. MRW exhibits properties of hazardous waste but is conditionally exempt under the state's Dangerous Waste Regulations (Chapter 173-303 of the Washington Administrative Code, WAC). Therefore, MRW falls under the purview of solid waste handling authority (Chapter 70.95 Revised Code of Washington, RCW) when the conditions of exemption have been met. Facilities that handle MRW are typically regulated by local solid waste handling rules implemented by local health districts or departments and must meet the requirements of the Minimum Functional Standards for Solid Waste Handling Facilities (MFS), Chapter 173-304 WAC. Because these MFS standards do not specifically address facilities that handle only MRW, these guidelines have been developed.

Moderate Risk Waste is exempt from full regulation under the Dangerous Waste Regulations. Therefore, terms such as "facility" and "storage" are not typically used in this guidance document to reflect the Dangerous Waste regulatory definitions but are descriptions of parts or functions of an MRW Fixed Facility. Nonetheless, there are occasional references to entities or activities that are fully regulated such as hazardous waste Treatment, Storage, and Disposal (TSD) facilities and licensed and permitted hazardous waste service providers.

Abbreviations used in this document are listed in Appendix A on page 52. These guidelines are effective on the date of publish and will remain effective until revised or superseded.

### A. Purpose

The purpose of this document is to provide guidance to those involved with MRW Fixed Facilities. This document is intended to be used as guidance to local health departments/districts and the Department of Ecology (Ecology) during the review and issuance of MRW Fixed Facility solid waste handling permits. It is also intended to guide local planners, designers, and operators of MRW Fixed Facilities. This document identifies issues that should be addressed or considered in planning, designing, constructing, permitting, and operating MRW Fixed Facilities. The context of the text should indicate whether the guidance is intended to protect public and worker health, safety, and protect the environment or simply is advise for practical or economic consideration. This is not a technical engineering manual or standard. Appropriate related manuals, standards and professional judgments need to be used with this guidance document. There is frequent reference to other standards and regulations in this guidance that should be consulted in addition to various professionals to create an appropriate and safe facility.

These guidelines were prepared primarily for MRW Fixed Facilities as opposed to MRW mobile facilities or collection events, although some of the information in this document may also be useful when designing or operating mobile facilities and/or collection events.

These are guidelines for MRW Fixed Facilities, to be used in conjunction, with the Minimum Functional Standards for Solid Waste Handling. Ecology would like to solicit comments regarding the usefulness, appropriateness, advantages, and shortfalls of this guidance, especially in regard to the potential development of future regulations or guideline revisions for MRW Fixed Facilities. Please send comments to:

MRW Fixed Facility Guidelines Comments  
Solid Waste and Financial Assistance Program  
Washington Department of Ecology  
P. O. Box 47600



B. MRW Defined

Moderate Risk Waste is waste that can be hazardous to human health, or the environment, but is conditionally exempt from the Dangerous Waste Regulations, Chapter 173-303 WAC.

Moderate Risk Waste has been specifically defined by RCW 70.105.010 (17) to mean:

- "a) Any waste that exhibits any of the properties of hazardous waste but is exempt from regulation under Chapter 70.105 RCW solely because the waste is generated in quantities below the threshold for regulation, and;
- b) Any household wastes which are generated from the disposal of substances identified by the department as hazardous household substances." (Such substances are identified in Ecology's "Planning Guidelines for Local Hazardous Waste Plans," 1994.)

The first part of this definition pertains to a category of waste producers called conditionally exempt small quantity generators, CESQGs, often referred to in Washington simply as Small Quantity Generators or SQGs. The second part of the definition includes household hazardous wastes, usually abbreviated as HHW.

CESQGs generate Dangerous Waste (DW) that may be conditionally exempt from the DW regulations. Dangerous Waste is Washington's counterpart of hazardous waste at the federal level. CESQGs are exempt from the DW regulations if their generated or accumulated wastes are:

1. Properly designated as solid waste, DW or Extremely Hazardous Waste (EHW) and amounts are below the Quantity Exclusion Limits (QELs) for wastes designated as either DW or EHW, **and**
2. The waste is handled in a manner consistent with WAC 173-303-070(8)(b), which means ensuring treatment or disposal by a:
  - a. Permitted Hazardous Waste TSD facility;
  - b. Moderate Risk Waste facility permitted as a solid waste handling facility under Chapter 173-304 WAC (MFS) , operated in accordance with state and local regulations, and consistent with the local hazardous waste plan that has been approved by Ecology;
  - c. Facility that beneficially uses or reuses, or legitimately recycles or reclaims the waste, or treats the waste prior to such recycling activities; or
  - d. Permitted Industrial or Municipal Solid Waste facility, in accordance with state and local regulations (which may restrict Moderate Risk Waste) or another state's solid waste laws if sent out of state.
3. Also, if the CESQG has obtained an EPA/state identification number, it must submit annual reports in accordance with WAC 173-303-220.

If a potential CESQG does not manage their waste according to these conditions, it is a fully regulated generator because the conditions for exemption have not been satisfied

For instance, the Dangerous Waste Regulations contain the Quality Exclusion Limits (QELs) for hazardous waste accumulation and monthly generation. For most DWs the monthly generation limit is 220 pounds per month with a total on-site accumulation limit of all DW at 2,200 pounds. For EHW, such as extremely toxic wastes, the QEL can be 2.2 pounds or below for monthly generation and accumulation, Ecology's regional DW inspectors and local MRW staff can provide site and waste specific determinations for quantities of DW and EHW limits for CESQGs.

### C. MRW Fixed Facility Defined

An "MRW Fixed Facility" means:

a staffed dedicated site provided with secondary waste containment that is specifically built or set up at a permanent or interim fixed location to collect, treat, recycle, exchange, store, and/or transfer Moderate Risk Waste.

This definition does not include mobile collection facilities nor collection events. These other MRW handling activities are geographically transient by nature and are therefore different from a fixed facility. Mobile MRW facilities and collection events are similar MRW program activities. For those involved in mobile or collection events a more useful set of guidelines will be found in Ecology's publication 88-6, Household Hazardous Waste Guidelines For Conducting Collection Events.

### D. Limited MRW Fixed Facility Defined

In many Local Hazardous Waste Management Plans, facilities have been or are to be built that collect only one specific or a few selected types of MRW. For these kinds of facilities, the term "Limited MRW Fixed Facility" may be used.

A "Limited MRW Fixed Facility" is:

a facility provided with secondary waste containment that is specifically built or set up at a fixed location to collect and store only one or a selected few MRW types.

Examples of possible Limited MRW Fixed Facilities are facility to collect only automotive wastes paint "drop and swaps," and county shops or parts stores for used oil, oil filters, and antifreeze.

The recommended criteria for evaluating whether a facility should be viewed as a Limited MRW Fixed Facility include:

- Compatibility of MRWs collected
- MRW characteristics and inherent (toxicity, stability, etc.)
- Collection of more than three or four MRW types
- Total MRW quantities experienced or expected
  - MRW handling other than collection and storage activities
- Facility design
- Site characteristics and adjacent land uses
- Other criteria as appropriate

Limited MRW Fixed Facilities typically collect and store wastes such as used motor oil, batteries, and oil-based paints. Pesticides are typically highly toxic compounds that present an intrinsically higher level of hazard to human health and the environment. Consequently, pesticides or other more intrinsically dangerous wastes should be carefully considered before being collected at a Limited MRW Fixed Facility. If allowed, they should be collected only by a well qualified highly trained attendant.

Experience with some used oil/automotive collection facilities has shown that unattended collection sites can result in more significant maintenance and oil contamination. As a result there is a trend to move these sites or locate new sites indoors or in a more closely matched area.

E. Comparison of MRW Facility Types

The distinction for a Limited MRW Fixed Facility is provided as a means to differentiate between the different associated hazard levels of handling a limited versus a comprehensive list of MRW types, as well as large quantities or highly toxic MRW.

Different environmental or human health hazards associated with the two categories of facilities call for different design and operating requirements. The use of the Limited MRW Fixed Facility category is at the option of the local health authority. It is intended that a requirement for a Solid Waste Handling Facility Permit be at the option of the local health authority for a Limited MRW Fixed Facility, as discussed in the operation and design sections of this document, and in accordance with other local requirements. Otherwise, the MRW Fixed Facility should be a fully permitted solid waste handling facility.

It is expected that a Limited MRW Fixed Facility would often function as a remote or satellite collection site and may have less sophisticated designs and operations. This limited facility designation is reasonable if, due to the limited types of wastes accepted, there is an associated reduction in potential human health and environmental hazards. A comparative summary of the two MRW facility types is shown on Table 1. The Limited MRW Fixed Facility designation should not be used to site multiple limited facilities at one location or site or used in any other way to avoid permitting, operating, design, or other safety, health, and environmental parameters that would otherwise be required.

<b>TABLE 1</b> Comparative Summary of Facility Types		
Typical Facility Characteristics	MRW Fixed Facility	Limited MRW Fixed Facility
MRW Types Handled	All	Up To Three or Four
MRW Collected and Stored With Minimal On-site Analysis and Handling	Yes	Yes
MRW Treated, Recycled, Exchanged, Unknown Chemical Analysis	Yes	No
Solid Waste Handling Facility Permit	Required	Case-by-Case
SEPA Review	Required	Often Required
Compliance With Local Codes, Zoning, Permits, etc.	Required	Required

Staffed During Open Hours	Yes	Recommended
Local health officials determine whether a facility will be considered "limited" and if a solid waste handling facility permit is required.		

Over time, a Limited MRW Fixed Facility operator may consider receiving additional types of MRW. As new MRW types are proposed or considered to be accepted at a Limited MRW Fixed Facility, the design, operations, safety, zoning, and other facility issues must be adequately reviewed. Additionally, review of the following should be included:

1. Status as a Limited MRW Fixed Facility versus an MRW Fixed Facility.
2. If the facility remains a Limited MRW Fixed Facility, is a solid waste handling facility permit required?

F. Used Oil Collection Facility Guidelines

RCW 70.95I.030(5) required Ecology to prepare guidelines for collection sites that collect used oil from households. This guidance was originally provided in the May 1993 revision of this document. Since then the Used Oil Management Standards, Chapter 173-354 WAC has been drafted, that rule will incorporate the required guidance contained in the May 1993 version of this document.

G. Background

Establishing MRW Fixed Facilities requires careful planning, design, and operation. An investment in thoughtful "common sense" planning, siting, design and operating features can benefit facility owners/operators by:

- Reducing the risk of hazardous materials exposure to the public and facility workers;
- Reducing the risk of accidental discharges of hazardous substances to the environment;
- Minimizing hazardous waste cleanup responses and long-term liability; and/or
- Assist in public and regulatory acceptance for the siting and operation of MRW Fixed Facilities.
- Increase the effectiveness of the facility design and operations which can result in lower construction and operating expenses.

MRW is primarily regulated as a solid waste although it can be chemically identical to materials that are regulated as Dangerous Wastes if generated in large quantities by non-household sources. As such, MRW is a hybrid between solid and hazardous wastes. Consequently, in many respects MRW Fixed Facilities should be designed and operated with a higher standard of worker and environmental protection in mind than a solid waste transfer facility. Experience and "common sense" needs to be applied to MRW Fixed Facilities when considering any written set of regulations.

Because of the wide variation in MRW facilities, these guidelines are not intended as a complete detailed design and operations manual. The following additional assumptions were used during the creation of this guidance:

The local regulatory environment will determine many parameters for design, operating, and permitting requirements.

Differences in populations served, volumes and types of MRW collected will necessitate differences in facility operation and design.

Flexible guidance is needed for creative solutions which address the significant hazards associated with the handling of MRW.

Much has been learned since the first facility became operational in Bellingham in the early 1980s. The author has attempted to include many of these learnings regarding the design and operation of MRW facilities in Washington and other states in this document.

## H. Applicability to Existing Facilities and Guideline Use by Health Officials

Existing MRW Fixed Facilities can use these guidelines to improve current operating practices, and planned expansions or upgrades to the existing facility. Existing MRW Fixed Facilities should diligently work toward meeting the recommendations in these guidelines as soon as possible before the end of the five-year planning timeline in their first generation Local Hazardous Waste Management Plan approved by Ecology.

Local health departments or districts should use discretion in applying the following guidance sections, especially for Limited MRW Fixed Facilities. The applicability of the following sections to a Limited MRW Fixed Facility should be largely influenced by the type of waste(s) to be collected, anticipated quantities of waste, waste handling methods, and the existing conditions at the proposed or existing site for implementation. Nonetheless, many concepts and principles written here apply equally to any handling of MRW.

## I. Liability Considerations

Solid waste or MRW generated and collected by the community is the community's responsibility, as is the potential federal Comprehensive Environmental Response, Compensation and Liability Act (CERCLA, commonly called "Superfund") liability, regardless of the final waste management method. An EPA policy memo "recommends that sponsors of HHW collection programs manage the collected HHW as a hazardous waste," OSWER 9574.00-1. This is because accepted methods for treating and otherwise managing hazardous waste, including disposal to hazardous waste landfills, "provide a greater level of environmental protection." The primary goal of managing MRW appropriately is to protect public health and the environment. Achieving this goal will reduce potential environmental degradation and thereby should also reduce potential environmental liabilities.

Owners and operators of MRW Fixed Facilities should be aware of their general liability as well as specific liability under CERCLA (Superfund) and the Washington State parallel Model Toxics Control Act (MTCA). General liability is concerned primarily with worker and participant safety. General liability insurance may be part of the owner and/or operator's insurance policy. CERCLA and MTCA liability is concerned primarily with long-term liability for releases of hazardous substances into the environment. It may be possible for long-term environmental degradation insurance coverage to be carried as a rider to a permitted hazardous waste transporter and/or treatment, storage and disposal facility's comprehensive pollution liability insurance.

CERCLA and MTCA assign financial liability to hazardous waste management facilities, transporters, and generators of hazardous waste, including small quantity generators and MRW facilities, for any pollution clean-up costs that may be caused by their waste. In short, if a waste disposal site (hazardous or solid waste) is identified as a significant source of pollution and is listed as a clean-up site, the owner and operator of a hazardous waste site and generators of the waste could be liable for clean-up costs. Removing MRW from the solid waste stream allows for more appropriate management of those wastes which otherwise might result in significant environmental degradation and/or damage to solid waste landfill liners.

The United States Environmental Protection Agency (EPA) noted in a November 1, 1988, policy memo, number OSWER 9574.00-1, that:

"Communities should recognize that potential liability under CERCLA applies regardless of whether the household hazardous waste was picked up as part of a community's routine waste collection service and disposed of in a municipal

waste landfill (RCRA Subtitle D) or if the household hazardous waste was gathered as part of a special collection program and taken to a hazardous waste landfill (RCRA Subtitle C). The additional safeguards provided by household hazardous waste collection and Subtitle C management may reduce the likelihood of environmental and human health impacts and, therefore, may also reduce potential CERCLA liability."

Given the unavoidable potential liability under CERCLA, as described above, it is questionable whether the local community can avoid any liability for potential future CERCLA actions by not being listed on the manifest as the generator of MRW or by not applying for an EPA/state identification number as a generator.

Local communities can choose to dispose of their MRW by various methods including land disposal, stabilization, or incineration for certain MRW types. By choosing methods such as incineration or other treatment techniques that provide toxicity or hazard reduction or elimination, the long-term potential liability may be reduced. There may be current operating cost differentials associated with these management technique choices.

If MRW is managed in such a way that it has the potential for or has caused a discharge or release which could pose a threat to the public health or environment, the responsible parties could be liable for Ecology actions. Specifically, in the Dangerous Waste Regulations section; 173-303-050 WAC, Department of Ecology clean-up authority; 173-303-145 WAC, Spills and discharges; and 173-303-960, Special powers and authorities of the department, provide for Ecology actions related to hazardous substances independent of the regulatory status as a solid or hazardous waste.

Prudent MRW Fixed Facility design and operating practices should minimize potential liability at these sites. Careful selection of a conscientious and responsible transporter and hazardous waste Treatment, Storage and Disposal (TSD) will help minimize the off-site liability potentials. For many MRW types there are recycling, on-site treatment or volume reduction, exchange/reuse, and other none TSD contractor options which may reduce operating costs and/or future environmental liability.

## II. PERMITS AND SEPA

<i>APPLICABILITY:</i>	This section applies to both MRW Fixed Facilities and Limited MRW Fixed Facilities.
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This section briefly describes the typical types of permitting and SEPA requirements that need to be fully explored and considered at the earliest proposal and design stages of an MRW Fixed Facility development project.

### A. Solid Waste Handling Facility Permit

An MRW Fixed Facility must obtain a solid waste handling facility permit from the jurisdictional health authority before beginning construction. Existing MRW Fixed Facilities, ones in operation as of March 1992, should obtain a permit as soon as possible. If the facility is sited at an existing solid waste handling facility, such as a landfill, the solid waste handling permit should be amended to reflect the proposed MRW Fixed Facility operations before construction. Additional guidance on solid waste handling permits for MRW Fixed Facilities is in Section IV.C. of these guidelines. Some Limited MRW Fixed Facilities may not require a solid waste handling facility permit or permit amendment. The need for a solid waste handling facility permit for a Limited MRW Fixed Facility will be determined by the local health authority on a case-by-case basis. Local health authorities may also determine whether to require all Limited MRW Fixed Facilities to obtain a solid waste handling permit or perhaps to conditionally exclude certain types of Limited MRW facilities from obtaining solid waste handling permits. For example, stand-alone used oil collection sites seldom receive solid waste permits. In any case, all MRW Fixed Facilities need to be designed and operated so as to provide reasonable protection from hazards to human health and the environment.

An outline of the procedure for obtaining a solid waste handling permit for a MRW Fixed Facility includes:

1. The owner or operator of the proposed MRW Fixed Facility must submit two signed copies of a solid waste handling permit application to the jurisdictional health district. The solid waste handling permit application must include the following information:
  - description of the facility including proposed and existing zoning
  - types of waste to be handled
  - a plan of operation (see Section V of this guidance document)
  - preliminary engineering report/plan and specifications
  - inspection schedule and log
  - closure plan
  - the facility's direct relationship to the recommended alternatives of the Ecology approved local solid and/or hazardous waste management plans
2. The applicant must also file an environmental checklist required under the State Environmental Policy Act (SEPA) and demonstrate that all required local permits and approvals for construction have been received or applications submitted.



3. Once the completed solid waste handling permit application is received by the jurisdictional health department, one copy is forwarded to the appropriate Ecology regional office. Ecology has 45 days from date of receipt to review the application and report its findings to the jurisdictional health department. The jurisdictional health department has 90 days from date of receipt of the application to issue or deny a permit or inform the applicant of the status of the permit. **NO CONSTRUCTION CAN OCCUR UNTIL THE PERMIT IS ISSUED.**

#### B. State Environmental Policy Act

A proposed MRW Fixed Facility may be required to undergo State Environmental Policy Act (SEPA) review as a part of the permitting process for establishing a facility. There may be some instances, such as the establishment of certain Limited MRW Fixed Facilities, where a proposed facility might obtain a local exemption from the SEPA process. In most cases, it is advisable to prepare a SEPA checklist to avoid future environmental and land use problems or public acceptance issues that may be associated with proposed facility siting, development, and operation. Based on the information provided, the lead agency may find the project to be exempt from SEPA, and then issue a threshold determination of nonsignificance (DNS).

In some cases, the project proponent will be required to, or opt to, prepare an environmental impact statement (EIS) for the proposed project. Some Local Hazardous Waste Management Plans call for SEPA review as individual recommended elements of the plan, such as an MRW Fixed Facility, are proposed for implementation. In addition, a permit, approval, or permit amendment process will often trigger SEPA review.

Local planning agencies can provide assistance with the SEPA process. Ecology has a SEPA manual that contains a handbook, the SEPA laws, and SEPA regulations at no charge for single copies. For copies of the SEPA manual call (360) 407-7513 or (360) 407-6923 in Olympia. These SEPA documents are also available on the internet at <http://olmpus.dis.wa.gov/www/access/ecology/ecyhome>.

#### C. Other Permits

An MRW Fixed Facility must also obtain other local permits as required by local agencies such as the local planning department for land use approvals, and building and fire safety authorities for building and occupancy permits. Required permits will vary from location to location. The owner/operator is responsible for securing all necessary permits prior to construction or operation, as appropriate.

#### D. Potential NPDES Permitting

National Pollutant Discharge Elimination System (NPDES) Storm Water Permits are required for MRW Fixed Facilities that are co-located with facilities of certain industry types or that have certain Standard Industrial Classification (SIC) codes. MRW Fixed Facilities in themselves do not require NPDES Storm Water Permits for operation. Examples of industrial activities that would require NPDES Storm Water Permits where MRW Fixed Facilities may also be located include:

Hazardous Waste Treatment Storage and Disposal Facilities (TSDs)

Landfills, Land Application Sites, and Open Dumps (final disposal sites) that have in the past or currently accept certain commercial or industrial wastes

Metal Scrapyards, Battery Reclaimers, Salvage Yards, Auto Dismantlers (not including drop-off or buy-back recycling centers)

Transportation related facilities which have vehicle maintenance shops and/or equipment cleaning operation

Domestic Wastewater Treatment Works with a design capacity of 1 million gallons per day or more or that require approval for pretreatment under 40 CFR Part 403.

Steam Electric Power Generating Facilities

These categories of industrial sites and others that are based on certain SIC codes, which are less likely to include MRW Fixed Facilities, are listed in 40 CFR Subpart 122.26(b)(14). The primary activity that occurs at the site controls whether a storm water permit is required. For instance, at a solid waste transfer station there may also be refuse truck maintenance performed. Because the primary activity is that of a solid waste transfer station, the location would reasonably have a SIC code of 4953, Sanitary Services, Refuse systems instead of a transportation related SIC code. Based on the 4953 SIC code, the transfer station would not require an NPDES Storm Water Permit. Generally, at establishments that have SIC Codes or industrial categories requiring an NPDES Storm Water Permit where there is also an MRW Fixed Facility, the Pollution Prevention Plan required by the permit should include provisions that cover the activities of the MRW Fixed Facility.

In addition to industries which need an NPDES Storm Water Permit, construction sites which disturb five or more acres of land area are required to obtain coverage under the NPDES Storm Water General Permit. This permit would be required for construction of an MRW Fixed Facility that disturbs five or more acres of land area. For more information on NPDES Storm Water Permits you may call Ecology's Water Quality Program for Point Source Management at

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#### E. Potential Air Quality Permitting

Based on the MRW Fixed Facility's operating procedures and ventilation provisions, some facilities might be regulated under the New Sources of Toxic Air Pollutants regulations, Chapter 173-460 WAC or the Washington Clean Air Act, Chapter 70.94 RCW. When the standard operating and MRW handling procedures have been drafted for a proposed MRW Fixed Facility, the local or state air authority should be consulted to determine if the MRW Fixed Facility is exempt from permitting. The contacts for local air authorities by county, or Ecology for counties without a local air authority are shown on Table 2.

**Sources of Information about Air Pollution in Washington State**

<p><b>1. Olympic Air Pollution Control Authority</b>  <i>(Clallam, Grays Harbor, Jefferson, Mason, Pacific, Thurston Counties)</i>                  909 Sleater-Kinney Road SE, Suite 1,                  Lacey WA 98503-1128                  Charles E. Peace, Air Pollution Control Officer  <i>Telephone: (360) 438-8768 or 1-800-422-5623</i>  <i>Fax: (360) 491-6308</i></p>	<p><b>2. Department of Ecology Northwest Regional Office</b>  <i>(San Juan County)</i>                  3190-160th Avenue SE,                  Bellevue, WA 98008-5452  <i>Telephone: (206) 649-7000</i>  <i>Fax: (206) 649-7098, TDD: (206)649-4259</i></p>
<p><b>3. Northwest Air Pollution Authority</b>  <i>(Island, Skagit, Whatcom Counties)</i>                  302 Pine Street #207,                  Mount Vernon, WA 98273-3852                  Terry L. Nyman, Air Pollution Control Officer  <i>Telephone: (360) 428-1617</i>  <i>Telephone: 1-800-622-4627 (Island &amp; Whatcom)</i>  <i>Fax: (360) 428-1620</i></p>	<p><b>4. Puget Sound Air Pollution Control Agency</b>  <i>(King, Kitsap, Pierce, Snohomish Counties)</i>                  110 Union Street, Suite 500                  Seattle, WA 98101-2038                  Dennis J. McLerran, Air Pollution Control Officer  <i>Telephone: (206) 343-8800 or 1-800-552-3565</i>                  1-800-595-4341 <i>(Burn Ban Recording)</i>  <i>Fax: (206) 343-7522</i></p>
<p><b>5. Southwest Air Pollution Control Authority</b>  <i>(Clark, Cowlitz, Lewis, Skamania, Wahkiakum Counties)</i>                  1308 NE 134th Street, Vancouver, WA 98685-2747                  Robert D. Elliot, Executive Director  <i>Telephone: (360) 574-3058 or 1-800-633-0709</i>  <i>Fax: (360) 576-0925</i></p>	<p><b>6. Department of Ecology Central Regional Office</b>  <i>(Chelan, Douglas, Kittitas, Klickitat, Okanogan Counties)</i>                  15 West Yakima Avenue, Suite #200                  Yakima, WA 98902-3401  <i>Telephone: (509) 575-2490</i>  <i>Fax: (509) 575-2809, TDD: (509) 454-7673</i></p>
<p><b>7. Yakima County Clean Air Authority</b>                  6 South 2nd Street, Room 1016                  Yakima, WA 98901                  Les Ornelas, Director  <i>Telephone: (509) 574-1410</i>  <i>Fax: (509) 574-1411</i></p>	<p><b>8. Department of Ecology Eastern Regional Office</b>  <i>(Adams, Aston, Columbia, Ferry, Franklin, Garfield, Grant, Lincoln, Pend Orielle, Stevens, Walla Walla, Whitman Counties)</i>                  N 4601 Monroe Street, Suite 202,                  Spokane, WA 99205-1295  <i>Telephone: (509) 456-3114</i>  <i>Fax: (509) 456-6175, TDD: (509) 458-2055</i></p>
<p><b>9. Spokane County Air Pollution Control Authority</b>                  W 1101 College Ave, Suite 403, Spokane, WA 99201                  Eric Skelton, Director  <i>Telephone: (509) 456-4727</i>  <i>Fax: (509) 459-6828</i></p>	<p><b>10. Benton County Clean Air Authority</b>                  650 George Washington Way, Richland, WA 99352                  Dave Lauer, Director  <i>Telephone: (509) 943-3396</i>  <i>Fax: (509) 943-0505 or 943-2232</i>  <i>Telephone: (509) 946-4489 (Burn Ban Recording)</i></p>

**Other Sources of Information about Air Pollution in Washington State**

<p><b>Washington State Department of Ecology</b>  <b>Air Quality Program</b>                  PO Box 47600, Olympia, WA 98504-7600  <i>Telephone: (360) 407-6800</i>  <i>Fax: (360) 407-6802, TDD: (360) 407-6006</i></p>	<p><b>Pulp Mills, Aluminum Smelters</b>  <b>Department of Ecology - Industrial Section</b>                  PO Box 47600, Olympia, WA 98504-7600  <i>Telephone: (360) 407-6916</i>  <i>Fax: (360) 407-6902</i></p>
<p><b>Department of Ecology Southwest Regional Office</b>                  PO Box 47775                  Olympia, WA 98504-7775  <i>Telephone: (360) 407-6300</i>  <i>Fax: (360) 407-6305, TDD: (360) 407-6006</i></p>	

### III. DEVELOPING THE WORKING CONCEPT

***APPLICABILITY:***

This section applies to both MRW Fixed Facilities and Limited MRW Fixed Facilities.

A useful approach to achieving an appropriate operations plan and final design is to first create a working concept of the proposed MRW Fixed Facility. Creation of the working concept involves looking back to the local planning efforts and motivation for building a facility. It also involves looking around to example facilities that may provide insights and wisdom into reaching the planning and policy objectives for the facility. Finally, the working concept integrates the things just mentioned with past collection results and waste stream estimates for the future to create the most appropriate facility for the community.

This section focuses on development of a working concept for MRW Fixed Facilities. The initial working concept focuses attention on important preliminary design and operating issues before undertaking a detailed examination of the applicable codes and regulation. The working concept is a starting point in the development of an appropriate and safe final design and operations plan. It is an important step in planning for a well-designed and operated facility. Some working concept elements of a MRW Fixed Facility will often be found in the Local Hazardous Waste Management Plan.

The MRW Fixed Facility working concept should outline at least the information in Table 3. The left hand column contains nine fundamental conceptual elements needed to develop an MRW facility working concept. The right hand column lists example information criteria or features that address the issues related to each of the nine conceptual elements. When completed the working concept will lead directly to development of a draft operation plan and elements to be included in the conceptual design drawings.

**TABLE 3**

**Elements of the Facility Working Concept**

Conceptual Element	Examples
1. Wastes to be Accepted	All CESQG and HHW wastes except explosives and used oil <b>OR</b> Only Used Oil and Latex Paint from households and the motor pool
2. Projected Quantity of Wastes Accepted Per Year For At Least Five Years	<p style="text-align: center;"><b>YEAR ONE</b></p> 6,000 gallons used oil 4,000 lbs. liquid flammables 2,000 lbs. corrosives 2,000 lbs. poisons 5,000 lbs. automotive batteries 1,000 gals. latex paints <p style="text-align: center;"><b>YEAR TWO</b></p> 8,000 gals. used oil etc ...
3. Management Techniques by Waste Type	Recycle used oil Bulk and ship liquid flammables Lab pack and ship corrosives Lab pack and ship poisons Palletize, wrap, and ship automotive batteries Recycle or solidify latex paints
4. Estimate Quantity of Containers for Wastes Needed by Waste Type Per Year for Collection, Packing, Shipping, and Storage	<p style="text-align: center;"><b>YEAR ONE</b></p> 2 - 300-gallon tanks for used oil 10 - 55-gallon drums for liquid flammables 6 - 55-gallon drums for lab packing corrosives 6 - 55-gallon drums for lab packing poisons 5 pallets for automotive batteries 30 - 55-gallon drums for solidifying unrecycled latex paints
5. Ideal or publicly sensitive Site Characteristics (these will vary significantly with local needs and conditions)	3% existing grade All utilities on site 1/2 block from main street Not nearby schools or vulnerable aquifers or water supply wells Fully fenced Zoned light industrial Near shopping district Highly visible site identification signs Publicly-owned property Existing unused building easily adaptable Room for future growth Near fire station
6. Staffing Level/Needs	1 supervisor/chemist 2 MRW handlers 0.5 records, traffic, office
7. Work Flow and Work Place Needs (plan for future growth)	Vehicle waiting area Receiving/unloading area Sorting area Flammables handling area

Conceptual Element	Examples
	<ul style="list-style-type: none"> <li>Bulking area</li> <li>Ventilation openings and equipment</li> <li>Lab packing area</li> <li>Supply storage area</li> <li>Operating and safety equipment storage and access</li> <li>Personal protective equipment storage area</li> <li>Container loading/shipping area</li> <li>Unknown identification/lab area</li> <li>Decontamination area “warm zone”</li> <li>Empty container storage areas</li> <li>Full container storage areas</li> <li>Full container aisle space</li> <li>Records area</li> <li>Lunch/office area</li> <li>Bathroom area(s)</li> <li>Incompatibles separation</li> <li>Materials flow safely and efficiently</li> <li>Explosion vent area/direction</li> <li>Communication equipment</li> <li>Emergency services access space</li> </ul>
8. Spills and Materials Release Prevention	<ul style="list-style-type: none"> <li>Surface water control measures</li> <li>Freeze and weather protection</li> <li>Primary and secondary containment</li> <li>Storage/housekeeping practices</li> <li>Materials handling</li> <li>Containment of fire suppression agents</li> <li>On-site minor spill cleanup</li> <li>Impervious surfaces</li> <li>Containment berms, curbs, dikes, grated trenches, sumps, totes, pallets</li> <li>Explosive, unstable, or incompatible materials handling</li> <li>Operating plan, contingency/emergency plan scope</li> <li>Coordination with local emergency agencies</li> </ul>
9. Emergency Equipment	<ul style="list-style-type: none"> <li>Alarm systems</li> <li>Safety equipment</li> <li>Fire safety and suppression</li> <li>Eyewash and shower</li> <li>First aid supplies</li> <li>Communications</li> <li>Backup utilities/systems</li> </ul>

As the elements of the MRW Fixed Facility working concept are being developed, various codes and regulations as they apply to the proposed facility must be reviewed with the responsible local official. Local officials should be consulted early and often from the time the working concept is being developed through final construction. Good communications can facilitate effective use of the expertise of local officials to create a safer facility and provide the local officials with a reasonable level of comfort regarding the nature and function of the facility. An increased comfort level can help avoid unnecessary design features that might otherwise be required without such a full understanding of the rationale and function of a MRW Fixed Facility. Assistance from Ecology personnel and consultations from Labor and Industries Safety and Health Consultants should also facilitate an effective and timely implementation of MRW Fixed Facilities.

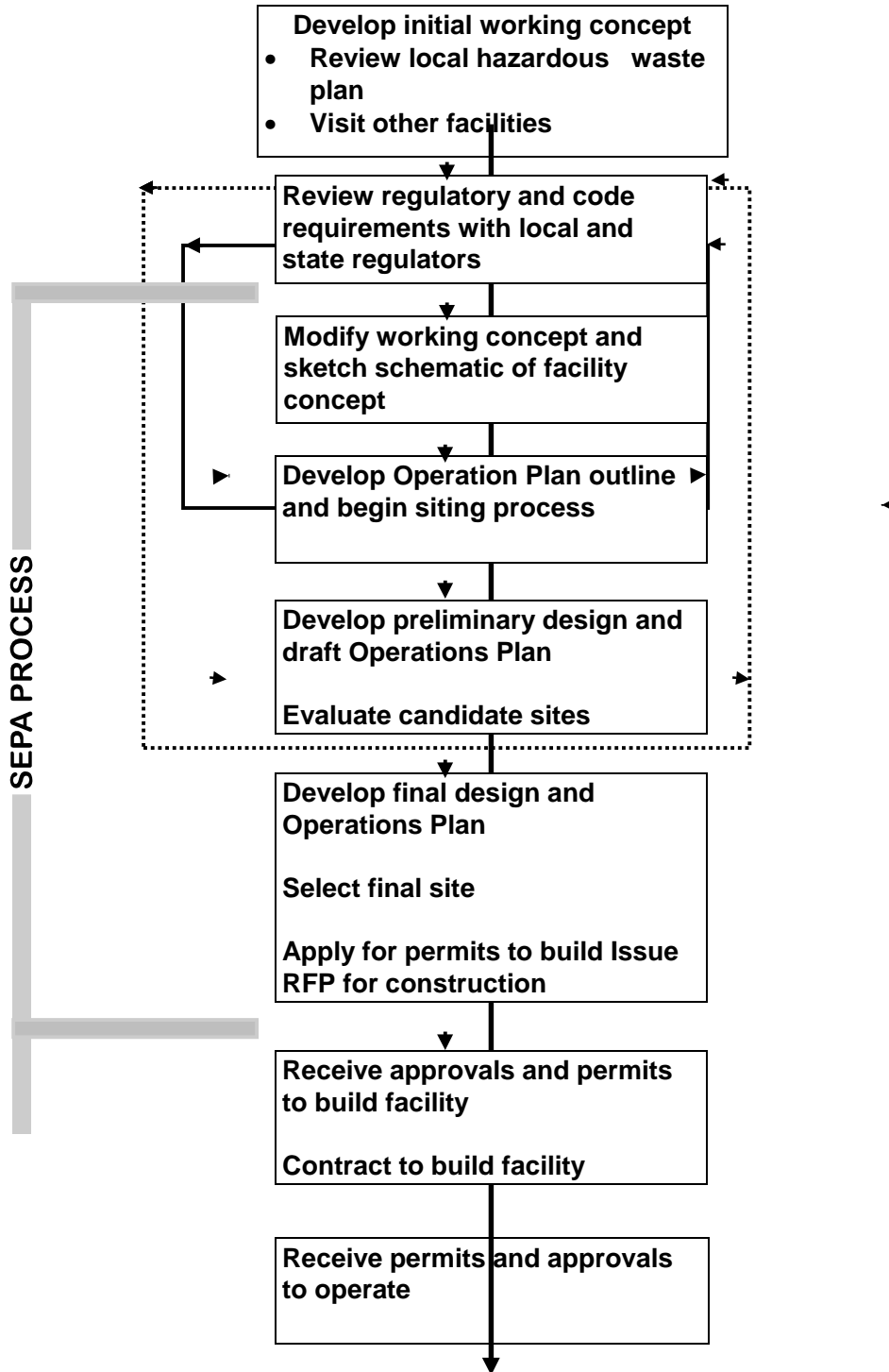
Local Labor and Industries Safety and Health Consultants are available for assistance in local regional offices. To find out the location and phone number of your nearest Labor and Industries Safety and Health Consultant call 1-800-4BE-SAFE.

A graphic representation of how a MRW Fixed Facility development process could proceed, from the initial working concept to final permits and approvals, is shown on Figure 1.

One additional strategy that will facilitate good design and smooth subsequent implementation include keeping public officials abreast of the project's progress, and involving the public early in the design and siting process. More than a few fixed facilities have had siting or permitting difficulties due to an ill-informed public reacting to a proposed facility. Be sure to include any local public/political sensitive issues in item 5 of your working concept conceptual element to avoid these foreseeable problems.

# Figure 1

## Conceptual MRW Fixed Facility Development Process





#### IV. REGULATIONS, CODES, AND STANDARDS

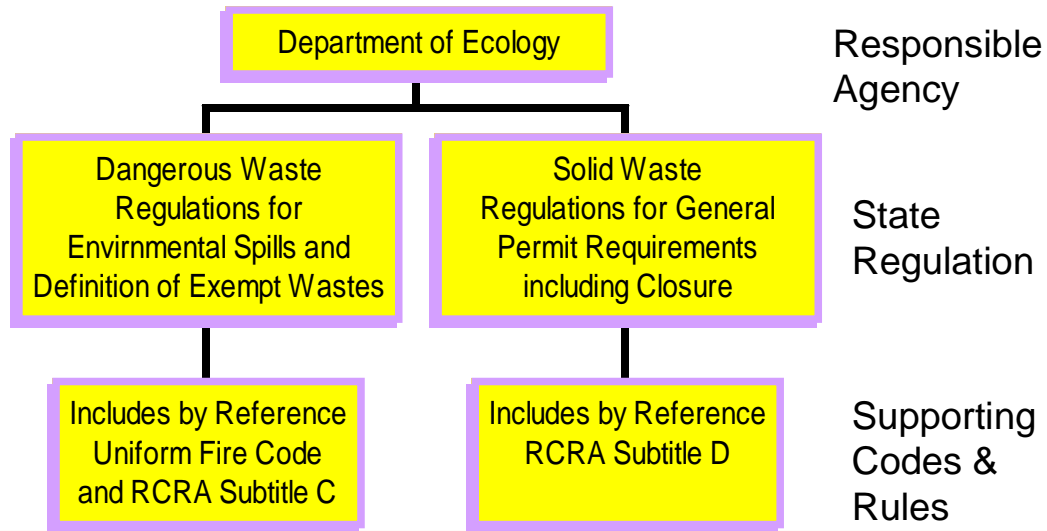
*APPLICABILITY:* This section applies to both MRW Fixed Facilities and Limited MRW Fixed Facilities. Also, see Subsection A. on page 19.

There are existing codes and regulations that will be applied, as appropriate, to the operation and design of MRW Fixed Facilities. The current codes and regulations must be interpreted as they apply to the specific local facility(ies). These local interpretations will shape both the operations and the final design.

There are many sets of regulations, codes, and standards that could conceivably be brought to bear on the eventual design and implementation of an MRW Fixed Facility. The following text highlights those which appear to be most useful in developing the final operating and design parameters and are likely to be used for permitting and approval criteria. Although these various requirements may initially appear unconnected, they are typically developed with consideration for, and often with reference to associated codes and standards. As such, they typically act as a uniform and comprehensive body of requirements.

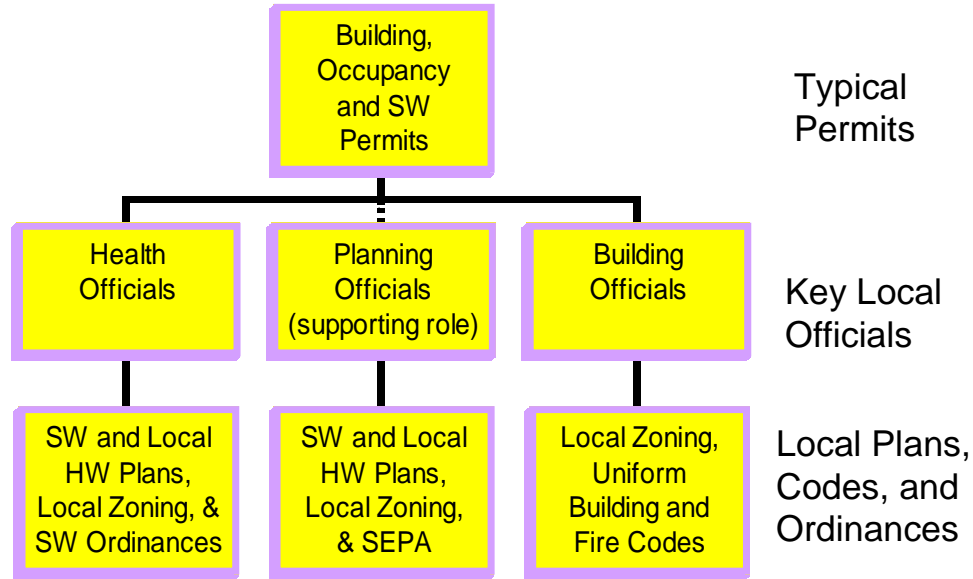
The interrelationship between the primary regulations, codes, and standards at the local and state level are shown on Figure 2. This figure shows state and local regulatory relationships separately; however, in practice, these regulatory domains also interrelate. For example, the MFS are used at both the state and local level and Ecology often provides technical assistance to local health authorities on solid waste permitting issues. Similarly, the various uniform, national standards and codes are relied upon by both state and local agencies/officials.

### *Primary Environ. Regulatory Relationships at the State Level*



Washington State Department of Ecology 12/7/95 8

# Local Regulatory Relationships



## A. Applicability of Requirements to Different Facilities

In general, the more varied the types of wastes accepted, the larger the quantities, and the more sophisticated the handling techniques employed at an MRW Fixed Facility, the more sophisticated and detailed the operations plan and final design should be. The existing requirements, referenced below, differentiate between the various levels of hazards, potential threats to human health and the environment, and the type of activity involved. For example, a facility that accepts only known substances, lab packs all MRW in drums, and expects to receive and ship MRW to fill only ten drums per year will have a relatively low potential human and environmental threat. This would be in comparison to a facility that receives unknown substances of potentially high hazard and MRW in large volumes that is then bulked before shipment, or treated onsite. Applying the same set of regulations, codes, and standards to different individual facilities, will result in different requirements for final design and operation.

## B. Regulatory Framework

MRW Fixed Facilities are regulated as a type of interim solid waste handling facility. This regulatory status applies so long as only HHW and conditionally exempt SQG wastes are accepted. A waste acceptance protocol needs to be established to assure maintenance of this regulatory status. If waste is accepted from a fully regulated hazardous waste generator, then the MRW facility will be regulated as a hazardous waste Treatment, Storage, and Disposal (TSD) facility until all waste is removed. Because MRW facilities do not usually hold permits to operate as a TSD, such an MRW Fixed Facility would immediately be in violation of the Dangerous Waste Regulations.

As a solid waste handling facility, an MRW Fixed Facility can be permitted by the local health authority. This process is much easier and quicker than the permit process for a hazardous waste facility under the Dangerous Waste Regulations. However, the nature of the materials received at an

MRW Fixed Facility are significantly more problematic to handle in a safe and environmentally sound way than other solid wastes. MRW Fixed Facilities perform some functions and activities typically found in fully regulated hazardous waste TSD facilities.

In order to account for the dichotomy between some of the TSD-like operating features of MRW Fixed Facilities and their solid waste regulatory status, the following regulatory approach has been chosen. For general environmental protection, the existing solid waste Minimum Functional Standards should be used, as described below. For additional operation and design requirements, existing health, safety, building, and other existing appropriate regulations, codes, and standards should be used.

The existing (non-Ecology) requirements are typically based on national and uniform codes and standards. These codes and standards differ from Ecology's regulations by relying on categories of equipment safety, empirical design data, human health and safety hazards, or materials classifications to trigger their application, rather than waste classifications. This regulatory approach allows for environmental and human health protection at MRW Fixed Facilities handling hazardous substances. A brief compilation of the Washington regulations that need to be reviewed and applied to MRW Fixed Facilities, as appropriate, are shown in Table 4.

**TABLE 4**

<b>SELECTED WASHINGTON REGULATIONS AND REFERENCES</b>		
<b>Washington Regulation</b>	<b>Subject(s)</b>	<b>Technical Assistance and Interpretation</b>
Chapter 173-304 WAC, <i>Minimum Functional Standards for Solid Waste Handling</i>	Applied to MRW Fixed Facilities (see below)	Local Health Authority Ecology Regional Office
Chapter 173-303 WAC, <i>Dangerous Waste Regulations</i>	Generator Status EPA/State ID# and reporting requirements	Ecology Regional Office
Chapter 296-24 WAC, <i>General Safety and Health Standards</i>	Part A-1 Education, Medical and First-Aid Requirements Part A-2 Personal Protective Equipment (PPE) Part E Hazardous Materials, Flammable and Combustible Liquids; storage, design, ventilation, container requirements, wiring Part G-2 Fire Protection Part G-3 Fire Suppression Equipment Part L Electrical	Department of Labor and Industries Division of Industrial Health and Safety, Voluntary Services
Chapter 296-62 WAC, <i>General Occupational Health Standards, Volumes I and II</i>	Parts A,B,C General, Records, Hazard Communication Part E Respiratory Protection (classification, selection, use, etc.) Parts H,I Air Contaminants (Permissible Exposure Limits, (PELs), etc.) Part K Hearing Conservation Part L Ventilation and Emergency Washing Part P Hazardous Waste Operations and Emergency Response Part Q Hazardous Chemicals in Laboratories	Department of Labor and Industries Division of Industrial Health and Safety, Voluntary Services

C. Minimum Functional Standards for Solid Waste Handling

MRW Fixed Facilities are considered interim handling solid waste facilities of a unique type. As such, the following guidance for the design, construction, permitting, and operation is provided and may be used in the future update the Minimum Functional Standards (MFS).

Unless exempted from the solid waste facility permitting process as a Limited MRW Fixed Facility, all MRW Fixed Facilities should be designed, constructed, and operated so as to:

1. Obtain a solid waste handling permit before construction through submission of an application addressing each issue listed below as part of the preliminary engineering report/plans and specifications for the facility, in accordance with WAC 173-304-600(3)(a), Permit requirements for solid waste facilities, except as noted below;
2. Comply with WAC 173-304-405, General facility requirements, except (2)(e), (2)(g), (4)(d), and (6);
3. Comply with WAC 173-304-407(1) through (5), General closure and post-closure requirements, assuming there will be no remaining waste or onsite contamination at the end of the closure activities;
4. Be surrounded by a fence or natural features that restrict access to the site;
5. Provide a lockable gate to control public access;
6. Be sturdy and constructed of easily cleanable materials and provide secondary containment for all MRW;
7. Be accessible by all-weather roads
8. Restrict public access while on site to unloading areas;
9. Be designed and serviced as often as necessary to ensure safe handling, appropriate MRW removal, and adequate collection and storage capacity at all times;
10. Be designed to exclude underfloor spaces and underground storage tanks, except for secondary containment spaces, pipes and/or sumps;
11. Have an adequate buffer zone around the operating area to minimize noise and dust nuisances, and have a buffer zone of fifty feet from the active area to the nearest property line in areas zoned residential;
12. Comply with local zoning, fire, and building codes including approved local variances and waivers;
13. Divert run-on water;
14. Provide pollution control measures to protect surface and ground waters, including run-off collection and discharge<sup>2</sup> from active areas<sup>2</sup> designed and operated to handle a twenty-four hour, twenty-five year storm, with impervious surfacing in all active MRW handling and storage areas;

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<sup>2</sup>NOTE: If collected run-off water is contaminated, it must be treated before being discharged or disposed of as a regulated waste water or hazardous waste depending on analysis of the contaminated water.

<sup>2</sup> An “active area” is

15. Provide pollution control measures to protect air quality including any applicable requirements of the Clean Air Washington Act of 1991;
16. Prohibit scavenging (this does not preclude materials exchanges);
17. Provide attendant(s) on-site during hours of operation;
18. Comply with Department of Labor and Industries Standards for health and safety, including Chapter 296-62 and 296-24 WAC (these requirements cannot be foregone by a solid waste handling permit exemption);
19. Have a sign readable from a distance of at least 25 feet that identifies the facility and shows at least the name of the site, hours during which the site is open for public use, and, if applicable, what constitutes materials not to be accepted, and other necessary information posted at the site entrance;
20. Have communication capabilities to immediately summon fire, police, or emergency service personnel in the event of an emergency; and
21. Remove all wastes at closure, as defined in WAC 173-304-100, from the facility to a permitted facility.

#### D. Health and Safety Standards

Under the Washington Industrial Safety and Health Act of 1973, WISHA, Chapter 49.17 RCW, the Division of Industrial Safety and Health within the Department of Labor and Industries has published minimum standards for health and safety at the workplace. These laws apply to all workplaces where employees are present, including MRW Fixed Facilities. Chapter 296-24 WAC, General Safety and Health Standards, and Chapter 296-62 WAC, General Occupational Health Standards contain regulatory standards which should be reviewed and applied as appropriate by those designing, operating, or evaluating an MRW Fixed Facility. Chapter 296-24 focuses more on safety while Chapter 296-62 focuses more on health issues. Overviews of selected parts of these two chapters follow. When there are overlapping parts or conflicts between these two chapters, those provisions more protective of employees apply.

##### 1. Chapter 296-24 WAC, General Safety and Health Standards Overview

This regulatory code requires operators (management) to provide a safe and healthful work environment, establish an accident prevention program, and training programs on the safe use of toxic materials and other information to promote safe operations.

The accident prevention program, WAC 296-24-040, requires all employers to develop a formal written safety orientation program. WAC 296-24-060 through -070 outlines first aid requirements. General personal protective equipment requirements such as eye protection and steel-toed boots are covered in Part A-2 of the regulations. Part B-1 covers sanitary requirements such as toilets and washing facilities. The State Board of Health also covers sanitation requirements. General regulations regarding safety signs for marking hazards are located in Part B-2.

Parts E, G, and L of Chapter 296-24 WAC contain standards that are especially applicable to MRW facilities. These parts include regulations for the handling, storage, and use of flammable and combustible liquids, fire protection systems, fire suppression equipment, and

electrical safety requirements necessary for the practical safeguarding of employees. These three parts, E, G, and L, are discussed in further detail below.

2. Flammable and Combustible Liquids, WAC 207=24-330

Part E, WAC 296-24-330, applies to the handling, storage, and use of flammable and combustible liquids with a flash point below 200°F. This applies to all flammable liquids classes, I-A, I-B, I-C, and combustible liquids classes II and III-A but not III-B. These classes reflect the Uniform Fire Code's definitions for flammable and combustible liquids. Class III-B combustible liquids are those with flash points at or above 200°F. Flammable and combustible liquids are often accepted at MRW Fixed Facilities. For example, gasoline has a flash point temperature of -50°F, flammable Class I-A, and kerosene has a flash point of between 150°F to 185°F, combustible Class III-A.

Extensive requirements which are likely to apply to MRW Fixed Facilities accepting flammable and combustible liquids include the following areas of WAC 296-24-330. Specifically, WAC 296-24-33007 covers piping, valves, and fittings, and WAC 296-24-33009 includes requirements regarding container and portable tank storage.

WAC 296-24-33009 applies only to the storage of flammable or combustible liquids in drums or other container not exceeding 60 gallons individual capacity and those portable tanks not exceeding 660 gallons individual capacity.

This section includes such items as requirements for construction of inside storage rooms and ventilation of storage rooms for flammable or combustible liquids. Regulations for storage of flammable combustible liquids inside or outside a building is included. Flammable or combustible liquids storage must be in closed, approved, fire-resistant containers or tanks. WAC 296-24-33009 also specifies where to locate fire extinguishers; and that no smoking or open flames are allowed in flammable and combustible liquids storage areas.

3. General Fire Safety

Part G-1, G-2, and G-3 of Chapter 296-24 WAC covers general fire safety regulations.

Within Section G-1, Means of Egress, are requirements for providing safe exits from fire and other emergencies and the elements which are required for an employer's Emergency Action Plan. An Emergency Action Plan covers the procedures the employer and employees must take to ensure employee safety from fire or other emergencies.

Section G-2, Fire Protection, covers the requirements whenever an employer decides to establish an internal fire brigade. Establishment of a fire brigade at MRW Fixed Facility is at the option of the facility owner/operator.

Section G-3, Fire Suppression Equipment, contains the regulations for the different types of equipment used to contain or overcome a fire.

4. Electrical Safety Hazardous Locations Classifications

Part L of Chapter 296-24 WAC addresses electrical safety in ordinary as well as hazardous locations which are classified depending on the properties of flammable vapors, liquids, gases, or combustible dusts or fibers. Each room, section, or area is considered individually in determining its classification. There are three hazardous location classes: I, II, and III and

Divisions 1 and 2 within each class. Class I, Division 1, is the most hazardous classification and Class III, Division 2, is the least restrictive hazardous location. These hazardous location classification definitions come from the National Electric Code (NEC).

It is expected that MRW Fixed Facilities typically include areas that will be classified as hazardous locations Class I, Division 1 or 2, such as the areas or rooms where liquid flammables are accepted, sorted, packed, or bulked. Class I locations are those in which flammable gases or vapors are or may be present in the air in quantities sufficient to produce explosive or ignitable mixtures. Class I Division 1 areas or rooms include, among others, those in which hazardous concentrations of flammable gases or vapors may exist under normal operation conditions. This classification usually includes locations where volatile flammable liquids or liquefied flammable gases are transferred from one container to another and all other locations where ignitable concentrations of flammable vapors or gases are likely to occur in the course of normal operations. Bulking of liquid flammables such as gasoline may create ignitable concentrations of flammable vapors depending on the ventilation system design, liquid transfer equipment, and operating practices.

Chapter 296-24 WAC define Class I, Division 2 location as one:

- "(i) In which volatile flammable liquids or flammable gases are handled, processed, or used, but in which the hazardous liquids, vapors, or gases will normally be confined within closed containers or closed systems from which they can escape only in case of accidental rupture or breakdown of such containers or systems, or in case of abnormal operation of equipment; or
- (ii) In which hazardous concentrations of gases or vapors are normally prevented by positive mechanical ventilation, and which might become hazardous through failure or abnormal operations of the ventilating equipment; or
- (iii) That is adjacent to a Class I, Division 1 location, and to which hazardous concentrations of gases or vapors might occasionally be communicated unless such communication is prevented by adequate positive-pressure ventilation from a source of clean air, and effective safeguards against ventilation failure are provided.

Note: This classification usually includes locations where volatile flammables liquids or flammable gases or vapors are used, but which would become hazardous only in case of an accident or of some unusual operating condition. The quantity of flammable material that might escape in case of accident, the adequacy of ventilating equipment, the total area involved and the record of the industry or business with respect to explosions or fires are all factors that merit consideration in determining the classification and extent of each location.

Piping without valves, checks, meters, and similar devices would not ordinarily introduce a hazardous condition even though used for flammable liquids or gases. Locations used for the storage of flammable liquids or a liquefied or compressed gases in sealed containers would not normally be considered hazardous unless also subject to other hazardous conditions." (Chapter 296-24 WAC, Part L)

## 5. National Electric Code References

Chapter 296-24 WAC incorporates by reference the National Electric Code and other National Fire Protection Association's (NFPA) standards or recommended practices. The National Electrical Code, NFPA 70, provides general rules for Class I locations including

wiring and equipment standards in Article 501. Article 504 covers the installation of intrinsically safe (I.S.) apparatus and wiring for Class I, II, and III locations. Article 725 specifies requirements for Class I, II, and III remote control, signaling, and power limited circuits.

The Department of Labor and Industries typically administers and enforces the National Electrical Code in Washington. For assistance regarding application of this code, call the Building and Construction Safety Inspection Service (BCSIS) at (360)902-5226 in Olympia or your local electrical inspector's office.

A supporting code for the National Electric Code which should be very useful in the design of areas to handle flammables is NFPA 30, Flammable and Combustible Liquids Code. The 1990 edition of NFPA 30 incorporated newly developed standards for the construction, use, and siting of hazardous materials storage lockers in Chapter 4. Hazardous materials storage lockers are defined in a way that relates closely to a typical flammables area of an MRW Fixed Facility. Both Chapter 4, Container and Portable Tank Storage, and Chapter 5, Operations, of NFPA 30 contain significant standards that can be applied to MRW Fixed Facilities flammables areas during facility planning, design, and operation.

#### 6. Chapter 296-62 WAC, Overview

The General Occupational Health Standards, Chapter 296-62 WAC, prescribe minimum requirements for the prevention or control of conditions hazardous to health. The Chapter is contained in two large volumes. It focuses on health hazards to employees and, as such, includes work environments where chemical and other hazards exist. As stated in WAC 296-62-07005,

"Chemical agents shall be controlled in such a manner that they will not constitute a hazard to the worker, or workers shall be protected from the hazard of contact with or exposure to chemical agents."

Part C, Hazard Communication, implements the portion of the Worker and Community Right-to-Know Act related to the workplace. Part C sets requirements for employers to provide information and training on hazardous chemicals to which employees are exposed to in the workplace. Because the composition of MRW brought to a fixed facility is often unknowable in advance, the training should be for typical waste types accepted at the facility. Because the specific used products brought to an MRW Fixed Facility cannot be predicted accurately and the fact that many will pre-date Material Safety Data Sheet (MSDS) requirements, typical MRW Material Safety Data Sheets kept at the facility would be appropriate to satisfy part of this hazard communication requirement.

A MRW Fixed Facility is not expected to have as elaborate an operations plan as a TSD facility. But MRW Fixed Facilities present potentially hazardous working conditions that can be partially mitigated by a clear, comprehensive, and site-specific operations plan that is understood and implemented by the employees. References to Chapter 296-62 WAC have been incorporated into Section V, Operations Plan, of this guidance document.

MRW Fixed Facilities may include an unknowns identification area resembling a small chemical laboratory. In those cases, Part Q of Chapter 296-62 should be referred for its "Hazardous Chemicals in Laboratories" requirements.

#### E. Uniform Building Code, Overview



The Uniform Building Code (UBC) has been adopted as a statewide standard and it is administered by local building officials. Buildings are classified by a letter and in some cases are subdivided by division numbers. It is likely that the waste handling areas of an MRW Fixed Facility would be classified as a Group H Occupancy, Division 2, 3 and/or 7. Depending on the hazards in a Division 7 occupancy, the code often builds upon Division 2 and 3 standards within Group H. The requirements for Group H Occupancies are found in Chapter 9 of the UBC, and will be interpreted by local building officials. The UBC also specifies standards for fire extinguishing systems in Chapter 38.

1. Chapter 9, UBC

UBC Chapter 9, Requirements For Group H Occupancies, relies on the Uniform Fire Code definitions, identification and control of hazardous materials. Group H Occupancies are buildings where its primary use is for storage and the aggregate quantity of hazardous materials stored is in excess of Table No. 9-A or 9-B in the UBC. Areas with one or two 55-gallon drums of flammable or combustible liquids will exceed the quantities in UBC's Table No. 9-A. The definition of hazardous materials for Group H, Division 7 Occupancies also includes corrosives, highly toxic, and other materials that present health hazards, as well as dispensing and mixing of flammable and combustible liquids. These additional materials categories and activities closely resemble the character and potential use of an MRW Fixed Facility. Therefore, Chapter 9 is a key part of the UBC focus for MRW Fixed Facilities.

Chapter 9 of the UBC refers directly to the Uniform Fire Code and the National Electrical Code for many of its standards. Table 5 lists selected UBC requirements of Group H Occupancies that do not primarily rely on reference to another code for Division 2 and 3 Occupancies:

**TABLE 5**  
**Selected UBC Group H Occupancy Division 2 and 3**  
**Outside UFC and NEC**

<u>UBC Chapter 9 Section #</u>	<u>Topics</u>
902 (a)	general construction, area and height limits
902 (b)	floor construction
902 (j)	single story, no underfloor spaces, water reactives area construction
903	exterior wall and property locations
904	exit facilities
905	light, ventilation, sanitation
906	shaft enclosures
907	sprinkler and standpipe systems
908	special hazards
910	explosion venting

UBC Table No. 9-C specifies certain distances from property lines as well as requirements for openings and fire resistance of or in exterior walls for each division of Group H Occupancy. If the quantities stored explosives amount to the equivalent of two pounds of TNT or more, there are different minimum property line distance and material storage distances specified in Table No. 9-D of the UBC. Jurisdictions typically choose not to store explosives at MRW Fixed Facilities and instead have operating plan that call in the nearest "bomb squad" or other law enforcement officials.

## 2. Chapter 38, UBC

UBC Chapter 38 contains requirements for automatic fire-extinguishing systems. These systems automatically detect fire and discharge an approved fire-extinguishing agent onto or into the area of the fire. These systems are required in Group H, Division 1, 2, 3, and 7 Occupancies. Water sprinklers are not appropriate where the application of water may constitute additional serious hazards, such as mixing of water with water-reactive wastes. Other automatic fire-extinguishing systems should be installed in areas where special hazards may be associated with the use of a water sprinkler system. More detailed guidance for hazardous materials areas fire extinguisher systems can be found in the Uniform Fire Code which complements the UBC in this area.

## F. Uniform Fire Code

### 1. Introduction

Like the Uniform Building Code, the Uniform Fire Code (UFC) has been adopted as a statewide minimum code and is administered by local officials. UFC provisions are intended to correlate with the Uniform Building Code so that they do not conflict. In fact, they are designed to be used together along with the Uniform Codes for Mechanical and Plumbing as well as the National Electrical Code (NEC). The UFC prescribes regulations to safeguard life and property from hazards of fire, explosion, and hazardous conditions arising from the storage and use of hazardous substances, materials, and devices.

Certain articles of the UFC are especially suited to the types of wastes and activities found at MRW Fixed Facilities. These include Article 79 \_ Flammable and Combustible Liquids, Article 80 \_ Hazardous Materials, and Article 86 \_ Pesticides Storage. As mentioned before, the National Fire Protection Association's Flammable and Combustible Liquids Code, NFPA 30, is a valuable supporting standard for MRW Fixed Facility development or upgrading. The following text highlights sections and certain requirements of Articles 79, 80 and 86 of the UFC.

### 2. Article 79, Flammable and Combustible Liquids

One of the important materials classifications originating in the UFC is the definitions for flammable and combustible liquids. The UFC defines these as follows:

Class 1 - A liquid having a flash point below 100°F with a vapor pressure not exceeding 40 pounds per square inch absolute at 100°F.

Sub-Class 1A - includes liquids with flash points below 73°F and boiling points below 100°F.

Sub-Class 1B - includes liquids with flash points below 73°F and boiling points at or above 100°F.

Sub-Class 1C - includes liquids with flash points at or above 73°F and flash points below 100°F.

Class II - A liquid having flash points at or above 100°F and below 140°F.

Class III A - A liquid having a flash point at or a above 140°F and below 200°F.

Class III B - A liquid having a flash point at or above 200°F.

In the Uniform Fire Code Class I liquids are considered flammable liquids. Class II, IIIA, and III B liquids are considered combustible liquids.

The UFC Article 79 definitions for flammable and combustible liquids are also used in the National Electrical Code. The NEC Classes I-A through III-B, described earlier in this section under the subheading “Electrical Safety Hazardous Locations Classifications.”. The UFC also builds on the Group and Division system of Occupancies developed in the Uniform Building Code in setting its standards. In fact, many parts of Article 79 have been incorporated into these other codes and NFPA standards. Conversely, the UFC cites various UBC and NEC definitions, tables, and standards that have been discussed above. As with the previous codes described, certain parts of Article 79 appear to be applicable to MRW Fixed Facilities. These parts in the code are divided into sections of UFC. Sections of particular interest in UFC Article 79 are listed in Table 6.

**TABLE 6**

**UFC Article 79 \_ Flammable and Combustible Liquids  
Divisions of Special Interest**

<u>UFC Article 79 Section</u>	<u>Title</u>
7901	General Provisions
7902	Container and Tank Storage
7903	Dispensing, Use, Mixing, and Handling

**NOTE:** Article 79 was completely reorganized as of the 1994 UFC.

The Flammable and Combustible Liquids Code, NFPA 30, is an important supporting document that should be used in concert with Articles 79 and 80 UFC requirements.

3. Article 80

UFC Article 80 is entitled Hazardous Materials. Hazardous materials are those chemicals and substances, whether in usable or waste condition, that are physical or health hazards. Hazardous materials are classified in Section 8002 of Article 80 and are further described with examples in Appendix VI-A of the UFC. Hazard categories are either physical hazards or health hazards.

Physical Hazards	Health Hazards
Explosives	Highly Toxic and Toxic Materials
Compressed Gases	Radioactive Materials
Flammable and Combustible Liquids	Corrosives

Flammable Solids Oxidizers Organic Peroxides Pyrophoric Materials Unstable (Reactive) Materials Water-reactive Materials Cryogenic Fluids	Carcinogens, Irritants, Sensitizers and Target Organ Toxins
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MRW Fixed Facilities will typically handle many of the types of the hazardous materials listed as physical or health hazards by the UFC. Article 80 of the UFC is intended to prevent, control, and mitigate dangerous conditions related to the storage, dispensing, use, and handling of hazardous materials. It also requires the dissemination of information needed by emergency response personnel.

Under UFC Article 80, Section 8001, a permit is likely to be required for MRW Fixed Facilities. Remaining sections of Section 8001 that may apply to MRW Fixed Facilities include requirements regarding:

- Release of Hazardous Materials
- Unauthorized Discharges
- Material Safety Data Sheets
- Hazard Identification Signs
- Construction Requirements
- Personnel Training and Written Procedures
- Facility Closure Plan
- Out-of-Service Facilities

Division III of UFC Article 80, Storage, includes detailed storage requirements likely to be applied to MRW Fixed Facilities. Division III specifies requirements for individual hazardous materials types. These requirements include the topics of:

- Indoor and outdoor storage
- Spill control
- Drainage control
- Secondary containment
- Ventilation
- Storage conditions
- Explosion control
- Fire-extinguishing systems
- Floor construction
- Separations between different hazardous materials
- Setback distances
- Other design and operating conditions for specific hazardous material types

Additional requirements regarding an MRW Fixed Facility may be applied from Article 80, Division IV, Dispensing, Use And Handling. Depending on specific hazardous material quantity thresholds, certain additional requirements are called for in this part of Article 80. These regulatory threshold quantities are listed in Tables Nos. 80.402-A and 80.402-B in Division IV. It is difficult to estimate actual quantities of MRW that will be collected or accumulated and quantities of MRW tend to increase over time. For collected MRW quantities that are expected to be within one magnitude of the hazardous material quantity threshold it would be prudent to follow the requirements of Division IV. In any

event, it has sound guidance that can be applied, as appropriate, to MRW Fixed Facility design and operations.

4. Article 86

UFC Article 86 specifies requirements for pesticide storage areas that should be applied to MRW Fixed Facilities that accept pesticides. In the 1991 UFC, this article is only two pages in length but includes significant restrictions on the design and operation of pesticide storage areas. These requirements include:

- containment of run-off from fire fighting operations;
- flammable or oxidizing pesticides;
- prohibition on storage with ammonium nitrate;
- a minimum of four feet separation from incompatible materials;
- prohibitions on basement and upper-story locations;
- restrictions for damp or wet areas, leaking or damaged containers, shelving;
- signs, labels;
- fire protection;
- emergency management;
- separation of storage area; and
- security.

G. Uniform Mechanical Code

Chapters 7 and 11 of the Uniform Mechanical Code include requirements for heating and ventilation equipment in areas that may contain flammable or combustible liquids, gases, or vapors. These requirements are to provide an environment that is equipped with heating and ventilating equipment that will not cause fire or explosions when such gases or vapors are present.

H. Reference Codes

A summary of the major uniform and national codes referenced above and sections of special interest in the codes are outlined in Table 7.

**TABLE 7**

<b>UNIFORM AND NATIONAL REFERENCE CODES</b>		
Code	Reference Section of Special Interest	Topics Included
Uniform Building Code	<ul style="list-style-type: none"> <li>· Chapter 9; Requirements for Group H Occupancies</li> <li>· Chapter 38; Fire Extinguishing Systems</li> </ul>	Occupancy Division Definitions, Construction, Spills, Containment, Emergency Power, Location on Property, Lighting, Ventilation, Sanitation, Fire Extinguishing Systems
Uniform Mechanical Code	<ul style="list-style-type: none"> <li>· Chapter 7, Section 704; Warm Air Heating Systems, Prohibited Installations</li> <li>· Chapter 11, Ventilation Systems and Product Conveying Systems</li> </ul>	Ventilation Equipment and Installation requirements, Fuel Burning Heating Systems prohibition in a "Hazardous Location"
Uniform Fire Code	<ul style="list-style-type: none"> <li>· Article 79, Flammable and Combustible Liquids</li> </ul>	Permits, Portable Containers (Drums, etc.), Fire Protection, Inside and Outside Storage, Piping, Valves, Fittings, Dispensing and

	· Article 80, Hazardous Materials	Mixing (MRW Handling), Loading and Unloading, Processing, Hazard Classification, Storage Requirements, Handling
	· Article 86, Pesticide Storage and Display	Pesticides Storage
National Electrical Code, NFPA 70	· Chapter 5, Special Occupancies	Classification of Hazardous Locations, installation and design of electrical equipment
Flammable and Combustible Liquids Code, NFPA 30	· Chapter 4, Container and Portable Tank Storage	Design, Construction Capacities, Indoor and Outdoor Storage, Fire Control, Protection Requirements, Hazardous Materials Storage Lockers Located Outside
	· Chapter 5, Operations	Facility Design; Liquid Handling, Transfer and Use; Fire Prevention and Control

## V. OPERATIONS PLAN

*APPLICABILITY:*

This section applies to MRW Fixed Facilities and Limited MRW Fixed Facilities in separate subsections A and B.

After the initial working concept for the MRW Fixed Facility has been developed, and the regulatory review findings have been incorporated into the working concept, the Operations Plan can be drafted. The development of a thorough and thoughtful Operations Plan that is clearly written and followed by the facility personnel is critical to protecting worker and public health as well as the environment.

Once a draft Operations Plan has been created, additional final design and permitting issues that need to be addressed before construction and operations should become more apparent. Reviewing the experience of other operating facilities and their operating documents should provide significant insights. Successes and failures of operations at existing MRW facilities can be used to improve operations at yet to be developed facilities as well as existing MRW facilities that want to upgrade or improve their operations.

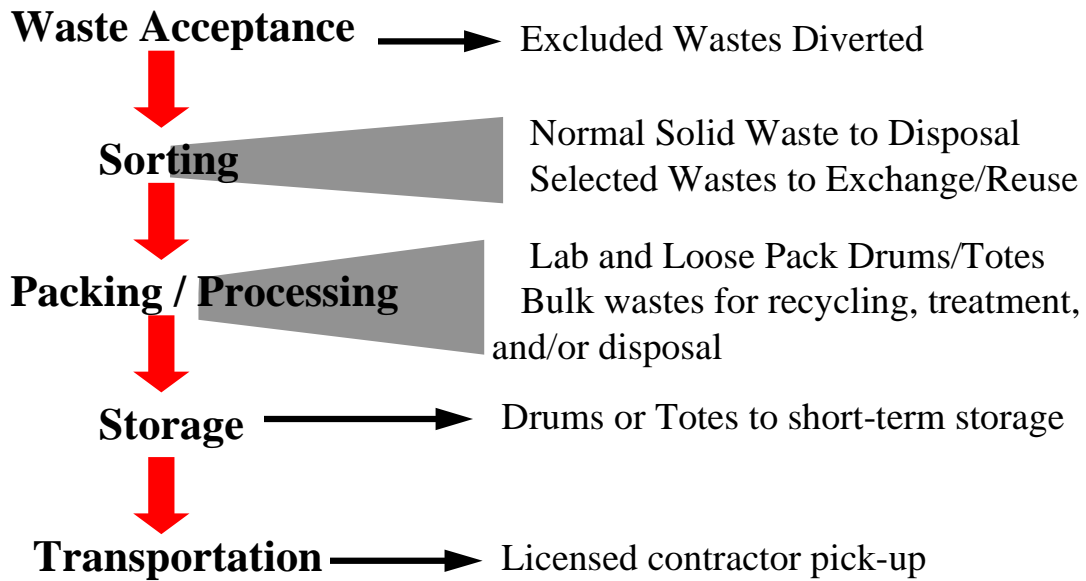
Operations plans will vary in detail and scope because of the varied MRW Fixed Facility designs and operations which typically reflect the needs of the specific populations served. This variety will include the time wastes will be stored before sending off-site. MRW shipping should be done as often as practical but there are no storage time limits by Ecology for MRW Fixed Facilities. Time limits for storage may be developed by local jurisdictions or through contractual arrangements with service companies. Any MRW Fixed Facility should avoid the routine collection and storage of MRW in excess of the facility design capacity. Exceeding design capacity can be avoided by implementing good operating practices and designing for potential expansion over time.

Figure 3 shows common MRW Fixed Facility handling practices from waste acceptance through transporting waste to a TSD. For an example of actual wastes collected at an MRW Fixed Facility, see Appendix B on page 54. Appendix B describes results of Thurston County's MRW Fixed Facility that serves a combination of urban and rural households. This Appendix summarizes the participants per month, MRW types accepted, MRW handling methods, and MRW quantities.

FIGURE 3 Common MRW Handling Practices  
MRW acceptance

### Figure 3

## Common Handling Practices





A. Operations Plan for MRW Fixed Facilities

An operations plan for MRW Fixed Facilities should include the following components:

1. A visitor policy and requirements for safety and supervision.
2. A waste acceptance protocol to preclude and redirect fully regulated dangerous waste generators and excluded waste types such as explosives and/or radioactives.
3. For materials exchanges, restrictions for certain materials should be established, e.g. unused, no banned products, etc.
4. Certain standard administrative procedures should be developed before operations begin, these procedures should be written into the operations plan. Also, the operations plan should describe certain records and reports which should be retained by the operator of the facility at or near the MRW Fixed Facility. These administrative procedures and retained records include:

All MRW labeling, packing, drum inventories, site waste inventories, and shipping procedures and documentation,

Final disposition of wastes handled (e.g. reused, recycled, H.W. landfilled, blended as a fuel, etc.) by waste type and quantity,

Periodic reporting as required by Ecology to update the statewide MRW implementation database,

Personnel training and medical records,

All completed facility inspection logs and log completion procedures including actions required and dates of actions, and

Other records and procedures as required by permits.

5. How each MRW type is to be handled on-site including descriptions of:

Facility drawings showing the location of fencing, signs, emergency equipment, absorbents and other supplies, shower(s), eye wash(es), fire extinguishers and other fire suppression equipment,

Methods for managing and/or identifying unknown wastes,

Conceptual drawing of where different MRW sorting, analysis, and storage will occur, including necessary aisle spacing between containers and any anticipated stacking of containers,

Procedures for managing wastes that arrive in corroded or leaking containers or when MRW is left at the gate when the facility is unattended,

Description of the MRW sorting protocol, and

Measures to take to protect containers of MRW from weather and temperature extremes.

6. How inspections and any environmental monitoring procedures are to be conducted and their frequency. This should include copies of blank inspection logs, how to check for leaks and what signs indicate container deterioration,
7. Actions to take if leaks in containers, tanks, or containment structures are detected.
8. Actions to take for other releases (e.g., failure of run-off contaminant system, gases generated due to chemical reactions or rapid volatilization).
9. How operating, environmental, and safety equipment will be maintained including personal protection equipment. This should also include a list of all on-site emergency equipment with its capability and purpose.
10. A Safety and Health Program that meets the requirements of Chapter 296-62 WAC including:

A policy stating lines of authority and accountability for implementation.

Means and procedures for identifying and controlling on-site hazards.

Health and Safety Plans and Procedures:

- Accident Prevention Plan\* (see 296-24-040 WAC)
- Hazards Communication Program\* (see 296-62-054 WAC)
- Respiratory Protection Program (see 296-62-07109 WAC)
- Emergency Action Plan\* (see 296-24-567 WAC) (Emergency Plans should be sent to local emergency response agencies and dispatch centers, e.g., 911 dispatch center, sheriff dispatcher, etc.)
- Emergency Response Plan (required only if facility employees are to respond to on-site chemical emergencies) see 296-62-3112 WAC. Most MRW facilities opt not to have staff act as emergency response personnel.

*\*Denotes elements that are already required by the Department of Labor and Industries of employers. These existing plans and programs can be amended to include the operation of MRW Fixed Facilities.*

How the Safety and Health Program will be communicated to facility employees including supervisors.

A medical surveillance program to monitor health and fitness of workers which entails at least pre-employment and annual physical examinations.

A training plan for employees and supervisors to develop the needed skills and knowledge to perform their work in a safe manner including use of personal protection equipment.

A means for providing feed back to improve the safety and health program including an annual or more frequent review of the program and written updates as needed.

11. Written job descriptions for each MRW employee including skills, knowledge, education, responsibilities and duties.

If there are satellite facilities that are associated with a central MRW Fixed Facility, the satellite facilities can be incorporated in a separate section of the central facility health and safety program by referencing appropriate sections of the document. Also, any other existing written plans, operating procedures, and/or program can be used to develop elements of the operations plan. In order to be most useful in day-to-day operations, the operations plan for MRW Fixed Facilities should be comprehensive but not exhaustive. **A brief, well formatted, clearly written operations plan is preferable to a thick, highly technical volume that is unlikely to be used or understood by the employees.**

#### B. Operations Plan for *Limited* MRW Fixed Facilities

The Operations plan for a Limited MRW Fixed Facility should include at least the following topics and answers to questions under each topic:

1. Facility Description \_ What is the facility's location, purpose, wastes accepted, and wastes prohibited? Who owns, supervises, and operates facility? Will the facility be attended?
2. Waste Management \_ How are waste(s) to be handled and what is the management method (sent to TSD, etc.) for the waste(s)? Who can wastes be accepted from? Who picks wastes up? How should wastes left at the facility gate during off-hours be managed? How often should MRW be collected and removed from site?
3. Waste Characteristics and Hazards \_ Is the waste(s) to be received flammable, toxic, reactive, etc.? What are the health and safety risks associated with wastes accepted?
4. Environmental Protection \_ What methods and design feature to prevent air, water, and land degradation will be implemented at the facility? What methods of secondary containment will be implemented?
5. Safety Measures (This may be part of an employer's safety and health program) \_ When and what personal protection equipment should be used? Where is fire suppression equipment and how is it used/activated? What special employee qualifications and training will be required?
6. Emergencies \_ What to do and who to call for help in different situations? Where is the phone or radio to call for help or instructions and alternate contacts? How will workers and neighbors be alarmed if an emergency occurs?
7. Inspections \_ Who will perform and log the results of periodic facility inspections? What will the frequency of inspection be, e.g., daily, weekly?

As the quantity, hazards, number of MRW types and sophistication of the limited facility increases, the operations plan will need to be upgrade from this minimum toward the plan described in sub section A above.

## VI. SITING

*APPLICABILITY:*

This section applies to MRW Fixed Facilities and Limited MRW Fixed Facilities.

When siting any MRW Fixed Facility, at least the following issues should be addressed. In some instances certain issues may not apply. For instance, if the facility is to be located at a currently permitted solid waste facility site local zoning issues might not be a significant issue.

- A. The relative impact to earth, air, and water resources if a release to the environment were to occur at each candidate site.
- B. The proximity of the facility to special land use areas and sensitive natural resources such as wetlands, streams, etc., and likely mitigating measures for preventing potential degradation.
- C. Availability of required utilities and distance from emergency response services.
- D. Aquifer sensitive or protection areas.
- E. Convenience to populations served, a convenient facility will be used more.
- F. Adjacent land uses.
- G. Local zoning and setback requirements.
- H. Archeological, paleontological, and historic sites.
- I. Fire codes and building codes for separation between property line and buildings and separation between buildings.
- J. Slope stability, earthquakes, erosion of foundation material, and other ground movement risks.
- K. Proximity to regular public gathering or assembly areas such as conference centers, schools, auditoriums, shopping areas, and theaters.
- L. Adequate ingress and egress to major streets and/or highways. Sufficient waiting areas and control need to be available during times of high use.
- M. Other issues identified in SEPA review process or by local permitting authorities.

All local jurisdictions in Washington are required to designate zones in which commercial hazardous waste treatment and storage facilities could be allowed. These designated zones may also be suitable for siting MRW Fixed Facilities. Potential MRW sites may also have been previously identified in the Local Hazardous Waste Management Plan and/or Comprehensive Solid Waste Management Plan.

## VII. GENERAL DESIGN GUIDANCE

<p><i>APPLICABILITY:</i></p>	<p>This section applies to MRW Fixed Facilities and Limited MRW Fixed Facilities. Subsection A, Introduction applies equally to all types of MRW Fixed Facilities. The remaining Subsections apply wherever appropriate to specific Limited MRW Fixed Facilities.</p>
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Certain features should be incorporated into the design and construction of an MRW Fixed Facility to prevent environmental degradation and endangerment of public or employee health. Many of the design features or required elements will have been determined by the working concept; types of MRW handled and stored; review and application of the appropriate regulations, codes, and standards; operations plan; and site selected for the MRW Fixed Facility.

### A. Introduction

In general, considerations in the design and construction of an MRW Fixed Facility, limited or not, should be made for:

Preventing fire, unwanted chemical processes, explosions, corrosion, free evaporation, gas reactions, etc. (See Figure 4, Potentially Incompatible MRW Categories and Materials.)

Preventing waste releases and degradation of groundwater, surface water, land, and air quality.

Limiting public and animal access to the waste handling areas.

Preventing endangerment to employee and public health.

Preventing negative aesthetic impacts for the public using rights of way and for adjacent landowners.

**FIGURE 4. Potentially Incompatible MRW Categories and Materials**

MRW OR MATERIALS CATEGORY	Oxidizing Acids and Compounds	Non-Oxidizing Acids	Bases	Non-Chlorinated Solvents/Flammable Materials	Chlorinated Solvents	Metals Materials (unprotected)	Metal Salts and Toxic Salts	Organic Toxics
<b>Oxidizing Acids and Compounds</b>		TG H	H	H F	TG H	FG H F E	TG FG H F E	TG H F
<b>Non-Oxidizing Acids</b>	TG H		H	H F	TG H	FG H F	TG FG H	TG FG H F
<b>Bases</b>	H	H		H E	H	FG H	G H	H E
<b>Non-Chlorinated Solvents/ Flammable Materials:</b> · solvents · flammables · formaldehyde	H F	H F	H E		H F	TG H F E	H F	TG FG H F
<b>Chlorinated Solvents:</b> · dry cleaning fluids/residuals · degreasers	TG H	TG H	H	H F		H F	H	TG H
<b>Metals Materials:</b> (unprotected building and container materials) · aluminum · copper · tin · steel (iron) · zinc	FG H F E	FG H F	FG H	TG H F E	H F		FG H F	TG FG H
<b>Metal Salts and Toxic Salts:</b> · cyanide and sulfide wastes · inorganic salts · plating wastes · ink sludges · lead-acid batteries · chrome waste	TG FG H F E	TG FG H	G H	H F	H	FG H F		G H E
<b>Organic Toxins:</b> · pesticides · pentachlorophenol	TG H F	TG FG H F	H E	TG FG H F	TG H	TG FG H	G H E	
<p><b>Note 1:</b> Each of the following need to be stored in a separate dry area: Epoxides, water reactives, and explosives.</p> <p><b>Note 2:</b> The purpose of this chart is to show the incompatibilities of general groups of common moderate risk wastes. It is only a guide and a precaution. It is not intended to prescribe the specific sorting and/or storage protocols of a facility. For example, in the table, lead acid batteries and electroplating wastes are combined in the category metal and toxic salts. Yet to manage these in the same manner would not be the most effective approach. The body of this table indicates the potential hazardous consequences of mixing or exposing materials or MRW from one category with those from another category. While these consequences are typical, there may be no reaction or in some cases, different reactions when specific chemicals between categories are combined.</p>					<p><b>LEGEND OF POTENTIAL CONSEQUENCES</b></p> <p>G = Innocuous and non-flammable gas generation  TG = Toxic Gas Generation  FG = Flammable Gas Generation  H = Heat Generation  F = Fire  E = Explosion</p>			

This figure was partially adapted from: "A Method for Determining the Compatibility of Hazardous Wastes," U.S. Environmental Protection Agency, EPA-600/2-80-076, April 1980.

More specific discussion and details related to these general considerations are provided below. The following subsections should be uniformly applied to MRW Fixed Facilities designed to receive a wide range of MRW types but should be used only selectively, where it is applicable, to specific Limited MRW Fixed Facilities.

#### B. Security, Access, and Emergency Equipment

Because of the hazardous nature of the materials collected at an MRW Fixed Facility the following security, access and emergency equipment measures should be designed and implemented.

1. Access for animals and unauthorized people should be physically restricted in the waste handling areas of the facility. There should be a specific controlled area for unloading MRW from the public.
2. The facility should be surrounded with security fencing (or equivalent artificial or natural barrier) with locked access gates and doors. Emergency services will be provided keys or other means for immediate access.
3. Warning signs should be posted such as "Danger, Hazardous Substances \_ Unauthorized Personnel Keep Out," at each entrance to the facility and at other locations in sufficient numbers to be read at any approach to the facility from at least 25 feet or as required by the Department of Labor and Industries and local officials.
4. Portable fire suppression equipment stations should be established in accessible locations near all entrance and exit points.
5. Storage area(s) for personal protection and minor spill supplies and equipment should be established at more than one accessible location on site and protected from chemical and environmental degradation during storage.
6. Emergency shower and eye wash station(s) should be installed to meet the requirements of WAC 296-62-130 (Emergency Washing Facilities).

#### C. Structural and Equipment Installation Features

1. The facility is required to comply with the Uniform Building Code, Uniform Fire Code, Mechanical Code, National Electrical Code, and other applicable codes. See discussion in Section IV: Regulations, Codes and Standards.
2. Storm water run-on into the receiving area should be diverted.
3. Interior building areas where MRW is handled should include floor construction that is liquid tight, provide containment, and be sloped for drainage or provide equivalent engineered control measures. See Appendix C on page 58. The floor drainage slope should be at least one percent and lead to a secondary containment area.
4. Keep incompatible materials separated in storage, drainage, and containment areas. See Figure 4 on page 39.
5. Drains within the facility should have a slope of at least one percent. Drains should be designed with a sump to aid cleanup and not discharge to storm or sanitary sewers. Drains and sumps should be constructed of materials that are compatible with the stored wastes.

See Appendix C. Drains and sumps should be designed to keep incompatible materials separated.

6. Secondary containment should be built into the facility and waste handling areas to contain accidental spills of hazardous materials. This is often provided by a drain and sump or a sunken floor area.
7. Secondary containment should have the capacity for containing ten percent of the total waste volume that would ever be stored in the area or 110% of the largest container, whichever is greatest. If a sprinkler system is installed at the facility, secondary containment should have the capacity for also containing the sprinkler system flow rate for 20 minutes. If rainwater could enter the containment area, the secondary containment capacity should also contain water from a 24-hour, 25-year storm.
8. Ventilation, via natural or mechanical means, should be built into enclosed areas of the facility. If natural ventilation is used, MRW bulking and other handling procedures or methods that promotes volatilization of MRW that are combustible, flammable, toxic, or otherwise create vapors that are a health or safety hazard, should be minimized, prohibited, or have a specific area that is under a mechanical ventilation hood or equivalent. Natural ventilation provided by exterior openings should be equivalent to an opening area of at least 1/10 of the total floor area with a contingent design to allow one-fourth or more opening area if and when needed. In many areas, natural ventilation designs will seasonally result in unacceptable heat loads or cold work areas prone to freezing.
9. Ventilation should draw or vent from both the tops and bases of facilities for fumes that are lighter or heavier than air.
10. Lighting, via natural or artificial means, should be provided for areas to be used by workers.
11. Positive grounding should be provided to prevent sources of ignition and electrical shock hazards.
12. Areas where flammables and combustibles are handled should have explosion-proof electrical wiring, fixtures, lights, motors, switches, and other electrical components approved for use in Class I, Division 1 or 2 Fire Areas.
13. Waste handling and storage areas must provide at least 30" aisles between rows of containers and allow access for quick and thorough periodic inspections of and emergency access to containers. Rows of drums should be no more than two drums wide with labels faced out for easy visibility.
14. There should be no basement or underfloor work or storage areas, except for secondary containment drains and sumps.
15. Drums and other heavy containers and portable equipment should have handling dollies for easy moving and ramps to traverse berms, spill containment lips, or any other step-type hazards.
16. Paved surfaces need to be able to contain MRW in that area and not be degraded by the MRW. For instance, asphalt is readily penetrated and degraded by oil and most solvents.



For most MRW, concrete is a better choice than asphalt for low permeability and chemical resistance. Joints between concrete slabs and slab/foundation interfaces should be eliminated or minimized in the facility and all required joints must be sealed. Concrete surfaces can be degraded by certain chemicals such as sulfate pesticides and may be penetrated by some chlorinated solvents. Surface coating can enhance the natural resistance and prevent chemical interactions between MRWs and paving as well as other building materials. Drain and sump areas, where a hydraulic head may occur, are especially critical places to consider surface coatings. See Figure 4 and Appendix C.

#### D. Outdoor Areas

1. Surface water run-on should be diverted from the facility and run-off drainage should be minimized from the active areas to prevent contamination of surface and ground water. See "Secondary Containment" and "drains" references in the preceding subsection, Structural and Equipment Installation Features.

2. Empty unused containers can be stored on impervious surfaces with separate drainage and without secondary containment or cover.

3. Waste handling and storage areas should:

Be constructed of an impervious surface such as coated reinforced concrete with sealed joints. Alternative construction that provides equivalent environmental protection from MRW to be contained would be acceptable. Surface coatings with good chemical resistivity should be considered especially for unloading and sorting/packing areas and where MRW may otherwise penetrate or degrade surfaces if container leaks or minor spills may be expected to occur. Examples of MRWs on uncoated surfaces that will not provide secondary containment or resist degradation are oil or petroleum based products and solvents on asphalt. See Appendix C.

Have adequate ventilation to protect employee and public health.

Be constructed to exclude below grade operating areas that could accumulate vapors.

Have a slope of at least one percent to a blind sump for containment of spills, run-off water and fire sprinkler system water as specified in VII.C.7. above

Have immediate access to all appropriate emergency communications and other safety equipment.

Provide 30" aisles and access to allow quick and thorough periodic inspections of containers.

4. Wastes remaining outside or in unheated areas should be stable and unaffected by freezing temperatures or summer heat. This means that the MRW stored in this way will not increase the likelihood of releases, or unsafe working conditions, or otherwise make the MRW less suitable for any anticipated use, handling, shipping, or processing.

## VIII. Design and Operating Efficiencies

### A. Introduction

In the operation and design of an MRW Fixed Facility there are opportunities for providing a workplace and workflow that meets regulatory requirements for safety and health and also enhances the efficiency and cost effectiveness of the program as a whole. A description of these insights to operating and design effucuebcues are listed in the following text.

#### 1. Materials Exchange

Paint or other usable chemicals with original packaging in good condition could potentially be reused by individuals or agencies from various MRW Fixed Facilities. This reuse is the highest method identified on the waste management hierarchy. MRW that is used for its intended, legal use can reduce costs of packing, transportation, and disposal. Some jurisdictions have shied away from this MRW management method because of perceived potential liability. Where materials exchanges are operating, a disclaimer or release form is typically required to be completed by the recipient of the material.

#### 2. Separate Flammables Area

Most MRW Fixed Facilities will accept flammable and combustible liquids and solids. The Uniform Fire Code and National Electrical Code have stringent requirements for the handling and storage of these materials. Spark proof, explosion proof areas with lights, heat, ventilation, and other fire proof building techniques and apparatus are expensive to design and build. Flammables typically must be segregated and packed separately for DOT shipping. Therefore, cost savings may be realized if a facility is designed to separate the flammables/combustibles handling, sorting, packing and storage areas from non-flammables/non-combustibles.

#### 3. Pre-Engineered Designs

There are many prefabricated pre-engineered hazardous waste storage manufacturers that can customize and ship a MRW work or storage facility to a prepared site. Factory Mutual and other certifying organizations may approve these structures. Local building, fire and health officials should be consulted prior to ordering such structures regarding the specific features or performance standards that such prefabricated structures must meet. Possible advantages to such a structure include: ability to be relocated, often designed by specialty manufacturer, the possibility of modular site expansion, custom specifications and sizing, can be designed as a "stand alone" facility for small or medium volume operations. Depending on the waste handling needs of and design talent available in a local jurisdiction, these pre-engineered designs may be desirable and save on design costs. One likely application could be for a separate flammables handling or storage area.

#### 4. Flexible Work Site

The MRW Fixed Facility site should be flexible in order to handle different proportions of MRW than initially anticipated, especially if no collection events or mobile collections have been previously performed. Also, many existing facilities quickly exceeded their design capacity. This has lead to less safe operating conditions, overworked staff and/or inadequate staff budget, overburdened storage area(s), and inadequate sorting capacity. It is common for MRW Fixed Facilities to experience and annual 50% to 100% increase in

MRW accepted in their early years of operation. Consequently, expansion areas or other appropriate contingencies should be planned for in the initial design and operations plan.

#### 5. Bulk Packing

Some MRW Fixed Facilities choose to bulk pack compatible materials together so that each drum sent off-site contains more material. This certainly saves on transportation costs. Care must be taken in the design and operation of any bulking areas to provide required safe ventilation, fire safety, and personal protection equipment as appropriate. To save on disposal costs, some facilities are solidifying bulk latex paints for municipal solid waste landfill disposal.

#### 6. Workflow and Work Environment

The waste handling and storage areas should segregate wastes and pack wastes as soon as possible after arrival. This operating and housekeeping method provides safer handling of MRW and can be enhanced by thoughtful design of materials workflow from acceptance to storage and loading for shipment.

In order to provide the most productive work environment, the waste handling area should be covered, heated and air conditioned wherever safe and practical. This will reduce working errors and encourage maximum work efficiency. At the least, there should be a convenient area for workers to decontaminate, escape from the elements, and use the restroom.

#### 7. Combined Operations and Purchasing

It may be possible to reduce costs by combining operations or materials from multiple MRW Fixed Facilities or other collections at a centrally located specially designed storage area. Such consolidation may result in reduced charges from the transporter and or TSD facility.

Another possible consolidation cost savings may be through multi-jurisdictional purchases of prefabricated pre-engineered facilities and operational supplies. A central facility with storage area for bulk or large quantity supplies will need to be designated and may require design modifications.

#### 8. Covered Areas

From both a safety and cost standpoint, it is advantageous to have all MRW handling areas under cover to prevent mixing of rainwater with spilled MRW. Some MRW may react when exposed to water while others will combine with water to create slippery walking surface hazards. As the spilled material mixes with the rainwater, it creates additional waste material which may have to be managed as a hazardous waste. If a sump is already partially filled with rainwater and a spill reaches the sump, the result may be a very large and costly amount of waste water to be treated or disposed. Also, the size and cost of a secondary containment collection sump will be less if it does not have to contain the precipitation from a 24-hour, 25-year storm event as well as the spill and potential sprinkler water. As noted earlier, work productivity and safety will be improved by providing cover.

#### 9. MRW Container Size Reduction

There are a number of devices available to reduce the size of MRW containers that are received in large quantities. The potential advantages of these compaction devices are that they can reduce the size and therefore transportation/disposal costs of the containers and in some cases recover most of the remaining MRW from the container. The containers include aerosol cans, latex paint cans, and oil filters. In addition to size reduction, there may also be an enhanced potential to recycle or beneficially use the container material instead of managing it by disposal to a municipal solid waste or hazardous waste facility. One exception may be for crushed oil filters, where the potential for recycling may be reduced unless the filter components can be separated before crushing. Oil filter crushing can achieve significant size reduction whether the filter components are separated or not. These devices should be operated with appropriate safety features and not in areas where flammable vapors are likely to exist.

## IX. TRAINING

**APPLICABILITY:**

This section applies to MRW Fixed Facilities and Limited MRW Fixed Facilities. Limited MRW Fixed Facilities would typically be expected to have an appropriately lower level of training required.

In addition to the design and operations plan described in the preceding sections, persons responsible for and working at an MRW Fixed Facility must have appropriate training. The following text discusses this issue.

Detailed training requirements specifically for the management and operation of an MRW Fixed Facility are not defined in existing laws, standards, or codes. There is general guidance for training in some of these references. For instance, Article 80 of the Uniform Fire Code requires that:

"Persons responsible for the operation or areas in which hazardous materials are stored, dispensed, handled or used shall be familiar with the chemical nature of the materials and the appropriate mitigating actions necessary in the event of fire, leak or spill."

Well trained personnel are needed to prevent potential hazards to workers, the public, and environmental releases. For Limited MRW Fixed Facilities, where there are hazards, addressing training needs to satisfy the intent of the general UFC language above may be sufficient. Depending on the nature of the Limited MRW Fixed Facility such training may be both brief and sufficiently comprehensive. Many MRW Fixed Facilities will need to have a more formal and extensive training program as described below. Whatever training is appropriate, it needs to be reflected by written training materials made readily available to the workers at the site.

All personnel need to have concern for the primary hazards associated with the wide variety of MRW that may be brought to a MRW Fixed Facility. Primary concerns include: chemical exposures, fire and explosions, electrical hazards, unwanted chemical reactions, site security, traffic control, and other health and safety hazards. These hazards result in part from wastes that are expected and well known as well as unexpected or unidentified, "unknowns". Often MRWs which are brought in, such as certain old pesticides, have no legal use and have been banned. All of these workplace descriptions are reflected at many hazardous waste management and clean-up sites for which training is readily available. However, there are some significant differences between these hazardous waste sites and a typical MRW Fixed Facility. Some primary differences between a hazardous waste management or clean-up sites and a typical MRW Fixed Facility which is built in accordance with this guidance are that at a MRW Fixed Facility:

Workers will often be able to readily identify wastes by questioning the participant that brings unmarked containers of MRW to the facility

Workers have a controlled built environment with emergency equipment close at hand

There will be protection from heat, cold and wind

There will be no sophisticated treatment processes

There will be relatively minimal regulatory oversight

The first four items listed would tend to reduce the need for training at MRW Fixed Facilities when compared to some hazardous waste management or clean-up sites while the last item shifts the responsibility and need for appropriate training to the local level. Individual facilities will handle different wastes in different ways. Some owners/operators will choose to limit bulking activities while others will bulk as much as possible but might accept fewer types of MRW. Depending on the specific

operating conditions and staffing levels, different levels and/or types of training will be appropriate. General recommendations for three job categories (general site worker, on-site management and supervision, and health and safety staff) have been developed for hazardous waste clean-up site workers. The training topics recommended for these categories cover much of the same information that is applicable to operation of an MRW Fixed Facility. A table summarizing these recommended training topics has been adapted from NIOSH Publication No. 85-115 in Table 8.

Training on these topics has been developed in various 24- and 40-hour health and safety courses by various agencies and vendors for use by those who manage or clean up hazardous waste. To meet the Department of Labor and Industries requirements, employees will need at least 24 hours of training. This may not be needed at some Limited MRW Fixed Facilities where the hazards and quantities of waste are minimal. This general minimum should be supplemented with additional training on topics pertinent to the specific MRW Fixed Facility operating plan. See Table 8 for recommended training topics. Annual refresher courses and continuing education is also needed. Some vendors are offering courses focused more closely on collection, identification, and handling of MRW. Other potential sources of specific training are: local community colleges with hazardous materials programs (Green River, South Seattle, Shoreline, Columbia Basin), local fire officials, local health officials, local red cross, industrial hygienists, toxicologists, chemistry and chemical engineer professionals.

Workers at an MRW Fixed Facility should have a background that provides them with a working knowledge in chemistry and have or receive training as recommended in Table 8 for general site workers. All of the topics listed may not be needed for all Limited MRW Fixed Facilities. Note that the references in Table 8 are for the federal law, OSHA, at regulated hazardous waste management sites and that these areas are covered in Washington by WISHA as administered by Labor and Industries.

**TABLE 8**

**Summary of Recommended Training Topics for MRW Fixed Facilities**

(Adapted from NIOSH Publication No. 85-115)

Recommended Training by Job Category\*

TRAINING TOPIC	EMPHASIS OF TRAINING	GENERAL SITE WORKER	ONSITE MANAGE- MENT AND SUPERVISORS	HEALTH AND SAFETY STAFF
<b>Biology, Chemistry, and Physics of Hazardous Materials</b>	Chemical and physical properties; chemical reactions; chemical compatibilities.	R	R	R
<b>Toxicology</b>	Dosage, routes of exposure, toxic effects, immediately dangerous to life or health (IDLH) values, permissible exposure limits (PELs), recommended exposure limits (RELs), threshold limit values (TLVs).	R	R	R
<b>Industrial Hygiene</b>	Selection and monitoring of personal protective clothing and equipment.  Calculation of doses and exposure levels; evaluation of hazards; selection of worker health and safety protective measures.		R  R	R  R
<b>Rights and Responsibilities of Workers Under OSHA</b>	Applicable provisions of Title 29 of the Code of Federal Regulations (the OSH Act).	R	R	R
<b>Monitoring Equipment</b>	Functions, capabilities, selection, use, limitations, and maintenance.	R	R	R
<b>Hazard Evaluation</b>	Techniques of sampling and assessment. Evaluation of field and lab results. Risk assessment.		R R O	R R R
<b>Site Safety Plan</b>	Safe practices, safety briefings and meetings, Standard Operating Procedures, site safety map.	R	R	R
<b>Standard Operating Procedures (SOPs)</b>	Hands-on practice. Development and compliance.	R	R R	R R
<b>Engineering Controls</b>	The use of barriers, isolation, and distance to minimize hazards.	R	R	R
<b>Personal Protective Clothing and Equipment (PPE)</b>	Assignment, sizing, fit-testing, maintenance, use, limitations, and hands-on training. Selection of PPE. Ergonomics.	R	R  O	R  R R
<b>Medical Program</b>	Medical monitoring, first aid, stress recognition. Advanced first aid, cardiopulmonary resuscitation (CPR); emergency drills. Design, planning, and implementation.	R O	R R	R R  R
<b>Decontamination</b>	Hands-on training using simulated field conditions. Design and maintenance.	R  R	R  R	R  R
<b>Legal and Regulatory Aspects</b>	Applicable safety and health regulations (OSHA, EPA, etc.)	O	R	R
<b>Emergencies</b>	Emergency help and self-rescue; emergency drills. Response to emergencies; follow-up investigation and documentation.	R	R  R	R  R

\*R = Recommended.  
O = Optional.

## IX. MRW HANDLING OPTIONS AND ISSUES

<i>APPLICABILITY:</i>	This section applies to MRW Fixed Facilities and Limited MRW Fixed Facilities.
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### A. MRW Options and Transporters for Residual MRW

Once MRW has been collected, some quantities could potentially be reused, recycled, or otherwise handled to reduce the need to dispose of it through a TSD. For the remaining MRW, final disposal will be required. It is recommended that all MRW requiring final disposal or other off-site treatment be sent from an MRW Fixed Facility directly to a permitted hazardous waste TSD facility using a registered transporter. MRW such as bulk latex paint, automotive wastes, or other materials that can be shipped for recycling or reuse, may be sent to the recycler or reuser instead of a primary TSD facility. These materials often have existing distribution systems and different DOT transporting requirements. Also, certain locally approved materials for disposal at municipal solid waste landfills, such as solidified latex paints, is allowed.

Some commercial hazardous waste transporter companies have affiliated TSD facilities and some transporters are only licensed to transport hazardous wastes that are not permitted to treat, store and dispose of MRW nor hazardous waste. Hazardous waste transporters and TSDs must have State/EPA Identification Numbers. Transporters should be familiar with appropriate handling, packaging and transportation requirements for MRW types. This may vary by the type of MRW shipped, for instance used oil tank trucks have different requirements from a truck hauling corrosives or poisons. Also, the TSD must be made aware of what you are shipping to them and agree to accept it before it is shipped.

### B. Department of Transportation Requirements and TSD Coordination

An example process for lab packing wastes and shipping in Department of Transportation (DOT) approved containers is shown in Appendix D. The DOT regulations for shipping container requirements and materials identification numbers are changing to performance based container requirements and an international waste labeling system, however the techniques described for lab packing are generally based on safety concerns. Check with a contracted TSD for their current preferred waste handling protocols and techniques before start-up.

In order to transport hazardous materials it must be packed in DOT approved containers with materials that are segregated by DOT hazard classes. Consequently, wastes at a MRW Fixed Facility that will be shipped according to DOT regulations also need to be segregated according to those hazard classes. The packing process envisioned at an MRW Fixed Facility needs to be reviewed with the TSD and transporter to assure consistency with their waste management systems and DOT regulations. A partial listing of spill assistance, spill response and TSDs is provided in Appendix E.

### C. Evaluating Prospective Transporters and TSDs

MRW transported by a registered transporter and disposed of by a permitted TSD facility needs to be handled and disposed of carefully. To avoid any unnecessary problems and potential liability from spills or other releases, candidate transporters and TSDs should demonstrate to the jurisdiction's satisfaction that they are in compliance with environmental and safety laws and have adequate liability insurance.



Regional Ecology Hazardous Waste Inspectors should be contacted to provide copies of facility inspection reports and to review the compliance history of candidate TSDs in their region. The Ecology regional office MRW Coordinator can provide this contact for local jurisdictions. If possible, TSD site visits should be performed by the sponsoring agency, consultants and other involved individuals to evaluate each potential service provider's operations. In addition to a TSD facility tour, review of a TSD's Health and Safety Plan, Operations Manual, Emergency Plan, Training Plan, Training Records, and waste handling records can provide valuable evaluation information. Transporters and TSDs must keep records of all wastes that they handle. Such records may be available for review by prospective clients. Final disposal for various waste streams may be directed to different locations, many out of state. Contact with the regulators and site inspections in the states where MRW is going is also a reasonable precaution to assure the best management of MRW. While site visits at all TSDs may not be feasible for many jurisdictions, a few phone calls to out-of-state regulatory agencies can be insightful without incurring large costs.

#### D. Working with Transporters and TSD

Many times MRW service providers will require that the sponsoring agency obtain a State/EPA Identification Number. This number is placed on a Uniform Hazardous Waste Manifest which is used to track the wastes from the generator to final disposal or other permitted use of the wastes at a TSD. A copy of this manifest is returned to the generator when the waste is accepted at the TSD facility. This generator manifest system is a way to reconcile wastes sent from an MRW Fixed Facility via the transporter. The manifest record does not assure that the waste was managed appropriately at the TSD. The generator, each transporter, and TSD accepting the waste all sign the manifest, thereby establishing a chain of custody for the waste. The MRW facility manifests or copies of the returned contractors manifests should be accounted for and retained by the local jurisdiction.

If manifested MRW destined for a TSD is picked up and copies of the completed, signed manifests are not returned from the TSD within 35 days of acceptance by the transporter, inquiries should be made with the transporter(s) and TSD(s) to find out why. If completed manifests for MRW are not returned within 45 days the Ecology Regional Office should be notified and an exception report filed with Ecology. The required contents of a generator's exception report are contained in WAC 173-303-220(2)(c).

Other issues that should be worked out between the local jurisdiction and a selected transporter and TSD include:

- Periodic MRW Fixed Facility and TSD facility inspections

- Waste acceptance protocol for unknowns, prohibited or problem waste (explosives, radioactives, PCBs, dioxins, etc.)

- How to comply with Department of Transportation requirements

- Under what conditions, if at all, will SQG wastes be accepted

- What will be the agreed packaging methods for each waste type (See Appendix F for common packaging by MRW type and proportions of MRW collected by example jurisdictions).

Will the agency or TSD carry a comprehensive pollution liability insurance rider during and after transportation.

## **APPENDIX A**

### **Abbreviations**

## ABBREVIATIONS

CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
Ecology	Washington State Department of Ecology
EPA	U.S. Environmental Protection Agency
MRW	Moderate Risk Waste
MTCA	Washington State Model Toxics Control Act
NEC	National Electric Code
NFPA	National Fire Protection Association
NPDES	National Pollutant Discharge Elimination System
OSHA	Occupational Safety and Health Act
RCRA	Resource Conservation and Recovery Act
RCW	Revised Code of Washington
SEPA	State Environmental Policy Act
TSD	Treatment, Storage, and Disposal Facility
UBC	Uniform Building Code
UFC	Uniform Fire Code
UMC	Uniform Mechanical Code
WAC	Washington Administrative Code
WISHA	Washington Industrial Safety and Health Act

**APPENDIX B**

**Example MRW Fixed Facility Program Results**

## EXAMPLE MRW FIXED FACILITY PROGRAM RESULTS

The following summary information has been provided from operating data of the Thurston County "Hazo-House" MRW Fixed Facility and the *Moderate Risk Waste Plan for Thurston County*, January 1991.

### Background

Thurston County encompasses an area of approximately 758 square miles with a population of approximately 160,000. The population has grown about 25% in the past 10 years. Approximately 90,000 people live in the 84 square miles designated as urban growth area which is centered around Olympia. The MRW fixed facility is located at the landfill, which is on the north edge of the Olympia urban area of the County.

The original Thurston County "Hazo-House" consisted of a small specially designed 2-room storage building provided with explosion proof electrical equipment and other safety features at a location adjacent to the Thurston County Landfill scale. This original "Hazo-House" began operation in 1987. Some of the historical program results from this less comprehensive earlier facility are included in Appendix F, Table F-2. It closed January 7, 1991, and the new, greatly expanded, "Hazo-House" facility opened on June 29, 1991. The County has also sponsored HHW collection events since 1985 and will continue to do so as funding allows.

The County collects only HHW at the "Hazo-House." This MRW Fixed Facility's program results are summarized in Tables B-1 and B-2. The information in these tables includes available data from June 29, 1991 (grand re-opening date) through December, 1991 for waste quantities and through the end of February, 1992 for participation. In Table B-1, the sharp increased participation in January 1992 is attributed to a paid advertising campaign. The "Hazo-House" has been operated using Public Works staff of between 1.5 and 2.0 full-time equivalents (FTEs) plus approximately 0.1 FTE for budgeting, administration, and policy support. It is attended and open for the public from 8-5 Thursdays and Saturdays. Thurston County is planning on operating the facility three days per week beginning in 1993.

Table B-1 Thurston County "Hazo-House" MRW Fixed Facility Participation	
Month	Households Per Month
June 1991*	38
July	199
August	314
September	310
October	297
November	254
December	240
January 1992**	493
February	428
*Opened beginning June 29, 1991. **Paid advertising campaign conducted.	

Table B-2  
 Thurston County "Hazo-House"  
 MRW Fixed Facility Waste Quantities  
 June 29, 1991 through December 31, 1991

MRW Type	Packing Method	Quantities (Gallons)
Used Oil	bulk	2,650
Uncrushed Oil Filters	loose	3/4 of 55-gallon drum
Antifreeze	bulk	495
Household Batteries	loose	3/4 of 55-gallon drum
Oil Base Paints*	bulk	1,925
Adhesives	loose	825
Aerosol Cans	loose	440
Poisons, ORM-A, Acids	lab pack	825
Fertilizers (non-pesticide)	loose	3/4 of 55-gallon drum
Oil Contaminated Soil from Household	loose	3/4 of 55-gallon drum

\* Including Other Liquid Fuels

Notes:

- (1) 400-600 gallons of latex paint is received per month. It is solidified with bentonite and cement and landfilled as municipal solid waste.
- (2) Limitations on households include: maximum of five-gallons of any one type of HHW per visit, latex paint cans must be 1/2 full to encourage pre-delivery consolidation and reduce labor and disposal costs at the facility.
- (3) Quantities listed for lab packed MRW represent full containers with MRW and absorbent packing materials. No more than 15 gallons of actual liquid MRW would have been lab packed in a 55-gallon drum. Loose and bulk packed MRW quantities represent actual quantities of MRW received.



## **APPENDIX C**

### **Drain and Containment Material Compatibility**

## **DRAIN AND CONTAINMENT MATERIAL COMPATIBILITY**

Care must be taken to assure that the materials contained do not degrade or penetrate the materials in the containment area. Incompatible materials spilled should be contained in segregated containment areas. MRW Fixed Facilities will typically have a floor and/or surfacing of concrete. These materials can provide protection of the environment from minor spills of certain MRWs which can be enhanced by using coatings. Secondary containment systems, in addition to the floor or surfacing, may incorporate other coatings, liners, pipes, valves etc.

The following pages contain text and a table that describe commonly used coatings and their characteristics for various plastic products. Additional information can be found regarding these and other materials in the Chemical Engineers' Handbook, and from manufacturers and suppliers of specific construction materials.

Guidance for Permit Writers

FACILITIES STORING HAZARDOUS WASTE IN CONTAINERS

This document (SW-XXX) was prepared by Fred C. Hart, Inc., under contract to EPA's Office of Solid Waste, and Karen A. Walker of the Hazardous and Industrial Waste Division, Office of Solid Waste.

U.S. ENVIRONMENTAL PROTECTION AGENCY

1982

d) Types of Coating and Lining

The general characteristics of commonly used industrial coating of each type of material are categorized in Table 3-2 by the general nature of the binder. It is important to recognize that differences in manufacturing processes and additives used to make coatings may result in considerable differences in lifetime and performance of coatings of the same generic type.

Furthermore, combinations of one or more generic types of coatings may provide protective systems with a resistance different and even superior to the separate components. An example is the addition of silicone to alkyds, or vinyls to other types of coatings to improve not only water and temperature resistance, but ease of application. Another instance is the copolymerization of epoxy with phenolics that makes an air-dry epoxyphenolic with superior chemical resistance superior to either the phenolic or epoxy alone.

The most widely used lining materials today are polyethylene, chlorinated polyethylene, and polypropylene. These materials have an excellent chemical resistance to strong acids and strong alkalis in concentrated and dilute form, but exhibit a poor resistance to certain organic solvents. They also feature excellent weatherability and durability.

Phenolics, vinyls, epoxies, and polyesters are among the many organic coatings applied to metal containers. The following are some of the most common materials used:

TABLE 3-2

Properties of Principal Coating Resins				
	Description	Performance	Limitations	Comments
<b>Alkyds</b>	Esterification of polyhydric alcohol (glycerol) and a polybasic acid (phthalic acid), modified with a drying oil. Hardens by solvent evaporation and oxidation.	Good resistance to atmospheric weathering and moderate chemical fumes; not resistant to chemical splash and spillage. Long oil alkyds have good penetration although are slow drying. Short oil alkyds are fast drying. Temperature resistant to 225°F.	Not chemically resistant; not suitable for application over alkaline surfaces such as fresh concrete.	Long oil alkyds make excellent primers for rusted and pitted steel and wooden surfaces. Corrosion resistance is adequate for mild chemical fumes that predominate in many industrial areas. Used as interior and exterior industrial and marine finishes.
<b>Vinyls</b>	Polyvinyl chloride--polyvinyl acetate copolymer dissolved in strong polar solvent, generally a ketone. Coating hardens by solvent evaporation.	Insoluble in oils, greases, aliphatic hydrocarbons and alcohols. Resistant to water and salt solutions. Not attacked at room temperature by inorganic acids and alkalis. Fire resistant; good abrasion resistance.	Strong polar solvents redissolve the vinyl. Initial adhesion poor. Relatively low thickness per cost (1.5-2.0 mils). Some types will not adhere to bare steel without primer. Pinholes in dried film more prevalent than other types.	Tough and flexible; low toxicity; tasteless, colorless; fire resistant. Used in potable water tanks and sanitary equipment; widely used industrial coating.
<b>Chlorinated rubbers</b>	Formed by adding chlorine to unsaturated isoprene units. Resin is dissolved in aromatic hydrocarbons, esters and ketones. Hardens by solvent evaporation.	Low moisture permeability and excellent resistance to water. Resistant to strong acids, alkalis, bleaches, soaps and detergents, mineral oils, mold and mildew. Good abrasion resistance.	Redissolved in strong solvents. Degraded by heat (200°F, dry and 140°F, wet) and ultraviolet light, but can be stabilized to improve these properties. May be difficult to spray, especially in hot weather.	Fire resistant; odorless; tasteless and non-toxic. Quick drying and excellent adhesion to concrete and steel. Used in concrete and masonry paints, swimming pool coatings, industrial coatings, marine finishes.
<b>Epoxy, amine cured</b>	Reaction of active hydrogens of aliphatic amines with epoxy groups of bis-phenol-A epichlor-hydrin resin. Coating hardens by solvent evaporation and cures by cross linking. Amine adduct epoxies consist of partially prepolymerized coatings to which the remainder of the amine is added prior to application to complete the cross linking.	Excellent resistance to alkalis, most organic and inorganic acids, water and aqueous salt solutions. Solvent resistance and resistance to oxidizing agents is good as long as not continually wetted. Amine adducts have slightly less chemical and moisture resistance.	Harder and less flexible than other epoxies and intolerant of moisture during application. Coating will chalk on exposure to ultra-violet light. Strong solvents may lift coatings. Temperature resistance: 225°F, dry, 190°F, wet. Will not cure below 40°F; should be top-coated within 72 hr. to avoid intercoat delamination. Maximum properties require about seven days cure.	Good chemical and weather resistance. Best chemical resistance of epoxy family. Excellent adhesion to steel and concrete. Widely used in maintenance coatings and tank linings.
<b>Epoxy, polyamide cured</b>	Reactive polyamide resins (condensation products of dimerized fatty acids with polyamines) combined with epoxide groups in the epoxy resin. Coating hardens by solvent evaporation but cures by cross linking.	Superior to straight epoxies for water resistance. Excellent adhesion, gloss, hardness impact and abrasion resistance. More flexible and tough than amine epoxies. Chemical resistance slightly less than straight epoxies. Temperature resistance: 225°F, dry; 150°F, wet.	Cross linking does not occur below 40°F. Maximum resistance generally require seven days cure at 70°F.	Easier to apply and topcoat, more flexible and better moisture resistance than straight epoxies. Excellent adhesion over steel and concrete. A widely used industrial and marine maintenance coating. Some formulations can be applied to wet or underwater surfaces.
<b>Epoxy ester</b>	Formed by reaction between epoxy resin and unsaturated fatty acids (commonly linseed and soya oils). Coating hardens by solvent evaporation and oxidation.	Least resistant of epoxy family. Good weather resistance, chemical resistance better than alkyds and usually sufficient to resist normal atmospheric corrosive attack.	Not resistant to strong chemical fumes, splash or spillage. Temperature resistance 225°F, dry.	A high quality oil base coating, good compatibility with most other coating types. Easy to apply. Used widely for atmospheric resistance in chemical environments on structural steel, tank exteriors, etc.
<b>Epoxy, coal tar</b>	Coat tar mixed with epoxy resin and cured using either an amine or a polyamide.	Excellent resistance to salt and freshwater immersion. Very good acid and alkali	Embrittles on exposure to cold or ultraviolet light. Cold weather abrasion resistance is	Good water resistance. Thicknesses to 10 mils per coat. Can be applied to bare steel or

**Properties of Principal Coating Resins**

	<b>Description</b>	<b>Performance</b>	<b>Limitations</b>	<b>Comments</b>
	Coating hardens and cures by cross linking.	resistance. Solvent resistance is good, although immersion in strong solvents may leech the coal tar.	poor. Should be top-coated within 48 hr to avoid intercoat adhesion problems. Will not cure below 50°F. Black or dark colors only. Temperature resistance 225°F, dry, 150°F, wet.	concrete without a primer. Low cost per unit coverage.
<b>Latex</b>	Latex resins (generally styrene-butadiene, polyvinyl acetate, acrylic or blends) are emulsified in a water vehicle. After application the water evaporates and the resin particles coalesce and sinter to form the coating.	Resistant to water, mild chemical fumes and weathering. Good alkali resistance. Latexes are compatible with most generic coating types, either as an undercoat or topcoat.	Must be stored above freezing. Does not penetrate chalky surfaces. Exterior weather and chemical resistance not as good as solvent or oil base coatings.	Ease of application and cleanup. No toxic solvents. Good concrete and masonry sealers because breathing film allows passage of water vapor. Used as interior and exterior coatings.
<b>Polyesters</b>	An unsaturated polyester (resulting from esterification reaction between polyhydric alcohol and polybasic acid) is further reacted with diallyl phthalate to cross link and harden.	Excellent resistance to acids, organic solvents and water, as well as abrasion and abuse resistance.	Hard and inflexible. Very short pot life. Swelled and softened by strong alkalis. Minimum thickness of 5 mil required for cure.	Inert tile-like appearance. Good adhesive and cohesive strength. High film build per coat (10 mils). Used in maintenance coatings and linings for tanks and process equipment.
<b>Silicone</b>	Composed of the siloxane bond with various organic side chains.	As heat resistant coating, requires catalyzation and baking. With aluminum pigments can withstand 1,000°F; with ceramic frits up to 1,400°F. As a water repellent, resinous silicones in hydrocarbon solvents are used on masonry. Water soluble alkaline silicone in water are used on limestone and concrete.	Heat resistant silicones have moderate chemical fume resistance at lower temperatures.	Can be combined with other coating types to improve properties such as heat and moisture resistance. Water repellants are clear, breathing and durable. Used as stack coatings and above grade water repellants.
<b>Zinc rich</b>	Inorganic type consists of zinc dust in binder such as a silicate. Can be post or self cure, and can harden either by curing compound, water evaporation or hydrolyzation. Organic form used vehicles such as epoxies, phenoxies or chlorinated rubber. Hardens by chemical cross linking or solvent evaporation.	Resistant to weathering and mild chemical fume environments. Zinc in the coating is attacked when pH is below 6 or above 10.5. Inorganic type is resistant to abrasion and temperatures up to 700°F.	Requires clean steel surfaces. More difficult to apply than conventional coatings. Topcoating may be difficult especially with inorganics. Must be topcoated in severe corrosion environments.	Eliminates pitting corrosion. Despite limitations, widely used as industrial and marine primer, in mild environments can be used as one coat system.
<b>Fire retardant</b>	Flame retardant use non-flammable resins and plasticizers with compounds (such as bromates) that generate non-flammable gases. Intumescent coatings bubble and swell upon heating, thus insulating substrate from the fire.	Can reduce surface flammability or initial heat effects of fire but should be used only with conventional fire protection methods. Properties are generally better the thicker the coating.	May not be as chemically resistant as same type non-fire retardant coating. Generally provide only a few minutes delay. Some intumescent coatings are water sensitive and will not retain full properties after prolonged exposure to weather.	Used to reduce flame spread on combustible materials and to initially insulate structural steel from heat of fire.

Source: K.B. Tator, "Engineers Guide to Protective Coatings", Chemical Engineering, Vol. 79. No. 27, Dec. 4, 1972.

1. Amine-cured epoxy coatings are widely used on tanks and containers. They exhibit excellent resistance to alkalis, most organic and inorganic acids, water and aqueous salt solutions, and organic solvents. Their main disadvantage is that they tend to chalk and deteriorate with prolonged exposure to ultraviolet light (i.e., sunlight).
2. Polyamide-cured epoxy coatings are superior to ordinary epoxies for their water resistance, hardness, impact and abrasion resistance, and adhesive strength. Their chemical resistance is comparable to that of ordinary epoxies, and their temperature resistance is higher.
3. Epoxy esters are the least resistant of the epoxy family. However, they have good weather and chemical resistance and are usually able to resist normal atmospheric corrosive attacks. They are not resistant to strong chemical fumes.
4. Polyesters are commonly used as maintenance coatings and linings for tanks and process equipment. They also may be used to coat steel containers. They exhibit excellent resistance to acids, organic solvents, water, abrasion, and improper handling. They tend, however, to swell and soften in the presence of strong alkalis.

In evaluating the compatibility of a coating or lining material with a specific waste, the permit writer may need to consult with its manufacturer. The characteristics of the waste must, however, be known, particularly pH and concentration of reactive chemical constituents, before contacting a coating or lining manufacturer.

Some examples of deterioration of liners by incompatible wastes include: polyvinyl chloride by strong polar solvents; chlorinated rubbers by strong solvents; polypropylene, polyethylene and ABS (acrylonitrile-butadiene-styrene) polymers by benzene, carbon tetrachloride, or acetone.

## **APPENDIX D**

### **Example "Lab" Pack Procedure**



## EXAMPLE "LAB" PACK PROCEDURE

1. Regulations applicable to lab packs are found in WAC 173-303-161 and 49 CFR Part 173.12 (DOT regulations).
2. Reactive wastes, other than cyanide- or sulfide-bearing waste, as defined in WAC 173-303-090(7)(a)(v), must be treated or rendered nonreactive prior to packaging in a lab pack. Cyanide-or sulfide-bearing waste may be lab packed without first being treated or rendered nonreactive.
3. Wastes meeting the DOT hazard class definition of flammable liquid, flammable solid, oxidizer, corrosive material, Poison B, or ORM-A, B, C, and E may be packaged in individual lab packs for highway transport.
4. Each lab pack shipping container may contain only one DOT hazard class AND the wastes must be chemically compatible.
5. Hazardous waste must be packaged in non-leaking containers inside the drum.
6. Inside packaging must be either glass containers of one-gallon capacity or less, or metal or plastic containers of five-gallon capacity or less. They must be labeled as to their contents.
7. Inside containers must be compatible with the wastes they contain. The containers must not react dangerously with, be decomposed by, or be ignited by the contained waste.
8. Inside containers must be tightly and securely sealed and, to the extent possible, should be full and contain as little air as possible to minimize voids.
9. Inside containers must be overpacked in an open-head, DOT shipping container meeting DOT's container performance standards.
10. Inside containers must be surrounded by, at a minimum, a sufficient quantity of absorbent material to completely absorb all of the liquid contents of the lab packed MRW.
11. The outer container (e.g., 55-gallon drum) must be full after packing with inside containers (lab packed MRW) and absorbent material.
12. The absorbent material used must not be capable of reacting dangerously with, being decomposed by, or being ignited by the contents of the inner containers. Clay "kitty litter" or "floor dry" type absorbent materials work well for most liquids.
13. Attach hazardous waste manifest label for shipping to a permitted TSD.
14. Record and retain an itemized list of all MRW, chemicals, and constituents per individually identifiable lab pack.
15. Verify within 35 days that lab pack has been received by TSD by return of manifest, otherwise call TSD and transporter. If manifest is not returned within 45 days, submit an exception report to Ecology; see WAC 173-303-220(2)(c).

**APPENDIX E**

**Spill Assistance and TSD Listing, October 1991**

Waste Spill Assistance List

City	Company Name	Spill Number	Spill Type		Area Covered		Services					*Other Services (key at bottom)
			Oil	Haz Mat	Regional	Statewide	Resp Team	Recycler	Treatment	Storage	Disposal	
	Apex Environmental	(360) 532-3590	X		X			X				DD, O, S, SP, V
	Coastal Containment	(360) 532-9051	X	X	X						X	DD, SD
	Evergreen Environmental Inc.	(360) 533-6141	X		X			X				DD, O, S, SP, V
	Harold's Petroleum	(360) 736-0119	X		X		X					SD, TT
Portland, OR	Islands' Oil Spill Association	(360) 378-5322	X		X		X					
	Chem. Waste Mgmt of NW	(206) 575-2250	X	X	X			X	X	X	X	B, CE, D, DD, O, SP, V
	Cowlitz Clean Sweep	(360) 423-6316	X	X		X	X					B, DD, SD, SP, V
	Coastal Tank Co.	(206) 624-9843	X	X		X	X	X	X	X	X	O, SP, TT, V
	Envirotech Systems	1-800-922-9395	X	X		X	X					B, D, DD, O, S, SP, V
	Foss Environmental	(206) 281-4728	X	X		X	X	X	X		X	B, DD, O, SD, V
	Global Environmental	(206) 623-0621	X	X		X	X	X	X	X	X	DD, SD, TT, TR
	Marine Vacuum Service	(206) 762-0240	X	X		X	X	X	X	X	X	B, O, S, SP, V
Portland, OR	Phillip Environmental	(206) 284-2450	X	X		X		X	X	X	X	DD, O, S, SP, V
Portland, OR	Phillip Environmental	(206) 762-3362	X	X		X		X	X	X	X	D, DD, O, S, SP, V
	Protective Environmental Svcs.	(206) 624-5503	X		X			X				DD, O, S, SD, SP, TR, TT, V
	Safeco Waste Exchange	(206) 242-3388	X			X						DD, O, S, SD, SP
Portland, OR	West Pac Environmental	(206) 762-1190	X	X		X						D, O, S, SP, V
	RoarTech, Inc.	(509) 535-6757	X	X	X		X	X	X	X	X	B, DD, LT, O, S, SD, SP, TT, TR, V
	Clean Care	(206) 627-3925	X	X		X		X	X	X	X	B, DD, O, S, SD, SP, TR, V
	SolPro	(206) 627-4822	X	X		X	X	X				B, DD, O, S, SD, SP, V
	Airo Services	(206) 383-4916	X	X		X	X	X				D, DD, O, S, SD, SP, V
	Phillip Environmental	(360) 835-8594	X	X		X	X	X	X	X	X	D, DD, O, S, SP, V
	Baker Tanks Continental	(206) 487-6503	X	X		X						TR
	Harbor Oil	(503) 285-4648	X		X			X		X		O, V
	Riedel-Smith Environmental	1-800-334-0004	X	X		X	X		X		X	B, D, DD, O, S, SD, SP, TR, V
Spokane, WA	Olympus Environmental	1-800-551-8153	X	X	X		X					B, C, DD, O, SD, V
Spokane, WA	Spencer Environmental	(206) 863-3310	X		X		X	X	X	X	X	B, C, O, V
Spokane, WA	S.M.E. Corp.	(206) 572-3822	X	X	X		X					LT, S, SD, SP, TT
	EnviroSafe	(208) 384-1500	X	X		X			X	X	X	D, O, S, V
Spokane, WA	ETSC Remedial Services	(708) 980-3872		X								REACTIVES & EXPLOSIVES

Keys to Other Services:

ardous Waste Broker  
nder  
vices to Dry Cleaners  
um Dealers

E: Explosives  
LT: Liner Testing  
O: Other than Vacuum Transport  
S: Assistance to Small Quantity Generators

SD: Sorbent Dealers  
SP: Pickup for Small Quantity Generators  
R: On-Site Tank Delivery/Rental  
TT: Tank Testing

V: Vacuum Transport  
PRC: WAC 173-181 Approved Primary Response Contractor (oil)  
TSD: RCRA permitted TSD Facility

Note: This is a partial list and does not constitute an endorsement. Information is current at time of production and is acknowledged as being subject to change. For copies of list or to update information, contact Kimberly Moyer at (360) 407-6958.

The Following is a List of Regional Treatment Centers for Petroleum Contaminated Soil:			
CR - Roosevelt	Roosevelt Regional Landfill	1-800-275-5641	Aeration
CR - Yakima	Anderson PCS Remediation	(509) 965-3621	Aeration
CR - Grandview	Lower Valley Remediation	(509) 882-1144	Aeration & Bioremediation
CR - Kittitas	Taneum Recovery Corp.	(509) 964-2363	Aeration & Bioremediation
ER - Spokane	Remtech, Inc.	(509) 624-0210	Thermal Desorption
NWR - Kennmore	Sterling Asphalt	(206) 485-5667	Asphalt Incorporation
NWR - Everett	Assoc. Sand and Gravel	(206) 355-2111	Thermal Desorption
NWR - Seattle	Holnam Cement	(206) 937-8025	Cement Incorporation
SWR - Tacoma/Portland	TPS Tech. Inc. (Woodworth)	1-800-375-3752	Thermal Desorption
SWR - Port Angeles	Fields Shotwell Corp.	(360) 457-1417	Thermal Treatment/Recycling
CR: Central Region ER: Eastern Region NWR: Northwest Region SWR: Southwest Region			

## **APPENDIX F**

### **Packing Methods by MRW Type, and MRW Proportions**

**Table F-1**

**Common packing method by MRW type  
at MRW Fixed Facilities as of September 1990**

Waste Type	Lab Pack	Loose Pack	Bulk Pack	Other
Poisons	*			
Used Oil			*	
Latex Paint			*	
Solvent Paint			*	
Solvents		*	*	
Acids	*			
Oxidizers	*			
Corrosives	*			
Aerosols		*		
Auto Batteries				wrapped pallets
Anti-Freeze			*	
Flammables	*			

Adapted from; "Washington State Department of Ecology Problem Waste Study, Moderate Risk Waste Issue Paper Number 2, Moderate Risk Waste Collection Methods", September 18, 1990, R.W. Beck and Associates and The Matrix Management Group.

Approximate quantities of waste per 55 gallon drum are estimated as:

- Lab or Loose Pack ≈ 20 gallons (less if lab pack with liquids only)
- Bulk Pack ≈ 50 gallons

For planning purposes it is reasonable to use a MRW liquid density of eight pounds per gallon.

**Table F-2****MRW Fixed Facility Waste Proportions**

## Drums and Proportions Collected By MRW Type Per Facility

Waste Type	Whatcom County (Drums , %)	Thurston County (Drums , %)	South Seattle Transfer Station (Drums , %)	San Bernardino County (Drums , %)
Poisons	5 , 4%	9 , 18%	39 , 7%	26 , 4%
Used Oil	-	-	294 , 55%	384 , 66%
Latex Paint	1 , 7%	10 , 21%	81 , 15%	41 , 7%
Solvent Paint	3 , 21%	9 , 18%	28 , 5%	78 , 13%
Solvents	1 (loose), 7%	6(loose),12% 4 (bulk), 8%	25 (bulk), 5%	-
Acids	1 , 7%	-	-	-
Oxidizers	-	-	-	2 , 1%
Corrosives	-	10 , 21%	35 , 7%	13 , 2%
Aerosols	-	1 , 2%	4 , 1%	-
Anti-Freeze	3 , 21%	-	-	-
Flammables	-	-	25 , 5%	41 , 7%
<b>Drum Totals</b>	<b>14</b>	<b>49</b>	<b>531</b>	<b>585</b>

Adapted from; "Washington State Department of Ecology Problem Waste Study, Moderate Risk Waste Issue Paper Number 2, Moderate Risk Waste Collection Methods", September 18, 1990, R.W. Beck and Associates and The Matrix Management Group.

Differences between MRW types collected at these facilities are a reflection of somewhat different waste segregation and packing categories as well as choices to receive or exclude certain waste types such as used oil, anti-freeze, and aerosols.

## **APPENDIX G**

### **References**



## REFERENCES

NIOSH Pocket Guide to Chemical Hazards, U.S. Department of Health and Human Services; DHHS (NIOSH) Publication No. 90-117, June 1990 [Phone:(513) 533-8287]

Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities, DHHS (NIOSH) Publication No. 85-115; U.S. Department of Health and Human Services, Public Health Services Centers for Disease Control, National Institute for Occupational Safety and Health, October 1985.

[Note: The NIOSH Documents can be obtained from: U.S. Government Printing Office Bookstore, 915 - 2nd Ave. Seattle, WA 98174; phone: (206) 553-4270.]

General Occupational Health Standards, Chapter 296-62 WAC (Volumes I and II); Washington State Department of Labor and Industries, Division of Industrial Safety and Health; November 1991, as revised effective December 24, 1991.

General Safety and Health Standards, Chapter 296-24 WAC; Washington State Department of Labor and Industries, Div. of Industrial Safety and Health; June 1991.

[Note: To receive copies of the Washington State Department of Labor and Industries Standards (WISHA), call (206) 753-2322 or on diskette (formatted in Displaywrite 4, WordPerfect 5.1, or DOS Text), call (206) 664-0543. Also, for general information call 1-(800) 423-7233, (206) 586-1851 (commercial), or 321-1851 (SCAN).]

National Electrical Code (NFPA 70, 1990 Edition), National Fire Protection Association.

Uniform Fire Code (1991 Edition, as amended by the state), International Conference of Building Officials and Western Fire Chiefs Association.

Uniform Building Code (1991 Edition, as amended by the state), International Conference of Building Officials.

Uniform Mechanical Code (1991 Edition, as amended by the state), International Conference of Building Officials and International Association of Plumbing And Mechanical Officials.

*(reference list continued on following page)*

[Note: Copies of the Uniform Codes are available in larger local libraries or can be purchased from: International Conference of Building Officials, Northwest Regional Office, 2122 - 112th Avenue N.E., Suite B-300, Bellevue, WA 98004; phone (206) 451-9541. State amendments can be purchased from the State Building Code Council, 906 Columbia Street S.W., P. O. Box 48300, Olympia, WA 98504-8300; phone (206) 586-8999.]

Flammable and Combustible Liquids Code (NFPA 30, 1990 Edition), National Fire Protection Association.

[Note: Copies of the NFPA Codes and Standards are available from: NFPA, 1 Batterymarch Park, P. O. Box 9146, Quincy, MA 02269-9146; phone: (617) 770-4543.]

A Method for Determining the Compatibility of Hazardous Wastes, EPA-600/2-80-076, U.S. Environmental Protection Agency, April 1980.

[Note: Copies of the above EPA document may be purchased from: NTIS, U.S. Department of Commerce, National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161; phone: (703) 487-4630.]

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