

## Chapter NR 645

## TANK SYSTEM STANDARDS

NR 645.01	Purpose (p. 237)	NR 645.11	Inspections (p. 259)
NR 645.02	Applicability (p. 237)	NR 645.12	Response to leaks or spills and disposition of leaking or unfit for use tank systems (p. 259)
NR 645.03	Definitions (p. 237)	NR 645.13	Special requirements for ignitable or reactive waste (p. 262)
NR 645.04	Exemptions (p. 237)	NR 645.14	Special requirements for incompatible wastes (p. 262)
NR 645.05	General (p. 238)	NR 645.15	Waste analysis and trial tests (p. 262)
NR 645.06	Feasibility and plan of operation report (p. 238)	NR 645.16	Small storage facility requirements (p. 262)
NR 645.07	Assessment of existing tank system's integrity (p. 248)	NR 645.17	Closure and long term care (p. 265)
NR 645.08	Design and installation of new tank system or tank system components (p. 249)		
NR 645.09	Secondary containment and detection of releases (p. 252)		
NR 645.10	General operating requirements (p. 258)		

**NR 645.01 Purpose.** The purpose of this chapter is to ensure that efficient and environmentally acceptable hazardous waste treatment and storage operations are practiced and to describe the requirements for feasibility and plan of operation reports and for closure plans as they apply to hazardous waste tank systems.

**History:** Cr. Register, February, 1991, No. 422, eff. 3-1-91.

**NR 645.02 Applicability.** Except as otherwise provided, this chapter applies to owners and operators of facilities that store or treat hazardous waste in tank systems. This chapter does not apply to solid waste facilities that store or treat only:

- (1) Non-hazardous solid waste,
- (2) Metallic mining wastes resulting from a mining operation as defined in s. 144.81 (5), Stats.,
- (3) Polychlorinated biphenyls (PCBs), except where portions of this chapter are referenced in ch. NR 157, or
- (4) A combination of wastes described in subs. (1) to (3).

**History:** Cr. Register, February, 1991, No. 422, eff. 3-1-91; correction made under s. 13.93 (2m) (b) 1, Stats., Register, August, 1992, No. 440.

**NR 645.03 Definitions.** The definitions in s. NR 600.03 apply to this chapter.

**History:** Cr. Register, February, 1991, No. 422, eff. 3-1-91.

**NR 645.04 Exemptions.** The requirements of this chapter do not apply to the following, except to the extent they are specifically included:

- (1) A generator accumulating hazardous waste on-site in tanks in compliance with s. NR 615.05 (4), except to the extent that the requirements of this chapter are made applicable under s. NR 600.07, discharge of hazardous waste and s. NR 615.05, general requirements.
- (2) The owner or operator of a totally enclosed treatment facility.
- (3) A small quantity generator accumulating waste on-site in tanks in compliance with ch. NR 610, small quantity generator standards.

(4) The owner or operator of a wastewater treatment unit, if the owner or operator complies with the requirements specified in s. NR 630.04 (1).

(5) The owner or operator of an elementary neutralization unit if the owner or operator complies with s. NR 630.04 (7).

(6) The owner or operator of a POTW storing spent pickle liquor, prior to recycling at the POTW, in a tank which is approved under s. 144.04, Stats.

History: Cr. Register, February, 1991, No. 422, eff. 3-1-91; am. (1), Register, August, 1992, No. 440, eff. 9-1-92.

**NR 645.05 General.** (1) Except as otherwise provided in s. NR 645.04, no person may maintain or operate a hazardous waste storage or treatment facility unless the person has obtained an interim license, operating license, variance or waiver from the department, in accordance with the requirements of ch. NR 680.

(2) Final disposal of hazardous waste may not be permitted at a hazardous waste storage or treatment facility, unless the facility has a separate license for disposal.

History: Cr. Register, February, 1991, No. 422, eff. 3-1-91.

**NR 645.06 Feasibility and plan of operation report.** (1) ALL FACILITIES. Unless specifically exempted in s. NR 645.04 (1) to (8), no person shall establish, construct or expand a hazardous waste storage or treatment facility or be issued an initial operating license under s. NR 680.34 without first obtaining written approval of a feasibility and plan of operation report from the department. The purpose of the feasibility and plan of operation report is to determine whether the site has potential for use as a hazardous waste storage or treatment tank facility and to identify and address any operating conditions which are necessary for the proper operation of the facility. Favorable feasibility determination and plan approval under this section does not guarantee final licensure. The feasibility and plan of operation report shall be submitted in accordance with the requirements of s. 144.44, Stats., and ss. NR 680.05 (1), 680.06 (3) and 680.10 and shall contain the applicable material required by this section. Additional report requirements for storage and treatment tank facilities are included in subs. (2) and (3). Feasibility and plan of operation report requirements for small storage tank facilities, that meet the criteria in s. NR 645.16 (1), are specified in s. NR 645.16 (3). The feasibility and plan of operation report shall also contain the following information:

(a) A narrative describing:

1. Legal description of the site.
2. Present ownership of the site.
3. Proposed site size and boundaries and present land use of the site and the area within  $\frac{1}{2}$  mile of the site. Particular note shall be made of parks, hospitals, nursing homes and areas of archaeological and historical significance.
4. Area served, including population and major industries.
5. A complete material balance for the facility, specifying the amounts and characteristics of hazardous waste to be received and the amounts

and characteristics of products and wastes which will be generated by the facility.

6. Types of vehicles and access routes used to transport hazardous waste into and out of the site or facility, an analysis of estimated traffic flow patterns on access routes and within the site or facility, and an analysis of increased quantities of traffic on access routes into and out of the site or facility. If roads are to be used, current or proposed access roads and weight restrictions shall be included.

7. Estimated quantities and characteristics of wastes resulting from facility operations and methods of treatment or disposal.

8. Person responsible for plant construction and operation.

9. Quality and quantity of air discharge expected from plant operation.

10. Appurtenances and procedures for the storage of hazardous waste beyond the end of the processing day, for the control of dust, odors, fire, windblown materials and potential explosions and for the handling of hazardous waste in the case of major treatment facility breakdown.

11. Names and locations of all hazardous and solid waste disposal sites and facilities at which hazardous and solid wastes from the treatment plant will be disposed.

12. Overall site or facility layout including conceptual building design, sizing of receiving area, methods of processing, and sizing of major process equipment or process areas.

13. A timetable for site or facility construction, start up and operation.

14. Operating schedule.

15. Provisions for protection of groundwater and surface waters during site or facility construction and operation.

16. Conceptual design of equipment indicating its capacity and dimensions.

17. The potential for the site to meet the location requirements in s. NR 630.18.

(b) A discussion of the regional site setting to provide a basis for comparison and interpretation to site specific information obtained through field investigations and for analyzing siting and environmental considerations. Discussions should be limited to information available from publications, although some field verification and updating may be desirable. Discussions shall be supplemented by maps and crosssections. The following items shall also be discussed:

1. Topography, including predominant topographic features.

2. Hydrology, including surface water drainage patterns and significant hydrologic features such as surface waters, springs, drainage basins and divides and wetlands.

3. Geology, including the nature and distribution of bedrock and unconsolidated deposits.

4. Hydrogeology, including depth to groundwater, groundwater flow direction, recharge and discharge areas, groundwater divides, aquifers and the identification of the aquifers use by public and private wells beneath the facility property and within one half mile of the proposed site, unless a demonstration is made to the department's satisfaction indicating why the information is not needed.

5. Ground and surface water quality as described in available regional literature.

6. Climatology.

7. Identification of adjacent landowners.

8. Zoning.

9. Present land use with particular emphasis on known recreational, historic or archaeological areas.

(c) An existing and proposed site condition topographic plan. This shall be a detailed topographic survey of the facility area and all area within a distance of 1500 feet of the facility. The minimum scale of this plan shall be one inch = 200 feet with a maximum 2-foot contour interval. The contour interval shall be sufficient to clearly show the pattern of surface water flow in the vicinity of and from each operating unit of the facility. All elevations shall be related to USGS data. More than one plan sheet shall be prepared to show the required information if one sheet will be too detailed to be clear. The plan or plans shall clearly show:

1. 100-year floodplain area.

2. Surface waters, including wetlands and intermittent streams.

3. Homes, buildings, man-made features and utility lines.

4. Surrounding land uses, such as residential, commercial, agricultural, recreational and wooded areas.

5. Proposed site boundary.

6. Property boundaries, facility or waste management boundaries, including any previous solid or hazardous waste disposal areas.

7. Access control, such as fences and gates.

8. Water supply wells and any other wells, such as irrigation wells.

9. Well boring locations and observation well locations.

10. Location of soil borings and test pits.

11. A wind rose, which shows prevailing wind speed and direction.

12. Buildings, treatment, storage or disposal operations or other structures such as recreation areas, runoff control systems, access and internal roads, storm, sanitary, and process sewerage systems, loading and unloading areas, fire control facilities, easements and rights-of way.

13. Barriers for drainage or flood control.

14. Features of historical and archeological significance.

15. Location of operational units within the facility where hazardous waste is or will be treated or stored, including equipment cleanup areas.

(d) The narrative in par. (a) shall be supplemented by the following maps or plans:

1. USGS quadrangle map. This shall be a 7½ minute, topographic map, if available. The radius of coverage shall be sufficient to show sources of waste for a minimum of 3 miles. If impractical to show the site or facility locations relative to the source of waste, a separate location map displaying this information shall be provided.

2. Plat map. This shall indicate property boundaries and zoning within ½ mile of the proposed facility and anticipated traffic routes within 2 miles of the site or facility.

3. Proposed facility plan. This plan shall include proposed site or facility access roads and traffic patterns, buildings, scales, utility lines, drainage diversion, screening, means of access control, final topography, areas to be cleared of vegetation and other design features. The extent of coverage and scale shall be the same as that for the existing site conditions map.

(e) If the presence of hazardous constituents has been detected in the groundwater at the point of compliance at the time of feasibility and plan of operation report submittal, the owner or operator shall submit sufficient information, supporting data and analyses to establish a compliance monitoring program which meets the requirements of ss. NR 635.05 to 635.15. Except as provided in s. NR 635.13 (9), the owner or operator shall also submit an engineering feasibility plan for a corrective action program necessary to meet the requirements of s. NR 635.15, unless the owner or operator obtains written authorization in advance from the department to submit a proposed license schedule for submittal of the plan. To demonstrate compliance with s. NR 635.13, the owner or operator shall submit the following items:

1. A description of the wastes previously handled at the facility;

2. A characterization of the contaminated groundwater, including concentrations of hazardous constituents;

3. A list of hazardous constituents for which compliance monitoring shall be undertaken in accordance with ss. NR 635.05 to 635.15;

4. Proposed concentration limits for each hazardous constituent, based on the criteria set forth in s. NR 635.09, including a justification for establishing any alternate concentration limits;

5. Detailed plans and an engineering report describing the proposed groundwater monitoring system in accordance with the requirements of ss. NR 635.05 to 635.15; and

6. A description of proposed sampling, analysis and statistical comparison procedure to be utilized in evaluating groundwater monitoring data.

(f) Recommendations on design constraints for development of the site considering all available data shall be made and reasons given for the recommendations. This shall include a discussion of the potential for the site to meet locational requirements in s. NR 630.18. For expansion of existing facilities, the report shall include sufficient information to assess

the effectiveness of the existing facility design and operation in protecting air, surface water and groundwater quality.

(g) Engineering plans, which shall consist of the following:

1. A title sheet indicating the project title, who prepared the plans, the person for whom the plans were prepared, a table of contents and a location map showing the location of the site and if applicable the area to be served.

2. A final site topography plan sheet indicating the appearance of the site at closing including the details necessary to prepare the site for long-term care.

(h) When applicable, the following information shall be presented on the plan sheets:

1. A survey grid with base lines and monuments to be used for field control.

2. All drainage patterns and surface water drainage control structures both within the actual facility and at the site perimeter. The structures may include all piping, berms, sedimentation basins, pumps, culverts, inlets and methods of erosion control.

3. Ground surface contours at the time represented by the drawing. Spot elevations shall be indicated for key features.

4. Access roads and traffic flow patterns to and within the facility.

5. All temporary and permanent fencing.

6. The methods of screening such as berms, vegetation or special fencing.

7. Groundwater monitoring devices and detection systems.

8. Support buildings, scales, utilities, gates and signs.

9. Special waste handling areas.

10. Construction notes and references to details.

11. Other appropriate site features.

(i) Except as otherwise provided in s. NR 645.02, owners and operators of tanks shall provide the following information:

1. A written assessment that is reviewed and certified by an independent, qualified, registered professional engineer as to the structural integrity and suitability for handling hazardous waste of each tank system as required by ss. NR 645.07 and 645.08;

2. Dimensions and capacity of each tank;

3. Description of feed systems, safety cutoff, bypass systems and pressure controls, such as vents;

4. A diagram of piping, instrumentation and process flow for each tank system;

5. A description of materials and equipment used to provide external corrosion protection as required under s. NR 645.08 (1) (c) 2.;

6. For new tank systems, a detailed description of how the tank system shall be installed in compliance with s. NR 645.08 (2) to (5);

7. Detailed plans and description of how the secondary containment system for each tank system is designed and constructed to meet the requirements of s. NR 645.09 (3) to (8);

8. For tank systems for which a variance from the requirements of s. NR 645.09 is sought as provided by s. NR 645.09 (9):

a. Detailed plans, engineering and hydrogeologic reports, as appropriate, describing alternate design and operating practices that shall, in conjunction with location aspects, prevent the migration of any hazardous waste or hazardous constituents into the groundwater or surface water during the life of the facility, or

b. A detailed assessment of the substantial present or potential hazards posed to human health or the environment should a release enter the environment.

9. Description of controls and practices to prevent spills and overflows as required under s. NR 645.10 (2).

10. Detailed plans and description of how the secondary containment system for each tank system is or shall be operated to meet the requirements of s. NR 645.09 (3) to (8); and

11. For tank systems in which ignitable, reactive or incompatible wastes are to be stored or treated, a description of how the operating procedures and the tank system and facility design shall achieve compliance with the requirements of ss. NR 645.13 and 645.14 (2).

(2) STORAGE FACILITIES. In addition to the requirements of sub. (1), the feasibility and plan of operation report for hazardous waste tank system storage facilities shall include the following:

(a) A description of the secondary containment system to demonstrate compliance with s. NR 645.09, including:

1. Basic design parameters, dimensions and materials of construction.
2. How the design promotes drainage or how tanks are kept from contact with standing liquids in the secondary containment system.
3. Capacity of the secondary containment system relative to the number and volume of tanks.
4. Provisions for preventing or managing run-on.
5. How accumulated liquids can be analyzed and removed to prevent overflow.

(b) A description of how s. NR 630.17 (2) shall be complied with to meet the requirements of ss. NR 645.13 and 645.14.

(c) Sketches, drawings or data demonstrating compliance with the buffer zone requirements of s. NR 645.13 (2).

(d) An operations and maintenance manual consisting of the following information:

1. Identification of the project title; engineering consultant; site owner, licensee and operator; proposed licensed acreage; site life and design capacity; municipalities, industries and collection and transportation agencies served; waste types and quantities to be treated or stored; and any exemptions applied for.

2. Specifications for site construction and operation shall be presented, including detailed instructions to the site operator and any contractors for all aspects of site construction and operation. References to specifications on the plan sheets shall be pointed out as well as additional instructions included, where appropriate. The specifications shall include, as applicable, the following information:

a. Initial site preparations including specifications for clearing and grubbing, other excavations, drainage control structures, access roads and entrance, screening, fencing and other special design features.

b. A plan for initial site preparations including a discussion of the field measurements, photographs to be taken and sampling and testing procedures to be utilized to verify that the infield conditions encountered were the same as those specified in the feasibility and plan of operation report.

3. A description of daily operations including, as appropriate, a discussion of the timetable for development, waste types accepted or excluded, typical waste handling techniques, hours of operation, traffic routing, drainage and erosion control, windy, wet and cold weather operations, fire protection equipment, manpower, methods for handling of incompatible waste types, methods for vector, daily clean-up, recordkeeping, parking for visitors and employees, monitoring, backup equipment with names and telephone numbers where equipment may be obtained and other special design features. This may be developed as a removable section to improve accessibility for the site operator.

(e) A design report shall be submitted which shall include supplemental discussions and design calculations to facilitate department review and provide supplemental information on financial responsibility for closure and long-term care as required by ss. 144.44 and 144.443, Stats., including the following information:

1. A discussion of the reasoning and logic behind the design of the major features of the site or facility as appropriate, such as traffic routing, base grade and relationships to subsurface conditions, anticipated waste types and characteristics, phases of development, facility monitoring, and similar design features shall be provided. A discussion of all calculations, estimate of site life and surface water run-off shall be included. The calculations shall be summarized with the detailed equations presented in the appendix to the feasibility and plan of operation report.

2. A closure plan as required by ss. NR 645.17 and 685.05.

3. A detailed analysis in accordance with s. NR 685.07 of the financial responsibility for closure from the time of site or facility closing to termination.

(f) A contingency plan as specified in ss. NR 630.21 and 630.22 (1) and (2).



(g) An appendix shall be submitted which shall include any additional data not previously presented, calculations, material specifications, operating agreements and other appropriate information.

(3) TREATMENT FACILITIES. In addition to the requirements of sub. (1), the feasibility and plan of operation report for hazardous waste treatment tank facilities shall address compliance with the following:

(a) The supplemental narrative information required by sub. (1) (d) shall include the following:

1. Proposed process layout. The extent of coverage shall include the receiving, processing and loadout areas. The minimum scale shall be one inch = 200 feet. Plan details shall include conceptual design for receiving area configuration and traffic flow patterns, treatment area and equipment configuration, loadout area and equipment configuration, traffic flow patterns and other pertinent design features.

2. Design report. A design report shall be submitted with the construction plans and specifications providing a discussion of design features, logic and calculations. Where applicable, show calculations for size and configuration of receiving area; size, configuration and capacity of process treatment equipment, methods of handling liquid wastes resulting from operations such as floor drains, sewers and water treatment facilities; residence time and process equipment; size and configuration of loadout and storage facilities for process outputs; sizing of surface water drainage control structures; traffic queuing and flow patterns; design life of facility equipment, buildings and appurtenances; timetable for construction; and methods of screening the facility from the surrounding area. The calculations shall be summarized with detailed equations presented in an appendix to the feasibility and plan of operation report.

(b) 1. Construction materials. The materials used in construction of the treatment facility shall be compatible, under expected operating conditions, with the hazardous waste and any treatment chemicals or reagents used in the treatment process.

2. Waste analyses for chemical, physical or biological treatment processes. In addition to the waste analysis required by s. NR 630.12, whenever a hazardous waste which is substantially different from waste previously treated in a treatment process or equipment at the facility is to be treated in that process or equipment, or a substantially different process than any previously used at the facility is to be used to chemically treat hazardous waste, the owner or operator shall:

a. Conduct waste analyses and trial treatment tests, such as bench scale or pilot plant scale tests; or

b. Obtain written, documented information on similar treatment of similar waste under similar operating conditions to show that this proposed treatment will meet all applicable requirements of par. (c) 2. and s. NR 630.17 (2).

3. Uncovered reaction vessels. All uncovered reaction vessels shall be sized to provide no less than 2 feet freeboard at any time to prevent splashing or spillage of hazardous waste during the treatment.

4. Emergency transfer of reactor contents. A facility shall have the capacity to remove and store the emergency transfer of reactor contents,

or shall have emergency storage capacity to be used in the event of an equipment breakdown or malfunction.

5. Malfunction abatement. Where hazardous waste is continuously fed into a treatment process or equipment, the process or equipment shall be equipped with an automatic waste feed cutoff or a by-pass system which is activated when a malfunction in the treatment process occurs.

6. Residuals or by-product analysis. All residuals or by-products from a treatment process shall either be analyzed to determine whether they are a hazardous waste as identified in ch. NR 605 or be assumed to be a hazardous waste.

7. Unloading of hazardous waste. Unloading of hazardous waste shall take place only in approved, designated areas.

8. Alternate methods for treatment or disposal. If for any reason the treatment facility is rendered inoperable or is not able to completely process the hazardous waste, an approved alternative method shall be used for hazardous waste treatment or disposal.

9. Compliance with general requirements. Chemical, physical or biological treatment of hazardous waste, shall comply with the general requirements for ignitable, reactive or incompatible wastes in s. NR 630.17 (2).

10. Incompatible wastes. Incompatible wastes shall not be placed in the same process or equipment used for chemical, physical or biological treatment.

11. Ignitable or reactive wastes. Ignitable or reactive waste shall not be placed in a process or equipment used to chemically, physically or biologically treat a hazardous waste unless:

a. The waste is treated, rendered or mixed before or immediately after placement in the process or equipment so that the resulting mixture or dissolution of material no longer meets the criteria of ignitable or reactive waste in s. NR 605.08 (2) or (4) so that s. NR 630.17 (2) is complied with, or;

b. The waste is treated in such a way that it is protected from any material or conditions which may cause the waste to ignite or react.

12. Secondary containment system. Detailed plans and description of how the secondary containment system for each tank system is or shall be operated to meet the requirements of s. NR 645.09 (3) to (8); and

13. Operating procedures. For tank systems in which ignitable, reactive or incompatible wastes are to be stored, a description of how the operating procedures and the tank system and facility design shall achieve compliance with the requirements of ss. NR 645.13 and 645.14 (2).

(c) A manual shall be prepared with separate sections specifying operating and maintenance procedures for the following:

1. Facility startup and process shakedown. This shall include a discussion of personnel training; quantities and characteristics of hazardous waste to be processed; process line startup procedures and equipment performance evaluations; fire, dust, and vapor control systems; perform-

ance evaluations; process raw materials on hand at startup; process outputs testing; and other appropriate startup procedures.

2. Normal operations. This shall include a discussion of operating personnel responsibilities; hours of operation; daily processing schedule; routine process monitoring including monitoring quantity and quality of hazardous waste input; process output testing; equipment maintenance schedules; methods of controlling explosions, fire, odors and windblown materials; special waste handling procedures; method of controlling access; daily cleanup procedures; facility bypass procedures during major breakdowns and alternative means of disposal; person responsible for operation; site or facility licensee and owner; recordkeeping; emergency procedures for handling of freezep during cold weather; methods to prevent hazardous waste from burning; and other pertinent information.

(d) Records of operating conditions as specified in s. NR 630.31.

(e) A closure plan as required by ss. NR 645.17 and 685.05.

(f) The owner or operator of a facility that chemically, physically or biologically treats hazardous waste shall inspect, where present:

1. Discharge control and safety equipment, such as waste feed cut-off systems, bypass systems, drainage systems and pressure relief systems, at least once each operating day, to ensure that it is in good working order;

2. Data gathered from monitoring equipment, such as pressure and temperature gauges, at least once each operating day, to ensure that the treatment process or equipment is being operated according to its design;

3. The construction materials of the process equipment, at least weekly, to detect corrosion or leaking of fixtures or seams; and

4. The construction materials of discharge confinement structures, such as dikes and the area immediately surrounding, at least weekly, to detect erosion or obvious signs of leakage, such as wet spots or dead vegetation.

(4) DEPARTMENT'S REVIEW. (a) Within 60 days after a feasibility and plan of operation report is submitted, the department shall either determine that the report is complete or notify the applicant in writing that the report is not complete, specifying the information which the applicant shall submit before the report is deemed complete. The department shall determine whether or not the feasibility and plan of operation report is complete by determining whether or not the minimum requirements in subs. (1) to (3) have been met. Additional information may be required of the applicant after a determination that the report is complete only if the department establishes that a detailed review of the report indicates that feasibility cannot be determined or the report is insufficient in the absence of additional information.

(b) If no hearing has been conducted under s. 144.44, Stats., the department shall issue the final determination for the feasibility and plan of operation report within 60 days after the 45 days notice period required under s. 144.44 (2) (l) and (m), Stats., has expired. If an informational hearing is conducted under s. 144.44 (2g), Stats., the department shall issue a final determination for the feasibility and plan of operation report within 60 days after the hearing is adjourned. If a contested case hearing

is conducted under s. 144.44 (2r), Stats., a final determination for the feasibility and plan of operation report shall be issued within 90 days after the hearing is adjourned.

History: Cr. Register, February, 1991, No. 422, eff. 3-1-91.

**NR 645.07 Assessment of existing tank system's integrity.** (1) For each existing tank system that does not have secondary containment meeting the requirements of s. NR 645.09, the owner or operator shall determine that the tank system is not leaking or is unfit for use. Except as provided in sub. (2) (e) 3, the owner or operator shall obtain and keep on file at that facility a written assessment reviewed and certified by an independent, qualified, registered professional engineer in accordance with s. NR 680.05 (2) (d), that attests to the tank system's integrity by September 1, 1992.

(2) This assessment shall determine that the tank system is adequately designed and has sufficient structural strength and compatibility with the wastes to be stored or treated to ensure that it will not collapse, rupture or fail. At a minimum, this assessment shall consider the following:

(a) Design standards, if available, according to which the tank and ancillary equipment were constructed;

(b) Hazardous characteristics of the waste or wastes that have been and will be handled;

(c) Existing corrosion protection measures;

(d) Documented age of the tank system, if available, or an estimate of the age; and

(e) Results of a leak test, internal inspection or other tank system integrity examination such that:

1. For underground tanks that cannot be entered, the assessment shall include a leak test that is capable of taking into account the effects of temperature variations, tank end deflection, vapor pockets and high water table effects, and

2. For tanks other than those underground tanks that cannot be entered and for ancillary equipment, this assessment shall include either a leak test, as described above, or other integrity examination, that is certified by an independent, qualified, registered professional engineer in accordance with s. NR 680.05 (2) (d), that addresses cracks, leaks, corrosion and erosion.

Note: The practices described in the American Petroleum Institute (API) Publication, Guide for Inspection of Refinery Equipment, Chapter XIII, "Atmospheric and Low-Pressure Storage Tanks," 4th edition, 1981, may be used, where applicable, as guidelines in conducting the integrity examination of other than an underground tank that cannot be entered. This publication may be obtained from:

American Petroleum Institute  
1220 L Street NW  
Washington, D.C. 20005

(3) Tank systems that store or treat materials that become hazardous wastes subsequent to March 1, 1991 shall conduct this assessment within 12 months after the date that the waste becomes a hazardous waste.

Register, August, 1992, No. 440

(4) If, as a result of the assessment conducted in accordance with sub. (1), a tank system is found to be leaking or unfit for use, the owner or operator shall comply with the requirements of s. NR 645.12.

(5) Tank systems which contain volatile waste shall be in compliance with all appropriate air management rules contained in chs. NR 400 to 499 regarding the control of organic compound emissions.

History: Cr. Register, February, 1991, No. 422, eff. 3-1-91.

**NR 645.08 Design and installation of new tank system or tank system components.** (1) Owners or operators of new tank systems or tank system components shall obtain and submit to the department, at the time of submittal of the feasibility and plan of operation report, a written assessment, reviewed and certified by an independent, qualified registered professional engineer, in accordance with s. NR 680.05 (2) (d), attesting that the tank system has sufficient structural integrity and is acceptable for the storing and treating of hazardous waste. The assessment shall show that the foundation, structural support, seams, connections and pressure controls, if applicable, are adequately designed and that the tank system has sufficient structural strength, compatibility with the wastes to be stored and treated and corrosion protection to ensure that it will not collapse, rupture or fail. This assessment, which will be used by the department to review and approve or disapprove the acceptability of the tank system design, shall include, at a minimum, the following information:

(a) Design standards according to which either tanks or the ancillary equipment, or both, are constructed;

(b) Hazardous characteristics of the wastes to be handled;

(c) For new tank systems or tank system components in which the external shell of a metal tank or any external metal tank system component will be in contact with the soil or with water, submit a determination by a corrosion expert of:

1. Factors affecting the potential for corrosion, including but not limited to:

a. Soil moisture content;

b. Soil pH;

c. Soil sulfides level;

d. Soil resistivity;

e. Structure to soil potential;

f. Influence of nearby underground metal structures, such as piping;

g. Existence of stray electric current;

h. Existing corrosion protection measures, such as coating or cathodic protection.

2. The type and degree of external corrosion protection that are needed to ensure the integrity of the tank system during the use of the tank system or tank system component, consisting of one or more of the following:

- a. Corrosion resistant materials of construction such as special alloys, fiberglass reinforced plastic, etc.;
- b. Corrosion resistant coating, such as epoxy or fiberglass, with cathodic protection, such as impressed current or sacrificial anodes; and
- c. Electrical isolation devices, such as insulating joints or flanges.

Note: The practices described in the National Association of Corrosion Engineers (NACE) standard, "Recommended Practice (RP-02-85) - Control of External Corrosion on Metallic Buried, Partially Buried or Submerged Liquid Storage Systems," whose address is:

National Association of Corrosion Engineers  
P.O. Box 218340  
Houston, Texas 77218  
Telephone: (713) 492-0535

and the American Petroleum Institute (API) Publication 1632, "Cathodic Protection of Underground Petroleum Storage Tanks and Piping Systems," whose address is:

American Petroleum Institute  
1220 L Street NW  
Washington, D.C. 20005

may be used, where applicable, as guidelines in providing corrosion protection for tank systems.

(d) Design considerations shall ensure that:

1. Tank foundations will maintain the load of a full tank;
2. Tank systems will be anchored to prevent floatation or dislodgement where the tank system is placed in a saturated zone, or is located within a seismic fault zone subject to the standards of s. NR 630.18 (5); and
3. Tank systems will withstand the effects of frost heave.

(e) For underground tank system components that are likely to be adversely affected by vehicular traffic, a determination of design or operational measures that shall protect the tank system against potential damage.

(2) The owner or operator of a new tank system shall ensure that proper handling procedures are adhered to in order to prevent damage to the system during installation. Prior to covering, enclosing or placing a new tank system or tank system component in use, an independent, qualified installation inspector or an independent, qualified, registered professional engineer, in accordance with s. NR 680.05 (2) (d), either of whom is trained and experienced in the proper installation of tank systems or tank system components, shall inspect the system for presence of any of the items in the following list. All discrepancies shall be remedied before the tank system is covered, enclosed or placed in use. The items to be inspected include:

- (a) Weld breaks;
- (b) Punctures;
- (c) Scrapes of protective coatings;
- (d) Cracks;
- (e) Corrosion;

(f) Other structural damage or inadequate construction or installation.

(3) New tank systems or tank system components and piping that are placed underground and that are backfilled shall be provided with a backfill material that is a noncorrosive, porous and homogeneous substance and that is installed so that the backfill is placed completely around the tank and compacted to ensure that the tank and piping are fully and uniformly supported.

(4) All new tanks and ancillary equipment shall be tested for leak tightness prior to being covered, enclosed or placed in use. If a tank system is found to not be tight, all repairs necessary to remedy any leak in the system shall be performed prior to the tank system being covered, enclosed or placed into use.

(5) Ancillary equipment shall be supported and protected against physical damage and excessive stress due to settlement, vibration, expansion or contraction.

Note: The piping system installation procedures described in American Petroleum Institute (API) Publication 1615, November, 1979, "Installation of Underground Petroleum Storage Systems," or ANSI Standard B31.3, "Petroleum Refinery Piping," and ANSI Standard B31.4, "Liquid Petroleum Transportation Piping System" may be used, where applicable, as guidelines for proper installation of piping systems. The API publication may be obtained from:

American Petroleum Institute  
1220 L Street N.W.  
Washington, D.C. 20005

The ANSI publication may be obtained from:

American National Standards Institute  
1430 Broadway  
New York, NY 10018

(6) The owner or operator shall provide the type and degree of corrosion protection recommended by an independent corrosion expert, based upon the information provided under sub. (1) (c), or other corrosion protection if the department, in its review of the proposed installation under sub. (1), believes other corrosion protection is necessary to ensure the integrity of the tank system during use of the tank system. The installation of a corrosion protection system that is field fabricated shall be supervised by an independent corrosion expert to ensure proper installation.

(7) The owner or operator shall obtain and keep on file at the facility, written statements by those persons who are required to certify the design of the tank system and supervise the installation of the tank system in accordance with the requirements of subs. (2) to (6), that attest that the tank system was properly designed and installed, and that repairs, pursuant to subs. (2) and (4), were performed. These written statements shall also include the certification statements as required in s. NR 680.05 (2) (d).

History: Cr. Register, February, 1991, No. 422, eff. 3-1-91.

**NR 645.09 Secondary containment and detection of releases.** (1) Tank systems that are used to store or treat hazardous waste which contains no free liquids and are situated inside a building with an impermeable floor that is designed and constructed to have a continuous base which is free of cracks or gaps and is impervious to the material to be stored or

treated, are exempt from the requirements in this section. To demonstrate the absence or presence of free liquids in the stored or treated waste, EPA Method 9095, Paint Filter Liquids Test, as described in "Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods", EPA Publication No. SW-846, shall be used.

Note: The publication SW-846 may be obtained from:

National Technical Information Service  
U.S. Department of Commerce  
Springfield, Virginia 22161

This publication is available for inspection at the offices of the department, the secretary of state and the revisor of statutes.

(2) Tank systems, including sumps, that serve as part of a secondary containment system to collect or contain releases of hazardous wastes are exempt from the requirements of subs. (3) and (11).

(3) In order to prevent the release of hazardous waste or hazardous constituents to the environment, secondary containment that meets the requirements of this section shall be provided, except as provided in subs. (8) and (9):

(a) For all new tank systems or tank system components prior to their being placed into service;

(b) For all existing tank systems used to store EPA Hazardous Waste Numbers F020, F021, F022, F023, F026 and F027, by September 1, 1993.

(c) For those existing tank systems that are owned or operated by small quantity generators or are underground and non-enterable for inspection, and that are of known and documented age, by March 1, 1991 or when the tank system has reached 15 years of age, whichever comes later. For all other existing tank systems that are of known and documented age, within 6 months of March 1, 1991 or when the tank system has reached 15 years of age, whichever comes later.

(d) For those existing tank systems that are owned or operated by small quantity generators or are underground and non-enterable for inspection, and for which the age cannot be documented, by January 12, 1995; but, if the age of the facility is greater than 7 years, secondary containment shall be provided within 15 years of commencement of construction of the facility or by March 1, 1991, whichever is later. For all other existing tank systems for which the age cannot be documented, by September 1, 1999; but, if the age of the facility is greater than 7 years, secondary containment shall be provided within 15 years of commencement of construction of the facility or by September 1, 1993, whichever is later; and

(e) For tank systems that store materials that become hazardous wastes subsequent to September 1, 1991, within time intervals required in pars. (a) to (d), except that the date that a material becomes a hazardous waste shall be used in place of September 1, 1991.

(4) Secondary containment systems shall be:

(a) Designed, installed and operated to prevent any migration of wastes or accumulated liquid out of the system to the soil, groundwater or surface water at any time during the use of the tank system; and



(b) Capable of detecting and collecting releases and accumulated liquids until the collected material is removed.

(5) To meet the requirements of sub. (4), secondary containment systems shall be at a minimum:

(a) Constructed of or lined with materials that are compatible with wastes that are to be placed in the tank system and shall have sufficient strength and thickness to prevent failure owing to the pressure gradients, including static head and external hydrological forces, physical contact with the waste to which it is exposed, climatic conditions and the stress of daily operation, including stresses from nearby vehicular traffic.

(b) Placed upon a foundation or base capable of providing support to the secondary containment system, resistance to pressure gradients above and below the system and capable of preventing failure due to settlement, compression or uplift;

(c) Provided with a leak detection system that is designed and operated to detect the failure of either the tank system or secondary containment structure or the presence of any release of hazardous waste or accumulated liquid in the secondary containment system within 24 hours or at the earliest practicable time if the owner or operator can demonstrate to the department that existing detection technologies or site conditions will not allow detection of a release within 24 hours; and

(d) Sloped or otherwise designed or operated to drain and remove liquids resulting from leaks, spills or precipitation. Spilled or leaked waste and accumulated precipitation shall be removed from the secondary containment system within 24 hours, or in as timely a manner as possible to prevent harm to human health and the environment, if the owner or operator can demonstrate to the department that removal of the released waste or accumulated precipitation cannot be accomplished within 24 hours.

Note: If the collected material is hazardous waste under s. NR 605.04, 605.08 (1) to (5) or 605.09, it is subject to management as a hazardous waste in accordance with all applicable requirements of chs. NR 600 to 685. If the collected material is discharged through a point source to waters of the state, or to a publicly owned treatment works (POTW), it is subject to regulation under ch. 147, Stats. If the collected material is released to the environment, it may be subject to the reporting requirements of s.144.76, Stats.

(6) Secondary containment for tanks shall include one or more of the following devices:

(a) A liner, external to the tank;

(b) A vault;

(c) A double walled tank; or

(d) An equivalent device as approved by the department.

(7) In addition to the requirements of subs. (4), (5) and (6), secondary containment systems shall satisfy the following requirements:

(a) External liner systems shall be:

1. Designed or operated to contain 100% of the capacity of the largest tank and its ancillary equipment within its boundary;

2. Designed or operated to prevent run-on or infiltration of precipitation into the secondary containment system unless the secondary containment system has sufficient excess capacity to contain run-on or infiltration. The additional capacity shall be sufficient to contain precipitation from a 25 year, 24 hour rainfall event;

3. Free of cracks or gaps; and

4. Designed and installed to surround the tank completely and to cover all surrounding earth likely to come into contact with the waste if the waste is released from the tank or tanks.

**Note:** Secondary containment systems must be capable of preventing lateral as well as vertical migration of the waste.

(b) Vault systems shall be:

1. Designed and operated to contain 100% of the capacity of the largest tank and its ancillary equipment within its boundary;

2. Designed or operated to prevent run-on or infiltration of precipitation into the secondary containment system unless the secondary containment system has sufficient excess capacity to contain run-on or infiltration. The additional capacity shall be sufficient to contain precipitation from a 25 year, 24 hour rainfall event;

3. Constructed with chemical resistant water stops in place at all joints, if any;

4. Provided with an impermeable interior coating or lining that is compatible with the stored or treated waste and that shall prevent migration of waste into the construction material of the vault;

5. Provided with a means to protect against the formation and ignition of vapors within the vault, if the waste being stored or treated:

a. Meets the criteria of ignitable waste under s. NR 605.08 (2); or

b. Meets the criteria of reactive waste under s. NR 605.08 (4), and may form an ignitable or explosive vapor.

6. Provided with an exterior moisture barrier or be otherwise designed or operated to prevent migration of moisture into the vault if the vault is subject to hydraulic pressure.

(c) Double walled tanks shall be:

1. Designed as an integral structure so that any release from the inner tank is contained by the outer shell.

**Note:** An integral structure would be an inner tank completely enveloped within an outer shell.

2. Protected, if constructed of metal, from both corrosion of the primary tank interior and of the external surface of the outer shell; and

3. Provided with a built-in continuous leak detection system capable of detecting a release within 24 hours, or at the earliest practicable time, if the owner or operator can demonstrate to the department, and the department concludes, that the existing detecting technology or site conditions would not allow detection of a release within 24 hours.

Note: The provisions outlined in the Steel Tank Institute's (STI) "Standard for Dual Wall Underground Steel Storage Tanks" may be used as guidelines for aspects of the design of underground steel double walled tanks.

(8) Ancillary equipment shall be provided with secondary containment, such as a trench, jacketing or double walled piping, that meets the requirements of subs. (4) and (5), except for:

(a) Above ground piping, exclusive of flanges, joints, valves and other connections that are inspected visually for leaks on a daily basis;

(b) Welded flanges, welded joints and welded connections, that are inspected visually for leaks on a daily basis;

(c) Sealless or magnetic coupling pumps and sealless valves, that are inspected visually for leaks on a daily basis; and

(d) Pressurized above ground piping systems with automatic shut-off devices that are inspected visually for leaks on a daily basis.

Note: Automatic shutoff devices include excess flow check valves, flow metering shutdown devices and loss of pressure actuated shut-off devices.

(9) The owner or operator may obtain a variance from the requirements of this section if the department finds, as a result of a demonstration by the owner or operator, either: that alternative design and operating practices, together with location characteristics, shall prevent the migration of any hazardous waste or hazardous constituents into the groundwater or surface water at least as effectively as secondary containment during the active life of the tank system, or, that in the event of a release that does migrate to groundwater or surface water, no substantial present or potential hazard shall be posed to human health or the environment. New underground tank systems may not be exempted from the secondary containment requirements of this chapter.

(a) In deciding whether to grant a variance based upon a demonstration of equivalent protection of ground and surface water, the department will consider:

1. The nature and quantity of the wastes;
2. The proposed alternate design and operation;
3. The hydrogeologic setting of the facility, including the thickness of soils present between the tank system and groundwater, and
4. All other factors that would influence the quality and mobility of the hazardous constituents and the potential for them to migrate to groundwater or surface water.

(b) In deciding to grant a variance based upon a demonstration of no substantial present or potential hazard, the department will consider:

1. The potential adverse effects upon groundwater, surface water and land quality, taking into account:

a. The physical and chemical characteristics of the waste in the tank system, including its potential for migration,

b. The hydrogeological characteristics of the facility and surrounding land,

c. The potential for health risks caused by human exposure to waste constituents,

d. The potential for damage to wildlife, crops, vegetation and physical structures caused by exposure to waste constituents, and

e. The persistence and permanence of the potential adverse effects;

2. The potential adverse effects of a release on groundwater quality, taking into account:

a. The quality and quantity of groundwater and of the direction of groundwater flow,

b. The proximity and withdrawal rates of groundwater users,

c. The current and future uses of groundwater in the area, and

d. The existing quality of groundwater, including other sources of contamination and their cumulative effect upon groundwater quality;

3. The potential adverse effects of a release upon surface water quality, taking into account:

a. The quality and quantity of groundwater and the direction of groundwater flow,

b. The patterns of rainfall in the region,

c. The proximity of the tank system to surface waters,

d. The current and future uses of surface waters in the area and any water quality standards established for those surface waters, and

e. The existing quality of surface water, including other sources of contamination and the cumulative effect upon surface water quality; and

4. The potential adverse effects of a release upon the land surrounding the tank system, taking into account:

a. The patterns of rainfall in the region, and

b. The current and future uses of the surrounding land.

(c) The owner or operator of a tank system, for which a variance from secondary containment had been granted in accordance with the requirements of sub. (9) (a), at which a release of hazardous waste has occurred from the tank but has not migrated beyond the zone of engineering control, as established in the variance, shall:

1. Comply with the requirements of s. NR 645.12, except sub. (4), and

2. Decontaminate or remove contaminated soil to the extent necessary to:

a. Enable the tank system for which the variance was granted to resume operation with the capability for the detection of releases at least equivalent to the capability it had prior to the release; and

b. Prevent the migration of hazardous waste or hazardous constituents to groundwater or surface water; and

3. If contaminated soil cannot be removed or decontaminated in accordance with subd. 2., comply with the requirements of s. NR 645.17 (1) (a) 2.

(d) The owner or operator of a tank system, for which a variance from secondary containment had been granted in accordance with the requirements of sub. (9) (a), at which a release of hazardous waste from the tank has occurred and has migrated beyond the zone of engineering control, as established in the variance, shall:

1. Comply with the requirements of s. NR 645.12 (1) to (4), and

2. Prevent the migration of hazardous waste or hazardous constituents to groundwater or surface water, if possible, and decontaminate or remove contaminated soil. If contaminated soil cannot be removed or if groundwater has been contaminated, the owner or operator shall comply with the requirements of s. NR 645.17 (1) (a) 2.; and

3. If repairing, replacing or reinstalling the tank system, provide secondary containment in accordance with the requirements of subs. (3) to (8) or reapply for a variance from secondary containment and meet the requirements for new tank systems in s. NR 645.08 if the tank system is replaced. The owner or operator shall comply with these requirements even if contaminated soil can be decontaminated or removed and groundwater or surface water has not been contaminated.

(10) The following procedures shall be followed in order to request a variance from the secondary containment requirements:

(a) The department shall be notified in writing by the owner or operator of the intention to conduct and submit a demonstration for a variance from secondary containment as allowed in sub. (9) according to the following schedule:

1. For existing tank systems, at least 24 months prior to the date that secondary containment shall be provided in accordance with sub. (3).

2. For new tank systems, at least 30 days prior to entering into a contract for installation of the tank system.

(b) As part of the notification, the owner or operator shall also submit to the department a description of the steps necessary to conduct the demonstration and a timetable for completing each of the steps. The demonstration shall address each of the factors listed in sub. (9) (a) or (b);

(c) The demonstration for a variance shall be completed and submitted to the department within 180 days after notifying the department of an intent to conduct the demonstration; and

(d) If a variance is granted under this subsection, the department shall require the licensee to construct and operate the tank system in the manner that was demonstrated to meet the requirements of the variance.

(11) All tank systems, until the time that secondary containment that meets the requirements of this section is provided, shall comply with the following:

(a) For underground tanks that cannot be entered, a leak test that meets the requirements of s. NR 645.07 (2) (e) or other tank integrity

method, as approved by the department, shall be conducted at least annually.

(b) For other than underground tanks that cannot be entered, the owner or operator shall conduct a leak test as in par. (a) or develop a schedule and procedure for an assessment of the overall condition of the tank system by an independent, qualified, registered professional engineer. The schedule and procedure shall be adequate to detect obvious cracks, leaks and corrosion or erosion that may lead to cracks and leaks. The owner or operator shall remove the stored waste from the tank, if necessary, to allow the condition of all internal tank surfaces to be assessed. The frequency of these assessments shall be based upon the material the tank and its ancillary equipment were constructed with, the age of the system, the type of corrosion or erosion protection used, the rate of corrosion or erosion observed during the previous inspection and the characteristics of the waste being stored or treated.

(c) For ancillary equipment, a leak test or other integrity assessment as approved by the department shall be conducted at least annually.

**Note:** The practices described in the American Petroleum Institute (API) Publication Guide for Inspection of Refinery Equipment, Chapter XIII, "Atmospheric and Low-Pressure Storage Tanks," 4th edition, 1981, may be used, where applicable, as guidelines for assessing the overall condition of the tank system.

(d) The owner or operator shall maintain on file at the facility a record of the results of the assessments conducted in accordance with pars. (a) to (c).

(e) If a tank system or tank system component is found to be leaking or unfit for use as a result of the leak test or assessment in pars. (a) to (c), the owner or operator shall comply with the requirements of s. NR 645.12.

**History:** Cr. Register, February, 1991, No. 422, eff. 3-1-91.

**NR 645.10 General operating requirements.** (1) Hazardous wastes or treatment reagents shall not be placed in a tank system if they could cause the tank, its ancillary equipment or the secondary containment system to rupture, leak, corrode or to otherwise fail.

(2) The owner or operator shall use appropriate controls and practices to prevent spills and overflows from tank or secondary containment systems. These include, at a minimum:

(a) Spill prevention controls, including check valves or dry disconnect couplings;

(b) Overfill prevention controls, including level sensing devices, high level alarms, automatic feed cutoff or bypass to another tank; and

(c) Maintenance of sufficient freeboard in uncovered tanks to prevent overtopping by wave or wind action or by precipitation.

(3) The owner or operator shall comply with the requirements of s. NR 645.12 if a leak or spill occurs in the tank system.

(4) In accordance with s. NR 630.31 (1) and (2), the identity and location of all stored or treated hazardous waste shall be known throughout the entire storage or treatment period.

(5) Storage or treatment of hazardous waste in tank systems shall comply with the requirements of s. NR 630.17.

History: Cr. Register, February, 1991, No. 422, eff. 3-1-91.

**NR 645.11 Inspections.** (1) The owner or operator shall develop and follow a schedule and procedure for inspecting overfill controls.

(2) The owner or operator shall inspect at least once each operating day:

(a) Overfill and spill control equipment, including waste feed cutoff systems, bypass systems and drainage systems to ensure that they are in good working order;

(b) The above ground portions of the tank system, if any, to detect corrosion or releases of waste;

(c) Data gathered from monitoring and leak detection equipment, including pressure or temperature gauges and monitoring wells to ensure that the tank system is being operated according to its design; and

(d) The construction materials and the area immediately surrounding the externally accessible portion of the tank system, including the secondary containment system, to detect erosion or signs of releases of hazardous waste.

Note: Signs of release of hazardous waste would include wet spots and dead vegetation.

(3) The owner or operator shall inspect cathodic protection systems, if present, according to, at a minimum, the following schedule to ensure that they are functioning properly:

(a) The proper operation of the cathodic protection system shall be confirmed within 6 months after initial installation and annually thereafter; and

(b) All sources of impressed current shall be inspected or tested or both, as appropriate, at least bimonthly.

Note: The practices described in the National Association of Corrosion Engineers (NACE) standard, "Recommended Practice (RP-02-85) - Control of External Corrosion on Metallic Buried, Partially Buried or Submerged Liquid Storage Systems," and the American Petroleum Institute (API) Publication 1632, "Cathodic Protection of Underground Petroleum Storage Tanks and Piping Systems," may be used, where applicable, as guidelines in maintaining and inspecting cathodic protection systems.

(4) The owner or operator shall document in the operating record of the facility each inspection of those items in subs. (1) to (3).

History: Cr. Register, February, 1991, No. 422, eff. 3-1-91.

**NR 645.12 Response to leaks or spills and disposition of leaking or unfit for use tank systems.** A tank system or secondary containment system from which there has been a leak or spill or which is unfit for use, shall be removed from service immediately, and the owner or operator shall satisfy the following requirements:

(1) **CESSATION OF USE; PREVENT FLOW OR ADDITION OF WASTES.** The owner or operator shall immediately stop the flow of hazardous waste into the tank system or secondary containment system and inspect the system to determine the cause of the release.

(2) **REMOVAL OF WASTE FROM TANK SYSTEM OR SECONDARY CONTAINMENT SYSTEM.** (a) If the release was from the tank system, the owner or operator shall, within 24 hours after detection of the leak or, if the owner or operator demonstrates to the department that it is not possible within 24 hours, at the earliest practicable time, remove as much of the waste as is necessary to prevent further release of hazardous waste into the environment and to allow inspection and repair of the tank system to be performed.

(b) If the material released was to a secondary containment system, all released material shall be removed within 24 hours or in as timely a manner as is possible to prevent harm to human health and the environment.

(3) **CONTAINMENT OF VISIBLE RELEASES TO THE ENVIRONMENT.** The owner or operator shall immediately conduct a visual inspection of the release and, based upon that inspection:

(a) Prevent further migration of the leak or spills to soils or to surface water; and

(b) Remove, and properly dispose of, any visible contamination of the soil or surface water.

(4) **NOTIFICATION REPORTS.** (a) Any release to the environment, except as provided in par. (b), shall be reported to the department within 24 hours of its detection. If the release has been reported pursuant to s. 144.76, Stats, that report will satisfy this requirement.

Note: 40 CFR 302, July 1, 1990, may require the owner or operator to notify the national response center of certain releases. Note: The publication containing the CFR references may be obtained from:

The Superintendent of Documents  
U.S. Government Printing Office  
Washington, D.C. 20402

(b) A leak or spill of hazardous waste is exempted from the requirements of this subsection if it is:

1. Less than or equal to the quantity of 453.6 grams (1.0 pound), and
2. Immediately contained and cleaned up.

(c) Within 30 days of detection of a release to the environment, the owner or operator shall submit a report to the department containing the following information:

1. Likely route of migration of the release;
2. Characteristics of the surrounding soil, including soil composition, geology, hydrogeology and climate;
3. Results of any monitoring or sampling conducted in connection with the release, if available. If sampling or monitoring data relating to the release are not available within 30 days, these data shall be submitted to the department as soon as they become available.
4. Proximity to downgradient drinking water, surface water and populated areas; and
5. Description of response actions taken or planned.



(5) **PROVISION OF SECONDARY CONTAINMENT, REPAIR OR CLOSURE.** (a) Unless the owner or operator satisfies the requirements of pars. (b) to (d), the tank system shall be closed in accordance with s. NR 645.17.

(b) If the cause of the release has not damaged the integrity of the tank system, the owner or operator may return the tank system to service as soon as the released waste is removed and repairs, if necessary, are made.

(c) If the cause of the release was a leak from the tank into the secondary containment system, the tank system shall be repaired prior to returning the tank system to service.

(d) If the source of the release was a leak to the environment from a tank system component without secondary containment, the owner or operator shall provide the tank system component from which the leak occurred with secondary containment that satisfies the requirements of s. NR 645.09 before it may be returned to service, unless the source of the leak is an above ground portion of a tank system that can be inspected visually. If the source is an above ground tank system component that can be inspected visually, the tank system component shall be repaired and may be returned to service without secondary containment as long as the requirements of sub. (6) are satisfied. If a tank system component is replaced to comply with the requirements of this paragraph, that tank system component shall satisfy the requirements for new tank systems or tank system components in ss. NR 645.08 and 645.09. Additionally, if a leak has occurred in any portion of a tank system component that is not readily accessible for visual inspection, including the bottom of an in-ground or onground tank, the entire tank system component shall be provided with secondary containment in accordance with s. NR 645.09 prior to being returned to service.

(6) **CERTIFICATION OF EXTENSIVE REPAIRS.** If the owner or operator has repaired a tank system in accordance with sub. (5), and the repair has been extensive, the tank system may not be returned to service unless the owner or operator has obtained a certification by an independent, qualified, registered professional engineer in accordance with s. NR 680.05 (2) (d), that the repaired tank system is capable of handling hazardous wastes without release for the intended life of the tank system. This certification shall be submitted to the department within 7 days after returning the tank system to use.

**Note:** Extensive repair may include but is not limited to installation of an internal liner or the repair of a ruptured tank system vessel.

**Note:** The department may, on the basis of any information received that there is or has been a release of hazardous waste or hazardous constituents into the environment, issue an order under s. 144.735, Stats., requiring corrective action under ch. NR 635 or other response as deemed necessary to protect human health or the environment.

**Note:** See s. NR 630.15 (3) for the requirements necessary to remedy a failure. Also, s. 144.76, Stats. and 40 CFR 302, July 1, 1990, may require the owner or operator to notify the Wisconsin division of emergency government and the national response center of certain releases. **Note:** The publication containing the CFR reference may be obtained from:

The Superintendent of Documents  
U.S. Government Printing Office  
Washington, D.C. 20402

**History:** Cr. Register, February, 1991, No. 422, eff. 3-1-91.

**NR 645.13 Special requirements for ignitable or reactive waste.** (1) Ignitable or reactive waste shall not be placed in tank systems, unless:

Register, August, 1992, No. 440

(a) The waste is treated, rendered or mixed before or immediately after placement in the tank system so that:

1. The resulting waste, mixture or dissolved material no longer meets the criteria of ignitable or reactive waste under s. NR 605.08 (2) and (4), and

2. The general requirements for ignitable, reactive or incompatible wastes in s. NR 630.17 (2) are complied with; or

(b) The waste is stored or treated in such a way that it is protected from any material or conditions that may cause the waste to ignite or react; or

(c) The tank system is used solely for emergencies.

(2) The owner or operator of a facility where ignitable or reactive waste is stored or treated in a tank system shall comply with the requirements for the maintenance of protective distances between the waste boundary and any public ways, streets, alleys or an adjoining property line that may be built upon as required in ch. ILHR 10.

**History:** Cr. Register, February, 1991, No. 422, eff. 3-1-91; correction made under s. 13.93 (2m) (b) 7, Stats., Register, August, 1992, No. 440.

**NR 645.14 Special requirements for incompatible wastes.** (1) Hazardous waste may not be placed in a tank system that has not been decontaminated and that previously held an incompatible waste or material unless s. NR 630.17 (2) is complied with.

(2) Incompatible wastes, or incompatible wastes and materials, shall not be placed in the same tank system unless s. NR 630.17 (2) is complied with.

**History:** Cr. Register, February, 1991, No. 422, eff. 3-1-91.

**NR 645.15 Waste analysis and trial tests.** (1) In addition to performing the waste analysis required by s. NR 630.12, the owner or operator shall, whenever a tank system is to be used to store a hazardous waste that is substantially different from waste previously treated or stored in that tank system:

(a) Conduct waste analyses and trial tests, such as bench scale or pilot plant scale tests; or

(b) Obtain written, documented information on similar waste under similar operating conditions to show that the proposed storage or treatment will meet the requirements of s. NR 645.10 (1).

**History:** Cr. Register, February, 1991, No. 422, eff. 3-1-91.

**NR 645.16 Small storage facility requirements.** (1) **GENERAL.** The feasibility report and plan of operation report submittal requirements of sub. (3) may be met in lieu of the requirements of s. NR 645.06 (1) and (2) for hazardous waste storage facilities that have the following characteristics:

(a) Hazardous waste storage is entirely in an enclosed and roofed structure having access limited or restricted to employees or other authorized personnel;

Register, August, 1992, No. 440

(b) Hazardous waste storage is confined to a floor area of 1500 sq. ft. or less;

(c) Hazardous waste storage in tank systems and containers does not exceed 10,000 gallons at any time;

(d) Hazardous waste is stored generally for the purpose of accumulating a sufficient quantity for an economical transfer for treatment or disposal; and

(e) Hazardous waste is stored in above ground tank systems or on-ground tank systems which meet the construction and operational requirements of ss. NR 645.05, 645.07 to 645.15 and 645.17.

(2) EXEMPTIONS. (a) Except as provided in subd. 3., the owner or operator of a hazardous waste small storage facility is exempt from the feasibility and plan of operation report requirements in sub. (3) for that facility, provided that:

1. The owner or operator has been issued a permit for storage of hazardous waste at the facility under 42 USC 6925 (c); and

Note: The publication containing Title 42 of the United States Code may be obtained from:

The Superintendent of Documents  
U.S. Government Printing Office  
Washington, D.C. 20402

2. The facility is in compliance with the permit required under subd. 1;

3. If the facility only stores wastes that do not contain free liquids, the facility shall obtain written approval of the information required under sub. (3) (a) 7. This information shall be submitted in accordance with s. NR 680.05 (1) (b) and (c).

(b) Any person exempt from sub. (3) under par. (a) shall obtain an operating license as required under s. NR 680.31.

(3) FEASIBILITY AND PLAN OF OPERATION REPORT. (a) Any person proposing to establish, construct, expand or obtain an initial operating license under s. NR 680.31 for a hazardous waste small storage facility shall first obtain written approval of a feasibility and plan of operation report from the department, unless exempted under sub. (2). The feasibility and plan of operation report shall be submitted in accordance with s. 144.44, Stats., and ss. NR 680.05, 680.06 and 680.10, and shall at a minimum, contain the following information:

1. A narrative description of the area proposed for storage of hazardous waste;

2. A general floor plan of the storage area and any pertinent adjacent areas;

3. A description of any existing or proposed fire prevention or control systems, communication equipment and security systems or arrangements at the facility;

4. A description of the hazardous or solid wastes, that will be stored at the proposed facility, along with projected volumes or weights and accumulation times;

5. An evaluation of the storage area's capability of containing spills;

6. A description of any past experience with storage of hazardous wastes at the facility;

7. For tank system storage, a description of the secondary containment and detection of release systems to demonstrate compliance with s. NR 645.09, including:

- a. Basic design parameters, dimensions and materials of construction.
- b. How the design promotes drainage or how tanks are kept from contact with standing liquids in the secondary containment system.
- c. Capacity of the secondary containment system relative to the number and volume of the tanks.
- d. Provisions for preventing run-on.
- e. How accumulated liquids can be analyzed and removed to prevent overflow;

8. For tank system storage, a description of the design and operation of the tank system which demonstrate compliance with ss. NR 645.05, 645.07, 645.08 and 645.10 to 645.15 including:

- a. References to design standards or other available information used, or to be used, in the design and construction of the tank.
- b. A description of design specifications, including identification of construction and lining materials and the pertinent characteristics such as corrosion and erosion resistance.
- c. Tank dimension, capacity and shell thickness.
- d. A diagram of piping, instrumentation and process flow.
- e. Description of feed systems, safety cutoff, bypass systems and pressure controls, such as vents;

9. Storage and waste management procedures, including a description of how s. NR 630.17 (2) will be complied with to meet the applicable requirements of s. NR 645.13 and 645.14;

10. An explanation of recordkeeping and tank labeling procedures;

11. A contingency plan, as required by ss. NR 630.21 and 630.22(1) and (2);

12. A plan sheet, sketch or other data which demonstrates compliance with requirements for the maintenance of protective distances between the waste boundary and any public ways, streets, alleys or an adjoining property line that may be built upon as required in ch. ILHR 10;

13. A closure plan for the facility, as required by ss. NR 685.05 and 645.17; and

14. The most recent closure cost estimate for the facility prepared in accordance with s. NR 685.07 (2).

(b) Within 60 days after a feasibility and plan of operation report is submitted, the department shall either determine that the report is complete or notify the applicant in writing that the report is not complete, specifying the information which the applicant shall submit before the

report is deemed complete. The department shall determine whether or not the feasibility and plan of operation report is complete by determining whether or not the minimum requirements in par. (a) have been met. Additional information may be required of the applicant after a determination that the report is complete only if the department establishes that a detailed review of the report indicates that feasibility cannot be determined or the report is insufficient in the absence of additional information.

(c) If no hearing has been conducted under s. 144.44, Stats., the department shall issue the final determination for the feasibility and plan of operation report within 60 days after the 45 days notice period required under s. 144.44 (2) (l) and (m), Stats., has expired. If an informational hearing is conducted under s. 144.44 (2g), Stats., the department shall issue a final determination for the feasibility and plan of operation report within 60 days after the hearing is adjourned. If a contested case hearing is conducted under s. 144.44 (2r), Stats., a final determination for the feasibility and plan of operation report shall be issued within 90 days after the hearing is adjourned.

(d) The department may conduct a site visit during the plan review period.

(e) Based on the site visit under par. (d), the department may require additional information for the feasibility and plan of operation report as provided in ss. NR 660.08 to 660.107.

(4) **OPERATION.** A storage facility approved under this section shall meet all of the substantive and operating requirements of ss. NR 645.05, 645.07 and 645.09 to 645.15.

(5) **CLOSURE.** Closure requirements specified under ss. NR 685.05 and 645.17 are applicable to small storage facilities approved under this section.

History: Cr. Register, February, 1991, No. 422, eff. 3-1-91; correction in (3) (a) 12. and (e) made under s. 13.93 (2m) (b) 7, Stats., Register, August, 1992, No. 440.

**NR 645.17 Closure and long term care.** (1) **CLOSURE.** Unless specifically exempted, the owner or operator of a facility that treats or stores hazardous waste shall meet the requirements specified in s. NR 685.05 and the following requirements for each tank system:

(a) The owner or operator of a facility that stores or treats hazardous waste in tank systems shall:

1. At closure, remove or decontaminate all waste residues, contaminated secondary containment system components, such as liners, etc., contaminated soils, structures and equipment that are contaminated with hazardous waste, and manage them as hazardous waste, unless s. NR 605.04 (3) applies. The closure plan, closure activities, cost estimates for closure and financial responsibility for tank systems shall meet all of the requirements specified in ss. NR 600.03, 685.02, 685.05, 685.06, 685.07 and 685.08.

2. If the owner or operator demonstrates that not all contaminated soils can be practicably removed or decontaminated as required in subd. 1. of this paragraph, then the owner or operator shall close the tank system and perform long-term care in accordance with the closure and long-term care requirements that apply to landfills in ss. NR 660.13 (10),

660.16 and 660.17. In addition, for the purposes of closure, long-term care and financial responsibility, the tank system is then considered to be a landfill, and the owner or operator shall meet all of the requirements for landfills specified in ss. NR 600.03, 685.02, 685.05, 685.06, 685.07 and 685.08.

3. If an owner or operator has a tank system that does not have secondary containment that meets the requirements of s. NR 645.09 (4) to (8), and has not been granted a variance from the secondary containment requirements in accordance with s. NR 645.09 (9), then:

a. The closure plan for the tank system shall include both a plan for complying with subd. 1. and a contingent plan for complying with subd. 2.

b. A contingent long-term care plan for complying with subd. 2. shall be prepared and submitted as part of the feasibility and plan of operation report.

c. The cost estimates calculated for closure and long-term care shall reflect the costs of complying with the contingent closure plan and contingent long-term care plan, if those costs are greater than the costs of complying with the closure plan prepared for the expected closure under subd. 1.

d. Financial assurance shall be based upon the cost estimates in subpar. c.

e. For the purposes of the contingent closure and long-term care plans, the tank system is considered to be a landfill, and the contingent plans shall meet all of the closure, long-term care and financial responsibility requirements for landfills under ch. NR 660 and ss. NR 600.03, 685.05, 685.06, 685.07 and 685.08.

(b) The owner or operator of a facility that treats hazardous waste in tank systems shall, at completion of closure, remove all hazardous waste and hazardous waste residues, including, but not limited to, ash and sludges, from the treatment process or equipment, discharge control equipment and discharge confinement structures. The department may require monitoring of groundwater or surface waters, if the operation or design of the facility in relation to the hazard of wastes handled at the facility warrants monitoring.

(2) **FINAL DISPOSAL.** Final disposal of hazardous waste may not be permitted at a hazardous waste storage or treatment facility, unless the facility has a separate license for disposal.

(3) **REMOVAL OF UNDERGROUND TANK SYSTEM.** Prior to removal of underground tank systems, the owner or operator shall comply with the requirements of sub. (1) and undertake the following successive steps:

(a) Disconnect and remove insofar as possible the inlet, outlet, gauge and vent lines;

(b) Cap or plug open ends of remaining lines; and

(c) Close all openings in the tank, except for a 1/8 inch hole for venting, with pipe plugs before the tank is removed from the ground.

**History:** Cr. Register, February, 1991, No. 422, eff. 3-1-91.