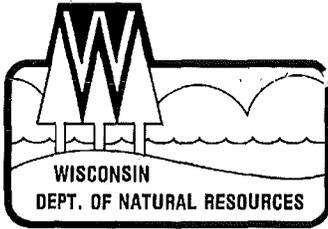


CR 9431



George E. Meyer
Secretary

State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

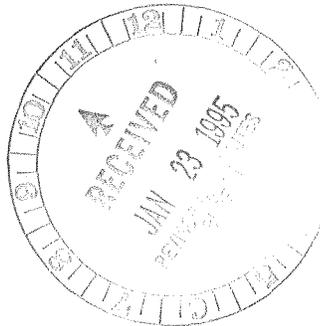
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STATE OF WISCONSIN)
)
DEPARTMENT OF NATURAL RESOURCES) SS

TO ALL TO WHOM THESE PRESENTS SHALL COME, GREETINGS:

I, George E. Meyer, Secretary of the Department of Natural Resources and custodian of the official records of said Department, do hereby certify that the annexed copy of Natural Resources Board Order No. SW-16-94a was duly approved and adopted by this Department on July 21, 1994. I further certify that said copy has been compared by me with the original on file in this Department and that the same is a true copy thereof, and of the whole of such original.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed the official seal of the Department at the Natural Resources Building in the City of Madison, this 21st day of January, 1995.



George E. Meyer
George E. Meyer, Secretary

(SEAL)

4-1-95

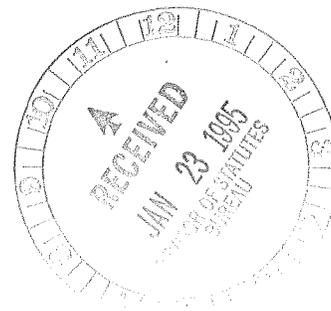


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ORDER OF THE STATE OF WISCONSIN NATURAL RESOURCES BOARD
REPEALING, RENUMBERING, AMENDING, REPEALING AND RECREATING, AND CREATING RULES

The Wisconsin Natural Resources Board adopts an order to repeal NR 716.09(3)(e) and 716.15(2); to renumber NR 700.02(3) and (4), 714.07(5), 716.15(3) and 718.13(6) 1. to 5.; to amend NR 110.09(2)(r), 150.03(6)(b)7., 158.07 (intro.), 213.07, 214.08, 635.17(1), 685.05(1)(f), 705.01 (note), 712.07(5), 718.09(1) and (6), 718.11(2)(b)(intro.), 2.f., 4. and 5., 718.11(3)(e) and 718.13(title); to repeal and recreate NR 708.05(6)(d), 708.07(intro.), 708.09(1) and 718.09(5); and to create NR 700.02(3), 700.03(42m), 708.11(3)(e), 714.07(3)(a)2(note), 714.07(5) and ch. NR 720 relating to the establishment of soil cleanup standards applicable to the investigation and remediation of environmental contamination at sites or facilities subject to the environmental repair statute, the hazardous substance spills statute or the abandoned container statute, and to the remediation of soil contamination, at certain solid waste facilities, hazardous waste facilities and wastewater sludge storage facilities, lagoons, and storage and treatment structures

SW-16-94a



Analysis Prepared by the Department of Natural Resources

Statutory authority: ss. 144.025(2)(c), 144.431(1)(a), 144.435(1), 144.44(4)(f)6, 144.44(7)(g), 144.442(4)(c), (5)(intro.) and (8)(b) and (c)3, 144.62(8), 144.76(5)(a), 144.77(3), 159.03(1)(a) and 227.11(2), Stats.

Statutes interpreted: ss. 144.431(1)(b), 144.435(1), 144.439, 144.44(4)(f), 144.44(7)(g), 144.442, 144.64, 144.735, 144.76, 144.77, 144.951, 144.98, 159.05 and chs. 147 and 160, Stats.

Chapter NR 720 is created to establish soil cleanup standards. These standards are designed to ensure that any residual soil contamination that may remain after remediation will not adversely affect the groundwater, or threaten human health through direct contact. Responsible parties may use the procedure in s. NR 720.19 to determine site-specific soil cleanup standards for a particular site or facility, or they may use the residual contaminant levels in Table 1 (based on groundwater protection) and Table 2 (based on human health risk from direct contact) to determine soil cleanup standards for each soil contaminant of concern at a site or facility. The soil cleanup standards in ch. NR 720 are applicable to soil contamination cleanups required under solid waste, hazardous waste and wastewater program regulatory authorities.

Changes to several related administrative rules are also proposed as part of this rules package. Additions or modifications to ss. NR 110.09(2)(r), 150.03(6)(b)7., 158.07, 213.07, 214.08, 635.17(1) and 685.05(1)(f) and chs. NR 700, 705, 708, 712, 714, 716 and 718 are included in the proposed rulemaking. These changes add references to the soil cleanup standards in ch. NR 720 to existing rules.

SECTION 1. NR 110.09(2)(r) is amended to read:

NR 110.09(2)(r) Any facility plan which recommends the abandonment of a wastewater treatment, sludge or septage storage lagoon, or land disposal system shall include an abandonment plan. An abandonment plan outlining the proposed method of abandonment of the facility shall be submitted as part of the facility plan to the department for approval. This abandonment plan shall provide for the removal and proper recycling, treatment or disposal of any accumulated solid matter, solid or liquid wastes or wastes in combination with soil. All recycling, treatment and disposal shall be conducted so as to protect of public health and the environment. Unless otherwise directed by the department, all abandonment plans for wastewater treatment, sludge or septage storage lagoons, or high rate land disposal systems shall comply with ch. NR 720 for soils that have been contaminated by the contents of the lagoon or system. The abandonment plan shall address relandscaping necessary to prevent accumulation of standing water or runoff and shall provide for completion of the relandscaping within 2 years of the date on which the structure was last used as it was originally intended. The department shall require groundwater monitoring for a minimum of one year at a quarterly frequency after the abandonment of facilities which have an existing groundwater monitoring system. Groundwater monitoring may be required on a case-by-case basis for facilities which do not have existing groundwater monitoring systems. The monitoring data shall be reviewed after one year and the department shall determine whether groundwater monitoring should be continued or not. Any groundwater monitoring wells which are no longer necessary shall be abandoned in accordance with ch. NR 141 and documentation of well abandonment shall be provided to the department.

SECTION 2. NR 150.03(6)(b)7 is amended to read:

NR 150.03(6)(b)

7. Emergency and Remedial Response plans

a. ~~Plans~~ Remedial action plans or III modifications of plans adopted by the department for projects funded by the environmental fund under s. 144.442, Stats.,

to respond to sites or facilities which pose a substantial danger to public health or welfare or the environment.

b. Remedial action plans or modifications of plans approved by the department under environmental repair contracts entered into pursuant to s. 144.442, Stats. IV

b c. Emergency environmental restoration plans including plans for emergency action in response to hazardous substance spills under s. 144.76, Stats., and plans for emergency response under s. 144.442, Stats. IV

SECTION 3. NR 158.07 (intro.) is amended to read:

NR 158.07 RESPONSE ACTIONS. Upon notification to the department in accordance with s. NR ~~150.05~~ 158.05, responsible parties shall conduct one or more of the necessary response actions in subs. (1) ~~through~~ to (5), either at the direction of the department, or where site or facility conditions warrant a response action, or both, unless the department determines no further action is warranted in accordance with s. NR 158.09:

SECTION 4. NR 213.07 is amended to read:

NR 213.07 ABANDONMENT. Lagoons, storage structures and treatment structures which will no longer be used, shall be properly abandoned within 2 years of the date on which the waste material was last stored or treated. A plan outlining the proposed method of abandonment shall be submitted to the department for approval. This plan shall contain a procedure to properly identify the presence and characteristics of any accumulated solid waste and provide appropriate removal, disposal or recycling or treatment alternatives in accordance with applicable solid and hazardous waste laws. All recycling, treatment and disposal shall be conducted so as to protect public health and the environment. Unless otherwise directed by the department, all abandonment plans shall comply with ch. NR 720 for soils that have been contaminated by the contents of the lagoon, storage structure or treatment structure. The plan shall also address site restoration and any

landscaping that will prevent accumulation of standing water or runoff. The department may require groundwater monitoring for a period of time after abandonment of the land treatment system to assess groundwater impacts. The design, installation, construction, abandonment and documentation of all monitoring wells shall be in accordance with the requirements of ch. NR 141.

SECTION 5. NR 214.08 is amended to read:

NR 214.08 ABANDONMENT. Land treatment systems, which will no longer be used, shall be properly abandoned within 2 years of the date on which waste material was last applied. The department may require a plan that includes a procedure to properly identify the presence and characteristics of any accumulated solid matter and provide appropriate removal, disposal, treatment or recycling alternatives in accordance with applicable solid and hazardous waste laws. All recycling, treatment and disposal shall be conducted so as to protect public health and the environment. Unless otherwise directed by the department, soil that has been contaminated by a land treatment system shall be remediated in compliance with ch. NR 720 when the land treatment system is abandoned. The plan shall also address site restoration and any landscaping that will prevent groundwater impacts, accumulation of standing water or runoff. The department may require groundwater monitoring for a period of time after abandonment of the land treatment system to assess groundwater impacts. The design, installation, construction, abandonment and documentation of all monitoring wells shall be in accordance with the requirements of ch. NR 141.

SECTION 6. NR 635.17(1) is amended to read:

NR 635.17(1) The owner or operator of a facility seeking a license for the treatment, storage or disposal of hazardous waste shall institute corrective action as necessary to protect human health and the environment for all releases of hazardous waste or hazardous waste constituents from any solid waste management unit at the facility, regardless of the time at which waste was placed in a unit. ~~Corrective~~ At a minimum, corrective action under this section shall, ~~at~~

~~a minimum,~~ restore contaminated soil in compliance with the requirements of ch. NR 720 and
restore contaminated groundwater in compliance with the requirements of ch. NR 140.

SECTION 7. NR 685.05(1)(f) is amended to read:

NR 685.05 (1)(f) Meets, in the case of a landfill or surface impoundment as specified in s. NR 660.15 or 660.16, applicable requirements in ch. NR 140 and applicable soil cleanup standards in ch. NR 720 or meets the applicable closure requirements of par. (c) or (d), whichever are more stringent.

SECTION 8. NR 700.02(3) and (4) are renumbered NR 700.02(5) and (6).

SECTION 9. NR 700.02(3) is created to read:

NR 700.02(3) In addition to being applicable to sites or facilities that are subject to regulation under s. 144.442 or 144.76, Stats., ch. NR 720 applies to soil contamination at:

(a) Solid waste facilities where remedial action is required by the department pursuant to s. NR 508.20(11);

(b) Hazardous waste facilities where the owner or operator is required to close the facility pursuant to s. 144.64(2m), Stats., or ch. NR 685, or to institute corrective action pursuant to s. 144.735, Stats., or s. NR 635.17, or where the department has imposed special requirements where a discharge has occurred under s. NR 600.07; and

(c) Wastewater lagoons, storage structures and treatment structures that are abandoned pursuant to s. NR 110.09, 213.07 or 214.08.

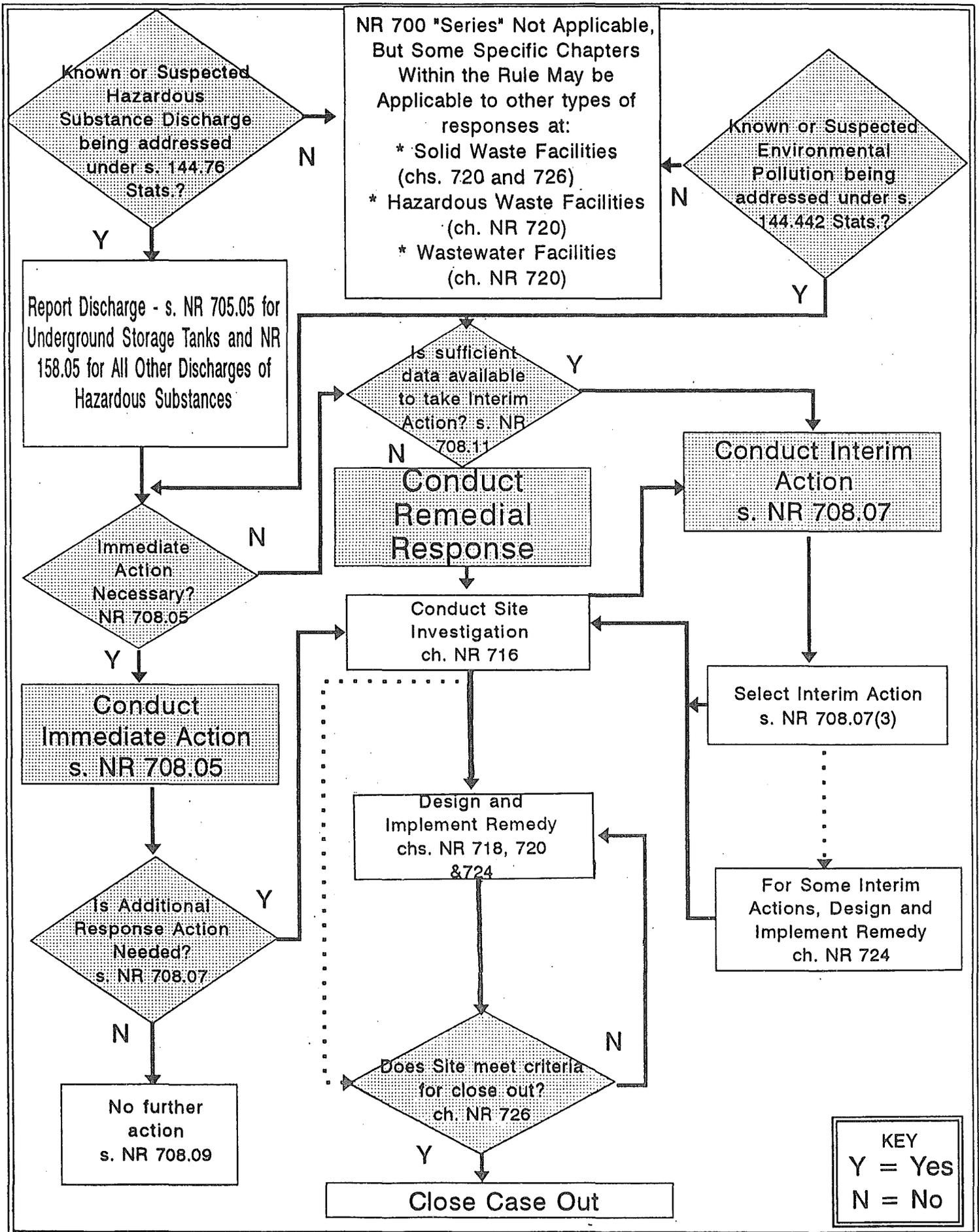
SECTION 10. NR 700.03 (42m) is created to read:

NR 700.03(42m) "Pathway" means the route a substance takes in traveling to a receptor or potential receptor or the specific portal of entry, such as lungs, skin or digestive tract, that the substance takes to potentially express its toxic effect, or both.

Note: The food chain pathway for cadmium, for example, refers to cadmium being taken up in plant tissue and the plant tissue being ingested by an organism.

SECTION 11. Appendix A to ch. NR 700 is repealed and recreated to read:

NR 700 Flow Chart



SECTION 12. NR 708.05(6)(d) is repealed and recreated to read:

NR 708.05(6)(d) Responsible parties may include the information required in par. (c) with a final report and letter of compliance required in s. NR 708.09 which documents that the immediate response action is complete and no further action is necessary to respond to a hazardous substance discharge or environmental pollution, provided that the information required in par. (c) is submitted within 45 days after the initial hazardous substance discharge notification is given to the department.

Note: It is the intent of the department to encourage submittal of the notification information required in s. NR 708.05(6) with the no further action information required in s. NR 708.09, provided that the notification information is submitted within 45 days. If the 45 day limit cannot be met, then 2 separate submittals will be needed, if no further action is being documented for the immediate response action.

SECTION 13. NR 708.07 (intro.) is repealed and recreated to read:

NR 708.07 ADDITIONAL RESPONSE ACTIONS. Unless s. NR 708.09 is applicable, responsible parties shall conduct all necessary additional response actions at the completion of an immediate action including, but not limited to, the actions listed in subs. (1) to (4), either at the direction of the department or where the responsible party has determined that site or facility conditions warrant an additional response action:

SECTION 14. NR 708.09(1) (intro.) is repealed and recreated to read:

NR 708.09 (1) GENERAL. (intro.) Unless sub. (2) is applicable, responsible parties shall submit a final report for completed immediate action at the site or facility which addresses the following criteria, where applicable, and a letter of compliance documenting that the immediate response action is complete and no further action is necessary to respond to a hazardous substance discharge or environmental pollution:

SECTION 15. NR 712.07(5) is amended to read:

NR 712.07(5) Submittals addressing any media other than groundwater, which are prepared to satisfy the requirements of ch. NR 716 or 720, shall be prepared by or under the supervision of a professional engineer, a hydrogeologist or a scientist.

SECTION 16. NR 714.07(3)(a)2 (note) is created to read:

Note: Responsible parties should consult s. NR 720.11, table 2, and the procedures established in s. NR 720.11 or the procedures established in s. NR 720.19(5) for residual contaminant levels based on protection of human health from direct contact, to assist in determining when contaminated soil poses a direct contact or inhalation threat to the public.

SECTION 17. NR 714.07(5) is renumbered NR 714.07(6).

SECTION 18. NR 714.07(5) is created to read:

NR 714.07(5) PUBLIC NOTICE OF REMEDIAL ACTION. Where a proposed action to address soil contamination includes a performance standard selected in accordance with s. NR 720.19(2), responsible parties shall publish a public notice as a class I notice under ch. 985, Stats. This notice shall be published concurrently with the submittal of the remedial action option plan for department review and shall contain all of the following information:

- (a) Names of responsible parties.
- (b) Phone number and mailing address of a contact person for the responsible parties.
- (c) Name and address of site or facility.
- (d) Summary of proposed remedial action and performance standard.
- (e) Location where remedial action option plan can be reviewed by the public.

SECTION 19. NR 718.09(1) is amended to read:

NR 718.09 TREATMENT OF EXCAVATED CONTAMINATED SOIL. (1) GENERAL. If excavated contaminated soil is treated at a non-commercial treatment unit or facility and the treatment unit or facility is operated by the responsible parties in compliance with the requirements of this chapter, that site or facility is exempt from solid waste program requirements for the treatment of the contaminated soil in ss. 144.43 to 144.441, 144.443 to 144.47, Stats., and chs. NR 500 to 536, except where solid waste program requirements are specifically referenced in this section. If contaminated soil is incorporated into hot-mix asphalt in accordance with sub. (5) the asphalt plant is exempt from solid waste program requirements for treatment of contaminated soil found in ss. 144.43 to 144.441, 144.443 to 144.47, Stats., and chs. NR 500 to 536, except where solid waste program requirements are specifically referenced in this section. Commercial treatment units or facilities, hot-mix asphalt plants where contaminated soil is treated by means other than incorporation into the asphalt mix, and thermal treatment units or facilities are required to be licensed under ss. 144.43 to 144.441, 144.443 to 144.47, Stats., and chs. NR 500 to 536, and are not exempt under this section.

SECTION 20. NR 718.09(5) is repealed and recreated to read:

NR 718.09(5) TREATMENT OF EXCAVATED CONTAMINATED SOIL AT HOT-MIX ASPHALT OR STRUCTURAL CONCRETE PLANTS. (a) Responsible parties may not transport or hire another entity to transport excavated contaminated soil to a hot-mix asphalt plant which incorporates contaminated soil into the asphalt mix unless the hot-mix asphalt plant has a current operating air permit under chs. NR 400 to 499 and is in compliance with chs. NR 400 to 499. Where the operator of a hot-mix asphalt plant who is in compliance with chs. NR 400 to 499 and has a current operating air permit under chs. NR 400 to 499 becomes a responsible party as a result of a hazardous substance discharge, that responsible party may remediate the resultant contaminated soil in accordance with this chapter by placing the soil directly into hot-mix asphalt.

When a hazardous substance discharge occurs that a hot-mix plant operator is responsible for, the department shall be notified immediately of the discharge to the environment and of the response action taken by the asphalt plant operator.

(b) If excavated contaminated soil is incorporated into asphalt at a hot-mix asphalt plant operated in compliance with the requirements of this chapter, that site or facility is exempt from solid waste program requirements for the treatment of the contaminated soil in ss. 144.43 to 144.441, 144.443 to 144.47, Stats., and chs. NR 500 to 536, except where solid waste program requirements are specifically referenced in this section.

(c) Storage of excavated contaminated soil at hot-mix asphalt plants which incorporate contaminated soil into the asphalt mix shall be in compliance with all of the following:

1. Storage shall comply with the requirements of s. NR 718.05(2)(a), (b), (e), (f) and (g).
2. Storage shall be in an area constructed of an asphalt base and asphalt berms, or other materials approved by the department.
3. Up to 5,000 cubic yards of soil may be stored at one time.
4. Storage may take place for up to 9 months per year.
5. Plant operators shall take steps to control windblown dust, and to control the infiltration of precipitation, at contaminated soil storage areas.

(d) Responsible parties may not transport or hire another entity to transport excavated contaminated soil to a hot-mix asphalt plant for treatment other than incorporation into the asphalt mix unless the hot-mix asphalt plant has a current operating air permit under chs. NR 400 to 499, is in compliance with chs. NR 400 to 499 and has an approval for solid waste processing under ss. 144.43 to 144.441, 144.443 to 144.47, Stats., and chs. NR 500 to 536. Hot-mix asphalt plants which do not incorporate contaminated soil into the asphalt mix and structural concrete plants which do not incorporate contaminated soil into concrete shall store excavated contaminated soil in compliance with ch. NR 502.

(e) Responsible parties may not transport or hire another entity to transport excavated contaminated soil to a structural concrete batch plant that does not have all required operating permits and approvals for incorporation of contaminated soils into the concrete mix.

Note: Placement of asphalt pavement which contains contaminated soil incorporated into asphalt at a hot-mix asphalt plant operated in compliance with the requirements of this chapter is not regulated as solid waste disposal.

SECTION 21. NR 718.09(6) is amended to read:

NR 718.09(6) THERMAL TREATMENT OF EXCAVATED CONTAMINATED SOIL. (a)

Responsible parties may not transport or hire another entity to transport excavated contaminated soil to a thermal treatment unit or facility unless that thermal treatment unit or facility has all required operating permits or licenses, including a current operating air permit under chs. NR 400 to 499, is in compliance with chs. NR 400 to 499, and has a current license or other approval under s. NR 502.08. Operators of soil treatment units shall take steps satisfactory to the department to minimize noise and dust, such as wetting treated soils and the work area to control dust.

(b) Storage of excavated contaminated soil at thermal treatment units or facilities is exempt from the storage requirements in ss. 144.43 to 144.441, 144.443 to 144.47, Stats., and chs. NR 500 to 536 if it is in compliance with the following:

1. Storage shall comply with the requirements of s. NR 718.05(2)(a) to (c) and (e) to (g).
2. Up to 5,000 cubic yards of soil may be stored at one time.
3. Storage may take place for up to 9 months per year.
4. Operators of soil treatment units shall take steps satisfactory to the department to control the infiltration of precipitation at contaminated soil storage areas.

SECTION 22. NR 718.11(2)(b)(intro.), 2.f., 4. and 5. are amended to read:

NR 718.11(2)(b)(intro.) Replacement of contaminated soil on the property from which it was excavated for disposal. Responsible parties may replace contaminated soil for the purpose of disposal in the excavation from which it was removed, or in another ~~excavation~~ location on the property from which it was excavated, if all of the following requirements are met:

2.f. Responsible parties shall report the analytical results to the department in writing within 2030 days after the completion of analysis.

4. Contaminated soil ~~that is to be~~ may be replaced on the property from which it was excavated ~~may not exceed the background soil quality at the site or facility for naturally occurring substances or the level of detection for non-naturally occurring substances~~ if the contaminants and the replacement location meet the criteria in ss. NR 720.09(1) and 720.11(2) and the soil is treated to levels at or below those in ss. NR 720.09(3)(a) and 720.11(2) in accordance with s. NR 720.07(1)(b)1.

Note: Allowable residual contaminant levels at the replacement location may also be determined using the procedures in s. NR 720.19(3) or another department approved method. However, this will require prior department approval. If contaminants of concern are not listed in table 1 or table 2 of ch. NR 720, the allowable residual contaminant levels can be determined using procedures in s. NR 720.19(3) or other department approved method, with prior department approval. For example, for soil contamination with diesel fuel where polycyclic aromatic hydrocarbons (PAH) are contaminants of concern, allowable levels for PAH's can be determined site specifically. if the disposal location meets the criteria in s. NR 720.09(1) and the soil is treated to levels at or below those required in ss. NR 720.09 and 720.11.

5. The contaminated soil shall be placed at least one meter above the high groundwater level.

SECTION 23. NR 718.11(3)(e) is amended to read:

NR 718.11(3)(e) ~~The type of~~ Additional remedial action to be conducted, if any.

SECTION 24. NR 718.13 (title) is amended to read:

NR 718.13 OFF-SITE DISPOSAL OF CONTAMINATED SOIL AT A RESPONSE ACTION SITE.

SECTION 25. NR 718.13(6)1. to 5. are renumbered NR 718.13(6)(a) to (e).

SECTION 26. Chapter NR 720 is created to read:

CHAPTER NR 720
SOIL CLEANUP STANDARDS

NR 720.01 PURPOSE. The purpose of this chapter is to establish soil cleanup standards, for the remediation of soil contamination, which result in restoration of the environment to the extent practicable, minimize harmful effects to the air, lands and waters of the state and are protective of public health, safety and welfare, and the environment as required by ss. 144.442 and 144.76, Stats., and which are consistent with ch. 160, Stats., and ch. NR 140. This chapter is adopted pursuant to ss. 144.431(1)(a) and (b), 144.442, 144.76 and 227.11(2), Stats.

NR 720.02 APPLICABILITY. (1) This chapter applies to all remedial actions taken by responsible parties to address soil contamination after an investigation has been conducted at a site, facility or portion of a site or facility that is subject to regulation under s. 144.442 or 144.76, Stats., regardless of whether there is direct involvement or oversight by the department. This chapter also applies to soil contamination at all of the following:

(a) Solid waste facilities, where remedial action is required by the department pursuant to s. NR 508.20(11);

Note: Chapter NR 720 does not apply to landspreading regulated under ch. NR 158 or solid waste facilities where ongoing operations are occurring, unless remedial action is required pursuant to s. NR 508.20(11).

(b) Hazardous waste facilities, where the owner or operator is required to close the facility pursuant to s. 144.64(2m), Stats., or ch. NR 685, to institute corrective action pursuant to s. 144.735, Stats., or s. NR 635.17, or to meet requirements imposed by the department under s. NR 600.07 where a discharge has occurred. However, if U.S. EPA requires that states employ soil cleanup standards for hazardous waste facilities that are more stringent than the standards in this chapter, the department is obligated under the state's hazardous waste management act, ss. 144.60 to 144.74, Stats., and its hazardous waste program RCRA authorization to apply the more stringent soil cleanup standards.

(c) Wastewater lagoons, storage structures and treatment structures that are abandoned pursuant to s. NR 110.09, 213.07 or 214.08.

Note: Chapter NR 720 applies to abandonment of lagoons, storage structures and treatment structures for sewage treatment facilities projects; abandonment of lagoons, storage structures and treatment structures that receive wastewaters, associated sludges, by-product solids and any resulting leachates from industrial, commercial or agricultural sources, except as provided in s. NR 213.02(2); and abandonment of land treatment systems for industrial liquid wastes, by-product solids and sludges, except as provided in s. NR 214.02(3). Chapter NR 720 does not apply to activities regulated under s. 146.20, Stats., or permitted activities regulated under 40 CFR 503 or ch. NR 204, 206 or 214, including permitted land spreading of sludge or land disposal of wastewaters from municipal and domestic wastewater treatment works and permitted land treatment of industrial liquid wastes, by-product solids and sludges.

(2) This chapter applies to interim actions taken by responsible parties, when at the completion of both the site investigation and interim action taken to address contaminated soil, the

responsible parties request that the site or facility be closed out in accordance with ch. NR 726, without taking a subsequent remedial action to address the contaminated soil.

(3) This chapter applies to remedial actions taken by the department where a department-funded response action is being taken under the authority of s. 144.442 or 144.76, Stats.

(4) Concentrations of legally applied pesticides are exempt from the requirements of this chapter when all of the following conditions are met:

(a) The application of the pesticide was done in compliance with:

1. The pesticide label currently registered with the U.S. EPA;
2. Sections 94.67 to 94.71, Stats.; and
3. Rules adopted under ss. 94.67 to 94.71, Stats.

(b) For pesticides that are intended to be applied to the soil, pesticide concentrations exceeding soil cleanup standards are only found in the surface soil layer, where the pesticide is expected to perform its intended purpose, and only at concentrations that would be expected from pesticide application, in compliance with the pesticide label requirements.

Note: The depth of the surface layer of soil will vary depending on the type of pesticide applied and the appropriate intended use of that pesticide.

(5) The department may exercise enforcement discretion on a case-by-case basis and choose to regulate a site, facility or a portion of a site or facility under only one of a number of potentially applicable statutory authorities. However, where overlapping restrictions or requirements apply, the more restrictive control. The department shall, after receipt of a request from a responsible party, provide a letter that indicates which regulatory program or programs the department considers to be applicable.

Note: Sites, facilities or portions of a site or facility that are subject to regulation under s. 144.442 or 144.76, Stats., may also be subject to regulation under other statutes, including solid waste statutes, ss. 144.43 to 144.47, Stats., or the hazardous waste management act, ss. 144.60 to 144.74, Stats., and the administrative rules adopted pursuant to those statutes. One portion of

a site or facility may be regulated under a different statutory authority than other portions of that site or facility. When necessary, the department will, to the best of its ability, facilitate coordination between the regulatory programs involved.

(6) The department may take any action within the context of regulatory programs established in statutes or rules outside this chapter, if those actions are necessary to protect public health, welfare or safety or prevent a damaging effect on the environment for present and future uses, whether or not a soil cleanup standard has been adopted under this chapter.

(7) Nothing in this chapter authorizes an impact on soil quality that would cause a violation of a groundwater quality standard contained in ch. NR 140, an impact on soil quality or groundwater quality that would cause a violation of a surface water quality standard contained in chs. NR 102 to 106 or an impact on soil quality that would cause a violation of an air quality standard contained in chs. NR 400 to 499.

NR 720.03 DEFINITIONS. In this chapter:

(1) "Aquifer" means a saturated subsurface geological formation of rock or soil.

(2) "Contaminant of concern" means a hazardous substance that is present at a site or facility in such concentrations that the contaminant poses an actual or potential threat to human health, safety or welfare or the environment based upon:

(a) The toxicological characteristics of the hazardous substance that influence its ability to adversely affect human health or the environment relative to the concentration of the hazardous substance at the site or facility;

(b) The chemical and physical characteristics of the hazardous substance which govern its tendency to persist in the environment and the chemical, physical and biological characteristics at the site or facility which govern the tendency for the hazardous substance to persist at the site or facility;

(c) The chemical and physical characteristics of the hazardous substance which govern its tendency to move into and through environmental media;

- (d) The naturally occurring background concentrations of the hazardous substance;
- (e) The thoroughness of the testing for the hazardous substance at the site or facility;
- (f) The frequency that the hazardous substance has been detected at the site or facility; and
- (g) Degradation by-products of the hazardous substance.

(3) "Cumulative excess cancer risk" means the upper bound on the estimated excess cancer risk associated with exposure to multiple hazardous substances or multiple exposure pathways.

(4) "Direct contact" means human exposure to substances in soil through inhalation of particulate matter or incidental ingestion of soil.

Note: The definition of direct contact will be expanded in future revisions to include human exposures by inhalation of vapors and dermal absorption.

(5) "Hazard index" means the sum of 2 or more hazard quotients for multiple hazardous substances or multiple exposure pathways.

(6) "Hazard quotient" means the ratio of the exposure of a single hazardous substance over a specified time period to a reference dose, or reference concentration where appropriate, for that hazardous substance derived for a similar exposure period.

Note: Hazard quotients and the hazard index are measures of noncarcinogenic risk.

(7) "Incidental ingestion of soil" means ingestion of soil by humans as a result of normal hand-to-mouth behaviors.

(8) "Inhalation of particulate matter" means inhalation by humans of air with contaminated soil particles less than 10 microns in diameter.

(9) "Limit of detection" means the lowest concentration level that can be determined to be statistically different from a blank.

Note: This definition of "limit of detection" is consistent with ss. NR 140.05(12) and 149.03(15).

(10) "Limit of quantitation" means the lowest concentration for an analytical test method and sample matrix at which the quantity of a particular substance can be measured with a stated degree of confidence.

(11) "Pathway" means the route a substance takes in traveling to a receptor or potential receptor or the specific portal of entry, such as lungs, skin or digestive tract, the substance takes to potentially express its toxic effect, or both.

Note: The food chain pathway for cadmium, for example, refers to cadmium being taken up in plant tissue and the plant tissue being ingested by an organism.

(12) "Responsible parties" means:

(a) Persons who are required to address soil contamination under s. 144.76, Stats., or who agree to address soil contamination in a contract entered into under s. 144.442, Stats.

(b) Owners and operators of solid waste facilities that are subject to regulation under ch. NR 508;

(c) Owners and operators of hazardous waste facilities that are subject to the closure requirements of s. 144.64(2m), Stats., or ch. NR 685 or the corrective action requirements of s. 144.735, Stats., or s. NR 635.17 or where the department has imposed special requirements where a discharge has occurred under s. NR 600.07; and

(d) Owners and operators of wastewater lagoons, storage structures or treatment structures that are abandoned and are subject to regulation under s. NR 110.09, 213.07 or 214.08.

(13) "Restricted access areas" means land immediately adjacent to highways or railroad right-of-ways, where the presence of structural controls, such as fencing, has eliminated pedestrian ingress by the public.

(14) "Risk" means the probability that a hazardous substance, when released to the environment, will cause adverse effects in exposed humans or other biological receptors.

NR 720.05 GENERAL. (1) Responsible parties shall select and implement a remedial action to address soil contamination when, after any of the following investigations has been completed,

information collected during the investigation indicates that a remedial action to address soil contamination is necessary to achieve compliance with the requirements of this chapter:

(a) Site investigation report developed in accordance with ch. NR 716 at sites or facilities subject to regulation under s. 144.442 or 144.76, Stats.

(b) Solid waste in-field conditions report prepared in accordance with the requirements of s. NR 508.20(11).

(c) Investigation done under a hazardous waste closure plan or a RCRA facility investigation report, developed in accordance with the requirements of ch. NR 685 or s. NR 635.17 or 600.07.

(d) Investigation done under a wastewater facility, structure or system abandonment plan developed in accordance with the requirements of s. NR 110.09(2)(r), 213.07 or 214.08.

Note: Remedial actions at some types of sites or facilities, such as the abandonment of wastewater lagoons, may only have to comply with ch. NR 720 and not other requirements in the NR 700 series, such as the minimum site investigation requirements in ch. NR 716. In this case, the department or responsible parties may choose to use the other chapters of the NR 700 rule series as guidance for complying with ch. NR 720.

(2) Remedial actions conducted by responsible parties to address soil contamination shall be designed and implemented to restore the contaminated soil to levels that, at a minimum, meet the soil cleanup standards for the site or facility determined in accordance with this chapter.

(3) If all soil contaminant concentrations meet applicable soil cleanup standards after a remedial action is completed the department may not require further remedial action for soils, unless the department determines that the residual soil contamination:

(a) Presents a threat to public health, safety or welfare or the environment at the site or facility;

(b) Will cause a violation of a groundwater quality standard contained in ch. NR 140;

(c) Will cause a violation of a surface water quality standard contained in chs. NR 102 to 106; or

(d) Will cause a violation of an air quality standard contained in chs. NR 400 to 499.

NR 720.07 PROCEDURES FOR ESTABLISHING SOIL CLEANUP STANDARDS APPLICABLE TO A SITE OR FACILITY. (1) GENERAL. (a) Responsible parties shall use information from the sources listed in s. NR 720.05(1) to determine the residual contaminant levels or performance standards for each exposure or migration pathway of concern for each soil contaminant of concern at a site or facility in accordance with ss. NR 720.09 to 720.19.

(b) In addition to meeting the requirements of par. (c), responsible parties shall establish the soil cleanup standard for each soil contaminant of concern at the site or facility as:

1. The residual contaminant level which is the lowest concentration of those determined in accordance with the requirements of ss. NR 720.09 to 720.19(3); or

Note: Numeric residual contaminant levels are determined separately for each exposure or migration pathway of concern at a site. These residual contaminant levels are not the soil cleanup standard for the site. The soil cleanup standard for the site is determined by selecting the lowest concentration from among the individual residual contaminant levels determined for each pathway.

2. A performance standard determined in accordance with s. NR 720.19(2).

(c) In addition to meeting the requirements of par. (b), a soil cleanup standard developed under this chapter shall comply with the following requirements:

1. Residual soil contamination at the site or facility shall not adversely affect surface water;
2. Residual soil contamination at the site or facility shall not adversely affect a sensitive environment; and
3. Residual soil contamination at the site or facility shall not concentrate through plant uptake and adversely affect the food chain.

Note: It is the department's intention to adopt in the future soil cleanup standards based on protection of human food chain exposures, protection of surface water quality and protection of terrestrial ecosystems after exposure assumptions and methods have been developed to allow the

department to calculate soil cleanup standards for these pathways of exposure. Responsible parties are required by ss. NR 720.07(2) and 720.19(6) to consider human food chain exposures, the protection of surface water quality and the protection of terrestrial ecosystems, if these pathways are of concern, when determining a residual contaminant level at a site or facility.

(2) COMPLIANCE WITH SOIL CLEANUP STANDARDS. (a) Contaminant concentrations in soil samples shall be determined using a department-approved and appropriate analytical method and reported on a dry weight basis. An appropriate analytical method shall have limits of detection or limits of quantitation, or both, at or below soil cleanup standards where possible. Responsible parties shall report the limit of detection and the limit of quantitation with sample results. The department may require that supporting documentation for the reported limit of detection and limit of quantitation be submitted.

(b) If a soil contaminant concentration in a sample exceeds the soil cleanup standard at or above the limit of quantitation for that soil contaminant, the soil cleanup standard shall be considered to have been exceeded.

(c) If a soil cleanup standard for a soil contaminant is between the limit of detection and the limit of quantitation, the soil cleanup standard shall be considered to be exceeded if the soil contaminant concentration is reported at or above the limit of quantitation.

(d) The following applies when a soil cleanup standard for a soil contaminant is below the limit of detection:

1. If a soil contaminant is not detected in a sample, the soil cleanup standard shall not be considered to have been exceeded.

2. If a soil contaminant is reported above the limit of detection but below the limit of quantitation, the soil cleanup standard shall be considered to have been exceeded if the presence of that soil contaminant has been confirmed by the use of an appropriate analytical method.

NR 720.09 DETERMINATION OF RESIDUAL CONTAMINANT LEVELS BASED ON PROTECTION OF GROUNDWATER. (1) CRITERIA AND PROCESS USING GENERIC RESIDUAL

CONTAMINANT LEVELS. If all of the following criteria are met, responsible parties may use one of the methods in sub. (3) and, where applicable, the standards in sub. (4) to determine residual contaminant levels based on groundwater protection for a site or facility:

(a) An investigation has been conducted and completed in accordance with applicable administrative rules, as specified in s. NR 720.05(1);

(b) The contaminants of concern are listed in Table 1, except that at sites or facilities with petroleum contamination where gasoline range organics (GRO) or diesel range organics (DRO), or both, are the only contaminants of concern present other than contaminants listed in Table 1, the standards in sub. (4)(a) may be used for non-specific GRO or DRO contamination in addition to the methods in sub. (3) which are applicable to contaminants listed in Table 1;

(c) The horizontal and vertical degree and extent of contamination is defined;

(d) The vertical distance from the base of the contaminated soil to carbonate bedrock (limestone or dolostone) or fractured bedrock is one meter (3.28 feet) or greater;

(e) The vertical thickness of the residual soil contamination is 6 meters (19.69 feet) or less;
and

(f) None of the residual contaminants or combinations of residual contaminants at the site or facility are known to contribute to facilitated transport or cosolvent effects.

Note: In some cases, a contaminant or combination of contaminants may contribute to an increased potential for migration of contaminants to groundwater by facilitated transport or by acting as a solvent for other contaminants, which would make the use of the values in Table 1 inappropriate. An example of facilitated transport might be polychlorinated biphenyls (PCBs) in the presence of an oily phase. An example of cosolvency might be polycyclic aromatic hydrocarbons (PAHs) in the presence of alcohols, where the alcohol acts to increase the solubility of the PAHs.

Note: If a site or facility meets the criteria in sub. (1), responsible parties are not required to use the methods for generic residual contaminant levels in sub. (3). The procedure in s. NR

720.19 may be used to determine site-specific soil cleanup standards even when the site or facility meets the criteria in sub.(1).

(2) **SITE-SPECIFIC PROCESS.** If any of the criteria in sub. (1) are not met, responsible parties shall use the procedure in s. NR 720.19 to determine soil cleanup standards specific to a site or facility based on groundwater protection.

(3) **METHODS FOR DETERMINING GENERIC RESIDUAL CONTAMINANT LEVELS.**

Responsible parties may select one of the following methods to determine residual contaminant levels based on groundwater protection for sites or facilities that meet all of the criteria in sub. (1) in addition to meeting the requirements of sub. (4), if applicable:

(a) Method 1. Responsible parties may use the residual contaminant levels based on protection of groundwater listed for each substance in Table 1.

(b) Method 2. 1. Responsible parties may determine the residual contaminant levels based on protection of groundwater using the baseline concentration for each substance listed in Table 1 multiplied by a groundwater dilution factor specific to the site or facility determined using parameter values from the site or facility determined in accordance with subd. 2. and a groundwater mixing zone depth of 5 feet (152.4 cm) in the following equation:

$$DF = 1 + \frac{K \times I \times d}{R \times l}$$

Where: DF = groundwater dilution factor,

K = hydraulic conductivity (cm/day),

I = hydraulic gradient (cm/cm)

d = depth of groundwater mixing zone (cm)

R = average groundwater recharge rate (cm/day), and

l = horizontal extent of contaminated soil parallel to the hydraulic gradient (cm).

2. Parameter values specific to the site or facility shall be determined as follows:

a. Hydraulic conductivity shall be determined as the geometric mean of values determined from appropriate aquifer tests. Appropriate aquifer tests may include slug tests and pumping tests, and shall be properly performed using accepted practices.

b. Hydraulic gradient shall be determined using water level measurements from a minimum of 3 groundwater monitoring wells whose screens intersect the same hydrogeologic unit using the procedures specified in s. NR 716.13(8). In cases where the magnitude of the hydraulic gradient is known to vary, an average value shall be used.

Note: Section NR 716.13(8) requires that water levels be measured and recorded to the nearest 0.01 foot prior to obtaining a groundwater sample from the well.

c. Horizontal extent of contaminated soil parallel to the hydraulic gradient shall be determined as the maximum lateral extent from the information listed in s. NR 720.05(1) and direction of the hydraulic gradient determined in subpar. b. In cases where the direction of the hydraulic gradient is known to vary, the longest appropriate dimension shall be used.

d. Average groundwater recharge rate shall be determined using an appropriate method or a default value of 0.07 cm/day.

Note: The default value of 0.07 cm/day is equivalent to an average annual recharge rate of 10 inches/year (25.4 cm/year).

Note: Average groundwater recharge rate can be approximated from the infiltration rate less the evapotranspiration rate. Appropriate methods may include the review of literature sources applicable to the site or facility or the use of field measurements, analytical solutions for estimating infiltration rate combined with analytical or empirical equations for estimating of evapotranspiration, or water balance approaches, among others. It is preferable to overestimate the average groundwater recharge rate rather than underestimate it.

Note: In some cases, use of Method 2 will yield residual contaminant levels lower than those for Method 1. In such cases, the residual contaminant level for Method 1 can be used.

(4) PETROLEUM CONTAMINATION. (a) Generic residual contaminant levels. 1. For sites or facilities with petroleum contamination where subd. 2 is not applicable, the soil cleanup standard for gasoline range organics (GRO) or diesel range organics (DRO) is a concentration in soil that may not exceed 100 milligrams per kilogram for either GRO or DRO.

2. For sites or facilities with petroleum contamination where contaminated soils and soils below the contaminated soil for a depth of 3 meters have a hydraulic conductivity of 1×10^{-6} cm/s or less, the soil cleanup standard for gasoline range organics (GRO) or diesel range organics (DRO) is a concentration in soil that may not exceed 250 milligrams per kilogram for either GRO or DRO.

Note: Milligrams per kilogram (mg/kg) is equivalent to parts per million (ppm) in soil.

(b) Site-specific determination. For sites or facilities with petroleum contamination where the concentration of gasoline range organics or diesel range organics, or both, is greater than the concentration specified in par. (a), Table 1 may be used to determine the residual contaminant levels for the compounds listed in Table 1 and soil cleanup standards for gasoline range organics and diesel range organics may be determined using the procedure in s. NR 720.19.

Table 1

Baseline Concentrations, Dilution Attenuation Factors
And Residual Contaminant Levels
Based On Protection Of Groundwater

Substance	Baseline Concentration $\mu\text{g}/\text{kg}$	Dilution Attenuation Factor	Residual Contaminant Level $\mu\text{g}/\text{kg}$
Benzene	0.093	59	5.5
1,2 Dichloroethane	0.041	120	4.9
Ethylbenzene	42	70	2900
Toluene	18	81	1500
Xylenes (total)	47	87	4100

Note: Micrograms per kilogram ($\mu\text{g}/\text{kg}$) is equivalent to parts per billion (ppb) in soil. Soil concentrations are on a dry weight basis.

Note: The residual contaminant levels for Method 1 listed in Table 1 represent concentrations of contaminants that can remain in soil at a site and not cause a violation of a ch. NR 140 preventive action limit in groundwater. These residual contaminant levels are based on the baseline concentration for a substance multiplied by the dilution attenuation factor for that substance listed in Table 1.

Note: The residual contaminant levels in Table 1 are based on protection of groundwater. These concentrations of hazardous substances in soil may not be protective of other pathways of concern.

NR 720.11 DETERMINING RESIDUAL CONTAMINANT LEVELS BASED ON PROTECTION OF HUMAN HEALTH FROM DIRECT CONTACT WITH CONTAMINATED SOIL. (1) LAND USE

CLASSIFICATION. (a) Responsible parties shall determine an appropriate land use classification for the site or facility in compliance with pars. (b) to (d), unless otherwise directed by the department.

(b) Responsible parties shall classify the land use of a site or facility as non-industrial unless all of the following criteria are met:

1. The site or facility is currently zoned for, or otherwise officially designated for, industrial use.

Note: A site or facility may be officially designated for industrial use by the issuance of a conditional use or special exception permit that allows an industrial use of that site or facility in a non-industrial zoning district or by the designation of an area as industrial in a county development plan or a municipal master plan, among other means.

2. The site or facility is expected to be used for industrial purposes due to zoning, statutory or regulatory restrictions, comprehensive plans, adjacent land use or other relevant factors.

3. More stringent residual contaminant levels for soil are not necessary to protect public health on or off the site or facility.

Note: Situations where s. NR 720.11(1)(b)3 would apply include site or facilities which could otherwise be classified as industrial, but where proximity to a nonindustrial land use, such as residential housing located across the street, makes a nonindustrial classification more appropriate.

(c) The land use of a site or facility may be classified as industrial if all of the criteria in par. (b) are met and if a deed restriction which meets the requirements of s. NR 726.05(8) is recorded within 30 days after remedial action is initiated at the site or facility.

(d) The industrial column in Table 2 may be applied to restricted access areas unless more stringent residual contaminant levels are necessary to protect public health on or of the site.

Note: A deed restriction must be recorded if soil cleanup levels based on industrial exposure are used.

(2) CRITERIA AND PROCESS FOR USING GENERIC RESIDUAL CONTAMINANT LEVELS. If all of the following criteria are met for a site or facility, responsible parties may use the residual contaminant levels based on protection from direct contact listed for each substance in Table 2 which are appropriate for the site or facility in accordance with the land use classification determined in sub. (1), unless sub. (3) or (5), or both, applies:

(a) An investigation has been conducted in accordance with applicable administrative rules, as specified in s. NR 720.05(1);

(b) The contaminants of concern present at the site or facility are listed in Table 2; and

Note: For example, at a site where soils are contaminated with diesel fuel, polynuclear aromatic hydrocarbon (PAH) compounds are present and may be considered contaminants of concern. With the exception of naphthalene, PAH compounds are generally only of concern for direct contact due to their relatively low migration potential.

(c) The horizontal and vertical degree and extent of contamination is defined.

Note: If a site or facility meets the criteria in s. NR 720.11(2) responsible parties are not required to use the procedure for generic residual contaminant levels in sub. (2). The procedure in s. NR 720.19 may be used to determine site-specific soil cleanup standards even when the site or facility meets the criteria in sub. (2).

(3) CUMULATIVE RISK. (a) The cumulative excess cancer risk may not exceed 1×10^{-5} and the hazard index for non-carcinogens may not exceed one for the contaminants of concern at a site or facility.

(b) Risks for carcinogens and for non-carcinogens are presumed to be additive within each category. The residual contaminant levels in Table 2 shall be prorated downward to keep the cumulative risk below the levels specified in par. (a).

Note: The residual contaminant levels for non-industrial land use in Table 2 are based on an excess cancer risk of 1×10^{-7} for carcinogens or a hazard quotient of 0.2 for noncarcinogens. These levels are intended to be analogous with the preventive action levels in ch. NR 140.

(4) SITE-SPECIFIC PROCESS. If any of the criteria in sub. (2) are not met, responsible parties shall use the procedure in s. NR 720.19 to determine soil cleanup standards specific to a site or facility based on protection from direct contact.

(5) EXCEPTIONS. If the background concentration for a substance in soil at a site or facility is higher than the residual contaminant level for that substance listed in Table 2 or determined using the procedure in s. NR 720.19(3), the background concentration in soil may be used as the residual contaminant level for that substance. The background concentration for a substance in soil shall be determined using a department-approved and appropriate method.

Note: Naturally occurring background concentrations of arsenic in soil, for example, may be higher than the residual contaminant level for arsenic listed in Table 2. In such instances, the naturally occurring background concentration should be used as the soil cleanup level.

Table 2
Residual Contaminant Levels Based On
Human Health Risk From Direct Contact Related To Land Use
(milligrams per kilogram)

Substance	Non-Industrial	Industrial	Basis
Arsenic	0.039	1.6	cancer
Cadmium	8	510	noncancer
Chromium, hexavalent	14	200	cancer
Chromium, trivalent	16,000	NA	noncancer
Lead	50	500	noncancer

NA = Not applicable

Note: Milligrams per kilogram (mg/kg) is equivalent to parts per million (ppm) in soil. Soil concentrations are on a dry weight basis.

Note: The residual contaminant levels in Table 2 are based on protection of human health from direct contact through ingestion of soil or inhalation of particulate matter. These concentrations of hazardous substances in soil may not be protective of other pathways of concern. The definition of direct contact will be expanded in future revisions to include human exposures by inhalation of vapors and dermal absorption. In addition, these levels may be higher than those which would be characteristic hazardous waste when tested using the toxicity characteristic leaching procedure (TCLP), U.S. EPA Method 1312.

NR 720.19 PROCEDURE FOR DETERMINING SOIL CLEANUP STANDARDS SPECIFIC TO A SITE OR FACILITY. (1) GENERAL. (a) Responsible parties shall propose a soil cleanup standard specific to a site or facility in accordance with the requirements of this section when required in ss. NR 720.09 to 720.11 or if it is determined that it is not practicable to achieve the residual contaminant level for a soil contaminant specified in ss. NR 720.09 to 720.11 using on-site

remedial action or, if the responsible party chooses to utilize off-site remedial actions, using off-site remedial action or a combination of on-site and off-site remedial actions at a site or facility.

(b) Responsible parties shall establish a soil cleanup standard for a specific soil contaminant or physical location at a site or facility using one of the methods in sub. (2) or (3).

(2) PERFORMANCE STANDARD. If selected, a performance standard shall be established for a remedial action so that the remedial action is operated and maintained, in compliance with chs. NR 722 and 724 when those chapters are applicable to the site or facility, until the lowest concentration that is practicable is achieved or a permanent engineering control is maintained, or both, so that the residual contaminants left in the soil do not pose a threat to public health, safety and welfare or the environment.

Note: Examples of performance standards include the allowable rate of infiltration by soil contaminants into the groundwater after a membrane liner has been installed, or the rate or percentage of removal efficiency offered by an in-situ treatment system at a specific site or facility. At a site or facility where an engineering control is being considered for selection, in accordance with the requirements of ch. NR 722, an engineering control may be selected even though the soil contaminants exceed a residual contaminant level.

(3) RESIDUAL CONTAMINANT LEVELS SPECIFIC TO A SITE OR FACILITY. If selected, residual contaminant levels specific to a site or facility shall be established that are protective of public health, safety and welfare and the environment and restore the environment to the lowest concentration practicable, in accordance with the requirements of sub. (4) to (6). Even in cases where the procedure in sub. (3) is selected by the responsible party, the procedure in sub. (2) may be used when the residual contaminant levels established under sub. (3) are not practicable to achieve.

(4) PROTECTION OF GROUNDWATER. (a) Residual contaminant levels for soil based on protection of groundwater shall be developed using the preventive action limits (PALs) established in ch. NR 140 or using procedures consistent with the methodology in ss. 160.13 and 160.15,

Stats., and the criteria in s. NR 722.07(2)(b)2. when there is no preventive action limit as the target concentrations in groundwater.

Note: In developing a residual contaminant level, any relevant information shall be considered, including public welfare concerns for groundwater, such as taste and odor.

(b) Responsible parties shall use one or more of the methods listed in this paragraph based on scientifically valid procedures that are subject to department review and approval and site-specific geological, physical and chemical conditions to establish residual contaminant levels.

1. A contaminant transport and fate model.
2. Leaching tests appropriate for the site or facility in both application and extent.
3. Any other appropriate method approved by the department for that specific site or facility, or other appropriate method suggested in department guidance.

(5) PROTECTION OF HUMAN HEALTH FROM DIRECT CONTACT. (a) General. Residual contaminant levels for soil based on protection of human health from direct contact shall be developed:

1. For individual compounds using the excess cancer risk of 1×10^{-6} and the hazard quotient for non-carcinogens of one; and
2. So that the cumulative excess cancer risk will not exceed 1×10^{-5} and the hazard index for non-carcinogens will not exceed one for the site or facility.
3. Risks for carcinogens and for non-carcinogens are presumed to be additive within each category, unless there is specific information that demonstrates that an alternative approach is more appropriate.
4. If toxicological indices for both carcinogenic and non-carcinogenic end points exist for a substance, both shall be evaluated and the value that generates the lowest residual contaminant level shall be used for the site or facility.

(b) Methods and procedures. Responsible parties shall determine a residual contaminant level to protect public health from direct contact with soil contamination using scientifically valid

procedures and toxicological values approved by the department and the default exposure assumptions identified in par. (c) or alternative assumptions specifically approved by the department in writing.

Note: The department will generally consider toxicological values in the following order: recommendations of the department of health and social services; indices contained in U.S. EPA's Integrated Risk Information System (IRIS); indices contained in U.S. EPA's Health Effects Assessment Summary Tables (HEAST); recommendations of U. S. EPA's Environmental Criteria and Assessment Office; indices withdrawn from IRIS; indices withdrawn from HEAST; and other pertinent toxicological information.

(c) Default exposure assumptions. 1. Non-carcinogens. When the contaminant is not a carcinogen, the following default exposure assumptions shall be used:

a. When the land use of a site or facility is classified as non-industrial, in accordance with s. NR 720.11(1), incidental ingestion of soil shall be assumed to occur at the rate of 200 mg of soil per day for a 15 kg child for 350 days each year and inhalation of particulate matter shall be assumed to occur at the inhalation rate of 20 m³ of air per day with a concentration of 1.4 µg/m³ of contaminated soil particles less than 10 µm in diameter for 350 days each year, for 6 years.

b. When the land use of a site or facility is classified as industrial, in accordance with s. NR 720.11(1), incidental ingestion of soil shall be assumed to occur at the rate of 100 mg of soil per day for a 70 kg adult worker for 250 days each year and inhalation of particulate matter shall be assumed to occur at the inhalation rate of 24 m³ of air per day with a concentration of 1.4 µg/m³ of contaminated soil particles less than 10 µm in diameter for 250 days each year, for 25 years.

2. Carcinogens. When the contaminant is a carcinogen, the following default exposure assumptions shall be used:

a. When the land use of a site or facility is classified as non-industrial, in accordance with s. NR 720.11(1), incidental ingestion of soil shall be assumed to occur at the rate of 200 mg of soil per day for 350 days each year for 6 years for a 15 kg child and the rate of 100 mg per day for

350 days each year for 24 years for a 70 kg adult and inhalation of particulate matter shall be assumed to occur at the inhalation rate of 20 m³ of air per day with a concentration of 1.4 µg/m³ of contaminated soil particles less than 10 µm in diameter for 350 days each year for 30 years, during a 70 year lifetime.

b. When the land use of a site or facility is classified as industrial, in accordance with s. NR 720.11(1), incidental ingestion of soil shall be assumed to occur at the rate of 100 mg of soil per day for 250 days each year for a 70 kg adult worker and inhalation of particulate matter shall be assumed to occur at the inhalation rate of 24 m³ of air per day with a concentration of 1.4 µg/m³ of contaminated soil particles less than 10 µm in diameter for 250 days each year, for 25 years during a 70 year lifetime.

Note: Department approval of alternative exposure assumptions for a site or facility will be based on consultation with the department of health and social services.

(6) OTHER PATHWAYS OF CONCERN. Responsible parties shall consider human food chain, surface water quality and terrestrial ecosystem pathways of exposure, when those pathways of exposure are of concern at a site or facility.

Note: In some cases, the potential for contaminant migration or exposure to contamination through other pathways may be of concern at a site or facility. These situations could include contaminated soil in close proximity to a surface water where the potential for runoff from the site or facility to cause an impact on surface water quality exists or contaminated soil where potential for bioaccumulation through the food chain resulting in adverse impacts to human health or terrestrial ecosystems exists. Section NR 720.19(6) requires responsible parties to establish appropriate residual contaminant levels protective of these pathways when necessary.

(7) SUBMITTALS. (a) Unless otherwise directed by the department, submittals under this section shall be included in the site investigation report or the draft remedial action options report required under s. NR 700.11(2)(b).

(b) Submittals to the department under this section shall include all of the following:

1. Complete background information and supporting documentation for the procedure to be used;
2. Documentation that the application of the procedure is valid for the site or facility under consideration;
3. Necessary data and documentation needed to fully evaluate the submittal; and
4. Legible copies of source documents or pertinent portions of source documents.

Note: The use of references to source documents alone in a submittal is generally not adequate for efficient department review. For example, background documentation for a given contaminant transport and fate model or articles in obscure publications may not be readily available or accessible to department staff. Considerable time can be spent in obtaining this documentation before a submittal can be reviewed. In order to facilitate department review of submittals, legible copies of entire source documents or the pertinent portions of source documents sufficient to evaluate the method or procedure used should be included with the submittal. The department will not purchase documents in order to review a particular submittal.

The foregoing rules was approved and adopted by the State of Wisconsin Natural Resources Board on July 21, 1994.

The rule shall take effect on the first day of the month following publication in the Wisconsin administrative register as provided in s. 227.22(2)(intro.), Stats.

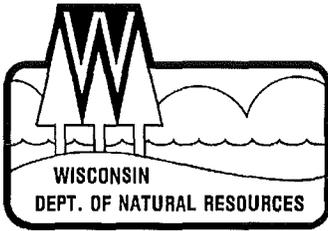
Dated at Madison, Wisconsin January 21, 1995

STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES

By George E. Meyer
George E. Meyer, Secretary

(SEAL)





George E. Meyer
Secretary

State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

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January 23, 1995

Mr. Gary L. Poulson
Assistant Revisor of Statutes
131 West Wilson Street - Suite 800
Madison, WI

Dear Mr. Poulson:

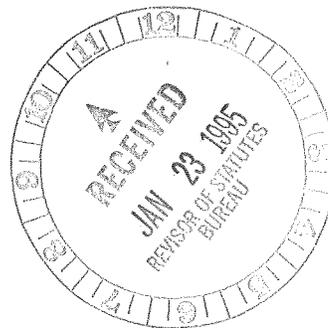
Enclosed are two copies, including one certified copy, of State of Wisconsin Natural Resources Board Order No. SW-16-94a. These rules were reviewed by the Assembly Committee-on Natural Resources and the Senate Committee on Environment and Energy pursuant to s. 227.19, Stats. Summaries of the final regulatory flexibility analysis and comments of the legislative review committees are also enclosed.

You will note that this order takes effect following publication. Kindly publish it in the Administrative Code accordingly.

Sincerely,

George E. Meyer
Secretary

Enc.



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